

Committee Members Steve Jones, Chairman Andrew Do Patrick Harper Fred Jung Tam Nguyen Vicente Sarmiento

Orange County Transportation Authority Board Room 550 South Main Street Orange, California Thursday, June 9, 2022 at 9:00 a.m.

Any person with a disability who requires a modification or accommodation in order to participate in this meeting should contact the OCTA Clerk of the Board at (714) 560-5676, no less than two business days prior to this meeting to enable OCTA to make reasonable arrangements to assure accessibility to this meeting.

Agenda Descriptions

Agenda descriptions are intended to give members of the public a general summary of items of business to be transacted or discussed. The posting of the recommended actions does not indicate what action will be taken. The Committee may take any action which it deems to be appropriate on the agenda item and is not limited in any way by the notice of the recommended action.

Public Availability of Agenda Materials

All documents relative to the items referenced in this agenda are available for public inspection at www.octa.net or through the OCTA Clerk of the Board's office at 600 South Main Street, Orange, California.

Meeting Access and Public Comments on Agenda Items

Members of the public can either attend in person (subject to OCTA's Coronavirus (COVID-19) safety protocols) or listen to audio live streaming of the Board and Committee meeting at: <u>Board of Directors - Live and Archived Audio</u>.

Members of the public may address the Board regarding any item two ways:

In Person Comment

Members of the public may attend in person (subject to OCTA's COVID-19 safety protocols) and address the Board regarding any item. Members of the public will be required to complete a COVID-19 symptom and temperature screening.

Please complete a speaker's card and submit it to the Clerk of the Board or notify the Clerk of the Board the item number on which you wish to speak. Speakers will be recognized by the Chairman at the time the agenda item is to be considered. A speaker's comments shall be limited to three minutes.



Written Comment

Written public comments may also be submitted by emailing them to <u>ClerkOffice@octa.net</u>, and must be received no later than **5:00 p.m. the day prior to the meeting**. If you wish to comment on a specific agenda item, please identify the item number in your email. All public comments that are timely received will be part of the public record and distributed to the Board. Public comments will be made available to the public upon request.

Call to Order

Pledge of Allegiance Director Do

Special Calendar

There are no Special Calendar matters.

Consent Calendar (Items 1 through 3)

All items on the Consent Calendar are to be approved in one motion unless a Committee Member or a member of the public requests separate action or discussion on a specific item.

1. Approval of Minutes

Approval of the minutes of the Transit Committee meeting of May 12, 2022.

2. Radio Voice Over Internet Protocol Pilot for Paratransit Vehicles Michael Beerer/Andrew Oftelie

Overview

The Orange County Transportation Authority's existing radio system for the paratransit vehicles will reach the end of its useful life and will need to be replaced in five years. Board of Directors' approval is requested for a pilot program using six paratransit vehicles to test functionality and operation of a new solution to replace the existing radio system.

Recommendation

Authorize the Chief Executive Officer to negotiate and execute sole source Agreement No. C-2-2165 between the Orange County Transportation Authority and Conduent Transport Solutions, Inc., in the amount of \$250,000, for a one-year term, for an Intelligent Transportation Management System radio voice over internet protocol pilot program for paratransit vehicles.



3. Bus Operations Performance Measurements Report for the Third Quarter of Fiscal Year 2021-22 Johnny Dunning, Jr.

Overview

The Orange County Transportation Authority operates fixed-route bus and demand-response paratransit service throughout Orange County and into neighboring counties. The established measures of performance for these services assess the safety, courtesy, reliability, and overall quality of the services. This report summarizes the year-to-date performance of these services through the third quarter of fiscal year 2021-22.

Recommendation

Receive and file as an information item.

Regular Calendar

4. Approval to Adopt the Mitigated Negative Declaration Finding for the Orange County Maintenance Facility Project Lora Cross/James G. Beil

Overview

On July 21, 2020, the Orange County Transportation Authority in cooperation with the Southern California Regional Rail Authority, entered into a Cooperative Agreement which defined roles, responsibilities, and funding for preliminary enaineerina and environmental the phase for the Metrolink Orange County Maintenance Facility. The Orange County Transportation Authority has been the lead on the preliminary engineering and environmental documentation. The Board of Directors' adoption of the Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program is required for the project to advance to the next phase.

Recommendation

Adopt Resolution No. 2022 025 to adopt the Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program, pursuant to the California Environmental Quality Act, for the Metrolink Orange County Maintenance Facility.



Discussion Items

5. OC Bus and OC ACCESS Services Update Johnny Dunning, Jr.

Staff will provide an update on the OC Bus and OC ACCESS Services.

6. Fiscal Year 2022-23 Budget Workshop Follow-up Victor Velasquez/Andrew Oftelie

Budget staff is available for follow-up questions, issues, or concerns that may have arisen at and/or since the budget workshop conducted with the Board on May 9, 2022.

- 7. Public Comments
- 8. Chief Executive Officer's Report
- 9. Committee Members' Reports

10. Closed Session

There are no Closed Session items scheduled.

11. Adjournment

The next regularly scheduled meeting of this Committee will be held at **9:00 a.m. on Thursday, July 14, 2022**, at the Orange County Transportation Authority, Board Room, 500 South Main Street, Orange, California.



| Committee Members Present | Staff Present |
|-------------------------------|--|
| Steve Jones, Chairman | Jennifer L. Bergener, Deputy Chief Executive Officer |
| Harry S. Sidhu, Vice Chairman | Andrea West, Interim Clerk of the Board |
| Patrick Harper | Gina Ramirez, Clerk of the Board Specialist, Senior |
| Tam Nguyen | Sahara Meisenheimer, Clerk of the Board Specialist |
| | James Donich, General Counsel |
| | OCTA Staff |
| Committee Members Absent | |
| Andrew Do | Via Teleconference |

Darrell E. Johnson, Chief Executive Officer

Call to Order

Vicente Sarmiento

The May 12, 2022, regular meeting of the Transit Committee (Committee) was called to order by Committee Chairman Jones at 9:02 a.m.

Pledge of Allegiance

Director Nguyen led the Pledge of Allegiance.

Special Calendar

There were no Special Calendar matters

Consent Calendar (Items 1 through 11)

1. Approval of Minutes

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present, to approve the minutes of the Transit Committee meeting of April 14, 2022.

2. Agreement for Installation of 12kV Electrical Switchgear Equipment at the Santa Ana Bus Base

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed bv those present. to authorize the Chief Executive Officer to negotiate and execute Agreement No. C-2-2231 between the Orange County Transportation Authority and Inter-Pacific, Inc., doing business as Inter-Pacific Systems, Inc., the lowest responsive, responsible bidder, in the amount of \$465,096, for the installation of 12kV electrical switchgear equipment at the Santa Ana Bus Base.



3. Agreement for Fire Alarm Control Panels Replacement at the Santa Ana Bus Base

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present, to authorize the Chief Executive Officer to negotiate and execute Agreement No. C-2-2230 County Transportation between the Orange Authority and ADT Commercial LLC, the lowest responsive, responsible bidder, in the amount of \$496,299, for fire alarm control panels replacement at the Santa Ana Bus Base.

4. Agreement for Building Repairs at Irvine Construction Circle Bus Base

A motion was made by Committee Vice Chairman Sidhu, seconded by passed Director Harper, and declared by those present, to authorize the Chief Executive Officer to negotiate and execute No. C-2-2243 between the Agreement Orange Countv Transportation Authority and Golden Gate Steel, Inc., doing business as Golden Gate Construction, the lowest responsive, responsible bidder, in the amount of \$553,417, for building repairs at the Irvine Construction Circle Bus Base fuel island.

5. Agreement for Drainage Pipe Repair at the Anaheim Bus Base Chassis Wash Bay

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present. to authorize the Chief Executive Officer to negotiate and execute Agreement No. C-2-2210 between the Orange County Transportation Authority and Vicon Enterprise Incorporated, the lowest responsive, responsible bidder, in the amount of \$99,500, for drainage pipe repair at the Anaheim Bus Base chassis wash bay.

6. Amendments to Cooperative Agreements with Special Agencies for the Provision of Transportation Services

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present, to:

Α. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 3 to Cooperative Agreement No. C-8-1917 between the Orange County Transportation Authority and Senior Services, LLC. doing business North County as Acacia Adult Day Services, for continued services, and to adjust the per trip rate to \$16.85, effective July 1, 2022 through June 30, 2023. This increase in rate will not change the current maximum obligation of \$1,302,621 due to underruns that cover the projected expenses as a result of the coronavirus pandemic.



- B. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 3 to Cooperative Agreement No. C-8-1918 between the Orange County Transportation Authority and Alzheimer's Family Center for continued services and to adjust the per trip rate to \$16.85, effective July 1, 2022 through June 30, 2023. This increase in rate will not change the current contract maximum obligation of \$1,343,599 due to underruns that cover the projected expenses as a result of the coronavirus pandemic.
- C. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 3 to Cooperative Agreement No. C-8-1919 between the Orange County Transportation Authority and Alzheimer's Orange County for continued services in the amount of \$29,803, and to adjust the per trip rate to \$16.85, effective July 1, 2022 through June 30, 2023. This will increase the maximum obligation of the agreement to a total contract value of \$596,126.
- D. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 3 to Cooperative Agreement No. C-8-1920 between the Orange County Transportation Authority and SeniorServ, doing business Community as Meals on Wheels Orange County, for continued services and to adjust the per trip rate to \$16.85, effective July 1, 2022 through June 30, 2023. This increase in rate will not change the current contract maximum obligation of \$1,362,793 due to underruns that cover the projected expenses as a result of the coronavirus pandemic.
- E. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 3 to Cooperative Agreement No. C-8-1921 between the Orange County Transportation Authority and Orange County Adult Achievement Center, doing business as My Day Counts, for continued services in the amount of \$259,952, and to adjust the per trip rate to \$16.76 and the Regional Center of Orange County pass-through per trip rate to \$6.31 effective July 1, 2022 through June 30, 2023. This will increase the maximum obligation of the agreement to a total contract value of \$3,371,620.
- F. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 1 to Cooperative Agreement No. C-8-1922 between the Orange County Transportation Authority and Innovative Integrated Health, formerly known as Sultan Adult Day Health Care, for continued services and to adjust the per trip rate to \$16.85 effective July 1, 2022 through June 30, 2023. This increase will not change the current maximum obligation of \$1,119,180 due to underruns that cover the projected expenses as a result of the coronavirus pandemic.





7. Amendment to Cooperative Agreement with the Regional Center of Orange County

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present, to authorize the Chief Executive Officer to negotiate and execute Amendment No. 3 to Cooperative Agreement No. C-8-1735 between the Orange County Transportation Authority and the Regional Center of Orange County to exercise the second, two-year option term to share in the cost of paratransit services provided to the Regional Center of Orange County consumers from July 1, 2022, through June 30, 2024.

8. Amendment to Cooperative Agreements with Non-Profit Agencies to Provide Senior Mobility Program Services

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present, to:

- A. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 1 to Cooperative Agreement No. C-1-3259 between the Orange County Transportation Authority and Abrazar, Inc., in the amount of \$89,387 to provide funding through June 30, 2023.
- B. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 1 to Cooperative Agreement No. C-1-3260 between the Orange County Transportation Authority and the Korean American Senior Association of Orange County, in the amount of \$109,894 to provide funding through June 30, 2023.
- C. Authorize the Chief Executive Officer to negotiate and execute Amendment No. 1 to Cooperative Agreement No. C-1-3261 between the Orange County Transportation Authority and Southland Integrated Services, Inc., in the amount of \$96,628, to provide funding through June 30, 2023.

9. Agreement for Transit Training Services

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present, to:

- A. Approve the selection of Mobility Management Partners, Inc. as the firm to provide transit training services.
- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-2-2187 between the Orange County Transportation Authority and Mobility Management Partners, Inc., in the amount of \$1,116,804, to provide transit training services for a three-year initial term with one, two-year option term.



10. Agreement for Coach Operator, Operations Instructor, and Field Supervisor Uniforms

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present, to:

- A. Approve the selection of Becnel Uniforms as the firm to provide coach operator, operations instructor, and field supervisor uniforms on an as needed basis.
- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-1-3928 between the Orange County Transportation Authority and Becnel Uniforms, in the amount of \$674,468, to provide coach operator, operations instructor, and field supervisor uniforms on an as-needed basis, for a three-year initial term effective July 1, 2022, through June 30, 2025, with one, two-year option term.

11. June 2022 Bus Service Change

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Harper, and declared passed by those present, to receive and file as an information item.

Regular Calendar

12. Making Better Connections Study Draft Service Plan

Kurt Brotcke, Director of Strategic Planning provided a presentation on this item.

The COB reported that public comment was received from Frank Russell on May 11, 2022 at 10:54 a.m. The comment was emailed to the Committee on May 12, 2022, at 8:18 a.m. and will be retained as part of today's meeting record.

A discussion ensued between Committee members and staff.

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Nguyen, and declared passed by those present, to:

- A. Direct staff to release the draft service plan and implement Phase 2 of the public outreach plan to gather feedback.
- B. Direct staff to return to the Board of Directors on July 25, 2022, to present the public outreach findings and to conduct a public hearing.



13. Agreement for the Development, Installation, and Implementation of the OC Streetcar Ticket Vending Machines System

Sam Kaur, Department Manager, Revenue Administration, and Alan Cheng of Jacobs Engineering, provided a presentation on this item.

A motion was made by Committee Vice Chairman Sidhu, seconded by Director Nguyen, and declared passed by those present, to:

- A. Approve the selection of INIT Innovations in Transportation, Inc., as the firm to develop, install, and implement the OC Streetcar ticket vending machines system.
- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-1-3279 between the Orange County Transportation Authority and INIT Innovations in Transportation, Inc., in the amount of \$2,107,765, for a five-year initial term with one, five-year option term for the development, installation, and implementation of the OC Streetcar ticket vending machines system.

14. Develop and Implement a Rider Validation System

Sam Kaur, Department Manager, Revenue Administration, provided a presentation on this item.

A motion was made by Director Harper, seconded by Committee Vice Chairman Sidhu, and declared passed by those present, to approve staff to pursue the development and implementation of a new rider validation system.

Discussion Items

15. OC Bus and OC ACCESS Services Update

Johnny Dunning, Jr., Interim Chief Operating Officer, and Ryan Maloney, Section Manager, Marketing and Customer Service, provided a presentation on this item.

Following the presentation, no action was taken on this item.

16. Fiscal Year 2022-23 Budget Workshop Follow-up

Andrew Oftelie, Chief Financial Officer, reported that this item will presented at all Committee and Board Meetings until June 13, when the Public Hearing for the Budget is scheduled. The feedback received from those meetings will be updated each time in a questions and answers handout.



17. Public Comments

There were no public comments received.

18. Chief Executive Officer's Report

Jennifer L. Bergener, Deputy Chief Executive Officer, reported that OCTA will host the second of two planned virtual meetings for the State Route 55 Improvement Project on Wednesday, May 18 at 5:00 p.m. via Zoom.

19. Committee Members' Reports

There were no Committee Members' Reports.

20. Closed Session

There were no Closed Session items scheduled.

21. Adjournment

The meeting adjourned at 9:58 a.m.

The next regularly scheduled meeting of this Committee will be held at **9:00 a.m. on Thursday, June 9, 2022**, at the Orange County Transportation Authority, Board Room, 500 South Main Street, Orange, California.

ATTEST:

Allison Cheshire Clerk of the Board Specialist, Senior



June 9, 2022

| То: | Transit Committee |
|-----|-------------------|
| | |

From: Darrell E. Johnson, Chief Executive Officer

Subject: Radio Voice Over Internet Protocol Pilot for Paratransit Vehicles

Overview

The Orange County Transportation Authority's existing radio system for the paratransit vehicles will reach the end of its useful life and will need to be replaced in five years. Board of Directors' approval is requested for a pilot program using six paratransit vehicles to test functionality and operation of a new solution to replace the existing radio system.

Recommendation

Authorize the Chief Executive Officer to negotiate and execute sole source Agreement No. C-2-2165 between the Orange County Transportation Authority and Conduent Transport Solutions, Inc., in the amount of \$250,000, for a one-year term, for an Intelligent Transportation Management System radio voice over internet protocol pilot program for paratransit vehicles.

Discussion

The Orange County Transportation Authority (OCTA) currently uses L3Harris Technology, Inc. (L3Harris) OpenSky II radio system. This radio system is obsolete and will be declared end-of-life (EOL) at some point this year according to the manufacturer, L3Harris. When L3Harris officially declares OpenSky II radio EOL, the OpenSky II support will terminate five years from the EOL declaration.

OCTA has developed and begun transitioning its fixed-route fleet from OpenSky II radios to a Voice Over Internet Protocol (VOIP) cellular solution, which is provided by Conduent Transport Solutions, Inc. (Conduent), utilizing existing technologies from AT&T FirstNet and Verizon. VOIP technology is proven communication technology that is being adopted to OCTA's fleet. OCTA also employs this technology for its On-Board Video Surveillance System and its electronic fare collection systems on OCTA's fixed-route vehicles. OCTA will utilize common carrier cellular technologies to transmit voice and data communications over common carrier cellular networks.

A separate pilot program for 12 fixed-route vehicles to test Conduent's VOIP solution has already been completed. OCTA was successful with this pilot and moved forward with outfitting new fixed-route vehicles with VOIP technologies as they are procured and delivered.

To ensure proper integration of the entire fleet into the Intelligent Transportation Management System (ITMS) provided by Conduent, OCTA is seeking to do the same type of pilot with its paratransit vehicles. Conduent has a new all-in-one device that is suitable for smaller paratransit and micro-transit vehicles. The primary aim of this pilot is to fully test and vet this new all-in-one equipment in real time operation to ensure it is suitable for OCTA's paratransit operation. Should the pilot program fail, Conduent would be required to extend the pilot program, at no additional cost to OCTA, to adjust its technology until the system works for OCTA's paratransit operation. Since the ITMS is integrated by Conduent, it is imperative that the new all-in-one device technology works. Otherwise, a new procurement would be needed to refresh the entire system.

Procurement Approach

The procurement was handled in accordance with OCTA's Board of Directors (Board)-approved policies and procedures for a sole source procurement.

Conduent is the exclusive owner of the new all-in-one equipment. Conduent has proprietary rights to its technology and is the sole entity able to market and sell its proprietary technology, as it does not have agreements that allow resale through other vendors. Therefore, Conduent meets OCTA's criteria for a sole source procurement, and based on its technical ability and financial status, the firm is deemed responsible.

Conduent's proposal was reviewed by staff from the Contracts Administration and Materials Management and Information Systems departments to ensure compliance with the contract terms and conditions, as well as the technical requirements.

In accordance with OCTA's sole source procurement procedures, a sole source over \$50,000 requires OCTA's Internal Audit Department to conduct a price review of the vendor's proposed pricing. As is common with these types of vendors, Conduent did not provide a detailed cost breakdown in a format that would be required in order to perform a price review. As a result, staff used the

Radio Voice Over Internet Protocol Pilot for Paratransit Vehicles Page 3

information available, including past contracts, to analyze the reasonableness of the quoted price. Staff determined that the quoted pricing from Conduent is consistent with contract pricing and quotes with other government agencies and OCTA for similar services, which are comparable in scope, requirements, and technical specifications. In addition, the quoted price is lower than the OCTA project manager's independent cost estimate. Therefore, the quoted price is deemed fair and reasonable.

Fiscal Impact

The project was approved in OCTA's Fiscal Year 2021-22 Budget, Finance and Administration, Information Systems Department, Account No. 1288-9028-D1111-0WY, and is funded through Local Transportation Funds.

Summary

Staff recommends the Board of Directors authorize the Chief Executive Officer to negotiate and execute sole source Agreement No. C-2-2165 between the Orange County Transportation Authority and Conduent Transport Solutions, Inc., in the amount of \$250,000, for a one-year term, for a radio Voice Over Internet Protocol pilot for paratransit vehicles.

Attachment

None.

Prepared by:

Michael Beerer Senior Section Manager, Information Systems 714-560-5352

Pia Veesapen^J Director, Contracts Administration and Materials Management 714-560-5619

Approved by:

Andrew Oftelie Chief Financial Officer Finance and Administration 714-560-5649



June 9, 2022

Jane Afel

From: Darrell E. Johnson, Chief Executive Officer

Subject: Bus Operations Performance Measurements Report for the Third Quarter of Fiscal Year 2021-2022

Overview

The Orange County Transportation Authority operates fixed-route bus and demand-response paratransit service throughout Orange County and into neighboring counties. The established measures of performance for these services assess the safety, courtesy, reliability, and overall quality of the services. This report summarizes the year-to-date performance of these services through the third quarter of fiscal year 2021-22.

Recommendation

Receive and file as an information item.

Background

The Orange County Transportation Authority (OCTA) operates a countywide network of 58 routes, including local, community, rail connector, and express bus routes serving over 5,000 bus stops. Fixed-route bus (OC Bus) service operates in a 798 square-mile area, serving more than three million residents in 34 cities and unincorporated areas, with connections to transit services in Los Angeles, Orange, and Riverside counties. OCTA provides these services through both directly-operated fixed-route (DOFR) and contracted fixed-route (CFR) service. OCTA also provides OC ACCESS, a federally mandated paratransit service, which is a shared-ride program available for people unable to use the OC Bus service because of functional limitations. Performance measures for OC Bus, OC ACCESS, and OC Flex services are summarized and reported quarterly (Attachment A). In response to a significant decline in ridership as the result of the coronavirus (COVID-19) pandemic, OC Bus service has operated on a significantly reduced schedule, beginning with a Sunday-only schedule, seven days a week, implemented in March 2020. This was followed by the implementation of a Saturday schedule, six days a week, in June 2020. This level of service was sustained through the entirety of fiscal year (FY) 2020-21, ending June 30, 2021. In August 2021 and February 2022, more capacity was added to support the return of students to in-person instruction in fall 2021 and increases in ridership. During this time, OCTA operated 52 of the 58 total OC Bus routes.

Discussion

This report provides an update on the performance of the OC Bus and OC ACCESS services by presenting the current trends and comparisons with OCTA-established performance standards for transit system safety, courtesy, and reliability. OCTA counts preventable vehicle accidents to evaluate system safety, customer complaints to assess courtesy, and uses both on-time performance (OTP) and miles between road calls (MBRC) to measure service reliability.

This report includes performance through the third quarter, including the months of January, February, and March of FY 2021-22. OCTA continues to operate a reduced level of service with the prolonged impact of the COVID-19 pandemic. This is reflected in the performance to be discussed in this report. During this reporting period, increased ridership coupled with driver availability negatively impacted OC Access OTP and courtesy. The ongoing procurement and replacement of OC Access cutaway buses resulted in an improvement in MBRC.

- Safety DOFR and CFR OC Bus service performed below the accident frequency standard of one preventable accident per 100,000 service miles. OCTA Operations and contracted staff continue to stress safety in the bus loading/unloading zones and vehicle operation that impacts passenger safety inside the vehicle (passenger falls). Training and discussions continue with coach operators emphasizing safety and identifying problem locations where fixed-object strikes frequently occur. Accident prevention is also reinforced during post-accident retraining and during annual refresher training. OC ACCESS exceeded the performance standard.
- Customer Service Customer service is measured by evaluating the number of valid customer complaints received compared to boardings. Through the third quarter, the DOFR and CFR modes of service performed above the respective standards. OC ACCESS fell below the

standard as increasing ridership and driver shortages resulted in challenges to meet key metrics, including OTP, causing an increase in customer complaints.

- Reliability Through the third quarter, the OTP for DOFR service met the standard while CFR service also improved but remained below standard. The improvements were a result of the service changes implemented in October 2021. OC ACCESS remained below standard due to increasing demand and driver shortages.
- MBRC The MBRC for CFR and OC ACCESS improved from the previous quarter and met the standard. DOFR also improved from the previous quarter but was slightly below the standard. Improvements are expected as OCTA continues to replace its OC ACCESS fleet.

The report also includes:

- An assessment of the efficiency of OCTA transit operations based on industry standards for ridership, productivity, farebox recovery, and cost per revenue vehicle hour;
- A review of contractor performance for CFR and OC ACCESS services;
- A route-level performance evaluation that includes subsidy per boarding, revenue per boarding, and resource allocation (buses); and
- A performance assessment of the OC Flex microtransit service and a report on the College Pass Program.

Summary

Through the third quarter of FY 2021-22, the performance of OC Bus service exceeded the performance in the area of courtesy and OTP but is below the performance standard for safety and reliability (MBRC). OC ACCESS exceeded the performance standard for safety and reliability (MBRC) but was below standard for Courtesy and OTP as the contractor had a difficult time with coach operator availability in light of increasing ridership. OCTA staff continues to focus on strategies to improve safety and reliability, track the established key performance indicators, manage the service agreements pursuant to contract requirements, and work to identify other strategies to improve overall system performance.

Bus Operations Performance Measurements Report for the Page 4 Third Quarter of Fiscal Year 2021-22

Attachment

A. Bus Operations Performance Measurements Report, Third Quarter, Fiscal Year 2021-22

Prepared by:

Johnny Dunning, Jr. Interim Chief Operating Officer, Operations (714) 560-5710



Bus Operations Performance Measurements Report

Third Quarter Fiscal Year 2021-22





About This Report

The Orange County Transportation Authority (OCTA) operates a countywide network of 58 routes, including local, community, rail connector, and express bus routes serving over 5,000 bus stops known as OC Bus. OCTA also operates paratransit service (OC ACCESS), a shared-ride program available for people unable to use the standard OC Bus service because of functional limitations. OC Bus service is provided through both direct operations by OCTA, referred to as directly-operated fixed-route (DOFR), and contracted operations, referred to as contracted fixed-route (CFR) service. The OC ACCESS service is a contract-operated demand-response service required by the Americans with Disabilities Act that is complementary to the fixed-route service and predominately accounts for the overall paratransit services operated by OCTA. These services make up the bus transit system and are evaluated by the performance measurements summarized in this report.

This report tracks bus system safety, as measured by vehicle accidents, courtesy, as measured by customer complaints, and reliability, as measured by on-time performance (OTP) and miles between road calls (MBRC). Along with these metrics, industry-standard measurements are tracked to assess OCTA bus operations; these measurements include ridership, productivity, farebox recovery ratio (FRR), and cost per revenue vehicle hour (RVH). Graphs accompany the details of each indicator showing the standards or goals and the values for the current reporting period. The following sections provide performance information for OC Bus service, DOFR and CFR, and OC ACCESS service.

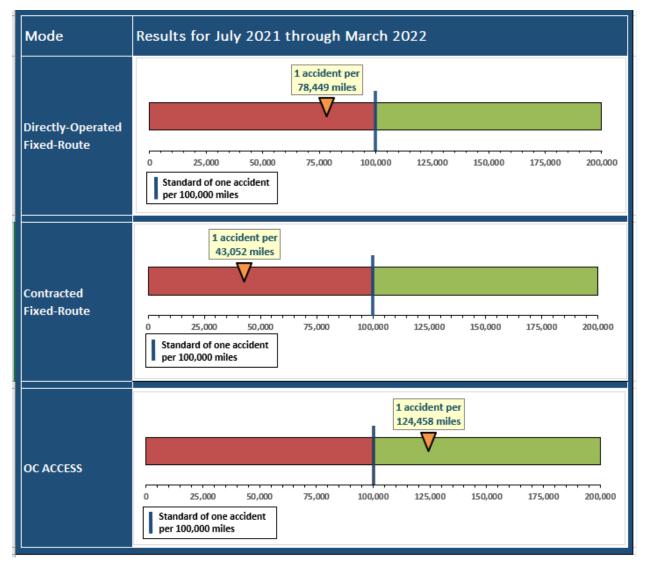
Through March 2022, OCTA continued to operate a reduced level of service through the prolonged impact of the coronavirus (COVID-19) pandemic. This is reflected in the performance to be discussed in this report. During this reporting period, increased ridership coupled with driver availability negatively impacted OC ACCESS OTP and Courtesy metrics. The ongoing procurement and replacement of OC ACCESS cutaway buses resulted in an improvement in MBRC.

FY2021-22 Q3 SUMMARY

• Safety: DOFR - 🔻 0 CFR - 🔻 0 OC ACCESS - 🔺 0 Courtesy: 0 DOFR - 🔺 CFR - 🔺 0 OC ACCESS - 🔻 0 OTP: 0 DOFR - 🔺 0 CFR - 🔻 0 OC ACCESS - 🔻 0 MBRC: 0 ○ DOFR - ▼ CFR - 🔺 0 OC ACCESS - 🔺 0

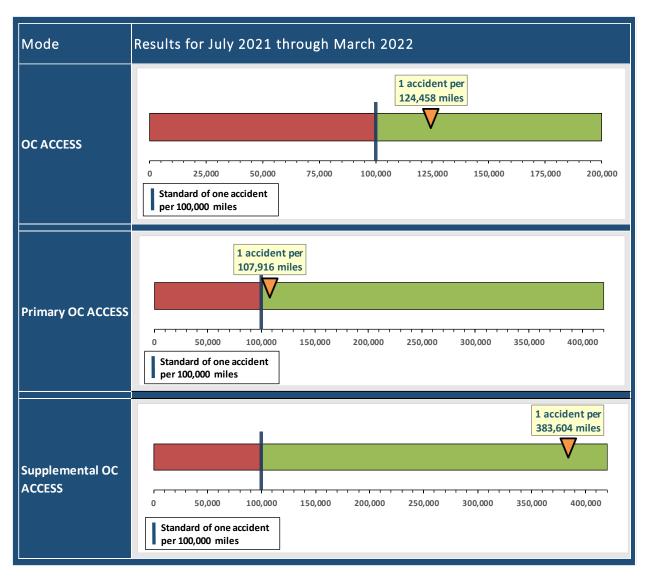
Safety: Preventable Vehicle Accidents

OCTA is committed to the safe delivery of the OC Bus service. The safety standard for DOFR, CFR, and OC ACCESS services is no more than one vehicle accident per 100,000 miles. Preventable vehicle accidents are defined as incidents when physical contact occurs between vehicles used for public transit and other vehicles, objects, or pedestrians, and where a coach operator failed to do everything reasonable to prevent the accident. On-board passenger falls on fixed-route service that are determined to be preventable are also included among these accidents. Through the third quarter (Q3) of fiscal year (FY) 2021-22, DOFR and CFR did not meet the standard of operating more than 100,000 miles between preventable accidents.



DOFR OC Bus continues to perform below the accident frequency standard and OCTA Operations staff continues to focus on and stress the importance of safety, conduct safety-related campaigns, and promote the safe driving award program. Training remains focused on safety with most preventable accidents during the quarter being the result of the operator striking fixed objects and parked cars.

For CFR, the number of miles between preventable accidents continues to be below the performance standard through Q3. The trends by accident type were similar to DOFR, with 60 percent of the preventable accidents being fixed-object strikes (curb, sign, pole, stationary vehicles). Staff continues working with the contractor to improve performance and reduce the current accident trends.

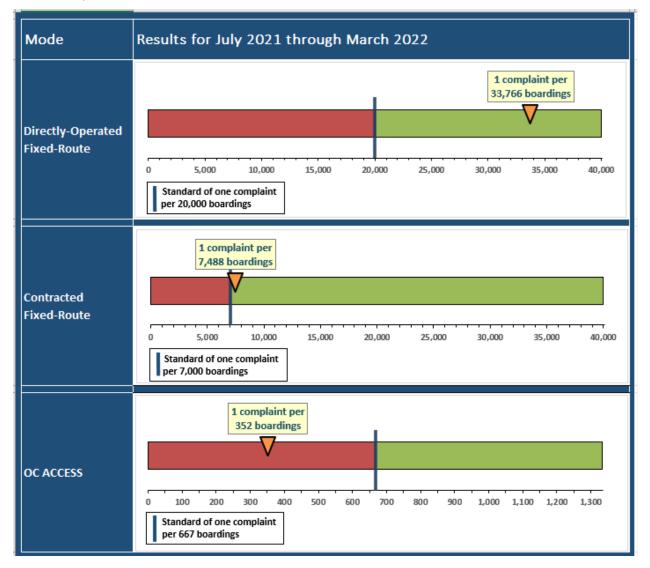


Both Primary and Supplemental OC ACCESS performed above the standard for the quarter, an improvement of 38.7 and 46.8 percent from the prior quarter, respectively.

Courtesy: Customer Complaints

OCTA strives to achieve a high level of customer satisfaction in the delivery of OC Bus services. The performance standard for customer satisfaction is courtesy as measured by the number of valid complaints received. Customer complaints are the count of incidents when a rider reports dissatisfaction with the service. The standard adopted by OCTA for DOFR OC Bus is no more than one customer complaint per 20,000 boardings; the standard for CFR OC Bus service is no more than one complaint per 7,000 boardings; and the contractual standard for OC ACCESS is no more than one complaint per 667 boardings.

Through Q3 of FY 2021-22, the DOFR and CFR modes of service continue to perform well, exceeding the courtesy standard with less than one valid complaint per 20,000 and 7,000 boardings, respectively, while OC ACCESS performed well below standard.

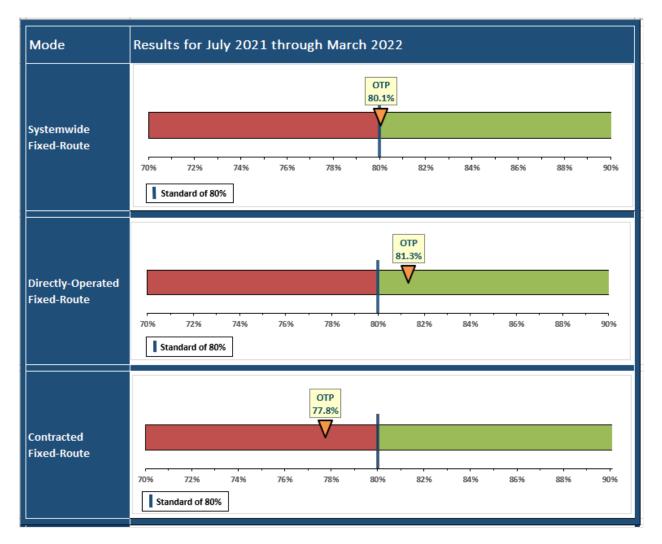


For OC ACCESS, the challenges associated with increasing ridership and operator shortages continued into Q3. As demand returns to pre-pandemic levels, the contractor is actively recruiting employee resources and expanding use of subcontractors to increase capacity and minimize service delays, which was the chief complaint throughout Q3.

Reliability: On-Time Performance

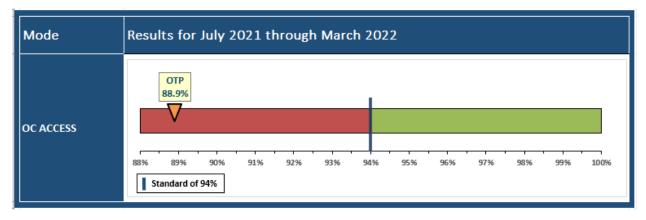
Reliability is vital to a successful transportation network. Reliability for OCTA is measured in part by OTP. OTP is a measure of performance which evaluates the schedule adherence of a bus operating in revenue service according to a published schedule. Schedule adherence is tracked by monitoring the departure of vehicles from time points, which are designated locations on a route used to control vehicle spacing as shown in the published schedule. For OC Bus service, a trip is considered on-time if it departs the scheduled time point from zero minutes before up to no more than five minutes after the time as printed on the bus route schedule. OCTA's fixed-route system standard for OTP is 80 percent. For OC ACCESS service, OTP is a measure of performance evaluating a revenue vehicle's adherence to a scheduled pickup time for transportation on a demand-response trip. A trip is considered on-time if the vehicle arrives within a 30-minute window. The OC ACCESS OTP standard is 94 percent.

Systemwide fixed-route OTP was 80.1 percent, 1.1 percent higher than the prior quarter. The OTP-related service adjustments implemented in October 2021 and February 2022 were the primary reason for the improvement. The OTP for DOFR met the standard operating at a rate of 81.3 percent. OC Bus operated by CFR and OC ACCESS services both fell below the respective standards during Q3 of FY 2021-22.



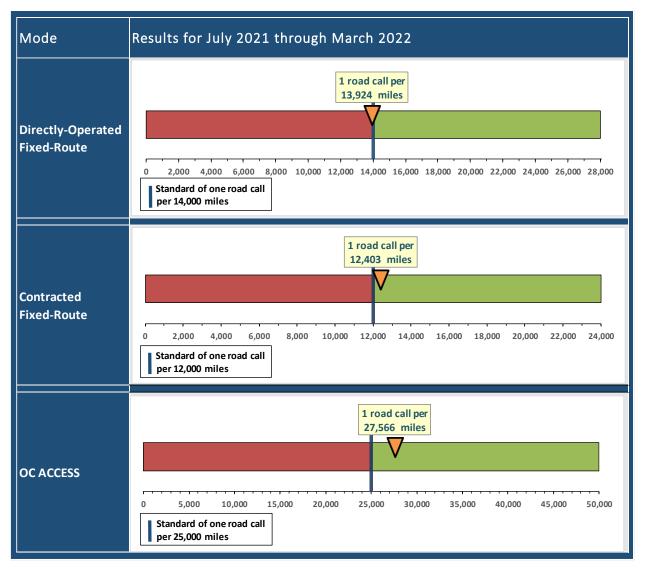
The OTP for CFR service may have suffered due to the substantial number of missed trips due to the surge in COVID cases. Missed trips potentially have cascading impacts on subsequent trips which experience delay due to higher-than-normal trip volumes and longer dwell times.

The OTP for OC ACCESS was below standard with a rate of 88.9 percent, 0.2 percent higher than the rate reported last quarter and 5.1 percent below the standard. The OC ACCESS contractor struggled to meet the OTP standard in Q3 due to significant increases in demand as adult day programs for seniors and individuals with disabilities throughout Orange County resumed operations or expanded their capacity. Staff is working closely with the contractor to ensure appropriate operator resources, both employee and subcontracted, are in place to meet the increasing demand as ridership continues to recover to prepandemic levels.



Reliability: Miles Between Road Calls

MBRC is a vehicle reliability performance indicator that measures the average distance in miles that a transit vehicle travels before failure of a vital component forces removal of the vehicle from service. OCTA has adopted standards for the MBRC for DOFR, CFR, and OC ACCESS services. These standards vary to align with the specific type of service being provided and to account for the variability inherent to each of these services including the vehicles assigned. The specific standards as adopted by OCTA are 14,000 MBRC for DOFR OC Bus service, 12,000 MBRC for CFR OC Bus service, and 25,000 MBRC for OC ACCESS.



Through Q3, the MBRC for DOFR was slightly under the performance standard while CFR and OC ACCESS services met the performance standard.

OCTA operates two primary fleets in fixed-route service, 2007/2008 New Flyer compressed natural gas (CNG) Low Floor buses, and 2016 New Flyer Xcelsior CNG buses. The first fleet is now at the end of its designed useful life and is experiencing failures due to long-term wear and tear. A new bus procurement is in effect to replace the 2007/2008 buses over the next year. The 2016 buses are now due for a planned

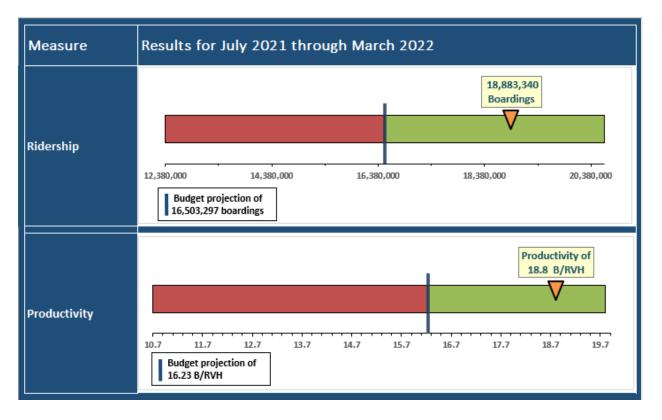
engine mid-life repower. OCTA is currently in the process of replacing the engines in the 2016 fleet with new near-zero emission engines. This will continue for the next 18 months and is expected to improve performance in terms of MBRC. Both CFR and DOFR are experiencing increased failures, including road calls, that can be expected and consistent with the age and current condition of the two fleets.

MBRC for OC ACCESS for Q3 of FY 2021-22 met the performance standard. Performance improved this quarter with the replacement of 82 cutaway buses, which represents 33 percent of the paratransit bus fleet. Improvements are expected to continue as the remaining 35 cutaway buses of a 117-bus procurement are delivered to replace the old buses which will be retired.

Ridership and Productivity – OC Bus

Ridership (or boardings) is the number of rides taken by passengers using public transit and is influenced by the level of service provided, weather, the economy, and seasonal variations in demand. Productivity is an industry measure that counts the average number of boardings for each revenue vehicle hour (RVH) that is operated. An RVH is any 60-minute increment of time that a vehicle is available for passengers within the scheduled hours of service, excluding deadhead (a non-revenue movement of a transit vehicle to position it for service). Boardings per RVH (B/RVH) is calculated by taking the boardings and dividing it by the number of RVH operated.

The COVID-19 pandemic continued to have an impact overall on ridership and productivity for all services through Q3. The COVID-19 Omicron variant continued to impact ridership into Q3; ridership began rising in late January as schools returned from winter break. Ridership rose throughout the quarter, averaging over 85,000 on weekdays through March. Through the end of Q3, total ridership is trending at 14.4 percent higher than the budgeted projection. Productivity for OC Bus service was also higher than the budgeted projection, trending at 18.8 boardings per RVH.



Ridership and Productivity – OC ACCESS

(Primary Service Provider and Supplemental Taxi Service)

Through Q3 of FY 2021-22, the total ridership and productivity for OC ACCESS was 9.3 percent and 45.6 percent higher than the budgeted projections, respectively. Travel for eligible riders continued to increase as facilities reopened and adult day programs for seniors and individuals with disabilities resumed operation throughout Orange County.

| Measure | Results for July 2021 through March 2022 |
|--------------|---|
| Ridership | 527,254 Boardings |
| | Budget Projection of 482,190 boardings |
| | Productivity of 1.66 B/RVH |
| Productivity | 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 Budget Projection of 1.14 B/RVH |

Contractor Performance: Fixed-Route

Per Agreement No. C-4-1737 between OCTA and First Transit, Inc. (First Transit), additional measures are tracked to ensure the CFR OC Bus service meets specified standards for safety, customer service, and reliability. When the contractor's monthly performance exceeds the standard as set forth in the agreement, financial incentives are paid to First Transit; conversely, when the monthly performance of the contractor is below the standard as set forth in the agreement, penalties are assessed and are paid to OCTA by First Transit.

For Q3 of FY 2021-22, the overall performance of the contracted OC Bus service as determined by the performance categories outlined in the contract was below standard for complaints per boardings, accident reporting, key positions, a California Highway Patrol (CHP) terminal inspection and missed trips.

Table 1 provides the penalties and incentives assessed to the contractor by quarter for FY 2021-22. The incentives paid in Q3 relate to courtesy and accident frequency ratio, which totaled \$15,000. The total penalties assessed to First Transit during the quarter was \$2,447,246, of which 93 percent was assessed for missed trips. During the reporting period, First Transit missed a significant amount of service due to an inadequate roster, the surge in COVID-19 cases related to the Omicron variant, and the coach operator shortage facing the transit industry across the country. Staff continues to work with First Transit to ensure their person power resources are balanced with the level of service assigned. Overall, the FY-to-date total payment to OCTA to \$2,437,475 after the adjustment for waived penalties.

| Table 1: | Performance Categories | FY22 Q1 | FY22 Q2 | | FY22 Q3 | FY22 Q4 | | FYTD 22 |
|------------|--|----------------|----------------|------|------------|---------|----|-------------|
| | On-Time Performance | \$ (3,000) | \$ (5,000) | \$ | - | \$ - | \$ | (8,000) |
| | Valid Complaints: Per 7,000 boardings | \$ - | \$ - | \$ | (7,900) | \$ - | \$ | (7,900) |
| | Unreported Accident | \$ (10,000) | \$ - | \$ | (5,000) | \$ - | \$ | (15,000) |
| | Accident Frequency Ratio | \$ - | \$ - | \$ | - | \$ - | \$ | - |
| | Key Positions | \$ - | \$ (28,766) | \$ | (132,346) | \$ - | \$ | (161,112) |
| Penalties | CHP Terminal Inspections | \$ - | \$ - | \$ | (25,000) | \$ - | \$ | (25,000) |
| renatives | Reports | \$ - | \$ - | \$ | - | \$ - | \$ | - |
| | Preventive Maintenance | \$ (1,600) | \$ (100) | \$ | - | \$ - | \$ | (1,700) |
| | Road Calls | \$ (1,700) | \$ (400) | \$ | - | \$ - | \$ | (2,100) |
| | Vehicle Damage: Per vehicle per day | \$ - | \$ - | \$ | - | \$ - | \$ | - |
| | Missed Trips | \$ (20,000) | \$ (51,000) | \$ (| 2,277,000) | \$ - | \$ | (2,348,000) |
| | Total | \$ (36,300) | \$ (85,266) | \$(| 2,447,246) | \$ - | Ş | (2,568,812) |
| | On-Time Performance | \$ - | \$ - | \$ | - | \$ - | \$ | - |
| Incentives | Valid Complaints: Per 7,000 boardings | \$ 6,400 | \$ 4,500 | \$ | - | \$ - | \$ | 10,900 |
| meentives | Accident Frequency Ratio | \$ 15,000 | \$ 15,000 | \$ | 15,000 | \$ - | \$ | 45,000 |
| | Total | \$ 21,400 | \$ 19,500 | \$ | 15,000 | \$ - | \$ | 55,900 |
| | Unreported Accident (Prior Period) | \$ - | \$ - | \$ | - | \$ - | \$ | - |
| Adjustment | Waived Penalties (On-Time Performance) | \$ 3,000 | \$ 5,000 | \$ | - | \$ - | \$ | 8,000 |
| | Waived Penalties (Key Position) | \$ - | \$ - | \$ | 67,537 | \$ - | \$ | 67,537 |
| | Waived Incentives | \$ - | \$ - | \$ | - | \$ - | \$ | - |
| | Road Calls | \$ - | \$ (100) | \$ | - | \$ - | \$ | (100) |
| | Total | \$ 3,000 | \$ 4,900 | \$ | 67,537 | \$ - | \$ | 75,437 |
| All | Total | \$ (11,900) | \$ (60,866) | \$(| 2,364,710) | \$ - | \$ | (2,437,475) |

Contractor Performance: OC ACCESS

(Primary Service Provider and Supplemental Taxi Service)

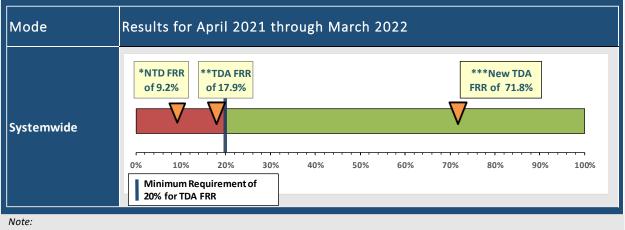
Per Agreement No. C-2-1865 between OCTA and MV Transportation, Incorporated which apply to Q1 and Q2 of FY 2021-22, and Agreement No. C-0-2150 between OCTA and First Transit, which apply to Q3, additional measures are tracked to ensure OC ACCESS meets the standards for safety, customer service, and reliability. Like the contracted fixed-route service, the contractor for OC ACCESS is paid financial incentives and penalties when monthly performance exceeds or comes in below the standard as set forth in the agreement. Financial incentives are paid to the contractor and assessed penalties are paid to OCTA by the contractor.

As presented in this report, the overall performance of the contractor providing OC ACCESS service through Q3 of FY 2021-22 is below standard with respect to courtesy and OTP. Table 2 lists, by quarter, the penalties and incentives assessed to the OC ACCESS contractor as established in the agreement. The penalties identified and under review for Q3 amount to \$482,200 for performance in pick up and arrival OTP, customer complaints, call center hold times, excessively early and late trips, missed trips, accident/incident notification, reports, routing efficiency and drug and alcohol audit. A penalty waiver is under consideration for some metrics in Q3 due to impacts to service resulting from the surge in COVID-19 cases experienced in Orange County.

| Table 2: | Performance Categories | | FY22 Q1 | | FY22 Q2 | FY22 Q3 | FY22 Q4 | FYTD 22 |
|------------|------------------------------------|----|-----------|----|-----------|-----------------|---------|-----------------|
| | Passenger Productivity | \$ | (30,000) | \$ | (30,000) | | | \$ (60,000) |
| | On-Time Performance | \$ | (45,000) | \$ | (95,000) | | | \$ (140,000) |
| | Pick-Up On-time Performance | | | | | \$ (50,000) | \$ - | \$ (50,000) |
| | Arrival On-Time Performance | | | | | \$ (109,000) | \$ - | \$ (109,000) |
| | Customer Comments | \$ | (32,900) | \$ | (30,800) | | | \$ (63,700) |
| | Customer Complaints | | | | | \$ (16,700) | \$ - | \$ (16,700) |
| | Call Center Hold Times | \$ | (31,000) | \$ | (15,000) | \$ (12,000) | \$ - | \$ (58,000) |
| | Excessively Early Trips | | | | | \$ (15,000) | \$ - | \$ (15,000) |
| | Excessively Late Trips | \$ | (30,000) | \$ | (30,000) | \$ (25,000) | \$ - | \$ (85,000) |
| | Missed Trips | \$ | (30,000) | \$ | (30,000) | \$ (25,000) | \$ - | \$ (85,000) |
| | Unreported Accident | \$ | (10,000) | \$ | (10,000) | | | \$ (20,000) |
| | Accident/ Incident Notification | | | | | \$ (4,000) | \$ - | \$ (4,000) |
| | Preventable Accidents | | | | | \$ - | \$ - | \$ - |
| Penalties | Preventable Incidents | | | | | \$ - | \$ - | \$ - |
| | Trip Denial | | | | | \$ - | \$ - | \$ - |
| | Terminal Inspections | \$ | - | \$ | - | \$ - | \$ - | \$ - |
| | Preventive Maintenance | \$ | (200) | \$ | (200) | \$ - | \$ - | \$ (400) |
| | Road calls | \$ | (300) | \$ | (500) | \$ - | \$ - | \$ (800) |
| | Reports | \$ | - | \$ | - | \$ (193,500) | \$ - | \$ (193,500) |
| | Vehicle Damage | | | | | \$ - | \$ - | \$ - |
| | Excessive Travel Time | | | | | \$ - | \$ - | \$ - |
| | Routing Efficiency | | | | | \$ (17,000) | \$ - | \$ (17,000) |
| | Key Positions | \$ | - | \$ | - | \$ - | \$ - | \$ - |
| | Drug and Alcohol Audit | M | | Ŵ | | \$ (15,000) | \$ - | \$ (15,000) |
| | Fare Variance | \$ | - | \$ | - | \$ - | \$ - | \$ - |
| | Total | \$ | (209,400) | \$ | (241,500) | \$ (482,200) | \$ - | \$ (933,100) |
| | Arrival On-time Performance | | | | | \$ - | \$ - | \$ - |
| | Pick-Up On-time Performance | \$ | - | \$ | - | \$ 10,000 | \$ - | \$ 10,000 |
| Incentives | Excessively Early Trips | | | | | \$ - | \$ - | \$ - |
| incentives | Excessively Late Trips | \$ | - | \$ | - | \$ - | \$ - | \$ - |
| | Missed Trips | \$ | - | \$ | - | \$ - | \$ - | \$ - |
| | Total | \$ | - | \$ | - | \$ 10,000 | \$ - | \$ 10,000 |
| | Unreported Accident (Prior Period) | \$ | - | \$ | - | \$ - | \$ - | \$ - |
| Adjustment | Waived Penalties | \$ | 30,000 | \$ | 76,700 | \$ 51,000 | \$ - | \$ 157,700 |
| Aujustment | Waived Incentives | \$ | - | \$ | - | \$ - | \$ - | \$ - |
| | Total | \$ | 30,000 | \$ | 76,700 | \$ 51,000 | \$ - | \$ 157,700 |
| All | Total | \$ | (179,400) | \$ | (164,800) | \$ (421,200) | \$ - | \$ (765,400) |

Farebox Recovery Ratio

Farebox Recovery Ratio (FRR) is a measure of the proportion of operating costs recovered by passenger fares, calculated by dividing the farebox revenue by total operating expenses. A minimum FRR of 20 percent for all service is required by the Transportation Development Act (TDA) for transit agencies to receive the state sales tax available for public transit purposes. To normalize seasonal fluctuations, data shown below reflects actuals over the last 12 months from April 2021 through March 2022.



^(*)National Transit Database (NTD) FRR consists of only passenger fares

(**) Transportation Development Act (TDA) FRR includes passenger fares, property tax revenue, advertising revenue and Measure M fare stabilization

(***) New Transportation Development Act (TDA) FRR allows federal funds to be counted and exclusions on ADA paratransit service, demand-response, microtransit operating cost, cost of improving payment and ticketing systems and services, and costs of planning for zero-emission transition

Based on the National Transit Database definition in which only passenger fares are included under revenue, FRR did not meet the 20 percent goal. However, with the passage of SB 508 (Chapter 716, Statutes of 2015), OCTA was able to adjust the FRR to include local funds. SB 508 states, "if fare revenues are insufficient to meet the applicable ratio of fare revenues to operating cost required by this article, an operator may satisfy that requirement by supplementing its fare revenues with local funds. As used in this section, 'local funds' are any non-federal or non-state grant funds or other revenue generated by, earned by, or distributed to an operator."

After incorporating property tax revenue, advertising revenue, and Measure M2 fare stabilization, the adjusted FRR was 17.9 percent, an increase of 4.2 percentage points from the same quarter as last year. Because of statewide impacts on the farebox because of the COVID-19 pandemic, the Governor signed AB 90 (Chapter 17, Statutes of 2020) in 2020, which removed all financial penalties for failing to meet the 20 percent FRR requirement until January 1, 2022. Last year, the Governor signed AB 149 (Chapter 81, Statutes of 2021), which includes an extension of this exemption through the 2022-23 fiscal year. In addition, AB 149 provided additional exemptions from the definition of "operating cost" for purposes of calculating TDA FRR. These exemptions include the:

- Costs of operating ADA paratransit service
- Costs to operate demand-response and microtransit services that expand access to transit service beyond fixed-route corridors
- Costs of security services and public safety contracts
- Any expense greater than the actuarially determined contribution associated with pensions and other post-employment benefits as required by Governmental Accounting Board Statement Numbers 68 and 75
- Costs of funding or improving payment and ticketing systems and services
- Costs of planning for improvements in transit operations, integration with other operators and agencies, zero-emission transition, and compliance with state and federal mandates. For the purposes of calculating the TDA FRR, discount and fare free transit passes are allowed to be counted at their full retail value, and federal funds are allowed to be counted as "local funds."

After applying applicable exemptions and authorization that can be quantified, the estimated new TDA FRR is approximately 71.8 percent.

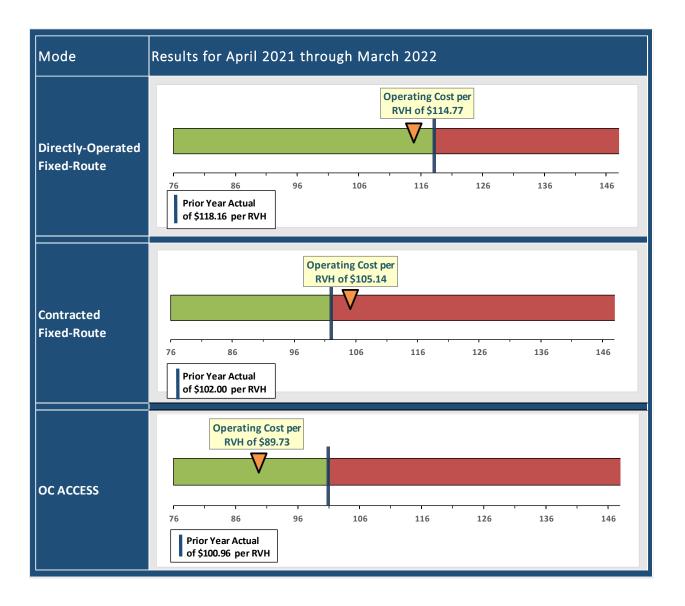
Operating Cost per RVH

Cost per RVH is one of the industry standards used to measure the cost efficiency of transit service. It is derived by dividing actual operating expenses by RVH that is scheduled for the reporting period. To provide a more comparable illustration, all metrics below are calculated based on direct operating cost, which excludes capital, general administrative, and other overhead costs. DOFR cost includes labor costs for coach operators and maintenance employees. It also includes consumables such as replacement parts, fuel, and tires. CFR and OC ACCESS costs includes contracted costs (net of assessed penalties and incentives) and costs incurred by OCTA for maintenance, parts, and fuel for the contracted fleet.

Similar to the FRR, the statistics above depict actuals over the last 12 months. The cost per RVH, when compared to the prior period, dropped by 2.9 percent for DOFR, increased by 3.1 percent for CFR, and decreased by 11.1 percent for OC ACCESS.

During the COVID-19 pandemic, costs were higher due to reduced levels of service, yet maintaining staffing levels to accommodate the service as well as a state of readiness. As service continues to ramp up for both DOFR and OC ACCESS; efficiency increases, thus slightly reducing the cost compared to the prior period.

Furthermore, the decrease in OC ACCESS cost per RVH resulted from service demand restoration from the COVID-19 pandemic with the new tier-structure operating rates based on service demand, which an increase in service from tier to tier would trigger a lower rate. Since the COVID-19 pandemic, the contracted rates for OC ACCESS had moved from tier 1 (highest cost per RVH) to tier 4, with tier 4 being one tier before the pre-pandemic equivalent tier. On the other hand, the increase in cost per RVH for CFR was primarily due to year-over-year contract rate increase resulting from the COVID-19 pandemic.



Performance Evaluation by Route

Continuing efforts are underway to better understand, evaluate, and improve route performance. Performance evaluation is important because it provides:

- A better understanding of where resources are being applied;
- A measure of how well services is being delivered;
- A measure of how well these services is used; and
- An objective basis for decisions regarding future service changes and service deployment.

The tables on the following pages summarize route-level performance through the third quarter. The first two tables present the route-level performance sorted by routes with the highest net subsidy per boarding to routes with a lower net subsidy per boarding. The remaining two tables present the same information sorted by routes with the highest boardings to routes with a lower level of boardings.

A route guide listing all the routes and their points of origin and destinations is provided after the routelevel performance tables. Route types are grouped by route numbers as follows:

- Routes 1 to 99: Local routes include two sub-categories:
 - <u>Major</u>: These routes operate as frequently as every 15 minutes during peak times. Major routes operate seven days a week throughout the day. Together, the Major routes form a grid on arterial streets throughout the highest transit propensity portions of the OC Bus service area, primarily in northern parts of the county.
 - Local: These routes operate on arterials within the grid created by the Major routes but at lower frequencies. Local routes also operate in parts of Orange County with lower transit demand. Most Local routes operate seven days per week; however, some operate on weekdays only.
- **Routes 100 to 199**: Community routes to connect pockets of transit demand with major destinations and offer local circulation. Routes tend to be less direct than Local routes, serving neighborhoods and destinations off the arterial grid. Half of the Community routes operate seven days per week.
- Routes 200 to 299: Intra-county express routes operate on weekdays only at peak times and connect riders over long distances to destinations within Orange County, using freeways to access destinations. (Did not operate during Q1 through Q3 of FY 2021-22).
- **Routes 400 to 499:** Stationlink routes are rail feeder services designed to connect Metrolink stations to nearby employment destinations. These routes have short alignments, with schedules tied to Metrolink arrivals and departures. They operate during weekday peak hours only, in the peak direction, from the station to destinations in the morning and the reverse in the evening.
- **Routes 500 to 599**: Bravo! routes are limited-stop services operated with branded vehicles.
- Routes 600 to 699: Seasonal or Temporary routes (these are not included on the following charts) such as the OC Fair Express. (Did not operate during Q1 through Q3 of FY 2021-22).
- Routes 700 to 799: Inter-county express routes that operate on weekdays only at peak times and connect riders over long distances to destinations outside of Orange County, often using freeways to access destinations. (Did not operate during Q1 through Q3 of FY 2021-22).



OCTA Operating Statistics By Route for Local and Community Services (Sorted by Subsidy per Boarding) Fiscal Year 2021-22

| OCTA | | | | | | | | | | | | | | E | Bus Cou | nt |
|-------|------|---------|-------------------------|-------------------|---------------------|---|-------------------------|-----------|-----------|-------------------|----------|----------|--------|-------|---------|-------|
| Route | Zone | Farebox | Subsidy per Boarding | Direct Subsidy | Indirect Subsidy | "Capital Subsidy" Per Boarding | Revenue per Boarding | Boardings | CostVSH | Direct CostVSH | CostVSM | BoardVSH | VSH | 40 FT | 32 FT | 60 FT |
| 862 | С | 2.3% | \$ 31.44 | \$ 17.99 | \$ 11.68 | \$ 1.77 | \$ 0.71 | 42,014 | \$ 185.27 | \$ 113.44 | \$ 21.11 | 6.10 | 6,891 | 3 | | - |
| 085 | S | 3.7% | 23.10 | 13.77 | 7.91 | 1.42 | 0.83 | 39,186 | 146.12 | 93.32 | 11.65 | 6.49 | 6,036 | 2 | | - |
| 178 | С | 4.8% | 19.23 | 11.56 | 6.55 | 1.12 | 0.91 | 49,915 | 145.46 | 93.10 | 11.71 | 7.65 | 6,527 | 2 | | - |
| 086 | С | 5.0% | 18.25 | 10.81 | 6.21 | 1.23 | 0.90 | 68,276 | 144.95 | 92.99 | 11.42 | 8.09 | 8,438 | 3 | | - |
| 123 | N | 5.1% | 18.12 | 10.66 | 6.24 | 1.22 | 0.90 | 106,371 | 155.14 | 98.82 | 11.31 | 8.71 | 12,206 | 6 | | - |
| 087 | S | 5.1% | 17.68 | 10.44 | 6.00 | 1.24 | 0.88 | 45,166 | 147.48 | 93.86 | 9.98 | 8.51 | 5,307 | 2 | | - |
| 167 | С | 5.1% | 17.63 | 10.49 | 5.95 | 1.19 | 0.88 | 93,961 | 145.73 | 93.11 | 12.14 | 8.42 | 11,163 | 4 | | - |
| 001 | S | 4.6% | 17.46 | 10.37 | 6.43 | 0.66 | 0.81 | 266,732 | 189.64 | 118.82 | 11.91 | 10.77 | 24,769 | 6 | | - |
| 153 | N | 5.7% | 15.91 | 9.64 | 5.47 | 0.80 | 0.91 | 69,744 | 144.14 | 92.78 | 11.21 | 9.00 | 7,748 | 2 | | - |
| 076 | С | 5.6% | 15.07 | 8.72 | 5.40 | 0.95 | 0.84 | 58,595 | 176.26 | 108.80 | 14.98 | 11.77 | 4,977 | 2 | | - |
| 529 | С | 6.3% | 14.44 | 7.91 | 4.90 | 1.63 | 0.87 | 28,554 | 204.01 | 121.45 | 17.74 | 14.91 | 1,915 | 5 | | - |
| 177 | S | 6.8% | 14.02 | 8.32 | 4.71 | 0.99 | 0.95 | 56,658 | 143.44 | 92.73 | 11.25 | 10.26 | 5,523 | 2 | | - |
| 083 | С | 5.8% | 13.99 | 8.25 | 5.11 | 0.63 | 0.82 | 309,632 | 186.11 | 116.38 | 10.30 | 13.13 | 23,582 | 8 | | - |
| 091 | S | 7.3% | 13.82 | 8.22 | 4.72 | 0.88 | 1.02 | 211,667 | 146.75 | 93.26 | 10.57 | 10.51 | 20,142 | 7 | | - |
| 143 | Ν | 6.4% | 13.25 | 8.03 | 4.55 | 0.67 | 0.86 | 97,629 | 146.17 | 92.98 | 12.08 | 10.87 | 8,978 | 3 | | - |
| 090 | S | 7.3% | 13.01 | 7.86 | 4.52 | 0.63 | 0.97 | 147,123 | 146.46 | 92.99 | 10.18 | 10.97 | 13,414 | 4 | | - |
| 129 | N | 7.5% | 12.95 | 7.78 | 4.41 | 0.76 | 0.98 | 109,501 | 147.28 | 93.42 | 12.43 | 11.19 | 9,789 | 3 | | - |
| 056 | Ν | 6.5% | 12.60 | 7.29 | 4.52 | 0.79 | 0.83 | 212,624 | 178.07 | 109.73 | 15.31 | 14.09 | 15,085 | 6 | | - |
| 150 | С | 7.4% | 11.61 | 6.54 | 3.87 | 1.20 | 0.83 | 92,989 | 162.07 | 97.77 | 16.47 | 14.43 | 6,445 | 4 | | - |
| 059 | С | 8.2% | 11.17 | 6.70 | 3.85 | 0.62 | 0.95 | 211,759 | 145.38 | 92.16 | 13.86 | 12.65 | 16,744 | 5 | | - |
| 072 | С | 7.6% | 11.15 | 6.58 | 4.08 | 0.49 | 0.87 | 244,495 | 177.70 | 109.74 | 14.59 | 15.41 | 15,866 | 5 | | - |
| 079 | С | 7.9% | 10.88 | 6.51 | 3.74 | 0.63 | 0.88 | 176,994 | 145.95 | 92.99 | 12.82 | 13.12 | 13,487 | 6 | | - |
| 560 | С | 8.0% | 10.69 | 6.10 | 3.78 | 0.81 | 0.86 | 276,923 | 185.40 | 113.16 | 15.95 | 17.27 | 16,037 | 8 | | - |
| 082 | S | 9.2% | 10.63 | 6.05 | 3.48 | 1.10 | 0.96 | 42,490 | 152.60 | 94.93 | 10.72 | 14.55 | 2,920 | 2 | | - |
| 026 | Ν | 8.2% | 10.60 | 6.33 | 3.63 | 0.64 | 0.89 | 188,390 | 145.80 | 92.60 | 12.86 | 13.44 | 14,013 | 5 | | - |
| 025 | Ν | 8.2% | 10.50 | 6.31 | 3.62 | 0.57 | 0.88 | 164,555 | 146.43 | 92.98 | 11.88 | 13.54 | 12,156 | 4 | | - |
| 033 | Ν | 7.6% | 10.04 | 5.96 | 3.43 | 0.65 | 0.77 | 114,377 | 144.55 | 92.38 | 11.55 | 14.22 | 8,042 | 4 | | - |
| 050 | N | 7.8% | 9.61 | 5.66 | 3.51 | 0.44 | 0.77 | 719,387 | 180.78 | 111.83 | 15.26 | 18.19 | 39,544 | 12 | | - |
| 037 | Ν | 8.4% | 9.39 | 5.55 | 3.44 | 0.40 | 0.82 | 485,250 | 185.97 | 114.65 | 16.20 | 18.96 | 25,598 | 7 | | - |
| 089 | S | 10.3% | 9.32 | 5.57 | 3.20 | 0.55 | 1.01 | 167,997 | 146.94 | 92.84 | 11.61 | 15.04 | 11,172 | 4 | | - |
| 071 | N | 9.2% | 9.29 | 5.59 | 3.21 | 0.49 | 0.89 | 306,033 | 145.69 | 93.15 | 11.38 | 15.03 | 20,361 | 6 | | - |
| 070 | С | 9.2% | 9.21 | 5.48 | 3.14 | 0.59 | 0.87 | 444,417 | 146.19 | 93.20 | 12.76 | 15.41 | 28,848 | 9 | | - |
| 055 | С | 9.8% | 9.03 | 5.36 | 3.32 | 0.35 | 0.94 | 687,170 | 178.72 | 110.22 | 16.17 | 18.58 | 36,991 | 10 | - | - |
| 046 | N | 9.2% | 8.40 | 5.08 | 2.92 | 0.40 | 0.81 | 231,393 | 144.82 | 92.78 | 12.83 | 16.42 | 14,090 | 4 | | - |
| 054 | N | 9.5% | 8.33 | 4.85 | 3.00 | 0.48 | 0.82 | 543,645 | 180.49 | 111.40 | 15.61 | 20.81 | 26,118 | 9 | - | - |
| 053 | С | 9.7% | 8.10 | 4.76 | 2.95 | 0.39 | 0.83 | 981,747 | 185.72 | 114.13 | 19.03 | 21.75 | 45,138 | 15 | - | - |
| 030 | N | 10.0% | 8.09 | 4.80 | 2.76 | 0.53 | 0.84 | 245,380 | 145.68 | 92.91 | 11.23 | 17.34 | 14,150 | 5 | | - |
| 543 | N | 9.6% | 8.09 | 4.72 | 2.92 | 0.45 | 0.81 | 435,666 | 177.67 | 109.27 | 17.27 | 21.02 | 20,726 | 7 | | - |
| 035 | Ν | 9.5% | 7.96 | 4.78 | 2.74 | 0.44 | 0.79 | 356,917 | 147.68 | 93.02 | 13.22 | 17.76 | 20,097 | 6 | | - |
| 047 | С | 11.0% | 7.72 | 4.52 | 2.80 | 0.40 | 0.91 | 1,128,737 | 185.30 | 114.38 | 16.22 | 22.52 | 50,118 | 14 | - | 2 |
| 038 | N | 10.8% | 7.60 | 4.42 | 2.54 | 0.64 | 0.84 | 520,033 | 148.62 | 93.71 | 11.52 | 19.05 | 27,296 | 12 | - | - |
| 029 | N | 10.6% | 7.45 | 4.36 | 2.70 | 0.39 | 0.83 | 1,144,450 | 181.48 | 112.29 | 15.75 | 22.97 | 49,820 | 5 | | 7 |
| 043 | Ν | 11.5% | 6.85 | 4.05 | 2.51 | 0.29 | 0.85 | 1,162,780 | 179.13 | 110.23 | 18.35 | 24.16 | 48,122 | 13 | - | - |
| 057 | С | 11.8% | 6.80 | 3.95 | 2.45 | 0.40 | 0.86 | 1,584,120 | 184.31 | 113.70 | 17.43 | 25.41 | 62,339 | - | - | 17 |
| 060 | С | 10.8% | 6.60 | 3.94 | 2.44 | 0.22 | 0.77 | 1,091,729 | 182.67 | 113.44 | 15.24 | 25.53 | 42,757 | 10 | - | - |
| 042 | N | 11.1% | 6.56 | 3.90 | 2.24 | 0.42 | 0.77 | 736,171 | 147.44 | 93.38 | 13.20 | 21.36 | 34,459 | 13 | - | - |
| 064 | С | 12.5% | 5.78 | 3.36 | 2.08 | 0.34 | 0.78 | 1,194,289 | 177.08 | 108.96 | 18.54 | 28.44 | 41,999 | 15 | - | - |
| 066 | С | 14.0% | 5.71 | 3.31 | 2.05 | 0.35 | 0.87 | 1,130,484 | 183.53 | 113.10 | 17.19 | 29.47 | 38,365 | 15 | - | - 1 |

Total bus count (346) is based on PM weekday equipment requirements.
 C under Zone is Central County, N is North County and S is South County.

Bus Operations Performance Measurements Report



OCTA Operating Statistics By Route for Stationlink Service (Sorted by Subsidy per Boarding) Fiscal Year 2021-22

| OCTA | | | | | | | | | | | | | | В | us Cou | nt |
|-------|------|---------|----------------------|-------------------|---------------------|---|-------------------------|-----------|-----------|-------------------|----------|----------|-------|-------|--------|-------|
| Route | Zone | Farebox | Subsidy per Boarding | Direct Subsidy | Indirect Subsidy | "Capital Subsidy" Per Boarding | Revenue per Boarding | Boardings | CostVSH | Direct CostVSH | CostVSM | BoardVSH | VSH | 40 FT | 32 FT | 60 FT |
| 463 | С | 1.9% | \$ 57.63 | \$ 24.40 | \$ 20.78 | \$ 12.45 | \$ 0.89 | 9,716 | \$ 189.10 | \$ 103.32 | \$ 18.85 | 4.10 | 2,367 | 5 | - | - |
| 480 | С | 3.4% | 33.17 | 14.06 | 11.97 | 7.14 | 0.91 | 7,821 | 195.41 | 104.92 | 15.51 | 7.25 | 1,078 | 2 | - | - |
| 453 | N | 2.8% | 31.00 | 12.70 | 10.81 | 7.49 | 0.69 | 9,935 | 205.23 | 106.69 | 31.15 | 8.48 | 1,172 | 3 | - | - |
| 472 | C | 4.5% | 23.97 | 9.51 | 8.10 | 6.36 | 0.84 | 13,176 | 180.85 | 101.48 | 15.47 | 9.80 | 1,344 | 3 | - | - |
| 473 | С | 6.3% | 18.40 | 7.50 | 6.39 | 4.51 | 0.94 | 18,577 | 195.76 | 104.04 | 18.07 | 13.20 | 1,407 | 3 | - | - |
| | | | | | | | | | | | | | | | | |

(1) Total bus count (346) is based on PM weekday equipment requirements.

(2) C under Zone is Central County, N is North County and S is South County.



OCTA Operating Statistics By Route for Local and Community Services (Sorted by Boardings) Fiscal Year 2021-22

| Route | Zone | Farebox | Subsidy per Boarding | Direct Subsidy | Indirect Subsidy | "Capital Subsidy" Per Boarding | Revenue per Boarding | Boardings | CostVSH | Direct CostVSH | CostVSM | BoardVSH | vsн | 4 |
|------------|--------|--------------|-------------------------|-------------------|---------------------|---|-------------------------|------------------|------------------|-------------------|----------------|---------------|----------------|---|
| 057 | С | 11.8% | \$ 6.80 | \$ 3.95 | \$ 2.45 | \$ 0.40 | \$ 0.86 | 1,584,120 | \$ 184.31 | \$ 113.70 | \$ 17.43 | 25.41 | 62,339 | L |
| 064 | С | 12.5% | 5.78 | 3.36 | 2.08 | 0.34 | 0.78 | 1,194,289 | 177.08 | 108.96 | 18.54 | 28.44 | 41,999 | |
| 043 | N | 11.5% | 6.85 | 4.05 | 2.51 | 0.29 | 0.85 | 1,162,780 | 179.13 | 110.23 | 18.35 | 24.16 | 48,122 | |
| 029 | N | 10.6% | 7.45 | 4.36 | 2.70 | 0.39 | 0.83 | 1,144,450 | 181.48 | 112.29 | 15.75 | 22.97 | 49,820 | |
| 066 | С | 14.0% | 5.71 | 3.31 | 2.05 | 0.35 | 0.87 | 1,130,484 | 183.53 | 113.10 | 17.19 | 29.47 | 38,365 | |
| 047 | С | 11.0% | 7.72 | 4.52 | 2.80 | 0.40 | 0.91 | 1,128,737 | 185.30 | 114.38 | 16.22 | 22.52 | 50,118 | L |
| 060 | С | 10.8% | 6.60 | 3.94 | 2.44 | 0.22 | 0.77 | 1,091,729 | 182.67 | 113.44 | 15.24 | 25.53 | 42,757 | L |
| 053 | С | 9.7% | 8.10 | 4.76 | 2.95 | 0.39 | 0.83 | 981,747 | 185.72 | 114.13 | 19.03 | 21.75 | 45,138 | L |
| 042 | N | 11.1% | 6.56 | 3.90 | 2.24 | 0.42 | 0.77 | 736,171 | 147.44 | 93.38 | 13.20 | 21.36 | 34,459 | L |
| 050 | N | 7.8% | 9.61 | 5.66 | 3.51 | 0.44 | 0.77 | 719,387 | 180.78 | 111.83 | 15.26 | 18.19 | 39,544 | L |
| 055 | С | 9.8% | 9.03 | 5.36 | 3.32 | 0.35 | 0.94 | 687,170 | 178.72 | 110.22 | 16.17 | 18.58 | 36,991 | L |
| 054 | N | 9.5% | 8.33 | 4.85 | 3.00 | 0.48 | 0.82 | 543,645 | 180.49 | 111.40 | 15.61 | 20.81 | 26,118 | L |
| 038 | N | 10.8% | 7.60 | 4.42 | 2.54 | 0.64 | 0.84 | 520,033 | 148.62 | 93.71 | 11.52 | 19.05 | 27,296 | L |
| 037 | N | 8.4% | 9.39 | 5.55 | 3.44 | 0.40 | 0.82 | 485,250 | 185.97 | 114.65 | 16.20 | 18.96 | 25,598 | L |
| 070 | С | 9.2% | 9.21 | 5.48 | 3.14 | 0.59 | 0.87 | 444,417 | 146.19 | 93.20 | 12.76 | 15.41 | 28,848 | L |
| 543 | N | 9.6% | 8.09 | 4.72 | 2.92 | 0.45 | 0.81 | 435,666 | 177.67 | 109.27 | 17.27 | 21.02 | 20,726 | L |
| 035 | N | 9.5% | 7.96 | 4.78 | 2.74 | 0.44 | 0.79 | 356,917 | 147.68 | 93.02 | 13.22 | 17.76 | 20,097 | L |
| 083 | С | 5.8% | 13.99 | 8.25 | 5.11 | 0.63 | 0.82 | 309,632 | 186.11 | 116.38 | 10.30 | 13.13 | 23,582 | L |
| 071 | N | 9.2% | 9.29 | 5.59 | 3.21 | 0.49 | 0.89 | 306,033 | 145.69 | 93.15 | 11.38 | 15.03 | 20,361 | L |
| 560 | С | 8.0% | 10.69 | 6.10 | 3.78 | 0.81 | 0.86 | 276,923 | 185.40 | 113.16 | 15.95 | 17.27 | 16,037 | L |
| 001 | S | 4.6% | 17.46 | 10.37 | 6.43 | 0.66 | 0.81 | 266,732 | 189.64 | 118.82 | 11.91 | 10.77 | 24,769 | L |
| 030 | N | 10.0% | 8.09 | 4.80 | 2.76 | 0.53 | 0.84 | 245,380 | 145.68 | 92.91 | 11.23 | 17.34 | 14,150 | L |
| 072 | С | 7.6% | 11.15 | 6.58 | 4.08 | 0.49 | 0.87 | 244,495 | 177.70 | 109.74 | 14.59 | 15.41 | 15,866 | L |
| 046 | N | 9.2% | 8.40 | 5.08 | 2.92 | 0.40 | 0.81 | 231,393 | 144.82 | 92.78 | 12.83 | 16.42 | 14,090 | L |
| 056 | N | 6.5% | 12.60 | 7.29 | 4.52 | 0.79 | 0.83 | 212,624 | 178.07 | 109.73 | 15.31 | 14.09 | 15,085 | L |
| 059 | С | 8.2% | 11.17 | 6.70 | 3.85 | 0.62 | 0.95 | 211,759 | 145.38 | 92.16 | 13.86 | 12.65 | 16,744 | L |
| 091 | S | 7.3% | 13.82 | 8.22 | 4.72 | 0.88 | 1.02 | 211,667 | 146.75 | 93.26 | 10.57 | 10.51 | 20,142 | L |
| 026 | N | 8.2% | 10.60 | 6.33 | 3.63 | 0.64 | 0.89 | 188,390 | 145.80 | 92.60 | 12.86 | 13.44 | 14,013 | L |
| 079 | С | 7.9% | 10.88 | 6.51 | 3.74 | 0.63 | 0.88 | 176,994 | 145.95 | 92.99 | 12.82 | 13.12 | 13,487 | L |
| 089 | S | 10.3% | 9.32 | 5.57 | 3.20 | 0.55 | 1.01 | 167,997 | 146.94 | 92.84 | 11.61 | 15.04 | 11,172 | ⊢ |
| 025 | N | 8.2% | 10.50 | 6.31 | 3.62 | 0.57 | 0.88 | 164,555 | 146.43 | 92.98 | 11.88 | 13.54 | 12,156 | ⊢ |
| 090 | S | 7.3% | 13.01 | 7.86 | 4.52 | 0.63 | 0.97 | 147,123 | 146.46 | 92.99 | 10.18 | 10.97 | 13,414 | ⊢ |
| 033 | N | 7.6% | 10.04 | 5.96 | 3.43 | 0.65 | 0.77 | 114,377 | 144.55 | 92.38 | 11.55 | 14.22 | 8,042 | ⊢ |
| 129 123 | N N | 7.5% 5.1% | 12.95 | 7.78 | 4.41 6.24 | 0.76 | 0.98 | 109,501 | 147.28 | 93.42 | 12.43 11.31 | 11.19 | 9,789 | ⊢ |
| | | | 18.12 | 10.66 | | | 0.90 | 106,371 | 155.14 | 98.82 | | 8.71 | 12,206 | ⊢ |
| 143 | N C | 6.4% | 13.25 | 8.03 | 4.55 | 0.67 | 0.86 | 97,629 | 146.17 | 92.98 | 12.08 | 10.87 | 8,978 | ⊢ |
| 167 150 | C C | 5.1% 7.4% | 17.63 | 10.49 6.54 | 5.95 | 1.19 1.20 | 0.88 | 93,961 | 145.73 162.07 | 93.11 97.77 | 12.14 16.47 | 8.42 | 11,163 | ⊢ |
| 150 | N | 7.4% 5.7% | 11.61 15.91 | 6.54 9.64 | 3.87 5.47 | 0.80 | 0.83 | 92,989 69,744 | 162.07 | 97.77 | 16.47 | 14.43 9.00 | 6,445 7,748 | ⊢ |
| | C | 5.7% | 15.91 | 9.64 | 6.21 | 1.23 | 0.91 | 69,744 | 144.14 | 92.78 | 11.21 | 9.00 | 8,438 | ⊢ |
| 086 | C | | | 10.81 | | | | | | | | 8.09 | | ⊢ |
| 076 | S | 5.6% | 15.07 | | 5.40 | 0.95 | 0.84 | 58,595 | 176.26 | 108.80 | 14.98 | | 4,977 | ⊢ |
| 177 178 | C | 6.8% 4.8% | 14.02 19.23 | 8.32 11.56 | 4.71 6.55 | 0.99 | 0.95 | 56,658 49,915 | 143.44 145.46 | 92.73 93.10 | 11.25 11.71 | 10.26 7.65 | 5,523 6,527 | ⊢ |
| 087 | S | 4.8% | 19.23 | 10.44 | 6.00 | 1.12 | 0.91 | 49,915 | 145.46 | 93.10 | 9.98 | 8.51 | 5,307 | ⊢ |
| 087 | S | 9.2% | 17.66 | 6.05 | 3.48 | 1.24 | 0.86 | 45,166 | 147.46 | 93.86 | 9.96 | 14.55 | 2,920 | ⊢ |
| 062 | 3 | 9.2% | 10.63 | 6.05 | 3.40 | 1.10 | 0.96 | 42,490 | 152.60 | 94.93 | 10.72 | 14.55 | 2,920 | ⊢ |

Total bus count (346) is based on PM weekday equipment requirements.
 C under Zone is Central County, N is North County and S is South County.

31.44

23.10

14.44

17.99

13.77

7.91

11.68

7.91

4.90

1.77

1.42

1.63

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0.83

0.87

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39,186

28,554

185.27

146.12

204.01

113.44

93.32

121.45

21.11

11.65

17.74

6.10

6.49

14.91

Bus Operations Performance Measurements Report

2.3%

3.7%

6.3%

862

085

529

С

S

С

Bus Count

40 FT 32 FT 60 FT

15 -

13 -

5 -

15 -

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10

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13 -

12 -

10 -

9 -

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7 -

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| | | A Opera Year 202 | • | tics By | Route f | or Statior | nlink Servio | ce (Sorted b | y Boardi | ings) | | |
|-------|------|---------------------|-------------|---------|----------|----------------------|--------------|--------------|----------|--------|---------|---|
| Pouto | Zone | Earobox | Subsidy per | Direct | Indirect | "Capital Subsidy" | Revenue per | Boardings | CoctVSH | Direct | CostVSM | B |

| Route | Zone | Farebox | Subsidy per Boarding | Direct Subsidy | Indirect Subsidy | Subsidy" Per Boarding | Revenue per Boarding | Boardings | CostVSH | Direct CostVSH | CostVSM | BoardVSH | VSH | 40 FT | 32 FT | 60 FT |
|-------|------|---------|-------------------------|-------------------|---------------------|-----------------------------|-------------------------|-----------|-----------|-------------------|----------|----------|-------|-------|-------|-------|
| 473 | С | 6.3% | \$ 18.40 | \$ 7.50 | \$ 6.39 | \$ 4.51 | \$ 0.94 | 18,577 | \$ 195.76 | \$ 104.04 | \$ 18.07 | 13.20 | 1,407 | 3 | - | - |
| 472 | С | 4.5% | 23.97 | 9.51 | 8.10 | 6.36 | 0.84 | 13,176 | 180.85 | 101.48 | 15.47 | 9.80 | 1,344 | 3 | - | - |
| 453 | Ν | 2.8% | 31.00 | 12.70 | 10.81 | 7.49 | 0.69 | 9,935 | 205.23 | 106.69 | 31.15 | 8.48 | 1,172 | 3 | - | - |
| 463 | С | 1.9% | 57.63 | 24.40 | 20.78 | 12.45 | 0.89 | 9,716 | 189.10 | 103.32 | 18.85 | 4.10 | 2,367 | 5 | - | - |
| 480 | С | 3.4% | 33.17 | 14.06 | 11.97 | 7.14 | 0.91 | 7,821 | 195.41 | 104.92 | 15.51 | 7.25 | 1,078 | 2 | - | - |
| | | | | | | | | | | | | | | | | |

Total bus count (346) is based on PM weekday equipment requirements.
 C under Zone is Central County, N is North County and S is South County.

Bus Count

Route Reference Table

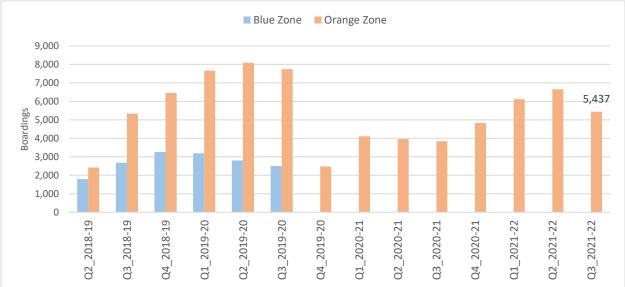
| Route | Route Description | Main Street | Route Category |
|-------|--|--|----------------|
| 1 | Long Beach - San Clemente | via Pacific Coast Hwy | LOCAL |
| 25 | Fullerton - Huntington Beach | via Knott Ave/ Goldenwest St | LOCAL |
| 26 | Fullerton - Yorba Linda | via Commonwealth Ave/ Yorba Linda Blvd | LOCAL |
| 29 | La Habra - Huntington Beach | via Beach Blvd | LOCAL |
| 30 | Cerritos - Anaheim | via Orangethorpe Ave | LOCAL |
| 33 | Fullerton - Huntington Beach | via Magnolia St | LOCAL |
| 35 | Fullerton - Costa Mesa | via Brookhurst St | LOCAL |
| 37 | La Habra - Fountain Valley | via Euclid St | LOCAL |
| 38 | Lakewood - Anaheim Hills | via Del Amo Blvd/ La Palma Ave | LOCAL |
| 42 | Seal Beach - Orange | via Seal Beach Blvd/ Los Alamitos Blvd/ Lincoln Ave | LOCAL |
| 43 | Fullerton - Costa Mesa | via Harbor Blvd | LOCAL |
| 46 | Long Beach - Orange | via Ball Road/ Taft Ave | LOCAL |
| 47 | Fullerton - Balboa | via Anaheim Blvd/ Fairview St | LOCAL |
| 50 | Long Beach - Orange | via Katella Ave | LOCAL |
| 53 | Anaheim - Irvine | via Main St | LOCAL |
| 54 | Garden Grove - Orange | via Chapman Ave | LOCAL |
| 55 | Santa Ana - Newport Beach | via Standard Ave/ Bristol St/ Fairview St/ 17th St | LOCAL |
| 56 | Garden Grove - Orange | via Garden Grove Blvd | LOCAL |
| 57 | Brea - Newport Beach | via State College Blvd/ Bristol St | LOCAL |
| 59 | Anaheim - Irvine | via Kraemer Blvd/ Glassell St/ Grand Ave/ Von Karman Ave | LOCAL |
| 60 | Long Beach - Tustin | via Westminster Ave/ 17th St | LOCAL |
| 64 | Huntington Beach - Tustin | via Bolsa Ave/ 1st St | LOCAL |
| 66 | Huntington Beach - Irvine | via McFadden Ave/ Walnut Ave | LOCAL |
| 70 | Sunset Beach - Tustin | via Edinger Ave | LOCAL |
| 71 | Yorba Linda - Newport Beach | via Tustin Ave/ Red Hill Ave/ Newport Blvd | LOCAL |
| 72 | Sunset Beach - Tustin | via Warner Ave | LOCAL |
| 76 | Huntington Beach - John Wayne Airport | via Talbert Ave/ MacArthur Blvd | LOCAL |
| 79 | Tustin - Newport Beach | via Bryan Ave/ Culver Dr/ University Ave | LOCAL |
| 82 | Foothill Ranch - Rancho Santa Margarita | via Portola Pkwy/ Santa Margarita Pkwy | LOCAL |
| 83 | Anaheim - Laguna Hills | via 5 Fwy/ Main St | LOCAL |
| 85 | Mission Viejo - Laguna Niguel | via Marguerite Pkwy/ Crown Valley Pkwy | LOCAL |
| 86 | Costa Mesa - Mission Viejo | via Alton Pkwy/ Jeronimo Rd | LOCAL |
| 87 | Rancho Santa Margarita - Laguna Niguel | via Alicia Pkwy | LOCAL |
| 89 | Mission Viejo - Laguna Beach | via El Toro Rd/ Laguna Canyon Rd | LOCAL |
| 90 | Tustin - Dana Point | via Irvine Center Dr/ Moulton Pkwy/ Golden Lantern St | LOCAL |
| 91 | Laguna Hills - San Clemente | via Paseo de Valencia/ Camino Capistrano/ Del Obispo St | LOCAL |
| 123 | Anaheim - Huntington Beach | via Malvern Ave/ Valley View/ Bolsa Chica | COMMUNITY |
| 129 | La Habra - Anaheim | via La Habra Blvd/ Brea Blvd/ Birch St/ Kraemer Blvd | COMMUNITY |
| 143 | La Habra - Brea | via Whittier Blvd/ Harbor Blvd/ Brea Blvd/ Birch St | COMMUNITY |
| 150 | Santa Ana - Costa Mesa | via Fairview St/ Flower St | COMMUNITY |
| 153 | Brea - Anaheim | via Placentia Ave | COMMUNITY |
| 167 | Orange - Irvine | via Irvine Ave/ Hewes St/ Jeffrey Rd | COMMUNITY |
| 177 | Foothill Ranch - Laguna Hills | via Lake Forest Dr/ Muirlands Blvd/ Los Alisos Blvd | COMMUNITY |
| 178 | Huntington Beach - Irvine | via Adams Ave/ Birch St/ Campus Dr | COMMUNITY |
| 453 | Orange Transportation Center - St. Joseph's Hospital | via Chapman Ave/ Main St/ La Veta Ave | STATIONLINK |
| 463 | Santa Ana Regional transportation Center - Hutton Centre | via Grand Ave | STATIONLINK |
| 472 | Tustin Metrolink Station - Irvine Business Complex | via Edinger Ave/ Red Hill Ave/ Campus Dr/ Jamboree Rd | STATIONLINK |
| 473 | Tustin Metrolink Station - U.C.I. | via Edinger Ave/ Harvard Ave | STATIONLINK |
| 480 | Irvine Metrolink Station - Lake Forest | via Alton Pkwy/ Bake Pkwy/ Lake Forest Dr | STATIONLINK |
| 529 | Fullerton to Huntington Beach | via Beach Blvd | BRAVO |
| 543 | Fullerton Transportation Center - Santa Ana | via Harbor Blvd | BRAVO |
| 560 | Santa Ana - Long Beach | via 17th St / Westminster Ave | BRAVO |
| 862 | Downtown Santa Ana Shuttle | via Civic Center Dr | COMMUNITY |

OC Flex

OC Flex Program

OC Flex service launched in October 2018 in two zones under a pilot program. The Board approved five primary goals and performance metrics to evaluate the pilot program. Upon approval of the pilot program, the Board directed staff to provide updates on the performance metrics as part of a quarterly Bus Operations Performance Measurements Report.

For Q3 of FY 2021-22, ridership in the Orange Zone remained comparable to the previous two quarters despite the introduction of the new OC Flex application, which required riders to download and create a new account, and the effects of the January 2022 COVID-19 surge in Orange County. Other metrics remained stable, and in some cases, the rate of shared rides and connecting trips increased compared to the previous two quarters. The subsidy rate per boarding increased in Q3 due to the new contract rate, beginning January 2022, and increased fuel costs.

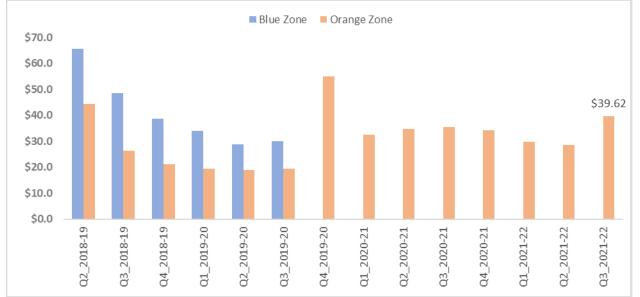


Quarterly OC Flex Ridership – Through Q3-FY 2021-22



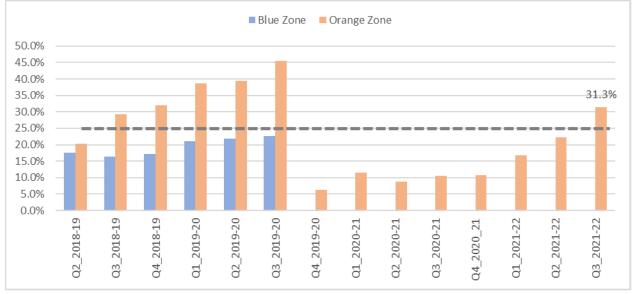
OC Flex Productivity (Boarding/RVH) – Through Q3-FY 2021-22 Target: Productivity – 6 B/RVH

Quarterly OC Flex Direct Subsidy per Boarding – Through Q3-FY 2021-22 Target: Direct Subsidy per Boarding - \$9 per Boarding

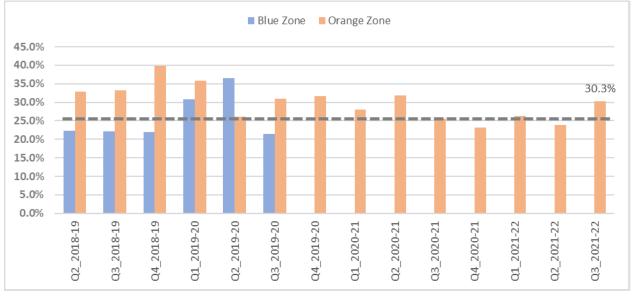


OC Flex Shared Trips – Through Q3-FY 2021-22

Target: 25 Percent of Booked Trips Sharing a Vehicle



OC Flex Connecting Trips (Transfers) – Through Q3-FY 2021-22 Target: 25 Percent of Trips Transfer to OC Bus or Metrolink Service



College Pass Program

In 2017, OCTA introduced community college students to the convenience and affordability of public transit with a shared-cost program that allows all participating students to travel free on any fixed-route OC Bus route. Since then, OCTA has built on the success of the program, which has helped increase ridership, introduced new riders to public transit, removed barriers to higher education for students, and helped take vehicles off the road. Despite the COVID-19 pandemic, which resulted in remote learning for most of the students, colleges have continued to stay in the program to help meet the essential travel needs of students. During this reporting period, Coastline College became the eighth college to join the College Pass Program.

During this reporting period, which is within the Spring semester of 2022, all colleges implemented a full return to campus while also offering remote online classes for about 30 percent of the curriculum. Amid many changes, such as hybrid in-person and virtual learning and declining enrollment across all colleges, the College Pass Program continues to be of great interest to both colleges and students. As of this reporting period, we have seen bus ridership from the College Pass Program climb back to 30 percent of the pre-pandemic level.

Staff continued working with several colleges to extend their existing agreements or establish new ones, including the last remaining college in Orange County, the Orange Coast College, which is planning to get on board in the fall of 2022.



June 9, 2022

app

From: Darrell E. Johnson, Chief Executive Officer

Subject: Approval to Adopt the Mitigated Negative Declaration Finding for the Orange County Maintenance Facility Project

Overview

On July 21, 2020, the Orange County Transportation Authority, in cooperation with the Southern California Regional Rail Authority, entered into a Cooperative Agreement which defined roles, responsibilities, and funding for the preliminary engineering and environmental phase of the Metrolink Orange County Maintenance Facility. The Orange County Transportation Authority has been the lead agency for the preliminary engineering and environmental documentation. Board of Directors' adoption of the Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program is required for the project to advance to the next phase.

Recommendation

Approve Resolution No. 2022-025 to adopt the Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program, pursuant to the California Environmental Quality Act, for the Metrolink Orange County Maintenance Facility.

Discussion

The proposed Metrolink Orange County Maintenance Facility (OCMF) project is part of the Metrolink Southern California Optimized Rail Expansion Capital Program, which is primarily funded by the State of California's Transit and Intercity Rail Capital Program. The OCMF project (Project) is also included in the Federal Transportation Improvement Program (FTIP) as ORA210601.

The Project will construct a rail maintenance facility that will allow for locomotive and railcar servicing and storage facilities for Metrolink trains. The construction of the OCMF will improve Metrolink's operational efficiency and overall system performance. Metrolink currently operates three maintenance facilities across its

Approval to Adopt the Mitigated Negative DeclarationPage 2Finding for the Orange County Maintenance Facility Project

service area: Central Maintenance Facility (CMF) in Los Angeles, Eastern Maintenance Facility (EMF) in San Bernadino County, and the North County Transit District's Stuart Mesa Facility in northern San Diego County. These existing facilities are near or at near capacity. A facility located in Orange County will increase the capacity at CMF and EMF and allow for more efficient train movement.

The Project site is a 21.3-acre parcel of land purchased by the Orange County Transportation Authority (OCTA) from the City of Irvine (City) on March 9, 2015, for the express purpose of a commuter rail maintenance facility. The site is located within the railroad corridor between Milepost (MP) 183.3 and MP 184.5. The Project will include the construction of a new rail yard, a new rail bridge over the Bee Canyon Channel, lead tracks and yard tracks, storage, operations and maintenance buildings, train wash, ancillary structures, landscape improvements, and safety and security features (Attachment A). The Project also includes the construction of street and traffic signal improvements to the extension of existing Ridge Valley south of Marine Way to allow access to the Project site.

The Project requires federal and state environmental clearance. OCTA is the California Environmental Quality Act (CEQA) lead agency, and the Federal Transit Administration (FTA) is the National Environmental Policy Act lead agency.

Due to the Project location within Planning Area 51 of the updated City General Plan, adopted in June 2015, the proposed use is conditionally allowable under the existing zone subject to the approval of a Conditional Use Permit (CUP) per the City's zoning ordinance. The City is currently processing the CUP approval for the Project, which will include public hearings at the City's Transportation Commission and Planning Commission. The City would act in the capacity of a CEQA-responsible agency as defined by CEQA Guideline §15381, and in accordance with the process for a responsible agency as provided in CEQA guidelines, the City would adopt the final CEQA documentation as part of the City's consideration for approval of the CUP.

Preliminary plans have been completed to 30 percent design, and the site-specific analysis was done to address detailed environmental impacts associated with the Project. The findings support the conclusion that the Project will not have a significant impact on the environment with the implementation of mitigation measures during construction of the Project. The final Mitigated Negative Declaration (MND) comprises the environmental analysis and findings, and a discussion on public outreach efforts for the Project (Attachment B). The MND appendices include technical data and reports in support of the findings

Approval to Adopt the Mitigated Negative DeclarationPage 3Finding for the Orange County Maintenance Facility Project

therein, responses to public comments during the public circulation period, and the Mitigation Monitoring and Reporting Program (MMRP).

The discussion below summarizes the findings in the MND supporting the conclusion that the proposed Project will not result in significant effects on the environment with the implementation of mitigation measures.

In accordance with CEQA guidelines, the proposed Project was evaluated for its effect on 21 environmental factors. The results of this evaluation showed that the Project would have no impact, or less than significant impact on 13 of 21 environmental factors, including aesthetics, hydrology/water quality, recreation, utilities/services systems, agriculture and forestry resources, greenhouse gas emissions, land use/planning, population/housing, transportation, wildfire, energy, mineral resources, and public services.

The environmental evaluation anticipates the Project to have potentially significant temporary effect on the remaining eight environmental factors related to construction including air quality, biological resources, cultural resources, geology/soils (paleontological resources), hazards and hazardous materials, noise, tribal cultural resources, and mandatory findings of significance (quality of the environment and substantial adverse effects on humans and human beings). However, technical studies on these resource areas determined that the implementation of mitigation measures during Project construction would be sufficient to avoid potentially significant effects and reduce all impacts to less than significant.

Staff has prepared a MMRP in compliance with Public Resources Code 21081.6 and CEQA Guideline 15097 to ensure compliance with the mitigation measures identified in the final MND during project construction. It should be noted that the MMRP was made available for review as Appendix K of the MND. The MMRP includes construction mitigation measures to address environmental impacts prior to and during construction. In addition, some of the measures will require further coordination with regulatory agencies that are further detailed in the MND. These measures would reduce the level of impacts to less than significant for the Project.

A public notice of intent for the MND was released on February 28, 2022 through March 29, 2022, to allow the public, affected and interested parties, and agencies an opportunity to provide input on the MND during the public review period. OCTA's process for public outreach during preliminary design and environmental review included the following efforts:

• A virtual public meeting was held on October 5, 2021, via zoom to inform the public about the Project. The public was notified of the meeting via a

Approval to Adopt the Mitigated Negative DeclarationPage 4Finding for the Orange County Maintenance Facility Project

postcard distributed to all properties within 500-feet of the Project property. This 500-foot area included two residences within the Travata community, a 55 and older community, which is the closest residential community to the Project. It was decided that the while only two residents were within the 500-foot area, the whole Travata community would be included in the notification. Five members of the public attended. A recording of this meeting was made available on the Project website and sent to the Travata property manager for distribution to residents.

- On Thursday, Nov. 4, 2021, a member of the OCTA outreach team went to the Travata community to provide information on the Project to those that may have missed the virtual meeting. The invitation was coordinated through the Travata property manager, as this is a gated private community, who sent the invitation in an email to residents. There were approximately 15 people in attendance.
- On Wednesday, January 12, 2022, the OCTA outreach team and a member of the technical team went back to the Travata community to answer questions and provide detail about the environmental process. The invitation was again coordinated through the property manager. There were approximately 25 people in attendance.
- On Monday, March 14, 2022, the OCTA outreach team and members of the technical team went back to Travata to go into further detail about the information in the draft Initial Study (IS)/MND and answer any questions, and to reiterate the comment process. Comment cards were handed out at the meeting if people wanted to submit an official comment the same day. City staff were also present at the meeting. The invitation was also coordinated through the property manager. There were approximately 60 people in attendance.
- The draft IS/MND and notices were posted on the OCTA web page, sent to the Travata property manager for distribution to residents via emails, and officially noticed in the Orange County Register newspaper.
- A special email address link was implemented on the web page to facilitate interested parties to comment on the draft IS/MND.
- The MND was sent to the State Clearinghouse and 16 public agencies during the public review period, including the City, and was available for review at OCTA's administrative office. A hard copy was delivered to the Travata Community for review in their club house.

Approval to Adopt the Mitigated Negative DeclarationPage 5Finding for the Orange County Maintenance Facility Project

During the MND 30-day public review period, OCTA received approximately 90 written comments, mostly from the Travata Community, as well as a petition signed by 288 people against the Project. The comments were primarily focused on concerns of noise, pollution, traffic, and lighting. All these concerns have been studied and found to be less than significant. The following is a summary from the IS/MND of these issues:

Section 3.3 of the IS/MND states impacts related to air quality would be less than significant with mitigation measures incorporated, and the criteria air pollutant emissions associated with the proposed Project would not expose sensitive receptors to substantial criteria pollutant concentrations.

As detailed in Table 3.3-15, Summary of Excess Cancer Risks, of the MND, and shown in Figure 10.2-2 (Contour Map of 30-Year Residential Cancer Risk) of Appendix B of the MND, the maximum excess cancer risk for an individual is less than the South Coast Air Quality Management District threshold of ten in a million. Therefore, the Project would not expose the surrounding residents to significant air quality impacts.

Section 3.13 of the IS/MND states impacts related to noise would be less than significant with mitigation measures, and the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project above the standards established in the local general plan or noise ordinance, or applicable standards of other agencies would be less than significant. Additionally, total Project sound levels would not meet or exceed the FTA thresholds for both on-site operational noise sources associated with the rail shops and yard, as well as automobile and truck traffic moving in and out of the Project site.

Section 3.17 of the IS/MND states impacts related to vehicle miles traveled would be less than significant. The estimated daily trip volumes would not exceed local or regional thresholds and meets the requirements of the Congestion Management Program Highway System.

Section 3.1 of the IS/MND states sensitive receptors (the Great Park and residences) would be too far from the Project site to experience spillover lighting from security lighting. Additionally, the nighttime lighting fixtures would be installed to direct the majority of the light adjacent to the OCMF, and away from sensitive areas to the maximum extent feasible. Therefore, impacts would be less than significant. This section also states views from the residences located to the northwest of the Project site would be blocked by existing mature trees on their properties, as well as the concrete wall that surrounds the residential complex. The view would also be blocked by fencing that would surround the Project site during construction and a six-foot concrete wall with landscaping during operations. The Project would not substantially alter the visual character for residential viewers primarily due to the distance of the Project buildings from the

Approval to Adopt the Mitigated Negative DeclarationPage 6Finding for the Orange County Maintenance Facility Project

residential viewers, and because the residences are surrounded by an existing tall concrete wall and large trees within their property. Additionally, no aesthetically significant view or landmark would be altered or blocked. Therefore, impacts would be less than significant.

The final MND is presented to the Board of Directors (Board) for adoption as the final environmental document (Attachment C). If the Board approves the MND, a Notice of Determination will be filed with and posted at the Orange County Clerk's office and the State Clearinghouse. In addition, staff will continue working with the City in their assessment and consideration of the CUP approval.

Summary

The MND for the OCMF indicates the Project would not have a significant effect on the environment with incorporation of the mitigation monitoring and reporting measures. The MND was circulated to allow the public, affected and interested parties, and agencies an opportunity to provide input on the MND during the public review process. The responses to questions/comments submitted is not part of the CEQA requirements but have been incorporated into the appendices of the MND. Staff recommends the Board approve Resolution No. 2022-025 to adopt the MND and MMRP, pursuant to the CEQA guidelines, for the OCMF.

Attachments

- A. Metrolink Orange County Maintenance Facility Project Location
- B. Metrolink Orange County Maintenance Facility Project, Initial
- Study/Mitigated Negative Declaration Appendices, Dated June 2022
- C. Resolution No. 2022-025

Prepared by:

Lora Cross Project Manager (714) 560-5788

Approved by:

1R1

James G. Beil, P.E. Executive Director, Capital Programs (714) 560-5646

Metrolink Orange County Maintenance Facility – Project Location

- LOCATION: CITY OF IRVINE
- PROPERTY OWNER: OCTA
- USE: METROLINK MAINTENANCE FACILITY



FIGURE 2: PROJECT LOCATION

Source: Google Maps, 2018



METROLINK ORANGE COUNTY MAINTENANCE FACILITY PROJECT

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION

ORANGE COUNTY TRANSPORTATION AUTHORITY

June 2022



Initial Study/ Mitigated Negative Declaration

Metrolink Orange County Maintenance Facility Project

Orange County Transportation Authority June 2022

Prepared for: Gannett Fleming Figueroa at Wilshire 601 S Figueroa St. #3800 Los Angeles, CA 90017

Prepared by: AECOM 401 W A St., Suite 1200 San Diego, CA 92101

Review Log

| REVISION | DESCRIPTION | DATE |
|----------|-------------------------------------|------------|
| 0 | Administrative Draft IS/MND | 05/28/2021 |
| 1 | Revised Administrative Draft IS/MND | 08/30/2021 |
| 2 | Draft IS/MND | 12/09/2021 |
| 3 | Revised Draft IS/MND | 02/15/2022 |
| 4 | Revised Draft IS/MND | 02/23/2022 |
| 5 | Final IS/MND | 04/01/2022 |
| 6 | Revised Final IS/MND | 05/05/2022 |

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- Appendix E Hazards and Hazardous Materials Technical Memorandum
- Appendix F Noise and Vibration Technical Memorandum
- Appendix G Paleontological Resources Technical Memorandum
- Appendix H Traffic Technical Memorandum
- Appendix I Public Outreach
- Appendix J Response to Comments
- Appendix K Mitigation Monitoring and Reporting Program

Acronyms and Abbreviations

| ACMAsbestor-containing materialsADAAmericans with Disabilities ActafyAcre-feet per yearAPSAAboveground Petroleum Storage ActAPSAAboveground Petroleum Storage ActAQPAir quality attainment plansAQMDAir Quality Management DistrictAQMPAir Quality Management PlanARBCalifornia Air Resources BoardAT&SFBest Available TechnologyBATsBest Available TechnologyBCTsBest Conventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAQSCalifornia Ambient Air Quality StandardsCAIEEModCalifornia Green Building StandardsCAIGreenCalifornia Green Building Standards CodeCAACalifornia Code of RegulationsCDFWCalifornia Department of Fish and GameCEQACalifornia Indepartment of Fish and GameCEQACalifornia Endingere Species ActCESACalifornia Fish and Game CodeCFRCode of Federal RegulationsCFGCCalifornia Fish and Game CodeCFACode of Federal RegulationsCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationsCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationsCFGCubir Fet per secondCH4MethaneCity of IrvineCubic feet per secondCFACubic feet per secondCF | AB | Assembly Bill |
|--|-----------------|---|
| afyAcre-feet per yearAPSAAboveground Petroleum Storage ActAPEArea of Potential EffectAQAPAir quality Attainment plansAQMDAir Quality Management DistrictAQMPAir Quality Management PlanARBCalifornia Air Resources BoardARBCalifornia Air Resources BoardBATsBest Available TechnologyBCTsBest Onventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Ambient Air Quality StandardsCaleen Air ActCAACAACalifornia Ceen Building Standards CodeCalifornia Code of RegulationsColifornia Ceen Air ActCCRACalifornia Department of Fish and GameCEQACalifornia Environmental Response, Compensation, and Liability ActCERACalifornia Fish and GameCEQACalifornia Fish and GameCEQACalifornia Fish and GameCEQACalifornia Fish and GameCEQACalifornia Fish and GameCEGACalifornia Fish and Game CodeCFRCode of Federal RegulationsCfsCubic feet per secondCH4WethaneCthy of IrvineChioCH4Cubic feet per secondCFGCalifornia Fish and Game CodeCFGCalifornia Fish and Game CodeCFGCalifornia Fish and Game CodeCFGCubic | ACM | |
| APSAAboveground Petroleum Storage ActAPEArea of Potential EffectAQAPAir quality attainment plansAQMDAir Quality Management DistrictAQMPAir Quality Management DistrictAQMPAir Quality Management PlanARBCalifornia Air Resources BoardARBCalifornia Air Resources BoardATSAFAtchison, Topeka and Santa Fe RailwayBATsBest Available TechnologyBCTsBest Conventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Creen Building Standards CodeCaltransCalifornia Celean Air ActCCRCalifornia Department of Fish and WildlifeCDFWCalifornia Department of Fish and GameCEQACalifornia Department of Fish and GameCEQACalifornia Environmental Response, Compensation, and Liability ActCESACalifornia Fish and Game CodeCFGCCalifornia Fish and Game CodeCFARCode of Federal RegulationsCfsCubic feet per secondCH4MethaneCity of IrvineCity of IrvineCMFCode of Federal RegulationsCfsCubic feet per secondCFARCode of Federal RegulationsCfsCubic feet per secondCFARCode of Federal RegulationsCfsCubic feet per second </td <td>ADA</td> <td>Americans with Disabilities Act</td> | ADA | Americans with Disabilities Act |
| APEArea of Potential EffectAQAPAir quality attainment plansAQMDAir Quality Management DistrictAQMPAir Quality Management PlanARBCalifornia Air Resources BoardAT&SFAtchison, Topeka and Santa Fe RailwayBATsBest Available TechnologyBCTsBest Conventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCaltErModCalifornia Creen Building Standards CodeCaltransCalifornia Code of RegulationsCDFWCalifornia Code of RegulationsCDFWCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCFSACalifornia Fish and Game CodeCFRCode of Federal RegulationsCFGCCalifornia Environmental Response, Compensation, and Liability ActCFSACode of Federal RegulationsCffCode of Federal RegulationsCffCode of Federal RegulationsCffCode of Federal RegulationsCfsCubic feet per sec | afy | Acre-feet per year |
| AQAPAir quality attainment plansAQMDAir Quality Management DistrictAQMPAir Quality Management PlanARBCalifornia Air Resources BoardAT&SFAtchison, Topeka and Santa Fe RailwayBATsBest Available TechnologyBCTsBest Available TechnologyBCTsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAQSCalifornia Ambient Air Quality StandardsCAIEEModCalifornia Crean Building Standards CodeCAIETSCalifornia Crean Building Standards CodeCaltransCalifornia Cean Air ActCCRCalifornia Cean Air ActCCRCalifornia Cean Air ActCCRCalifornia Cean Air ActCCRCalifornia Department of TransportationCDFGCalifornia Department of Fish and GameCDFGCalifornia Department of Fish and GameCEQACalifornia Department of Fish and GameCEQACalifornia Department of Fish and GameCEQACalifornia Intransportes Species ActCFGCalifornia Fish and Game CodeCFRCode of Federal RegulationsCFSCubic feet per secondCFRCubic feet per secondCH4MethaneCityCity of IrvineCMFCongestion Management Program | APSA | Aboveground Petroleum Storage Act |
| AQMDAir Quality Management DistrictAQMPAir Quality Management PlanARBCalifornia Air Resources BoardAT&SFAtchison, Topeka and Santa Fe RailwayBATsBest Available TechnologyBCTsBest Available TechnologyBGTsBest Conventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Green Building StandardsCaltaransCalifornia Cean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of TransportationCCAACalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERACalifornia Environmental Response, Compensation, and Liability ActCERACalifornia Fish and Game CodeCFFGCalifornia Fish and Game CodeCFRCode of Federal RegulationsCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationsCfsfCubic feet per secondCH4MethaneCity of IrvineCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | APE | Area of Potential Effect |
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| ARBCalifornia Air Resources BoardAT&SFAtchison, Topeka and Santa Fe RailwayBATsBest Available TechnologyBCTsBest Conventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Green Building Standards CodeCAACalifornia Green Building Standards CodeCataransCalifornia Clean Air ActCCRCalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of TransportationCDFGCalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCongestion Management Program | AQMD | Air Quality Management District |
| AT&SFAtchison, Topeka and Santa Fe RailwayBATsBest Available TechnologyBCTsBest Conventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Emissions Estimator ModelCALGreenCalifornia Green Building Standards CodeCARCalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of TransportationCDFWCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornia Fish and Game CodeCFRCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCulic feet per secondCH4MethaneCity of IrvineCity of IrvineCMFCity of IrvineCMFCongestion Management Program | AQMP | Air Quality Management Plan |
| BATsBest Available TechnologyBCTsBest Conventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Green Building Standards CodeCaltransCalifornia Green Building Standards CodeCAACalifornia Clean Air ActCCRCalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of TransportationCDFQCalifornia Department of Fish and WildlifeCDFQCalifornia Department of Fish and GameCEQACalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | ARB | California Air Resources Board |
| BCTsBest Conventional Pollutant Control TechnologybgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Emissions Estimator ModelCALGreenCalifornia Green Building Standards CodeCaltransCalifornia Clean Air ActCCAACalifornia Clean Air ActCCAACalifornia Clean Air ActCCRCalifornia Clean Air ActCDFWCalifornia Department of Fish and WildlifeCDFQCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCFRCode of Federal RegulationscfsCubic feet per secondCFRCubic feet per secondCH4MethaneCity of IrvineCity of IrvineCMFCongestion Management Program | AT&SF | Atchison, Topeka and Santa Fe Railway |
| bgsBelow ground surfaceBMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Emissions Estimator ModelCALGreenCalifornia Green Building Standards CodeCaltransCalifornia Clean Air ActCCAACalifornia Clean Air ActCCAACalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of Fish and WildlifeCDFQCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCity of IrvineCity of IrvineCMFCongestion Management Program | BATs | Best Available Technology |
| BMPBest Management PracticeBSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Emissions Estimator ModelCALGreenCalifornia Green Building Standards CodeCaltransCalifornia Department of TransportationCCAACalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | BCTs | Best Conventional Pollutant Control Technology |
| BSABiological Survey AreaCAAClean Air ActCAAQSCalifornia Ambient Air Quality StandardsCalEEModCalifornia Emissions Estimator ModelCALGreenCalifornia Green Building Standards CodeCaltransCalifornia Department of TransportationCCAACalifornia Clean Air ActCCRCalifornia Department of Fish and WildlifeCDFWCalifornia Department of Fish and GameCEQACalifornia Department of Fish and GameCEQACalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | bgs | Below ground surface |
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| CalEEModCalifornia Emissions Estimator ModelCALGreenCalifornia Green Building Standards CodeCaltransCalifornia Department of TransportationCCAACalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCity of IrvineCity of IrvineCMFCongestion Management Program | CAA | Clean Air Act |
| CALGreenCalifornia Green Building Standards CodeCaltransCalifornia Department of TransportationCCAACalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CAAQS | California Ambient Air Quality Standards |
| CaltransCalifornia Department of TransportationCCAACalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornia Fish and Game CodeCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CalEEMod | California Emissions Estimator Model |
| CCAACalifornia Clean Air ActCCRCalifornia Code of RegulationsCDFWCalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornia Fish and Game CodeCFRCode of Federal RegulationsCfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCongestion Management Program | CALGreen | California Green Building Standards Code |
| CCRCalifornia Code of RegulationsCDFWCalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornian Endangered Species ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCongestion Management Program | Caltrans | California Department of Transportation |
| CDFWCalifornia Department of Fish and WildlifeCDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornian Endangered Species ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CCAA | California Clean Air Act |
| CDFGCalifornia Department of Fish and GameCEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornian Endangered Species ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CCR | California Code of Regulations |
| CEQACalifornia Environmental Quality ActCERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornian Endangered Species ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CDFW | California Department of Fish and Wildlife |
| CERCLAComprehensive Environmental Response, Compensation, and Liability ActCESACalifornian Endangered Species ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CDFG | California Department of Fish and Game |
| CESACalifornian Endangered Species ActCFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CEQA | California Environmental Quality Act |
| CFGCCalifornia Fish and Game CodeCFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFRCode of Federal RegulationscfsCubic feet per secondCH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CESA | Californian Endangered Species Act |
| cfsCubic feet per secondCH₄MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CFGC | California Fish and Game Code |
| CH4MethaneCityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | CFR | Code of Federal Regulations |
| CityCity of IrvineCMFCentral Maintenance FacilityCMPCongestion Management Program | cfs | Cubic feet per second |
| CMFCentral Maintenance FacilityCMPCongestion Management Program | CH ₄ | Methane |
| CMP Congestion Management Program | City | City of Irvine |
| | CMF | Central Maintenance Facility |
| CNDDB California Natural Diversity Database | CMP | |
| | CNDDB | California Natural Diversity Database |
| CNEL Community Noise Equivalent Level | | |
| CNRA California Natural Resources Agency | | |
| CO Carbon monoxide | CO | Carbon monoxide |

| CO ₂ | Carbon dioxide |
|-------------------|--|
| CO ₂ e | Carbon dioxide equivalent |
| СР | Control Point |
| CRHR | California Register of Historical Resources |
| CRMDP | Cultural Resources Monitoring and Discovery Plan |
| CRMMP | Cultural Resources Monitoring and Management Plan |
| CUP | Conditional Use Permit |
| CUPA | Certified Unified Program Agency |
| CWA | Clean Water Act |
| DAMP | Drainage Area Management Plan |
| dBA | A-weighted decibel |
| DCSD | Design Capture Storm Depth |
| Diesel PM | Diesel particulate matter |
| DOC | California Department of Conservation |
| DON | Department of the Navy |
| DON | United States Department of the Navy |
| DTSC | Department of Toxic Substances Control |
| DWR | Department of Water Resources |
| EIR | Environmental Impact Report |
| EIS | Environmental Impact Statement |
| EMA | California Emergency Management Agency |
| EMF | Eastern Maintenance Facility |
| EMFAC | Emission Factor |
| EPA | U.S. Environmental Protection Agency |
| EPCRA | Emergency Planning and Community Right-to-Know Act |
| ESA | Environmental Site Assessment |
| FEIR | Final Environmental Impact Report |
| FEMA | Federal Emergency Management Agency |
| FESA | Federal Endangered Species Act |
| FIRM | Flood Insurance Rate Map |
| FTA | Federal Transit Administration |
| GBN | Ground-Born Noise |
| GBV | Ground-Borne Vibration |
| GHG | Greenhouse gas |
| gpm | gallons per minute |
| GWP | Global Warming Potential |
| НСР | Habitat Conservation Plan |
| HFC | Hydrofluorocarbon |
| НМВР | Hazardous Materials Business Plan |
| HMMP | Habitat Mitigation and Monitoring Plan |
| HRA | Health Risk Assessment |

| I-405 | Interstate 405 |
|----------------------|---|
| I-5 | Interstate 5 |
| IC | Institutional Control |
| IDR | Intensity Duration Recurrence |
| in/sec | Inches per second |
| IPaC | Information for Planning and Consultation |
| IRP | Installation Restoration Program |
| IRWD | Irvine Ranch Water District |
| IS/MND | Initial Study / Mitigated Negative Declaration |
| ITP | Incidental Take Permit |
| IUSD | Irvine Unified School District |
| kBtu | Thousand British Thermal Units |
| КОР | Key Observation Point |
| kWh | Kilowatt-hours |
| LARWQCB | Los Angeles Regional Water Quality Control Board |
| lbs/day | Pounds per day |
| L _{dn} | Day-night average sound level |
| L _{eq} | Equivalent sound level |
| LHMP | Local Hazard Mitigation Plan |
| L _{max} | Maximum sound level |
| L _{min} | Minimum sound level |
| LOP | Letter of Permission |
| LOS | Level of Service |
| LSAA | Lake and Streambed Alteration Agreement |
| LST | Localized Significance Threshold |
| LT | Long-Term |
| Magnuson-Stevens Act | Magnuson-Stevens Fisher Conservation and Management Act |
| MATES IV | Multiple Air Toxics Exposure Study IV |
| MBTA | Migratory Bird Treaty Act |
| MCAS | Marine Corps Air Station |
| MEIR | Maximally Exposed Individual Resident |
| MEIW | Maximally Exposed Individual Worker |
| Metrolink | SCRRA Metrolink Commuter Rail System |
| MLC | Mineral Land Classification |
| MMBTu | Million British Thermal Units |
| MMT | Million metric tons |
| MRZ | Mineral Resource Zone |
| MS4 | Municipal separate storm sewer system |
| MT | Metric tons |
| MWD | Metropolitan Water District |
| N ₂ O | Nitrous oxide |

| NAAQS | National Ambient Air Quality Standards |
|-------------------|---|
| NAHC | Native American Heritage Commission |
| NB | Northbound |
| NCCP | Natural Community Conservation Planning |
| NCTD | North County Transit District |
| NEPA | National Environmental Policy Act |
| NHTSA | National Highway Traffic and Safety Administration |
| NO ₂ | Nitrogen dioxide |
| NOx | Nitrogen oxides |
| NPDES | National Pollutant Discharge Elimination System |
| NRHP | National Register of Historic Places |
| OCFA | Orange County Fire Authority |
| OCFCD | Orange County Flood Control District |
| OCGP | Orange County Great Park |
| OCHCA | Orange County Health Care Agency |
| OCMF | Orange County Maintenance Facility |
| OCTA | Orange County Transportation Authority |
| OCWD | Orange County Water District |
| OEHHA | Office of Environmental Health Hazard Assessment |
| OPR | Office of Planning and Research |
| OU | Operating Unit |
| P-C | Production and consumption |
| PFC | Perfluorocarbon |
| PMI | Point of Maximum Exposure |
| PM ₁₀ | Particulate matter less than 10 microns in diameter |
| PM _{2.5} | Particulate matter less than 2.5 microns in diameter |
| PP | Pocket penetrometer |
| PPV | Peak particle velocity |
| PRC | Public Resources Code |
| Project | Orange County Maintenance Facility |
| PVC | Polyvinyl chloride |
| Qyf | Quaternary Young Alluvial Fan |
| Qof | Old Alluvial Fan |
| RCB | Reinforced concrete box |
| RCP | Reinforced concrete pipe |
| RCRA | Resource Conservation and Recovery Act |
| REC | Recognized Environmental Condition |
| RGP | Regional General Permit |
| ROW | Right-of-way |
| RMS | Root mean square |
| RTP/SCS | Regional Transportation Plan/Sustainable Communities Strategy |
| | |

| RV | Recreational vehicle |
|-----------------|--|
| RWQCB | Regional Water Quality Control Board |
| S&I | Service and Inspection |
| SAMP | Special Area Management Plan |
| SARA | Superfund Amendments and Reauthorization Act |
| SARWQCB | Santa Ana Regional Water Quality Control Board |
| SB | Senate Bill |
| SB | Southbound |
| SCAB | South Coast Air Basin |
| SCAG | Southern California Association of Governments |
| SCAQMD | South Coast Air Quality Management District |
| SCCIC | South Central Coastal Information Center |
| SCE | Southern California Edison |
| SCG | Southern California Gas |
| Scoping Plan | Climate Change Scoping Plan. A Framework for Change |
| SCORE | Southern California Optimized Rail Expansion |
| SCRRA | Southern California Regional Railroad Authority |
| SDC | San Diego Creek |
| SF ₆ | Sulfur hexafluoride |
| SGMA | Sustainable Groundwater Management Act |
| SGU | Shallow Groundwater Unit |
| SHPO | State Historic Preservation Officer |
| SLF | Sacred Lands File |
| SMARA | Surface Mining and Reclamation Act of 1975 |
| SMGB | State Mining and Geology Board |
| SO ₂ | Sulfur dioxide |
| SO _x | Sulfur oxides |
| SPCC | Spill Prevention Control and Countermeasures |
| SR-133 | State Route 133 |
| SRA 19 | Saddleback Valley Source Receptor Area |
| ST | Short-Term |
| SWPPP | Storm Water Pollution Prevention Plan |
| SWRCB | State Water Resources Control Board |
| TAC | Toxic air contaminant |
| TDP | Transportation Design Procedure |
| TMDLs | Total Maximum Daily Loads |
| TSCA | Toxic Substances Control Act |
| tsf | Tons per square feet |
| UBC | Uniform Building Code USACE U.S. Army Corps of Engineers |
| USACE | U.S. Army Corps of Engineers |
| USFWS | U.S. Fish and Wildlife Service |
| | |

| VdB | Velocity Level in Decibels (Vibration) |
|-------|--|
| VMT | Vehicle Miles Traveled |
| VOC | Volatile organic compounds |
| WEAP | Worker Environmental Awareness Program |
| WL | Watch List |
| WMP | Waste Management Plan |
| WQMP | Water Quality Management Plan |
| μg/m³ | Micrograms per cubic meter |

ORGANIZATION OF THIS DOCUMENT

This document is organized to comply with the guidelines for Initial Study and Mitigated Negative Declaration as provided in the 2021 California Environmental Quality Act (CEQA) Guidelines. As such, the organization of this document is as follows:

- Environmental Factors Potentially Affected. The language and format of this section are taken from Appendix G of the 2021 CEQA Guidelines, specifically Page 329. This section provides a determination of the Initial Study provided in Section 3. It also contains the signature of the lead agency.
- **Mitigated Negative Declaration**. This section contains a brief summary of the Project information. This section also provides a consolidated list all of the mitigation measures presented in Section 3 Initial Study. This listing of mitigation measures in this section is typical and similar in format to an executive summary.
- Section 1 Introduction. This section provides an introduction to the lead agency, the history of the proposed Project, and its setting.
- Section 2 Project Description. This section provides a detailed description of the proposed Project, its elements, and construction and operational information, as well as figures.
- Section 3 Initial Study. This section follows the 21 environmental topics as presented in the 2021 CEQA Guidelines Appendix G. The questions contained in Appendix G are presented and responses to each question are provided with research to back up the determinations. Mitigation measures are presented where needed.
- Section 4 List of Preparers. This section lists all of the preparers and reviewers of this document by agency and consultant.
- Section 5 References. This section presents the references used for the completion of the Initial Study.
- Appendices. This document has eight (8) appendices, which are related to technical memos completed for Aesthetic Resources, Air Quality and Greenhouse Gas Resources, Biological Resources, Cultural Resources, Paleontological Resources, Hazards and Hazardous Materials, Noise and Vibration, and Transportation.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this Project, as indicated by the checklist on the following pages.

| Aesthetics | Agriculture and Forestry Resources | Air Quality |
|-----------------------------|---------------------------------------|---------------------------------------|
| Biological Resources | Cultural Resources | 🔀 Energy |
| Geology /Soils | Greenhouse Gas Emissions | Hazards & Hazardous Materials |
| Hydrology / Water Quality | Land Use/Planning | Mineral Resources |
| Noise | Population/Housing | Public Services |
| Recreation | Transportation | Tribal Cultural Resources |
| Utilities / Service Systems | ⊠ Wildfire | Mandatory Findings of Significance |

DETERMINATION: (To be completed by the lead agency)

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR) is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

June XX, 2022

Date

James G. Beil, Executive Director, Capital Programs Orange County Transportation Authority

MITIGATED NEGATIVE DECLARATION

| Date of Publication of Final Mitigated Negative Declaration: 06/XX/2 | <mark>.022</mark> |
|--|----------------------------------|
| Lead Agency: Orange County Transportation Authority | |
| Agency Contact Person: Lora Cross | Telephone: (714) 560-5788 |
| Project Title: Metrolink Orange County Maintenance Facility Project | |
| Project Sponsor: Southern California Regional Rail Authority | |
| Project Contact Person: Robert Mason | Telephone: (909) 929-2372 |
| Project Location: Great Park, Irvine, CA | |
| City and County: Orange County | |

Project Description: Refer to Section 2 in the main document.

THIS PROJECT WILL NOT HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT. This finding is based upon the criteria of the Guidelines of the State Secretary for Resources, Sections 15064 (Determining Significant Effect), 15065 (Mandatory Findings of Significance), and 15070 (Decision to Prepare a Negative Declaration), and the reasons documented in the Environmental Evaluation (Initial Study) for the Project, which is attached. Mitigation measures are included in this Project to avoid potentially significant effects and reduce all impacts to less than significant. Mitigation measures are presented in summary in the table below. The impacts that necessitated these mitigation measures are evaluated in Section 3 Initial Study, along with the determination of significance after their implementation.

AIR QUALITY

| MM-AQ-1: Utilize low VOC paint for architectural coating activities during Phase 2 construction. | To reduce volatile organic compound (VOC) emissions during construction, the Project contractor shall utilize water-based or low VOC interior and exterior paints. The VOC content of the architectural coatings shall comply with the VOC content limits in South Coast Air Quality Management District (SCAQMD) Rule 1113 or not exceed 100 grams per liter, whichever is lower. To ensure that low VOC paint will be used during Project construction, this requirement will be included in applicable bid documents, purchase orders, and contracts. Successful contractor(s) must demonstrate the ability to supply the compliant architectural coatings for use prior to any coating activities. A copy of each proposed architectural coating Material Safety Data Sheet and VOC content shall be available upon request. Alternatively, the contractor may utilize tilt-up concrete buildings that do not require the use of architectural coatings. |
|---|--|
| BIOLOGICAL RESOURCES | |
| MM-BIO-1: Designate Project Biological Monitor(s). | Ground-disturbing activities during construction shall occur outside of the nesting bird season (generally February 15 through September 1). If avoiding the nesting season is not practicable, the following additional measures shall be employed: |

| | A pre-construction nesting survey shall be conducted by a qualified biologist within 3 days prior to the start of construction activities to determine whether active nests are present within or directly adjacent to the construction zone. All nests found shall be recorded. If construction activities must occur within 300 feet of an active nest of any passerine bird or within 500 feet of an active nest of any raptor, with the exception of an emergency, a qualified biologist shall monitor the nest on a weekly basis, and the activity shall be postponed until the biologist determines that the nest is no longer active. If the recommended nest avoidance zone is not feasible, the qualified biologist shall determine whether an exception is possible and obtain concurrence from the resource agencies before construction work can resume within the avoidance buffer zone. All work shall cease within the avoidance buffer zone until either agency concurrence is obtained or the biologist determines that the adults and young are no longer reliant on the nest site. |
|---|---|
| MM-BIO-2: Compliance with USACE SAMP Mitigation Procedures. | Pursuant to Special Area Management Plan (SAMP) requirements, if a permanent loss of regulated waters or streambed occurs because of the Project, compensatory mitigation (purchase of credit at an in-lieu fee or mitigation bank approved by the resource agencies, or applicant proposed enhancement or establishment of waters or streambed) shall be provided at a minimum ratio of 1:1. Temporary impacts shall be restored to pre-Project conditions to the extent practicable. |
| CULTURAL RESOURCES | |
| MM-CUL-1: Cultural Resources Awareness Training. | Prior to construction, OCTA shall retain a qualified archaeologist who meets the Secretary of the Interior's Guidelines for Archaeology (36 CFR Part 61). The qualified archaeologist shall prepare a Cultural and Tribal Cultural Resources Awareness Training as part of the Project Worker Environmental Awareness Program (WEAP). The training will instruct workers as to the laws protecting cultural and tribal cultural resources and also give examples of the kinds of resources that can be reasonably expected to be found in the Area of Potential Effect (APE). An environmental compliance contact responsible for enforcing mitigation measures and who is to be notified in the event of a find will be identified in the training. Training will be delivered to all staff involved in ground-disturbing activities prior to their working on the project. |

MM-CUL-2: Preparation of a Cultural Resources Monitoring and Discovery Plan. Prior to construction, a project-specific cultural resources monitoring and discovery plan (CRMDP) will be developed by a qualified archaeologist who meets the Secretary of the Interior's Guidelines for Archaeology (36 CFR Part 61). The monitoring plan should identify what construction activities that occur in native soils would require archaeological and tribal monitoring, describe monitoring procedures, and outline the protocol to be followed in the event of a find. Criteria will be defined and triggers identified as to when further consultation is required for the treatment of finds. Plans of treatment of typical finds will be detailed, as will a plan of treatment for any human remains that are inadvertently encountered. If a potentially significant discovery is made and cannot feasibly be avoided, then additional work, potentially including data recovery excavations, may be required. Key staff will be identified, and the process of notification and consultation will be specified within the CRMDP. A curation plan will also be outlined within the CRMDP. All work should be conducted under the direction of a qualified archaeological Principal Investigator who meets the Secretary of the Interior's standards for archaeology. Consulting tribes under AB52 for the Project shall have the opportunity to review and comment on the draft CRMDP.

PALEONTOLOGICAL RESOURCES

| MM-GEO-1: Worker | Prior to construction, OCTA shall retain a qualified paleontologist who |
|-------------------------------|---|
| Environmental Awareness | meets the requirements to be included in Orange County's list of qualified |
| Program. | paleontologists. The qualified paleontologist shall prepare a WEAP. The |
| | WEAP will describe the types of resources that may be encountered during |
| | construction, the laws protecting those resources, and the procedures to |
| | follow when finds are encountered. The WEAP will be presented either in |
| | person or in video form to all construction employees involved in ground- |
| | disturbing activities before they begin work at the Project Site. |
| MM-GEO-2: Response to | If buried paleontological resources are uncovered during construction, all |
| Unanticipated Paleontological | work shall be halted in the vicinity of the discovery until a qualified |
| Finds. | paleontologist can visit the site of discovery and assess the significance of |

HAZARDS AND HAZARDOUS MATERIALS

| MM-HAZ-1: Notifications to | The Project applicant shall notify the appropriate agencies (e.g., Orange |
|----------------------------|--|
| Federal, State and Local | County Health Care Agency [OCHCA], Department of Toxic Substances |
| Agencies. | Control [DTSC], United States Environmental Protection Agency [EPA], or |
| | the Regional Water Quality Board) regarding soil, soil gas and/or |
| | groundwater contamination in connection with the ongoing military clean- |
| | up site associated with the former El Toro Marine Corps Air Station (MCAS) |
| | Superfund site. |

the resource and, if necessary, recommend treatment.

| MM-HAZ-2: Groundwater Monitoring Requirements. | Where the Project Site construction and operational activities coincide with the current groundwater monitoring systems (e.g., wells, water transfer conveyance lines), the requirements of the Institutional Control (IC) in connection with IRP Site 24 for the ongoing military clean-up site associated with the former El Toro MCAS Superfund site shall be adhered to in order to protect human health and the environment from potential hazardous materials exposures. |
|---|--|
| MM-HAZ-3: Soil Assessment for Hazardous Materials. | Prior to construction activities at the Project Site, if required by the state or local regulatory oversight agencies, then further assessment including soil, soil vapor and/or groundwater investigations shall be conducted to reveal the presence, if any, of potential hazardous materials at the Project Site that were identified as a result of the Phase I ESA, and would assist in determining further mitigations required to address human health and/or the environmental impacts due to potential hazardous materials exposures. |
| NOISE | |
| MM-NOI-1: <i>Relocate Pile Driving</i> Activities. | If feasible, relocate Project elements requiring pile driving to locations greater than 250 feet from occupied buildings. |
| MM-NOI-2: Alternative Pile Insertion. | If MM-NOI-1 is not feasible, use a less intrusive form of pile insertion, such as pre-augured piling. |
| MM-NOI-3: Schedule Pile Driving Activities. | Arrange to conduct pile driving activities during a period when the affected building(s) are not in use (such as Saturdays). |

TRIBAL CULTURAL RESOURCES

MM-TCR-1: Retain a Native American Monitor Prior to Commencement of Ground-Disturbing Activities. A. The project applicant/lead agency shall retain a Native American Monitor from or approved by the Gabrieleño Band of Mission Indians – Kizh Nation. The monitor shall be retained prior to the commencement of any "ground-disturbing activity" for the subject project at all project locations (i.e., both on-site and any off-site locations that are included in the project description/definition and/or required in connection with the project, such as public improvement work). "Ground-disturbing activity" shall include, but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching.

B. A copy of the executed monitoring agreement shall be submitted to the lead agency prior to the earlier of the commencement of any ground-disturbing activity, or the issuance of any permit necessary to commence a ground-disturbing activity.

C. The monitor will complete daily monitoring logs that will provide descriptions of the relevant ground-disturbing activities, the type of construction activities performed, locations of ground-disturbing activities, soil types, cultural-related materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe. Monitor logs will identify and describe any discovered TCRs, including but not limited to, Native American cultural and historical artifacts, remains, places of significance, etc., (collectively, tribal cultural resources, or "TCR"), as well as any discovered Native American (ancestral) human remains and burial goods. Copies of monitor logs will be provided to the project applicant/lead agency upon written request to the Tribe.

D. On-site tribal monitoring shall conclude upon the latter of the following (1) written confirmation to the Kizh from a designated point of contact for the project applicant/lead agency that all ground-disturbing activities and phases that may involve ground-disturbing activities on the project site or in connection with the project are complete; or (2) a determination and written notification by the Kizh to the project applicant/lead agency that no future, planned construction activity and/or development/construction phase at the project site possesses the potential to impact Kizh TCRs.

E. Upon discovery of any TCRs, all construction activities in the immediate vicinity of the discovery shall cease (i.e., not less than the surrounding 50 feet) and shall not resume until the discovered TCR has been fully assessed by the Kizh monitor and/or Kizh archaeologist. The Kizh will recover and retain all discovered TCRs in the form and/or manner the Tribe deems appropriate, in the Tribe's sole discretion, and for any purpose the Tribe deems appropriate, including for educational, cultural and/or historic purposes.

MM-TCR-2: Unanticipated Discovery of Human Remains and Associated Funerary Objects. A. Native American human remains are defined in PRC 5097.98 (d)(1) as an inhumation or cremation, and in any state of decomposition or skeletal completeness. Funerary objects, called associated grave goods in Public Resources Code Section 5097.98, are also to be treated according to this statute.

B. If Native American human remains and/or grave goods discovered or recognized on the project site, then all construction activities shall immediately cease. Health and Safety Code Section 7050.5 dictates that any discoveries of human skeletal material shall be immediately reported to the County Coroner and all ground-disturbing activities shall immediately halt and shall remain halted until the coroner has determined the nature of the remains. If the coroner recognizes the human remains to be those of a Native American or has reason to believe they are Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission, and Public Resources Code Section 5097.98 shall be followed.

C. Human remains and grave/burial goods shall be treated alike per California Public Resources Code section 5097.98(d)(1) and (2).

D. Construction activities may resume in other parts of the project site at a minimum of 200 feet away from discovered human remains and/or burial goods, if the Kizh determines in its sole discretion that resuming construction activities at that distance is acceptable and provides the project manager express consent of that determination (along with any other mitigation measures the Kizh monitor and/or archaeologist deems necessary). (CEQA Guidelines Section 15064.5(f).)

E. Preservation in place (i.e., avoidance) is the preferred manner of treatment for discovered human remains and/or burial goods. Any historic archaeological material that is not Native American in origin (non-TCR) shall be curated at a public, non-profit institution with a research interest in the materials, such as the Natural History Museum of Los Angeles County or the Fowler Museum, if such an institution agrees to accept the material. If no institution accepts the archaeological material, it shall be offered to a local school or historical society in the area for educational purposes.

F. Any discovery of human remains/burial goods shall be kept confidential to prevent further disturbance.

MM-TCR-3: *Procedures for Burials and Funerary Remains.*

A. As the Most Likely Descendant ("MLD"), the Koo-nas-gna Burial Policy shall be implemented. To the Tribe, the term "human remains" encompasses more than human bones. In ancient as well as historic times, Tribal Traditions included, but were not limited to, the preparation of the soil for burial, the burial of funerary objects with the deceased, and the ceremonial burning of human remains.

B. If the discovery of human remains includes four or more burials, the discovery location shall be treated as a cemetery and a separate treatment plan shall be created.

C. The prepared soil and cremation soils are to be treated in the same manner as bone fragments that remain intact. Associated funerary objects are objects that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later; other items made exclusively for burial purposes or to contain human remains can also be considered as associated funerary objects. Cremations will either be removed in bulk or by means as necessary to ensure complete recovery of all sacred materials.

D. In the case where discovered human remains cannot be fully documented and recovered on the same day, the remains will be covered with muslin cloth and a steel plate that can be moved by heavy equipment placed over the excavation opening to protect the remains. If this type of steel plate is not available, a 24-hour guard should be posted outside of working hours. The Tribe will make every effort to recommend diverting the project and keeping the remains in situ and protected. If the project cannot be diverted, it may be determined that burials will be removed.

E. In the event preservation in place is not possible despite good faith efforts by the project applicant/developer and/or landowner, before ground-disturbing activities may resume on the project site, the landowner shall arrange a designated site location within the footprint of the project for the respectful reburial of the human remains and/or ceremonial objects.

F. Each occurrence of human remains and associated funerary objects will be stored using opaque cloth bags. All human remains, funerary objects, sacred objects and objects of cultural patrimony will be removed to a secure container on site if possible. These items should be retained and reburied within six months of recovery. The site of reburial/repatriation shall be on the project site but at a location agreed upon between the Tribe and the landowner at a site to be protected in perpetuity. There shall be no publicity regarding any cultural materials recovered.

G. The Tribe will work closely with the project's qualified archaeologist to ensure that the excavation is treated carefully, ethically and respectfully. If data recovery is approved by the Tribe, documentation shall be prepared and shall include (at a minimum) detailed descriptive notes and sketches. All data recovery data recovery-related forms of documentation shall be approved in advance by the Tribe. If any data recovery is performed, once complete, a final report shall be submitted to the Tribe and the NAHC. The Tribe does NOT authorize any scientific study or the utilization of any invasive and/or destructive diagnostics on human remains.

1. INTRODUCTION

The Southern California Regional Railroad Authority (SCRRA) Metrolink commuter rail system (Metrolink) is proposing to construct the Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project") in the City of Irvine (or City). The Project would include several facilities including a transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth, sand silos, a maintenance facility, a maintenance facility extension, and 11 tracks. The Project consists of buildings that would have a total building area of approximately 90,000 square feet when combined. Approximately 80 employees would report to the Project. Metrolink currently operates three maintenance facilities across its service area: Central Maintenance Facility (CMF) in Los Angeles, Eastern Maintenance Facility (EMF) in San Bernardino County, and the North County Transit District's (NCTD's) Stuart Mesa Facility in northern San Diego County. Due to projected population expansion within its service area, Metrolink will require an increased number of commuter rail services, as well as additional train storage and maintenance facilities associated with an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the Project Site would provide an optimal location for a new Metrolink maintenance facility. The Orange County Transportation Authority (OCTA) is the lead agency under the California Environmental Quality Act (CEQA). The City of Irvine and SCRRA are the responsible agencies under CEQA.

1.1. Background

The six counties served by SCRRA include: Los Angeles, Orange, Riverside, San Bernardino, Ventura and San Diego. Based on the projected population expansion within the six-county area currently served by the SCRRA, Metrolink will operate an increased number of commuter rail services to support that growth. Consequently, the Metrolink system (Figure 1.1-1) will require additional train storage and maintenance facilities to support an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the proposed site would provide the optimal location for the additional Metrolink facility.

Metrolink currently operates three maintenance facilities across its service area. Its CMF is located on the east bank of the Los Angeles River near the Interstate 5 (I-5) and Interstate 10 (I-10) freeways, just south of the location of the former Southern Pacific Taylor Yard. The EMF is located in Colton and provides daily and routine servicing for San Bernardino Line trains. Metrolink trains are also serviced at NCTD's Stuart Mesa Facility, which is located in Camp Pendleton South between Oceanside and Marine Corps Base Camp Pendleton in San Diego County.

CMF is currently near capacity, which will impact the ability to provide the necessary train servicing for the planned service expansion of various Metrolink lines throughout the system under the Southern California Optimized Rail Expansion (SCORE) program. By transferring a portion of the current fleet from CMF to the proposed OCMF (specifically the Orange County Line trains), capacity for the non-Orange County trains will be increased at CMF. The Orange County Line has the highest ridership within the Metrolink system; therefore, a maintenance facility to serve the Orange County area with sufficient storage and servicing capabilities for both locomotives and rail cars is critical to controlling operating costs.



Figure 1.1-1: Metrolink System Map

Source: SCRRA, 2019

To optimize rail service in the region, the proposed OCMF would need to be completed by 2028. The SCORE program may also require heavy overhaul capabilities at OCMF, depending on pending decisions regarding fleet technology and management.

The expansion of Orange County and overall Metrolink commuter rail service will ultimately require additional or expanded equipment servicing capabilities for both locomotives and rail cars. Because a significant portion of the fleet will serve Orange County, a maintenance facility located along the Metrolink route through Orange County would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and Colton. The proposed OCMF would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Much of the inspection and maintenance activity is federally mandated and must be performed at specific intervals.

1.2. Project Setting

The proposed Project Site is on a 21.3-acre OCTA-owned parcel on Ridge Valley south of Marine Way in the City of Irvine Tracks, between mileposts 183.50 and 184.00 (Figure 1.2-1). This location is within a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was quitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City that same year. OCTA then purchased the fee ownership of the Project Site from the City. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley.

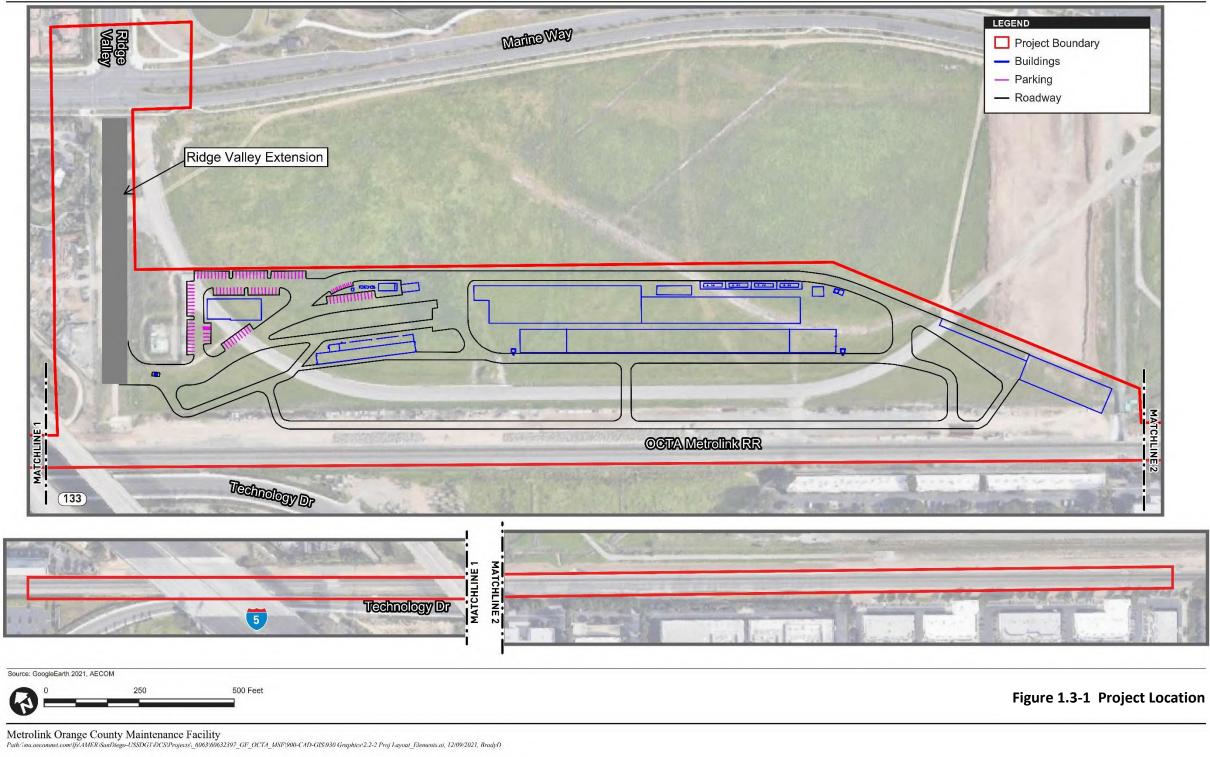
1.3. Project Location

The Project Site is currently vacant and includes 1,000-foot-long storage for miscellaneous rail equipment including temporary railroad bridges, signal houses, railroad ties, and electrical conduits. Although not part of the Project, OCTA has immediate plans to install a single 1,000-foot-long, single-ended storage track and fencing of the perimeter of the property. The storage track will be connected to the mainline with a left-hand No. 10 turnout that would feed into and out of the yard site from the north end.

The Project will be developed in two phases with an anticipated completion date of 2028. Phase 1 focuses on developing facilities needed for train storage. The yard is planned to have phased construction, with Phase 1 consisting of the Service and Inspection (S&I) Facility tracks, train wash track, storage tracks, set-out track(s), yard lead tracks, transportation building, and employee parking. Phase 2 includes construction of the Maintenance Building and associated tracks. Other potential items in this phase are the conversion of the West Lead Track into a drill track, and the construction of a second runaround track within the mainline track corridor.

The Project is within Planning Area 51 of the updated City of Irvine General Plan, adopted in June 2015. Per the City's zoning ordinance, the proposed use is a conditionally allowable use under the existing zone. Therefore, OCTA has filed a CUP application for this Project.

Figure 1.3-1.3-1: Project Location



Source: ESRI, 2021, and OCTA, 2021

2. **PROJECT DESCRIPTION**

2.1. Existing Land Uses

The City of Irvine General Plan has designated the area where the Project Site is located as Planning Area 51 (Figure 2.1-1), with land use designated as the Great Park (Figure 2.1-2) and is zoned as 6.1 Institutional (Figure 2.1-3).

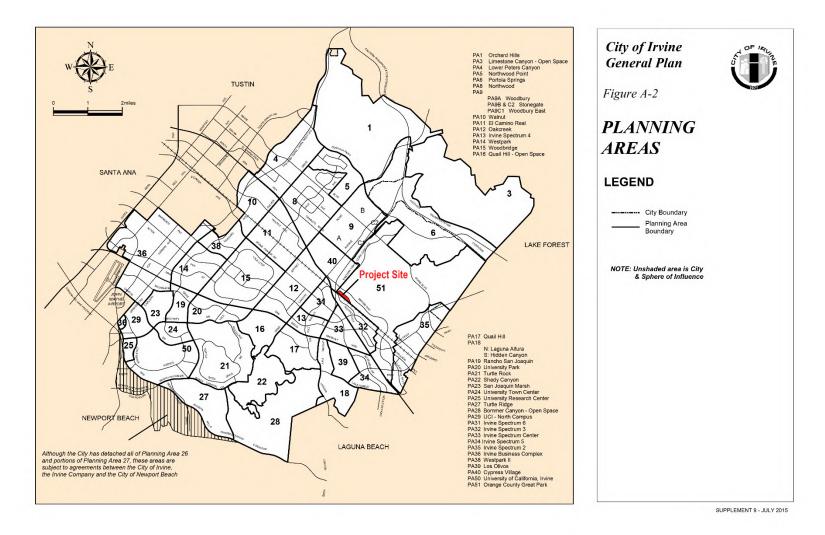


Figure 2.1-1: City of Irvine Planning Areas Map

Source: City of Irvine, 2015

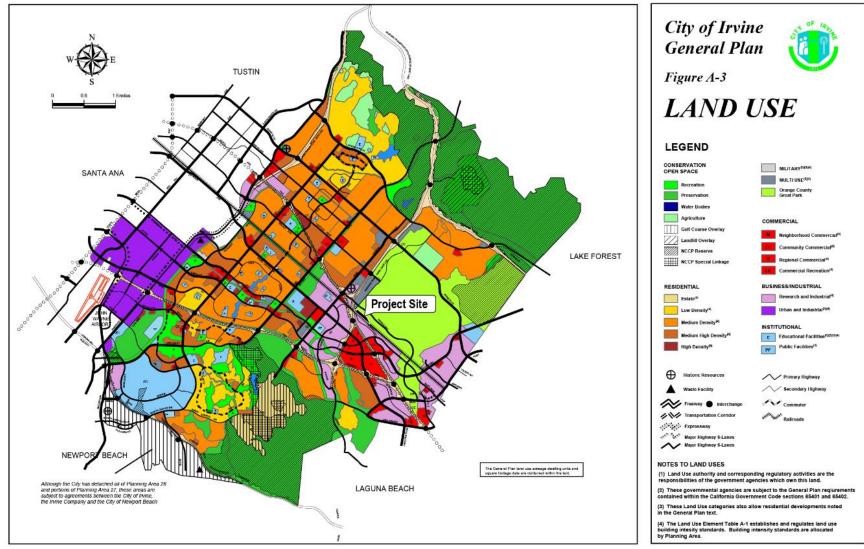


Figure 2.1-2: City of Irvine Land Use Map

Source: City of Irvine (2015)

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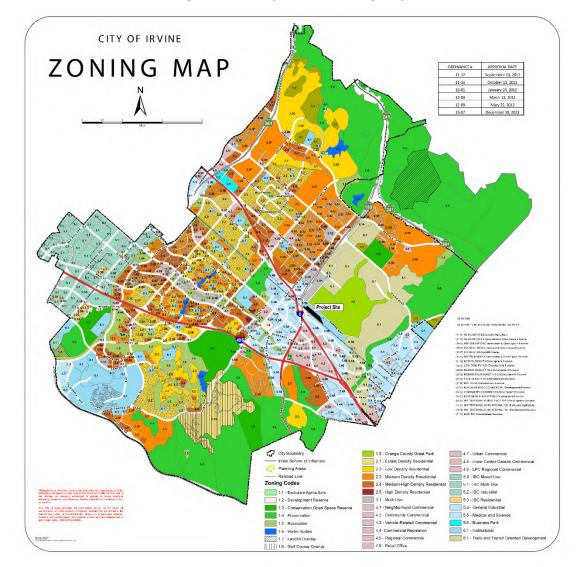


Figure 2.1-3: City of Irvine Zoning Map

Source: City of Irvine (2015)

2.2. Alternatives Considered

Alternative layouts have been developed for the site with the main difference among the alternatives being the location of the S&I Facility. Below is a brief description of each of the proposed alternative layouts.

Layout 1 - S&I Facility South

The S&I Facility and the Train Wash Building would be located on the south side of the Project Site to optimize the space available on the Project's longest track. The storage tracks would be located north of the S&I Facility with an offset of 23.25 feet from track centerline to track centerline. The storage track alignment would run parallel to the Train Wash building and would be accessible from the S&I tracks.

The Maintenance Building would be located closest to the north side of the property while the Fueling Tanks and Sanding Silos would be located near the S&I Facility in an at-grade configuration.

Layout 1 would require large vehicle deliveries, including fuel trucks, to utilize the perimeter road that crosses the storage tracks at both ends of the site. Therefore, Layout 1 was withdrawn from consideration.

Layout 2 - S&I Facility North

Layout 2 would position the S&I Facility on the north side of the Project Site. The distance between the S&I Facility and mainline tracks would allow SCRRA to store up to two (2) incoming trains on lead tracks to the S&I Facility and leave the East Lead track free of train traffic. This would provide additional capacity so that trains would not have to idle due to ingress and egress capabilities through the East Lead to exit the yard.

Fueling Tanks and Sanding Silos would be located near the S&I Facility in an at-grade configuration. The Maintenance Building would be located within the center of the yard between the S&I Facility and the storage tracks.

Storage tracks would have alternating track spacing of 23.25 feet and 18 feet, and both S&I tracks converge into the Train Wash with no run-around track.

Layout 2 has potential safety issues during operations. This alternative's track configuration and the resulting access road layout would compromise Fire Department standards for access due to the 60-foot tangent between reverse curves. The southeast corner of the Project Site would be in violation of fire code. Therefore, Layout 2 was withdrawn from further consideration.

Layout 3 - S&I Facility Center

Layout 3 would place the S&I Facility in the center of the Project Site. Compared to the other layout alternatives, Layout 3 would minimize the length of piping for fueling and sanding elements and the frequency of crossing tracks for material deliveries. The future Maintenance Building would be located closest to the north side of the property.

Fueling tanks would be located near the Maintenance Building in an at-grade configuration. While this alternative layout would necessitate higher quantities of piping for fuel during operations, delivery trucks would not need to cross the Metrolink tracks. Sanding silos would be located near the S&I Facility in an at-grade configuration, which results in delivery trucks crossing the tracks for the Maintenance Building and S&I Facility in order to make deliveries and then exit the yard. The Maintenance Building is located at the north end of the yard enabling future construction to take place outside of the normal operation of the yard. This alternative has been selected as the Preferred Alternative and is evaluated in this document.

Storage tracks have alternating spacing of 23.25 feet and 18 feet, and there would be tracks to run around the Train Wash accessible from one of the S&I tracks, for which the run-around track also serves as a set-out track.

2.3. Project Description

The Project would be developed in two phases. Phase 1 focuses on developing facilities needed for train storage. The yard would have phased construction, with Phase 1 comprising of the following facilities: the transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth and sand silos. A total of 11 tracks would be constructed including two lead tracks, six storage tracks, one runaround track, and two temporary stub-ended set out tracks that would be converted to shop tracks in Phase 2. Phase 2 would construct the Maintenance Building and the future Maintenance Building Expansion. Other potential items in this phase are the conversion of the West Lead Track into a drill track, and the construction of a second run-around track within the mainline track corridor.

2.3.1. General Yard Layout

The proposed maintenance facility has three (3) basic components: S&I Facility, Train Wash, and Storage Tracks (refer to Figure 2.3-1). During normal operation of the yard, trains would go through each of these facilities in this order to be inspected: serviced (sanding and fueling), washed, and then stored for their next use. Most of the movements in and out of the yard would be from the east, with few trains entering the yard from the west. As such, based on the order of normal operations, the S&I Facility is the first destination for trains entering the yard and is located toward the east end of the yard. The Train Wash follows and is located along the same set of tracks toward the west end of the facility. Since the site is not long enough for storage tracks to be in line with the S&I and Train Wash to the Storage Tracks. For the OCMF, the West Lead Track serves as a tail track as it is long enough for a train to pull forward on to it, stop, and reverse direction.

The OCMF would also have a Maintenance Building approximately 430 feet long as part of a future phase, which is to handle preventative maintenance and light repair, with two double-ended tracks going through it. In coordination with SCRRA, a secondary future phase for the Maintenance Building has been provisioned to allow the building to be extended to accommodate a full train length. The yard layout has been designed to not preclude this expansion.

The Storage Tracks, S&I Facility, and future Maintenance Building would be parallel to each other. Trains would need to use one of the lead tracks when traveling to and from these locations.

2.3.2. Parking and Roadway

Parking

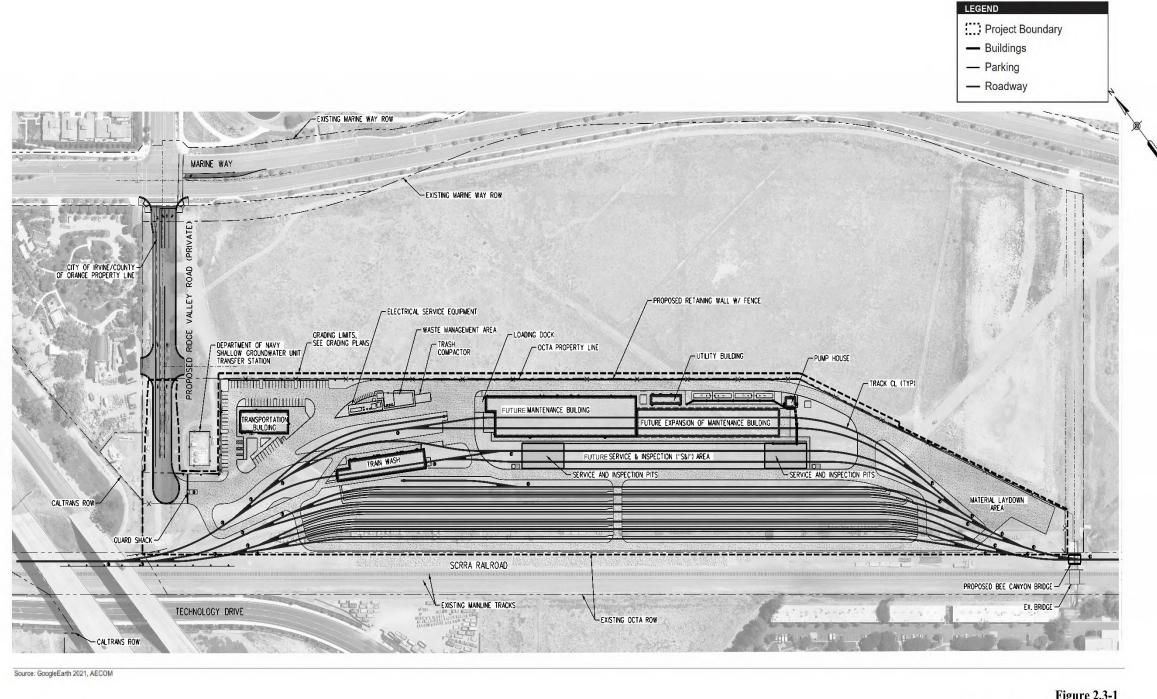
Parking would be provided surrounding the Transportation Building in the Northwest corner of the site. Additional parking would be placed near the Water Treatment Room as well as near the Maintenance Shop and S&I area, with an approximate total of 114 parking spaces.

Roadway

The roadway design and vehicle routing are heavily influenced by the track design and configuration. Fire truck access would be compliant with the Orange County Fire Authority (OCFA) Requirements. Vehicle routes for fuel/materials and small parts deliveries are being considered within the evaluation. Roadways and vehicle routing are being evaluated utilizing four different vehicles:

- Single Tanker Truck
- Double Tanker Truck
- Caltrans 65
- Orange County Fire Authority Emergency Vehicles

Figure 2.3-1: Project Layout and Elements



Metrolink Orange County Maintenance Facility

Figure 2.3-1 Project Layout and Elements

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The Project would allow large vehicles to cross storage tracks within the Project Site. Additionally, the Project provides flexibility in large-vehicle routing in the form of loop- and hammerhead-turns. Both large vehicle route options require crossing of the maintenance tracks on the west side of the Maintenance Building.

The Site Entrance would be 40-feet wide with track centers at 18-feet spacing. Access roads are 12-feet wide between storage tracks. Light poles between the tracks would restrict the width of a vehicle to 5-feet when travelling parallel to tracks. At the ends of the storage tracks, the width of the access road would be a minimum of 5-feet.

Within the facility, access roads vary from 15 to 37 feet wide. Access roads to specific locations or facilities are a minimum of 10-feet wide.

Site Access

Access to the OCMF would require a roadway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The final design configuration for the access road would be coordinated with third-party stakeholders, including but not limited to the County of Orange, City of Irvine, Irvine Ranch Water District, and Heritage Fields LLC. The only site access comes from the new Ridge Valley Extension. At the entrance a security booth, gate arms, and fencing are provided to limit unauthorized access to the site.

2.3.3. Drainage

The Project would relocate existing drainage and install new drainage infrastructure for new storage and grading needs. The Project would tie into existing City and County facilities within the Project Site.

Existing Drainage Facilities

The existing topography of the site provides a drainage pattern that slopes from east to west. Run-off is collected at the surface via open earth channels and concrete drainage inlets, which is then routed to the north end of the site through two 24-inch corrugated steel pipes. Run-off leaves the site through an open concrete channel and empties downstream into a channel owned by the Orange County Flood Control District (OCFCD). The Bee Canyon Channel, located on the south end of the site, runs east to west and does not take run-off from the Project Site. Part of the project includes a reprofiling of the existing Bee Canyon Channel in order to construct a second railroad bridge. The Project proposes the reprofiling of an approximately 70-foot segment of the Bee Canyon Channel. This will result in a lower top of channel wall, a lower Hydraulic Grade Line with freeboard contained within the new top of wall elevation, and a 2.5-feet channel drop at the inlet of the 60-inch reinforced concrete pipe lateral to the channel. The existing hydraulic performance of the Bee Canyon Channel would be maintained at the lower profile. It is anticipated that this existing drainage pattern would be not be altered or re-routed after the development of the maintenance facility. The existing outlet discharge would also be maintained so that the OCFCD facilities are not impacted.

Drainage Analysis

In order to establish the correct sizing of the drainage facilities, a drainage analysis shall be performed to establish the Project requirements. The following drainage criteria shall form the basis of analysis:

- 25-Year Design Storm for Roadway based on the Orange County Hydrology Manual Intensity Duration Recurrence (IDR) curves and intensity calculations
 - Intensity (25-year) = 4.82 inch/hour based on the intensity calculation for mean precipitation. Intensities for non-mountainous areas.
- 25-Year Design Storm for urban flood protection
- 50-Year Design Storm for Roadway (sump conditions) based on the Orange County Hydrology
- Manual IDR curves and intensity calculations.
 - Intensity = 5.44 inch/hour based on the intensity calculation for mean precipitation Intensities for non-mountainous areas.
- All new culverts would have a minimum cleanout velocity of 5 feet/s, according to the City of Irvine Storm Drain Design Manual.
- Design Capture Storm Depth (DCSD) shall be the 85th percentile of a 24-hour rain event
- DCSD = 0.80 inch (from 85th percentile 24-hour event)

Water Quality Management Plan (WQMP)

The Project Site is located within the Santa Ana Regional Water Quality Control Board (SARWQCB) jurisdiction and shall follow the Model Water Quality Management Plan (WQMP) that the OCFCD uses to address post-construction urban runoff and stormwater pollution from new developments or significant redevelopments. The Project is located within the Upper San Diego Creek Watershed, which is a high-risk receiving watershed. The San Diego Creek Reach 2 has established Total Maximum Daily Loads (TMDLs) that need to be considered during the development of the WQMP. Based on this, the preferred Best Management Practice (BMP) type would be infiltration, evapotranspiration, or harvest/use. The Project would install a 115 foot by 115 foot by 5 feet deep underground cistern that would hold approximately 552,254 gallons for retention and capture/reuse.

2.3.4. Trackwork

The yard features six (6) storage tracks, each long enough to store two (2) full trains. At least four (4) spots are provided for a train with two (2) locomotives, with six (6) spots being the preferred capacity.

Special trackwork within the Project Site would utilize only #8 turnouts per SCRRA Standards and be located on horizontal and vertical tangents. At least 15-feet of tangent is provided leading to each switch with 30 feet being the preferred minimum distance.

Track Leads

There are two (2) lead tracks to the yard: the west and east lead tracks. Both lead tracks are positioned such that a third main track can be constructed between the lead track and the SCRRA Orange Subdivision Main Track 1.

At the request of SCRRA, the Project shall incorporate the turnout to the East Lead Track into Control Point (CP) Tinkham in order to increase the clear capacity of the lead. The extended length of the East Lead would allow two (2) trains to be set out on the lead prior to entering the OCMF. Having the East Lead Track tie into CP Tinkham would minimize protect-in-place activities for the existing 30-inch Southern California Gas (SCG) line located on the southern portion of the Project Site.

The West Lead Track must be able to hold one (1) train, so that a train coming from the west can clear the main tracks and the track can be used as a tail track to facilitate movements from the S&I track to the storage tracks for normal yard operations. The design of the yard would use the existing track to the west of the yard as the West Lead Track. A #10 Left Hand Crossover would be installed to the west of the existing #10 Turnout to facilitate movements from Main Track 2 into the yard. The crossover and turnout would become a new Control Point.

Set-Out Track

Two set-out tracks would be provided that can hold up to three (3) passenger cars. In Phase 1 construction, the Maintenance Building tracks can be partially constructed to provide set-out tracks on each side of the future maintenance building. The ability to set cars on those tracks would then be converted with the construction of the Maintenance Building as shop tracks.

Run-Around Track

One (1) run-around track is necessary so that trains or locomotives can get from one end of the yard to the other without going out onto the main tracks. If future operations require a second run-around track, the West and East Lead Tracks can be connected which would provide this benefit.

2.3.5. Vehicle and Train Dimensions

Passenger vehicles are 85-feet long and 9-feet 10 inches wide. Locomotives may be either 58-feet or 69feet long depending on the model and are about 10-feet wide at and below the platform level. For design purposes, locomotives are assumed to be 70-feet long. The design train length is 750-feet. This accounts for eight passenger cars (each 85-feet long) and 1 locomotive. In the storage tracks several spots for trains with 2 locomotives would be provided with the design train length being 820-feet.

It is anticipated that eight-car trains can be pulled by a single locomotive. Trains with a second locomotive are anticipated in cases of emergency whereby the second locomotive pulls the entire train. Therefore, the S&I Facility and Maintenance Building are designed for a train length of 750-feet. The Project would not increase operational services or expand ridership through the increase in vehicle numbers or capacity.

2.3.6. Total Yard Storage

A total number of 21 trains can be accommodated on the site at full build out, with 12 trains on the storage tracks, 2 trains on the S&I Facility tracks, 2 trains on the Maintenance Building tracks, 2 trains on the Run-Around track, 1 train on the West Lead Track and 2 trains on the East Lead Track. Excluding runaround and lead tracks, 16 trains can be stored on the tracks within the yard.

2.3.7. Building Layouts

The buildings are functionally located throughout the yard to comply with day-to-day operations. The approximate square footage and building heights for the building layouts and facilities are shown in Table 2.3-1. Trains enter from the main line tracks and access the S&I Tracks for daily service of the 8-car consists. This service cycle lasts roughly 30-45 minutes and includes fueling, sanding, fluid topping, toilet dump, and locomotive inspection. Upon completion of the service and inspection cycle the consists then operate through the Train Wash Building and over to a designated track at the storage tracks. Accessibility from the storage tracks is available for locomotives or cars requiring detailed maintenance service. At this time, they are moved through the access tracks to the Maintenance Building (Phase 2) where repair work is performed on the locomotives and cars. Train consists, once serviced, are staged in the storage tracks for dispatch and morning pull-out.

The building structure requirements are programmed to serve various functions within the working yard. This includes Phase 1 and Phase 2 design concepts for the ultimate facility. These structures include:

- Transportation Building (Phase 1)
- Maintenance Building (Phase 2)
- Service and Inspection Facility (Phase 1)
- Utility Building (Phase 1)
- Train Wash Building (Phase 1)
- Maintenance Building Expansion(Phase 2)

| Building/Facility/Item | Building Area | Building Height |
|--------------------------------|----------------|-----------------|
| Transportation Building | 7,495 sq. ft. | 20 ft |
| Train Wash Building | 11,110 sq. ft. | 21 ft |
| Maintenance Building | 40,392 sq. ft. | 48 ft |
| Maintenance Building Expansion | 27,880 sq. ft. | |
| Utility Building | 981 sq. ft. | 20 ft |
| Pump House | 750 sq. ft. | 14 ft |
| Guard Booth | 36 sq. ft. | |
| Equipment Booth | 48 sq. ft. | |
| Sand Silos (2 Total) | 576 sq. ft. | |
| Total | 89,268 sq. ft. | |

Table 2.3-1: Building Specifications

Source: Gannett Fleming, Metrolink (2022)

Note: sq. ft. = square feet; ft = feet

Transportation Building

The Transportation Building is approximately 7,495 square feet with an industrial architectural style. This building would have administrative functions and would be used to serve all employees working in the facility. Locker room and restroom areas are designated in this building for all crew members, mechanics, cleaners, and supervisors for multiple shifts in the facility. The exact layout of locker and restroom facilities would be determined during final design.

Maintenance Building

The Maintenance Building is approximately 40,392 square feet with an industrial architectural style. This building has two (2) maintenance and inspection service bays: one single flat bay for minor maintenance and another bay with a service pit and platforms on both sides for access to roof tops of trains. A dual overhead crane also helps service both bays, with a dedicated component and material drop-off area and Support Shop adjacent to the service bays. A secure High-Level Automated Parts Storage Area is also adjacent to the service bays, with a shipping, receiving, and staging area inside the Storage Area for deliveries.

Service and Inspection Facility

The S&I Area is approximately 815 feet by 60 feet. The S&I Facility consists of several services for train cars in the facility, listed below:

- Dual S&I Fueling and Inspection Tracks/Areas (for bi-directional train access)
- Locomotive Fueling Area
- Platform Area Sanding Stations and Lubricant Reels at engine compartment access.
- Inspection Pit level.
- Toilet Dump Stations throughout the length of the eight-car consist

Utility Building

The Utility Building is approximately 981 square feet with an industrial architectural style. An additional 45 feet in length adjacent to the building is designated for the trash compactor and the baler, where the trash and waste from throughout the facility is handled. See full list of the building's program below:

- Lube Pump Room (Storage of new and used fluids)
- Air Compressor Room
- Trash Compactor and Bailer outdoor area with roll-off container pick up access
- Propane Storage Room
- Welding Gas Cylinder Storage Area
- Water Treatment Room (Oil Water Separator)
- Sewer Ejector Lift Station (Outside Building)
- Industrial Waste Tank (Outside Building)

Pump Building and Fuel Storage

The Pump House is a one-story unoccupied facility located on the south east side of the yard near the Utility Building. The square footage of the building is 750 square feet, and it has a building height of approximately 15'-6" from grade, with an industrial architectural style. It houses the elaborate fuel pumping system that will distribute diesel fuel to two locations at the S&I fuel stations to support the four fuel cranes. The Pump Building is also supported by a rubber tire vehicle fuel station and an adjacent Diesel Exhaust Fluid (DEF) tank and pump system that will support the dispensing of DEF at the fuel stations.

The tank farm located adjacent to the Pump Building provides a total of 120,000 gallon of diesel fuel storage located in four 30,000-gallon double walled aboveground tanks (AST) supplied with fuel delivery spill boxes and alarm systems. Distribution piping routed between the Utility Building, AST tanks, Pump Building and Fuel Stations is supported via a structural pipe bridge interconnection the Utility Building, Pump House, and S&I Fueling canopies for Phase 1 construction. Phase 2 construction will allow the extension of such bridge for fluid and air distribution to the future maintenance Building.

- Pump room housing diesel pump system and supporting equipment.
- Four 30,000-gallon aboveground double wall diesel fuel tanks.
- DEF tank and pump system.
- Rubber tire vehicle fueling station.
- Supply pipe bridge for distribution of fuel line, fluid lines and air distribution lines along with all required electrical conduit

Train Wash Building

The Train Wash Building is approximately 11,110 square feet with an industrial architectural style. Train cars are cleaned in this building. Coordination with the City of Irvine is necessary to establish the requirement of a canopy. The design of the Train Wash and its tracks would enable trains to pass through it in either direction. The wash would activate on only when desired so trains can go through the wash without being washed. A full list of the building's program is listed below:

- Drive-Thru Brush Vehicle Wash Bay with Speed Control and Water Stripper System
- Equipment Room
- Reclamation System
- Reverse Osmosis Spot Free Rinse
- Storage Vessels
- Pump Systems
- Underground pit collection system
- Electrical Room

Material Storage Building

The Material Storage Building is approximately 15,600 square feet with an industrial architectural style. Most material and equipment for the facility is stored in this building, as well as hazardous material and batteries. Final confirmation with SCRRA is pending to determine if the storage site is to be an enclosed prefabricated structure or an open-site area. Additional coordination with the City of Irvine is necessary to establish allowable proximity of the structure face to the property line. See full list of the building's program below:

- Large Material Storage Area
- Equipment Storage Area
- Battery Shop for battery charging and storage
- Hazardous Materials Storage Area

2.4. Construction

The Project would be developed in two phases with an anticipated completion date of 2028.

2.4.1. Phase 1

Phase 1 of the Project would involve construction of most of the infrastructure in the yard, including the S&I Facility tracks, train wash track, storage tracks, set-out track(s), yard lead tracks, transportation building, and employee parking. The construction activities, their duration, and personnel assumptions for construction of Phase 1 are shown in Table 2.4-1.

2.4.1. Phase 2

The second phase would construct the Maintenance Building and the Maintenance Building Expansion. Other potential items in this phase are the conversion of the West Lead Track into a drill track, and the construction of a second run-around track within the mainline track corridor. The construction activities, their duration and personnel assumptions for construction of Phase 2 are shown in Table 2.4-2.

| Activity | Duration (Months) | Personnel | |
|---|-------------------|-----------|--|
| Clear and Grub | 3 | 10 | |
| Site Utilities | 24 | 16 | |
| Demolition | 3 | 10 | |
| Earthwork-Excavation, grading and compacting | 6 | 16 | |
| Foundations | 4 | 24 | |
| Roadway/Paving/Curbs | 4 | 15 | |
| Building | 19 | 57 | |
| Bridge (assume precast) | 6 | 36 | |
| Trackwork- Ballasted- (top of sub ballast up) | 10 | 30 | |
| Trackwork- Direct Fixation | 3 | 10 | |
| Major Equipment | 6 | 33 | |
| Commissioning | 2 | N/A | |

Table 2.4-1: Construction Assumptions for Phase 1

Source: Gannett Fleming, 2021

Table 2.4-2: Construction Assumptions for Phase 2

| Activity | Duration (Months) | Personnel | |
|---|-------------------|-----------|--|
| Clear and Grub | <1 | 10 | |
| Site Utilities | 4 | 16 | |
| Demolition | 1 | 10 | |
| Earthwork-Excavation, grading and compacting | 2 | 16 | |
| Foundations | 2 | 24 | |
| Roadway/Paving/Curbs | 2 | 15 | |
| Building | 15 | 57 | |
| Trackwork- Ballasted- (top of sub ballast up) | 4 | 30 | |
| Trackwork- Direct Fixation | 3 | 10 | |
| Major Equipment | 6 | 33 | |
| Commissioning | 2 | N/A | |

Source: Gannett Fleming, 2021

2.5. Operations

2.5.1. Proposed Rail Conditions and Operations

The OCMF would provide overnight servicing and storage for trains – like Orange County Line trains – ending their day or revenue operations in or near Orange County. The OCMF would provide regular light repair, daily, and scheduled light maintenance on a three, six, and twelve-month schedule. Heavy repair

operations would continue to be performed at the CMF in Los Angeles. The rail operations functions of the yard may include, but not be limited to, the following:

- Rail Fleet Services vehicle storage, maintenance, and repair. Provides for 3 or 4 shifts per day for rail fleet services staff and Yard Crew.
- Rail Transportation train operator's services including:
 - Train operators report desk services.
 - Train operators transport services.

Typically, trains would enter the yard from the mainline going directly to the S&I pits. Once serviced, fueled, sanded, and cleared of waste, the trains head to the train wash for exterior cleaning. From the train wash they are sent to the storage yard for overnight keeping. Trains leaving the yard are inspected daily on the storage tracks before being released to revenue service by rail fleet services. The daily inspections include:

- The Automatic Train Protection system is tested
- Emergency braking system is tested
- The brakes are tested
- The doors are tested including their sensitive edges
- The couplers are checked
- The destination signs are tested
- The master controller and deadman controls are checked
- Defaced (graffiti) and worn passenger seats are documented
- Interior and exterior lights are checked
- Public address and intercom systems are tested
- Air conditioning system is checked
- Vehicle horn and gong is checked

Once the daily inspection is complete, trains are released to transportation services for operations. Trains passing the pre-trip inspections would be routed from storage to lead tracks in preparation for entry to the mainline. Specific train movements have been identified as standard movements in the daily operation of the yard:

- Mainline Northbound (NB) to Service and Inspection
- Service and Inspection to Train Wash
- Train Wash to Lead Tracks
- Lead Tracks to Storage Tracks
- Storage Tracks to Daily Inspection
- Daily Inspection to Lead Tracks
- Lead Tracks to Mainline Southbound (SB)

Approximately 80 employees are expected to access the Project Site daily following the Project's full buildout and the completion of Phase 2. Phase 1 and Phase 2 of the Project would anticipate

approximately approximately 52 and 28 employees respectively. Employees would enter the Project Site throughout the entire day, split across three eight-hour shifts.

2.6. Required Permits

OCTA is the lead agency for this Project and must oversee environmental review under CEQA, prior to approving the Project. OCTA recognizes the need for a close relationship with the City of Irvine and wishes to pursue the planning and environmental review of the Project in such a way that OCTA and the City of Irvine can agree that the Project would be of overall community benefit and that all reasonable efforts to avoid significant environmental effects have been made. Towards this end, OCTA would comply with regulations regarding site planning and construction, including such ordinances as the noise regulations and provisions of the City of Irvine's stormwater sewer system discharge permit.

The Project requires the following approvals and permits from agencies including:

- Army Corps of Engineering Clean Water Act (CWA) Section 404 Permit
- Army Corps of Engineering Amendment to the approved Habitat Mitigation and Monitoring Plan ("HMMP"), if necessary
- City of Irvine Public Works and Building and Safety Department Grading Permit
- City of Irvine Building and Safety Department Building Permit
- City of Irvine Community Development Services Department Conditional Use Permit (CUP)
- Department of Navy
- Orange County Flood Control District ("OCFCD") Encroachment permits may be required if any improvements are proposed within OCFCD right-of-way
- Santa Ana Regional Water Quality Control Board (SARWQCB)'s National Pollutant Discharge Elimination System (NPDES) Construction General Permit Order 2009-0009-DWQ
- South Coast Air Quality Management District (SCAQMD) Issue any needed Air Quality Permits
- A consultation with U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) would be conducted if special status plant species cannot be protected and an Incidental Take Permit (ITP) would be attained

2.7. Public Outreach of Draft IS/MND

In anticipation of the release of the Draft IS/MND, OCTA held meetings with the nearby residential community of Travata on various dates. All of the outreach materials are presented in Appendix I.

The meetings held with the Travata residents prior to the release of the Draft IS/MND included:

| Meeting Date | Meeting Time | Meeting Format | Purpose |
|------------------|---------------------|-----------------------|--|
| October 5, 2021 | 5:30 p.m. | Virtual | Introduce Project |
| November 4, 2021 | 10:30 a.m. | In-Person | Provide residents with ways to access Project information if they missed the virtual meeting |
| January 12, 2022 | 5:00 p.m. | In-Person | Review project, answer questions and clarify environmental process |

In addition, one public meeting during the public review period was held on March 14, 2022. This meeting was held at 5 p.m. at the Travata Clubhouse and included a presentation by the OCTA Project Manager and the OCTA Outreach Manager. Many questions were taken at the meeting by residents and the written comments are included in the response to comments matrix in Appendix J.

3. INITIAL STUDY

This section follows the Environmental Checklist format as provided by Appendix G of the 2020 CEQA Thresholds of the California Office of Planning and Research. The purpose of this section is to present the evaluation of the proposed Project against the questions in all environmental categories listed below. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts. Brief but adequate explanation is required for all answers and these answers must adequately be supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis). Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

3.1. AESTHETICS

| | provided in Public Resources Code Section | Potentially Significant Impact | Less Than Significant with Mitigation | Less Than Significant Impact | No Impact |
|---------------------------|---|--------------------------------------|--|------------------------------------|-------------|
| 21099, would the project: | | | Incorporated | | |
| 3.1.3.1 | Have a substantial adverse effect on a scenic vista? | | | | \boxtimes |
| 3.1.3.2 | Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway? | | | | |
| 3.1.3.3 | If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | | | | |
| 3.1.3.4 | Create a new source of glare which would adversely affect day or nighttime views in the area? | | | | |

3.1.1. Existing Conditions

The Project Site is in a relatively flat area adjacent to the Great Park, with a multi-sport complex to the northeast, office/industrial uses to the southwest, and I-5 to the east and State Route 133 (SR-133) to

the north. The existing area in the vicinity of the Project Site consists of an active railroad corridor; vacant, undeveloped land; active parkland associated with the Great Park; and urbanized areas containing medium-high rise commercial office buildings (Google Maps, 2021). A complex of two-story single-family homes (Travata 55+) is located at the northwest corner of Marine Way and Ridge Valley.

The Santa Ana Mountains can be seen to the east of the Project Site, and Bommer and Shady Canyon can be seen southwest of the Project Site. There are no designated California Department of Transportation (Caltrans) scenic vistas or scenic resources in the area (Caltrans, 2019). The City of Irvine General Plan does not delineate or designate any scenic resources or specific views as protected scenic vistas in the Project Site (City of Irvine, 2015).

At this time, there is no planned development for the area between the Project and Marine Way. The existing Project Site does not have any light sources. Sources of lighting in the vicinity include the Great Park's tennis courts, sports fields, and parking lot security lighting. Additionally, the adjacent highways have light sources for roadway visibility and headlights from motor vehicle traffic.

Project Site

The Project Site is currently vacant and undeveloped; its visual character exhibits some natural landforms and vegetation, such as low grasses. A narrow, paved road traverses the Site. Minor visual structural features include unused stormwater drains, valves and vents, rail equipment, signal houses, and storage of other rail or electrical equipment. The form of the Project Site is generally flat and low, with no vertical elements that dominate the landscape. The lines associated with the Project Site are generally horizontal, curving, and continuous, but occasionally irregular, and do not visually dominate the view. Colors visible within the landscape primarily include hues of brown, with some patches of greens and grays. The texture of the Project Site is fine-grained, dense, patchy, with occasional areas of striation. The existing visual quality of the Project Site is considered to have low vividness, intactness, and unity because it does not exhibit distinctive or memorable visual elements; the integrity of the visual environment is not consistent or patterned; and the visual elements do not combine to form a coherent visual design or organization.

Most of the areas surrounding the Project Site vary greatly in visual character from the Project Site in terms of form, line, color, and texture due to the presence of more and taller vertical features such as trees, residences, and elevated highways, as well as vibrant large areas of green spaces. The visual quality of the surrounding area varies but generally exhibits a slightly higher degree of vividness, intactness, and unity.

Viewer Characteristics and Sensitivity

In considering aesthetic impacts of the Project, key views and visually prominent features have been assessed to determine how they would most influence impact perception. The viewer population is a mix of viewer groups, including residents, park patrons, office building and industrial workers, transit patrons, commuters, and bicyclists. Motorists are anticipated to have low sensitivity to visual change than other viewer groups because they are focused on driving in traffic. Workers in the nearby office

buildings and industrial buildings are anticipated to have low sensitivity to visual change. The residents and park patrons would have high sensitivity to visual change in the area because their activities are elective or because they spend a great deal of time in the area of the Project Site.

Light sensitive receptors or land uses may include, but are not limited to, all types of residences; commercial or institutional uses that require minimal nighttime illumination for proper function, physical comfort, or commerce; and natural areas.

3.1.2. Regulatory Framework

City of Irvine General Plan Land Use Policy Objective A-1 Policy (a) - Objective A-1 of the City of Irvine's Land Use Policy is to strengthen Irvine's identity. One policy mechanism to achieve this objective is through the conservation of visual resources along the scenic corridors that define the City of Irvine.

3.1.3. Discussion

3.1.3.1. Would the Project have a substantial adverse effect on a scenic vista?

Determination: NO IMPACT

Construction and Operational Impacts

A scenic vista generally provides focal views of objects, settings, or features of visual interest; or panoramic views of large geographic areas of scenic quality, primarily from a given vantage point. A significant impact would occur if a project introduced incompatible visual elements within a field of view containing a scenic vista or substantially altered a view of a scenic vista.

As described in Appendix A (Aesthetics Technical Memorandum), the City of Irvine General Plan does not delineate or designate any specific views as protected scenic vistas in the Project Site. There are no designated Caltrans scenic vistas or scenic resources in the area. Therefore, no construction and operational impacts would occur related to a substantial adverse effect on a scenic vista.

3.1.3.2. Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Determination: NO IMPACT

Construction and Operational Impacts

The Project is not located along or near an officially designated California Scenic Highway or locally designated scenic highway. There are no designated Caltrans scenic vistas or scenic resources in the area. The closest designated scenic highway is Highway 91 approximately 13 miles away from the Project. Old Town Irvine is a registered California historical landmark,

approximately half-mile away from the Project Site; however, it is occluded by SR-133 and I-5 (Caltrans, 2019).

The Project would not impact any groves of trees, street trees, rock outcroppings, historic buildings, or any other potential scenic resources during construction or operations, as no existing scenic resources are present on the Project Site. Therefore, no construction or operational impacts would occur related to scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway.

3.1.3.3. In non-urbanized areas, would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

Visually, the Project Site consists of a vacant area with a minor accessory structure and access roads. The Project Site does not contain any buildings, trees, or landscaping and the existing landscape is not memorable. This is a contrast from the green space area to the north that includes the Great Park. During the construction phase, construction equipment, staging areas, construction trucks and vehicles, and temporary fencing would be visible to several viewer groups and would result in a contrast and change in visual character from the existing vacant area. However, construction is currently ongoing for the County of Orange's RV storage area; thus, construction activities such as grading would not be different than what is encountered now.

Transit patrons, motorists, and bicyclists would primarily experience views of construction activities while riding trains on the adjacent Metrolink tracks, driving along Marine Way adjacent to the Project Site, and while traveling in the bike path along Marine Way. The change in the visual character of the Project Site during the construction phase would be noticed by these viewer groups; however, transit patrons, motorists, and bicyclists are considered receptors with low sensitivity.

The employees of office buildings and industrial land uses in the vicinity of the Project Site would primarily experience views of the construction activities on the Project Site as they approach and leave their place of work. Therefore, their views of the construction activities would mostly take place while en route to and from these locations. The change in the visual character of the Project Site during the construction phase would be noticed by these viewer groups. However, employees of office buildings and industrial land uses are considered to have a low sensitivity to visual changes on the Project Site.

Residents and Great Park patrons would primarily experience views of construction activities while traveling to and from their homes and while recreating in the Great Park. Views from the residences located northwest of the Project Site would be blocked by existing mature

trees on their properties, as well as the concrete wall that surrounds the residential complex. The view would also be blocked by fencing that would surround the Project Site during construction and operations.

Overall, the construction phase would represent a temporary change in the visual quality and character of the Project Site. However, the construction site would be visibly similar to other construction projects in the City. During construction, the Project Site would be surrounded by fencing that would also block the majority of the construction activities. Therefore, construction impacts related to visual character would be less than significant.

Operational Impacts

The Project would include a new maintenance facility adjacent to the Metrolink right-of-way (ROW) and would involve the construction and operation of up to 30-foot-tall buildings, and approximately 30-foot-tall metal structures that would serve as bridges for utility lines. The new structures would be set back on the site over 500 feet from Marine Way to the north. The Project would be within an urban environment and would be consistent with the City's General Plan goals of conservation of visual resources along the scenic corridors in the City. To assess the potential visual changes that would result from the operation of the Project, three Key Observation Points (KOPs) were selected specifically for the Project, as shown below. KOPs represent key locations where the visual character is representative and can be used for visual simulations to evaluate potential visual impacts. Visual simulations from these KOPs were prepared to provide a before and after comparison of the visual effects that would result from the Project. The locations of the three KOPs are shown Figure 3.1-1. The KOP existing views and simulations are shown in Figures 3.1-4 through 3.1-6.

The KOPs are representative of direct views within the Project Site and its surrounding area. Simulations from the same locations show how these views would change as a result of the implementation of the Project. The simulated views represent conceptual design and are not intended to represent the Project's final design.

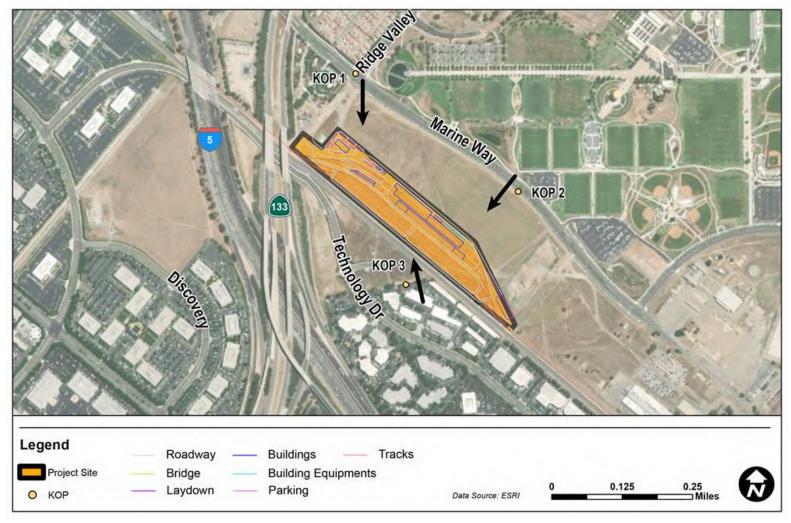


Figure 3.1-1: Location of Key Observation Points

Source: ESRI (2021), OCTA (2021)

KOP 1 shows the Project Site looking southeast from along Marine Way and the intersection with Ridge Valley (see Figure 3.1-2). The Marine Way ROW, including traffic signals and a streetlight pole, dominate the foreground of the view. Public parkway landscaping and fencing are visible directly adjacent to the roadway. The flat and somewhat vegetated Project Site is visible in the middle ground of the view with no existing structures present. The background of the view includes a segment of elevated freeway on the right, as well as trees and tall office buildings on the center and left. In the distance, the tops of hills can be seen above the elevated I-5.

As shown in Figure 3.1-2, the Project is visible in the middle ground of the view. The new buildings interrupt some of the background views of the distant office buildings, trees, and the elevated I-5. The tops of the hills can still be seen. The Project includes a solid wall that is visible throughout the center of the view from right to left. The simulated view from KOP 1 represents a visual change compared to existing conditions as development would occur on a site with no existing structures. However, due to the urban and visual environment of the area surrounding the Project Site, including various types of uses and structures, this visual change would not be inconsistent with other development in the vicinity of the Project Site. The Project would include new large aboveground structures; however, the height and massing of the buildings would not substantially alter visual character for residential viewers from this viewpoint primarily due to the distance of the Project buildings from the residential viewers, and because the residences are surrounded by a tall concrete wall and large trees. Additionally, no aesthetically significant view or landmark would be altered or blocked. Therefore, operational impacts related to visual character would be less than significant for KOP 1.

KOP 2 shows the Project Site looking southwest from along Marine Way, approximately 1,800 feet southeast of Ridge Valley (see Figure 3.1-3). The Great Park is located approximately 94 feet behind the view perspective. This view represents the perspective of motorists, pedestrians, cyclists, and Great Park patrons. Visible in the foreground is the public sidewalk, landscaping, small bushes, a small tree, and a small concrete slab housing a manhole cover and a small, green aboveground utility box. Visible in the middle ground is a narrow dirt road, and a large area of green and brown ground vegetation within the Project Site. The elevated I-5 is visible in the background on the right and center of the view. Mature trees, commercial and office buildings, other development, and distant hills are visible in the background in the center and partially in the right side of the view.

Figure 3.1-2: KOP 1 – Before and After Simulation View, Looking Southeast from Residential Uses at Marine Way/Ridge Valley Intersection





Source: OCTA/Trimble (2021), OCTA (2021)

As shown in the simulated view of Figure 3.1-3, the Project would be visible in the middle ground of the view, with the tallest buildings being on the right. The new buildings would block the background views of the elevated I-5 on the right, and would only partially block views of the mature trees, commercial and office buildings, other development, and distant hills. The Project would include a solid wall that would be visible throughout the center of the view from right to left. The simulated view from KOP 2 represents a visual change compared to existing conditions as development would occur on a site with no existing structures. However, due to the urban and visual environment of the area surrounding the Project Site, including various types of uses and structures, this visual change would not be inconsistent with other development in the vicinity of the Project Site. The Project would include new large aboveground structures; however, the height and massing of the buildings would not substantially alter visual character for motorists, pedestrians, cyclists, and Great Park patrons from this viewpoint primarily due to the distance of the Project from the viewers. Additionally, no aesthetically significant view or landmark would be altered or blocked. Therefore, operational impacts related to visual character would be less than significant for KOP 2.

KOP 3 shows the Project Site looking north from the parking lot adjacent to a commercial/office building approximately 335 feet south of the Project Site (see Figure 3.1-4). This view represents the perspective of commercial and industrial building users. Visible in the foreground is a portion of the paved and striped surface parking lot, and a mature and smaller tree, as well as small bushes and a chain link fence that spans the view from right to left. Visible in the middle ground of the view is a vacant site that is not a part of the Project Site, as well as the Project Site itself. The ground vegetation on the vacant site and Project Site render the sites indistinguishable in this view. The Metrolink ROW divides these two sites, but this is indistinguishable in this view due to the vegetation. The background includes distant views of residential buildings on the center/left, as well as mature trees, Great Park, and hills on the right and center.

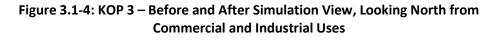
As shown in the simulated view in Figure 3.1-4, the Project would be visible in the middle ground of the view. The proposed maintenance building would block the distant background views of mature trees, the Great Park, and hills that would be visible on the right and center of the view. The simulated view from KOP 3 represents a visual change compared to existing conditions as development would occur on a site with no existing structures. However, due to the urban and visual environment of the area surrounding the Project Site, including various types of uses and structures, this visual change would not be inconsistent with other development in the vicinity of the Project Site. The Project would include new large aboveground structures and although the height and massing of the buildings would substantially alter views for commercial, office, and industrial building users, these are considered viewers with low to moderate sensitivity. Additionally, no aesthetically significant view or landmark is being altered or blocked. Therefore, no operational impacts related to visual character would occur for KOP 3.

Figure 3.1-3: KOP 2 – Before and After Simulation View, Looking Southwest from Marine Way and the Great Park





Source: OCTA/Trimble (2021), OCTA (2021)





Source: OCTA/Trimble (2021), OCTA (2021)

Overall, the operation of the Project would represent a change in visual character as compared to the existing Project Site as development would occur on a site with no existing structures. However, the Project is in an urban area that currently has a mix of open space, industrial and office buildings, residential homes, and adjacent elevated freeway segments. Users of commercial businesses and offices would have a low to moderate sensitivity to this visual change. Residents and park patrons would likely have high sensitivity to the visual change; however, views from the residences would be interrupted by mature trees and existing and proposed walls, as well as the RV storage area between Marine Way and the Project Site. As a result, the Project would not conflict with any other regulations governing scenic quality because the Project would not substantially change views in the area or along any scenic corridor. Therefore, operational impacts related to visual character would be less than significant.

3.1.3.4. Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

The Project Site does not currently have any sources of lighting. A high level of existing ambient lighting currently exists surrounding the Project Site, including a substantial amount of high-poled sports field lighting located in the Great Park complex to the north. Construction of the Project would not include nighttime construction activities (primarily due to construction noise restrictions on work hours), which would require nighttime construction lighting. However, the Project Site would include standard safety lighting during construction. Nevertheless, sensitive receptors (the Great Park and residences) would be too far from the Project Site to experience spillover lighting due to security lighting. Therefore, construction impacts related to lighting would be less than significant. Regarding glare, construction equipment is not likely to be a significant source of glare. Therefore, no impacts related to glare would occur.

Operational Impacts

The Project would include installation of new standard exterior and interior security lighting around and within the OCMF, including buildings, which would operate continuously. The sensitive receptors for lighting are too far from the Project Site to be impacted by spillover lighting. However, per BMPs, the nighttime lighting fixtures would be installed to direct the majority of the light to within and directly adjacent to the OCMF, and away from sensitive areas, to the maximum extent feasible. In addition, the materials used in the exterior of buildings and structures visible above the proposed 6-foot-tall wall between the Project Site and Marine Way would comply with applicable City regulations under its Municipal Code (Division 9) and Zoning Ordinance (Section 3.16) to ensure no substantial source of glare.

Figure 3.1-5 and Figure 3.1-6 illustrate that the existing CMF and EMF, to which the Project would be similar, include typical exterior building materials, such as concrete, and do not exhibit reflective properties that could result in glare. Therefore, operational impacts related to the creation of a substantial source of light or glare would be less than significant.

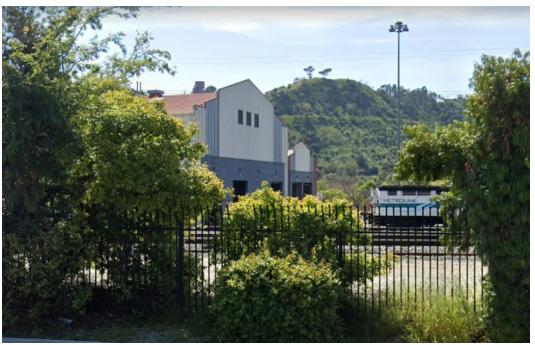


Figure 3.1-5: Existing Central Maintenance Facility, Exterior Building Materials

Source: Google Maps (2021)



Figure 3.1-6: Existing Eastern Maintenance Facility, Exterior Building Materials

Source: Google Maps (2021)

3.2. AGRICULTURE AND FORESTRY RESOURCES

| | | Less Than | | |
|-------|-----------|-------------|-------------|-----------|
| Pot | tentially | Significant | Less Than | |
| Sig | gnificant | with | Significant | No Impact |
| lı lı | mpact | Mitigation | Impact | |
| | l | ncorporated | | |

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the State's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

| 3.2.3.1 | Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | | |
|---------|---|--|-------------|
| 3.2.3.2 | Conflict with existing zoning for agricultural use, or use or a Williamson Act contract? | | |
| 3.2.3.3 | Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220 (g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | | |
| 3.2.3.4 | Result in the loss of forest land or conversion of forest land to non-forest use? | | \boxtimes |
| 3.2.3.5 | Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non- agricultural use or conversion of forest land to non-forest use? | | |

3.2.1. Existing Conditions

The California Department of Conservation (DOC) (2018) has designated the Project Site's existing land use as Other Land with some Urban and Build-out land use (see Figure 3.2-1). Additionally, the City of Irvine has designated the Project Site's existing land use as part of the Great Park (refer to Section 3.11 Land Use and Planning) and is zoned for 6.1 Institutional purposes. The Project Site is not located or zoned for any farmland, agriculture, or forestland land use.

3.2.2. Regulatory Framework

<u>State</u>

California Land Conservation Act of 1965 (also known as the Williamson Act) - The Williamson Act enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. The Act allows the DOC to establish agricultural conservation easements on farmland.

Local

City of Irvine General Plan, Land Use Element - The Project Site is currently undeveloped and is designated by the City of Irvine General Plan as Planning Area 51, the Great Park land use type.

City of Irvine Zoning Ordinance - The Project Site is zoned for 6.1 Institutional uses.

3.2.3. Discussion

3.2.3.1. Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance?

Determination: NO IMPACT

Construction and Operational Impacts

As stated in Section 3.2.1, the DOC has designated the Project Site's existing land use as Other Land with some Urban and Built-Up land use. The City of Irvine has designated the Project Site's existing land use as part of the Great Park (refer to Chapter 3.11 Land Use and Planning) and is zoned for 6.1 Institutional purposes. Although the proposed Project is not an institutional land use, a CUP would be requested to ensure compliance with existing goals of the City. Therefore, no construction or operational impacts would occur related to the conversion of any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.

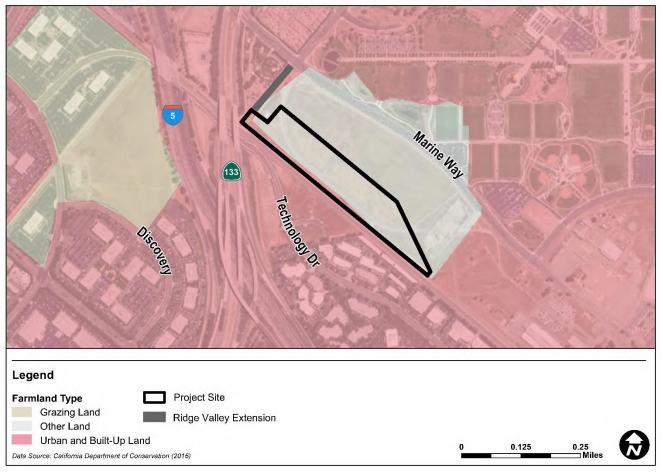


Figure 3.2-1: Existing Farmland In the Vicinity of the Project Site

Source: DOC (2016), and OCTA (2020)

3.2.3.2. Would the Project conflict with existing zoning for an agricultural use or a Williamson Act contract?

Determination: NO IMPACT

Construction and Operational Impacts

The Project Site is not on agricultural land (refer to 3.2.3.1) and would, consequently, not conflict with existing zoning for an agricultural use or a Williamson Act contract. Therefore, no construction or operational impacts would occur related to existing zoning for an agricultural use or a Williamson Act contract.

3.2.3.3. Would the Project conflict with existing zoning, or cause rezoning of, forest land?

Determination: NO IMPACT

Construction and Operational Impacts

The Project Site is not zoned as forestland, timberland, or timberland production. Therefore, no construction and operational impacts that would conflict with existing zoning or cause rezoning of forestry resources would occur.

3.2.3.4. Would the Project result in the loss of forest land or result in the conversion of forest land to non-forest use?

Determination: NO IMPACT

Construction and Operational Impacts

The Project Site is not zoned as forestland, timberland, or timberland production. Therefore, no construction and operational impacts that would result in the loss of forestland or result in the conversion of forestland to non-forest use would occur.

3.2.3.5. Would the Project involve other changes in the existing environment which could result in the conversion of farmland to non-agricultural use or conversion of forestland to non-forest use?

Determination: NO IMPACT

Construction and Operational Impacts

The Project Site is not located within the vicinity of land use categorized as farmland or forestland. Therefore, no construction and operational impacts that would result in the conversion of farmland to non-agricultural use or conversion of forestland to non-forest use would occur.

3.3. AIR QUALITY

| Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project: | | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|--|--|--------------------------------------|--|------------------------------------|-----------|
| 3.3.3.1 | Conflict with or obstruct implementation of the applicable air quality plan? | | | \boxtimes | |
| 3.3.3.2 | Result in cumulatively considerable net increase of any criteria pollutant for which the project region is in non- attainment under an applicable federal or state ambient air quality standard? | | | | |
| 3.3.3.3 | Expose sensitive receptors to substantial pollutant concentrations? | | | \boxtimes | |
| 3.3.3.4 | Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | | | | |

3.3.1. Existing Conditions

Criteria Air Pollutants

The primary purpose of an air quality plan is to bring an area that does not attain National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) into compliance with those standards pursuant to the requirements of the Clean Air Act (CAA) and California Clean Air Act (CCAA). NAAQS and CAAQS have been established for the following criteria pollutants: ozone, carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter less than 10 micrometers in diameter (PM₁₀), particulate matter less than 2.5 micrometers in diameter (PM_{2.5}), and lead. The NAAQS and CAAQS are described in more detail in Appendix B.

The Project Site is located within the South Coast Air Basin (SCAB) in the Saddleback Valley Source Receptor Area (SRA 19). The SCAQMD is the regulatory agency that oversees all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. Under the CCAA, the SCAQMD is required to develop an air quality attainment plan for nonattainment criteria pollutants within the air district. The most recent air quality plan developed by the SCAQMD is the 2016 Air Quality Management Plan (AQMP). The 2016 AQMP is the legally enforceable blueprint for how the region will meet and maintain the NAAQS and CAAQS. The 2016 AQMP identifies strategies and control measures needed to achieve attainment of the 8-hour ozone standard and federal annual and 24-hour standard for PM_{2.5} in the SCAB (SCAQMD, 2017a). The future emission forecasts are primarily based on demographic and economic growth projections provided by the Southern California Association of Governments (SCAG). As detailed in Appendix B, with respect to the NAAQS, the SCAB is designated as a nonattainment area for ozone and PM_{2.5}, a maintenance area for CO and PM₁₀, and as an attainment or unclassified area for all other pollutants. With respect to the CAAQS, the SCAB is designated as a nonattainment area for ozone, PM₁₀, and PM_{2.5}, and as an attainment area for all other pollutants (SCAQMD, 2016; EPA, 2020).

Toxic Air Contaminants

In addition to criteria pollutants, both federal and state air quality regulations also focus on toxic air contaminants (TACs). TACs can be separated into carcinogens and noncarcinogens based on the nature of the effects associated with exposure to the pollutant. TACs may be emitted by stationary, area, or mobile sources. Common stationary sources of TAC emissions include gasoline stations, dry cleaners, and diesel backup generators, which are subject to local air district permit requirements. The other, often more significant, sources of TAC emissions are motor vehicles on freeways, high-volume roadways, or other areas with high numbers of diesel particulate matter-emitting activities, such as distribution centers and railyards. Off-road mobile sources are also major contributors of TAC emissions and include construction equipment, ships, and trains. In 2015, the SCAQMD published the Multiple Air Toxics Exposure Study IV (MATES IV), a monitoring and evaluation study conducted in the SCAB. The MATES IV consists of a monitoring program, an updated emissions inventory of TACs, and a modelling effort to characterize risk across the SCAB. The study focuses on the carcinogenic risk from exposure to air toxics. The MATES IV estimated population weighted risk in the SCAB is 897 per million, a decrease of about 57 percent compared to the previous study (MATES III). The study also showed that diesel exhaust emissions had declined by about 70 percent, but diesel particulate matter (diesel PM) continued to account for about two-thirds of the cancer risk from air toxics (SCAQMD, 2017b). MATES IV estimates an excess cancer risk of 626 per million for the Project Site (SCAQMD, 2015).

Sensitive Receptors

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. The SCAQMD considers a sensitive receptor to be a receptor such as a residence, hospital, or convalescent facility where it is possible that an individual could remain for 24 hours (SCAQMD, 2008). Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution because exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time.

The Project Site is adjacent to the Great Park, which serves outdoor recreational activities for the community. The nearest receptors to the Project Site are the residences of a senior community approximately 650 feet north of the Project Site on Ridge Valley, worker receptors located at the

buildings along Technology Drive and at the nursery to the west of the Project Site, and the recreational receptors at the Great Park.

3.3.2. Regulatory Framework

<u>State</u>

California Clean Air Act - The CCAA was adopted in 1988 and requires the California Air Resources Board (ARB) to establish CAAQS. In most cases, CAAQS are more stringent than NAAQS. Other ARB responsibilities include, but are not limited to, overseeing local air district compliance with state and federal laws; approving local air quality plans; submitting State Implementation Plans to EPA; monitoring air quality; determining and updating area designations and maps; and setting emission standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

Tanner Toxics Act - TACs in California are regulated primarily through the Tanner Air Toxics Act (Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act (Chapter 1252, Statutes of 1987). Assembly Bill (AB) 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before ARB can designate a substance as a TAC. The Air Toxics Hot Spots Information and Assessment Act requires that TAC emissions from stationary sources be quantified and compiled into an inventory according to criteria and guidelines developed by ARB, and, if directed to do so by the local air district, a health risk assessment must be prepared to determine the potential health impacts of such emissions.

<u>Local</u>

SCAQMD Regional Significance Thresholds - As stated in Appendix G of the CEQA Guidelines, the significance criteria established by the applicable air quality management board or air pollution control district may be relied on to make the impact determinations for specific program elements. The SCAQMD has established recommended screening level thresholds of significance for regional emissions. The SCAQMD regional significance thresholds are shown in Table 3.3-1. The regional thresholds of significance were designed to identify those projects that would result in significant levels of air pollution and to assist the region in attaining the applicable state and federal ambient air quality standards, which were established using health-based criteria to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution, these thresholds of significance can also be used to assess Project emissions and inform the Project's impacts to regional air quality and health risks under CEQA.

| Pollutant | Daily Emissions lbs/day (Construction) | Daily Emissions lbs/day (Operation) |
|-------------------|---|--|
| NOx | 100 | 55 |
| PM10 | 150 | 150 |
| PM2.5 | 55 | 55 |
| СО | 550 | 550 |
| VOC | 75 | 55 |
| SO _X | 150 | 150 |
| Lead ¹ | 3 | 3 |

Table 3.3-1: SCAQMD Regional Thresholds of Significance for Select Criteria Pollutants

Notes: SCAQMD = South Coast Air Quality Management District; NO_X = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter;

PM_{2.5} = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide;

VOC = volatile organic compounds; SO_x = sulfur oxides; lbs/day = pounds per day.

¹ This analysis does not directly evaluate lead because little to no quantifiable and foreseeable emissions of this substance would be generated by the Project. Lead emissions have significantly decreased due to the near elimination of leaded fuel use.

Source: SCAQMD, 2019

SCAQMD Localized Significance Thresholds (LSTs) - The SCAQMD also established LSTs, which represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards. The LSTs are developed based on the ambient concentrations of that pollutant for each source receptor area. Since the LSTs consider the ambient air quality, LSTs can also be used to identify those projects that would result in significant levels of air pollution and impact sensitive receptors.

The LST Methodology provides Look-Up Tables with different thresholds for nitrogen oxides (NO_x), CO, PM₁₀, and PM_{2.5} based on the location and size of the project site and distance to the nearest sensitive receptors. The Look-Up Tables provide thresholds for 1, 2, and 5-acre project sites. Since the Project Site has an area of approximately 21.3 acres, the 5-acre project site threshold was utilized to provide a conservative analysis for CO and PM₁₀ emissions. The 5-acre project site threshold can be used as a conservative measure because it assumes daily emissions associated with the emissions-generating activities are emitted on a 5-acre site (and therefore concentrated over a smaller area with higher air pollutant concentrations to the surrounding receptors). Thus, if emissions are less than the LSTs developed by SCAQMD for a 5-acre project, then a more detailed evaluation for a larger project site is not required. However, since the region is in nonattainment for ozone and PM_{2.5} and the Project Site is larger than 5 acres, consistent with SCAQMD guidance, project-specific localized dispersion modeling was performed for NO₂ (an ozone precursor) and PM_{2.5}. The Project limits are located within Source Receptor Area 19, Saddleback Valley.

As described previously, the nearest sensitive receptors are residences in the senior housing community located approximately 650 feet (200 meters) north of the Project Site. As such, the applicable LST for PM_{10} was determined assuming a receptor distance of 200 meters. In addition, since it is reasonable to

assume that off-site workers located at the nursery to the west of the Project Site and buildings along Technology Drive could be present for periods of 1 to 8 hours, the LST analysis was also performed for these worker receptors for pollutants with shorter averaging times, such as CO. The LST for CO was based on a 5-acre project site and 25-meter receptor distance. Since project-specific localized dispersion modeling was performed for NO₂ and PM_{2.5}, the LSTs were based on the SCAQMD ambient air quality thresholds for these criteria pollutants. Table 3.3-2 presents the LSTs applicable to the Project.

SCAQMD Health Risk Assessment (HRA) Thresholds - The SCAQMD has also developed HRA thresholds for TACs including carcinogens and noncarcinogens. These thresholds are summarized in Table 3.3-3.

| Threshold ¹ | NOx | CO | PM ₁₀ | PM _{2.5} |
|--|---|--------|-------------------------|-------------------|
| Mass-Rate Look Up Tables for LSTs for a 5-Acre Project Site Construction (lbs/day) | 197 | 1,804 | 74 | 30 |
| Mass-Rate Look Up Tables for LSTs for a 5-Acre Project Site Operations (Ibs/day) | 197 | 1,804 | 18 | 8 |
| Operational Ambient Air Quality Standards for Criteria Pollutants | 0.18 ppm (338.4 μg/m ³) 0.03 ppm (56.4 μg/m ³) | 20 ppm | 2.5 μg/m³ | 2.5 μg/m³ |

Table 3.3-2: SCAQMD Localized Thresholds for SRA 19

Notes: SCAQMD = South Coast Air Quality Management District; LST = localized significance threshold; NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; Ibs/day = pounds per day.

¹ The mass-rate LSTs developed by SCAQMD are for a 5-acre project site. As detailed above, due to the region's nonattainment status for ozone and PM_{2.5} and the Project Site size, criteria pollutant modeling was performed for NO₂ (an ozone precursor) and PM_{2.5}. These ambient air quality standards are obtained from the SCAQMD ambient air quality thresholds for criteria pollutants based on South Coast AQMD Rule 1303, Table A-2. Source: SCAQMD, 2008

Table 3.3-3: SCAQMD Health Risk Assessment Thresholds

| Description | Threshold |
|---------------------------------|-----------------|
| Maximum Incremental Cancer Risk | 10 in 1 million |
| Chronic & Acute Hazard Index | 1.0 |

Notes: SCAQMD = South Coast Air Quality Management District Source: SCAQMD, 2019

3.3.3. Discussion

3.3.3.1. Would the Project conflict with or obstruct implementation of the applicable air quality plan?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

Construction of the Project would involve the use of off-road equipment and haul trucks, and worker commute trips. Assumptions for off-road equipment emissions in air quality plans are developed based on hours of activity and equipment population reported to ARB for rule compliance. The use of construction equipment in the AQMP is estimated for the region on an annual basis, and construction-related emissions are estimated as an aggregate in the AQMP. Since Project construction is limited to short-term activities and construction activities would not involve unusual characteristics that would necessitate the use of extensive off-road equipment, the Project would not increase the assumptions for off-road equipment use in the AQMP. In addition, the Project would result in emissions that would be below the SCAQMD regional and localized thresholds during construction (as shown below in Section 3.3.3.2). The thresholds were developed to assist the region in attaining the applicable state and federal ambient air quality standards; therefore, the Project would not result in an increase in the frequency or severity of existing air quality violations and would not have the potential to cause or affect a violation of the NAAQS or CAAQS. Furthermore, construction activities would comply with SCAQMD rules and regulations, including but not limited to Rule 401 (Visible Emissions), Rule 402 (Nuisance), Rule 403 (Fugitive Dust), and Rule 1113 (Architectural Coatings). As such, the Project would also comply with the applicable SCAQMD rules and regulations, which are developed to implement AQMP control measures. Therefore, construction impacts related to, conflicting with or obstructing implementation of the applicable air quality plan would be less than significant.

Operational Impacts

Currently, the Project Site land use designation is the Great Park under the City of Irvine General Plan, adopted in June 2015. However, as described in Section 2 Project Description, the use of the site as a rail maintenance facility would be deemed consistent with the purpose and intent of the zoning district. Although the land use assumptions are not consistent with land use assumptions in the General Plan (which is why the Project would be requesting a CUP), the purpose of the Project is to provide the space and equipment to inspect, clean, and maintain train cars and locomotives on a regular and efficient basis. As described in in Section 2, a maintenance facility located along the SCRRA Orange Subdivision through Orange County, such as the Project, would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and Colton. The storage and maintenance activities that would occur operationally at the OCMF would be a shift in these operations from the existing storage and maintenance facilities to the proposed Project Site. As such, due to the optimal location of the Project Site, the Project is also anticipated to result in reduced locomotive travel in the region and thereby result in a reduction in the emissions associated with locomotive travel in the region. It is also anticipated that total regional emissions associated with train idling would decrease at the existing maintenance facilities due to more efficient operations and logistics. Thus, the Project would not conflict with mobile source control measures included in the AQMP aimed at reducing facility-based emissions at railyards and intermodal facilities (MOB-02; SCAQMD, 2017a). In addition, as shown in Section 3.3.3.2 below, operational emissions would also be below the SCAQMD regional and localized thresholds. Therefore, the Project would not conflict with or obstruct implementation of the applicable air quality plan, and impacts would be less than significant.

3.3.3.2. Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction Impacts

As described in more detail in Appendix B, sources of construction-related criteria air pollutant emissions include construction equipment exhaust; construction-related trips by workers; delivery and hauling truck trips; fugitive dust from site preparation activities; and off-gassing from traffic coating, paving, and architectural coating activities. Construction of Phase 1 is assumed to begin in 2023 and last approximately 30 months. Construction of Phase 2 is anticipated to begin in 2025 and last approximately 23 months. Emissions generated by construction activities were modeled using emission factors from ARB's OFFROAD 2017 and Emission Factor (EMFAC) 2017 inventory models. Construction emissions from the operation of diesel-fueled off-road equipment were estimated by multiplying construction equipment usage information by the equipment-specific emissions from on-site and off-site on-road motor vehicles were estimated using vehicle trips, vehicle miles traveled (VMT), and EMFAC 2017 mobile source emission factors. The emission factors represent the fleet-wide average emission factors in Orange County. On-road emissions estimates also considered particulate matter from brake wear, tire wear, and re-entrained roadway dust.

Fugitive dust emissions were estimated using EPA's Compilation of Air Pollutant Factors (AP 42) and California Emissions Estimator Model (CalEEMod) methodology for activities, including material loading into haul trucks; VMT; and earthwork quantities and activities including graders, scrapers, and dozers leveling land or moving dirt. Fugitive dust emission estimates of PM₁₀ and PM_{2.5} include reductions associated with implementation of fugitive dust control practices per SCAQMD Rule 403 (e.g., watering disturbed surface areas at least twice per day). Additional modeling assumptions and methodology are provided in Appendix B.

Tables 3.3-4 and 3.3-5 present the maximum daily emissions associated with Project construction of Phase 1 for comparison to the SCAQMD regional and localized thresholds of significance, respectively.

| Table 3.3-4: Phase | 1 Regional Construction-Related | Maximum Daily Emissions |
|--------------------|---------------------------------|-------------------------|
| | | |

| Description | VOC | СО | NOx | SOx | PM ₁₀ | PM _{2.5} |
|---|-------|-------|-------|------|-------------------------|-------------------|
| Phase 1 Maximum Daily Emissions (lbs/day) ¹ | 38.06 | 77.07 | 75.20 | 0.25 | 41.47 | 22.82 |
| SCAQMD Threshold (lbs/day) | 75 | 550 | 100 | 100 | 150 | 55 |
| Exceeds Threshold? | No | No | No | No | No | No |

Notes: VOC = volatile organic compounds; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM₁₀ = suspended particulate matter less than 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than 2.5 micrometers in diameter;

CO = carbon monoxide; lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

¹Phase 1 emissions are based on the overlap of subphases per the anticipated construction schedule. Maximum daily emissions for NOx and SO_X occur during the overlap of site utilities/electric, earthwork, foundations, bridge, and roadways/paving construction activities. Maximum daily emissions of VOC and CO occur during the overlap of site utilities/electric, foundations, bridge, roadways/paving, and building construction activities. Maximum daily emissions for PM₁₀ and PM_{2.5} occur during the overlap of clear and grub, site utilities/electric, demolition, and earthwork construction activities.

Table 3.3-5: Phase 1 Localized Construction-Related Maximum Daily Emissions

| Description | NOx | СО | PM ₁₀ | PM _{2.5} |
|---|-------|-------|-------------------------|-------------------|
| Maximum Daily On-Site Emissions (lbs/day) ¹ | 63.96 | 69.49 | 38.63 | 21.98 |
| SCAQMD Localized Threshold (lbs/day) | 197 | 1,804 | 74 | 30 |
| Exceeds Threshold? | No | No | No | No |

Notes: NO_x = nitrogen oxides; CO = carbon monoxide; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

¹ Maximum daily localized emissions account for on-site activities including off-road equipment use, fugitive dust, and on-site on-road vehicle travel. It was assumed that approximately 7 percent of the total on-road vehicles would occur on-site (estimated portion of vehicle emissions occurring on-site compared to the CalEEMod average trip length).

As shown in Tables 3.3-4 and 3.3-5, Phase 1 construction activities would not exceed the SCAQMD regional and localized thresholds of significance. Tables 3.3-6 and 3.3-7 summarize the maximum daily emissions associated with Phase 2 construction for comparison to the SCAQMD regional and localized thresholds of significance, respectively.

| Cable 3.3-6: Phase 2 Regional Construction-Related Maximum Daily Emissions |
|--|
|--|

| Description | VOC | CO | NO _x | SO _x | PM ₁₀ | PM _{2.5} |
|---|-------|-------|-----------------|-----------------|-------------------------|-------------------|
| Phase 2 Maximum Daily Emissions (lbs/day) ¹ | 80.36 | 57.92 | 45.32 | 0.12 | 14.22 | 8.02 |
| SCAQMD Threshold (lbs/day) | 75 | 550 | 100 | 100 | 150 | 55 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

Notes: VOC = volatile organic compounds; CO = carbon monoxide; NO_x = nitrogen oxides; SO_x = sulfur oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; Ibs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

¹ Phase 2 emissions are based on the overlap of subphases per the anticipated construction schedule. Maximum daily emissions for all pollutants except PM_{10} and $PM_{2.5}$ occur during the overlap of site utilities/electric, building, trackwork-direct fixation, and major equipment construction activities. Maximum daily emissions for PM_{10} and $PM_{2.5}$ occur during the overlap of site utilities/electric and earthwork construction activities.

Table 3.3-7: Phase 2 Localized Construction-Related Maximum Daily Emissions

| Description | NOx | СО | PM ₁₀ | PM _{2.5} |
|---|-------|-------|------------------|-------------------|
| Maximum Daily On-Site Emissions (lbs/day) ¹ | 44.91 | 51.99 | 13.32 | 7.76 |
| SCAQMD Localized Threshold (lbs/day) | 197 | 1,804 | 74 | 30 |
| Exceeds Threshold? | No | No | No | No |

Notes: NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

¹ Maximum daily localized emissions account for on-site activities including off-road equipment use, fugitive dust, and on-site on-road vehicle travel. It was assumed that approximately 7percent of the total on-road vehicles would occur on-site (estimated portion of vehicle emissions occurring on-site compared to the CalEEMod average trip length).

As shown in Table 3.3-6, Phase 2 construction activities would not exceed any of the localized thresholds of significance or regional thresholds of significance for any pollutant except VOCs. Therefore, construction impacts would be potentially significant, and mitigation would be required. The exceedance of the VOC threshold is primarily related to architectural coating activities of the maintenance building. As such, implementation of Mitigation Measure AQ-1 would be required to reduce VOC emissions below the threshold of significance.

• MM-AQ-1: Utilize low VOC paint for architectural coating activities during Phase 2

construction. To reduce VOC emissions during construction, the Project contractor shall utilize water-based or low VOC interior and exterior paints. The VOC content of the architectural coatings shall comply with the VOC content limits in SCAQMD Rule 1113 or not exceed 100 grams per liter, whichever is lower. To ensure that low VOC paint would be used during Project construction, this requirement would be included in applicable bid documents, purchase orders, and contracts. Successful contractor(s) must demonstrate the ability to supply the compliant architectural coatings for use prior to any coating activities. A copy of each proposed architectural coating Material Safety Data Sheet and VOC content shall be available upon request. Alternatively, the contractor may utilize tiltup concrete buildings that do not require the use of architectural coatings.

Table 3.3-8 demonstrates the maximum daily emissions associated with construction of Phase 2 with implementation of Mitigation Measure AQ-1.

| Description | VOC | СО | NO _x | SO _x | PM ₁₀ | PM _{2.5} |
|---|-------|-------|-----------------|-----------------|-------------------------|-------------------|
| Phase 2 Maximum Daily Emissions (lbs/day) ¹ | 35.78 | 57.92 | 45.32 | 0.12 | 14.22 | 8.02 |
| SCAQMD Threshold (lbs/day) | 75 | 550 | 100 | 100 | 150 | 55 |
| Exceeds Threshold? | No | No | No | No | No | No |

 Table 3.3-8: Phase 2 Mitigated Construction-Related Maximum Daily Emissions

Notes: VOC = volatile organic compounds; CO = carbon monoxide; NO_x = nitrogen oxides; SO_x = sulfur oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District. ¹ Phase 2 emissions are based on the overlap of subphases per the anticipated construction schedule. Maximum daily emissions for all pollutants occur during the overlap of site utilities/electric, building, trackwork-direct fixation, and major equipment construction activities.

As shown in Table 3.3-8, with implementation of Mitigation Measure AQ-1, emissions of VOC would no longer exceed the SCAQMD threshold of significance. As such, construction impacts would be less than significant with mitigation measures incorporated. Project construction of Phase 2 would overlap with Phase 1 operational activities. Therefore, the maximum daily emissions associated with overlapping activities of Phase 1 operations and Phase 2 construction are summarized in Tables 3.3-11 and 3.3-12 below.

Operational Impacts

As described in more detail in Appendix B, operations would generate long-term emissions of criteria air pollutants from a variety of sources. Emissions generated by operational activities were modeled for locomotive operations; heavy-duty equipment used on-site (such as cranes and forklifts); fuel tank emissions; natural gas consumption; and on-road vehicle travel for worker, delivery, and haul trips to and from the site. Operational emissions were based on anticipated equipment and vehicle fleets for the earliest possible operational year. Locomotive emissions were estimated for on-site activity, which is anticipated to include idling during service and inspection activities as well as travel through the wash bay. Emission factors for calculations were based on EPA's 2009 Emission Factors for Locomotives Technical Highlights (EPA-240-F-09-025). Fugitive emissions associated with train fueling and sanding were also estimated. Emissions from the operation of diesel-fueled off-road yard equipment were estimated using emission factors for ARB's OFFROAD 2017 emissions database.

The Project would not result in an increase in commuter rail service or additional locomotive train travel in the region. Therefore, emissions associated with in-transit locomotive

operations were assumed to remain similar to existing conditions. However, as described in more detail in Appendix B, for the purposes of localized emissions and health risk assessment, emissions associated with on-site idling and train travel within one mile of the proposed Project Site were estimated. As described in Section 2 Project Description, a maintenance facility located along the SCRRA Orange Subdivision through Orange County, such as the Project, would be the optimal location as it would reduce operating costs by limiting nonrevenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and Colton. The Project would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. The storage and maintenance activities that would occur operationally at the OCMF would be a shift in these operations from the existing storage and maintenance facilities to the proposed Project Site. As such, due to the optimal location of the proposed Project Site, the Project is also anticipated to result in reduced locomotive travel in the region and result in a reduction in the emissions associated with locomotive travel in the region. It is also anticipated that total regional emissions associated with train idling would decrease at the existing maintenance facilities due to more efficient operations and logistics.

Tables 3.3-9 and 3.3-10 present the maximum daily emissions associated with Project operations for comparison to the SCAQMD regional and localized thresholds of significance, respectively.

| Description | VOC (lbs/day) | CO (lbs/day) | NO _x (lbs/day) | SO _x (lbs/day) | PM ₁₀ (lbs/day) | PM _{2.5} (lbs/day) |
|---|------------------|-----------------|------------------------------|------------------------------|-------------------------------|--------------------------------|
| Yard Equipment | 0.83 | 3.48 | 2.53 | 0.01 | 0.11 | 0.15 |
| Staff and Truck Vehicles | 0.06 | 2.00 | 1.58 | 0.02 | 2.26 | 0.01 |
| Architectural Coatings | 0.13 | - | - | - | - | - |
| Natural Gas Consumption | 0.04 | 0.32 | 0.39 | 0.002 | 0.03 | 0.03 |
| Train Fueling | 0.41 | - | - | - | - | - |
| Sand Silos | - | - | - | - | 0.04 | 0.06 |
| Total Maximum Daily Increase in Regional Emissions | 1.48 | 5.80 | 4.50 | 0.03 | 2.44 | 0.25 |
| SCAQMD Threshold | 55 | 550 | 55 | 100 | 150 | 55 |
| Exceeds Threshold? | No | No | No | No | No | No |

Table 3.3-9: Operational Maximum Daily Increase in Regional Emissions

Notes: VOC = volatile organic compounds; CO = carbon monoxide; NO_x = nitrogen oxides; SO_x = sulfur oxides; PM₁₀ = suspended particulate matter less than 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than 2.5 micrometers in diameter; lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

| Description | NO _x (Ibs/day) | CO (lbs/day) | PM ₁₀ (lbs/day) | PM _{2.5} (lbs/day) |
|--|------------------------------|-----------------|-------------------------------|--------------------------------|
| On-Site Locomotive Operations (Maintenance and Testing) | 98.30 | 101.85 | 1.98 | 1.92 |
| Yard Equipment | 2.53 | 3.48 | 0.11 | 0.15 |
| Staff and Truck Vehicles ¹ | 0.11 | 0.14 | 0.16 | <0.01 |
| Natural Gas Consumption | 0.39 | 0.32 | 0.03 | 0.03 |
| Sand Silos | - | - | 0.04 | 0.06 |
| Total Maximum Daily Localized Emissions (lbs/day) | 101.34 | 105.80 | 2.32 | 2.16 |
| SCAQMD Localized Threshold | 197 | 1,804 | 18 | 8 |
| Exceeds Threshold? | No | No | No | No |

Notes: NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter;

lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

¹ Maximum daily localized emissions account for on-site activities including on-site locomotive operations, on-site off-road equipment use (e.g., forklifts, cranes), and on-road vehicle travel. It was assumed that approximately 7 percent of the total on-road vehicles would occur on-site (estimated portion of vehicle emissions occurring on-site compared to the CalEEMod average trip length).

As shown in Tables 3.3-9 and 3.3-10, Project operational emissions would not exceed the SCAQMD regional and localized thresholds of significance. As described previously, since construction of Phase 2 may overlap with operation of Phase 1, the overlapping emissions are summarized in Tables 3.3-11 and 3.3-12. Consistent with SCAQMD guidance, these overlapping emissions are compared to the SCAQMD thresholds of significance applicable to operations.

As shown in Table 3.3-12, with implementation of Mitigation Measure AQ-1, the maximum daily emissions associated with overlapping activities of Phase 1 operations and Phase 2 construction would also not exceed the SCAQMD threshold of significance.

| Description | VOC (lbs/day) | CO (lbs/day) | NO _x (lbs/day) | SO _x (lbs/day) | PM ₁₀ (lbs/day) | PM _{2.5} (lbs/day) |
|--|------------------|-----------------|------------------------------|------------------------------|-------------------------------|--------------------------------|
| Mitigated Phase 2 Construction Emissions | 35.78 | 57.92 | 45.32 | 0.12 | 14.22 | 8.02 |
| Yard Equipment | 0.83 | 3.48 | 2.53 | 0.01 | 0.11 | 0.15 |
| Staff and Truck Vehicles | 0.06 | 2.00 | 1.58 | 0.02 | 2.26 | 0.01 |
| Architectural Coatings | 0.13 | - | - | - | - | - |
| Natural Gas Consumption | 0.04 | 0.32 | 0.39 | 0.00 | 0.03 | 0.03 |
| Train Fueling | 0.41 | - | - | - | - | - |
| Sand Silos | - | - | - | - | 0.04 | 0.06 |
| Total Maximum Daily Increase in Regional Emissions (Ibs/day) | 37.25 | 63.72 | 49.82 | 0.15 | 16.66 | 8.27 |
| SCAQMD Threshold | 55 | 550 | 55 | 100 | 150 | 55 |
| Exceeds Threshold? | No | No | No | No | No | No |

Table 3.3-11: Overlapping Mitigated Construction and Operational Maximum Daily Increase in Regional Emissions

Notes: VOC = volatile organic compounds; CO = carbon monoxide; NO_x = nitrogen oxides; SO_x = sulfur oxides; PM₁₀ = suspended particulate matter less than 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than 2.5 micrometers in diameter; lbs/day = pounds per day.

Table 3.3-12: Overlapping Construction and Operational LocalizedOperational Maximum Daily Emissions

| Description | NO _x | СО | PM ₁₀ | PM _{2.5} |
|--|-----------------|--------|-------------------------|-------------------|
| Phase 2 Localized Construction Emissions | 44.91 | 51.99 | 13.32 | 7.76 |
| On-Site Locomotive Operations (Maintenance and Testing) | 98.30 | 101.85 | 1.98 | 1.92 |
| Yard Equipment | 2.53 | 3.48 | 0.11 | 0.15 |
| Staff and Truck Vehicles ¹ | 0.11 | 0.14 | 0.17 | 0.04 |
| Natural Gas Consumption | 0.39 | 0.32 | 0.03 | 0.03 |
| Sand Silos | - | - | 0.04 | 0.06 |
| Total Maximum Daily Localized Emissions (lbs/day) | 146.25 | 157.79 | 15.64 | 9.92 |
| SCAQMD Localized Threshold | 197 | 1,804 | 18 | 8 |
| Exceeds Threshold? | No | No | No | Yes ² |

Notes: NO_x = nitrogen oxides; CO = carbon monoxide; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter;

lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

¹ Maximum daily localized emissions account for on-site activities including on-site locomotive operations, on-site off-road equipment use (e.g., forklifts, cranes), and on-road vehicle travel. It was assumed that approximately 7 percent of the total on-road vehicles would occur on-site (estimated portion of vehicle emissions occurring on-site compared to the CalEEMod average trip length).

²As described in Table 3.3-2, the mass-rate LSTs are based on a 5-acre project site and thus, exceedance of this threshold does not represent a significant impact. Project-specific dispersion modeling was performed for PM_{2.5} for comparison to the SCAQMD's ambient air quality thresholds as described below and shown in Table 3.3-13.

As described above, due to the Project size, the exceedance of the mass-rate screening LST for PM_{2.5}, and the region's nonattainment status for ozone and PM_{2.5}, project-specific dispersion modelling was performed for NO₂ and PM_{2.5} for comparison to the SCAQMD's ambient air quality thresholds for the localized emissions analysis. The results of the criteria pollutant modelling analysis for 1 hour and annual NO₂ and 24-hour PM_{2.5} are summarized in Table 3.3-13 for both phases of operations (2025-2027 and 2028¹). As shown in Table 3.3-13, the maximum modelled concentration at the point of maximum exposure (PMI) for both pollutants and averaging periods modelled were less than their respective SCAQMD ambient air quality thresholds. Therefore, this localized impact would also be less than significant.

| Criteria Averaging Pollutant Period | | Rank | Maximum Modeled Concentration $(\mu g/m^3)^1$ | | JCAQIVID | |
|--|---------|-----------------|---|----------------------------|----------|------------|
| | | | 2025-2027 ² | 2028 + ³ | (µg/m³) | Threshold? |
| NO | 1-hour | 1 st | 103.1 | 102.3 | 338.4 | No |
| NO ₂ | Annual | 1 st | 5.7 | 3.8 | 56.4 | No |
| PM _{2.5} | 24-hour | 8 th | 1.3 | 1.2 | 2.5 | No |

Notes: NO_2 = nitrogen dioxide; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; $\mu g/m^3$ = micrograms per cubic meter; SCAQMD = South Coast Air Quality Management District.

 1 The point of maximum exposure (unoccupied land near OCTA boundary, to the north).

² Period when train fleet mix includes both Tier 2 and Tier 4 locomotive engines.

³ Period when trains are all Tier 4.

In summary, with implementation of Mitigation Measure AQ-1, the Project is not anticipated to result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment. Furthermore, due to the optimal location of the proposed Project Site, the Project is also anticipated to result in reduced locomotive travel in the region and a reduction in the emissions associated with locomotive travel in the region. However, the emission estimates in the tables above conservatively do not account for the potential reduction in emissions. Therefore, operational impacts related to a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment would be less than significant with mitigation measures incorporated.

¹ Phase 2 of construction would be completed at the end of 2027 and result in additional operational emissions sources beyond Phase 1. Furthermore, all trains serviced at the facility are assumed to be Tier 4 by 2028. Based on these changes, the dispersion analysis was conducted for the initial operational period from July 2025 through end of 2027, followed by years of operation from 2028 and later.

3.3.3.3. Would the Project expose sensitive receptors to substantial pollutant concentrations?

Determination: LESS THAN SIGNIFICANT IMPACT

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. For the purposes of a CEQA analysis, the SCAQMD considers a sensitive receptor to be a receptor such as a residence, hospital, or convalescent facility where it is possible that an individual could remain for 24 hours (SCAQMD, 2008). Sensitive receptors also include facilities that house or attract children, the elderly, and people with illnesses or others who are especially sensitive to the effects of air pollutants. As described above, the nearest receptors include residences in a senior community approximately 650 feet away, workers at the nursery to the west of the Project Site and along Technology Drive, and recreational receptors at the Great Park.

Criteria Pollutants

Construction and Operational Impacts

As shown in Tables 3.3-4 through 3.3-13, construction-related and operational activities would result in emissions of criteria air pollutants, but at levels that would not exceed the SCAQMD regional or localized thresholds of significance. The regional thresholds of significance were designed to identify those projects that would result in significant levels of air pollution and to assist the region in attaining the applicable state and federal ambient air quality standards, which were established using health-based criteria to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution. In addition, the LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards and are developed based on the ambient concentrations of that pollutant for each source receptor area. As such, the criteria air pollutant emissions associated with the proposed Project would not expose sensitive receptors to substantial criteria pollutant concentrations.

Toxic Air Contaminants

Construction Impacts

The greatest potential for TAC emissions during construction would be related to diesel PM emissions associated with heavy-duty equipment operations. The Office of Environmental Health Hazard Assessment (OEHHA) developed a Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015). According to OEHHA methodology, health effects from carcinogenic TACs are usually described in terms of individual cancer risk, which is based on a 30-year exposure duration (or residency time) to TACs as the basis for public notification and risk reduction audits and plans. An HRA of TACs was prepared for the Project and is included in Appendix B. Sources evaluated in the HRA include off-road construction equipment and heavy-duty diesel trucks along the truck route based on the 4.5-year construction duration

and off-road equipment list provided by the Project Applicant. This analysis uses EPA's AERMOD air dispersion modeling program, ARB's HARP2 model, and the latest HRA guidance from the OEHHA to estimate excess lifetime cancer risks and hazard index to the nearest sensitive receptors. Table 3.3-14 summarizes the construction-related cancer risk and chronic hazard index on the nearby receptors. Additional modeling details are provided in Appendix B.

| Construction Period | Project Construction Incremental Cancer Risk (in a million) | Chronic Hazard Index |
|---|---|-------------------------|
| 2023 | 0.20 | 2.24E-04 |
| 2024 | 0.18 | 2.21E-04 |
| 2025 | 0.01 | 8.48E-05 |
| 2026 | 0.01 | 5.14E-05 |
| 2027 | 0.004 | 3.07E-05 |
| Total Project Construction (4.5 years) | 0.40 | 0.001 |
| SCAQMD Threshold | 10 | 1.0 |
| Exceeds Threshold? | No | No |

 Table 3.3-14: Summary of Construction-Related Health Risks

Note: SCAQMD = South Coast Air Quality Management District

The maximum incremental cancer risk exposure during the 4.5-year period of construction is less than 0.5 in a million. The chronic hazard index is also well below the SCAQMD threshold of 1.0. Therefore, sensitive receptors would not be exposed to substantial TAC concentrations during construction of the Project and this impact would be less than significant.

Asbestos is also a listed TAC; however, the Project Site is not in an area known to contain naturally occurring asbestos. Furthermore, demolition activities associated with Project construction are minimal and limited to an abandoned road; stormwater drains; and an underground bunker with a network of pipelines, valves, and associated vents that are currently not in use. Prior to site demolition activities, building materials must be carefully assessed for the presence of asbestos-containing materials (ACM), and removal of this material, where necessary, must comply with state and federal regulations, including SCAQMD Rule 1403. SCAQMD Rule 1403 specifies work practices with the goal of minimizing asbestos emissions during building demolition activities, including the removal and associated disturbance of ACMs. The requirements for demolition and renovation activities include asbestos surveying; notification; ACM removal procedures and time schedules; ACM handling and clean-up procedures; and storage, disposal, and landfill disposal requirements for ACMs. If ACMs are found during construction, the Project would comply with the requirements of SCAQMD Rule 1403. Therefore, exposure to asbestos during construction would be less than significant.

Operational Impacts

As discussed previously, following construction of the Project, operations would generate long-term emissions, including TACs, from a variety of sources. Diesel PM would be the dominant TAC generated at the Project Site. Sources of diesel PM at the Project Site would include locomotive usage (during fueling, servicing, inspection, brake testing, train washing, load testing, yard switching, idling, and train movement throughout the yard), on-site equipment (emergency generator, cranes, and forklifts used for maintenance activities), refueling, and on-road trucks (fuel and vendor delivery trucks). The majority of the diesel PM emissions would be generated along the tracks, maintenance building, fueling/sanding pit, and service and inspection facility, which are located at distances of approximately 1,100 feet from the nearest residential receptors. In its 2005 Air Quality and Land Use Handbook: A Community Health Perspective, ARB recommends a 1,000-foot buffer between sensitive receptors and major service and maintenance railyards based on a study that found that the area of highest impact is within 1,000 feet of the yard (ARB, 2005). The next highest impact was found to be between half to one mile of the maintenance railyards. As described previously, the nearest sensitive receptors are the residences in the senior housing community located approximately 650 feet (200 meters) north of the Project Site. The closest recreational fields and walking/running paths to the site are approximately 700 feet from maintenance buildings. The nearest worker receptors are located at the nursery to the west of the Project Site and buildings along Technology Drive. As such, a quantitative HRA was performed to evaluate the Project's operational TAC emissions on existing nearby off-site receptors, including nearby residences, recreational facilities, and adjacent workers located at the buildings along Technology Drive and at the nearby nursery.

The operational period would begin in July 2025, upon the completion of Phase 1 construction. Phase 2 of construction would be completed at the end of 2027 and result in additional operational emissions sources. Furthermore, all trains serviced at the facility are assumed to be Tier 4 by 2028. Based on these changes, the HRA for operations includes an initial operational period from July 2025 through end of 2027, followed by years of operation starting in 2028. The total of these two operational periods are compared against the SCAQMD threshold of 10 in a million. Additional modeling and methodology details are provided in Appendix B. The summary of excess cancer risks and chronic and acute risks are summarized in Tables 3.3-15 and 3.3-16.

| Receptor | Years of Age | Maximum N Risk | lodeled Exco (in a millio | SCAQMD | Exceeds | |
|------------------------|--|------------------------|------------------------------|--------|-----------|------------|
| | | 2025-2027 ¹ | 2028 + ² | Total | Ihreshold | Threshold? |
| MEIR _{<50} | 3 rd Trimester – 30 (30 years) | 5.85 | 3.40 | 9.25 | 10 | No |
| MEIR≥50 | 50 - 80 (30 years) | 0.24 | 1.45 | 1.68 | 10 | No |
| MEIW | 16 – 41 (25 years) | 0.94 | 4.37 | 5.31 | 10 | No |
| MEI Recreation | 0 – 39 (40 years) | 1.29 | 2.05 | 3.33 | 10 | No |

Notes: $MEIR_{<50}$ = maximally exposed individual resident in non-55+ age-restricted communities; $MEIR_{\geq50}$ = maximally exposed individual resident in 55+ age-restricted communities; MEIW = maximally exposed individual worker; MEI Recreation = maximally exposed individual at recreation area; SCAQMD = South Coast Air Quality Management District. ¹ Period when train fleet mix includes both Tier 2 and Tier 4 locomotive engines.

² Period when trains are all Tier 4.

Table 3.3-16: Summary of Chronic and Acute Risks

| Diale | | Maxim | um Modeleo | SCAQMD | Exceeds | |
|---------|-------------------|------------------------|----------------------------|--------|-----------|------------|
| RISK | Risk Years of Age | 2025-2027 ¹ | 2028 + ² | Total | Threshold | Threshold? |
| Chronic | DNAL | 0.05 | 0.01 | 0.06 | 1.0 | No |
| Acute | PMI | 0.0006 | 0.0004 | 0.001 | 1.0 | No |

Notes: PMI = point of maximum exposure (unoccupied land near OCTA boundary, to the north);

SCAQMD = South Coast Air Quality Management District.

¹ Period when train fleet mix includes both Tier 2 and Tier 4 locomotive engines.

² Period when trains are all Tier 4.

As shown in Tables 3.3-15 and 3.3-16, the maximum incremental cancer risk, and chronic and acute hazard index, respectively, for the maximally exposed individual resident, maximally exposed individual worker, and recreational receptor would not exceed the SCAQMD thresholds of significance. Therefore, receptors would not be exposed to substantial pollutant concentrations of TACs during operations and this impact would be less than significant.

3.3.3.4. Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Determination: LESS THAN SIGNIFICANT IMPACT

The occurrence and severity of other emissions, such as those leading to odor impacts, depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies. Projects with the potential to frequently expose individuals to objectionable odors are deemed to have a significant impact. Typical facilities that generate odors include wastewater treatment facilities, sanitary landfills, composting facilities, petroleum refineries, chemical manufacturing plants, and food processing facilities.

Construction Impacts

Construction activities associated with the Project could result in short-term odor emissions from diesel exhaust associated with construction equipment. The Project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Therefore, construction impacts related to other emissions (such as those leading to odors) adversely affecting a substantial number of people would be less than significant.

Operational Impacts

Project operations would not include any land uses identified by ARB as being associated with the generation of objectionable odors. However, the locomotive rail operations on the tracks that access the OCMF and locomotive idling and refueling activities may increase the potential for generation of odors from locomotive diesel fuel combustion. However, these odors would be intermittent and of short duration. Any odors resulting from diesel fuel combustion along rail alignment would be intermittent and short term and not considered a significant odor-generating source (ARB, 2005). Therefore, operational impacts related to other emissions (such as those leading to odors) adversely affecting a substantial number of people would be less than significant.

3.4. BIOLOGICAL RESOURCES

| Would the | nzcionti | Potentially Significant Impact | Less Than Significant with Mitigation | Less Than Significant Impact | No Impact |
|----------------------|--|--------------------------------------|--|------------------------------------|-------------|
| Would the 3.4.3.1 | Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special- status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service? | | | | |
| 3.4.3.2 | Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service? | | | | |
| 3.4.3.3 | Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | | | | |
| 3.4.3.4 | Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | | | | |
| 3.4.3.5 | Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | | | | \boxtimes |
| 3.4.3.6 | Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | | | | |

3.4.1. Existing Conditions

The area evaluated for biological resources includes the Project Site and a 500-foot survey buffer, known as the Biological Survey Areas (BSA). A buffer around the Project Site was evaluated in order to capture

potential indirect effects to biological resources from implementation of the Project. Indirect effects could include elevated noise and dust levels and increased human activity within the BSA. A 500-foot survey buffer is appropriate for capturing potential indirect impacts from a project on biological resources. It is anticipated that indirect impacts beyond 500 feet for this Project are generally diffuse and would not significantly impact biological resources.

Vegetation

On-site habitat can be characterized as "upland mustards and other ruderal forbs" or "wild oat and annual brome grasslands" as described below and in A Manual of California Vegetation (Sawyer et al., 2009). These communities lack trees and shrubs and consist primarily of invasive non-native species, with little to no native vegetation. The vegetated area to the north of the existing Metrolink facilities is dominated by non-native herbaceous species, including wild mustard (Hirschfeldia incana), red brome (Bromus madritensis spp. rubens), black mustard (Brassica nigra), yellow starthistle (Centaurea solsticialis), and wild oats (Avena sp.), as well as one native herb, doveweed (Croton setigera). The area south of the existing Metrolink tracks is highly disturbed and consists mostly of bare ground. Native species identified on the site include ragweed (Ambrosia psilostachya), doveweed, jimsonweed (Datura wrightii), Canada horseweed (Erigeron canadensis), and telegraph weed (Heterotheca grandiflora). No trees or shrubs exist within the proposed Project Site. It appears that most of the Project Site is regularly mowed to control non-native weeds. Areas at the eastern and western extents of the Project Site, at the bends in Marine Way, appear to be mowed less frequently and contain additional non-native herbaceous plant species. Appendix C presents the plant species identified during the field survey. Bee Canyon Channel, a drainage channel occurring along the southeast perimeter of the Project Site, contains some riparian vegetation consisting of willow (Salix sp.) and mulefat (Baccharis salicifolia). No natural vegetation communities exist within the BSA. The nearest areas of natural communities occur approximately four miles to the northeast in the foothills of the Santa Ana Mountains, and approximately three miles to the southwest in the San Joaquin Hills.

Wildlife

With most vegetation being less than a foot in height and with a lack of trees or shrubs, the Project Site provides limited suitable habitat for wildlife to forage, nest, or rest, or for cover. Wildlife observed onsite was minimal during the field survey. Observed species include western fence lizard (*Sceloporus occidentalis*), mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), and common raven (*Corvus corax*). No active or old bird nests were observed within the proposed Project Site; however, killdeer (*Charadrius vociferous*), a common ground-nester, could potentially nest on-site.

The BSA occurs within an urbanized area and does not occur within or intersect a recognized or established regional wildlife corridor. Vegetative growth within the proposed Project Site and ornamental trees and shrubs within landscaped areas within the surrounding BSA provide some opportunities for cover, resting, foraging, and nesting to localized bird populations; however, they do not function as a significant wildlife movement corridor.

Special-Status Plant and Wildlife Species

No rare or sensitive plant or wildlife species were observed during the field survey. The site does not provide habitat suitable to support sensitive plant or wildlife species, and they are not anticipated to occur on-site due to the marginal habitat value of the Project Site and within the BSA.

The California Natural Diversity Database (CNDDB) was reviewed to determine if any special-status plant or wildlife species have been recorded from the Project Site or surrounding area. Although no trees or shrubs occur within the proposed Project Site, the low and sometimes sparse vegetative growth present is potentially suitable for ground-nesting bird species such as California horned lark (Eremphila alpestris actia), a CDFW Watch List (WL) species. Records of burrowing owl (Athena cunicularia), a CDFW Species of Special Concern, are known from one to two miles east of the Project Site from 2010 (CDFW, 2020a). No burrows suitable for this species were observed, and although this species prefers open grassland habitat with low plant growth, regular vegetation maintenance on-site creates conditions generally unsuitable for this species. CNDDB records from 1999 of tricolored blackbird (Agelaius tricolor), listed as Endangered under the California Endangered Species Act (CESA), are known from one to two miles west and southwest of the Project Site, on the other side of I-5 from the Project. Subsequent surveys for this species in 2014 noted it was no longer present and the area had been developed (CDFW, 2020a). This species nests in marsh habitat, which is absent from the Project Site. Records of other special-status wildlife species and special-status plants occur two plus miles southwest of the Project Site, in the vicinity of Sand Canyon Reservoir; however, the natural habitats preferred by these species are absent from the Project Site and they are not expected to occur on-site.

3.4.2. Regulatory Framework

Several regulations and standards have been established by federal, state, and local agencies to protect and conserve biological resources. The proposed Project's compliance with the regulations and standards listed below were assessed.

Federal (refer to Appendix C for explanation of laws)

- Federal Endangered Species Act (FESA)
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act
- Clean Water Act (CWA)
- Magnuson-Stevens Fisher Conservation and Management Act (Magnuson-Stevens Act)

State (refer to Appendix C for explanation of laws)

- California Fish and Game Code (CFGC)
- Porter-Cologne Water Quality Control Act

Local

Orange County Central and Coastal Subregion Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP) - The NCCP/HCP (County of Orange, 1996) was prepared by the County of Orange in cooperation with California Department of Fish and Game (CDFG, now CDFW) and U.S. Fish and Wildlife Service (USFWS). The document was prepared in accordance with the provisions of the state Natural Community Conservation Planning Act of 1991 (NCCP Act), Sections 1600 et seq. of the CFGC and ESA. The 208,000-acre Central and Coastal Subregion is part of a five-county NCCP Study Area established by the state as part of the Southern California Coastal Sage Scrub NCCP Program. The proposed Project falls within the Central Subregion of the NCCP/HCP.

In addition, a Joint Programmatic Environmental Impact Report and Environmental Impact Statement (Joint EIR/EIS) (County of Orange, 1996b) that addresses the effects related to the NCCP/HCP was prepared in accordance with CEQA and the National Environmental Policy Act (NEPA). The County of Orange is the lead agency responsible for preparation of the NCCP/HCP and the EIR. The USFWS is the lead agency responsible for preparation of the HCP and EIS.

As presented in Section 8 of Appendix C, significant impacts to special-status and sensitive biological resources are not expected and the proposed Project is not anticipated to conflict with the NCCP/HCP.

3.4.3. Discussion

3.4.3.1. Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS?

Determination: NO IMPACT

Construction and Operational Impacts

Herbaceous vegetation composed primarily of non-native mustard and grass species occurs within the proposed Project Site; no trees or shrubs occur on-site. During the field survey conducted on July 30, 2020, it was noted that no federally listed or state-listed species were identified and special-status plant species are not expected to occur in the BSA due to a lack of potentially suitable habitat. Additionally, no USFWS-designated critical habitats for federally listed species or any other sensitive, protected, or managed communities or habitats were identified during a review of the USFWS online Information for Planning and Consultation (IPaC) on the Project Site.

Indirect impacts to vegetation during Project construction could include the accumulation of fugitive dust and further colonization of non-native, invasive plant species. Other indirect impacts could include the potential for surface runoff, increased erosion, and sediment deposition beyond the footprint of disturbance as a result of the use of heavy construction equipment and general construction-related activities. However, standard construction practices related to fugitive dust and erosion control would be implemented.

Likewise, suitable habitat for special-status plants is not present in the BSA. Therefore, no direct or indirect impacts to vegetation or special-status plant species would occur.

During operations, the Project Site would be a combination of impermeable and permeable surfaces, but no portion of it would be left undisturbed. As such, the Project Site would not retain any existing vegetation, nor would it be an improved condition for sensitive species habitats to occur. Therefore, no operational impacts related to substantial adverse effects, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS would occur.

3.4.3.2. Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFW or the USFWS?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction Impacts

No sensitive natural vegetation communities occur within the BSA; however, Bee Canyon Channel, an aquatic feature under regulatory jurisdiction of the CDFW and Regional Water Quality Control Board (RWQCB) occurs within the BSA. Jurisdiction of the U.S. Army Corps of Engineers (USACE) within the Project Site is still to be determined, pending coordination with USACE. The Project occurs within the San Diego Creek (SDC) Watershed Special Area Management Plan (SAMP) area and is located outside of any pre-defined Aquatic Resource Integrity Area. Additionally, this segment of Bee Canyon Channel is not located within the "major streams" category.

The Project proposes to construct a new bridge over Bee Canyon Channel that would require reprofiling of the wash. Construction of the bridge over Bee Canyon Channel would likely require a permit pursuant to Section 404 of the CWA. Construction of the Project would meet the terms and conditions of a Letter of Permission (LOP), and operation and maintenance would potentially meet the criteria for authorization under Regional General Permit (RGP) No. 74.

Regardless of the permitting process that is ultimately implemented in coordination with USACE, RWQCB, and CDFW, adherence to Mitigation Measure BIO-1 in Section 9 of (Appendix C), would reduce the impacts of bridge installation over Bee Canyon Channel to a level less than significant.

Operational Impacts

Impacts to biological resources during operation and maintenance of the proposed Project are not anticipated as such activities would be conducted within previously disturbed and developed surfaces containing non-native vegetation and would generally not change biological conditions from those present prior to and after Project construction. Therefore, operational impacts related to substantial adverse effects on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFW or the USFWS would not occur.

Mitigation Measure BIO-2 presented below would mitigate potential impacts of the proposed bridge to Bee Canyon Channel, ensuring impacts to this jurisdictional feature remain less than significant.

MM-BIO-2: Compliance with USACE SAMP Mitigation Procedures. Pursuant to SAMP requirements, if a permanent loss of regulated waters or streambed occurs because of the Project, compensatory mitigation (purchase of credit at an in-lieu fee or mitigation bank approved by the resource agencies), or applicant proposed enhancement or establishment of waters or streambed) shall be provided at a minimum ratio of 1:1. Temporary impacts shall be restored to pre-Project conditions the extent practicable.

3.4.3.3. Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction Impacts

Construction of a bridge to carry rail tracks over an isolated, open portion of Bee Canyon Channel may be eligible to obtain an LOP or RGP 74 from the USACE as a "Road Crossing," which includes construction and/or maintenance of new and existing bridges and culverts.

No wetlands, including marsh, vernal pools, coastal wetlands, etc. are within the Project Site; therefore, there would be no impacts on wetlands from construction or operation of the project. Suitable habitats for wetland-riparian species were not identified in the BSA; therefore, no impacts would occur. However, adherence to Mitigation Measure BIO-1 would reduce the impacts of bridge installation over Bee Canyon Channel to a level less than significant.

Additionally, construction of the proposed bridge over Bee Canyon Channel would require the Project Applicant to obtain a permit pursuant to Sections 404 and 401 of the CWA and to Section 1600 et seq. of CFGC. The Project Applicant shall coordinate with the USACE to obtain authorization pursuant to Section 404 of the CWA (i.e., LOP or RGP 74 per SAMP permit procedures) and the RWQCB to obtain a Water Quality Certification pursuant to Section 401 of the CWA. Additionally, if the project results in any modification of the bed or banks of Bee Canyon Channel, then the Project Applicant shall coordinate with CDFW to determine the need to obtain a Lake and Streambed Alteration Agreement (LSAA) pursuant to Section 1600 et seq. of CFGC.

Operational Impacts

Impacts to biological resources during operation and maintenance of the proposed Project are not anticipated as such activities would be conducted within previously disturbed and developed surfaces containing non-native vegetation and would generally not change biological conditions from those present prior to and after Project construction. Therefore, operational impacts would not occur related to substantial adverse effects on state or federally protected wetlands (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Mitigation Measure BIO-2 would mitigate potential impacts of the proposed bridge to Bee Canyon Channel, ensuring impacts to this jurisdictional feature remain less than significant.

3.4.3.4. Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction Impacts

Wildlife

The BSA occurs within an urbanized area and does not occur within or intersect a recognized/established regional wildlife corridor or a native wildlife nursery site. Although no trees or shrubs occur within the proposed Project Site, the low and sometimes sparse vegetative growth present is potentially suitable for ground-nesting bird species such as California horned lark and killdeer (*Charadrius vociferus*). Additionally, trees in ornamental landscapes within the surrounding BSA at the athletic fields to the northeast and in commercial development to the southwest provide potentially suitable nesting opportunities for localized bird populations, which are protected under the MBTA and by CFGC. However, the BSA does not provide functions as a significant wildlife movement corridor and by implementing avoidance and minimization measures outlined in Mitigation Measure BIO-1, direct impacts to any birds protected under the MBTA and by CFGC that may occur in the BSA would be less than significant.

Indirect impacts to nesting birds within the BSA could occur during construction as a result of noise, dust, increased human presence, and vibrations resulting from construction activities. Such disturbances could result in increased nestling mortality due to nest abandonment or decreased feeding frequency and would be considered significant. However, implementing and adhering to avoidance and minimization measures outlined in Mitigation Measure BIO-1 would reduce potential indirect impacts to nesting birds protected under the MBTA and by CFGC to a level that is less than significant.

Bee Canyon Channel occurs along the southern limit of the proposed Project. This feature conveys ephemeral flows of stormwater, is concrete-lined, and underground along much of its length in the vicinity of the proposed Project and does not provide a movement corridor for wildlife, including passage for fish.

Special-Status Wildlife Species

No federal- or state-listed wildlife species have been identified in the BSA, and potentially suitable habitat for such species is absent from the BSA. However, as presented in Section 5.2 of Appendix C, two CDFW WL bird species, Cooper's hawk (*Accipiter cooperii*) and California horned lark, have some potential to occur within the BSA. As a result, direct and indirect impacts to special-status wildlife could occur. However, by implementing and adhering to avoidance and minimization measures outlined in Mitigation Measure BIO-1, potential impacts to nesting individuals of these special-status birds, or any other special-status bird species, would be reduced to a level that is less than significant.

Operational Impacts

Impacts to common wildlife, special-status wildlife species, and wildlife movement are not anticipated during operation and maintenance of the proposed Project. Therefore, operational impacts would not occur related to the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

With the potential for ground-nesting birds protected under the MBTA and CFGC to occur within the Project Site and other bird species to occur in the surrounding BSA, implementation of Mitigation Measure BIO-1 presented below would mitigate potential impacts to nesting birds should construction overlap the bird breeding season (February 15 through September 1).

- MM-BIO-1: Designate Project Biological Monitor(s). Ground-disturbing activities during construction shall occur outside of the nesting bird season (generally February 15 through September 1). If avoiding the nesting season is not practicable, the following additional measures shall be employed:
 - A pre-construction nesting survey shall be conducted by a qualified biologist within 3 days prior to the start of construction activities to determine whether active nests are present within or directly adjacent to the construction zone. All nests found shall be recorded.
 - If construction activities must occur within 300 feet of an active nest of any passerine bird or within 500 feet of an active nest of any raptor, with the exception of an emergency, a qualified biologist shall monitor the nest on a weekly basis, and the

activity shall be postponed until the biologist determines that the nest is no longer active.

 If the recommended nest avoidance zone is not feasible, the qualified biologist shall determine whether an exception is possible and obtain concurrence from the resource agencies before construction work can resume within the avoidance buffer zone. All work shall cease within the avoidance buffer zone until either agency concurrence is obtained or the biologist determines that the adults and young are no longer reliant on the nest site.

3.4.3.5. Would the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Determination: NO IMPACT

Construction and Operational Impacts

There is no wildlife or plant species within the Project Site that would be protected by local policies or ordinances. In addition, no trees are present within the Project Site. Thus, no tree preservation policy or ordinance would apply to this Project. Therefore, no construction or operational impacts that would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, would occur.

3.4.3.6. Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Determination: NO IMPACT

Construction and Operational Impacts

Although the Project Site falls within the boundary of the Orange County Central/Coastal NCCP/HCP, OCTA is not a participating landowner. As a result, the Project is not eligible for coverage under the NCCP/HCP for impacts to federally and/or state-listed species. However, because no federally and/or state-listed species are expected to be impacted, no sensitive communities occur on-site, and avoidance and minimization measures will be implemented to reduce impacts to nesting birds protected under the MBTA and CFGC, the Project does not conflict with the NCCP/HCP and will not require payment of a Mitigation Fee per the NCCP/HCP for such impacts.

Significant impacts to special-status and sensitive biological resources are not expected to occur and the Project is not anticipated to conflict with the NCCP/HCP. Therefore, no construction or operational impacts that would conflict with the provisions of an adopted HCP; NCCP; or other approved local, regional, or state habitat conservation plan would occur.

3.5. CULTURAL RESOURCES

| Would the | e project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|---|--------------------------------------|--|------------------------------------|-----------|
| 3.5.3.1 | Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5? | | | | |
| 3.5.3.2 | Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5? | | | | |
| 3.5.3.3 | Disturb any human remains, including those interred outside of formal cemeteries? | | | | |

3.5.1. Existing Conditions

Prehistoric Overview

Refer to Appendix D (Cultural Resources Technical Memorandum).

Project Site Development History

MCAS El Toro was decommissioned in 1999. The roadways to the northwest and south of the Project Site were further developed in the 1990s. The I-5 bridge crossing the Atchison, Topeka and Santa Fe Railway (AT&SF) (now the SCRRA Orange Subdivision) was constructed in 1992, the SR-133 bridge crossing Marine Way was constructed in 1997, and the SR-133 bridge over the former AT&SF (by this point BNSF) was constructed in 1998 (NBI 2020). In 2001, Measure W was passed, which authorized the former air station's use as a park and multi-use development, now known as the Great Park area.

Based on review of historical topographic maps and aerial photographs, the Project Site itself has undergone some development in the past 100 years. The earliest topographic map from 1901 shows the railroad alignment, but no buildings are depicted. A 1938 aerial photograph shows the area as agricultural fields bound to the southwest by the SCRRA Orange Subdivision alignment (NETR, 2020). From 1942 to 1950, a rail siding was added bisecting the Project Site. In 1952, the water transfer vault located at the northwestern end of the Project Site was present. The current footprint of the perimeter road was present by 1963, and trees were planted alongside the perimeter road by 1994 (NETR, 2020). Additional fencing and water transfer equipment structures were constructed at the northwestern end of the Project Site during the mid-2000s. The SCRRA Orange Subdivision alignment, southwest of the Project Site boundaries, has been altered over time for modern use, with modifications accommodating technological developments and commercial demands (e.g., larger trains, second track, automated switches), and other ongoing maintenance.

Archival Research

On April 30, 2020, AECOM requested a California Historical Resources Information System records search from the South Central Coastal Information Center (SCCIC) housed at California State University, Fullerton. The research focused on the identification of previously recorded cultural resources within the Project Site and a half-mile radius. The SCCIC responded via email on August 19, 2020.

The records search revealed that 37 cultural resources investigations were previously conducted within a half-mile radius of the Project Site (refer to Appendix D). Four of these investigations overlap the Project Site in whole or in part. The entirety of the Project Site has been subject to previous archaeological study.

The records search further revealed that 14 resources have been recorded within half-mile of the Project Site. Of these 14 resources, two are located within the Project Site, and are discussed in further detail below (refer to Appendix D).

Resource P-30-100372

This resource is an isolated Venus clam shell. The shell was observed next to a gopher hole with no other shell or artifacts in the vicinity. A shovel test pit was excavated next to the shell to a depth of 30 centimetres with negative results. Because of the distance from the coast, it was assumed that the shell was transported to this location by human activity. However, it is impossible to determine when or how the shell was transported, or whether the shell's transportation to this location was intentional or accidental. By their nature, isolated resources are in general not eligible for inclusion in the California Register of Historic Resources (CRHR).

Resource P-30-176663

This resource is an approximately 14.7-mile-long segment of the SCRRA Orange Subdivision railroad tracks (originally part of the AT&SF Railway and subsequently BNSF Railway) within Orange and Los Angeles Counties. While originally constructed between 1885 and 1888, the railroad has been continuously used, resulting in replacement of all or most of its historic fabric. Because of its lack of integrity, this resource has been repeatedly recommended ineligible for listing in the National Register of Historic Places (NRHP). The eligibility of this segment has not been formally determined via State Historic Preservation Officer (SHPO) consensus.

Field Survey

A reconnaissance-level archaeological and built environment survey was conducted on July 30, 2020. Evidence of superficial disturbances included abundant gopher holes and remains of an irrigation system in the form of 3/4-inch polyvinyl chloride (PVC) pipes and sprinkler heads. The ground also appeared recently disced or plowed.

Subsurface Investigations (Extended Phase I)

An Extended Phase I (XPI) cultural resources identification was completed in 2021 by HDR (HDR, 2021). The XPI was conducted because the Project area was determined to have a moderate sensitivity to encounter buried cultural resources. The purpose of the XPI was to determine the presence or absence of buried historic or prehistoric cultural resources and to further assess the overall archaeological sensitivity in portions of the OCMF project area where deep Project-related excavations are proposed. XPI investigations consisted of 40 subsurface shovel test probe excavations to confirm the presence or absence of buried cultural materials. All tests were negative for the presence of prehistoric cultural material. No historic properties, historic resources, or unique archaeological resources were identified during the XPI. Based on the results of the XPI, it is not anticipated that the Project will impact buried cultural resources.

Archaeological Resources

No archaeological resources were observed within the Project Site. The previously recorded isolated clam shell (P-30-100372) was not relocated during the survey.

Built Environment Resources

P-30-176663 SCRRA Orange Subdivision Segment

The portion of the SCRRA Orange Subdivision (formerly AT&SF) Railway south of the Project Site is a double track that runs northwest to southeast. This segment has been altered over time for modern use, with modifications accommodating technological developments and commercial demands (e.g., larger trains, second track, automated switches), and other ongoing maintenance. The original elements of the rail line have been repaired and replaced. This portion of the SCRRA Orange Subdivision Railway has been previously evaluated and recommended not eligible for inclusion in the CRHR.

Water Transfer Vault

Approximately 350 feet northeast of the SR-133 bridge over the SCRRA Orange Subdivision Railway is a rectangular water transfer vault constructed circa 1950 and abandoned in 2006. The resource is a concrete domestic water intake structure originally used for MCAS El Toro. The vault located on the western periphery of the former MCAS El Toro property does not have any distinct associations with the United States Marine Corps' mission operations during the 1950s and is a minor and vernacular water infrastructure element. Entrance to the structure is by way of stairs covered by a metal grate. The vault measures approximately 46 feet long and 27 feet wide; the interior is approximately 10 feet tall. The vault's footprint appears unchanged since construction; however, a low concrete interior partition appears to have been removed in order to install new piping. Additional fencing and water transfer equipment structures were constructed adjacent to the vault during the mid-2000s.

CRHR Evaluation

The Water Transfer Vault located in the Project Site does not appear to meet the criteria for listing in the CRHR, nor does it appear to be a historical resource for purposes of CEQA, either as an individual resource or as a contributor to a larger resource. The structure does not meet any of the significance criteria necessary for eligibility for listing in the CRHR and does not retain its historic integrity.

3.5.2. Regulatory Framework

<u>State</u>

California Environmental Quality Act - A cultural resource is considered a "historical resource" under CEQA if the resource meets the criteria for listing in the CRHR (Public Resources Code [PRC] Section 5024.1, Title 14 California Code of Regulation [CCR], Section 4852). The CRHR was designed to be used by state and local agencies, private groups, and citizens to identify existing historical resources within the state and to indicate which of those resources should be protected, to the extent prudent and feasible, from substantial adverse change. The criteria for the CRHR (PRC Section 5024.1, Title 14 CCR, Section 4852) focus on resources of statewide, rather than national, significance.

Potential historical resources eligible for listing in the CRHR may include buildings, sites, structures, objects and historic districts. A resource less than 50 years of age may be eligible if it can be demonstrated that sufficient time has passed to understand its historic importance. While the criteria for the CRHR is less rigorous than the NRHP with regard to the issue of integrity, there is the expectation that properties reflect their appearance during their period of significance (Title 14 CCR, Section 4852).

Archaeological resources identified as "unique archaeological resources" are similarly protected by Division 13, Chapter 2.6, of the PRC. An archaeological resource that is considered nonunique need be given no additional consideration other than its existence being recorded, unless it is determined to be a tribal cultural resource.

Public Resources Code Section 5097.5 - PRC Section 5097.5 states that no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological, or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. "Public lands" refers to land owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

Local

City of Irvine General Plan - The City of Irvine General Plan includes Element E on Cultural Resources. It recognizes the importance of historical, archaeological and paleontological resources in the City and establishes a process for their early identification, consideration, and where appropriate, preservation. It

requires assessment of potential resources on projects and utilizes planning policies, ordinances, approval conditions and mitigation measures to protect the resources.

Cultural resources are the physical remains of the City's historic and prehistoric heritage (City of Irvine, 2015). Historical resources include sites established after 1542 A.D., the date when European contact with California began, which may be significant to history, architecture, or culture. Archaeological resources include any location containing evidence of human activities which took place prior to 1750 A.D. Historical sites established prior to 1750 A.D. are also archaeological sites. Paleontological resources include any location containing a trace of plants or animals from past ages.

3.5.3. Discussion

3.5.3.1. Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction Impacts

Section 15064.5(b) indicates that the significance of an historical resource is materially impaired when a project:

- (A) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
- (B) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- (C) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

Two resources that exceed 45 years of age were identified as a result of the archival research and field survey. One is a previously recorded segment of the SCRRA Orange Subdivision Railway (P-30-176663). The other is a water transfer vault constructed during the 1950s. However, neither resource appears eligible for inclusion in the CRHR, and therefore neither resource constitutes a historical architectural resource for the purposes of CEQA. Furthermore, neither resource is considered a unique archaeological resource. However, there still is the potential to uncover unknown historical resources (which include archaeological resources) during construction. With the implementation of Mitigation Measures CUL-1 and CUL-2, impacts to archaeological resources during construction would be less than significant.

- **MM-CUL-1: Cultural Resources Awareness Training.** Prior to construction, OCTA shall retain a qualified archaeologist who meets the Secretary of the Interior's Guidelines for Archaeology (36 CFR Part 61). The qualified archaeologist shall prepare a Cultural and Tribal Cultural Resources Awareness Training as part of the Project Worker Environmental Awareness Program (WEAP). The training will instruct workers as to the laws protecting cultural and tribal cultural resources and also give examples of the kinds of resources that can be reasonably expected to be found in the Area of Potential Effect (APE). An environmental compliance contact responsible for enforcing mitigation measures and who is to be notified in the event of a find will be identified in the training. Training will be delivered to all staff involved in ground-disturbing activities prior to their working on the project.
- MM-CUL-2: Preparation of a Cultural Resources Monitoring and Discovery Plan. Prior to construction, a project-specific cultural resources monitoring and discovery plan (CRMDP) will be developed by a qualified archaeologist who meets the Secretary of the Interior's Guidelines for Archaeology (36 CFR Part 61). The monitoring plan should identify what construction activities that occur in native soils would require archaeological and tribal monitoring, describe monitoring procedures, and outline the protocol to be followed in the event of a find. Criteria will be defined and triggers identified as to when further consultation is required for the treatment of finds. Plans of treatment of typical finds will be detailed, as will a plan of treatment for any human remains that are inadvertently encountered. If a potentially significant discovery is made and cannot feasibly be avoided, then additional work, potentially including data recovery excavations, may be required. Key staff will be identified, and the process of notification and consultation will be specified within the CRMDP. A curation plan will also be outlined within the CRMDP. All work should be conducted under the direction of a qualified archaeological Principal Investigator who meets the Secretary of the Interior's standards for archaeology. Consulting tribes under AB52 for the Project shall have the opportunity to review and comment on the draft CRMDP.

Operational Impacts

Operation of the OCMF is not anticipated to result in the disturbance of any native soils. Therefore, no operational impacts related to historical resources would occur.

3.5.3.2. Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Section 15064.5(c) indicates that CEQA applies to effects on an archaeological site if that site is determined by the lead agency to be an historical resource.

PRC, Section 21083.2(g) defines a unique archaeological resource as an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Section 15064.5(c) further indicates that if an archaeological resource is neither a unique archaeological nor an historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

Determination: LESS THAN SIGNIFCANT WITH MITIGATION INCORPORATED

Construction Impacts

In the course of the archival research, one previously-recorded Venus shell fragment was identified within the Project Site (P-30-100372). The resource was not relocated during the survey. Isolated resources, such as the shell fragment, are by their nature neither historical resources nor unique archaeological resources. They are therefore generally not eligible for inclusion in the CRHR and, therefore, are not considered cultural resources for the purposes of CEQA.

While some of the Project's three-dimensional area of direct impact has been previously disturbed by past farming or by the construction and use of MCAS El Toro, unknown archaeological resources may be encountered during ground-disturbing activities associated with the Project. With the implementation of Mitigation Measures CUL-1 and CUL-2, impacts to archaeological resources during construction would be less than significant.

Operational Impacts

Operation of the OCMF is not anticipated to result in the disturbance of any native soils. Therefore, no operational impacts related to archaeological resources would occur.

3.5.3.3. Would the Project disturb human remains, including those interred outside of formal cemeteries?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction Impacts

As outlined in Appendix G (Paleontological Resources Technical Memorandum), no known burial sites are located within the Project Site and some of the area of direct impact has been previously disturbed. No evidence of human remains was observed during the site survey. As such, human remains are unlikely to be encountered during construction. If human remains are discovered, work in the immediate vicinity of the discovery will be suspended and the Orange County Coroner contacted. If the remains are determined to be archaeological, Mitigation Measure CUL-2 will be implemented in order to evaluate the archaeological site and recommend appropriate treatment in accordance with PRC Section 21083.2(i). If the remains are deemed Native American in origin, the Coroner would contact the Native American Heritage Commission and identify a Most Likely Descendant pursuant to PRC Section 5097.98 and CCR Section 15064.5. Work may be resumed at OCTA's discretion but will only commence after consultation and treatment have been concluded. Work may continue on other parts of the proposed Project Site while consultation and treatment are conducted. Therefore, compliance with Mitigation Measure CUL-2 and existing regulations would ensure construction impacts related to human remains would be less than significant.

Operational Impacts

Operation of the OCMF is not anticipated to result in the disturbance of any native soils. Therefore, no operational impacts related to human remains would occur.

3.6. ENERGY

| Would the | e project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|--|--------------------------------------|--|------------------------------------|-----------|
| 3.6.3.1 | Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | | | | |
| 3.6.3.2 | Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | | | \boxtimes | |

3.6.1. Existing Conditions

The Project Site is located in the City of Irvine, where the primary supplier of natural gas is Southern California Gas Company (SCG) and the primary supplier of electricity is Southern California Edison Company (SCE) (City of Irvine, 2015).

The City of Irvine developed a Strategic Energy Plan to outline actions the City can take to reduce energy consumption in municipal operations and identify effective measures the Irvine community can implement to become energy efficient and responsibly manage energy resources. The objectives of the Energy Plan included analyzing the City's baseline energy use to project future energy needs, evaluating priorities to meet those needs, and identifying funding opportunities to implement the strategies in the Energy Plan (City of Irvine, 2020). As described in more detail in the Irvine Strategic Energy Plan, Figure 3.6-1 presents the energy consumption based on a 2018 inventory. Communities account for the largest percentage of energy consumption. Additionally, facilities are responsible for 41 percent of energy use, followed by 35 percent for transportation, and 24 percent for services (primarily streetlights and traffic controls). Figure 3.6-2 summarizes the City's energy consumption trend.

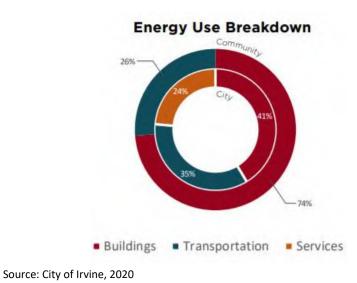
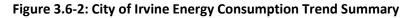
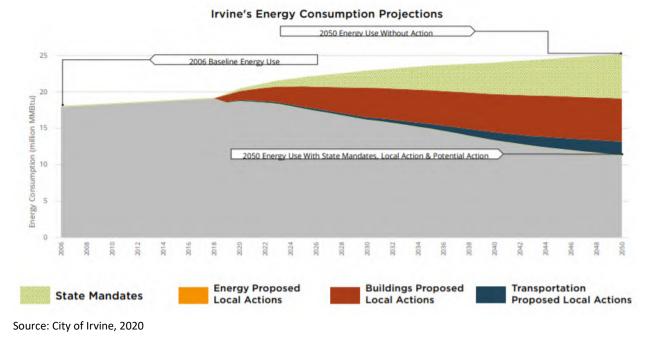


Figure 3.6-1: City of Irvine Energy Consumption Breakdown





3.6.2. Regulatory Framework

The regulatory background of energy plans, policies, regulations, and laws is presented below. Generally, these plans, policies, regulations, and laws do not directly apply to the Project, but are presented to provide context to the regulatory setting.

<u>State</u>

Senate Bills 1078 and 107, Executive Orders S-14-08 and S-21-09, and Senate Bills 350 and 100 - Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) required retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Executive Order S-14-08 expanded the state's Renewables Portfolio Standard to 33 percent renewable power by 2020. Executive Order S-21-09 directs ARB, under its AB 32 authority, to enact regulations to help the state meet its Renewables Portfolio Standard goal of 33 percent renewable energy by 2020.

The 33-percent-by-2020 goal and requirements were codified in April 2011 with SB X1-2. This new Renewables Portfolio Standard applies to all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. SB 350 (2015) increased the renewable-source requirement to 50 percent by 2030. This was followed by SB 100 in 2018, which further increased the Renewables Portfolio Standard to 60 percent by 2030 and added the requirement that all state's electricity come from carbon-free resources by 2045.

California Green Building Standards Code - In January 2010, the State of California adopted the California Green Building Standards Code, which establishes mandatory green building standards for all buildings in California. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. These standards include a set of minimum requirements and more rigorous voluntary measures for new construction projects to achieve specific green building performance levels. This code went into effect as part of local jurisdictions' building codes on January 1, 2011. The 2019 California Building Standards Code (CCR Title 24) was published July 1, 2019, with an effective date of January 1, 2020.

Local

City of Irvine General Plan, Energy Element - The City of Irvine's General Plan was last updated in June 2015 and includes an Energy Element. The Energy Element includes the following measure for energy conservation (City of Irvine, 2015).

<u>Objective 1-1 Energy Conservation</u>: Maximize energy efficiency through land use and transportation planning.

<u>Policy (a)</u>: Consider the following or comparable design features, to the extent feasible, in developments at time of concept plan, subdivision, or development review:

• Encourage energy-efficient landscaping (water conserving plants, indigenous vegetation, and use of on-site water runoff) consistent with the City's Sustainability and Landscaping Ordinance

<u>Policy (b)</u>: Encourage and promote incorporation of energy conservation measures. The measures should be developed in conjunction with the applicant and may include:

- Active solar water and/or space heating
- Passive design features for heating and cooling
- Use of energy efficient devices

<u>Policy (e)</u>: Facilitate the participation of industries in the following conservation programs where cost effective:

- Cogeneration (process heat/steam/electricity)
- Reclaiming waste products (biomass, solid waste, wastewater)
- Carpooling
- Mass Transportation

<u>Policy (f)</u>: Require developers of major commercial or industrial facilities who develop a transportation management plan to address such measures as:

- Flex time and/or shifting work schedules to avoid peak traffic
- Employee carpools and vanpools
- Preferential and free parking for carpoolers and vanpoolers
- Ridesharing programs
- Shuttle services from regional transportation (e.g., rail/bus) stations to final destination
- Subsidies for transit passes
- Locker room facilities for employees (e.g., for bicyclists)

Policy (g): Promote use of alternative modes of transportation by the following programs:

- 1. Encourage use of regional public transportation (e.g., rail service).
- 2. Encourage use of the bus system by working with OCTA.
- 3. Encourage use of public transit and ridesharing by promoting and participating in public information programs aimed at schools, sports clubs and other institutions and organizations.

3.6.3. Discussion

3.6.3.1. Would the Project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

Implementation of the Project would increase energy consumption for the duration of construction in the form of electricity, natural gas, and fossil fuels (e.g., gasoline, diesel fuel). Transportation energy use during construction would come from the transport and use of construction equipment (off-road), delivery and haul trucks (on-road), and construction employee passenger vehicles (on-road). Construction-related transportation energy use depends on the type and number of trips, VMT, fuel efficiency of vehicles, and travel mode. The majority of construction equipment during excavation, site work, building construction, and paving would be gas or diesel powered. The use of fuel by on-road and off-road vehicles would be temporary and would fluctuate according to the phase of construction. Construction fuel use for the Project would cease upon completion of Project construction.

Table 3.6-1 presents the total fuel consumption anticipated for proposed construction activities for Phase 1 and Phase 2 of the Project. The information in these tables is based on the emissions calculations, as presented in Section 3.8 Greenhouse Gas Emissions, for proposed construction activities and application of the U.S. Energy Information Administration's carbon dioxide (CO₂) emissions coefficients (EIA, 2016) to estimate fuel consumption for construction activities.

Table 3.6-2 presents the annual energy consumption as a result of the fuel used during construction of the Project. Inputs used to calculate energy consumption are provided in Appendix B.

| Phase/Description | Source | MT CO ₂ e ^a | Fuel Type | Factor (MT CO₂/Gallon) ^ь | Gallons |
|--|--------------------|-----------------------------------|-----------|--|--|
| | Off-Road Equipment | 757 | Diesel | 0.0102 | 74,129 |
| Phase 1 | Worker Trips | 456 | Gasoline | 0.0088 | 74,129 51,933 47,693 20,320 28,598 2,196 144,339 80,531 |
| | Haul Truck Trips | 487 | Diesel | 0.0102 | 47,693 |
| | Off-Road Equipment | 207 | Diesel | 0.0102 | 20,320 |
| Phase 2 | Worker Trips | 251 | Gasoline | 0.0088 | 28,598 |
| | Haul Truck Trips | 22 | Diesel | 0.0102 | 2,196 |
| | [| Diesel | 144,339 | | |
| | | asoline | 80,531 | | |
| Amortized Demands (over 30 years) ¹ | | | Diesel | | 4,811 |
| | | | Gasoline | | 2,684 |

Notes: MT CO₂e = metric tons carbon dioxide equivalent; MT CO₂e/gallon = metric tons carbon dioxide equivalent per gallon ¹Assumed amortization period is 30 years, based on the typically assumed project lifetime. Air districts in California (e.g., Sacramento Metropolitan Air Quality Management District 2021, South Coast Air Quality Management District 2008, San Luis Obispo County Air Pollution Control District 2012) recommend amortizing greenhouse gas emissions from construction activities over a project's operational lifetime.

Sources: ^a Modeled by AECOM in 2021, ^b EIA, 2016

| Fuel | Amortized Energy Requirement | Unit | Annual Energy Consumption (MMBtu) | | |
|-------------|---------------------------------|------------------|--------------------------------------|--|--|
| Diesel | 4,811 | gallons per year | 664 | | |
| Gasoline | line 2,684 gallons per year | | 336 | | |
| Total 1,000 | | | | | |

Table 3.6-2: Project Construction-Related Energy Requirements

Notes: MMBtu = million British thermal units

As shown in Table 3.6-2, the annual energy consumption associated with construction of the Project (including transportation fuel use by off-road equipment, worker vehicle trips, and material delivery trips) would be approximately 1,000 million British thermal units (MMBtu), respectively. Based on the anticipated phasing of the Project, temporary nature of construction, and project type, the Project would not include unusual characteristics that would necessitate the use of construction equipment that is less energy efficient than at comparable construction sites.

In addition, contractors are required, in accordance with the ARB Airborne Toxic Control Measure for Diesel-Fueled Commercial Motor Vehicle Idling, to minimize idling time of construction equipment by shutting equipment off when not in use or reducing the time of idling to 5 minutes. These required practices limit wasteful and unnecessary energy consumption. Furthermore, as described in more detail below, construction of the Project would allow for more efficient operations and logistics for locomotive travel and maintenance in the region, thereby encouraging fuel and energy efficiency. Therefore, construction impacts related to potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.

Operational Impacts

Operation of the Project would include energy consumptions associated with fuel use from locomotive operations; heavy-duty equipment used on-site (such as cranes and forklifts); and on-road vehicle travel for worker, delivery, and haul trips to and from the site. Additionally, the OCMF would also result in natural gas and electricity consumption and energy consumption associated with water consumption.

As described in more detail in Appendix B, the OCMF energy demand (electricity and natural gas) was based upon CalEEMod default data. The energy consumption associated with the supply, treatment, and disposal of water was estimated based on the anticipated water needs per train wash and added to the estimated waster demand for the buildings based on CalEEMod default data. Table 3.6-3 presents the annual energy consumption as a result of operation of the Project.

| Description/Source | Energy Requirement | Unit | Annual Energy Consumption (MMBtu) | |
|------------------------------------|---|--------------------------|---|--|
| Locomotive Operations | Locomotive Operations 725,225 gallons of diesel/yea | | 99,632 | |
| On-Site Equipment | 11,004 | gallons of diesel/year | 1,512 | |
| On-Road Vehicles (Diesel-Fueled) | 18,689 | gallons of diesel/year | 2.076 | |
| On-Road Vehicles (Gasoline-Fueled) | 11,708 | gallons of gasoline/year | 3,976 | |
| Building Energy (Electricity) | 1,535,961 | kWh/year | F 2F0 | |
| Building Energy (Natural Gas) | 8,981 | kBtu/year | 5,250 | |
| Water Consumption | 112,137 | gallons/year | 383 | |
| | | Total | 110,753 | |

Table 3.6-3: Annual Operational Requirements

Notes: MMBtu = million British thermal units; kWh = kilowatt-hours; kBtu = thousand British thermal units

As shown in Table 3.6-3, the annual energy consumption associated with operation of the Project would be approximately 110,753 MMBtu. However, it should be noted that this estimate provides a conservative value as it does not account for the reduction in locomotive fuel consumption and energy associated with the reduced locomotive travel in the region due to the optimal location of the proposed Project Site. In addition, it is also anticipated that total regional fuel consumption associated with train idling would decrease at the existing

maintenance facilities due to more efficient operations and logistics. Since the purpose of the Project is to provide the space and equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis, operation of the Project would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources. Therefore, operational impacts related to potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.

3.6.3.2. Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

The Project would not use land that would otherwise be slated for renewable energy production and does not otherwise conflict with any state or local renewable energy plans. Therefore, Project construction would not obstruct any state or local plans for renewable energy and would conform with state and local plans for energy efficiency. As described above, the purpose of the Project is to provide the space and equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Thus, implementation of the Project would promote and allow for fuel (and energy) efficient operations within the SCRRA transportation network.

In addition, consistent with the City of Irvine Strategic Energy Plan, the Project would be built to meet Title 24 – Building Energy Efficiency Standards (Part 6), including California Green Building Standards (CALGreen) Code (Part 11). Title 24 Standards require sustainable construction practices and building design in the categories of planning and design, including energy efficiency. Therefore, the Project's operation would not obstruct any state or local plans for renewable energy or energy efficiency. Therefore, construction and operational impacts related to conflicting with or obstructing a state or local plan for renewable energy or energy efficiency would be less than significant.

3.7. GEOLOGY AND SOILS

| Would the project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|--|--------------------------------------|--|------------------------------------|-------------|
| Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: | | incorporated | | |
| 3.7.3.1 Rupture of a known earthquake fault, as delineated on the most recent Alquist- Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | | | | |
| 3.7.3.2 Strong seismic ground shaking? | | | \boxtimes | |
| 3.7.3.3 Seismic-related ground failure, including liquefaction? | | | \boxtimes | |
| 3.7.3.4 Landslides? | | | | \boxtimes |
| 3.7.3.5 Result in substantial soil erosion or the loss of topsoil? | | | \boxtimes | |
| 3.7.3.6 Be located on a geologic unit or soil that is unstable, or that would become unstable a a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | s | | | |
| 3.7.3.7 Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | | | \boxtimes | |
| 3.7.3.8 Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | | | | |
| 3.7.3.9 Directly or indirectly destroy a unique paleontological resource or site or unique geological feature? | | \boxtimes | | |

3.7.1. Existing Conditions

Geology and Soils

The Project Site is located within the San Juan Capistrano Quadrangle and is in a seismically active region. However, it is not located in an Alquist-Priolo fault zone and no known faults intersect with the Project Site (DYA, 2021). According to the State of California Department of Conservation Fault Activity Map, the nearest known fault is the San Joaquin Hills Blind Thrust located in subsurface approximately 6 miles southwest of the Project Site (Figure 3.7-1). The Newport-Inglewood Fault (approximately 9.5 miles southwest from the Project Site) and the Elsinore Fault (approximately 15 miles northeast of the Project Site) are the closest active faults to the Project Site with surface expression. No earthquake faults are identified on the Project Site.

Based on the State of California Seismic Hazard Zones, the Project Site is not mapped within the areas subject to liquefaction or earthquake-induced landslides (Figures 3.7-2 and 3.7-3). The Project Site is underlain by denser soils with a deeper groundwater table, defined as SRA-2 Denser Soils/Deeper Ground water on the City of Irvine Seismic Response Areas, which would also make the site less susceptible to liquefaction and subsidence.

The Project Site is within the Peninsular Ranges geomorphic province. The Peninsular Ranges geomorphic province extends approximately 900 miles southward from the Los Angeles Basin to the tip of the Baja California Peninsula and is characterized by elongate, northwest-trending mountain ranges separated by sediment-floored valleys (California Geological Survey, 2002). The most dominant structural features of the province are the northwest-trending fault zones, most of which die out, merge with, or are terminated by steep reverse faults at the southern margin of the Transverse Ranges geomorphic province.

The Project Site is predominantly situated in an area with a Soil Component referred to as "Sorrento." The soil surface texture consists of loam from surface to approximately 11 inches below ground surface (bgs), silty clay loam from approximately 11 inches to 61 inches bgs, and stratified loamy fine sand to silt loam from approximately 61 inches to 72 inches bgs (Kleinfelder, 2014).

A Geotechnical Sampling and Analysis Plan was prepared by Diaz, Yourman & Associates in 2020 prior to field exploration. The field exploration for the Project Site was conducted in December 2020 and January 2021. The subsurface soils encountered in the upper 24 feet consisted of predominately medium-stiff to hard sandy lean clays and sandy fat clays with varying amounts of loose to medium-dense clayey sands. Varying amounts of trace gravels were also present within the upper layer soils. The clays within this range were generally of medium to high plasticity with measured field pocket penetrometer (PP) values from 2.5 to greater than 4.5 tons per square feet (tsf). From a depth of approximately 24 to 39 feet bgs, the subsurface soils consisted of predominately medium stiff to hard sandy fat clays and sandy lean clays with varying amounts of loose to medium-dense clayey sands. The fine-grained undisturbed samples in this range had measured PP values from 1.5 to greater than 4.5 tsf. From a

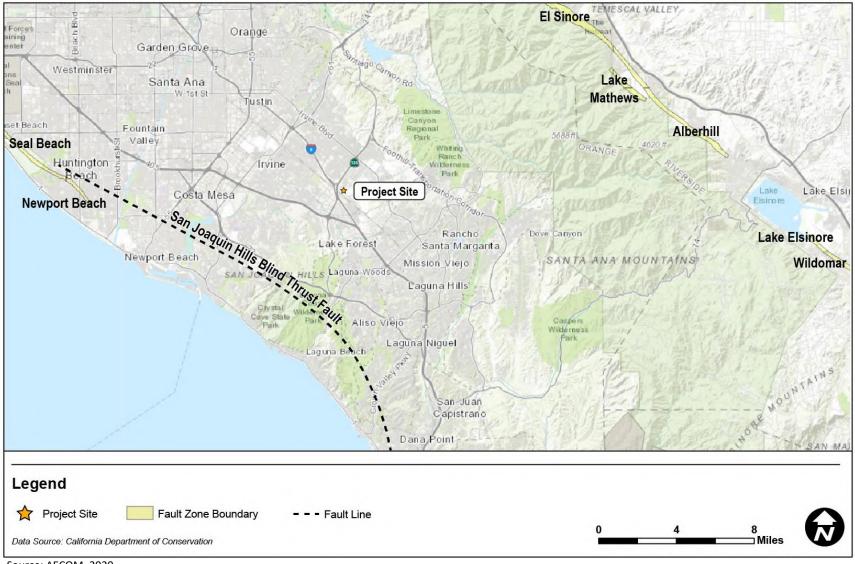


Figure 3.7-1: Fault Zones

Source: AECOM, 2020

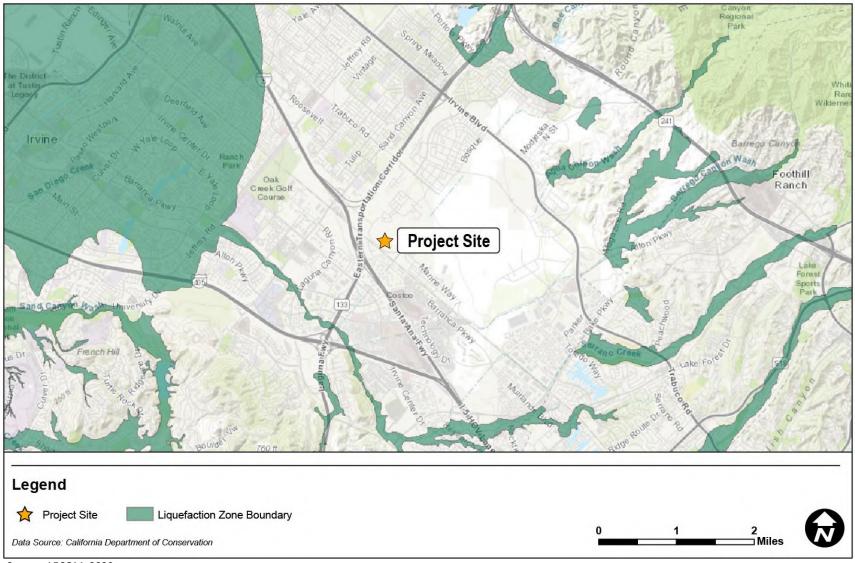


Figure 3.7-2: Liquefaction Zones

Source: AECOM, 2020

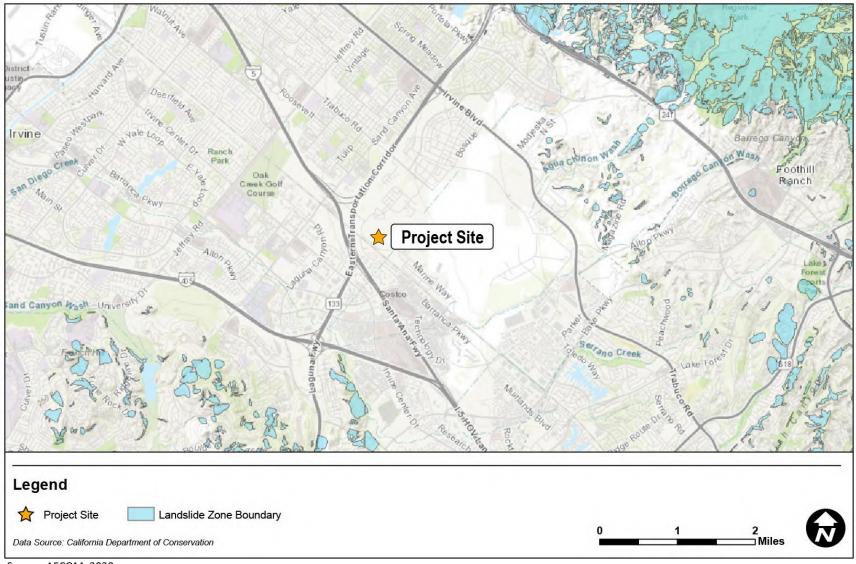


Figure 3.7-3: Landslide Zones

Source: AECOM, 2020

depth of approximately 39 to 60 feet bgs, the subsurface soils predominately consisted of hard sandy lean clays and sandy fat clays of medium to high plasticity with varying amounts of loose to very dense sands (DYA, 2020).

Paleontological Resources

Geologic maps indicate that the entire Project Site is covered with surficial deposits of younger Quaternary alluvium – Quaternary young alluvial fan (Qyf) deposits (Morton and Miller, 2006; Figure 3.7-4). These deposits, which date to the Holocene, are typically too young to contain significant fossils. However, in this vicinity, older Quaternary alluvium typically underlies younger Quaternary alluvium at varying depths. Older Quaternary alluvium, which dates to the Pleistocene, has yielded significant fossils.

A paleontological records search identified the closest Natural History Museum vertebrate fossil locality from older Quaternary deposits is LACM 7867, approximately a half-mile northeast of the Project Site, which produced fossil specimens of pocket gopher, *Thomomys*, at a depth of 25 feet below the surface. The next closest vertebrate fossil from older Quaternary deposits is LACM 7713, approximately 1.5 miles southwest of the Project Site on the western side of SR-133 at the southern end of the interchange with Interstate 405 (I-405), which produced a fossil specimen of ground sloth, *Mylodontidae*, from unstated but shallow depth.

3.7.2. Regulatory Framework

<u>State</u>

The principal state guidance relating to geologic hazards is contained in the Alquist-Priolo Act (PRC 2621 et seq.) and the Seismic Hazards Mapping Act of 1990 (PRC 2690-2699.6). The Alquist-Priolo Act prohibits the location of most types of structures for human occupancy across active traces of faults in earthquake fault zones, shown on maps prepared by the state geologist, and regulates construction in the corridors along active faults (earthquake fault zones). Earthquake fault zones are regulatory zones around active faults designated by the state. The zones vary in width but average about one-quarter mile wide.

The Seismic Hazards Mapping Act of 1990 focuses on hazards related to strong ground shaking, liquefaction, and seismically induced landslides. Under its provisions, the state is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards. The maps are to be used by cities and counties in preparing their general plans and adopting land use policies to reduce and mitigate potential hazards to public health and safety.

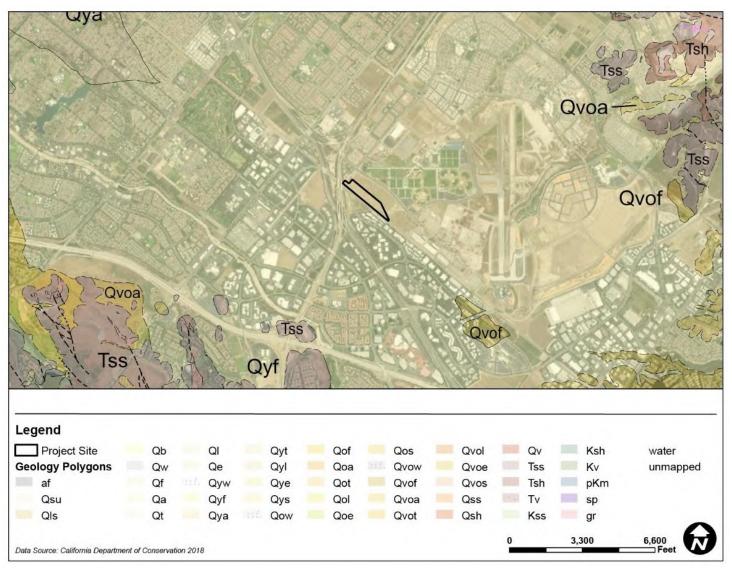


Figure 3.7-4: Quaternary Surficial Deposits Map

Source: California Department of Conservation, 2018

Pursuant to the Surface Mining and Reclamation Act (PRC 2710 et seq.), the State Mining and Geology Board identifies, in adopted regulations, areas of regional significance known to contain mineral deposits judged to be important in meeting the future needs of the area (PRC 2426 and 2790; Title 14 PRC 3350, et seq.). The State Mining and Geology Board also adopts state policy for the reclamation of mined lands and certifies local ordinances for the approval of reclamation plans as being consistent with state policies (PRC 2755-2764, 2774 et seq.).

Public Resources Code Section 5097.5

PRC Section 5097.5 states that no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological, or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. "Public lands" refers to land owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

3.7.3. Discussion

3.7.3.1. Would the Project, directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

Determination: NO IMPACT

Construction and Operational Impacts

The nearest known fault is the San Joaquin Hills Blind Thrust located in subsurface approximately 6 miles southwest of the Project Site (see Figure 3.7-1). The Newport-Inglewood Fault (located approximately 9.5 miles southwest from the Project Site) and the Elsinore Fault (located approximately 15 miles northeast of the Project Site) are the closest active faults to the Project Site with surface expression. However, no earthquake faults are identified on the Project Site. Construction and operation of the Project is not expected to expose people or structures to adverse effects caused by the rupture of a known fault. Therefore, no construction and operational impacts related to potential substantial adverse effects, including the risk of loss, injury, or death with rupture of a known earthquake fault, would occur.

3.7.3.2. Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

The Project Site is within the San Juan Capistrano Quadrangle and is considered in a seismically active region. Although the Project Site is not near any active faults, it is possible that the region could be affected by future seismic activity. However, the magnitude of the incident would not likely be severe. Depending on the strength of ground shaking, it is possible that structures in the area could be damaged during such an event. All new structures proposed for the Project Site would be required to comply with construction standards and seismic design criteria contained in the most updated California Building Code.

Although the potential for seismic ground shaking to occur at the Project Site is unavoidable, the risk of excessive permanent damage is minor because facilities would comply with building standards for seismic safety as required by the California Building Code and the Orange County Department of Public Works. Therefore, construction and operational impacts related to exposing people or structures to strong seismic ground shaking would be less than significant.

3.7.3.3. Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

Since the Project Site is in an active seismic region, there is some potential for seismic-related ground failure. However, soil types in Orange County are not conducive to liquefaction because they are too dense in texture and are underlain by a deeper groundwater table (see Figure 3.7-2). The probability of soil liquefaction in the area is considered a low to moderate hazard because of the substantial distance from active fault zones and the intensity of ground shaking expected (see Section 3.7.3.1, above).

Prior to final design, a site-specific geotechnical study would be prepared, as required by the California Building Code (Title 24 of the CCR). The geotechnical study would be used to determine the appropriate design features and construction measures necessary to minimize potential adverse effects associated with seismic-related ground failure, including liquefaction, lurching, or lateral spreading. In addition, new structures would be constructed to meet all Title 24 seismic safety regulations. Therefore, construction and operational impacts related to seismic-related ground failure would be less than significant.

3.7.3.4. Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

Determination: NO IMPACT

Construction and Operational Impacts

The Project Site is not mapped within the areas subject to earthquake-induced landslides as shown in Figure 3.7-3. Minimal landslides have occurred within Orange County due to recent wildfires, which make the soils susceptible to landslides. However, the Project Site is in a flat area so there is no risk of landslides in such terrain. Therefore, no construction and operational impacts related to landslides would occur.

3.7.3.5. Would the Project result in substantial soil erosion or the loss of topsoil?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

As mentioned above, the Project Site is predominantly situated in an area with a soil component referred to as "Sorrento." The soil surface texture consists of loam from the surface to approximately 11 inches bgs, silty clay loam from approximately 11 inches to 61 inches bgs, and stratified loamy fine sand to silt loam from approximately 61 inches to 72 inches bgs.

The Project Site lies atop soil units with poor topsoil quality, which are susceptible to water or wind erosion. On-site soils are considered non-corrosive to structural elements. Construction and operation of the Project could erode and cause indirect impacts on water quality and loss of high value soil, which collectively would result in a substantial indirect effect.

By implementing standard construction practices and BMPs, Project construction would have limited impacts from erosion. Therefore, construction impacts related to substantial soil erosion or the loss of topsoil would be less than significant.

Operational Impacts

During operations, most of the Project Site would be paved, contain buildings, or ballast. Small landscaped areas would be planted to avoid any potential soil erosion or loss of topsoil. Therefore, operational impacts related to substantial soil erosion or the loss of topsoil would be less than significant.

3.7.3.6. Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Determination: NO IMPACT

Construction and Operational Impacts

Refer to the discussion under Section 3.7.3.3, above, regarding lateral spreading and liquefaction and under Section 3.7.3.4 regarding landslides. Therefore, no construction or operational impacts related to being located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse would occur.

3.7.3.7. Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Determination: LESS THAN SIGNIFICANT IMPACT

Predominately clayey soils in the upper 10 feet have a moisture content ranging from 6 to 54 percent, and sandy soils in the upper 10 feet have a moisture content ranging from 3 to 13 percent. The optimum moisture content corresponding to the maximum dry density from the bulk bag samples collected in the upper 5 feet of soil range from approximately 9 to 14 percent; therefore, in general, drying of the clayey soils and adding moisture to the sandy soils should be anticipated during construction.

Most of the soils in the upper 5 feet of the soil profile within the Project Site were generally found to have very low to high shrink-swell (expansive) potential. The earth loads associated with at-grade segments of the trackwork may not be sufficient to overcome swell potential. This impact is considered to have substantial intensity because this impact could result in loss of life or substantial property damage if not adequately addressed during design and construction.

Construction and Operational Impacts

Construction of the Project on soils with low to high shrink-swell potential could result in damage to the building facilities during operation of the Project. The potential for shrink-swell also represents a risk to the track system and track ROW for long-term operations for Metrolink lines by differential track movement. This type of impact is more critical at locations with at-grade segments. The earth loads associated with at-grade segments of the rail lines may not be sufficient to overcome swell potential. Soils with swell potential would likely be present along the track alignments and building facilities.

Because of the shrink-swell potential risk, the Project could be subject to unstable soil conditions such as settlement or expansion during construction and operation. Sandy portions

of the subsurface materials (fat and dense clayey) could be subject to compression, causing settlement. When weak soils are reengineered specifically for stability prior to use, these potential effects can be reduced or eliminated. To meet the City's design standards for grading and to comply with the California Building Code (Title 24 of the CCR), a site-specific evaluation of soil conditions would be required by the city. This evaluation would identify recommendations for ground preparation and earthwork specific to the Project Site and would become an integral part of the Project design.

An acceptable degree of soil stability could be achieved for expansive or compressible soils through routine soil treatment programs (replacement, grouting, compaction, drainage control, etc.). In addition, properly designing foundations and footings and diverting runoff away from buildings would help to prevent the structural damage caused by shrinking and swelling. In addition, properly designing buildings and roads can offset the limited ability of the soil to support a load. Compliance with building regulations and site-specific recommendations to address the on-site soil conditions would reduce the severity of construction and operation impacts. Therefore, construction and operational impacts related to the Project being located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property would be less than significant.

3.7.3.8. Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

The Project would include the construction of new wastewater drainage pipes that would tie into existing utilities located on Marine Way, as it is located in an urbanized setting. As discussed in Section 3.10 (Hydrology), an underground cistern would be included as part of the Project to capture and treat storm and wastewater. As described in Section 3.7.3.3 above, the Project would include a site-specific evaluation of soil conditions to comply with the California Building Code (Title 24 of the CCR). This evaluation would identify recommendations for ground preparation and earthwork specific to the Project Site, including evaluation of soil conditions. With the implementation of BMPs, as well as compliance with building regulations and site-specific recommendations to address on-site soil conditions, the severity of construction and operational impacts on soils incapable of supporting the use of septic tanks would reduce significantly. Therefore, construction and operational impacts related to soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems would be less than significant.

3.7.3.9. Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction Impacts

The sensitivity of the Project to encounter significant fossil remains appears low. Geologic maps indicate that the surficial deposits at the Project Site consist of younger Quaternary alluvium as shown in Figure 3.7-4. These Holocene deposits are too young to typically contain significant fossils. The shallow excavations required for the Project are unlikely to encounter older deposits. Moreover, soils at the relatively shallow depths required for the Project's excavations can reasonably be assumed to have been disturbed in the recent past, by chemical and mechanical weathering, grading, and utilities excavations, and by activities related to the SCRRA Orange Subdivision and MCAS El Toro.

Nevertheless, it is possible that the proposed Project will encounter older Qyf deposits or old alluvial fan (Qof) deposits during deeper excavations. Unknown fossil resources may exist within these deposits, which have yielded significant fossils in the near vicinity of the Project. The sensitivity for the Project to encounter significant fossils increases with depth. The following mitigation measures are recommended to reduce any impacts to unknown paleontological resources encountered during excavations to a less than significant level.

- MM-GEO-01: Worker Environmental Awareness Program. Prior to construction, OCTA shall retain a qualified paleontologist who meets the requirements to be included in Orange County's list of qualified paleontologists. The qualified paleontologist shall prepare a Worker Environmental Awareness Program (WEAP). The WEAP will describe the types of resources that may be encountered during construction, the laws protecting those resources, and the procedures to follow when finds are encountered. The WEAP will be presented either in person or in video form to all construction employees involved in ground-disturbing activities before they begin work at the Project Site.
- MM-GEO-02: Response to Unanticipated Paleontological Finds. If buried paleontological resources are uncovered during construction, all work shall be halted in the vicinity of the discovery until a qualified paleontologist can visit the site of discovery and assess the significance of the resource and, if necessary, recommend treatment.

Implementation of Mitigation Measures MM-GEO-1 and MM-GEO-2 would reduce construction impacts related to paleontological resources to less than significant.

Operational Impacts

Operations of the OCMF and associated buildings would not require excavation activities. Therefore, no operational impacts related to paleontological resources would occur.

3.8. GREENHOUSE GAS EMISSIONS

| Would the | e project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|--|--------------------------------------|--|------------------------------------|-----------|
| 3.8.3.1 | Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | | | | |
| 3.8.3.2 | Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | | | | |

3.8.1. Existing Conditions

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters the earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected towards space. This infrared radiation (i.e., thermal heat) is absorbed by GHGs within the earth's atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on the earth.

GHGs are present in the atmosphere naturally, are released by natural and anthropogenic sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals, and plants; decomposition of organic matter; and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels, waste treatment, and agricultural processes. The following GHGs are widely accepted as the principal contributors to human-induced global climate change:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)

- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF₆)

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO_2 . The GWP of a GHG is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere ("atmospheric lifetime"). The reference gas for GWP is CO_2 ; therefore, CO_2 has a GWP of 1. The other main GHGs attributed to human activity include CH_4 , which has a GWP of 25, and N_2O , which has a GWP of 298 (EPA, 2017). For example, 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 25 tons of CO_2 . GHGs with lower emissions rates than CO_2 may still contribute to climate change because they are more effective at absorbing outgoing infrared radiation than CO_2 (i.e., high GWP). The concept of CO_2 -equivalents (CO_2e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation.

The largest source of GHG emissions from human activities in the United States is from burning fossil fuels for electricity, heat, and transportation. In 2018, the United States generated 6,676 million metric tons (MMT) CO₂e (EPA, 2020). The transportation sector was the single largest source of GHG emissions in 2018, accounting for 29 percent of total GHG emissions. The transportation sector was followed by the electric power and industry sectors, which account for 27 and 22 percent of the total GHG emissions, respectively (EPA, 2020).

ARB performs an annual GHG inventory for emissions and sinks of the six major GHGs. California produced 425 MMT CO₂e in 2018 (ARB, 2020). Combustion of fossil fuel in the transportation category was the single largest source of California's GHG emissions in 2018, accounting for 40 percent of total GHG emissions in the state. The transportation category was followed by the industrial and electric power (including in-state and out-of-state sources) categories, which account for 21 and 15 percent of the state's total GHG emissions, respectively (ARB, 2020).

3.8.2. Regulatory Framework

<u>State</u>

Senate Bill 97 (SB 97) - California SB 97 mandates that the Governor's Office of Planning and Research (OPR) amend the state's CEQA Guidelines to address impacts from GHGs, and these amendments must be adopted by the California Natural Resources Agency (CNRA). The CNRA adopted CEQA amendments to the CEQA Guidelines on December 30, 2009.

Executive Order S-3-05 - Executive Order S-3-05, signed in June 2005, proclaimed that California is vulnerable to the impacts of climate change. Executive Order S-3-05 declared that increased temperatures could reduce the Sierra Nevada's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established total GHG emissions targets. Specifically, emissions were to be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below the 1990 levels by 2050.

Assembly Bill 32 - In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in Executive Order S-3-05: reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies ARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target. AB 32 also established several programs to achieve GHG emission reductions, including the Low Carbon Fuel Standard and the Cap-and-Trade program.

Senate Bill 32 - In 2016, the California State Legislature adopted SB 32 and its companion bill AB 197, and both were signed by Governor Brown (California Legislative Information). SB 32 establishes a new climate pollution reduction target of 40 percent below 1990 levels by 2030.

ARB Climate Change Scoping Plans - In December 2008, ARB adopted its *Climate Change Scoping Plan. A Framework for Change* (Scoping Plan), which contains the main strategies California will implement to achieve the GHG reductions required by AB 32 (ARB, 2008). The Scoping Plan also includes ARBrecommended GHG reductions for each emissions sector of California's GHG inventory. ARB further acknowledges that decisions about how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors.

ARB is required to update the Scoping Plan at least once every five years to evaluate progress and develop future inventories that may guide this process. ARB approved First Update to the Climate Change Scoping Plan: Building on the Framework in June 2014 (ARB, 2014). The Scoping Plan update includes a status of the 2008 Scoping Plan measures and other federal, state, and local efforts to reduce GHG emissions in California, and potential actions to further reduce GHG emissions by 2020.

In November 2017, ARB released the 2017 Climate Change Scoping Plan, which establishes a framework of action for California to reduce statewide emissions by 40 percent by 2030, compared to 1990 levels (ARB, 2017). The 2017 Scoping Plan builds upon the framework established by the 2008 Scoping Plan and the 2014 Scoping Plan Update, while also identifying new, technologically feasible and cost-effective strategies to ensure that California meets its GHG reduction targets.

SCAG 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) - On September 23, 2020, SCAG adopted Connect SoCal, the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy. As a plan with the goal of accelerating the region's progress towards transportation and GHG reduction targets, programs within the RTP/SCS focus on shifting travel to active transportation modes, expanding the transit network, and efficient movement of goods (SCAG, 2020).

GHG Threshold of Significance - The geographic scope of consideration for GHG emissions is on a global scale as such emissions contribute, on a cumulative basis, to global climate change. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies evaluate the cumulative impacts of GHGs, even relatively small additions, on a global basis. By their nature, GHG evaluations under CEQA are a cumulative study. (See *Center for Biological Diversity v. California Department of Fish and Wildlife* [2015] 62 Cal.4th 204.)

The CEQA Guidelines encourage but do not require lead agencies to adopt thresholds of significance (CEQA Guidelines, Section 15064.7). When developing these thresholds, and consistent with the December 2018 CEQA and Climate Change Advisory published by the California Office of Planning and Research (OPR, 2018), the Guidelines allow lead agencies to develop their own significance threshold and/or to consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence. Individual lead agencies may also undertake a case-by-case approach for the use of significance thresholds for projects consistent with available guidance and current CEQA practice (OPR, 2018).

As the City of Irvine has not established screening thresholds for GHG emissions, the analysis reviewed the applicable significance thresholds developed by the SCAQMD. The SCAQMD has adopted a significance threshold of 10,000 MT of CO_2e per year for industrial (stationary source) projects (SCAQMD, 2008). The Project type is closest to an industrial project (i.e., doesn't include residential or commercial land uses). The 10,000 MT CO_2e threshold was developed in 2008 and was intended to ensure at least 90 percent of new GHG emissions would be reviewed and assessed for mitigation, thereby contributing to GHG emissions reduction goals of AB 32. However, the Project would begin construction in 2023; thus, construction-related GHG emissions should also be analyzed in the SB 32 statewide framework (which established a 2030 GHG emissions reduction target of 40 percent below 1990 levels). However, the SCAQMD has not adopted a threshold of significance consistent with SB 32 goals. To provide this additional information to put the Project-generated GHG emissions in the appropriate statewide context, this analysis presumes that a 40 percent reduction in the SCAQMD's existing threshold (resulting in 6,000 MT CO_2e) is necessary to achieve California's 2030 GHG reduction goal (which is a 40 percent reduction below 1990 GHG emissions levels).

It is not the intent of this CEQA document to cause the adoption of these thresholds as mass emissions limits for this or other projects, but rather to provide this additional information to put the Project-generated GHG emissions in the appropriate statewide context.

3.8.3. Discussion

3.8.3.1. Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

Heavy-duty off-road equipment, materials transport, and worker commutes during construction of the Project would result in exhaust-related GHG emissions. Construction-related GHG emissions were estimated using the methodology discussed earlier under Section 3.3 Air Quality, and described in more detail in Appendix B. As shown in Table 3.8-1, total construction-related GHG emissions would be approximately 2,181 MT CO₂e. The SCAQMD recommends that construction emissions associated with a project be amortized over the life of the project (typically assumed 30 years). Therefore, this analysis includes a quantification of the total modeled construction-related GHG emissions. Those emissions are then amortized and evaluated over the life of the project (assumed 30 years). As such, the amortized GHG emissions would be approximately 73 MT CO₂e per year. Therefore, construction impacts related to the Project generating GHG gas emissions, either directly or indirectly, that may have a significant impact on the environment would be less than significant.

Operational Impacts

As described above in Section 3.3 Air Quality, GHG emissions associated with operation of the Project would include emissions from locomotive operations; heavy-duty equipment used onsite (such as cranes and forklifts); fuel tank emissions; natural gas consumption; and on-road vehicle travel for worker, delivery, and haul trips to and from the site. Indirect emissions were also modeled for indirect sources associated with electricity use, water demand, and waste generation. The Project would not result in an increase in commuter rail service or additional locomotive train travel in the region. Therefore, emissions associated with in-transit locomotive operations were assumed to remain similar to existing conditions. GHG emissions associated with implementation of the Project are summarized in Table 3.8-1. As described in more detail in Appendix B, on-site idling of trains for storage and maintenance purposes would not result in a regional increase in emissions, as these activities (and related emissions) currently occur at the existing storage and maintenance facilities and would simply shift these emissions sources to the proposed Project Site. Thus, these emissions are not included in Table 3.8-1. In addition, the emissions below do not account for the potential reduction in GHG emissions associated with more efficient locomotive travel and logistics. Therefore, the emissions presented below are conservative.

| Source | GHG Emissions (MT CO₂e/year) |
|---------------------------------------|------------------------------|
| Total Construction | 2,181 |
| Amortized Construction ¹ | 73 |
| Yard Equipment | 98 |
| Staff and Truck Vehicles | 0.13 |
| Natural Gas Consumption | 85 |
| Electricity Consumption | 329 |
| Water and Wastewater Consumption | 24 |
| Solid Waste Generation | 279 |
| Operations Subtotal | 815 |
| Total (Construction and Operations) | 888 |
| SCAQMD Threshold | 10,000 |
| SCAQMD Threshold (Adjusted for SB 32) | 6,000 |
| Exceeds Threshold? | No |

Table 3.8-3.8-1: Annual GHG Emissions

Notes: GHG = greenhouse gas; MT CO₂e = metric tons carbon dioxide equivalent; SCAQMD = South Coast Air Quality Management District

¹ Assumed amortization period is 30 years, based on the typically assumed project lifetime (SCAQMD, 2008), which recommends amortizing GHG emissions from construction activities over a project's operational lifetime.

As shown in Table 3.8-1, GHG emissions would not exceed the SCAQMD's adopted significance threshold of 10,000 MT CO_2e per year nor the adjusted SB 32 threshold of 6,000 MT CO_2e per year. Therefore, this impact would be less than cumulatively considerable. As such, operational impacts related to the Project generating GHG emissions, either directly or indirectly, that may have a significant impact on the environment would be less than significant.

3.8.3.2. Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

As discussed above, in response to AB 32 and SB 32, ARB has approved a series of Climate Change Scoping Plans. While the Climate Change Scoping Plans do include measures that would indirectly address GHG emissions associated with construction and operational activities, including the phasing in of cleaner technology for diesel engine fleets (including construction equipment) and the Low Carbon Fuel Standard, successful implementation of these measures predominantly depends on the development of laws and policies at the state level. As such, none of these statewide plans or policies constitutes a regulation to adopt or implement a regional or local plan for reduction or mitigation of GHG emissions. Thus, it is assumed that any requirements or policies formulated under the mandate of AB 32 and SB 32 that would be applicable to the Project, either directly or indirectly, would be implemented consistent with statewide policies and laws.

The 2017 Climate Change Scoping Plan also identifies GHG reduction strategies and actions in six key sectors: low carbon energy, industry, transportation sustainability, natural and working lands, waste management, and water (ARB, 2017). Within the transportation sustainability sector, ARB calls for improving freight and goods movement efficiency and sustainability, including transportation system improvements relating to efficient land use. The 2017 Climate Change Scoping Plan acknowledges that the network of transportation technology and infrastructure, in turn, shapes and is shaped by development and land use patterns that can either support or detract from a more sustainable, low carbon, multi-modal transportation future. Strategies to reduce GHG emissions from the transportation sector, therefore, must actively address not only infrastructure and technology, but also coordinated strategies to achieve development, conservation, and land use patterns that align with the state's GHG and other policy goals. In addition, the SCAG 2020-2045 RTP/SCS, Connect SoCal, includes goals and strategies to improve and maintain the operational regional transportation system efficiency. The purpose of the Project is to provide the space and equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. As described in Section 2 Project Description, a maintenance facility located along the SCRRA Orange Subdivision through Orange County, such as the Project, would be the optimal location as it would reduce

operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and Colton. As such, due to the optimal location of the proposed Project Site, the Project is also anticipated to result in reduced locomotive travel in the region and a reduction in the emissions associated with locomotive travel in the region. It is also anticipated that total regional emissions associated with train idling would decrease at the existing maintenance facilities due to more efficient operations and logistics.

Furthermore, as an effort to meet the goals of AB 32 to reduce statewide GHG emissions, the California Building Standards Code established CALGreen. CALGreen encourages sustainable construction practices and building design in the categories of planning and design, including energy efficiency. The Project would be built to meet CALGreen. Thus, the Project would not conflict with goals and strategies of the 2017 Climate Change Scoping Plan; the SCAG 2020-2045 RTP/SCS; or any other applicable plan, policy, or regulation for the purpose of reducing GHG emissions. Therefore, construction and operational impacts related to the Project conflicting with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs would be less than significant.

3.9. HAZARDS AND HAZARDOUS MATERIALS

| Would the | e project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|--|--------------------------------------|--|------------------------------------|-----------|
| 3.9.3.1 | Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | | | | |
| 3.9.3.2 | Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | | | | |
| 3.9.3.3 | Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | | | | |
| 3.9.3.4 | Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | | | | |
| 3.9.3.5 | For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? | | | | |
| 3.9.3.6 | Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | | | | |
| 3.9.3.7 | Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? | | | | |

3.9.1. Existing Conditions

The Project Site is within a portion of the former MCAS El Toro, which was decommissioned in 1999. Hazardous materials, including chemicals and jet fuels, were stored and used on various portions of the former air station, including the OCMF site. These chemicals resulted in contamination of the soils, for which the DON was required to perform environmental remediation. From records provided by the DON, two groundwater monitoring wells were installed within the Project Site after the closure of MCAS El Toro. One of the wells is in the middle of the proposed storage yard (between storage tracks), so it may need to be relocated. The other well is near the south entrance of the site and appears out of conflict with any major proposed improvements. The Project Site would be developed to provide for periodic access to the wells by the DON. Previous analysis related to hazardous materials has been prepared to address contamination on the Project Site. Figure 3.9-1 shows the known hazardous materials sites in the vicinity of the Project Site. A Phase I Site Assessment completed in 2014 did not find any recognized environmental condition (REC) sites (Kleinfelder, 2014). An updated Phase I Environmental Site Assessment has been completed and was used to inform this analysis (see Appendix E).

3.9.2. Regulatory Framework

Federal

Hazardous Materials Resources - EPA is the lead federal agency responsible for enforcing federal regulations regarding hazardous materials. The primary legislation governing hazardous materials includes the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Superfund Amendments and Reauthorization Act (SARA); and the Toxic Substances Control Act (TSCA).

Comprehensive Environmental Response, Compensation, and Liability Act - CERCLA, also known as Superfund, created a tax on the chemical and petroleum industries to provide for response and cleanup of hazardous substances that may endanger public health or the environment. CERCLA established requirements for abandoned hazardous waste sites and provided for liability of persons responsible for releases of hazardous waste at these sites.

Superfund Amendments and Reauthorization Act - SARA amended CERCLA to increase state involvement and required Superfund actions to consider state environmental laws and regulations. SARA also established a regulatory program for underground storage tanks and the Emergency Planning and Community Right-to-Know Act (EPCRA).

<u>State</u>

In case of any chemical release of hazardous materials, the Project will comply with the Hazardous Materials Release Notification, including the following:

- Health and Safety Codes Sections 25270.7, 25270.8, and 25507
- Vehicle Code Section 23112.5
- Public Utilities Code Section 7673 (PUC General Orders #22-B, 161)
- Government Code Sections 51018, 8670.25.5 (a)
- Water Codes Sections 13271, 13272
- Labor Code Section 6409.1(b)10

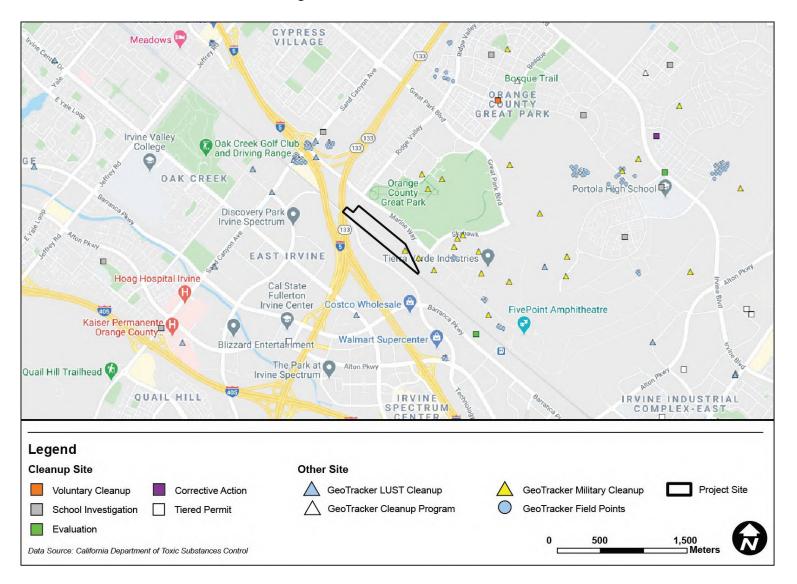


Figure 3.9-1: Known Hazardous Material Sites

Source: AECOM, 2020

If more than a specified amount ("reporting quantity") of hazardous materials or extremely hazardous materials are to be handled at the Project Site, the Project shall develop and submit a Hazardous Materials Business Plan (HMBP) as mandated both by the federal government (Code of Federal Regulations [CFR]) and the State of California (Health and Safety Code) to the Orange County Health Care Agency (OCHCA).

<u>Local</u>

The Project would comply with the Irvine Municipal Code, especially Division 9 (Emergency Services) and Division 17 (Hazardous Materials) of Title 4 (Public Safety), as well as the Irvine Zoning Ordinance, Chapter 2-13 (Hazardous Waste Facility Procedure).

The Project would comply with the Hazardous Materials Disclosure Program and the Accidental Release Prevention Program. The Unified Program is implemented at the local government level by OCHCA. The Hazardous Materials Division of OCHCA is designated by the State Secretary for Environmental Protection as the Certified Unified Program Agency (CUPA) for Orange County. Inspections and business plans are managed by the Orange County Fire Authority (OCFA) on behalf of OCHCA.

AB 1130 authorized CUPAs to administer and implement programs related to the Aboveground Petroleum Storage Act (APSA) for any business with a total aboveground storage capacity of 1,320 gallons of petroleum products in tanks or containers larger than 55 gallons. APSA defines "petroleum" as crude oil, or any fraction thereof, which is liquid at a temperature of 60 degrees Fahrenheit and an absolute pressure of 14.7 pounds per square inch. Tank facilities regulated under APSA are also regulated by the EPA Region 9 Oil Program Clean Water Act Compliance Office. Since the Project will consider building underground storage tanks or aboveground tanks for petroleum products/fuels, the plan will need to comply with the CCR for underground and aboveground tanks, respectively, with oversight by OCHCA. APSA would require the following of the Project if storage of petroleum tanks meets or exceeds the 1,320-gallon aboveground petroleum products/fuels storage threshold:

- Complete and submit to OCHCA an initial Aboveground Petroleum Storage Tank Facility Statement Form.
- Prepare and implement a Spill Prevention Control and Countermeasures (SPCC) Plan in accordance with 40 CFR 112.
- Conduct periodic inspections of ASTs to ensure compliance with the 40 CFR 112.
- Allow OCHCA to conduct periodic inspections.
- Immediately notify the California Emergency Management Agency (EMA) and OCHCA upon discovery of a spill or release of 42 gallons or more of petroleum.

Facilities regulated under APSA or the Federal SPCC Rule must prepare and implement an SPCC. Regulated facilities fall into three categories:

- Facility with aboveground storage capacity more than 10,000 gallons, for which a full plan must be prepared that has been certified by a Professional Engineer and approved by the facility or corporation management.
- Facility with aboveground storage capacity more than 1,320 gallons and less than 10,000 gallons, and with no history of release, can prepare and self-certify an abbreviated plan. These businesses are known as "Qualified Facilities." There are, in turn, two types of Qualified Facilities, Tier I and Tier II Qualified Facilities:
 - Tier I Qualified Facility has a capacity between 1,320 and 10,000 gallons with no single container greater than 5,000 gallons and has no single discharge to navigable waters or adjacent shorelines exceeding 1,000 gallons and no two discharges, each exceeding 42 gallons within any 12-month period in the past 3 years.
 - Tier II Qualified Facility has a capacity between 1,320 and 10,000 gallons with a single container greater than 5,000 gallons and has no single discharge to navigable waters or adjacent shorelines exceeding 1,000 gallons and no two discharges, each exceeding 42 gallons within any 12-month period in the past 3 years.

The Project will need to notify the appropriate state and local agencies (e.g., OCHCA, California Department of Toxic Substances Control [DTSC], or the RWQCB) since soil and groundwater contamination is present due to the MCAS site. Notification to these state and local regulatory oversight agencies will simultaneously satisfy coverage under the applicable federal agencies under Superfund. If requested as follow-up by the state and/or local regulatory oversight agency(ies), then an environmental site assessment or a risk assessment (e.g., human health risk assessment) shall be prepared to ensure that future site activities and/or uses pose no risks to human health and/or the environment.

In accordance with the State Water Resources Control Board's (SWRCB's) requirements for construction sites greater than 1 acre, a stormwater pollution prevention plan (SWPPP) must be prepared and implemented during construction for coverage under the NPDES Construction General Permit. Similarly, construction sites subject to the Construction General Permit are required to implement a SWPPP in the City of Irvine. While the SARWQCB issues the Construction General Permit, the Water Quality Ordinance (No. 10-06) gives the City adequate legal authority as may be necessary to carry out the requirements of the NPDES Permit and accomplish the requirements of the CWA.

3.9.3. Discussion

3.9.3.1. Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction and Operational Impacts

Construction and operation of the Project Site would require the routine handling and storage of petroleum products and hazardous materials. Wastes, including used oils and hazardous wastes generated from the Project Site, would be properly managed, transported and disposed per regulatory standards specified under the CCR Title 22 Division 4.5. Criteria for identifying characteristics of hazardous waste are also designated in CCR Title 22 Division 4.5. Construction and operational impacts that would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials would be less than significant.

3.9.3.2. Would the Project create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

The primary incidents involving the routine handling and use of petroleum products and hazardous materials that could occur during construction of the Project include minor drips, leaks, or spills. Impacts from such incidents would be avoided by thoroughly cleaning up minor drips, leaks, or spills as soon as they occur, in compliance with all applicable regulations for proper handling of these materials. As discussed in Section 3.10 Hydrology and Water Quality, a site SWPPP would be developed and implemented as a compliance mechanism with the NPDES General Construction Permit to ensure quick response to minor drips, leaks, or spills. Therefore, construction impacts that would create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be less than significant.

Operational Impacts

Operations of the Project include the routine handling and use of petroleum products and hazardous materials that could leak or spill if equipment such as tanks is damaged from a seismic event, fire, or other unforeseen incident. The Project would construct a Material Storage Building that would store hazardous materials and batteries. To minimize potential impacts, the design of the Project provides containment and/or diversionary structures or equipment to prevent illicit discharge of an oil or hazardous materials spill. The OCMF would

develop and implement an HMBP as required by the regulatory framework set forth by the CFR, the State of California Health and Safety Code, and OCHCA. The HMBP would be developed and approved before reportable quantities of hazardous materials/wastes or tanks/oil-filled equipment are handled or stored on-site. The HMBP includes an Emergency Response Plan element.

If the Project has aboveground petroleum products/fuel tanks larger than 55 gallons with the storage capacity of 1,320 gallons or more, the SPCC Plan would be required to comply with the regulatory framework set forth by the Aboveground Storage Tank Act. Tank facilities regulated under APSA are also regulated by the EPA Region 9 Oil Program Clean Water Act Compliance Office. The Project would be required to prepare and implement an SPCC Plan in accordance with 40 CFR 112. In addition, SCRRA would be required to immediately notify the California EMA and OCHCA upon discovery of a spill or release of 42 gallons or more of petroleum. These programs and plans would be developed to be consistent with other Metrolink maintenance facilities. Therefore, operational impacts that would create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be less than significant.

3.9.3.3. Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Determination: NO IMPACT

Construction Operational Impacts

There are no existing schools or educational institutions within one-quarter mile of the Project Site. Cypress Elementary School and California State University, Fullerton's Irvine Center are the closest educational intuitions to the Project Site. Each is approximately one mile from the Project Site. Therefore, no construction or operational impacts related to emitting hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would occur.

3.9.3.4. Would the Project create a significant hazard to the public or environment as a result of being located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction and Operational Impacts

The Project Site is located within a portion of the MCAS El Toro Superfund site, situated within a portion of Operating Unit (OU) 2A - Installation Restoration Program (IRP) Site 24 - water transfer facility. According to the Phase I Environmental Site Assessment (ESA), one groundwater monitoring well (18BGMW101A) and one groundwater extraction well (24EX11) in connection with IRP Site 24 are located within the Project Site boundaries. According to additional information provided in site documents available in the online California DTSC's Envirostor database and on the EPA's Superfund Site El Toro MCAS webpage, buried water transfer conveyance lines associated with these wells are also within the Project Site boundaries. An Institutional Control (IC) is in effect in connection with IRP Site 24, which includes the following land use restrictions and/or requirements:

- Activities prohibited that disturb the remediation and monitoring systems without approval;
- Annual inspection and/or report;
- No drilling for drinking water, oil, or gas without approval;
- Notify damages to remedy and monitoring systems no later than 10 days upon discovery;
- Notify no later than 30 days after change of property owner; and
- Only extraction of groundwater for site remediation and/or construction dewatering permitted.

Before and after the Project's construction, proper notifications to the required parties shall be made in accordance with the IRP Site 24 IC in order to maintain compliance with the site management requirements/IC in connection with the ongoing military clean-up site operations. Therefore, construction and operational impacts related to the creation of a significant hazard to the public or environment as a result of being on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 would be less than significant with mitigation incorporated.

- MM-HAZ-1: Notifications to federal, state, and local agencies. The Project applicant shall notify the appropriate agencies (e.g., OCHCA, DTSC, EPA, or the Regional Water Quality Board) regarding soil, soil gas and/or groundwater contamination in connection with the ongoing military clean-up site associated with the former El Toro MACS Superfund site.
- MM-HAZ-2: Groundwater monitoring requirements. Where the Project Site construction and operational activities coincide with the current groundwater monitoring systems (e.g., wells, water transfer conveyance lines) the requirements of the IC in connection with IRP Site 24 for the ongoing military clean-up site associated with the former El Toro MCAS Superfund site shall be adhered to in order to protect human health and the environment from potential hazardous materials exposures.
- MM-HAZ-3: Soil assessment for hazardous materials. Prior to construction activities at the Project, if required by the state or local regulatory oversight agencies, then further assessment including soil, soil vapor and/or groundwater investigations shall be conducted to reveal the presence, if any, of potential hazardous materials at the Project Site that were identified as a result of the Phase I ESA, and would assist in determining

further mitigations required to address human health and/or the environment impacts due to potential hazardous materials exposures.

The implementation of Mitigation Measures HAZ-1 through HAZ-3 would reduce impacts related to the Project's location within the MCAS El Toro Superfund site to less than significant.

3.9.3.5. Would the Project create a safety hazard or excessive noise for people residing or working in the project area as a result of being located within an airport land use plan or within two miles of a public or public use airport?

Determination: NO IMPACT

Construction and Operational Impacts

The Project Site is not within 2 miles of a public airport or public use airport. The closest airport to the Project Site is John Wayne Airport in Santa Ana adjacent to the City of Irvine boundary, approximately 7 miles to the west. The Project Site is located outside of the John Wayne Airport Clear Zones according to the City of Irvine General Plan's Safety Element. Also, no private airstrip exists in the vicinity of the Project. Therefore, no construction or operational impacts related to the Project Site as a result of being located within an airport land use plan or within 2 miles of a public or public use airport would occur.

3.9.3.6. Would the Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Determination: NO IMPACT

Construction Impacts

In places where the components of the Project span a road or require a lane closure, construction activities would be coordinated with the City of Irvine to prevent closure of any emergency access route. While flaggers may direct and hold oncoming traffic during construction, emergency vehicles would be provided access even in the event of temporary road closures. Emergency access would not be directly impacted by construction of the Project because all streets would remain open to emergency vehicles at all times during construction. Therefore, no construction impacts related to implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan would occur.

Operational Impacts

As discussed in Section Impact 3.20.3.1, the Project does not include any characteristics such as permanent road closure or long-term blocking of road access that would physically impair or otherwise conflict with the City's Emergency Preparedness Program. The Project configuration would comply with required emergency response plan or emergency evacuation plan elements in accordance with Project design and permitting requirements. Emergency access roadways would be designed to meet OCFA fire prevention guidelines (Guideline B-09) and City Ordinance provisions Sec. 5-9-519 Emergency access. The OCMF would comply with the 2019 California Fire Code Part 9, Title 24 CCR. The City of Irvine Standard Condition 4.9 shall require an inspection by the Police Department and OCFA prior to the Project opening, to ensure compliance with the Emergency Access Plan requirements. Therefore, no operational impacts related to implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan would occur.

3.9.3.7. Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

Determination: NO IMPACT

Construction and Operational Impacts

The Project Site is not within or in proximity to an area designated as "High Fire Severity Rating & Open Space with Fire Potential" according to the City of Irvine General Plan's Safety Element. The Project Site is in an urbanized area and would be grubbed of vegetation and graded, further minimizing the potential for wildland fires. Therefore, no construction or operational impacts related to the Project exposing people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires would occur.

3.10. HYDROLOGY AND WATER QUALITY

| Would the | project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|--|--------------------------------------|--|------------------------------------|-------------|
| 3.10.3.1 | Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? | | | \boxtimes | |
| 3.10.3.2 | Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | | | | |
| | Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: | | | | |
| 3.10.3.3 | Result in substantial erosion or siltation on- of off-site; | | | \boxtimes | |
| 3.10.3.4 | Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite; | | | | |
| 3.10.3.5 | Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or | | | | |
| 3.10.3.6 | Impede or redirected flood flows? | | | \boxtimes | |
| 3.10.3.7 | In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? | | | | \boxtimes |
| 3.10.3.8 | Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | | | | |

3.10.1. Existing Conditions

The Project Site lies within the San Diego Creek Watershed and its water quality is managed by the SARWQCB. The San Diego Watershed covers approximately 122 square miles within Orange County comprising the cities of Irvine, Tustin, Santa Ana, Costa Mesa, and some portions of Laguna Hills and Lake Forest (Figure 3.10-1).

Existing topography consists of an existing upward grade of approximately 1.3 percent from the footprint's northwest limit at Ridge Valley to the footprint's southeast limit at the open storm drain culvert, Bee Canyon Channel (Metrolink, 2019). Existing drainage channels exist and are owned and maintained by the Irvine Ranch Water District (IRWD) and the OCFCD. The Bee Canyon Channel runs perpendicular to the site on its southern boundary while the Marshburn Channel is located approximately 1,400 feet to the north.

Formerly owned by the DON, the Project Site is currently located within the RWQCB's El Toro Marine Base Groundwater Plume Protection Boundary (Figure 3.10-2). The DON is currently remediating the contamination and has two existing groundwater monitoring wells on the Project Site.

The Project Site is within the Coastal Plain of the Orange County Groundwater Basin (also referred to as Basin 8-1). The basin's area spans approximately 350 square miles and is bordered by Los Angeles County to the north, the Santa Ana Mountains to the northeast, and the Pacific Ocean (refer to Figure 3-10-1). The Sustainable Groundwater Management Act (SGMA) is a landmark law that empowers local agencies to sustainably manage their groundwater and authorizes SWRCB intervention if local agencies are unable to do so. The Department of Water Resources (DWR) has identified the Coastal Plain of Orange County Groundwater Basin as a medium-priority basin due to its heavy reliance on groundwater as a source of water supply. The Orange County Water District (OCWD), IRWD, and the City of La Habra jointly prepared the Basin 8-1 Alternative and generated a water budget to ensure the sustainable recharge of the groundwater aquifer.

The segment of the existing Bee Canyon Channel adjacent to the existing SCRRA Orange Subdivision bridge consists of a double 11-foot-wide by eight-foot-high reinforced concrete box (RCB) at the upstream segment and changes to an open u-channel under the existing SCRRA Orange Subdivision bridge and at the downstream section. The concrete u-channel ranges between 21.67 to 24.30 feet in width and 6.5 to 14 feet in height. Just after the channel changes from the closed double RCB to open uchannel, a 60-inch reinforced concrete pipe (RCP) outlets into the channel from a tributary area on the south side. This segment of the existing Bee Canyon Channel was last modified and constructed in 2015 and is owned and maintained by the OCFCD.

The existing channel was designed for a 100-year storm and takes in approximately 1,607.9 cubic feet per second (cfs) at the upstream section and 1,781 cfs at the downstream section after the 60-inch RCP is introduced.

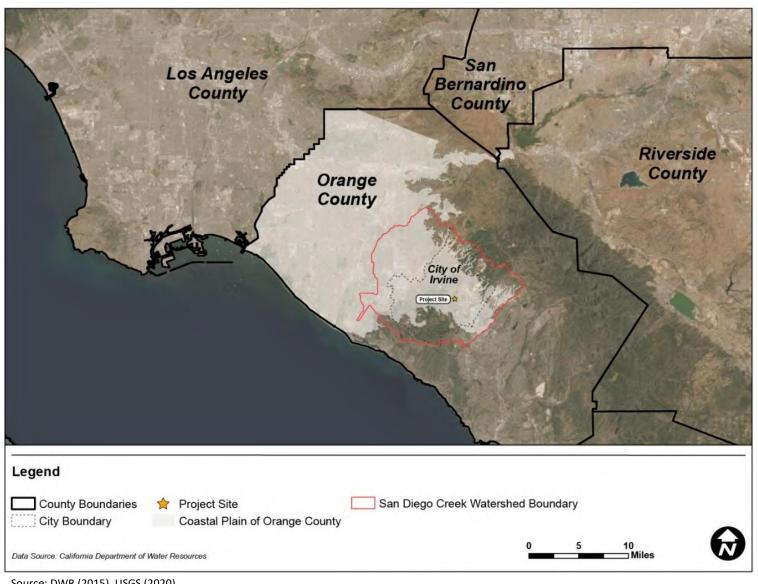
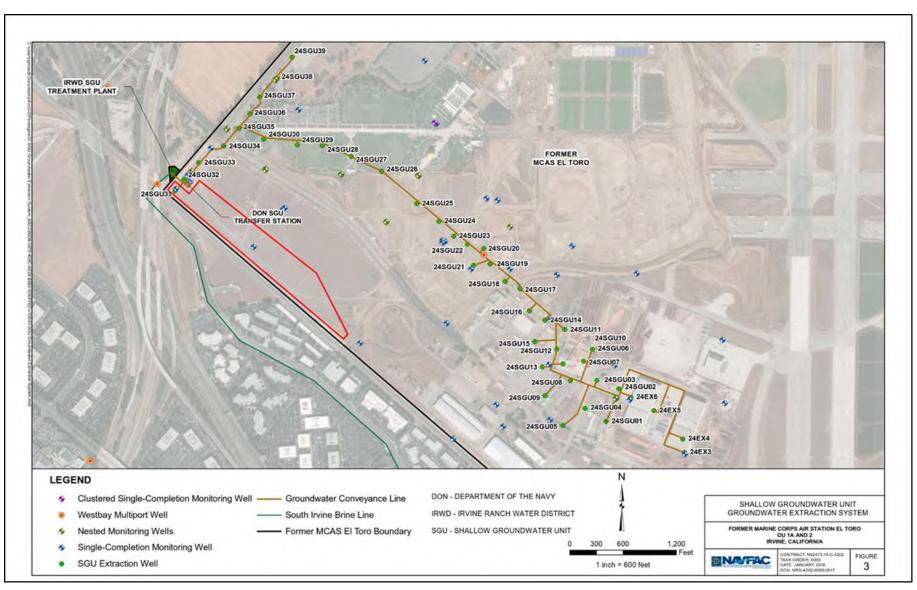


Figure 3.10-1: Coastal Plain of Orange County Basin (Basin 8-1) and San Diego Creek Watershed

Source: DWR (2015), USGS (2020)





Source: Metrolink (2019)

A hydraulic analysis for the channel was provided in the as-builts (O.C.F.C.D. Facility No. F17 – 2014) and gave a flow depth ranging from 6.5 feet at the upstream section and 2.6 feet at the downstream section as shown in the as-builts. Using a minimum freeboard requirement of three feet above the flow depth, the required structural soffit clearance between the channel flow line and the top of the freeboard ranges from 9.5 feet at the upstream section and 5.6 feet at the downstream section.

Based on the information provided, it was found that the existing freeboard elevation encroaches over the top of the existing u-channel for approximately 30 feet at the upstream portion of the channel. To accommodate this, a grouted rock slope protection was added on the side slopes between the SCRRA Orange Subdivision bridge and the closed double RCB.

The Project Site does not lie within any flooding hazard zones. Federal Emergency Management Agency (FEMA) has designated the location of the Project Site as Zone X, which is defined as an area of minimal flooding (see Figure 3.10-3). The FEMA designated Zone A area adjacent to the Project Site is within the existing SCRRA ROW. The closest tsunami zone is approximately 10 miles from the Project at Upper Newport State Marine Conservation Area. In the event of seismic activity, the Salton Sea is the closest large body of water that could be subjected to a seiche; it lies across the Santa Ana Mountains approximately 21 miles from the Project Site. Santiago Dam is approximately eight miles from the Project Site; its flood zone does not affect the Project Site.

3.10.2. Regulatory Framework

<u>State</u>

Clean Water Act Section 401 - The SWRCB has jurisdiction over all Waters of the State. Under CWA Section 401, the SWRCB must issue a 401 Water Quality Certification to ensure compliance with state water quality standards for any activity resulting in a discharge to a water body.

CWA Section 402 - Through delegated jurisdiction under the federal CWA, the SWRCB regulates point source discharges to Waters of the U.S. under the NPDES. Regulated discharges also include diffuse sources of discharge caused by general construction activities covering an area greater than 1 acre, and stormwater discharges in municipal separate storm sewer systems (MS4s) in which runoff is carried through a developed conveyance system to specific discharge locations. The SWRCB issues both a construction general permit for protection of water quality from stormwater discharges during construction activities, and an industrial general permit for protection of water quality from stormwater discharges during industrial activities.

Sustainable Groundwater Management Act - The SGMA is a landmark law that empowers local agencies to sustainably manage their groundwater and authorizes SWRCB intervention if local agencies are unable to do so. The SGMA requires governments and water agencies of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Basins should reach sustainability within 20 years of implementing their sustainability plans.



Figure 3.10-3: FEMA Designated Floodplains

Source: FEMA (2018)

California Fish and Game Code Section 1602 - CDFW has jurisdiction over ephemeral, intermittent, and perennial waterways, including natural lakes and manmade reservoirs. CDFW's jurisdiction can also extend over the habitats adjacent to waterways. Under Section 1602, CDFW must be notified of any activity that substantially diverts or obstructs a waterway; changes or uses material from the bed, channel, or bank of a waterway; or deposits or disposes of debris, waste, or other material containing ground pavement where it may pass into any waterway. Notification of CDFW (through a Lake or Streambed Alteration Agreement) would be required prior to the start of construction.

Porter-Cologne Water Quality Control Act - The act authorizes the SWRCB to adopt, review, and revise policies for all waters of the state (including both surface and groundwater); regulates discharges to surface and groundwater; and directs the RWQCBs to develop regional basin plans. The Act divides the state of California into nine RWQCB areas. Each RWQCB implements and enforces provisions of the CWA, subject to policy guidance and review by the SWRCB. The Project Site is located in the Los Angeles Regional Water Quality Control Board (LARWQCB) Region 4, the Los Angeles Region.

Local

Irvine City Council Ordinance No. 10-6 - The purpose of the ordinance is to continue the City of Irvine's participation in the improvement of water quality and to ensure adequate legal authority exists for the City to enforce federal and state requirements for the control of pollutants from stormwater and urban runoff. The ordinance conforms to the policies and goals in the General Plan adopted by the City for protecting the regional watershed.

3.10.3. Discussion

3.10.3.1. Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

The SWRCB and RWCBs, the County of Orange, and the City of Irvine have set forth existing water quality regulations with which the Project would be required to comply. Since grading activities would disturb over 1 acre of soil, the Project would be required to obtain an NPDES General Construction Permit through the SWRCB' Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ). Approvals would be granted by the SARWQCB. The City of Irvine and the County of Orange utilize the Drainage Area Management Plan (DAMP) as their primary policy and implementation document for compliance with the NPDES Municipal Stormwater Permits for Orange County, which was adopted by the SARWQCB in 2003. The Water Quality Ordinance (No. 10-06) gives the City of Irvine adequate legal authority as may be necessary to carry out the requirements of the NPDES Permit and accomplish the requirements of the CWA.

To ensure that water quality is protected, the NPDES General Construction Permit would require that the Project develop and implement a SWPPP as the primary compliance mechanism. The SWPPP's objectives are to identify the sources of sediment and pollutants that affect the quality of stormwater discharges and to ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater discharges. The SWPPP would include BMPs that address source control, BMPs that address pollutant control, and BMPs that address treatment control. BMPs specified in the DAMP developed by the County of Orange; OCFCD; and incorporated Cities, including Irvine; are shown in Table 3-10-1. The Project would incorporate these BMPs to maintain water quality during its construction phase.

| Category BMP | | BMP Name |
|-----------------------|-------|-------------------------------|
| | SE-1 | Silt Fence |
| | SE-2 | Sediment Basin |
| | SE-3 | Sediment Trap |
| S | SE-4 | Check Dam |
| MP | SE-5 | Fiber Rolls |
| Sediment Control BMPs | SE-6 | Gravel Bag Berm |
| ontr | SE-7 | Street Sweeping and Vacuuming |
| it Cc | SE-8 | Sandbag Barrier |
| nen | SE-9 | Straw Bale Barrier |
| edir | SE-10 | Storm Drain Inlet Protection |
| Ň | SE-11 | Active Treatment Systems |
| | SE-12 | Temporary Silt Dike |
| | SE-13 | Compost Socks and Berms |
| | SE-14 | Biofilter Bags |

Table 3-10-1: Sediment Control BMPs

BMP = Best Management Practice Source: Orange County Public Works (2003)

The Project Site is located on the former MCAS El Toro where two regional groundwater contamination plumes of VOC exist. Both plumes are within the OCWD Management Area and are under active remediation by the DON. As discussed in Section 3.9 Hazards and Hazardous Materials, the Project would need to notify the appropriate state and local agencies (e.g., OCHCA, DTSC, or the SARWQCB) since soil and groundwater contamination is present due to the MCAS site. Notification to these state and local regulatory oversight agencies will simultaneously satisfy coverage under the applicable federal agencies under Superfund. If requested as follow-up by the state and/or local regulatory oversight agency(ies), then an environmental site assessment or a risk assessment shall be prepared to ensure that future site activities and/or uses pose no risks to human health and/or the environment.

While a groundwater contamination plume of VOC exists underneath the Project Site, discharging of groundwater associated with Project construction is not anticipated. Historical

data for the Project Site shows the groundwater depth below 30 feet and, as a result, the Project would not encounter groundwater. Adherence to federal, state, regional, County of Orange, and the City of Irvine regulations would make impacts related to the violation of any water quality standards or waste discharge requirements or that would otherwise substantially degrade surface or groundwater quality less than significant.

Operational Impacts

A Project WQMP must be submitted for new development and significant redevelopment projects in the City of Irvine to comply with the NPDES permit and the City's Low Implementation Plan standards. Project WQMPs shall be approved by the City of Irvine's Building and Safety Division prior to the issuance of building or safety permits. Monitoring of the Project WQMP and the integration of BMPs into the design would result in less than significant impacts related to the violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.

Since the Project would create over 10,000 square feet of impervious surfaces, the City of Irvine considers it a priority project under the Irvine Municipal Code 6-8-301 and mandates that a Project WQMP be prepared and executed. The SARWQCB and the City of Irvine would approve and adopt the Project WQMP that shall align with water quality standards set forth by the SWRCB. Of the 21.30 acres within the Project Site, the Project would convert 19.50 acres of undeveloped land into paved surface, train storage tracks, service platforms, and maintenance buildings. Of the 19.50 acres, 17.47 acres (761,000 square feet) would be impervious surfaces.

BMPs would minimize pollutants in stormwater discharge. Maintenance and servicing of trains would create pollutants of concern, including heavy metals, oil and grease, toxic organic compounds, and trash and debris in stormwater runoff. The Project drainage would consist of an underground cistern to capture and treat the 24-hour storm to eliminate the possibility of downstream modification. The cistern would have a capacity of 132,500 cubic feet and would capture the additional runoff created by the Project. Cartridge media filters would be used to filter pollutants prior to discharging stormwater.

Monitoring of the WQMP and implementation of the underground cistern into the Project design would result in less than significant operational impacts related to the violation of any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.

3.10.3.2. Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

The Project is located within the Coastal Plain of Orange County (Basin 8-1) shown in Figure 3-10-1. The Pacific Ocean and Tertiary semi-permeable marine deposits define the basin's boundaries. San Diego Creek drains a portion of the southern region of Orange County.

The SGMA requires that all high and medium priority basins designated by DWR be sustainably managed. DWR designated Basin 8-1 as a medium-priority basin, primarily due to heavy reliance on the basin's groundwater as a source of water supply. The Project is within the South East Management Area, which contains portions of IRWD, El Toro Water District, and the City of Orange. The South East Management Area was formed in 2016 in collaboration with OCWD, an agency responsible for managing groundwater in Basin 8-1 within OCWD's boundaries. There is relatively little existing, or potential, groundwater development within the South East Management Area. The OCWD Management Area includes approximately 76 percent of the land area within Basin 8-1 where 98 percent of groundwater production occurs. This area includes the portion of Basin 8-1 that is within OCWD's service area. When pumping does occur, it is less than 200 acre-feet per year (afy), which is much less than the over 14,000 afy of recharge to the area. Water levels and storage levels are steady (Orange County Water District, City of La Habra, and Irvine Water District, 2017).

During the construction phase, the Project Site would remain similarly pervious as it currently exists. Construction would introduce some temporary impervious surfaces from equipment and materials stored on-site but would have minimal impact in the percolation of natural precipitation and overall recharge of the aquifer. Historical data for the Project Site anticipates a groundwater depth below 30 feet in some locations and, as a result, it is not expected to be encountered during construction activities. As a result, construction impacts related to substantially decreasing groundwater supplies or interfering substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin would be less than significant.

Operational Impacts

As discussed in Section 3.10.3.1, operations would convert 19.50 acres of undeveloped land into paved surface, train storage tracks, service platforms, and maintenance buildings. Of the 19.50 acres, 17.47 acres would be impervious. In comparison to the 14,000 afy or recharge area, the impervious area introduced by the Project would account for 0.125 percent of the recharge area. Bee Canyon Channel's existing configuration is lined with concrete and is therefore impervious. As such, operational impacts related to substantially decreasing

groundwater supplies or interfering substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin would be less than significant.

3.10.3.3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: result in substantial erosion or siltation on- or off-site.

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

Grading activities associated with the construction of the Project would result in the loss of existing vegetation and shrubs that act as an erosion barrier to the existing conditions of the Project Site. The County of Orange's 2003 DAMP requires industrial/commercial construction operations that result in a disturbance of 1 acre or more of total land area to be required to develop and implement BMPs to control erosion and siltation at construction sites. Grading ordinances and codes, the Green Book, and Public Works construction specifications contain requirements for construction practices for erosion control. The Project WQMP complies with the County's DAMP and would implement non-structural and structural BMPs for landscape management during construction activities. The DAMP enforces that sediments from areas disturbed by construction shall be retained on-site using an effective combination of erosion and sediment controls to the maximum extent practicable. Stockpiles of soil shall be properly contained to minimize sediment transport from the site to streets, drainage facilities, or adjacent properties via runoff, vehicle tracking, or wind. BMPs detailing erosion control by the City of Irvine and the 2003 DAMP can be found in the California Stormwater Quality Association (2003), Stormwater Best Management Practice Handbook, Construction, 2002 Edition, and are shown in Table 3-10-2.

The reprofiling of the existing Bee Canyon Channel would lower the channel by 2.5 feet. However, the gradient and shape of the Bee Canyon Channel would not be modified. Functionally, Bee Canyon Channel would be similar to existing conditions. During construction, any potential for erosion would be regulated by state and local jurisdictions.

Adherence to the County of Orange's 2003 DAMP and the City's WQMP would make construction impacts related to the alteration of existing drainage pattern of the site or area, including the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation on- or off-site less than significant.

Operational Impacts

The existing topography of the site provides a drainage pattern that slopes from east to west. Runoff is collected at the surface via open earth channels and concrete drainage inlets and is then routed to the southwest end of the site through two 24-inch corrugated steel pipes. Runoff leaves the site through an open concrete channel and empties downstream into Marshburn Channel, owned by the OCFCD. The site design will have a grading with a similar direction of flow as that of the existing topography. Water will continue to flow east to west across the Project Site and be routed to a series of underground cisterns. The water will then be treated through a cartridge media filter system, before reaching the existing channel. The cisterns would be located in the northern corner of the Project Site, underneath the proposed parking lot, and would provide enough storage to contain the Design Capture Volume. The Project would introduce 17.47 acres (OCTA, 2021) that would be impervious surfaces. However, with the implementation of the underground cisterns, runoff volumes and stormwater flow rates would be reduced to prevent erosion and siltation of the Project Site.

| Category | BMP | BMP Name |
|----------------------|-------|-------------------------------------|
| | EC-1 | Scheduling |
| | EC-2 | Preservation of Existing Vegetation |
| | EC-3 | Hydraulic Mulch |
| | EC-4 | Hydroseeding |
| S | EC-5 | Soil Binders |
| Erosion Control BMPs | EC-6 | Straw Mulch |
| ol B | EC-7 | Geotextiles and Mats |
| ntro | EC-8 | Wood Mulching |
| L Co | EC-9 | Earth Dikes and Drainage Swales |
| sior | EC-10 | Velocity Dissipation Devices |
| Ero | EC-11 | Slope Drains |
| | EC-12 | Streambank Stabilization |
| | EC-13 | Reserved |
| | EC-14 | Compost Blanket |
| | EC-15 | Soil Preparation/Roughening |
| | EC-16 | Non-Vegetative Stabilization |

Table 3-10-2: Erosion Control BMPs

BMP = Best Management Practice

Source: Orange County Public Works (2003)

The current configuration of Bee Canyon Channel's invert is lined with a concrete bottom. The proposed design features related to the operation of the Project would match the existing impervious conditions.

Therefore, operational impacts related to the alteration of the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation on- or off-site, would be less than significant.

3.10.3.4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

The use of BMPs during grading activities as required by the State of California would be implemented in accordance with state, regional, county and city regulations as noted in Impact 3.10.3.1, to preempt surface runoff and flooding on-site.

The reprofiling of the existing Bee Canyon Channel would lower the channel by 2.5 feet. However, the gradient and shape of Bee Canyon Channel would not be modified. Functionally, Bee Canyon Channel would be similar to existing conditions. During construction, there would be temporary impervious surfaces. However, this would be temporary any potential for runoff would be regulated by state and local jurisdictions.

Adherence to the City WQMP and the County DAMP would enforce the use of a Projectspecific SWPPP plan and render construction impacts related to substantially altering the existing drainage pattern of the site or area, which would result in substantial increase of the rate or amount of surface runoff in a matter that would result in flooding on- or off-site, to be less than significant.

Operational Impacts

As discussed in Section 3.10.3.3, the existing topography of the Project Site would be similar to the final drainage configuration. While 17.47 acres of impervious surfaces would be introduced by the Project, stormwater would be routed to a series of underground cisterns that would provide enough storage to contain the Design Capture Volume and thereby prevent flooding on- or off-site. The existing Bee Canyon Channel within the Project Site is composed of an RCB that transitions into a concrete u-channel. The Project would design Bee Canyon Channel to be consistent with existing hydraulics and the reconfigured channel would match its existing impervious concrete conditions. Therefore, operational impacts associated with the Project substantially altering the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in flooding on- or off-site, would be less than significant.

3.10.3.5. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

The use of BMPs during grading activities as required by the State of California would be implemented in accordance to state, regional, county, and city regulations as noted in Impact 3.10.3.1, to preempt surface runoff and flooding on-site. Adherence to the City WQMP and the County DAMP would enforce the use of a Project-specific SWPPP plan and would render construction impacts related to altering the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, to be less than significant.

Operational Impacts

Maintenance and servicing of trains related to the Project's operations would create pollutants of concern including heavy metals, oil and grease, toxic organic compounds, trash, and debris. As discussed in Section 3.10.3.1, the existing topography of the site provides a drainage pattern that slopes from east to west. Although the Project would introduce 17.47 acres of impervious surfaces to the Project Site, the final grading configuration would have a similar direction of flow as that of the existing topography. Stormwater would continue to flow east to west across the Project Site and be routed to a series of underground cisterns. The water would then be treated through a cartridge media filter system, before reaching the existing channel. The cisterns would be located in the northern corner of the Project Site underneath the proposed parking lot, and would provide enough storage to contain the Design Capture Volume, which would include the additional stormwater as a result of the increase in impervious surfaces. Pollutants as a result of the stormwater runoff would collect in the basin of the underground cistern instead of discharging into the stormwater drainage systems. Bee Canyon Channel would maintain a concrete lining and match existing impervious conditions. With the implementation of the underground cisterns, operational impacts that would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, would be less than significant.

3.10.3.6. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

Construction activities related to the Project are determined to fall in FEMA Zone-X (Figure 3.10-2). Zone-X is an area of minimal flood hazard and therefore has no impact in impeding or redirecting flood flows. Therefore, no construction impacts would occur that would impede or redirect flood flows.

Operational Impacts

As discussed above, operational activities related to the Project are determined to fall in FEMA Zone-X. Zone-X is an area of minimal flood hazard and therefore has no impact in impeding or redirecting flood flows. The existing Bee Canyon Channel is designed for a 100-year storm. The Project would design Bee Canyon Channel to be consistent with existing hydraulics and would not alter flood flow so that it is redirected or impeded. Therefore, no operational impacts would occur that would impede or redirect flood flows.

3.10.3.7. In flood hazard, tsunami, or seiche zones, would the Project risk release of pollutants due to project inundation?

Determination: NO IMPACT

Construction and Operational Impacts

The Project Site does not lie in a flooding hazard zone, tsunami zone, or seiche zone. Therefore, no construction or operational impacts related to the release of pollutants due to project inundation would occur.

3.10.3.8. Would the Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

The construction and operation of the Project would not conflict with or obstruct implementation of water quality control plans or sustainable groundwater management plans set forth by state and regional authorities. The Project falls within the authority of the SARWQCB that adheres to state water quality standards for any activity resulting in a discharge to a water body. At a minimum, local water management plans comply with these thresholds to meet water quality standards through the County of Orange DAMP and the City of Irvine's Water Quality Ordinance (No 10-06). It is anticipated that construction and operations of the Project would not encounter groundwater or disrupt monitoring wells that may otherwise affect the Superfund remediation efforts performed by the DON to satisfy EPA requirements.

The OCWD, City of La Habra, and the IRWD filed Basin 8-1 Alternative Overview in January 2017 under the SGMA of 2014. The Sustainability Goal for the South East Management Area is to continue monitoring sustainable conditions to ensure that no significant and unreasonable results occur in the future. The Project's construction and operations would have a less than significant impact on the recharge of Basin 8-1 discussed in Impact 3.10.3.2. As a result, no construction or operational impacts related to conflicting with or obstruction of implementation of water quality control plans or sustainable groundwater management plans set forth by state and regional authorities would occur.

3.11. LAND USE AND PLANNING

| Would the | project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|---|--------------------------------------|--|------------------------------------|-------------|
| 3.11.3.1 | Physically divide an established community? | | | | \boxtimes |
| 3.11.3.2 | Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | | | | |

3.11.1. Existing Conditions

The Project Site is owned by OCTA and is located about 1.5 miles north of the existing Irvine Metrolink Station. The Project Site is bound by the existing SCRRA Orange Subdivision railroad corridor to the west. To the east, it is bound by County-owned land. Figure 3.11-1 presents the existing land use types in the vicinity of the Project Site, which is currently vacant. There is a senior residential community north of Marine Way along Ridge Valley approximately 650 feet from the Project Site. Most of the existing land uses to the south and southwest of the Project Site are industrial with one exception of the vacant land located southwest of I-5.

Land Use Designation

The Project Site is currently undeveloped and is designated by the City of Irvine General Plan as Planning Area 51 and the Great Park Land Use type. Planning Area 51 encompasses 1,233,000 square feet of institutional land uses, specifically on public facilities. The 1,233,000 square feet consists of the following: 122,500 square feet for OCTA facilities; 300,000 square feet for Orange County facilities; 263,000 square feet for warehousing for homeless providers; 468,000 square feet for institutional uses; 26,000 square feet for a sports park; and 53,500 square feet for a remote airport terminal (City of Irvine, 2015a).

To develop at the maximum intensities in Planning Area 51, the property owners of this planning area entered into a development agreement with the City on July 12, 2005, which requires the dedication of land and the development or funding of infrastructure improvements in excess of the City's standard requirements, and the long-term maintenance of public facilities (City of Irvine, 2015a). The detailed standard requirements can be referenced in the City of Irvine Zoning Ordinance Chapter 3.37, Section 3-37-11.-1.9 Great Park.

The City of Irvine is currently updating its General Plan to serve as the City's policy blueprint for the future. It will update community goals and public policy direction to ensure Irvine's high quality of life is preserved and enhanced as the city matures.

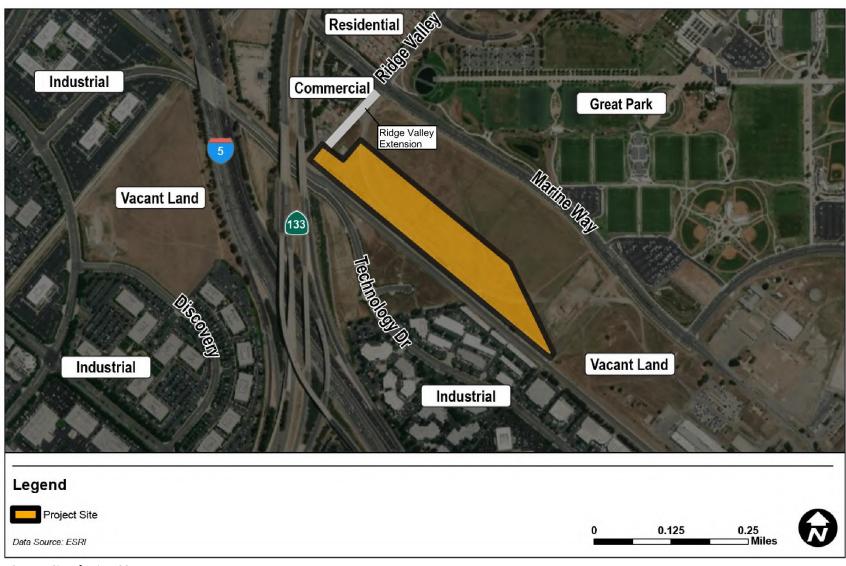


Figure 3.11-1: Existing Land Use Map

Source: City of Irvine, 2015a

Zoning

The existing zoning of the Project Site is "6.1 Institutional" as indicated in Figure 3.11-2. This category applies to land for public and quasi-public facilities such as churches, schools, or utilities. Table 3.11-1 summarizes the permitted uses and uses that require a CUP for institutional zoning areas.

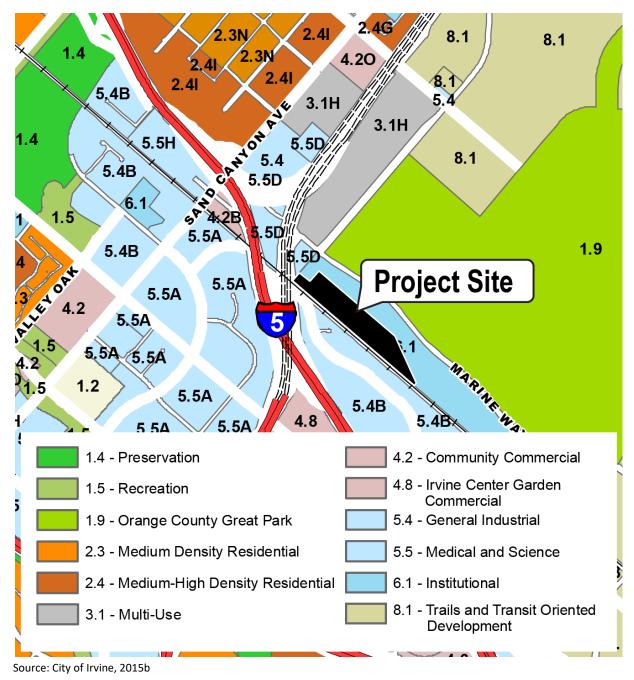




Table 3.11-1: Institutional Usage

| Permitted Uses | Conditional Uses | |
|---|--|--|
| Accessory use | Dairy, commercial - Prohibited in Planning Areas 30 or 51 | |
| Agriculture | Kennel - Prohibited in Planning Area 30 | |
| Apiary - Prohibited in Planning Area 30 | Manufactured structure (over 2 years) | |
| Caretaker's quarters | Stable, public - Prohibited in Planning Area 30 | |
| Greenhouse | Transit | |
| Manufactured structure permit (up to 2 years) | Passenger Vehicles | |
| Packing plant for agricultural products - Prohibited in Planning Area 30 | | |
| Stable, private | | |
| Wireless communication facility | | |

Source: City of Irvine, Irvine Strategic Energy Plan, 2020

3.11.2. Regulatory Framework

City of Irvine General Plan, Land Use Element, Objective A-4: Balanced Land Uses - Manage growth to ensure balanced residential and nonresidential development throughout the City.

• Policy (f): Attract land uses that generate revenue to the City, while maintaining a balance of other community needs such as housing, open space, and public facilities.

City of Irvine Zoning Ordinance Chapter 3.37, section 3-37-37. - 6.1 Institutional development standards.

3.11.3. Discussion

3.11.3.1. Would the Project physically divide an established community?

Determination: NO IMPACT

Construction and Operational Impacts

The closest established community is approximately 800 feet north of the Project Site on the north quadrant of Marine Way and Ridge Valley. The Project Site is not located within this established community and, consequently, would not cause it to be divided. No construction or operational impacts related to physically dividing an established community would occur.

3.11.3.2. Would the Project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Determination: NO IMPACT

Construction and Operational Impacts

The City of Irvine does not have specific plans for the Project Site. The Project Site is currently undeveloped and is designated by the City of Irvine General Plan as Planning Area 51 and Great Park Land Use type. The zoning designation for the Project Site is "6.1 Institutional" as indicated in Figure 3.11-2.

Institutional zoning designates land for public and quasi-public facilities such as churches, schools or utilities. The Project can be categorized as one of the conditional uses under 6.1 Institutional zoning—government facility; therefore, it is consistent with local zoning requirements. The Project proposes to apply for a CUP that is allowed (Transit) as shown in Table 3.11-1.

In addition, the Project would be consistent with the City's General Plan, Land Use Element, Objective A-4: Balanced Land Uses, Policy (g). Encouraging large infrastructure improvements planned or built in the Project Site that have reduced land available for development. Building the Project could potentially help maintain the intensity ceilings of the current development in the General Plan as it would reduce about 21 acres of land available for development based on the Project Site.

Based on the information described above, no construction or operational impacts related to the Project causing a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect would occur.

3.12. MINERAL RESOURCES

| Would the | project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|--|--------------------------------------|--|------------------------------------|-----------|
| 3.12.3.1 | Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | | | | |
| 3.12.3.2 | Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | | | | |

3.12.1. Existing Conditions

In this section, the mineral resources at the Project Site are identified and their regional significance are evaluated pursuant to the two-phase classification-designation process, defined by The Surface Mining and Reclamation Act of 1975 (SMARA).

Mineral Resources Classification

The Mineral Land Classification Special Report 143 Part III - Classification of Sand and Gravel Resource Areas, Orange County-Temescal Valley Production-Consumption (P-C) Region specifies the mineral classifications at the Project Site. As shown in Figure 3.12-1, the Project Site spans two of the U.S. Geological Survey defined 7.5-minute quadrangles: Tustin Quadrangle and El Toro Quadrangle. The existence of mineral resources within the Project Site are classified as MRZ-1. MRZ-1 areas are defined as areas where adequate geologic information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence (DOC, 2000). As a result, the Project Site is not in any designated regionally significant construction aggregate resource areas.

3.12.2. Regulatory Framework

<u>State</u>

The Surface Mining and Reclamation Act of 1975 - SMARA mandated the State Geologist to produce Mineral Land Classification (MLC) studies to help identify and protect mineral resources in areas within the state subject to urban expansion or other irreversible land uses which would preclude mineral extraction. SMARA also allowed the State Mining and Geology Board (SMGB), after receiving MLC studies from the State Geologist, to designate lands containing mineral deposits of regional or statewide significance. This two-phase process is called classification-designation process. The MLC studies evaluate the mineral resources and present this information in the form of Mineral Resource Zones (MRZs).

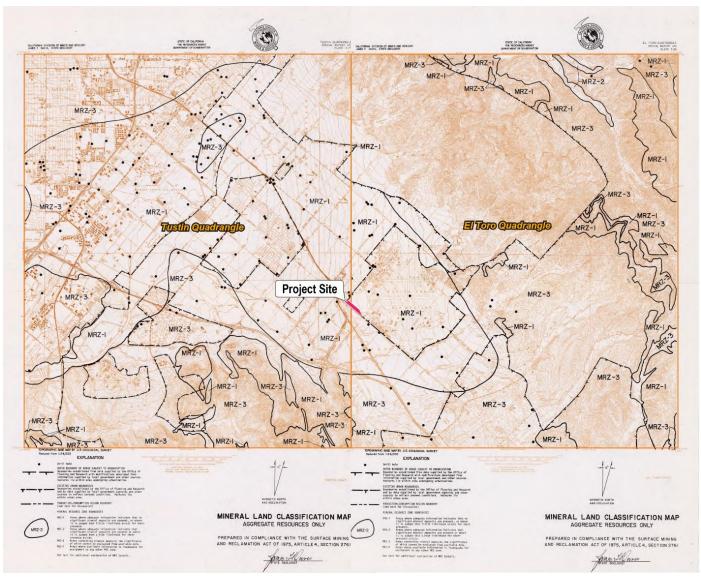


Figure 3.12-1: The Mineral Land Classification in Tustin and El Toro Quadrangles

Source: California Department of Conservation, 2000

3.12.3. Discussion

3.12.3.1. Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Determination: NO IMPACT

Construction and Operational Impacts

In 1984, the SMGB designated MRZ-1 mineral resources within the Tustin Quadrangle and El Toro Quadrangle, which span the Project Site. As mentioned above, significant mineral deposits are not present within the Project Site or surrounding areas. As such, the Project is not on or in the vicinity of valuable regional or state mineral resources. Therefore, no construction or operational impacts related to loss of availability of a known mineral resource that would be of value to the region and the residents of the state would occur.

3.12.3.2. Would the Project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Determination: NO IMPACT

Construction and Operational Impacts

Since the Project Site is not on or within the vicinity of valuable mineral resources, the Project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Therefore, no construction or operational impacts related to the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, or other land use plan, specific plan, or other land use plan. Therefore, no construction or operational impacts related to the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan would occur.

3.13. NOISE

| Would the | project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|---|--------------------------------------|---|------------------------------------|-----------|
| 3.13.3.1 | Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | | | | |
| 3.13.3.2 | Generation of excessive groundborne vibration or groundborne noise levels? | | \boxtimes | | |
| 3.13.3.3 | For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | | | | |

3.13.1. Existing Conditions

Noise measurements were conducted at the Project Site and selected nearby noise sensitive locations on July 30 and 31, 2020. The measurements were conducted with ANSI Type 1 sound level meters within their manufacturer's recommended 1-year calibration period. Measurements were conducted and documented in keeping with standard environmental noise measurement procedures. Weather conditions during the measurement period were generally typical for this location during this time of year.

Noise measurements were conducted at five locations in the vicinity of the Project Site, including one Long-Term (LT) measurement location for an entire 24-hour period, and four Short-Term (ST) locations with durations of approximately 20 to 30 minutes each. The noise measurement locations are shown in Figure 3.13-1 below.

The noise measurement locations were selected to represent the following acoustical environments:

LT-1. This location at the Project's northern fence line is intended to represent the typical hour-to-hour variation of noise levels in the general Project Site over the course of an entire day. Contributing sound sources here included traffic noise from I-5 and SR-133 and local roads, and occasional rail activity on the nearby SCRRA Orange Subdivision tracks, as well as minor contributions from other miscellaneous local sound sources.





Source: AECOM, 2020

ST-1. This location represents the residential development to the north of the Marine Way and Ridge Valley intersection. The contributing sound sources here included traffic on SR-133 and local roadways, with lesser contributions from traffic on I-5, rail activity, and other local noise sources.

ST-2. This location represents a passive use area within the park (quiet area near the reflecting pond) and with direct exposure to the Project Site. Contributing sound sources here were similar to LT-1.

ST-3. This location represents an active sports area within the park (soccer field) with direct exposure to the Project Site. Noise sources here were similar to those observed at ST-2.

ST-4. This location represents an informal exterior use area in a commercial area south of the SCRRA Orange Subdivision tracks (a bench in a grassy area in the parking area presumably used as a short-term break area for employees).

Figure 3.13-2 provides the LT noise measurement data displaying the equivalent average (L_{eq}), maximum (L_{max}) and minimum (L_{min}) for each 10-minute measurement interval over the entire 24-hour measurement period (between 10:00 am on 7/30/2020 and 10:00 am on 7/31/2020). The L_{eq} level values range mostly between 45 A-weighted decibels (dBA) (during the early morning hours) and 60 dBA (during peak morning and afternoon hours). Individual spikes in the L_{eq} and L_{max} data are mostly caused by train pass-by events (the LT location was situated about 450 feet from the SCRAA Orange Subdivision tracks).

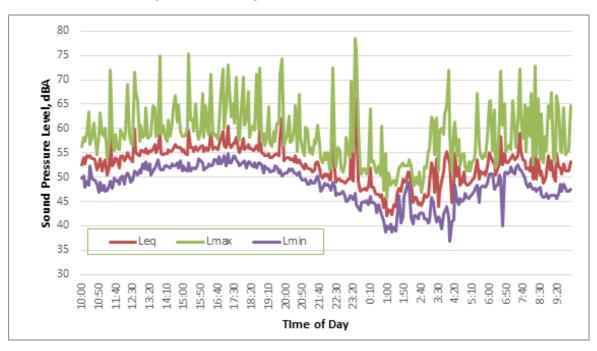


Figure 3.13-2: Long-Term Noise Measurement Data

Table 3.13-1 provides a summary of the ST measurement locations. Each location was measured twice (L_{eq} -ST value) and the long-term metrics (L_{eq} -day, day-night average sound level [Ldn], and Community Noise Equivalent Level [CNEL]) were calculated by using a relative comparison to the 24-hour data collected at the central LT measurement location.

| Ν | leasurement Ti | me and Dur | ation | | Measured or Calculated Sound Level, dBA | | | | |
|------|----------------|------------|-------|----------|---|----------------------|------|------|--|
| ID | Date | Start | End | Duration | L_{eq} -ST | L _{eq} -Day | Ldn | CNEL | |
| ST-1 | 7/30/20 | 10:58 | 11:30 | 0:32 | 65.7 | 67.8 | 72.1 | 72.5 | |
| | 7/31/20 | 10:00 | 10:24 | 0:24 | 66.9 | | | | |
| ST-2 | 7/30/20 | 12:46 | 13:12 | 0:26 | 54.7 | 54.5 | 58.7 | 59.1 | |
| | 7/31/20 | 9:45 | 10:04 | 0:19 | 53.2 | | | | |
| ST-3 | 7/30/20 | 13:25 | 13:52 | 0:27 | 63.3 | 59.9 | 64.1 | 64.5 | |
| | 7/31/20 | 9:05 | 9:24 | 0:19 | 57.5 | | | | |
| ST-4 | 7/30/20 | 14:10 | 14:40 | 0:30 | 51.5 | 51.8 | 56.1 | 56.4 | |
| | 7/31/20 | 8:30 | 8:50 | 0:20 | 49.7 | | | | |

Table 3.13-1: Short-term Noise Measurement Summary

dBA = A-weighted decibels; ST = Short-Term; L_{eq} = equivalent sound level; L_{dn} = day-night average sound level; CNEL = Community Noise Equivalent Level

Source: AECOM, 2020

Noise measurement site photos and field data sheets and sound level meter equipment calibration certificates are maintained on file and are available for inspection upon request.

3.13.2. Regulatory Framework

Federal

Federal Transit Administration - As a transit project, the primary source used for the prediction and assessment impacts associated with noise and vibration for the Project would come from the Federal Transit Administration (FTA) Noise and Vibration Impact Assessment Manual (2018), which provides prediction methodology and impact assessment guidance for both construction and operational phases of the Project as outlined below.

Construction Noise and Vibration

FTA recommended construction noise impact criteria are presented in Table 3.13-2, as a function of land use.

| | Leq-equip.(8hr), dBA | | Leq-equip.(30 day) , dBA |
|-------------|----------------------|-------|--------------------------|
| Land Use | Day | Night | 30-day Average |
| Residential | 80 | 70 | 75 |
| Commercial | 85 | 85 | 80* |
| Industrial | 90 | 90 | 85* |

| Table 3.13-2: Construction | Noise Impact Criteria |
|----------------------------|-----------------------|
|----------------------------|-----------------------|

dBA = A-weighted decibels

Note: *Uses a 24-hour $L_{eq(24hr)}$ instead of $L_{dn-equip(30day)}$ Source: FTA, 2018 (Table 7-3)

For construction vibration, FTA guidance provides impact criteria for two different impact types, potential building damage and potential human annoyance, both categorized by building type or land use, which are presented in Table 3.13-3 and Table 3.13-4, respectively.

Table 3.13-3: Construction Vibration Damage Criteria

| Building/Structural Category | PPV, in/sec | Approximate L _v * |
|---|-------------|---------------------------------|
| I. Reinforced-concrete, steel or timber (no plaster) | 0.5 | 102 |
| II. Engineered concrete and masonry (no plaster) | 0.3 | 98 |
| III. Non-engineered timber and masonry buildings | 0.2 | 94 |
| IV. Buildings extremely susceptible to vibration damage | 0.12 | 90 |

PPV = peak particle velocity; in/sec = inches per second

*RMS = root mean square velocity in decibels, VdB re 1 micro-in/sec

Source: FTA, 2018 (Table 7-5)

Table 3.13-4: Indoor Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria for General Vibration Assessment

| | | GBV Impact Lev 3 re 1 micro-inc | | GBN Impact Levels (dBA re 20 micro Pascals) | | | |
|--|--------------------|------------------------------------|----------------------|--|----------------------|----------------------|--|
| Land Use Category | Frequent Events | Occasional Events | Infrequent Events | Frequent Events | Occasional Events | Infrequent Events | |
| Category 1: Buildings where vibration would interfere with interior operations. | 65 VdB * | 65 VdB * | 65 VdB * | N/A ** | N/A ** | N/A ** | |
| Category 2: Residences and buildings where people normally sleep. | 72 VdB | 75 VdB | 80 VdB | 35 dBA | 38 dBA | 43 dBA | |
| Category 3: Institutional land uses with primarily daytime use. | 75 VdB | 78 VdB | 83 VdB | 40 dBA | 43 dBA | 48 dBA | |

VdB = velocity level in decibels (vibration); dBA = A-weighted decibels; N/A = not applicable

* This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. For equipment that is more sensitive, a Detailed Vibration Analysis must be performed.

** Vibration-sensitive equipment is generally not sensitive to ground-borne noise; however, the manufacturer's specifications should be reviewed for acoustic and vibration sensitivity.

Source: FTA, 2018 (Table 6-3)

Operational Noise and Vibration

FTA operational noise impacts are determined as a function of the predicted project noise and existing noise exposure and land use category, as shown in Figure 3.13-3. Generally, the higher the existing noise exposure, the higher the limit for moderate and severe impacts. For example, at a Category 2 (residential) receptor location with an existing noise exposure level of 55 dBA Ldn, a moderate noise impact would be triggered with a project noise exposure of 56 dBA Ldn and a severe impact at a project noise level of 61 dBA Ldn. However, for the same receiver location with an existing exposure of 60 dBA Ldn, a moderate impact at a project noise level of 58 dBA Ldn, and a severe impact at 63 dBA Ldn. Operational ground-borne-vibration impact criteria are the same as for construction activity, as shown in Table 3.13-4.

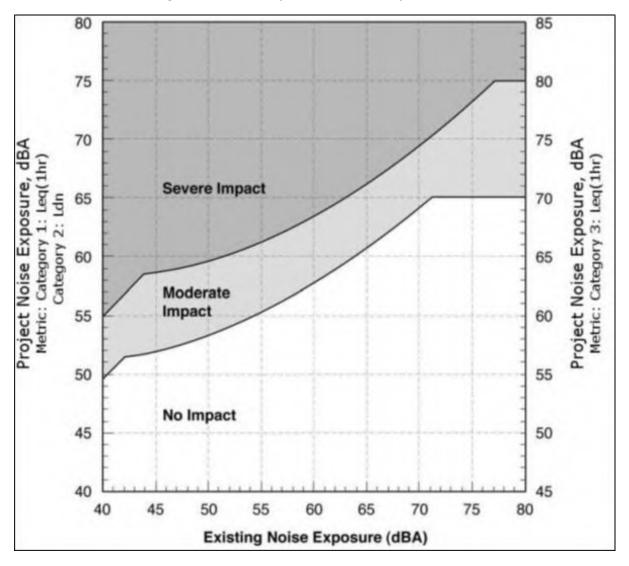


Figure 3.13-3: FTA Operational Noise Impact Criteria

Source: FTA, 2018

Local

City of Irvine General Plan, Noise Element - The noise standards specified in the City's General Plan Noise Element (shown in Table 3.13-5) are used as a guideline to evaluate the acceptability of the noise levels generated by the traffic flow. These standards are for assessment of long-term vehicular traffic noise impacts. The City has exterior noise criteria for outdoor living areas associated with residential uses and requires that interior areas of new residential homes not exceed 45 dBA CNEL and that exterior active use areas not exceed 65 dBA CNEL. Other short-term noise impacts (e.g., construction activities or on-site stationary sources) are regulated by the noise ordinance.

| | Land Use Categories | Energy Avera | age (CNEL) |
|---------------|---|-----------------------------------|-----------------------|
| Categories | Uses | Interior ¹ | Exterior ² |
| Residential | Single-Family, Multiple-Family | 45 ³ , 55 ⁴ | 65 ⁷ |
| | Mobile Home | — | 65 ⁵ |
| Commercial/ | Hotel, Motel, Transient Lodging | 45 | 65 ⁶ |
| Industrial | Commercial, Retail, Bank, Restaurant | 55 | — |
| | Office Building, Professional Office, Research & Development | 50 | _ |
| | Amphitheater, Concert Hall, Auditorium, Meeting Hall | 45 | _ |
| | Gymnasium (Multipurpose) | 50 | — |
| | Health Clubs | 55 | _ |
| | Manufacturing, Warehousing, Wholesale, Utilities | 65 | _ |
| | Movie Theater | 45 | _ |
| Institutional | Hospital, School Classroom | 45 | 65 |
| | Church, Library | 45 | _ |
| Open Space | Parks | _ | 65 |

Table 3.13-5: City of Irvine Interior and Exterior Noise Standards

Notes:

¹ Interior environment excludes bathroom, toilets, closets, and corridors.

² Outdoor environment limited to private yard of single-family or multifamily residences private patio, which is accessed by a means of exit from inside the unit; mobile home park; hospital patio; park picnic area; school playground; and hotel and motel recreation area.

³ Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided pursuant to Appendix Chapter 12, Section 1208 of UBC.

⁴ Noise level requirement with open windows, if they are used to meet natural ventilation requirement.

⁵ Exterior noise level shall be such that interior noise level will not exceed 45 dBA CNEL.

⁶ Except those areas affected by aircraft noise.

⁷ Multifamily developments with balconies that do not meet the 65 dBA CNEL are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

CNEL = Community Noise Equivalent Level; UBC = Uniform Building Code

Source: City of Irvine General Plan Supplement No. 3, Noise Element, Table F-1 (2005).

Municipal Code. Section 6-8-204 of the City's Municipal Code (City of Irvine, 2015a) establishes the maximum permissible noise level that may intrude into a neighbor's property. The Noise Ordinance (adopted in 1975 and revised in 2015) establishes noise level standards for various land use categories affected by stationary noise sources. Land use categories in Irvine are defined in four noise zones, as listed below. Table 13.3-5 provides the City's maximum noise standard based on the noise zone, the location of the noise (exterior/interior), and the time period. As shown in Table 3.13-6, the City's noise standards do not apply to multifamily residence private balconies (City of Irvine, 2015a).

Noise Zone 1: All hospitals, libraries, churches, schools, and residential properties

Noise Zone 2: All professional office and public institutional properties

Noise Zone 3: All commercial properties excluding professional office properties

Noise Zone 4: All industrial properties

| Noise Zone | Exterior/ Interior | Time Period | L50 (30 mins) | L25 (15 mins) | L8 (5 mins) | L2 (1 min) | L _{max} (Anytime) |
|---------------|-----------------------|---------------------|------------------|---------------------|-----------------|-----------------|-------------------------------|
| 1 | Exterior | 7:00 AM to 10:00 PM | 55 | 60 | 65 ¹ | 70 | 75 |
| | | 10:00 PM to 7:00 AM | 50 | 55 | 60 | 65 ¹ | 70 |
| | Interior | 7:00 AM to 10:00 PM | — | | 55 | 60 | 65 |
| | | 10:00 PM to 7:00 AM | — | | 45 | 50 | 55 |
| 2 | Exterior | Anytime | 55 | 60 | 65 | 70 | 75 |
| | Interior | Anytime | — | | 55 | 60 | 65 |
| 3 | Exterior | Anytime | 60 | 65 | 70 | 75 | 80 |
| | Interior | Anytime | — | | 55 | 60 | 65 |
| 4 | Exterior | Anytime | 70 | 75 | 80 | 85 | 90 |
| | Interior | Anytime | _ | _ | 55 | 60 | 65 |

Table 3.13-6: City of Irvine Maximum Noise Level Standards

Notes:

It shall be unlawful for any person at any location within the City to create any noise or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level when measured on any property within designated noise zones either within or without the City to exceed the applicable noise standard. Each of the noise standards specified above shall be reduced by 5 dBA for impact, or predominant tone noise or for noises consisting of speech or music. In the event the noise source and the affected property are within different noise zones, the noise standards of the affected property shall apply.

¹ This standard does not apply to multifamily residence private balconies. Multifamily developments with balconies that do not meet the 65 dBA CNEL are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

Source: City Municipal Code (City of Irvine, 2015a).

The City's Municipal Code Noise Ordinance has not established any upper limits for construction noise because construction noise is temporary and will stop after Project construction is complete. Section 6-8-205a of the City's Municipal Code Noise Ordinance regulates the timing of construction activities and includes special provisions for sensitive land uses. Construction activities shall occur only between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and between 9:00 a.m. and 6:00 p.m. on Saturday. No construction shall be permitted outside of these hours or on Sundays and federal holidays, except for Columbus Day, unless a temporary waiver is granted by the Chief Building Official or his or her

authorized representative. Trucks, vehicles, and equipment that are making or are involved with material deliveries, loading, or transferring materials, equipment service, maintenance of any devices or appurtenances for or within any construction project in the City shall not be operated or driven on City streets outside of these hours or on Sundays and federal holidays unless a temporary waiver is granted by the City. Any waiver granted shall take into consideration the potential impact on the community. No construction activity will be permitted outside of these hours except in emergencies, including maintenance work on the City ROWs that might be required.

Zoning Ordinance. Sections 5-8-4.A.5a and 5-8-4.A.5b of the City's Zoning Ordinance (City of Irvine, 2015b) establish requirements to minimize construction noise and vibration impacts. Although these requirements are intended for residential and mixed-use spaces in the Irvine Business Complex, the requirements listed below are applicable for the Project. Section 5-8-4.A.5a of the City's Zoning Ordinance requires that, before the issuance of grading permits, the project applicants shall incorporate the following measures as a note on the grading plan cover sheet to ensure that the greatest distance between noise sources and sensitive receptors during construction activities has been achieved:

- Construction equipment, fixed or mobile, shall be equipped with properly operating and maintained noise mufflers consistent with manufacturer's standards.
- Construction staging areas shall be located away from off-site sensitive uses during the later phases of Project development.
- The project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the Project Site, whenever feasible.
- For construction of sound walls that have been incorporated into the Project design, prior to construction of the building foundation, installation of temporary sound blankets (fences typically composed of poly-vinyl-chloride-coated outer shells with absorbent inner insulation) shall be placed along the boundary of the Project Site during construction activities.

Section 5-8-4.A.5b of the City's Zoning Ordinance requires that, before the issuance of a grading permit, applicants for individual projects that involve vibration-intensive construction activities (e.g., pile drivers, jack hammers, and vibratory rollers) near sensitive receptors shall submit a noise vibration analysis. If construction-related vibration is determined to exceed the FTA vibration annoyance criterion of 78 Velocity Level in Decibel (Vibration) (VdB) for residential uses during the daytime (FTA, 2018), additional requirements, such as the use of less vibration-intensive equipment or construction techniques, shall be implemented during construction (e.g., drilled piles to eliminate use of a vibration-intensive pile driver). In the same FTA guidelines, 84 VdB is the vibration annoyance criterion for offices and non-sensitive areas.

3.13.3. Discussion

3.13.3.1. Would the Project cause generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

The Project would require the use of heavy civil equipment to support construction activities related to utilities, drainage, roadway, structures, track, and buildings for the OCMF. Construction noise impacts were assessed by predicting construction noise levels using methods consistent with the FTA Noise and Vibration Manual (FTA, 2018) and comparing these values to identified impact thresholds (AECOM, 2021). The methodology is discussed in Appendix F (Noise and Vibration Technical Memorandum).

The range of predicted construction values presented in Table 3.13-7 represents the predicted noise levels over the 30-month Phase 1 schedule (i.e., for ST-1, 50 dBA during the least noisy month up to 68 dBA during the noisiest month). Locations of the Receiver ID can be viewed in Figure 3.13-1 of this section. Additionally, impact thresholds shown in Table 3.13-7 relate to the FTA thresholds discussed in Table 3.13-8. The predicted range of construction noise related to the Project is less than the FTA thresholds. Therefore, construction impacts related to the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies would be less than significant.

| Receiver ID/ Land Use | Impact Metric | Impact Threshold (L _{dn} /L _{eq}) | Distance to Project Center (feet) | Acoustical Shielding (dBA) | Predicted Range (L _{dn} /L _{eq}) | Impact |
|--------------------------|------------------|--|--|----------------------------------|---|--------|
| ST-1/Residential | L _{dn} | 75 | 1,275 | 5 ¹ | 50-68 | None |
| ST-2/Park | L _{eq} | 80 | 1,100 | 0 | 57-74 | None |
| ST-3/Park | L _{eq} | 80 | 1,220 | 0 | 56-73 | None |
| ST-4/Commercial | L _{eq} | 80 | 650 | 5 ² | 56-73 | None |

Table 3.13-7: Construction Noise Levels and Impacts Summary (Worst Case for All Phases)

 $ST = Short-Term; L_{dn} = day-night average sound level; L_{eq} = equivalent sound level; dBA = A-weighted decibels;$

Source: AECOM, 2021

Operational Impacts

Table 3.13-8 below provides a summary of the operational noise level predictions and impact assessment. The total Project noise level includes contributions from both on-site operational noise sources associated with the Rail Shops and Yard, as well as automobile and truck traffic in and out of the site. Methodologies detailing the calculations and noise estimates related to

the Project's construction can be found in Appendix F (Noise and Vibration Technical Memorandum). Total Project sound levels would not meet or exceed the FTA thresholds shown in Table 3.13-8. Operational impacts related to the Project that could cause the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies would be less than significant.

| Receiver info | | | | | Impact T (dl | Prediction (dBA) | | |
|---------------|-------------|---|---------------------|----------------------------|---|---------------------------------|-------------------------------|--------|
| ID | Land Use | Distance to Project Center (feet) | Analysis Metric | Existing Noise Level | Total Project- Only Sound Level | Moderate Impact Threshold | Severe Impact Threshold | Impact |
| ST-1 | Residential | 1,275 | L _{dn} | 67 | 52* | 63 | 67 | None |
| ST-2 | Park | 1,100 | L _{eq-1hr} | 55 | 41 | 61 | 66 | None |
| ST-3 | Park | 1,220 | L _{eq-1hr} | 60 | 39 | 63 | 68 | None |
| ST-4 | Industrial | 650 | Leq-1hr | 52 | 51 | 60 | 65 | None |

Table 3.13-8: Operational Noise Levels and Impacts Summary

dBA = A-weighted decibels; ST = Short-Term

*Predicted Project-only noise level at ST-1 includes contributions from both facility site and Project-related traffic on adjacent local roads.

Source: AECOM, 2021

3.13.3.2. Would the Project cause the generation of excessive groundborne vibration or groundborne noise levels?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction Impacts

Construction vibration typically only generates potential impacts at existing structures within a maximum of a few hundred feet, and only then with the use of equipment with particularly high vibration levels such as vibratory roller and impact pile drivers. Of these, impact pile drivers were identified for potential use on just two construction sub-phases, Foundations and Bridges. The exact locations of the potential pile driving activity are currently unknown, but if pile driving is conducted within approximately 250 feet of an occupied commercial building, a short-term significant impact could occur with a predicted vibration level of 75 VdB or greater (corresponding to vibration annoyance for "frequent" events). Only the commercial buildings on the southwest side of the existing SCRRA Orange Subdivision tracks could potentially be within this distance.

Ground-borne vibration for construction activities would not be expected to approach potential damage thresholds at any nearby structures. The closest distance between a pile driver and an existing building might be approximately 120 feet from the existing commercial building south of the SCRRA Orange Subdivision tracks, with an estimated vibration level from impact pile driving of 0.144 inches per second (in/sec) peak particle velocity (PPV), which is well below the damage threshold of 0.5 in/sec PPV for modern commercial buildings.

Construction impacts that could be considered significant would be construction vibration annoyance resulting from pile-driving equipment if these are used within 250 feet of an existing structure. The commercial buildings on the southwest side of the existing SCRRA Orange Subdivision tracks could potentially be within this distance. The following mitigation measures should be implemented to reduce or eliminate vibration impacts associated with the use of impact pile drivers during construction:

- **MM-NOI-1:** If feasible, relocate Project elements requiring pile driving to locations greater than 250 feet from occupied buildings.
- **MM-NOI-2:** If MM-NOI-1 is not feasible, use a less intrusive form of pile insertion, such as pre-augured piling.
- **MM-NOI-3:** Arrange to conduct pile driving activities during a period when the affected building(s) are not in use (such as Saturdays).

Operational Impacts

Metrolink actively operates on the railroad corridor that the Project would be servicing. No additional train services or increase of any train vehicles is associated with operations of the Project. While ground vibration may be generated by some types of operational rail or industrial activity, no significant ground vibration sources are anticipated from the operation of the OCMF. Methodology and findings for this topic can be found in Appendix F. Therefore, operational impacts related to the generation of excessive groundborne vibration or groundborne noise levels would be less than significant.

3.13.3.3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels?

Determination: NO IMPACT

Construction and Operational Impacts

With a distance of approximately 7 miles, John Wayne Airport is the closest airport to the Project Site. The Project would not locate new or additional sensitive receptors in the area of influence of any airports. Therefore, no construction or operational impacts would occur related to being within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, that would expose people residing or working in the vicinity of the Project to excessive noise levels.

3.14. POPULATION AND HOUSING

| Would the | project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|---|--------------------------------------|--|------------------------------------|-------------|
| 3.14.3.1 | Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | | | | |
| 3.14.3.2 | Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | | | | \boxtimes |

3.14.1. Existing Conditions

Housing does not currently exist on the Project Site and the nearest residences of a senior community are approximately 650 feet to the northeast of the Project Site. The City of Irvine has designated the existing Project Site's land use as the Great Park and zoned for 6.1 Institutional (City of Irvine, 2015). Institutional uses include a variety of publicly or privately owned and operated facilities such as hospitals, schools, religious facilities, and other nonprofit land uses.

3.14.2. Regulatory Framework

Local

City of Irvine General Plan Housing Element:

Goal 1.0 Policy 1.6: Ensure proper land use planning for adequate infrastructure, services, and facilities is provided to serve existing and future residents. The City of Irvine takes measures to ensure dedicated land for infrastructure development in support of future residents' transportation needs.

3.14.3. Discussion

3.14.3.1. Would the Project induce substantial unplanned population growth in an area either directly or indirectly?

Determination: NO IMPACT

Construction Impacts

Due to the Project's proximity to urban centers, such as the cities of Irvine and Tustin, the Project would likely draw workforce from the existing local market. If construction workers from outside the region were employed during the construction period, the temporary nature of the work suggests that it would be unlikely those non-local workers would permanently relocate. Therefore, no construction impacts related to inducing substantial unplanned population growth directly or indirectly would occur.

Operational Impacts

The Project does not include a housing component, so there would be no direct population growth induced. The nature of the work proposed under the Project is not likely to require relocation of staff, given the proximity of the Project Site to urban centers and the extended network of highways in the vicinity. Therefore, no operational impacts related to inducing substantial unplanned population growth directly or indirectly would occur.

3.14.3.2. Would the Project displace substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere?

Determination: NO IMPACT

Construction and Operational Impacts

The Project would be located on vacant land where no housing currently exists. Therefore, no construction or operational impacts related to displacing substantial numbers of housing or people necessitating the construction of replacement housing elsewhere would occur.

3.15. PUBLIC SERVICES

| | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|--|--------------------------------------|--|------------------------------------|-------------|
| Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: | | | | |
| 3.15.3.1 Fire protection? | | | \boxtimes | |
| 3.15.3.2 Police protection? | | | \boxtimes | |
| 3.15.3.3 Schools? | | | | \boxtimes |
| 3.15.3.4 Parks? | | | | \boxtimes |
| 3.15.3.5 Other public facilities? | | | | \boxtimes |

3.15.1. Existing Conditions

Table 3.15-1 lists the closest public service facilities to the Project Site. Figure 3.15-1 shows their geographical relation to the Project Site. The City of Irvine contracts with OCFA to provide fire suppression, and emergency medical, rescue, and fire prevention services to the City. Eleven OCFA fire stations serve the City, 10 of which are within a five-mile buffer from the Project Site. In addition, the Irvine Police Department serves as the main location responsible for receiving all 911 calls. The four fire and police stations located closest to the Project Site are identified in Table 3.15-1.

| Public Service Category | Name | Distance | Direction to the Project Site |
|----------------------------|--|--|----------------------------------|
| | Fire Station #20 – Irvine | 0.4 mile | Northeast |
| Fire and Freezenau | Fire Station #36 – Woodbridge | 2 miles | West |
| Fire and Emergency | Fire Station #47 – Irvine | 2.1 miles | Southwest |
| | Fire Station #51 – Irvine Spectrum | 1.9 miles | Southeast |
| | Irvine Valley College Police Department | 1.4 miles | West |
| Police Protection | Cal State Fullerton Police Department | 1 mile | Southwest |
| | Irvine Police Department – Spectrum Substation | 1.1 miles | South |
| | Irvine Police Department | 4.4 miles | Northwest |
| | Irvine Valley College | 1.4 miles | Northwest |
| | Cal State Fullerton Irvine Center | 1 mile | Southwest |
| Schools | Portola High School | 2 miles | East |
| | Lakeside Middle School | 2.6 miles | Northwest |
| | Cypress Village Elementary School | DistanceProject Site0.4 mileNortheast2 milesWest2.1 milesSouthwest1.9 milesSoutheast1.9 milesWest1.4 milesWest1 mileSouthwest1 mileSouthwest1.1 milesSouth4.4 milesNorthwest1.4 milesNorthwest1.1 mileSouth2 milesEast2 milesEast2.6 milesNorthwest1.1 mileSouthwest1.5 milesNorthwest1.4 milesSouthwest1.5 milesSouthwest1.4 milesSouthwest1.5 milesSouthwest1.5 milesNorthwest1.5 milesSouthwest1.5 milesNorthwest1.5 milesNorthwest1.6 milesNorthwest2.4 milesNorthwest | |
| | Cypress Community Park | 1.5 miles | Northwest |
| Parks | Oak Creek Community Park | 1.1 miles | Southwest |
| | Great Park | 600 feet | Northeast |
| | Hoag Hospital Irvine | 1.4 miles | Southwest |
| | Kaiser Permanente – Alton/Sand Canyon Medical Offices | 1.5 miles | Southwest |
| | Irvine Community Church | 0.5 mile | Northwest |
| Other Services | Grace City Church | 1.6 miles | Northwest |
| | Orange County Library – Heritage Park | 2.4 miles | Northwest |
| | Orange County Library – University Park | 4 miles | Southwest |

Source: AECOM, 2020



Figure 3.15-1: Public Service Facility Location Map

Source: AECOM 2020

Table 3.15-2 summarizes the fire responses and incidents that occurred in the City of Irvine in 2019.

| Jurisdiction | Population | Unit | Fire | Fire | EMS | Other | Total |
|--------------|------------|-----------|----------|-----------|-----------|-----------|-----------|
| | (2019) | Responses | Stations | Incidents | Incidents | Incidents | Incidents |
| Irvine | 280,202 | 25,385 | 11 | 252 | 12,729 | 5,091 | 18,072 |

Table 3.15-2: City of Irvine Response Data Summary

Source: OCFA, 2019

The OCFA - Standards of Coverage and Deployment Plan published in 2014 delineated that, during larger incidents, OCFA is typically acting together with one or more neighboring fire departments in providing fire and life protection through a coordinated regional response system of mutual and automatic aid agreements. It is suggested in the plan that a prompt arrival of at least four personnel is critical for structure fires (OCFA, 2014). According to OCFA, three of the four fire stations located nearest to the Project Site all have less than 1,000 annual responses. This means that the stations have less workload than 70 percent of the other OCFA fire stations and are not at full capacity and would be able to handle additional fire service needs.

Police Services

The Irvine Police Communications Bureau serves as the primary answering point for all 911 emergency calls and is responsible for dispatching of police and animal services field resources. It functions under the Business Services Division in the Irvine Police Department. The Communications Bureau staff is composed of one communications bureau supervisor, four supervising dispatchers, 15 full-time dispatchers, and two part-time dispatchers (City of Irvine, 2020a).

Table 3.15-3 summarizes the existing police service level in Irvine. Currently, every 10,000 Irvine residents are served by eight officers and 11 law enforcement employees.

| Jurisdiction | Officers per 10k Population | Officers | Total Law Enforcement per 10k Population | Total Law Enforcement |
|--------------|--------------------------------|----------|---|--------------------------|
| Irvine | 8.0 | 213 | 11.3 | 301 |

Table 3.15-3: Police Service Staffing Summary

Source: Governing calculations of employment and population data from 2016 FBI Uniform Crime Reporting program

As shown in Table 3.15-1, three police stations are located near the Project Site. They are the Irvine Valley College Police Department, the Cal State Fullerton Police Department, and the Irvine Police Department – Spectrum Substation. The Spectrum Substation will be the principal service provider to the Project Site. The two school police departments do not usually answer requests outside of their respective campuses; however, additional staff could be dispatched for emergencies. In addition, the Irvine Police Department headquarters located 4.4 miles northwest of the Project Site could also serve as a backup in situations where the other three closer police departments are short in staff. With a low crime rate, the capacity of police service is sufficient for the Project Site through coordination of the three police departments.

School Services

The Irvine Unified School District (IUSD) provides service to the Project Site. As indicated in Table 3.15-1, the closest schools to the Project Site are Cypress Village Elementary School, Lakeside Middle School, and Portola High School.

Park Services

There are currently 23 community parks, six special facilities, and 39 neighborhood parks serving the City of Irvine. As of 2019, approximately 1,926 acres of park facilities are serving a population of 280,202. On average, 1 acre of park facility is serving 145 Irvine residents (City of Irvine, 2020b).

The community parks closest to the Project Site are Cypress Community Park, Oak Creek Community Park, and the Great Park.

Other Services

Other services include public facilities such as libraries, churches, and hospitals. The facilities located closest to the Project Site are identified in Figure 3.15-1 and described in Table 3.15-1.

3.15.2. Regulatory Framework

Regional

Orange County Fire Authority - Standards of Coverage and Deployment Plan (2014)

The Orange County Fire Authority - Standards of Coverage and Deployment Plan lays out the response time objectives in the scenarios below:

- Total response time for arrival of the first arriving response unit at a core incident. The first response unit capable of initiating effective incident intervention shall arrive at a core emergency within the time specified for each level of service area from receipt of the call at the dispatch center 90 percent of the time. In Urban Areas, the goal is 8 minutes, 45 seconds.
- Total response time for arrival of the first arriving Advanced Life Support response unit at a core medical incident. The first response unit capable of initiating effective incident intervention shall arrive at a core emergency within the time specified for each level of service area from receipt of the call at the dispatch center 90 percent of the time. In Urban Areas, the goal is 9 minutes and 54 seconds.

Local

City of Irvine General Plan Public Service Element

The City of Irvine also established response time standards in its General Plan:

• For fire and basic life safety incidents in urban areas, a first due unit shall be on scene within a five-minute response time, 80 percent of the time.

• For advanced life support incidents, units shall be located and staff available within an eight-minute response time, 80 percent of the time.

The standards for typical school sizes are as follows:

- Elementary School (K-6): Permanent core building to house 600 students, with provisions for relocatable buildings to house a maximum of 720 students on an average site of 10 acres.
- Middle School (7-8): Permanent facilities for 700 students with provision for relocatable buildings and short-term overload of facilities to house a maximum of 900 students on an average site of 20 acres.
- High School (9-12): Permanent facilities for 1,800 students with provisions for relocatable buildings and short-term overload of facilities to house a maximum of 2,400 students on an average site of 40 acres.

3.15.3. Discussion

3.15.3.1. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for <u>fire protection</u>?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

Construction of the Project would require the use of temporary construction workers. However, as discussed in the Section 3.14 Population and Housing, these construction workers would not result in a permanent increase in residential population. Therefore, no substantial increase in demand for fire services would result and no new facilities would be required. As such, construction impacts related to the provision of new facilities as a result of an increase in demand for fire services would be less than significant.

Operational Impacts

Operation of the Project would generate some work-based trips in the Project Site. As discussed in Section 3.14, this increase in work-based trips would not result in a generation of a permanent residential population. Nevertheless, an increase in demand for fire services is likely due to the increase in workforce in this area. As part of the design process, coordination with the local fire department would be required before any building occupancy to ensure worker safety measures are in place. As previously stated, three of the four fire stations that would be serving the Project Site, including Fire Stations #20, #47, and #51, are not at full capacity and would be able to handle additional fire service needs through local coordination. Coordination across the four existing fire stations would sufficiently meet any potential

increase in fire service demand due to operations of the Project. Therefore, operational impacts related to the provision of new facilities as a result of increased demand for fire services would be less than significant.

3.15.3.2. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for <u>police protection</u>?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

Construction of the Project would generate temporary construction workers. However, the construction workers are not anticipated to generate a permanent residential population and, therefore, no substantial demand increase for police services. Therefore, construction impacts related to the provision of new facilities as a result of an increase in demand for police services would be less than significant.

Operational Impacts

Operation of the Project would generate some work-based trips in the Project Site. Increased work-based activities would not result in generation of a permanent residential population but would still increase demand for police services. However, police service needs induced by the Project are small enough to be covered by the existing police and sheriff resources in the vicinity of the Project. The Irvine Police Department – Spectrum Substation would be the principal service provider to meet the additional police service needs at the Project Site. Furthermore, the Irvine Police Department headquarters, as well as the nearby Irvine Valley College Police Department and Cal State Fullerton Police Department, would be available for situations when the aforementioned resources have been exhausted. It is anticipated that the capacity of police service is sufficient for the Project Site through coordination of three police departments. Therefore, operational impacts related to the provision of new facilities as a result of increased demand for police services would be less than significant.

3.15.3.3. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for <u>schools</u>?

Determination: NO IMPACT

Construction and Operational Impacts

The Project does not include a housing component that would induce direct population growth that would then generate school-age population. Workers, temporary or permanent,

are not anticipated to generate a permanent residential population that would generate school age children that would in turn increase demand for school services. Therefore, no construction or operational impacts related to the provision of new facilities as a result of an increase in demand for school services would occur.

3.15.3.4. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for <u>parks</u>?

Determination: NO IMPACT

Construction and Operational Impacts

The Project does not include a housing component that would induce direct population growth that would then generate demand for parks. Workers, temporary or permanent, are not anticipated to generate a permanent residential population that would generate demand for parks. Therefore, no construction or operational impacts related to the provision of new facilities as a result of an increase in demand for parks would occur.

3.15.3.5. Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for <u>other public service facilities</u>?

Determination: NO IMPACT

Construction and Operational Impacts

The Project does not include a housing component that would induce direct population growth that would then generate demand for other public services facilities. Workers, temporary or permanent, are not anticipated to generate a permanent residential population that would generate increased demand for other public services facilities. Therefore, no construction or operational impacts related to the provision of new facilities as a result of an increase in demand for other public service facilities would occur.

3.16. RECREATION

| Would the | project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|--|--------------------------------------|--|------------------------------------|-----------|
| 3.16.3.1 | Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | | | | |
| 3.16.3.2 | Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? | | | | |

3.16.1. Existing Conditions

The City of Irvine's public park system can be broken down into two categories: community parks and neighborhood parks. Community parks are owned and maintained by the City. These parks are generally a minimum of 20 acres in size and able to accommodate 10,000 persons (City of Irvine, 2015). There are two types of neighborhood parks: public neighborhood parks and private neighborhood parks. Public neighborhood parks are generally a minimum of 4 acres in size and able to serve a minimum of 2,500 persons (City of Irvine, 2015). Currently, 23 community parks and 39 neighborhood parks serve the City of Irvine. Additionally, the City is providing special recreation services to their residents through six special facilities such as the Irvine Animal Care Center, Harvard Skate Park, and Aquatic Centers such as the William Woollett Jr. Aquatics Center and the Northwood Aquatics Center. Recreational facilities and services can also be provided by the private sector and by jurisdictions other than the City. Private parks are owned and maintained by homeowner associations or maintenance districts (City of Irvine, 2015). In terms of jurisdictions other than the City, a county-wide regional park is located in the City and adjacent to the Project Site, which is known as the Great Park.

According to the City of Irvine General Plan, developers of residential subdivisions are required to dedicate parkland, or pay fees in lieu of dedication, at the rate of 5 acres per 1,000 population. The allocation of 5 acres of parkland is apportioned as 2 acres for community parks and 3 acres for neighborhood parks (City of Irvine, 2015).

One of the objectives in the City's General Plan is to "provide community parks which serve residents of a planning area to citywide level by providing facilities appropriate for citizens of various ages and interests, such as: community centers, athletic facilities, and picnic areas" (City of Irvine, 2015). Therefore, many community parks also function as community centers with athletic and picnic facilities. Parks are not the only facilities that can provide recreation services. Several other commercial

recreational facilities such as the Ranch House - Recreation Center and the Trabuco Center also offer spaces for community activities and programs.

Table 3.16-1 lists the nearest recreational facilities to the Project Site. Figure 3.16-1 shows their geographical relation to the Project Site.

Two community parks, four community parks/community centers, and two recreation centers are within a three-mile radius of the Project Site.

| Recreational Facility Name | Distance to Project Site | Direction from the Project Site | | |
|--|--------------------------|------------------------------------|--|--|
| Great Park | 600 feet | Northeast | | |
| Oak Creek Community Park | 1.1 miles | Southwest | | |
| Cypress Community Park/Recreation Center | 1.5 miles | Northwest | | |
| Trabuco Center | 1.7 miles | Northwest | | |
| Woodbury Community Park/Recreation Center | 1.8 miles | North | | |
| Los Olivos Community Park/Recreation Center | 2.1 miles | South | | |
| Quail Hill Community Park/Recreation Center | 2.3 miles | Southwest | | |
| Ranch House - Recreation Center | 2.8 miles | Northeast | | |

Table 3.16-1: Recreational Facility Summary

Source: AECOM, 2020

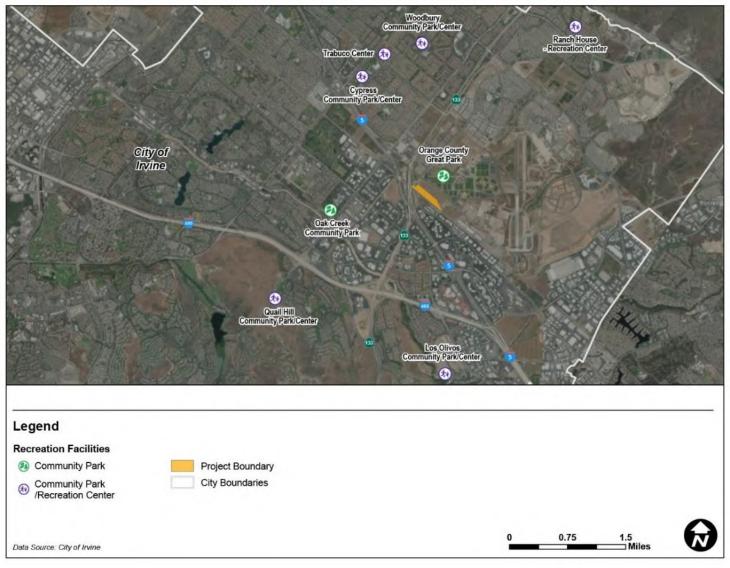


Figure 3.16-1: Recreational Facility Location Map

Source: AECOM, 2020

3.16.2. Regulatory Framework

City of Irvine General Plan, Parks and Recreation Element Objective K-1, Recreational Opportunities:

Developers of residential subdivisions are required to dedicate park land, or pay fees in lieu of dedication, at the rate of 5 acres per 1,000 population. The allocation of 5 acres park land is apportioned as 2 acres for community parks and 3 acres for neighborhood parks.

Provide for a broad spectrum of recreational opportunities and park facilities, in either public or private ownership, to accommodate a variety of types and sizes of functions.

Policy (a) Provide community parks which serve residents of a planning area to citywide level by providing facilities appropriate for citizens of various ages and interests, such as:

- Community centers
- Athletic facilities
- Competition-level swimming pools
- Picnic areas
- Cultural centers
- Day care centers

3.16.3. Discussion

3.16.3.1. Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Determination: NO IMPACT

Construction and Operational Impacts

The Project does not include a housing component that would induce direct population growth that would then generate demand for parks or recreational facilities. Workers, temporary or permanent, are not anticipated to generate a permanent residential population that would generate demand for parks or recreational activities. As such, the Project would not conflict with the city's General Plan because the proposed OCMF would not be required to dedicate park land, or pay fees in lieu of dedication. Therefore, there are no construction or operational impacts related to the increase in use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

3.16.3.2. Would the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Determination: NO IMPACT

Construction and Operational Impacts

The Project does not include new recreational facilities or require the expansion of existing recreational facilities. Therefore, no construction or operational impacts would occur.

3.17. TRANSPORTATION

| Would the | project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|--|--------------------------------------|---|------------------------------------|-----------|
| 3.17.3.1 | Conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities? | | | | |
| 3.17.3.2 | Would the project conflict with or inconsistent with CEQA Guidelines Section 15064.3 subdivision (b)? | | | | |
| 3.17.3.3 | Substantially increase hazards due to a geometric design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)? | | | | |
| 3.17.3.4 | Result in inadequate emergency access? | | | | \square |

3.17.1. Existing Conditions

The 21.3-acre Project Site, which is undeveloped and vacant, lies directly northeast of the existing SCRRA Orange Subdivision railroad tracks (between mileposts 183.50 and 184.00) and south of Marine Way and the Great Park. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley. The Project Site is bordered by a property owned by Orange County to the northeast, which connects to I-5 through ramps to/from Sand Canyon Avenue. To the southwest, the Project Site is bound by the existing SCRRA Orange Subdivision ROW (Figure 3.17-1).

Pedestrian access to/from the Project Site would be available via public sidewalks on Marine Way. Bicycle access to/from the Project Site would be available via Class II bikeways on Marine Way.

Surface parking spaces are available in two parking lots of the Great Park are northeast of the site on the north side of Marine Way.

OCTA currently operates bus Routes 90, 402, and 403 in the vicinity of the Project Site, with four stops within 1.3 miles of the Project (Figure 3.17-2).

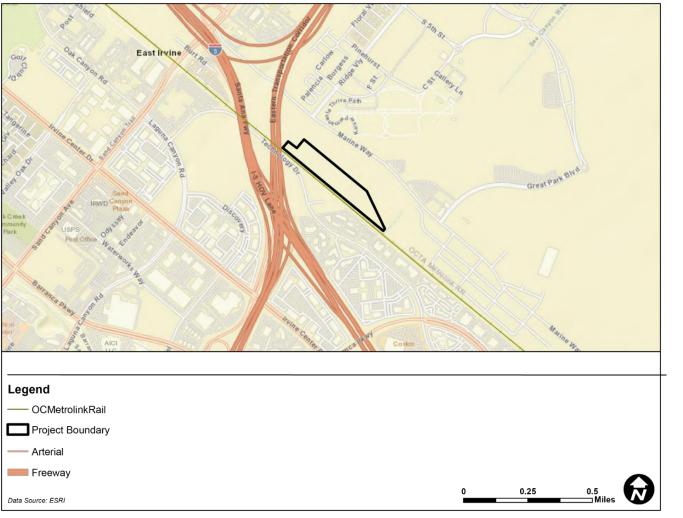
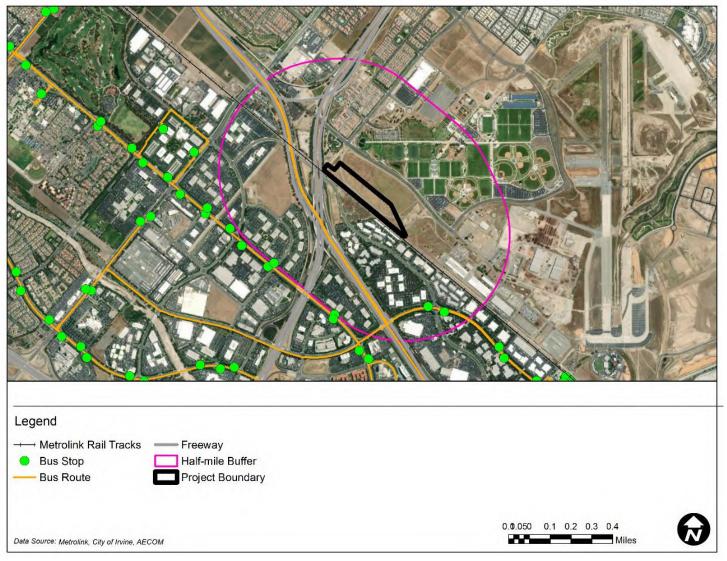


Figure 3.17-1: Roadway Network in the Project Site Vicinity

Source: AECOM, 2020





Source: AECOM, 2020

3.17.2. Regulatory Framework

Local

City Standard Condition 3.17 (Emergency Access Plan) - An Emergency Access Plan will need to be submitted and approved by the Chief of Police, identifying and locating all Knox Boxes, Knox key switches, and Click2Enter radio access control receivers per the Irvine Uniform Security Code requirements.

City Standard Condition 4.9 (Emergency Access Inspection) - An inspection will need to be arranged prior to the Project opening, which is to be performed by the City of Irvine Police Department and OCFA, to ensure compliance with the Emergency Access Plan requirements. Test acceptance and locations of all Knox boxes, key switches and Click2Enter devices as depicted on the approved plan will need to be verified.

- The Project will also need to comply with the following City of Irvine municipal/zoning code items: Irvine Municipal Code, Title 6 (Public Works), Division 3 (Transportation), Chapter 6 (Trip Reduction Facilities).
- Irvine Municipal Code, Title 6 (Public Works), Division 3 (Transportation), Chapter 7 (North Irvine Transportation Mitigation Program).

Irvine Sustainability Community Initiative (Initiative Ordinance 10-11) - The Irvine Sustainability Community Initiative, adopted by the voters of the City as Initiative Measure S on November 2, 2010, and certified by the City Council on December 14, 2010, became effective December 24, 2010. The ordinance was adopted to ratify and implement policies in support of renewable energy and environmental programs for a sustainable community. It outlines the City's direction for continuing to develop and implement programs geared towards green building, renewable energy, and sustainability. For example, the City will continue to develop and implement participation in alternative transportation modes, including but not limited to alternate fuel, reduced emission or zero emission vehicles, mass transit services, carpooling, bicycling, and walking.

City of Irvine Engineering Standard Plans - The City's Engineering Standard Plans provide detailed requirements (e.g., dimensions, location) and illustrations for the design and construction of, among other things, roadways, driveways, curbs, raised medians, and sight distances.

City of Irvine Street Design Manual - All grading and improvement projects, whether public or private, are required to be designed in accordance with the City of Irvine Design Manual, Section 101 Street Design (2013). The Project will need to comply with the Design Manual since driveways and private roads will be added.

3.17.3. Discussion

3.17.3.1. Would the Project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Determination: LESS THAN SIGNIFCANT IMPACT

Construction Impacts

Transportation-related programs, plans, ordinances, and policies relevant to the Project are listed below:

- City of Irvine General Plan (Amended through June 2015)
- Connect SoCal (SCAG, 2020)
- OCTA Long-Range Transportation Plan (OCTA, 2018)
- City of Irvine Traffic Study Guidelines (City of Irvine, 2021)
- City of Irvine Transportation Design Procedures (City of Irvine, 2007)
- Orange County Foothills Bikeways Strategy (OCTA, 2016)
- City of Irvine Active Transportation Plan (City of Irvine, 2015)

During construction of the Project, a temporary increase in VMT is anticipated along the roadway network at the Project Site and along Marine Way and Ridge Valley due to construction activities.

No transit, freight, or pedestrian infrastructure is identified in the immediate vicinity of the Project Site. There are existing Class II bikeways along Marine Way and Ridge Valley. The construction of the Project would not require new or additional transit, freight, bicycle, or pedestrian infrastructure because the existing roadway network would provide sufficient construction access to the Project Site.

Therefore, no construction impacts related to the Project being in conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, freight, bicycle, and pedestrian facilities, would occur.

Operational Impacts

Level of Service (LOS) Impacts

The Project Site can be accessed by I-5 at Sand Canyon Avenue, supplemented by SR-133 for regional trips. Local access is primarily provided by Marine Way and Ridge Valley. The LOS of four intersections and three roadway segments were analyzed to determine the LOS deficiency resulting from the Project. The four intersections analyzed are:

- 1. Sand Canyon Avenue / I-5 Northbound Ramps
- 2. Sand Canyon Avenue / Marine Way
- 3. Sand Canyon Avenue / I-5 Southbound Ramps

4. Ridge Valley / Marine Way

The three roadway segments analyzed are:

- A. Marine Way between Sand Canyon Avenue and Ridge Valley
- B. Marine Way east of Ridge Valley
- C. Ridge Valley between Great Park Boulevard and Marine Way

Table 3.17-1 summarizes the LOS for the four intersections analyzed under six scenarios during AM Peak hours and PM Peak hours, respectively. Table 3.17-2 summarizes the LOS for the three roadway segments analyzed under six scenarios.

Table 3.17-1: Summary of Traffic Effects (Intersection LOS) in OCTA Project Vicinity

| | | Intersection LOS | | | | | | | |
|----------------------|----------------|--------------------------------------|---------------------------------|--------------------------------------|-----------------------------|--|--|--|--|
| Scenario | Time Period | Sand Canyon Ave./ I-5 NB Ramps | Sand Canyon Ave./ Marine Way | Sand Canyon Ave./ I-5 SB Ramps | Ridge Valley/ Marine Way | | | | |
| Evicting Deceline | AM Peak | А | В | А | A | | | | |
| Existing Baseline | PM Peak | В | А | А | А | | | | |
| Existing Baseline + | AM Peak | А | В | В | A | | | | |
| Project | PM Peak | В | А | А | А | | | | |
| Short-term Interim | AM Peak | С | А | В | А | | | | |
| Year Alt 1 | PM Peak | D | C | С | А | | | | |
| Short-term Interim | AM Peak | С | А | В | А | | | | |
| Year Alt 1 + Project | PM Peak | D | C | С | А | | | | |
| Short-term Interim | AM Peak | С | A | В | А | | | | |
| Year Alt 2 | PM Peak | С | A | С | A | | | | |
| Short-term Interim | AM Peak | С | A | В | A | | | | |
| Year Alt 2 + Project | PM Peak | С | A | С | А | | | | |

Source: AECOM (2022)

Based on the results of the LOS analysis in Table 3.17-1 and Table 3.17-2, all study intersections and roadway segments would operate at acceptable LOS under all scenarios based on the City's LOS thresholds, with the exception of the segment of Marine Way between Sand Canyon Avenue and Ridge Valley, which would be deficient under Short-Term Interim Year Alternative 1, with and without the Project. However, a peak-hour link analysis indicates that this segment would operate at acceptable conditions based on peak-hour LOS, even with the addition of the Project. Therefore, the Project would not result in or substantially contribute to LOS deficiencies at any study intersections or roadway segments and no improvements are required.

| | Roadway Segment LOS | | | | | | | |
|--|--|------------------------------------|--|--|--|--|--|--|
| Scenario | Marine Way between Sand Canyon Avenue and Ridge Valley | Marine Way East of Ridge Valley | Ridge Valley between Great Park Boulevard and Marine Way | | | | | |
| Existing Baseline | D | А | А | | | | | |
| Existing Baseline + Project | D | A | A | | | | | |
| Short-term Interim Year Alt 1 | F | А | А | | | | | |
| Short-term Interim Year Alt 1 + Project | F | А | А | | | | | |
| Short-term Interim Year Alt 2 | А | А | А | | | | | |
| Short-term Interim Year Alt 2 + Project | A | A | A | | | | | |

Table 3.17-2: Summary of Traffic Effects (Roadway Segment LOS) in OCTA Project Vicinity

Source: AECOM (2012)

An analysis of the City of Irvine's Transportation Design Procedures (TDPs) was conducted to determine if the roadway modifications to provide direct access to the Project Site would satisfy the City's TDPs. The Transportation Technical Memorandum (Appendix H) concluded that all Project modifications comply with all applicable TDPs, including TDP-10 (Distance Between Driveways and Intersections), TDP-11 (Corner Clearance), and TDP-14 (Driveway Lengths).

Congestion Management Program Impacts

Table 3.17-3 indicates the Project's weekday daily trip generation to be 220. As a result, a VMT impact analysis is not required for the Project, in accordance with the project screening criteria established in Exhibit 8 of the City of Irvine Traffic Study Guidelines (City of Irvine, 2021).

| | Vehicle Trips | | | | | | | | | |
|--------------------|---------------|-------|-----|--------------|----|-----|--------------|----|-----|-------|
| Trip category | | Daily | | AM peak hour | | | PM peak hour | | | |
| | | In | Out | Total | In | Out | Total | In | Out | Total |
| Worker commutes | 80 employees | 80 | 80 | 160 | 8 | 24 | 32 | 0 | 8 | 8 |
| Fleet vehicles | 10 vehicles | 10 | 10 | 20 | 3 | 1 | 4 | 1 | 6 | 7 |
| Other | | 20 | 20 | 40 | 3 | 3 | 6 | 3 | 3 | 6 |
| Total | | 110 | 110 | 220 | 14 | 28 | 42 | 4 | 17 | 21 |

Notes: "Other" includes deliveries, visitors, and other ancillary traffic. No "other" trips are assumed during a.m. and p.m. peak hours.

Source: AECOM (2022)

The daily weekday trip generation of 220 is also below the general threshold of 2,400 daily trips for all development projects and the specific threshold of 1,600 daily trips for development projects with direct access to, or in proximity to, the Congestion Management Program (CMP) Highway System. Therefore, a CMP Traffic Study to determine the Project's consistency with the CMP is not required, in accordance with Exhibit 6 of the City of Irvine Traffic Study Guidelines (City of Irvine, 2021).

<u>Freight</u>

The Project would not contribute to increased traffic on the SCRRA Orange Subdivision,. Therefore, no operational impacts would occur related to the Project being in conflict with a program, plan, ordinance, or policy addressing the circulation system.

Bicycles

While the Project is a specialized use with limited access for the general public and would not be a major activity generator or attractor for bicycle activities, bicycle access would be provided by existing Class II bikeways along Marine Way, Ridge Valley, and Sand Canyon Avenue, as well as Class I bikeways along Sand Canyon Avenue (Sand Canyon Side Path) and within the Great Park and the surrounding neighborhoods. The Project would not physically alter existing bikeways, and the proposed modifications at the Ridge Valley / Marine Way intersection as part of the Ridge Valley extension would be designed in accordance with applicable standards to facilitate safe bicycle circulation at this location.

Bicycle infrastructure at the Project's operational phase conforms to Objective B-4 of the Circulation Element of the City's General Plan, which is to "plan, provide and maintain a comprehensive bicycle trail network that together with the regional trail system, encourages increased use of bicycle trails for commuters and recreational purposes."

Pedestrians

The Project would be considered a specialized use without access for the general public and would not be a major activity generator or attractor. Pedestrian circulation from the general public is not anticipated for the Project and therefore sidewalks would not be provided on the Ridge Valley extension. The Project would provide two sidewalk curb ramps on the Ridge Valley and Marine Way intersection. These modifications would generally support Objective B-3 and the three associated policies by providing safe, convenient, and direct pedestrian access. Proposed modifications would also be designed in accordance with applicable standards (such as City of Irvine street design standards and Americans with Disabilities Act [ADA] design standards) and would facilitate safe pedestrian circulation at this location.

<u>Transit</u>

As shown in Figure 3.17-2, there are no transit services in the immediate vicinity of the Project Site. The closest major route is OCTA's Route 90, with the closest stops located approximately 1.3 miles away from the Ridge Valley / Marine Way intersection. Supplemental peak-period-only bus service is provided by two OCTA Shuttle routes (402C and 403D) at Metrolink's Irvine Station. Route 402C is approximately 1.1 miles away from the Ridge Valley / Marine Way intersection and Route 403D is approximately 1.4 miles away from the Ridge Valley / Marine Way intersection.

These two routes are designed to connect Metrolink passengers with workplaces in the areas surrounding the station, and only operate in commute directions (departing the station during the a.m. peak period and arriving at the station during the p.m. peak period).

Given the above considerations, construction and operation of the Project would generally conform to and support—and not conflict with—programs, plans, ordinances, and policies addressing the circulation system, and the associated impacts of Project operation related to the regulatory setting would be less than significant.

3.17.3.2. Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction Impacts

During the construction phase of the OCMF, an increase of VMT induced by constructionrelated vehicular activities to and from the proposed OCMF is anticipated. However, these activities are not anticipated to generate a permanent increase in VMT. Therefore, construction impacts related to the Project being in conflict with CEQA Guidelines section 15064.3 subdivision (b) would be less than significant.

Operational Impacts

While some increase in localized VMT is anticipated due to vehicles traveling to and from the proposed OCMF, impacts resulting from increased VMT would be minor and would not generate a permanent increase in VMT. Therefore, operational impacts related to the Project being in conflict with CEQA Guidelines section 15064.3 subdivision (b) would be less than significant.

3.17.3.3. Would the Project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Determination: NO IMPACT

Construction and Operational Impacts

The Project would involve construction and operation of a new commuter rail storage and maintenance facility, along with associated trackwork and site access improvements.

There are no existing at-grade crossings along the SCRRA Orange Subdivision near the Project Site. The service tracks, storage tracks, access tracks, and run-around track would be constructed on the existing vacant land. The lead tracks and some set-out tracks would be constructed within the existing SCRRA ROW. The inside circulation, including at-grade crossings within the Project Site, would be designed to avoid geometric features that would increase hazards or incompatible uses. No new at-grade crossing or any permanent physical barriers on existing public streets would be created as part of the Project.

In addition, the design, construction, and operation of the Project would comply with applicable standards at the federal, state, and local level. Similarly, design, construction, and operation of site access improvements, including new roadways or modifications to existing roadways, would adhere to applicable standards such as the California Manual on Uniform Traffic Control Devices and the City of Irvine's standard plans and design guidelines. Design approval for specific Project components would be sought from the appropriate agencies as part of detailed design and subsequent stages of the Project.

Given these considerations, no construction or operational impacts related to hazards from geometric design features or incompatible uses would occur.

3.17.3.4. Would the Project result in inadequate emergency access?

Determination: NO IMPACT

Construction and Operational Impacts

Local vehicle access in the area is currently provided primarily by Marine Way and Ridge Valley. Emergency access to the Project would be through the extension of Ridge Valley on the northwest side of the Project Site. Although the emergency access would be on the west side

of the Project Site, the internal circulation design would ensure easy access to the east side of the Project Site.

The Project does not involve elimination of a through-route, nor does it involve the narrowing of a roadway. However, the Project would include the modification of the traffic signal at the existing Marine Way/Ridge Valley intersection for vehicles leaving the Project Site. The proposed access road and drive lanes extending from the existing Ridge Valley would be required to meet standards. The access road design for the Project must be coordinated with third-party stakeholders including but not limited to the County of Orange, City of Irvine, IRWD, and Heritage Fields LLC. The design also needs to comply with all building, fire, and safety codes, and plans are subject to review and approval by the City of Irvine's Public Works and the Transportation Departments, the Building Division, and OCFA. Any temporary roadway closures would be coordinated with local agencies to minimize any disruptions to the circulation system, including to emergency vehicle response.

Given these considerations, no construction or operational impacts related to the Project resulting in inadequate emergency access would occur.

3.18. TRIBAL CULTURAL RESOURCES

| Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: | | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|--|---|--------------------------------------|--|------------------------------------|-----------|
| 3.18.3.1 | Listed or eligible for listing in the California Register of Historic Resources, or in the local register of historical resources as defined in Public Resources Code Section 5020.1(k) or | | | | |
| 3.18.3.2 | A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision(c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision(c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | | | | |

3.18.1. Existing Conditions

No resources eligible for listing in the NRHP, CRHR, or local register were identified during the course of the archival research or archaeological survey. No potential tribal cultural resources were identified during the courses of archival research or the archaeological survey.

On July 8, 2020, AECOM contacted the Native American Heritage Commission (NAHC) and requested the Sacred Lands File be searched for documented sacred sites within the APE or its vicinity. The NAHC responded in a letter dated July 9, 2020. According to the NAHC letter, "The results were positive [meaning that there are known sacred lands or resources in the vicinity of the APE]. Please contact the Juaneno Band of Mission Indians and the Juaneno Band of Mission Indians Acjachemen Nation - Belardes on the attached list for more information." The response also included a list of 11 Native American representatives of nine State-recognized tribal governments who may have interest in and knowledge of resources that may be impacted by the Project.

OCTA contacted each of the tribal contacts by mail on June 2, 2021, to invite them to consult under both AB 52. One of these letters was returned by the U.S. Postal Service as undeliverable. Follow-up emails were sent on June 30, 2021, to each tribal contact who did not respond to the mailing.

To date, one tribal representative has responded to the request for AB 52 consultation. Chairperson Andrew Salas of the Gabrieleno Band of Mission Indians-Kizh Nation requested a meeting with OCTA to discuss his tribe's concerns regarding the project. On September 9, 2021, a meeting was held between OCTA representatives and Chairperson Salas and Tribal Archaeologist John Torres representing the Kizh Nation. At the meeting, Chairperson Salas expressed that the Project APE is sensitive for buried tribal cultural resources. He pointed out that his tribe, and his family in particular, have ties to the region. He noted that railroads often followed traditional Native American trails, and also observed that military bases often encompassed ancient village sites. Moreover, he informed OCTA that his monitors are currently involved in projects elsewhere in the Irvine area where buried human remains were identified by his tribal monitors. Chairperson Salas recommended tribal monitoring during ground-disturbing activities in order to identify and protect any tribal cultural resources that may exist within the APE. Chairperson Salas provided OCTA with more historical information regarding the general project region, the project APE, as well sample language to help guide mitigation measures to be developed for this project.

3.18.2. Regulatory Framework

<u>State</u>

CEQA - CEQA was modified in 2014 with the passage of AB 52. AB 52 established a new category of protected resources in CEQA called tribal cultural resources. The purpose of establishing this new category of resources is to consider tribal cultural values in addition to scientific and archaeological values when determining project impacts and mitigation measures during the planning process.

Assembly Bill 52 - AB 52 recognizes that "California Native American tribes may have expertise with regard to their tribal history and practices, which concern the tribal cultural resources with which they are traditionally and culturally affiliated. Because the California Environmental Quality Act calls for a sufficient degree of analysis, tribal knowledge about the land and tribal cultural resources at issue should be included in environmental assessments for projects that may have a significant impact on those resources."

According to PRC Section 21074, tribal cultural resources consist of either of the following:

- (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
 - (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.
 - (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
- (2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Additionally, PRC Section 21080.3.1 was also added to the Public Resources Code by Assembly Bill 52. Section 21080.3.1 recognizes that California Native American tribes which are traditionally and culturally affiliated with a geographic area may have expertise regarding potential tribal cultural resources that may be impacted by proposed projects. Section 21080.3.1 also mandates that a lead agency consult with geographically and culturally affiliated Native American tribes prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report for a project in order to identify potential impacts to tribal cultural resources and, if necessary, craft mitigation measures to reduce impacts to tribal cultural resources.

3.18.3. Discussion

3.18.3.1. Would the Project cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historic Resources, or in the local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

Determination: LESS THAN SIGNIFCANT WITH MITIGATION INCORPORATED

Construction Impacts

A resource is generally considered "historically significant" if the resource meets at least one of the four criteria for listing in the CRHR (PRC Section 5024.1[a]). The CRHR is used as a guide by state and local agencies, private groups, and citizens to identify the state historical resources and to include which properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The CRHR evaluation criteria are similar to NRHP criteria. For a property to be eligible for inclusion in the CRHR, it must meet one or more of the following criteria:

- It is associated with events that have made a significant contribution to the broad patterns of California history and cultural heritage;
- It is associated with the lives of persons important in California's past;
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- It has yielded, or may be likely to yield, important information in prehistory or history.

An archival records search for the Project Site was conducted at the SCCIC. Previously conducted cultural resources investigations and previously identified cultural resources were reviewed as part of this investigation. A half-mile radius around the Project Site was examined. Archival research indicates that the entire Project Site has been previously studied. A pedestrian survey was conducted within all portions of the Project Site to identify and record cultural resources that are at least 45 years old and evaluate any discovered resources for historical significance based on criteria for listing in the CRHR.

In the course of the archival research, one previously-recorded Venus shell fragment was identified within the Project Site (P-30-100372), refer to Section 3.5.3.2. The resource was not relocated during the survey. The clam shell fragment may or may not have been deposited as a result of Native American use of the Project Site. As described in detail above, a resource is generally considered "historically significant" if the resource meets at least one of the four criteria for listing in the CRHR (PRC Section 5024.1[a]). Isolated resources such as the shell fragment are by their nature generally not eligible for inclusion in the CRHR and therefore are not considered cultural resources for the purposes of CEQA. It is therefore by definition not a tribal cultural resource unless additional "substantial evidence" provided during tribal consultation indicates that it possesses significance to a California Native American Tribe.

The subsurface investigations conducted to identify potential buried archaeological resources was negative. However, Native American consultation indicates that the Project area has a heightened sensitivity for potential buried tribal cultural resources.

Project construction requires ground-disturbing activities that have the potential to impact archaeological resources that may be eligible for inclusion in the NRHP, CRHR, or local register. Most of the Project's three-dimensional area of direct impact has been previously disturbed by past farming or by the construction and use of MCAS El Toro. However, unknown archaeological resources may be encountered during ground-disturbing activities associated with the Project, with the sensitivity for archaeological resources increasing with depth.

Mitigation Measures TCR-1, TCR-2, and TCR-3 would be implemented during construction. With the implementation of Mitigation Measures TCR-1, TCR-2, and TCR-3 construction impacts to archaeological tribal cultural resources would be less than significant.

MM-TCR-1: Retain a Native American Monitor Prior to Commencement of Ground-Disturbing Activities.

- A. The project applicant/lead agency shall retain a Native American Monitor from or approved by the Gabrieleño Band of Mission Indians – Kizh Nation. The monitor shall be retained prior to the commencement of any "ground-disturbing activity" for the subject project at all project locations (i.e., both on-site and any off-site locations that are included in the project description/definition and/or required in connection with the project, such as public improvement work). "Ground-disturbing activity" shall include, but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching.
- B. A copy of the executed monitoring agreement shall be submitted to the lead agency prior to the earlier of the commencement of any ground-disturbing activity, or the issuance of any permit necessary to commence a ground-disturbing activity.
- C. The monitor will complete daily monitoring logs that will provide descriptions of the relevant ground-disturbing activities, the type of construction activities performed, locations of ground-disturbing activities, soil types, cultural-related materials, and any

other facts, conditions, materials, or discoveries of significance to the Tribe. Monitor logs will identify and describe any discovered TCRs, including but not limited to, Native American cultural and historical artifacts, remains, places of significance, etc., (collectively, tribal cultural resources, or "TCR"), as well as any discovered Native American (ancestral) human remains and burial goods. Copies of monitor logs will be provided to the project applicant/lead agency upon written request to the Tribe.

- D. On-site tribal monitoring shall conclude upon the latter of the following (1) written confirmation to the Kizh from a designated point of contact for the project applicant/lead agency that all ground-disturbing activities and phases that may involve ground-disturbing activities on the project site or in connection with the project are complete; or (2) a determination and written notification by the Kizh to the project applicant/lead agency that no future, planned construction activity and/or development/construction phase at the project site possesses the potential to impact Kizh TCRs.
- E. Upon discovery of any TCRs, all construction activities in the immediate vicinity of the discovery shall cease (i.e., not less than the surrounding 50 feet) and shall not resume until the discovered TCR has been fully assessed by the Kizh monitor and/or Kizh archaeologist. The Kizh will recover and retain all discovered TCRs in the form and/or manner the Tribe deems appropriate, in the Tribe's sole discretion, and for any purpose the Tribe deems appropriate, including for educational, cultural and/or historic purposes.

• MM-TCR-2: Unanticipated Discovery of Human Remains and Associated Funerary Objects.

- A. Native American human remains are defined in PRC 5097.98 (d)(1) as an inhumation or cremation, and in any state of decomposition or skeletal completeness. Funerary objects, called associated grave goods in Public Resources Code Section 5097.98, are also to be treated according to this statute.
- B. If Native American human remains and/or grave goods discovered or recognized on the project site, then all construction activities shall immediately cease. Health and Safety Code Section 7050.5 dictates that any discoveries of human skeletal material shall be immediately reported to the County Coroner and all ground-disturbing activities shall immediately halt and shall remain halted until the coroner has determined the nature of the remains. If the coroner recognizes the human remains to be those of a Native American or has reason to believe they are Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission, and Public Resources Code Section 5097.98 shall be followed.
- C. Human remains and grave/burial goods shall be treated alike per California Public Resources Code section 5097.98(d)(1) and (2).
- D. Construction activities may resume in other parts of the project site at a minimum of 200 feet away from discovered human remains and/or burial goods, if the Kizh determines in its sole discretion that resuming construction activities at that distance is acceptable and

provides the project manager express consent of that determination (along with any other mitigation measures the Kizh monitor and/or archaeologist deems necessary). (CEQA Guidelines Section 15064.5(f).)

- E. Preservation in place (i.e., avoidance) is the preferred manner of treatment for discovered human remains and/or burial goods. Any historic archaeological material that is not Native American in origin (non-TCR) shall be curated at a public, non-profit institution with a research interest in the materials, such as the Natural History Museum of Los Angeles County or the Fowler Museum, if such an institution agrees to accept the material. If no institution accepts the archaeological material, it shall be offered to a local school or historical society in the area for educational purposes.
- F. Any discovery of human remains/burial goods shall be kept confidential to prevent further disturbance.
- MM-TCR-3: Procedures for Burials and Funerary Remains.
 - A. As the Most Likely Descendant ("MLD"), the Koo-nas-gna Burial Policy shall be implemented. To the Tribe, the term "human remains" encompasses more than human bones. In ancient as well as historic times, Tribal Traditions included, but were not limited to, the preparation of the soil for burial, the burial of funerary objects with the deceased, and the ceremonial burning of human remains.
 - B. If the discovery of human remains includes four or more burials, the discovery location shall be treated as a cemetery and a separate treatment plan shall be created.
 - C. The prepared soil and cremation soils are to be treated in the same manner as bone fragments that remain intact. Associated funerary objects are objects that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later; other items made exclusively for burial purposes or to contain human remains can also be considered as associated funerary objects. Cremations will either be removed in bulk or by means as necessary to ensure complete recovery of all sacred materials.
 - D. In the case where discovered human remains cannot be fully documented and recovered on the same day, the remains will be covered with muslin cloth and a steel plate that can be moved by heavy equipment placed over the excavation opening to protect the remains. If this type of steel plate is not available, a 24-hour guard should be posted outside of working hours. The Tribe will make every effort to recommend diverting the project and keeping the remains in situ and protected. If the project cannot be diverted, it may be determined that burials will be removed.
 - E. In the event preservation in place is not possible despite good faith efforts by the project applicant/developer and/or landowner, before ground-disturbing activities may resume on the project site, the landowner shall arrange a designated site location within the footprint of the project for the respectful reburial of the human remains and/or ceremonial objects.

- F. Each occurrence of human remains and associated funerary objects will be stored using opaque cloth bags. All human remains, funerary objects, sacred objects and objects of cultural patrimony will be removed to a secure container on site if possible. These items should be retained and reburied within six months of recovery. The site of reburial/repatriation shall be on the project site but at a location agreed upon between the Tribe and the landowner at a site to be protected in perpetuity. There shall be no publicity regarding any cultural materials recovered.
- G. The Tribe will work closely with the project's qualified archaeologist to ensure that the excavation is treated carefully, ethically and respectfully. If data recovery is approved by the Tribe, documentation shall be prepared and shall include (at a minimum) detailed descriptive notes and sketches. All data recovery data recovery-related forms of documentation shall be approved in advance by the Tribe. If any data recovery is performed, once complete, a final report shall be submitted to the Tribe and the NAHC. The Tribe does NOT authorize any scientific study or the utilization of any invasive and/or destructive diagnostics on human remains.

Operational Impacts

Operation of the OCMF would result in the complete excavation of the Project Site. Operation of the OCMF is not anticipated to result in the disturbance of any native soils. Therefore, no operational impacts would occur related to tribal cultural resources.

3.18.3.2. Would the Project cause a substantial adverse change in the significance of a tribal cultural resource that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision(c) of Public Resources Code Section 5024.1 in applying the criteria set forth in subdivision(c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Determination: LESS THAN SIGNIFCANT WITH MITIGATION INCORPORATED

OCTA contacted the NAHC and requested that a Sacred Lands File (SLF) search be conducted for the Project Site. The NAHC responded in a letter dated July 9, 2020, and stated: "A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were positive. Please contact the Juaneno Band of Mission Indians and the Juaneno Band of Mission Indians Acjachemen Nation - Belardes on the attached list for more information. Other sources of cultural resources should also be contacted for information regarding known and recorded sites." The response included the names and contact information for eleven Native American representatives who may have knowledge of and interest in tribal cultural resources located within the Project Vicinity and Project Site.

On June 2, 2021, the eleven Native American representatives were notified by mail of the project and invited to consult. One Native American representative, Chairperson Andrew Salas

of the Gabrieleno Band of Mission Indians—Kizh Nation responded by letter on June 18, 2021, and requested formal consultation.

To date, one tribal representative has responded to the request for AB 52 consultation. Chairperson Andrew Salas of the Gabrieleno Band of Mission Indians-Kizh Nation requested a meeting with OCTA to discuss his tribe's concerns regarding the project. On September 9, 2021, a meeting was held between OCTA representatives and Chairperson Salas and Tribal Archaeologist John Torres representing the Kizh Nation. At the meeting, Chairperson Salas expressed that the Project APE is sensitive for buried tribal cultural resources. He pointed out that his tribe, and his family in particular, have ties to the region. He noted that railroads often followed traditional Native American trails, and also observed that military bases often encompassed ancient village sites. Moreover, he informed OCTA that his monitors are currently involved in projects elsewhere in the Irvine area where buried human remains were identified by his tribal monitors. Chairperson Salas recommended tribal monitoring during ground-disturbing activities in order to identify and protect any tribal cultural resources that may exist within the APE. Chairperson Salas provided OCTA with more historical information regarding the general project region, the project APE, as well sample language to help guide mitigation measures to be developed for this project. Consultation is ongoing.

Background research and Native American consultation have not identified specific resources within the Project Site that may be tribal cultural resources. However, tribal consultation indicates that there is a high probability that resources that may be considered tribal cultural resources exist within the Project Site.

Due to the Project APE's sensitivity, an XPI study was also conducted to probe the APE for subsurface archaeological deposits. No resources were identified during the execution of the XPI for this project. Although the entire Project APE has been subject to surficial ground disturbance including farming and the construction of Marine Corps Station El Toro and despite the negative findings of the XPI, the likelihood of encountering native sedimentary deposits that may preserve significant archaeological remains increases with depth. With the implementation of Mitigation Measures CUL-2, TCR-1, TCR-2, and TCR-3, construction impacts to archaeological tribal cultural resources would be less than significant.

Construction Impacts

No tribal cultural resources were identified within the Project Site as a result of background research or Native American consultation. However, Project construction requires ground-disturbing activities that have the potential to impact archaeological resources that may be eligible for inclusion in the NRHP, CRHR, or local register, or that may otherwise be of significance to a California Native American tribe. Unknown archaeological resources may be encountered during ground-disturbing activities associated with the Project, with the sensitivity for archaeological tribal cultural resources increasing with depth.

Compliance with TCR-3 would ensure tribal input is included in the treatment and final disposition of any resources of Native American origin encountered during ground-disturbing activity.

Operational Impacts

Operation of the OCMF would result after the complete excavation of the Project Site. Operation of the OCMF is not anticipated to result in the disturbance of any additional native soils. Therefore, no operational impacts would occur related to archaeological resources that may be tribal cultural resources.

3.19. UTILITIES AND SERVICE SYSTEMS

| Would the | project: | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|-----------|--|--------------------------------------|---|------------------------------------|-----------|
| 3.19.3.1 | Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | | | | |
| 3.19.3.2 | Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? | | | | |
| 3.19.3.3 | Result in a determination by the wastewater treatment provider which serves or may serve the project that is has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? | | | | |
| 3.19.3.4 | Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | | | | |
| 3.19.3.5 | Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | | | | |

3.19.1. Existing Conditions

The Project Site is adjacent to existing water, sewer, storm, gas, and underground electrical and communication lines on Ridge Valley, Marine Way, and Skyhawk. IRWD owns several water facilities including a 12-inch PVC potable water mainline on Marine Way and multiple PVC reclaimed water lines that tie into a shallow groundwater unit (SGU) pump next to the northeast corner of the Project Site. Additionally, a six-inch reclaimed water line is located approximately 80-feet from the westerly edge of the site. There are 12-inch and 24-inch IRWD sewer lines located on Ridgeway Valley and Skyhawk that transverse underneath the Metrolink ROW. Bee Canyon Channel and other storm drain lines of varying sizes run on Ridge Valley and Skyhawk. An SCE duct bank and 30-inch SCG line runs parallel with the railroad track alignment within the SCRRA Orange Subdivision ROW is south of the proposed OCMF perimeter road.

Some existing and abandoned utilities are within the Project Site. Metrolink's Composite Utility Plan suggests that one 24-inch corrugated metal pipe storm drain would require removal (Figure 3.19-1). A sanitary sewer line, a 30-inch SCG gas line, and a 2-inch MCI communication (subsidiary of Verizon) conduit line would require protect-in-place measures. Two DON groundwater monitoring wells exist on the Project Site; one well would require relocation.

Utility as-builts (Figure 3.19-2) from IRWD show multiple sewer and storm drain manholes that can serve as future connections for the Project. Similarly, a water service feed stub-out wye from the 12-inch IRWD waterline on Marine Way is oriented towards the Project Site and can serve as a future connection point.

The regulatory framework set forth by the State of California and the City of Irvine would require the Project to implement waste reduction detailed in the Regulatory Framework Section below. The Project encompasses over 5,000 square feet and would be subjected to the City's Pre-Project Waste Management Plan per City Council Ordinance No. 07-18.

3.19.2. Regulatory Framework

<u>State</u>

Integrated Solid Waste Management Act (AB 939) - AB mandates each city and county to develop and implement waste reduction and recycling plans. AB 939 requires all jurisdictions to divert 50 percent of solid waste generated (as compared to 1990 levels) from landfills by the year 2000.

<u>Local</u>

Irvine City Council Ordinance No. 07-18 - Projects involving new non-residential development of at least one structure with a Project Site of 5,000 square feet or greater require a Pre-Project Waste Management Plan (WMP) from the City of Irvine Department of Public Works. The ordinance requires the City of Irvine to implement source reduction and recycling plans to reach landfill diversion goals to regulate the volume of waste materials going to landfills and to otherwise remain in compliance with AB 939. The ordinance requires at least 75 percent of all concrete and asphalt construction and demolition debris and 50 percent of all other construction and demolition debris generated by an approved Project to be delivered to a material recovery facility, wherein the material would be recycled or diverted from landfills.

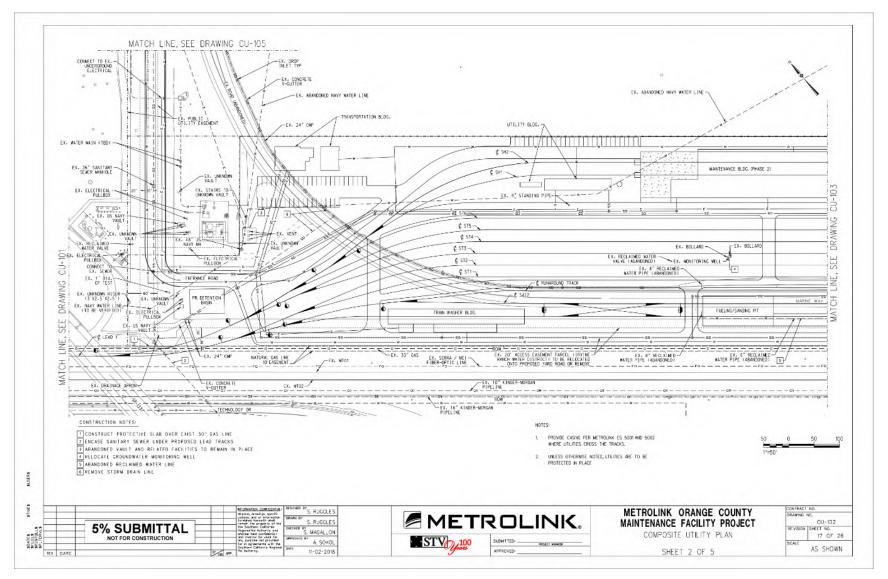
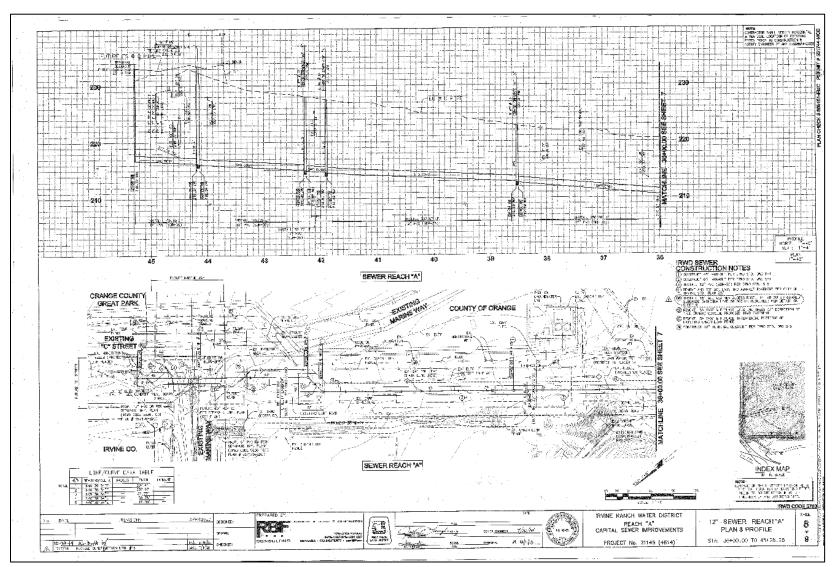


Figure 3.19-1: Metrolink Composite Utility Plan

Source: Metrolink, 2019





Source: IRWD, 2014

3.19.3. Discussion

3.19.3.1. Would the Project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

The Project would require the relocation of existing drainage facilities as well as the installation of new drainage infrastructure for new storage and grading needs. It is anticipated that new or expanded water or stormwater drainage for the Project would tie into existing City and County facilities within the Project Site. Additionally, existing electrical, natural gas, and telecommunication facilities would require protect-in-place measures. In addition to typical fire service (hydrant) and sanitary facilities, other project needs include the expansion of water, gas, and sanitary services for proposed train wash operations and emergency fixtures (safety shower/eyewash), which would tie into existing facilities located along the permitter of the Project Site.

Sanitary waste would be generated during construction activities and for building facilities during operation. As such, the construction of new underground wastewater pipes would occur as part of this Project. Michelson Water Recycling Plant in Irvine has been IRWD's primary source of recycled water for more than half a century. Tertiary treatment of sewage there results in excellent-quality recycled water, which is used for landscape and agricultural irrigation, and for industrial and commercial needs. IRWD is currently developing a new master plan that will identify optimal locations and methods for conveying, treating, and distributing sewage and recycled water within their service area. This includes an evaluation of expanding the capacity at Michelson Water Recycling Plant. As mentioned above, a water service feed stub-out wye from the 12-inch IRWD waterline on Marine Way is oriented towards the Project Site and can serve as a future connection point for sewer or wastewater drainage. As such, connections to this existing line would minimize construction of new or expanded wastewater facilities. Therefore, construction or operational impacts related to new wastewater drainage systems would be less than significant.

The Project would require the construction of new stormwater drainage facilities within the Project Site with the development of the access road and buildings. As such, a stormwater drainage system would be constructed to provide drainage for stormwater from the access road and other maintenance facility amenities. Because the Project is located within the SARWQCB's jurisdiction, it shall follow the Model WQMP that the OCFCD uses to address post-construction urban runoff and stormwater pollution from new developments or significant redevelopments. Additionally, the Project is within the Upper San Diego Creek Watershed, which is a high-risk receiving watershed. The San Diego Creek Reach 2 has established TMDLs

that need to be considered during the development of the WQMP. Based on this, the preferred BMP type would be infiltration, evapotranspiration, or harvest/use. Therefore, the Project would integrate a 115-foot by 115-foot by 5-foot deep underground cistern that would hold approximately 552,254 gallons for retention and capture/reuse.

The existing topography of the Project Site provides a drainage pattern that slopes from east to west. Runoff is collected at the surface via open earth channels and concrete drainage inlets and is then routed to the north end of the site through two 24-inch corrugated steel pipes. Runoff leaves the site through an open concrete channel and empties downstream into a channel owned by OCFCD. The Bee Canyon Channel, located on the south end of the site, runs east to west and does not take runoff from the Project Site. It is anticipated that this existing drainage pattern would not be altered or rerouted after the development of the OCMF. The existing outlet discharges and volumes would also be maintained so that the OCFCD facilities are not impacted. Prior to construction, a drainage analysis shall be performed to establish the Project requirements in order to establish the correct sizing of the drainage facilities. Implementing standard construction practices such as Best Available Technology Economically Feasible (BATs), Best Conventional Pollutant Control Technology (BCTs), and BMPs would help reduce potential impacts related to stormwater drainage systems. Therefore, construction or operational impacts related to new stormwater drainage systems would be less than significant.

As discussed in the Project Description, the Project would reprofile Bee Canyon Channel. This will result in a lower Hydraulic Grade Line and a 2.5-feet channel drop at the inlet of the 60-inch reinforced concrete pipe lateral to the channel. An existing 30-inch SCG crosses the storm drain perpendicularly and would require relocation and/or protect in place measures to maintain vertical clearance from the invert of the storm drain. The Project would require the construction of electrical and telecommunication facilities, such as lighting, wireless security cameras, and information panels. However, construction or operational impacts related to the expansion of electrical and telecommunication facilities would be minimal and less than significant.

3.19.3.2. Would the Project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Determination: NO IMPACT

Construction and Operational Impacts

IRWD provides water supply for areas within the Project Site and for more than 370,000 residents in its service area. IRWD's drinking water comes from two primary sources: local groundwater and imported water. The blending of these sources varies according to the time of year and the geographic location within the IRWD. Approximately 48 percent of the overall supply comes from local groundwater wells in the Orange County Groundwater Basin, and the

Irvine and Lake Forest sub-basins. The Dyer Road Wellfield Project extracts low-cost, highquality water from deep within the Orange County Groundwater Basin. IRWD now operates 25 groundwater wells within its service area. IRWD imports 27 percent of its water through the Municipal Water District of Orange County, which purchases water from the Metropolitan Water District of Southern California (MWD), a regional water wholesaler that delivers imported water from Northern California and the Colorado River.

Additionally, IRWD produces approximately a quarter of the recycled water supply by capturing water that normally would run out to the ocean, treating it, and reusing it for irrigation and other non-potable, or non-drinking, uses. IRWD supplements their supplies by cleaning non-potable groundwater to make it suitable for irrigation.

IRWD manages its supply and demand with careful research and analysis regarding flow, diversions, climate, customer demand, and population estimates to ensure an adequate supply of clean, reliable water well into the future. Since future land use within the Project Site is designated for the Great Park use, it is assumed sufficient water supplies would be available to serve the Project and future developments during normal, dry and multiple dry years.

During Project operations, water irrigation would be required for landscape within the Project Site and for train washing activities. In addition, the proposed OCMF would require onsite irrigation that would be tied to an existing recycled water main line located on Ridge Valley. Domestic water requirements are estimated under 250 gallons per minute (gpm) and would require a two to four-inch connection line to an existing 12-inch water main line on Marine Way, which would adequately support the project needs. Therefore, no construction or operational impacts related to having sufficient water supplies would occur.

3.19.3.3. Would the Project result in a determination by the wastewater treatment provider which serves or may serve the project that is has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Determination: NO IMPACT

Construction and Operational Impacts

As described under Impact 3.19.3.1, the Project would generate wastewater from building facilities with restrooms, as well as for train washing. As described under Impact 3.19.3.1, the Project would require the construction of new underground wastewater pipes, that would tie into existing utilities located on Marine Way. A 12-inch sewer line and a 24-inch IRWD sewer line are located on Ridge Valley and Skyhawk, and transverse underneath the SCRRA Orange Subdivision ROW. A water service feed stub-out wye from a 12-inch IRWD waterline on Marine Way is oriented towards the Project Site, which can serve as a future connection point.

Wastewater produced by restrooms would not likely exceed existing capacity. Wastewater was estimated under 150 gpm and would be connected to the existing 12-inch sanitary sewer main line fronting the property on Ridge Valley via a proposed four to eight-inch service line. Water and service connection requirements are being coordinated with the IRWD and OCFA. As such, no construction or operational impacts would occur that would result in a determination by the wastewater treatment provider that is has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

3.19.3.4. Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Determination: NO IMPACT

Construction and Operational Impacts

During Project construction and operations, waste would be disposed of by using bins for both recycling and waste material in compliance with IRWD, local, state, and federal criteria, standards, regulations, or laws, and would be disposed of through a commercial collector. Solid waste collected during construction within the Project Site would be sent to the Prima Deshecha Landfill approximately 20 miles south in the City of San Juan Capistrano within Orange County. Any contaminated soil removed from the Project Site as a result of grading activities would require testing by California ELAP Certified Laboratories for amounts more than 5 cubic yards. The laboratory would submit a report to a Materials Regulation Specialist who would review the lab results and determine if the soil meets criteria for disposal. The landfill is owned and operated by Orange County. The total acreage permitted is 1,530, with 697 acres designated for waste disposal. The Prima Deshecha landfill has a projected capacity to serve residents and businesses until approximately 2102. As such, there is adequate capacity at the landfill site within Orange County to dispose of solid waste from Project construction. The Project would need to notify the appropriate agencies (e.g., OCHCA, DTSC, or the RWQCB) since soil and groundwater contamination is possible due to the MCAS El Toro site.

As discussed in Section 3.10 Hydrology and Water Quality, the Project would be required to obtain the NPDES General Construction Permit, which requires that the Project develop and implement a SWPPP as the primary compliance mechanism. The SWPPP would include BMPs that address source control, BMPs that address pollutant control, and BMPs that address treatment control.

During Project operations, solid waste would be collected by underground pipes that would connect to existing utilities on Marine Way that would transfer wastewater from the Project Site. The Project would also be required to divert (recycle) 50 percent of the solid waste generated by both construction and operation to comply with the 50 percent solid waste diversion rate mandated by the California Integrated Waste Management Act of 1989 (AB

939). Additionally, monitoring of the Project WQMP and the integration of BMPs would reduce impacts related to solid waste. As such, no construction or operational impacts would occur that exceed state or local standards, including excess capacity of local infrastructure that would impair the attainment of solid waste reduction goals.

3.19.3.5. Would the Project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Determination: NO IMPACT

Construction and Operational Impacts

As described in Impact 3.19.3.1 through Impact 3.19.3.4 above, construction and operation of the Project would meet the requirements of applicable federal, state, and local statutes for regulating solid waste. This is accomplished by implementing BATs, BCTs, and BMPs, as well as applying for all the required water and disposal permits from the City and County for construction and operation permits. Therefore, no construction or operational impacts related to compliance with federal, state, and local statutes and regulations related to solid waste would occur.

3.20. WILDFIRE

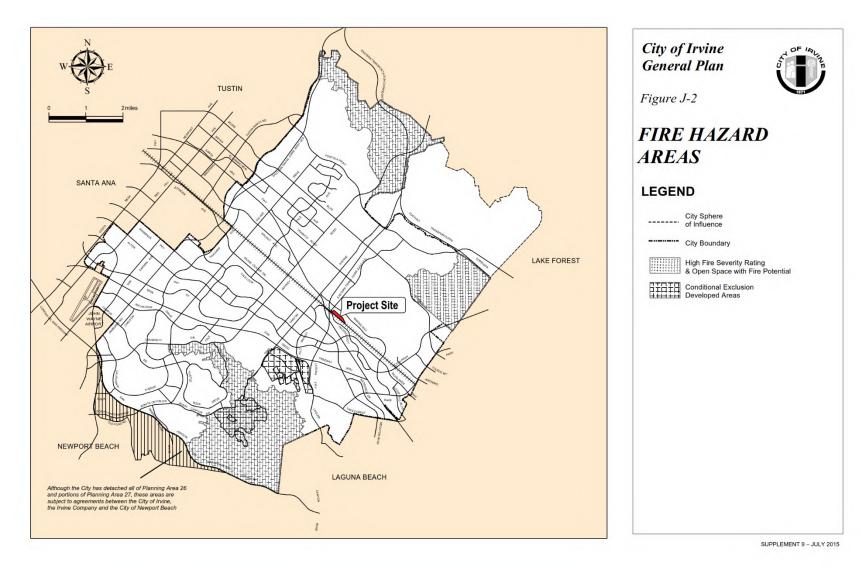
| If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: | | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|--|---|--------------------------------------|--|------------------------------------|-----------|
| 3.20.3.1 | Substantially impair an adopted emergency response plan or emergency evacuation plan? | | | | |
| 3.20.3.2 | Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | | | | |
| 3.20.3.3 | Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | | | | |
| 3.20.3.4 | Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slop instability, or drainage changes? | | | | |

3.20.1. Existing Conditions

According to the City of Irvine General Plan's Safety Element, the Project Site is not within fire hazard areas (Figure 3.20-1). Additionally, according to the CAL FIRE Fire and Resource Assessment Program, the Project Site is not within or near a Very High Fire Hazard Severity Zone of a State or Local Responsibility Area (Figure 3.20-2).

The Project Site is located in a developed portion of the City. According to the track plan and profile developed for this Project, the Project Site is relatively flat (up to 2 percent grading) and there are no significant slopes adjacent to the site. The Project does not include any characteristics (such as permanent road closure or long-term blocking of road access) that would physically impair or otherwise conflict with the City's Emergency Preparedness Program.

The Project is in an urbanized area and would require wet and dry utilities service connections from existing mainlines in the vicinity of the Project Site. In addition, a 30-inch SCG line runs longitudinally along the east edge of the railroad ROW. The extension of the tracks to and from the Project Site would necessitate a crossing of the line. Appropriate protect-in-place details incorporated into the track design would be required and coordinated with the utility owner.

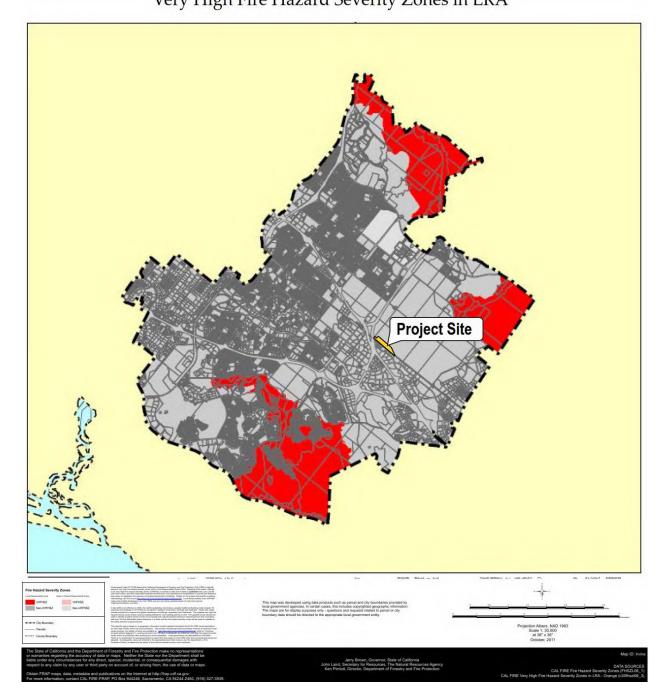




Source: City of Irvine, 2015

Figure 3.20-2: City of Irvine Very High Fire Hazard Severity Zones in LRA (CAL FIRE)





Source: Office of the State Fire Marshal, 2011

Moreover, the Project Site is not in a flood hazard zone according to the Safety Element of the General Plan; based on the FEMA Flood Insurance Rate Map (FIRMs) (panel number 06059C0315J, dated December 3, 2009), the Project Site is within Zone X, which is defined as an area of minimal flooding.

3.20.2. Regulatory Framework

<u>State</u>

California Fire Plan - The Project would comply with terms where applicable as listed in the California Fire Plan, which is a roadmap for reducing the risk of wildfire through planning and prevention.

Regional

County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan - The County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan promotes "sound public policy designed to protect residents, critical facilities, infrastructure, key resources, private property, and the environment from natural hazards in County unincorporated area, fire hazards in the OCFA service area, and County and OCFA owned facilities."

Orange County Fire Authority - OCFA has set forth fire prevention guidelines in the Fire Master Plans for Commercial and Residential Development Guideline B-09. The document is a general guideline pertaining to the creation and maintenance of fire department access roadways, access walkways to and around buildings, and hydrant quantity and placement as required by the 2016 California Fire and Building Codes and as amended by local ordinance.

Local

City of Irvine Standard Condition 4.9 (Emergency Access Inspection) - An inspection would need to be arranged prior to the Project opening, which is to be performed by the Police Department and OCFA, to ensure compliance with the Emergency Access Plan requirements. Test acceptance and locations of all Knox boxes, key switches, and Click2Enter devices as depicted on the approved plan would need to be verified.

City of Irvine the Irvine Uniform Security Code Sec. 5-9-518. Special parking facilities provisions:

Structures or fencing designed to screen trash enclosures from public view shall be designed with no more than three solid walls and (an) access gate(s). They shall be designed in such a manner as to allow a maximum of six inches clearance between trash bins, walls and gates.

Exterior pedestrian doors which provide access into the parking facility, shall be constructed and equipped as follows:

1. A minimum 18-gauge steel and equipped with automatic hydraulic closure device.

- A minimum 100-square-inch vision panel, with the width not less than five inches, to provide visibility into the area being entered. Vision panels shall meet requirements of the Uniform Building Code.
- 3. Vision panels shall preclude manipulation of the interior locking device from the exterior.
- 4. No openings within twenty-four inches of the locking device which would allow a piece of metal, 1/16-inch diameter or greater to be inserted and access gained to the interior side of the door.
- 5. When panic hardware is required, it shall have a self-locking mechanism and be constructed/equipped.
- 6. Emergency exits not intended as a primary entrance shall have no exterior handles, knobs, or levers.
- 7. Hinges shall be equipped with nonremovable hinge pins or a mechanical interlock to preclude removal of the door from the exterior by removing the hinge pins.

Sec. 5-9-519. Emergency access:

Private roads and parking areas or structures controlled by unmanned mechanical parking type gates shall provide for police emergency access utilizing an approved key switch device and designed as follows:

- A control pedestal consisting of a metal post/pipe shall be installed at a height of 42 inches and a minimum of 15 feet from the entry/exit gate. It shall be located on the driver's side of the road or driveway and accessible in such a manner as to not require a person to exit their vehicle to reach it; nor to require any back-up movements in order to enter/exit the gate.
- 2. A control housing consisting of a heavy gauge metal, vandal and weather resistant square or rectangular housing which shall be installed on the top of the control pedestal. The key switch is to be mounted on the side facing the roadway.

Nonresidential multi-tenant buildings utilizing electronic access control systems on the main entry doors, and enclosed retail shopping centers shall provide police emergency access utilizing an approved key switch-device or approved key vault which shall be installed as follows:

- All doors using an electromagnetic type lock shall install a key switch device within the building's exterior telephone/intercom console or in a control housing as described in section (a)(2) above, located within close proximity and in a visible area near the door.
- 2. Exterior main entry doors of an enclosed shopping center utilizing mechanical door locks shall install a key vault within close proximity and in a visible area near the door.

City of Irvine Municipal Code, Title 5 (Planning), Division 9 (Building Regulations) - The code provides regulations on the state fire code with local considerations, which would require compliance.

City of Irvine Local Hazard Mitigation Plan - The Plan provides a comprehensive assessment of threats that the City faces (both natural and man-made), as well as an assessment of the current conditions. The Project would comply with the strategy developed as part of this plan to lessen the vulnerability and severity of future disasters and hazardous situations.

3.20.3. Discussion

3.20.3.1. Would the Project substantially impair an adopted emergency response plan or emergency evacuation plan?

Determination: NO IMPACT

Construction and Operational Impacts

The City of Irvine's Local Hazard Mitigation Plan (LHMP) focuses on minimizing the harm caused by a disaster. The LHMP provides a comprehensive assessment of the threats that the City faces from natural and human-caused hazard events and a coordinated strategy to reduce these threats. The Project Site is in an urbanized area not located in a Fire Hazard Zone and, therefore, would not be subject to wildland fire risks. The Project does not include any characteristics such as permanent road closure or long-term blocking of road access that would physically impair or otherwise conflict with the City's Emergency Preparedness Program. Furthermore, the Project shall comply with fire prevention regulations codified by local, regional, and state authorities. Emergency access roadways would be designed to meet OCFA fire prevention guidelines (Guideline B-09) and City Ordinance provisions Sec. 5-9-519 Emergency access. The OCMF would comply with the 2019 California Fire Code Part 9, Title 24 CCR. The City of Irvine Standard Condition 4.9 shall require an inspection by the Police Department and OCFA prior to the Project opening, to ensure compliance with the Emergency Access Plan requirements. Therefore, no construction or operational impacts related to substantially impairing an adopted emergency response plan or emergency evacuation plan would occur.

3.20.3.2. Would the Project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

The Project is not located in a Fire Hazard Zone according to the City of Irvine General Plan. In Southern California, the most common type of severe wind event is Santa Ana winds, which are often the leading cause of wildfires in California. While the City of Irvine is often affected by Santa Ana winds blowing through the Santa Ana Mountain range, the Project Site is in an urbanized area wherein the existence of brush and dry plant material would not exist during construction or operations. The City notes that sometimes the start of wildfires may occur if power lines located around overgrown trees or fuel cause a spark and ignite a fire. Existing electrical lines within the Project Site are underground and the service feeds associated with the Project would also be routed underground. The Project Site's profile would be flat with drainage and track grade ranging at approximately 1 percent slope. As a result, construction and operational impacts related to the Project, due to slope, prevailing winds, and other factors, that would exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire would be less than significant.

3.20.3.3. Would the Project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

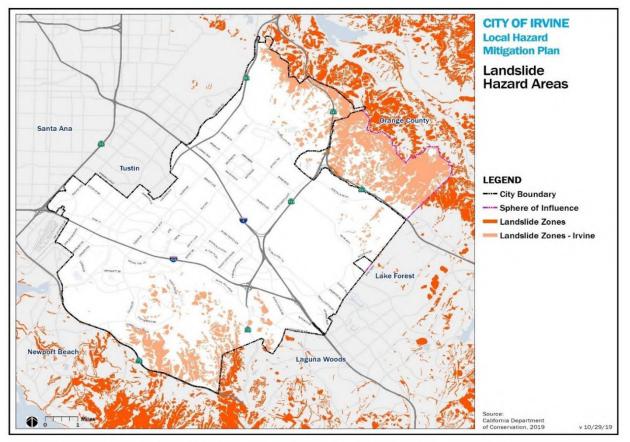
While the addition of utility service feeds would be required for the OCMF, the Project is in an urbanized area where utility mainlines already exist in the vicinity of the Project Site. Electrical service feeds for the OCMF would tie into an existing underground duct bank. Roadways within the Project Site would meet design standards to allow for emergency services per OCFA (OCFA, 2020). Additionally, the OCMF would be designed to meet building codes per City of Irvine Municipal Code, Title 5, Division 9. Building design, materials, and operations would comply with state regulations set forth in the 2019 California Fire Code Part 9, Title 24 CCR. Therefore, construction and operational impacts related to the installation and maintenance with associated infrastructure that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment would be less than significant.

3.20.3.4. Would the Project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slop instability, or drainage changes?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

A majority of the City's identified landslide hazards are located in the foothills of the San Joaquin Hills and Santa Ana Mountains. These areas are characterized by steep slopes that have the potential to create landslides after long periods of heavy rainfall. The Project Site is not located in a landslide zone (Figure 3.20-3) and, as a result, would not be susceptible to landslides or post-fire slope instability. As discussed in the Section 3.10.3.1 Hydrology and Water, the existing topography of the site provides a drainage pattern that slopes from east to west. The Project's final grading configuration would have a similar direction of flow as that of





the existing topography. Underground cisterns would be located in the northern corner of the Project Site underneath the proposed parking lot and would provide enough storage to contain the Design Capture Volume and collect excess stormwater runoff. As a result, stormwater runoff and drainage changes related to the Project would not induce any downslope or landslides. Post-fire slope instability would also not be of concern since the Project is not within a landslide hazardous area.

The Project Site is not located in a flood hazard zone according to the Safety Element of the General Plan. Based on the FEMA FIRMs (panel number 06059C0315J, dated December 3, 2009), the Project Site is within Zone X, which is defined as an area of minimal flooding. Additionally, reconfigurations of Bee Canyon Channel would match runoff conditions since the existing concrete-lined bottom is impervious. Bee Canyon Channel's drainage would have similar drainage capacity and runoff conditions as in existing conditions. Therefore, construction and operational impacts related to the Project's exposure to people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes would be less than significant.

Source: City of Irvine, 2019

3.21. MANDATORY FINDINGS OF SIGNIFICANCE

| | | Potentially Significant Impact | Less Than Significant with Mitigation Incorporated | Less Than Significant Impact | No Impact |
|----|---|--------------------------------------|--|------------------------------------|-----------|
| 1) | Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | | | | |
| 2) | Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? | | | | |
| 3) | Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | | | | |

3.21.1. Discussion

3.21.1.1. Does the Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction and Operational Impacts

Refer to Sections 3.4 Biological Resources, 3.5 Cultural Resources, and 3.7 Geology and Soils.

Mitigation measures MM-BIO-1 and MM-BIO-2 would reduce any potential impacts related to degrading the quality of the environment, substantially reducing the habitat of a fish or

wildlife species, causing a fish or wildlife population to drop below self-sustaining levels, threatening to eliminate a plant or animal community, substantially reducing the number or restrict the range of a rare or endangered plant or animal to less than significant.

Mitigation measures MM-CUL-1, MM-CUL-2, MM-GEO-1, and MM-GEO-2 would reduce any potential impacts related to eliminated important examples of the major periods of California history or prehistory to less than significant.

Therefore, impacts would be less than significant with mitigation incorporated.

3.21.1.2. Does the Project have impacts that are individually limited, but cumulatively considerable?

Determination: LESS THAN SIGNIFICANT IMPACT

Construction and Operational Impacts

The related projects (

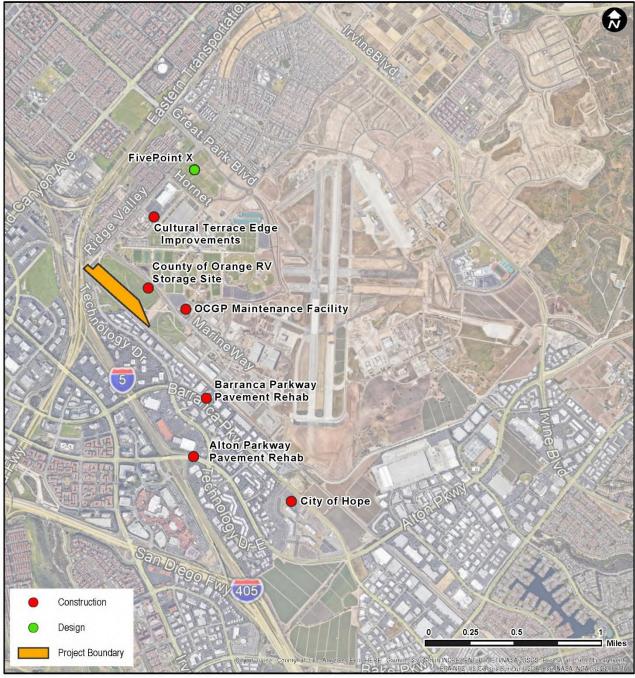
Figure 3.21-1) that would be in construction or be developed during the construction and operations of the Project include:

 Great Park Maintenance Facility – The City of Irvine has design plans to expand the maintenance facility that serves and maintains the Great Park, and Bee and Bosque Trail. The location of the proposed maintenance facility is near the intersection of Marine Way and Skyhawk and approximately 850 feet from the Project Site. Construction is scheduled to begin in Summer 2022.

The Great Park Maintenance Facility would require construction related vehicles. In the event that the construction of the Project and the Great Park Maintenance Facility project occur simultaneously, it is anticipated that Marine Way would experience a temporary increase in VMT from both projects. As a decommissioned military site, the area surrounding the Project Site has a limited roadway network and the projects would utilize Marine Way as a primary roadway to access the I-5 freeway during construction. The increase in traffic impacts as a result of the Great Park Maintenance Facility's construction activities would be less than the Project due to the nature of the Great Park Maintenance Facility's size and lesser extent of its construction scope. Therefore, the impacts related to traffic due to the Project and the Great Park Maintenance Facility would not be cumulatively considerable.

The Great Park Maintenance Facility exists within a portion of the MCAS El Toro Superfund site and would impact the ongoing military clean-up site operations. This project would be required to implement measures to reduce significant impacts in separate environmental approval processes and would therefore be required to comply with the regulatory frameworks set forth by federal, state, and local agencies concerning hazardous materials. Therefore, the impacts related to hazardous materials due to the Project and the Great Park Maintenance Facility would not be cumulatively considerable.





Source: City of Irvine, 2021

 Barranca Parkway Pavement Rehab – This project consists of pavement rehabilitation from the I-5 Freeway to Ada. Specific improvements include cold mill damaged roadway and pave rubberized asphalt concrete, construction of ADA-compliant access ramps and driveways, and reconstructing damaged curb, gutter and sidewalk. Construction began March 2021 and will be completed in November 2021.

In addition to the one-mile distance between the two projects, the existing Metrolink ROW serves as a physical barrier between the Barranca Parkway Pavement Rehab and the Project. Geographical constraints (distance of projects and existing Metrolink ROW barrier) and lack of construction overlap would result in no cumulatively considerable impacts.

3. Cultural Terrace Roadway Edge Improvements – The project consists of continuing the Great Park landscape into the Cultural Terrace road network. Construction activities include improving the edge conditions along future roadways in the Cultural Terrace including landscape, sidewalks, lighting, irrigation, signage, and water quality. The project location is bounded by Marine Way, Skyhawk, and Great Park Avenue and is approximately 0.25 miles from the Project Site. The start date for construction has not been determined.

The Cultural Terrace Roadway Edge Improvements project would require construction related vehicles. As a decommissioned military site, the area surrounding the Project Site has a limited roadway network. In the event that the construction of the Project and the Cultural Terrace Roadway Edge Improvements project occur simultaneously, it is anticipated that Marine Way would experience a temporary increase in VMT. The projects would utilize Marine Way as one of the primary roadways to access the I-5 freeway. However, the Cultural Terrace Roadway Edge Improvements project would utilize Skyhawk and Great Park Boulevard as alternative routes for access to the I-5 freeway. Additionally, the increase in traffic as a result of the Cultural Terrace Roadway Edge Improvements would be less than the Project due to the project's scope of construction. Therefore, the impacts related to traffic due to the Project and the Cultural Terrace Roadway Edge Improvements would not be cumulatively considerable.

The Cultural Terrace Roadway Edge Improvements project exists within a portion of the MCAS El Toro Superfund site and would impact the ongoing military clean-up site operations. This project would be required to implement measures to reduce significant impacts in separate environmental approval processes and would therefore be required to comply with the regulatory frameworks set forth by federal, state, and local agencies concerning hazardous materials. Therefore, the impacts related to hazardous materials due to the Project and the Cultural Terrace Roadway Edge Improvements project would not be cumulatively considerable.

4. FivePoint X – This new mixed-use commercial project would be located just south of the Great Park Neighborhoods. The project is approximately one-half mile from the Project Site and is bound by Great Park Boulevard, Ridge Valley, and Hornet. The commercial center is designed to provide amenities for Great Park visitors and neighboring residential communities. Two hotels situated along Hornet and a warehouse for operations and shopping will also be part of the project. This project has been approved by the City; however, the construction start date has not been determined. The Irvine City Council approved the Orange County Great Park (OCGP) Final Environmental Impact Report (FEIR) on May 27, 2013, which outlines roadway and utility improvements for future developments within the Great Park.

Due to the nature of the project and its location, in the event that the FivePoint X development and the Project would be constructed simultaneously, it is anticipated that impacts on traffic, utilities, noise, and hazardous materials could be cumulatively considerable. The FivePoint X development would require construction related vehicles, new or expanded water and wastewater utilities, and would be located on decommissioned military site. The area surrounding the project site has a limited roadway network and the project would utilize Ridge Valley and Marine Way as primary roadways to access the I-5 freeway during construction. As such, it is anticipated that Ridge Valley and Marine Way would experience a temporary increase in VMT from both projects. The 2013 OCGP EIR concluded that all transportation impacts resulting from increased traffic congestion in relation to the existing traffic load and capacity of the street system would result in less than significant impacts with mitigation incorporated. The report also concluded that impacts to emergency vehicle access would be less than significant with mitigation incorporated. The increase in traffic impacts as a result of the FivePoint X development construction activities would be less than the Project due to the distance from the Project Site and the number of alternative roadways, including Great Park Boulevard and Ridge Valley, that can be used to access the site. Therefore, impacts related to increased traffic due to the Project and FivePoint X development would not be cumulatively considerable.

The FivePoint X development would require the construction of utilities and service systems. Commercial and residential projects typically result in increased demands on water supply, and more substantial generation of wastewater and solid waste. In the event that the construction and operations of the Project and FivePoint X development occur simultaneously, it is anticipated that an increase in sufficient water supplies would occur from both projects. However, the FivePoint X development would be required to comply with all applicable regulations and standards that control these utilities. In addition, mitigation measures outlined in the 2013 OCGP EIR would reduce impacts related to utilities, wastewater systems, and sufficient water supply to be less than significant during project construction and operations. Therefore, the impacts related to

utilities and service systems due to the Project and the FivePoint X development would not be cumulatively considerable.

The FivePoint X development would require the use of construction related vehicles and machinery. In the event that the construction of the Project and the FivePoint X development occur simultaneously, it is anticipated that a temporary increase in noise levels would occur from both projects. However, due to geographical constraints (distance of projects) and lack of construction overlap would result in no cumulatively considerable impacts.

The FivePoint X development exists within a portion of the MCAS El Toro Superfund site and would impact the ongoing military clean-up site operations. This project would be required to implement measures to reduce significant impacts in separate environmental approval processes and would therefore be required to comply with the regulatory frameworks set forth by federal, state, and local agencies concerning hazardous materials. Therefore, the impacts related to hazardous materials due to the Project and the FivePoint X development would not be cumulatively considerable.

5. City of Hope – This new cancer treatment center of approximately 60,000 square feet, as well as medical offices of approximately 190,000 square feet is located between Alton Parkway and Barranca Parkway approximately 1.4 miles southeast of the proposed OCMF site. Construction of the medical office was completed in December 2017, and a new aboveground parking structure is currently under construction along Barranca Parkway near the intersection of Marine Way, which is a separate roadway from the Marine Way used for the Project.

The parking structure requires construction related vehicles and dewatering activities. In the event that the construction of the Project and the City of Hope parking structure occur simultaneously, it is anticipated that both projects would experience a temporary increase in water usage. Due to geological barriers (Metrolink ROW and separate roadway for Marine Way), any increase in VMT is not anticipated if both projects were to be constructed concurrently, and would not be cumulatively considerable.

Operations of the City of Hope medical office and parking structure could also result in impacts to local utilities and service systems. Commercial projects typically result in increased demands on electrical and water supply, and the generation of wastewater and solid waste. This project would be required to comply with all applicable regulations and standards that control these utilities. Demand on utilities and services systems during operations would not result in new facilities being required and would not exceed applicable requirements. In addition, the existing Metrolink ROW serves as a physical barrier between the proposed OCMF and the City of Hope project. Therefore, the

proposed OCMF in conjunction with the City of Hope project would not be cumulatively considerable.

6. County of Orange RV Storage Site - The vacant parcel between the Project Site and Marine Way is currently being developed into an RV (recreational vehicle) storage area by the County of Orange. The intended use of this parcel is for storage of unoccupied vehicles. However, construction is currently ongoing for the County of Orange's RV Storage Site and, thus, construction activities such as grading would not be different than what is encountered now.

The County of Orange RV Storage Site would require construction related vehicles. In the event that construction of the County of Orange's RV Storage Site and the Project occur simultaneously, a temporary increase in VMT would occur along Marine Way and Ridge Valley during project construction due to construction vehicles utilizing these roadways to access the project site. However, the increase in traffic as a result of the County of Orange RV Storage Site would be less than the Project due to the project's scope of construction. Therefore, the proposed OCMF in conjunction with the County of Orange RV Storage Site would not be cumulatively considerable.

The project site is located in the adjacent parcel north of the Project. In the event that the construction of the County of Orange's RV Storage Site and Project occur simultaneously, it is anticipated that residential properties located northwest of the project site and visitors from the Great Park would experience temporary visual impacts from both projects. However, visual impacts as a result of the County of Orange's RV Storage Site construction activities would be less than the Project due to the nature of the County of Orange's RV Storage Site size and lesser extent of its construction scope. Therefore, the impacts related to visual quality and aesthetics due to the Project and the County of Orange's RV Storage Site would not be cumulatively considerable.

The County of Orange's RV Storage Site exists within a portion of the MCAS EL Toro Superfund site and would impact the ongoing military clean-up site operations. This project would be required to implements measures to reduce significant impacts in separate environmental approval processes and would therefore be required to comply with the regulatory frameworks set forth by federal, state, and local agencies concerning hazardous materials. Therefore, the impacts related to hazardous materials due to the Project and the County of Orange's RV park would not be cumulatively considerable.

For this Project, given the extent and comprehensive character of mitigation that has been provided in this document to reduce impacts to less than significant, the Project in conjunction with the related projects listed above would not have substantive residual or significant impacts and thus it is not anticipated that this Project would contribute considerably to any significant cumulative impacts.

3.21.1.3. Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Determination: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Construction and Operational Impacts

As discussed in Section 3.9, Hazards and Hazardous Materials, the Project Site is located on the former MCAS El Toro where two regional groundwater contamination plumes of VOC exist. Both plumes are within the OCWD Management Area and are under active remediation by the DON. The Project would need to notify the appropriate state and local agencies (e.g., OCHCA, DTSC, or the SARWQCB) since soil and groundwater contamination is present due to the MCAS site. Mitigation measures MM-HAZ-2 and MM-HAZ-3 would reduce any potential impacts related to causing a substantial adverse effect on human beings, either directly or indirectly. Therefore, impacts would be less than significant with mitigation incorporated.

4. LIST OF PREPARERS

4.1. ORANGE COUNTY TRANSPORTATION AUTHORITY (Lead Agency)

| Name | Title | Role |
|-------------------|---------------------|-----------------------|
| Lora Cross, PMP | Project Manager III | Project Manager |
| Huey Yann Ooi, PE | Project Manager | Environmental Manager |

4.2. GANNETT FLEMING (Prime Consultant)

| Name | Title | Role | |
|--|-----------------|---------------------------------|--|
| Mrika Simoni, PE | Project Manager | Project Manager | |
| Jason Neff, EIT PMP | Design Manager | Deputy Project Manager | |
| Jerry Pascoe, PE GE Principal Geotechnical Engineer Environmental Do | | Environmental Document Reviewer | |

4.3. AECOM (Environmental Consultant)

| Name | Title | Role | |
|--------------------|---------------------------------|--|--|
| Rob Hertz | Vice President | Project Manager | |
| Jaime Guzmán | Senior Project Manager | Environmental Manager | |
| David DeRosa | Transportation Planning Manager | Independent Review (Tech Memos) | |
| Ryan Park | Transportation Engineer | Independent Review (IS/MND) | |
| Katherine Lee | Transportation Planner | Deputy Environmental Manager/ IS/MND Preparer | |
| Jessica Koon | Transportation Planner | IS/MND Preparer | |
| Victor Xie | Transportation Planner | nner IS/MND Preparer/Graphics/GIS | |
| Shannon Ledet | Senior Environmental Planner | nner Visual | |
| Paola Peña | Air Quality Scientist | Air Quality/GHG/Energy | |
| Suzanne McFerran | Environmental Planner IV | Air Quality/GHG/Energy | |
| Mary Kaplan | Air Quality Scientist IV | Air Quality/Health Risk Assessment | |
| Christopher Warren | Air Quality Scientist III | III Air Quality/Health Risk Assessment | |
| Arthur Popp | Biologist | Biological Resources | |

| Name | Title | Role | |
|-------------------|---------------------------------|---|--|
| Erik Larsen | Ecologist IV | st IV Biological Resources/Waters/Permits | |
| Marc Beherec | Senior Archaeologist | Cultural/Tribal Resources | |
| Trina Meiser | Architectural Historian | Cultural Resources | |
| Joe Stewart | Environmental Scientist IV | Paleontological Resources | |
| Paul Burge | Principal Engineer | neer Noise & Vibration | |
| Anthony Mangonon | Transportation Planner III | Transportation | |
| Therese Tempereau | Technical Editor | Technical Editing | |
| Marisa Fabrigas | Document Production Coordinator | Word Processing | |

5. REFERENCES

Aesthetics (Section 3.1)

- 1. AECOM. 2021. Metrolink Orange County Maintenance Facility Aesthetics Technical Memorandum.
- Caltrans. 2019. List of Eligible and Officially Designated State Scenic Highways. Available: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-iscenic-highways.
- City of Irvine. 2015. City of Irvine General Plan, Land Use Element: https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=20687.
- 4. Google Maps Street view, captured 2021.
- 5. State of California. 2020. California Historical Landmarks. Available: https://ohp.parks.ca.gov/?page_id=21445.

Agricultural and Forestry Resources (Section 3.2)

6. State of California Department of Conservation (DOC). 2018. California Important Farmland Finder. Available: https://maps.conservation.ca.gov/DLRP/CIFF/.

Air Quality (Section 3.3)

- 7. California Air Resources Board (ARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. Available: http://www.arb.ca.gov/ch/landuse.htm. Accessed January 2021.
- 8. Office of Environmental Health Hazard Assessment (OEHHA). 2015. Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments. Available: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed January 2021.
- South Coast Air Quality Management District (SCAQMD). 2008. Localized Significance Thresholds. Available: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significancethresholds/final-lst-methodology-document.pdf?sfvrsn=2. Accessed January 2021.
- 10. ———. 2015. Multiple Air Toxics Exposure Study IV. Available: https://scaqmdonline.maps.arcgis.com/apps/webappviewer/index.html?id=470c30bc6daf4ef6a43f0082973ff45f. Accessed January 2021.
- ———. 2016. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin. Available:http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-managementplans/naaqs-caaqs-feb2016.pdf. Accessed January 2021.
- ———. 2017a. 2016 Air Quality Management Plan. Available: https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15. Accessed January 2021.

- ———. 2017b. Board Meeting Funding for Multiple Air Toxics Exposure Study V. Available: http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-jul7-009.pdf?sfvrsn=7. Accessed January 2021.
- ———. 2019. South Coast AQMD Air Quality Significance Thresholds. Available: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significancethresholds.pdf. Accessed January 2021.
- 15. U.S. Environmental Protection Agency (EPA). 2020. Nonattainment Areas for Criteria Pollutants (Green Book). Available: https://www.epa.gov/green-book. Accessed April 2021.

Biological Resources (Section 3.4)

- California Department of Fish and Wildlife (CDFW). 2020a. California Natural Diversity Data Base (CNDDB). Full condensed report for the El Toro, Tustin, Orange, Black Star Canyon, Corona South, Santiago Peak, Laguna Beach, San Juan Capistrano, and Canada Gobernadora quadrangles. Generated December 21, 2020.
- 17. Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, CA. 1300 pp.
- 18. County of Orange. 1996. Orange County Central and Coastal Subregion Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP). Available at: https://wildlife.ca.gov/Conservation/Planning/NCCP/Plans/Orange-Coastal.
- County of Orange. 1996b. Joint Programmatic Environmental Impact Report and Environmental Impact Statement. Available at: https://www.fws.gov/carlsbad/HCPs/SOOCSRHCP/Orange%20County%20Southern%20Subregion%2 0HCP/So_OR%20HCP%20EXEC%20SUMMARY.pdf

Cultural Resources (Section 3.5)

- City of Irvine. 2015. General Plan Cultural Resource Element. Available: http://alfresco.cityofirvine.org/alfresco/guestDownload/direct?path=/Company%20Home/Shared/C D/Planning%20and%20Development/General%20Plan/06.%20Cultural%20Resources%20Element%2 0-%20Aug%202015.pdf.
- 21. National Bridge Inventory Data (NBI). 2020. "Orange County." Electronic database: https://bridgereports.com/ca/orange/. Accessed August 18, 2020.
- Nationwide Environmental Title Research (NETR). 2020. Historic Aerials. Years accessed: 1938, 1946, 1952, 1963, 1967, 1972, 1980, 1994, 2002, 2010, and 2016. Electronic database: https://www.historicaerials.com/. Accessed August 18, 2020.
- 23. HDR. 2021. Technical Memorandum: OCTA OCMF Extended Phase I Cultural Resource Survey. Prepared for Orange County Transportation Authority, November 29, 2021.

Energy (Section 3.6)

- 24. City of Irvine. 2015. General Plan: Energy Element. Available: https://www.cityofirvine.org/community-development/current-general-plan. Accessed April 2021.
- 25. ———. 2020. Strategic Energy Plan. Available: https://records.cityofirvine.org/OnBaseAgendaOnlineGREC/Documents/ViewDocument/STRATEGIC %20ENERGY%20PLAN.pdf?meetingId=3010&documentType=Agenda&itemId=101569&publishId=32 144&isSection=false. Accessed April 2021.
- 26. U.S. Energy Information Administration (EIA). 2016. Carbon Dioxide Emissions Coefficients. Available: https://www.eia.gov/environment/emissions/co2_vol_mass.php. Accessed April 2021.

Geology and Soils (Section 3.7)

- 27. California Geological Survey, 2002, California Geomorphic Provinces, Note 36, 2002.
- 28. Morton, D.M., and F.K. Miller. 2006. Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangles, California. Reston, Virginia: United States Geological Survey.
- 29. Diaz Yourman & Associates (DYA). 2020. Metrolink Orange County Maintenance Facility, Geotechnical Sampling and Analysis Plan.
- 30. Diaz Yourman & Associates (DYA). 2021. Metrolink Orange County Maintenance Facility, Phase I Environmental Site Assessment.
- 31. Kleinfelder. 2014. Phase I Environmental Site Assessment. OCTA Excess Land APN: 580-081-53, 21.3 Acres in "Great Park" Area Irvine, California.

Greenhouse Gas Emissions (Section 3.8)

- California Air Resources Board (ARB). 2008. Climate Change Scoping Plan. Available: https://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed January 2021.
- 33. ———. 2014. First Update to the Climate Change Scoping Plan: Building on the Framework. Pursuant to AB 32, the California Global Warming Solutions Act of 2006. Available: https://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan. pdf. Accessed January 2021.
- 34. ———. 2017. California's 2017 Climate Change Scoping Plan. Available: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed January 2021.
- 35. ———. 2020. California Greenhouse Gas Inventory for 2000–2018. Available: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf. Accessed January 2021.
- 36. Office of Planning and Research (OPR). 2018. CEQA and Climate Change Advisory. Available: http://opr.ca.gov/docs/20181228-Discussion_Draft_Climate_Change_Adivsory.pdf. Accessed January 2021.

- 37. South Coast Air Quality Management District (SCAQMD). 2008. Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans. Available: http://www.aqmd.gov/docs/defaultsource/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significancethresholds/ghgboardsynopsis.pdf?sfvrsn=2. Accessed January 2021.
- Southern California Association of Governments (SCAG). 2020. Connect SoCal: 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy. Available: https://www.connectsocal.org/Documents/Adopted/0903fConnectSoCal-Plan.pdf. Accessed January 2021.
- 39. U.S. Environmental Protection Agency (EPA). 2017. Understanding Global Warming Potentials. Available: https://www.epa.gov/ghgemissions/understanding-global-warming-potentials. Accessed January 2021.
- 40. ———. 2020. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018. Available: https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-maintext.pdf. Accessed January 2021.

Hazards and Hazardous Materials (Section 3.9)

- 41. Diaz, Yourman & Associates. Draft Phase I Environmental Site Assessment, Metrolink Orange County Maintenance Facility, Version 1, 11/2020.
- 42. Kleinfelder. 2014. Phase I Environmental Site Assessment, OCTA Excess Land APN: 580-081-53, 21.3 Acres in "Great Park" Area Irvine, California.

Hydrology and Water Quality (Section 3.10)

- 43. California Stormwater Quality Association. (2003) Stormwater Best Management Practice Handbook, Construction, 2002 Edition. Available: https://www.casqa.org/sites/default/files/BMPHandbooks/BMP_Municipal_Complete.pdf
- 44. Orange County Transportation Authority (OCTA). 2021. Metrolink OCMF Preliminary Water Quality Water Management Plan Draft.
- 45. Metrolink. 2019. OCTA Project Study Report for Orange County Maintenance Report.
- 46. Orange County Water District, City of La Habra, and Irvine Water District. 2017. Draft Basin 8-1 Alternative Overview. Available: https://www.ocwd.com/media/4787/basin-8-1-alternative-tocomply-with-sustainable-groundwater-management-act.pdf.

Land Use and Planning (Section 3.11)

- 47. City of Irvine. 2015a. City of Irvine General Plan, Land Use Element. Available: https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=20687.
- City of Irvine. 2015b. City of Irvine Zoning Ordinance. Available: https://library.municode.com/ca/irvine/codes/zoning?nodeId=ZOOR_DIV3GEDESTLAUSRE_CH3-37ZODILAUSREDEST_S3-37-111.9ORCOGRPA.

Mineral Resources (Section 3.12)

- The California Department of Conservation (DOC). 1984. Designation of Regionally Significant Construction Aggregate Resource Areas in the Orange County – Temescal Valley and San Gabriel Valley Production-Consumption Regions. Available: https://www.conservation.ca.gov/smgb/reports/Documents/Designation_Reports/SMARA%20Desig nation%20Report%20No.%203.pdf. Accessed March 30, 2021.
- 50. Guidelines for Classification and Designation of Mineral Lands, 2000: https://www.conservation.ca.gov/smgb/Guidelines/Documents/ClassDesig.pdf

Noise (Section 3.13)

- 51. Federal Transit Authority. 2018. Transit Noise and Vibration Impact Assessment Manual. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf
- 52. City of Irvine. 2015a. Noise Element of the Irvine General Plan. Available at: https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=20695#:~:text=maximum%20in terior%20noise%20levels%20of,7%20a.m.%20for%20typical%20occupancy.
- 53. City of Irvine Municipal Code Irvine. 2015b. Available at: https://library.municode.com/ca/irvine/codes/code_of_ordinances?nodeId=TIT6PUWO_DIV8PO_C H2NO

Population and Housing (Section 3.14)

54. City of Irvine. 2015. City of Irvine General Plan, Land Use Element: https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=20687.

Public Services (Section 3.15)

- 55. City of Irvine . 2020a. Divisions, Bureaus & Units. Available: https://www.cityofirvine.org/irvine-police-department/divisions-bureaus-units.
- 56. ———. 2020b. Public Parks and Facilities Inventory. Available: http://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=29899.
- 57. Orange County Fire Authority (OCFA). 2014. Standards of Coverage and Deployment Plan, Available: https://www.ocfa.org/_uploads/pdf/Orange%20County%20Fire%20Authority%20SOC_FINAL.pdf.
- 58. ———. 2019. Statistical Annual Report. Available: https://www.ocfa.org/Uploads/Transparency/OCFA%20Annual%20Report%202019.pdf.

Recreation (Section 3.16)

 59. City of Irvine. 2015. City of Irvine General Plan Parks and Recreation Element. Available: http://alfresco.cityofirvine.org/alfresco/guestDownload/direct?path=/Company%20Home/Shared/C D/Planning%20and%20Development/General%20Plan/12.%20Parks%20and%20Recreation%20Elem ent%20-%20Aug%202015.pdf.

Transportation (Section 3.17)

- 60. City of Irvine. 2007. Transportation Design Procedures. Available: https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=10062.
- 61. ———. 2015a. City of Irvine General Plan, Circulation Element. Available: http://alfresco.cityofirvine.org/alfresco/guestDownload/direct?path=/Company%20Home/Shared/C D/Planning%20and%20Development/General%20Plan/03.%20Circulation%20Element%20-%20Aug%202015.pdf.
- 62. ———. 2015b. Active Transportation Plan. Available: https://alfresco.cityofirvine.org/alfresco/guestDownload/direct?path=/Company%20Home/Shared/ PW/Active%20Transportation%20Plan/IrvineATP%20TW%20-%20Final.pdf.
- 63. ———. 2020. Traffic Study Guidelines. Available: https://irvine.granicus.com/MetaViewer.php?view_id=81&event_id=1634&meta_id=105401.
- 64. City of Irvine Design Manual. 2013. Section 101 Street Design. Available: file:///C:/Users/jessica.koon/Downloads/Section%20101%20-%20Street%20Design.pdf
- 65. Orange County Transportation Authority (OCTA). 2016. OC Foothills Bikeways Strategy. Available: https://www.octa.net/pdf/20160404_OC%20Foothills%20Bikeways_Final%20Final.pdf.
- 66. Southern California Association of Governments (SCAG). 2020. Connect SoCal. Available: https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176.
- 67. ———. 2018. OCTA Long-Range Transportation Plan. Available: http://www.octa.net/pdf/OCTALRTP111618FINAL.pdf.
- 68. Transportation Research Board. 2017. Highway Capacity Manual.

Utilities and Service Systems (Section 3.19)

- 69. Metrolink, OCTA, Project Study Report for Orange County Maintenance Report, 2019
- County of Orange Waste & Recycling, Prima Deshecha Landfill. Available: https://www.oclandfills.com/landfills/active-landfills/prima-deshecha-landfill. Accessed March 30, 2021.
- 71. Irvine Ranch Water District, Michelson Water Recycling Plant. Available: https://www.irwd.com/construction/michelson-water-recycling-plant. Accessed March 30, 2021.
- 72. ———. Water Supply and Reliability. Available: https://www.irwd.com/services/water.Accessed March 30, 2021.

Wildfire (Section 3.20)

73. Orange County Fire Authority (OCFA). 2020. Fire Master Plans for Commercial and Residential Development Guideline B-09.

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METROLINK ORANGE COUNTY MAINTENANCE FACILITY PROJECT

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION APPENDICES ORANGE COUNTY TRANSPORTATION AUTHORITY

June 2022



Initial Study/ Mitigated Negative Declaration Appendices

Metrolink Orange County Maintenance Facility Project

Orange County Transportation Authority June 2022

Prepared for: Gannett Fleming Figueroa at Wilshire 601 S Figueroa St. #3800 Los Angeles, CA 90017

Prepared by: AECOM 401 W A St., Suite 1200 San Diego, CA 92101

Appendix A Technical Memorandum Aesthetics

Metrolink Orange County Maintenance Facility

Prepared for:

Orange County Transportation Authority 550 S. Main St. Orange, CA 92868

And

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

Prepared by:

AECOM 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|---|-----------|
| 0 | Draft Aesthetics Technical Memorandum | 01/15/21 |
| 1 | Draft Aesthetics Technical Memorandum (Incorporating OCTA's comments) | 4/27/2021 |
| 2 | Draft Aesthetics Technical Memorandum (Incorporating OCTA's comments) | 6/17/2021 |

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1. INTRODUCTION

The Southern California Regional Railroad Authority (SCRRA) Metrolink Commuter Rail System (Metrolink) is proposing to construct a new Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project"). The Project would include several facilities including a transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth, sand silos, a maintenance facility, a maintenance facility extension, and 11 tracks. Approximately 80 employees would report to the Project. The Project consists of buildings that would have a total building area of approximately 90,000 square feet when combined. Metrolink currently operates two maintenance facilities across its service area: Central Maintenance Facility (CMF) in Los Angeles and Eastern Maintenance Facility (EMF) in San Bernardino County. Due to projected population expansion within its service area and the agency's goal to be prepared for the 2028 Los Angeles Summer Olympic Games, Metrolink will require an increased number of commuter rail services, as well as additional train storage and maintenance facilities associated with an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the Project would provide an optimal location for a new Metrolink maintenance facility. Metrolink's member agency, the Orange County Transportation Authority (OCTA), proposes to build this facility on an OCTA-owned parcel in the City of Irvine. OCTA is the lead agency under the California Environmental Quality Act (CEQA). The City of Irvine and SCRRA are the responsible agencies under CEQA.

The purpose of this memorandum is to describe the potential impacts that the Project would have on the existing baseline visual and aesthetic resources.

2. PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

As a result of the projected population expansion within the five-county area (Orange County, Los Angeles County, San Bernardino County, Riverside County, and Ventura County) currently served by the SCRRA, Metrolink will require an increased number of commuter rail services to support the growth. Consequently, the Metrolink system (Figure 2.1-1) would require additional train storage and maintenance facilities to support an increased fleet size.



Figure 2.1-1 Metrolink System Map

Source: SCRRA (2019)

Metrolink's CMF facility is located on the east bank of the Los Angeles River near the Interstate 5 (I-5) and Interstate 10 (I-10) highways, just south of the location of the former Southern Pacific Taylor Yard. The CMF is currently near capacity, which will impact the ability to provide the necessary train servicing for planned service-expansion of various Metrolink lines throughout the system under the Southern California Optimized Rail Expansion (SCORE) program. By transferring a portion of the current fleet from CMF to the proposed OCMF (specifically the Orange County Line trains), capacity for the non-Orange County trains will be increased at CMF. The Orange County Line has the highest ridership within the Metrolink system; therefore, a maintenance facility to serve the Orange County area with sufficient storage and servicing capabilities for both locomotives and rail cars is critical to controlling operating costs. In order to optimize rail service in the region, the proposed facility development would need to be completed by 2028. The SCORE program may also require heavy overhaul capabilities at OCMF, subject to pending decisions regarding fleet technology and management.

The expansion of Orange County and overall Metrolink commuter rail service will ultimately require additional or expanded equipment servicing capabilities for both locomotives and rail cars. Since a significant portion of the fleet will be in Orange County, a maintenance facility located along the Metrolink route through Orange County would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and San Bernardino. The proposed maintenance facility would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Much of the inspection and maintenance activity is federally mandated and must be performed at specific intervals. The OCMF will also provide refueling services thus reducing fuel costs, reducing fuel consumption, and will reduce emissions. Currently trains operating in the Orange County Region must travel either the CMF or EMF for refueling, which are sometimes non-revenue runs. The location of the Project is on a 21.3-acre OCTA-owned parcel on Ridge Valley south of Marine Way in the City of Irvine (Project Site). The Project Site is located within the boundaries of a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was guitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City of Irvine that same year. OCTA then purchased the fee ownership of the Project Site from the City of Irvine. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley.

Prior to the current construction of the storage/set-out track, the Project Site was mostly vacant. The site currently includes 1,000-foot-long storage for miscellaneous rail equipment including temporary railroad bridges, signal houses, railroad ties, and signal components. Although not part of the Project, OCTA is currently installing a single 1,000-foot-long, single-ended storage track and fencing of the perimeter of the property to provide temporary storage of two trainsets and/or track maintenance equipment when necessary. There is a segment of an abandoned road, stormwater drains, and underground water transfer vault with a network of pipelines, valves and associated vents, that are currently not in use.

2.2 PROJECT DESCRIPTION

The OCMF would be located in the City of Irvine, on a 21.3-acre parcel owned by OCTA and adjacent to Marine Way and the Metrolink Orange subdivision between mileposts 183.50 and 184.00 on Metrolink's "Orange" Subdivision (Figure 2.2-1). The Project Site is located within Planning Area 51 of the updated City of Irvine General Plan, adopted in June 2015, and designated for the Great Park (formerly known as the Orange County Great Park (OCGP)), land use under the General Plan (City of Irvine, 2015). Per the City's zoning ordinance, the proposed use is a conditionally allowable use under the existing zone; therefore, OCTA is submitting a Conditional Use Permit to the City of Irvine for approval,

The Project would be developed in two phases with an anticipated completion date of 2028. Phase 1 focuses on developing facilities needed for the storage and routine cleaning, inspection, and servicing of the anticipated trainsets. The total area of the Phase 1 buildout would be approximately 20,996 square feet and would be comprised of the following facilities: the transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth and sand silos (Table 0-1). A total of 11 tracks would be built. The Phase 1 layout situates the train wash, fueling/sanding, and service and inspection tracks on the two tracks with the greatest tangent length, which are the ones nearest to the railroad right-of-way ("ROW"). This is important in fitting a second fueling/sanding facility so that there is one at each end of the service and inspection platform to support having the locomotive at either end, all within tangent track. Additionally, all six storage tracks and appurtenant features (air, water, head end power and toilet dump facilities) would be constructed. The storage tracks would be built near the middle of the site east of the service and inspection tracks. Phase 1 of the buildout would anticipate approximately 52 employees total throughout the entire day, split across three eight-hour shifts.

| Building/Facility/Item | Building Area | Building Height |
|--------------------------------|----------------------|------------------------|
| Transportation Building | 7,495 sq. ft. | 20 ft |
| Train Wash Building | 11,110 sq. ft. | 21 ft |
| Maintenance Building | 40,392 sq. ft. | 48 ft |
| Maintenance Building Expansion | 27,880 sq. ft. | |
| Utility Building | 981 sq. ft. | 20 ft |
| Pump House | 750 sq. ft. | 14 ft |
| Guard Booth | 36 sq. ft. | |
| Equipment Booth | 48 sq. ft. | |
| Sand Silos (2 Total) | 576 sq. ft. | |
| Total | 89,268 sq. ft. | |

Table 0-1 Building Specifications

Source: Gannett Fleming, Metrolink (February 2022)

Note: sq. ft. = square feet; ft = feet

A runaround track would be provided between the service and inspection tracks and storage tracks. Additionally, two temporary stub-ended set out tracks would be provided in the Phase 1 layout that occupies the footprint of the future shop tracks (one at the north and one at the south end of the yard). These set out tracks would be converted to shop access tracks in Phase 2 and therefore, would no longer be available as set out tracks. A new set out track would then be provided as part of Phase 2.

A transportation building that would be utilized for administrative purposes is also included in Phase 1. This building would house managerial offices, welfare spaces for train crews and on-site personnel. This facility would include restrooms, showers, locker rooms, a break/day room, vending space and a kitchenette.

Parking would be provided for staff reporting to the site. Fire department compliant roadways would be developed to permit circulation of the site for Metrolink vehicles as well as delivery trucks (sand and fuel).

Phase 2 completes the full buildout of the Project. It would include development of the maintenance shop building and its future extension that would comprise of a total buildout area of 68,272 square feet (Table 0-1). The shop would have capabilities to perform regular three-month, six-month, and one-year preventive maintenance cycles on trainsets. Phase 2 of the buildout would consist of approximately 28 employees. With the full buildout of Phase 1 and Phase 2, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts. Access to the OCMF would require a roadway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The Project includes the southern extension of Ridge Valley Road from Marine Way and associated traffic signal improvements to provide access to the OCMF.

The 11 new east and west lead tracks, as discussed in this section above, would be constructed within the existing railroad corridor between MP 183.0 and MP 184.00 on Metrolink's "Orange" Subdivision to connect the existing mainline railroad to the proposed OCMF rail yard. A new single span concrete bridge over the Bee Canyon Channel (Channel) would be built for the east lead track. A segment of the Channel and utilities that are found to be in conflict would be lowered by approximately 2.5 feet to facilitate the construction of the bridge.

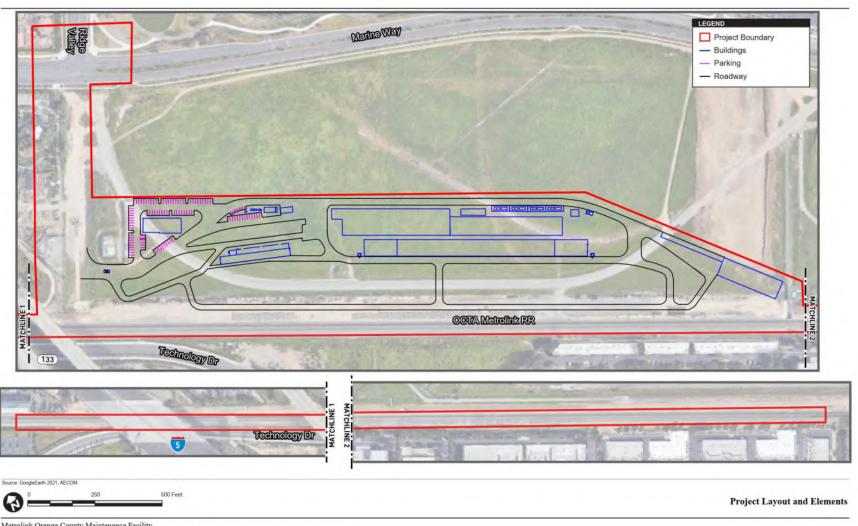


Figure 2.2-1 Project Layout and Elements

Metrolink Orange County Maintenance Facility Park 'na account con/ft: LMER.Sm.Dego-USSDGI DCS/Project: _066166613897_GF_OCTL_MER908-CLD-GIS980 Graphics: 2:-2 Proj Layout_Element: ai, 12 09 2021, Brah,D

Source: ESRI (2021), OCTA (2021)

3. ENVIRONMENTAL SETTING

3.1 EXISTING CONDITIONS

The Project Site is located in a relatively flat area adjacent to the OCGP, with a multi-sport complex in close proximity to the northeast, office/industrial uses to the southwest, and the I-5 and State Route 133 (SR-133) highways. The existing area in the vicinity of the Project consists of an active railroad corridor, vacant, undeveloped land, active parkland associated with the OCGP, and other urbanized attributes areas containing medium-high rise commercial office buildings (Google Maps, 2018). A complex of two-story single-family homes is located at the northwest corner of Marine Way and Ridge Valley Boulevard. The City of Irvine and their private partner are converting 1,300 acres of the former military base into 472 acres of developed parkway for Great Park with amenities hosting: twenty-five tennis courts, thirteen soccer fields, a golf course, twelve baseball fields, and other community buildings and open space features (City of Irvine, 2020). Future development will consist of museums and other cultural and entertainment components that would require approval from the Irvine City Council. The OCGP would be the fourth largest sports complex in the nation after full build out.

The Santa Ana Mountains can be seen to the east of the Project Site and Bommer and Shady Canyon can be seen southwest of the Project Site. There are no designated Caltrans scenic vistas or scenic resources in the area (Caltrans, 2019).

The vacant parcel between the Project Site and Marine Way is currently being developed into an RV (recreational vehicle) storage area by the County of Orange. The intended use of this parcel is for storage of unoccupied vehicles.

The existing Project Site does not have any light sources. Sources of lighting in the vicinity of the Project Site include the OCGP's tennis courts, sports fields, and parking lot security lighting. The highways additionally have light sources for roadway visibility and headlights from motor vehicle traffic.

3.2 EXISTING VISUAL CHARACTER AND QUALITY

The existing visual character of the Project Site exhibits some natural landforms and vegetation, such as low grasses, due to the Project Site currently being vacant and undeveloped (Figure 3.2-1 and 3.2-2). Other landforms such as a narrow paved road traverses the visual landscape. Minor visual structural features on the Project Site include unused stormwater drains, valves and vents, rail equipment, signal houses, and storage of other rail or electrical related equipment. The form of the Project Site is generally flat, low, and simple, with no vertical elements that dominate the landscape. Lines associated with the Project Site are generally horizontal, curving and continuous, but occasionally irregular, which do not visually dominate the view. Colors that are visible within the landscape include primary hues of brown, with some patches of greens and variable lines including grays. The texture of the Project Site is fine-grained, dense, patchy, with occasional areas of striation. The existing visual quality of the Project Site is considered to have low vividness, intactness, and unity because the Project Site does not exhibit distinctive or memorable visual

elements; the integrity of the visual environment is not consistent or patterned; and the visual elements do not combine to form a coherent visual design or organization.

A majority of the areas surrounding the Project Site vary greatly in visual character from the Project Site in terms of form, line, color, and texture due to the presence of more and taller vertical features such as trees, residences, elevated highways, as well as vibrant large areas of green spaces. The visual quality of the surrounding area varies, but generally exhibits a slightly higher degree of vividness, intactness, and unity.



Figure 3.2-1 View from within the Project Site, Looking West

Source: Google Maps (2018)





Source: Google Maps (2018)

3.3 VIEWER CHARACTERISTICS AND SENSITIVITY

Viewer sensitivity or concern is based on the visibility of resources in the landscape, the proximity of viewers to the aesthetic resource, the relative elevation of the viewers compared to the aesthetic resource, the frequency and duration of views, the number of viewers, and the types of individuals. In considering aesthetic impacts of the Project, key views and visually prominent features have been assessed to determine how they would most influence impact perception.

The viewer population is a mix of viewer groups, including residents, park patrons, office building and industrial workers, transit patrons, commuters and bicyclists. Commuters, including bicyclists and motorists on streets and freeways, are anticipated to have low sensitivity to visual change than other viewer groups because they are focused on driving in traffic. Similarly, transit patrons are anticipated to have low sensitivity to visual change because they are taking transit (e.g., Metrolink) typically for the specific purpose of traveling to and from their place of employment. Workers in the nearby office buildings and industrial buildings are anticipated to have low sensitivity to visual change because they arent to visual change because they are present in this area primarily to work, and not for leisure activities. The residents and park patrons would have high sensitivity to visual change in the area either because their activities are elective or because they spend a great deal of time in the area surrounding the Project Site.

Light sensitive receptors or land uses may include, but are not limited to, all types of residences; commercial or institutional uses that require minimal nighttime illumination for proper function, physical comfort, or commerce; and natural areas. In the vicinity of the Project Site, the sensitive receptors include the senior residential community to the northwest. OCGP, as a park, would be considered a light sensitive receptor; however, it already contains several sources of nighttime illumination for its sports fields. Therefore, the OCGP is not considered a light sensitive receptor for the purposes of this Project.

3.4 REGULATORY FRAMEWORK

City of Irvine General Plan Land Use Policy Objective A-1 Policy (a)- Objective A-1 of City of Irvine's Land Use Policy is to strengthen Irvine's identity. One policy mechanism to achieve this objective is through the conservation of visual resources along the scenic corridors that define the City of Irvine.

4. METHODOLOGY

Visual or aesthetic resources are the natural and built features of the landscape that can be seen. The combination of landform, water, and vegetation patterns represents the natural landscape features that define an area's visual character. Built features, such as buildings, roads, utility structures, and ornamental plantings, reflect human modifications to the landscape. These natural and built landscape features, or visual resources, contribute to the public's experience and appreciation of the environment.

The process used in this visual impact assessment generally follows the guidelines outlined in the publication *Guidelines for the Visual Impact Assessment of Highway Projects* published by the Federal Highway Administration (FHWA) in January 2015, which is an updated version of publication *Visual Impact Assessment for Highway Projects* also published by FHWA in March 1981. Although this guidance was

developed for highway projects, it is adaptable to many types of projects. The major components of the visual impact assessment include establishing the visual setting and assessing impacts of the project on visual resources, such as nearby natural or constructed features.

The degree of aesthetic or visual impact was determined by assessing the visible changes that would be introduced by the Project. The assessment focuses on areas where changes in the visual environment would be greatest, such as areas with higher viewer sensitivity and/or where sensitive views would be affected. The assessment of potential aesthetic impacts addresses the following:

- Conflicts or complements to the existing visual character;
- Changes in visual quality;
- Likely impact on viewers with consideration of viewer sensitivity;
- Visual intrusion and blockage of sensitive views with an emphasis placed on any views that are identified by local jurisdictions as requiring protection; and
- Increases in light and glare.

The viewer population is a mix of major viewer groups that includes residents, park patrons, office building and industrial workers, transit patrons, commuters and bicyclists. Scenic views are defined as long-range views toward preserved natural areas or recognized visual and/or historic landmarks. A visual change would be considered significant if it introduces obstructive elements substantially out of character with existing land uses or substantially obscures a scenic view or vista available to major viewer groups near project features. The degree of visual impact is determined by assessing visible changes that would be introduced by the Project during construction and operation, as well as viewers' exposure and sensitivity to these changes.

4.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT THRESHOLDS

CEQA considers an impact significant if the Project would:

- 1. Have a substantial adverse effect on a scenic vista.
- 2. Substantially degrade scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- 3. In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings. (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, if the project would conflict with applicable zoning and other regulations governing scenic quality.
- 4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

5. IMPACTS ANALYSIS

5.1 SCENIC VISTAS

A scenic vista generally provides focal views of objects, settings, or features of visual interest; or panoramic views of large geographic areas of scenic quality, primarily from a given vantage point. A significant impact would occur if a project introduced incompatible visual elements within a field of view containing a scenic vista or substantially altered a view of a scenic vista.

Scenic views or vistas are panoramic public views of various natural features, including the ocean, striking or unusual natural terrain, or unique urban or historic features. Public access to these views may be available from nearby parklands, private and public-owned sites, and public ROW.

The City of Irvine General Plan does not delineate or designate any specific views as protected scenic vistas in the Project Site. There are no designated Caltrans scenic vistas or scenic resources in the area. The closest designated scenic highway is Highway 91 and is located approximately 13 miles away from the Project. The Project Site is within an urban setting within the eastern portion of Irvine, directly adjacent to the Metrolink ROW and an elevated freeway. The Project Site is relatively flat, and implementation of the Project would not result in a significant alteration of its topography. The Project would include a new maintenance facility located along the Metrolink ROW and would involve the construction and operation of up to 30-foot-tall buildings, and approximately 30-foot-tall metal structures that would serve as bridges for utility lines. The construction and operations of the Project would not result in the disruption of any designated scenic vistas from the perspective of residences to the northwest of the Project Site or patrons at the surrounding OCGP complex. Therefore, construction and operational impacts related to effects on a scenic vista would be less than significant.

5.2 SCENIC RESOURCES

A significant impact would occur where scenic resources within a state scenic highway were damaged or removed as a result of the Project. The Project is not located along or near an officially designated California Scenic Highway or locally designated scenic highway. The closest designated scenic highway is Highway 91 and is located approximately 13 miles away from the Project. Old Town Irvine is a registered California historical landmark, located approximately ½ mile away from the Project Site; however, it is occluded by the SR-133 and I-5 highways (State of California Office of Historic Preservation, 2020; National Park Services, 2020).

The Project would not impact any groves of trees, street trees, rock outcroppings, historic buildings, or any other potential scenic resources during construction or operations as no existing scenic resources are located on the Project Site. Therefore, no construction or operational impacts would occur related to scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

5.3 VISUAL CHARACTER

Construction Impacts

Project construction would include two phases and would be temporary in nature. Phase 1 would consist of the primary build-out of the facility and would last up to 30 months in duration. Phase 2 is a secondary build-out of up to 24 months in duration.

Visually, the Project Site consists of a vacant area with a minor accessory structure and access roads. The Project Site does not contain any buildings, trees, or landscaping and the existing landscape is not memorable. This is a contrast from the green open space area to the north which includes the OCGP. During the construction phase, construction equipment, staging areas, construction trucks and vehicles, and temporary fencing would be visible to several viewer groups and would result in a contrast and change in visual character from the existing vacant area. However, construction is currently ongoing for the County of Orange's RV park and, thus, construction activities such as grading would not be different than what is encountered now.

Transit patrons, commuters, and bicyclists would primarily experience views of construction activities while riding the adjacent Metrolink, driving along Marine Way adjacent to the Project Site, and while traveling in the bike path that also exists along Marine Way. The latter two groups would have some blockage of views of the construction site by the proposed RV storage area between Marine Way and the Project Site. In addition, commuters may have prolonged views while idling on the congested freeways. The change in the visual character of the Project Site during the construction phase would be noticed by these viewer groups. However, transit patrons, commuters, and bicyclists are considered to have a low sensitivity to any visual changes on the Project Site as they are likely passing through the vicinity of the Project Site to reach their destinations and their duration of exposure and awareness of landscape changes would be low.

The employees of office buildings and industrial land uses in the vicinity of the Project Site would primarily experience views of the construction activities on the Project Site as they approach and leave their place of work. Therefore, their views of the construction activities would primarily take place while en route to and from these locations in the Project Site. The change in the visual character of the Project Site during the construction phase would be noticed by these viewer groups. However, patrons and employees of office buildings and industrial land uses are considered to have a low sensitivity to any visual changes on the Project Site as they are likely passing through the vicinity to reach their place of work or business and their duration of exposure and awareness of landscape changes would be low.

Residents and OCGP patrons would primarily experience views of construction activities while driving to and from their homes and while recreating in the OCGP. Views from the residences located northwest of the Project Site would be blocked by existing mature trees on their properties, as well as the concrete wall which surrounds the residential complex. It would also be blocked by fencing that would surround the Project Site. In addition, park patrons would have prolonged views while spending time in the OCGP located directly north of the Project Site, although their view would be obstructed by the proposed RV storage area between Marine Way and the Project Site, as well as the fencing around the Project Site during construction and operations.

Overall, the construction phase would represent a temporary change in the visual quality and character of the Project Site. However, the construction site would be visibly similar to other construction projects in the City and urban areas. During construction, the Project Site would be surrounded by fencing that would also block the majority of the construction activities. Therefore, construction impacts related to visual character would be less than significant.

Operational Impacts

The Project would include a new maintenance facility located adjacent to the Metrolink ROW and would involve the construction and operation of up to 30-foot-tall buildings, and approximately 30-foot-tall metal structures that would serve as bridges for utility lines. The new structures would be set back on the Project Site over 500 feet from Marine Way to the north. The Project would be within an urban environment and would be consistent with the City's General Plan goals of conservation of visual resources along the scenic corridors in the City. To assess the potential visual changes that would result from the operation of the Project, three Key Observation Points (KOPs) were selected specifically for the Project, as shown below. KOPs represent key locations where the visual character is representative and can be used for visual simulations to evaluate potential visual impacts. Visual simulations from these KOPs were prepared to provide a before and after comparison of the visual effects that would result from the Project. The locations of the three KOPs are shown on Figure 5.3-1. The KOP existing views and simulations are shown on Figures 5.3-2 through 5.3-4.

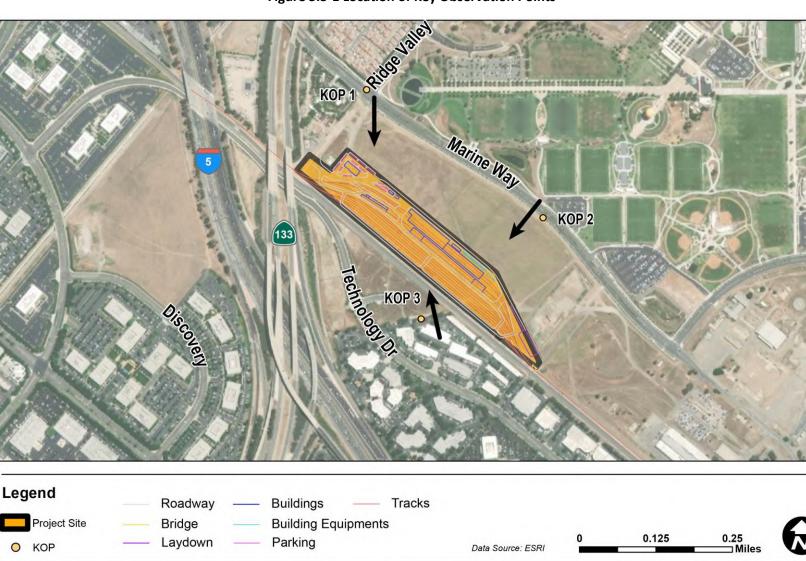


Figure 5.3-1 Location of Key Observation Points

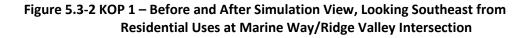
Source: ESRI (2021), OCTA (2021)

The KOPs are representative of direct views within the Project Site and its surrounding area; simulations from the same locations show how these views would change as a result of the implementation of the Project. The simulated views represent conceptual design and are not intended to represent the Project's final design.

KOP 1 shows the Project Site looking southeast from along Marine Way and the intersection with Ridge Way (see Figure 5.3-2). The Marine Way street ROW, including traffic signals and a streetlight pole, dominate the foreground of the view. Public parkway landscaping and fencing is visible directly adjacent to the roadway. The flat and somewhat vegetated Project Site is visible in the middle ground of the view with no existing structures present. The background of the view includes a segment of elevated freeway on the right, as well as trees and tall office buildings on the center and left. In the distance, the tops of hills can be seen above the elevated freeway.

As shown on Figure 5.3-2, the Project is visible in the middle ground of the view. The new buildings interrupt some of the background views of the distant office buildings, trees, and the elevated freeway. The tops of the hills can still be seen. The Project includes a solid wall that is visible throughout the center of the view from right to left. The simulated view from KOP 1 represents a visual change compared to existing conditions as the development would occur on a site with no existing structures. However, due to the urban and visual environment of the area surrounding the Project Site, including various types of uses and structures, this visual change would be consistent with other developments in the vicinity of the Project Site. The Project would include new large aboveground structures; however, the height and massing of the buildings would not substantially alter visual character for residential viewers since the residential buildings are surrounded by a tall concrete wall and large trees. Additionally, the Project would not substantially alter visual character of the Project buildings from the residential viewers. No aesthetically significant view or landmark would be altered or blocked. Therefore, operational impacts related to visual character would be less than significant for KOP 1.

KOP 2 shows the Project Site looking southwest from along Marine Way, approximately 1,800 feet southeast of Ridge Valley (see Figure 5.3-3). The OCGP is located approximately 94 feet behind the view perspective. This view represents the perspective of vehicle drivers, pedestrians, cyclists, and OCGP patrons. Visible in the foreground is the public sidewalk, landscaping, small bushes, a small tree, and a small concrete slab housing a manhole cover and small, green aboveground utility box. Visible in the middle ground is a narrow dirt road, and a large area of green and brown ground vegetation within the Project Site. The elevated freeway is visible in the background on the right and center of the view. Mature trees, commercial and office buildings, other development, and distant hills are visible in the background in the center and partially in the right side of the view.







Source: Trimble (2021), OCTA (2021)

Figure 5.3-3 KOP 2 – Before and After Simulation View, Looking Southwest from Marine Way and the OCGP





Source: Trimble (2021), OCTA (2021)

As shown in the simulated view of Figure 5.3-3, the Project would be visible in the middle ground of the view, with the tallest buildings being on the right. The new buildings would block the background views of the elevated freeway on the right and would only partially block views of the mature trees, commercial and office buildings, other development, and distant hills. The Project would include a solid wall that would be visible throughout the center of the view from right to left. The simulated view from KOP 2 represents a visual change compared to existing conditions as the development would occur on a site with no existing structures. However, due to the urban and visual environment of the area surrounding the Project Site, including various types of uses and structures, this visual change would be consistent with other developments in the vicinity of the Project Site. The Project would include new large aboveground structures; however, the height

and massing of the buildings would not substantially alter visual character for vehicle drivers, pedestrians, cyclists, and OCGP patrons from this viewpoint primarily due to the distance of the Project from the viewers. Also, no aesthetically significant view or landmark is being altered or blocked. Therefore, operational impacts related to visual character would be less than significant for KOP 2.

KOP 3 shows the Project Site looking north from the parking lot adjacent to a commercial/office building located approximately 335 feet south of the Project Site (see Figure 5.3-4). This view represents the perspective of commercial and industrial building users. Visible in the foreground is a portion of the paved and striped surface parking lot, a mature and smaller tree, as well as small bushes and a chain-linked fence that spans the view from right to left. Visible in the middle ground of the view is a vacant site that is not a part of the Project Site, as well as the Project Site itself. The ground vegetation on the vacant site and Project Site render the sites indistinguishable in this view. The Metrolink ROW divides these two sites, but this is indistinguishable in this view due to the vegetation. The background includes distant views of residential buildings on the center/left, as well as mature trees, OCGP, and hills on the right and center.

As shown in the simulated view in Figure 5.3-4, the Project would be visible in the middle ground of the view. The proposed maintenance building blocks the distant background views of mature trees, OCGP, and hills that would be visible on the right and center of the view. The simulated view from KOP 3 represents a visual change compared to existing conditions as the development would occur on a site with no existing structures. However, due to the urban and visual environment of the area surrounding the Project Site, including various types of uses and structures, this visual change would be consistent with other developments in the vicinity of the Project Site. The Project would include new large aboveground structures. Although the height and massing of the buildings would substantially alter views for commercial, office, and industrial building users, these are considered viewers with low sensitivity. Additionally, no aesthetically significant view or landmark is being altered or blocked. Therefore, no operational impacts related to visual character would occur for KOP 3.

Figure 5.3-4 KOP 3 – Before and After Simulation View, Looking North from Commercial and Industrial Uses





Source: Trimble (2021), OCTA (2021)

Overall, the operation of the Project would represent a change in visual character as compared to the existing Project Site as the development would occur on a site with no existing structures. However, the Project is in an urban area that currently has a mix of open space, industrial and office buildings, residential homes, and adjacent elevated freeway segments. Commercial businesses and offices would have a low to moderate sensitivity to this visual change. Viewers including residents and park patrons would likely have high sensitivity to the visual change; however, views from the residences would be interrupted by mature trees, existing and proposed walls, as well as the RV storage area between Marine Way and the Project Site. As a result, the Project would not conflict with any other regulations governing scenic quality because the Project would not substantially change views in the area or along any scenic corridor. Therefore, operational impacts related to visual character would be less than significant.

5.4 LIGHTING AND GLARE

Construction Impacts

The Project Site does not currently have any sources of lighting. A high level of existing ambient lighting currently exists surrounding the Project Site, including a substantial amount of high-poled sports field lighting located in the OCGP complex to the north. Construction of the Project would not include nighttime construction activities (primarily due to construction noise restrictions on work hours), which would require nighttime construction lighting. However, the Project Site would include standard safety lighting during construction. Nevertheless, sensitive receptors (the OCGP and residences) would be too far from the Project Site to experience spillover lighting due to security lighting. Therefore, construction impacts related to lighting would be less than significant. Regarding glare, construction equipment is not likely to be a significant source of glare. Therefore, no impacts related to glare would occur.

Operational Impacts

The Project would include installation of new standard exterior and interior security lighting around and within the maintenance facility, including buildings, which would operate continuously. Although, the sensitive receptors for lighting are located too far from the Project Site to be impacted by spillover lighting, per best management practices, nightime lighting fixtures would be installed to direct the majority of the light to within and directly adjacent to the facility, and away from sensitive areas, to the maximum extent feasible. In addition, the materials used in the exterior of buildings and structures visible above the proposed six-foot-tall wall between the Project Site and Marine Way would need to comply with applicable City regulations under their Municipal Code (Division 9) and Zoning Ordinance (Section 3.16) to ensure no substantial source of glare. Figure 5.4-1 and Figure 5.4-2 illustrate that the existing Central Maintenance Facility and Eastern Maintenance Facility, which the Project would be similar to, include typical exterior building materials, such as concrete, and do not exhibit reflective properties that could result in glare. Therefore, operational impacts related to the creation of a substantial source of light or glare would be less than significant.



Figure 5.4-1 Existing Central Maintenance Facility, Exterior Building Materials

Source: Google Maps (2021)



Figure 5.4-2 Existing Eastern Maintenance Facility, Exterior Building Materials

Source: Google Maps (2021)

6. MITIGATION MEASURES

No mitigation measures are required.

7. IMPACTS AFTER MITIGATION

Construction and operation of the Project would be less than significant.

8. **REFERENCES**

- Caltrans, List of Eligible and Officially Designated State Scenic Highways, 2019 Available: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-iscenic-highways
- State of California Office of Historic Preservation, California Historical Landmarks, Accessed in December 2020, Available: https://ohp.parks.ca.gov/?page_id=21445
- National Park Services, National Register of Historic Places (NRHP), Extracted 2020, Available: https://npgallery.nps.gov/NRHP/AssetDetail?assetID=ac52da44-fdce-4fe3-af84-d77c1f1d1e02

Google Maps Street view, captured 2018.

- Google Maps Street view, captured 2021.
- City of Irvine, City of Irvine General Plan, Land Use Element, 2015: https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=20687
- City of Irvine, Great Park, , Accessed in December 2020, Available at: https://www.cityofirvine.org/orangecounty-great-park
- Federal Highway Administration (FHWA), Guidelines for the Visual Impact Assessment of Highway Projects, January 2015, Available at:https://www.environment.fhwa.dot.gov/env_topics/other_topics/VIA_Guidelines_for_Highway_P rojects.pdf. Accessed: January 12, 2021.
- Southern California Regional Rail Authority (SCRRA), Metrolink System Map, October 2019, Available at: https://metrolinktrains.com/about/agency/

Appendix B Technical Memorandum Air Quality & Greenhouse Gases

Metrolink Orange County Maintenance Facility

Prepared for: Orange County Transportation Authority

> 550 S. Main St. Orange, CA 92868

> > And

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

ΑΞϹΟΜ

Kaiser Center 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|--|----------|
| 0 | Draft Air Quality and Greenhouse Gases Technical Memorandum | 03/03/21 |
| 1 | Draft Air Quality and Greenhouse Gases Technical Memorandum (Incorporating OCTA's comments and results of Health Risk Analysis and Dispersion Modeling) | 05/17/21 |
| 2 | Draft Air Quality and Greenhouse Gases Technical Memorandum (Incorporating OCTA's comments, which includes clarifying receptor spacing for HRA model runs, maps illustrating maximum cancer risk impacts and contour maps of cancer risk, and rationale behind assessing the recreational exposure scenario). | 08/04/21 |
| 3 | Draft Air Quality and Greenhouse Gases Technical Memorandum (Revised calculations based on internal QA) | 12/08/21 |

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1 INTRODUCTION

The Southern California Regional Railroad Authority (SCRRA) Metrolink Commuter Rail System (Metrolink) is proposing to construct a new Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project"). The Project would include several facilities including a transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth, sand silos, a maintenance facility, a maintenance facility extension, and 11 tracks. Approximately 80 employees would report to the Project. The Project consists of buildings that would have a total building area of approximately 90,000 square feet when combined. Metrolink currently operates two maintenance facilities across its service area: Central Maintenance Facility (CMF) in Los Angeles and Eastern Maintenance Facility (EMF) in San Bernardino County. Due to projected population expansion within its service area and the agency's goal to be prepared for the 2028 Los Angeles Summer Olympic Games, Metrolink will require an increased number of commuter rail services, as well as additional train storage and maintenance facilities associated with an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the Project would provide an optimal location for a new Metrolink maintenance facility. Metrolink's member agency, the Orange County Transportation Authority (OCTA), proposes to build this facility on an OCTA-owned parcel in the City of Irvine. OCTA is the lead agency under the California Environmental Quality Act (CEQA). The City of Irvine and SCRRA are the responsible agencies under CEQA.

The purpose of this memorandum is to present the results of the air quality and greenhouse gas (GHG) analyses and to describe the potential impacts associated with the Project.

2 PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

As a result of the projected population expansion within the five county area (Orange County, Los Angeles County, San Bernardino County, Riverside County, and Ventura County) currently served by SCRRA, Metrolink will require an increased number of commuter rail services to support the growth. Consequently, the Metrolink system (Figure 2.1-1) would require additional train storage and maintenance facilities to support an increased fleet size.



Figure 2.1-2.1-1 Metrolink System Map

Source: SCRRA (2019)

Metrolink's CMF facility is located on the east bank of the Los Angeles River near the Interstate 5 (I-5) and Interstate 10 (I-10) highways, just south of the location of the former Southern Pacific Taylor Yard. The CMF is currently near capacity, which will impact the ability to provide the necessary train servicing for planned service-expansion of various Metrolink lines throughout the system under the Southern California Optimized Rail Expansion (SCORE) program. By transferring a portion of the current fleet from CMF to the proposed OCMF (specifically the Orange County Line trains), capacity for the non-Orange County trains will be increased at CMF. The Orange County Line has the highest ridership within the Metrolink system; therefore, a maintenance facility to serve the Orange County area with sufficient storage and servicing capabilities for both locomotives and rail cars is critical to controlling operating costs. In order to optimize rail service in the region, the proposed facility development would need to be completed by 2028. The SCORE program may also require heavy overhaul capabilities at OCMF, subject to pending decisions regarding fleet technology and management.

The expansion of Orange County and overall Metrolink commuter rail service will ultimately require additional or expanded equipment servicing capabilities for both locomotives and rail cars. Since a significant portion of the fleet will be in Orange County, a maintenance facility located along the Metrolink route through Orange County would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and San Bernardino. The proposed maintenance facility would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Much of the inspection and maintenance activity is federally mandated and must be performed at specific intervals. The OCMF will also provide refueling services thus reducing fuel costs, reducing fuel consumption, and will reduce emissions. Currently trains operating in the Orange County Region must travel either the CMF or EMF for refueling, which are sometimes non-revenue runs.

The location of the Project is on a 21.3-acre OCTA-owned parcel on Ridge Valley south of Marine Way in the City of Irvine (Project Site). The Project Site is located within the boundaries of a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was quitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City of Irvine that same year. OCTA then purchased the fee ownership of the Project Site from the City of Irvine. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley.

Prior to the current construction of the storage/set-out track, the Project Site was mostly vacant. The site currently includes 1,000-foot-long storage for miscellaneous rail equipment including temporary railroad bridges, signal houses, railroad ties, and signal components. Although not part of the Project, OCTA is currently installing a single 1,000-foot-long, single-ended storage track and fencing of the perimeter of the property to provide temporary storage of two trainsets and/or track maintenance equipment when necessary. There is a segment of an abandoned road, stormwater drains, and underground water transfer vault with a network of pipelines, valves and associated vents, that are currently not in use.

2.2 PROJECT DESCRIPTION

The OCMF would be located in the City of Irvine, on a 21.3-acre parcel owned by OCTA and adjacent to Marine Way and the Metrolink Orange subdivision between mileposts 183.50 and 184.00 on Metrolink's "Orange" Subdivision (Figure 2.2-1). The Project Site is located within Planning Area 51 of the updated City of Irvine General Plan, adopted in June 2015, and designated for the Great Park (formerly known as the Orange County Great Park (OCGP)) land use under the General Plan. The City has indicated that a Conditional Use Permit (CUP) would need to be obtained for the Project and application thereof filed with the City. The use of the site as a rail maintenance facility, although deemed consistent with the purpose and intent of the zoning district, has characteristics that the City has indicated would require Zoning Administrator review in order to avoid conflicts with surrounding land uses. Therefore, OCTA would be filing a CUP application for the Project.

The Project would be developed in two phases with an anticipated completion date of 2028. Phase 1 focuses on developing facilities needed for the storage and routine cleaning, inspection and servicing of the anticipated trainsets. The total area of the Phase 1 buildout would be approximately 20,996 square feet and would be comprised of the following facilities: the transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth and sand silos (**Error! R eference source not found.**). A total of 11 tracks would be built. The Phase 1 layout situates the train wash, fueling/sanding, and service and inspection tracks on the two tracks with the greatest tangent length, which are the ones nearest the railroad right of way ("ROW"). This is important in fitting a second fueling/sanding facility so that there is one at each end of the service and inspection platform to support having the locomotive at either end, all within tangent track. Additionally, six storage tracks and appurtenant features (air, water, head end power and toilet dump facilities) would be constructed. The storage tracks would be built near the middle of the site east of the service and inspection tracks. Phase 1 of the buildout would anticipate approximately 52 employees total throughout the entire day, split across three eight-hour shifts.

| Building/Facility/Item | Building Area | Building Height | | | |
|--------------------------------|----------------------|------------------------|--|--|--|
| Transportation Building | 7,495 sq. ft. | 20 ft | | | |
| Train Wash Building | 11,110 sq. ft. | 21 ft | | | |
| Maintenance Building | 40,392 sq. ft. | 48 ft | | | |
| Maintenance Building Expansion | 27,880 sq. ft. | | | | |
| Utility Building | 981 sq. ft. | 20 ft | | | |
| Pump House | 750 sq. ft. | 14 ft | | | |
| Guard Booth | 36 sq. ft. | | | | |
| Equipment Booth | 48 sq. ft. | | | | |
| Sand Silos (2 Total) | 576 sq. ft. | | | | |
| Total | 89,268 sq. ft. | | | | |

Table 2.2-1 Building Specifications

Source: Gannett Fleming, Metrolink (February 2022)

Note: sq. ft. = square feet; ft = feet

A runaround track would be provided between the service and inspection tracks and storage tracks. Additionally, two temporary stub-ended set out tracks would be provided in the Phase 1 layout that occupies the footprint of the future shop tracks (one at the north and one at the south end of the yard). These set out tracks would be converted to shop access tracks in Phase 2 and, therefore, would no longer be available as set out tracks. A new set out track would then be provided as part of Phase 2.

A transportation building that would be utilized for administrative purposes is also included in Phase 1. This building would house managerial offices, welfare spaces for train crews and on-site personnel. This facility would include restrooms, showers, locker rooms, a break/day room, vending space and a kitchenette. Approximately 120 automobile parking spaces would be provided for staff reporting to the site. Fire department compliant roadways would be developed to permit circulation of the site for Metrolink vehicles as well as delivery trucks (sand and fuel).

Phase 2 completes the full buildout of the Project. It would include development of the maintenance shop building and its future extension that would comprise of a total buildout area of 68,272 square feet (**Error! R eference source not found.**). The shop would have capabilities to perform regular three-month, six-month, and one-year preventive maintenance cycles on trainsets. Phase 2 of the buildout would consist of approximately 28 employees. With the full buildout of Phase 1 and Phase 2, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts. Access to the OCMF would require a roadway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The Project includes the southern extension of Ridge Valley Road from Marine Way and associated traffic signal improvements to provide access to the OCMF.

The 11 new east and west lead tracks, as discussed in this section above, would be constructed within the existing railroad corridor between MP 183.0 and MP 184.00 on Metrolink's "Orange" Subdivision to connect the existing mainline railroad to the proposed OCMF rail yard. A new single span concrete bridge over the Bee Canyon Channel (Channel) would be built for the east lead track. A segment of the Channel and utilities that are found to be in conflict would be lowered by approximately 2.5 feet to facilitate the construction of the bridge.

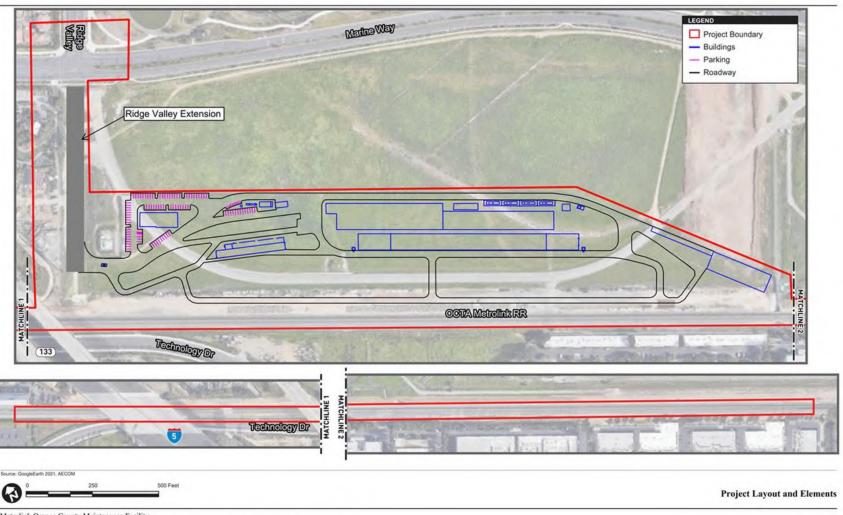


Figure 2.2-1 Project Layout and Elements

Metrolink Orange County Maintenance Facility Path: Ina accommet.com/fit/MUR SanDiego-USSDGF-DCS/Project/_6063-6063

GF_OCTA_MSF'909-CAD-GIS/930 Graphics 2.2-2 Proj Layout_Elements.ai, 12/09/2021, BradyD

Source: ESRI (2021), OCTA (2021)

3 AIR QUALITY ENVIRONMENTAL SETTING

3.1 EXISTING CONDITIONS

Air quality is defined by the concentration of pollutants in relation to their impact on human health. Concentrations of air pollutants are determined by the rate and location of pollutant emissions released by pollution sources, and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, and sunlight. Therefore, ambient air quality conditions within the local air basin are influenced by such natural factors as topography, meteorology, and climate, in addition to the amount of air pollutant emissions released by existing air pollutant sources.

Climate, topography, and meteorology influence regional and local ambient air quality. Southern California is characterized as a semiarid climate, although it contains three distinct zones of rainfall that coincide with the coast, mountain, and desert. The Project is located within the City of Irvine, which is within the South Coast Air Basin (SCAB). The SCAB is bounded by the Pacific Ocean to the west, the San Gabriel mountains, San Bernardino mountains, and San Jacinto mountains to the north and east, and the San Diego County line to the south.

The topography and climate of Southern California combine to make the SCAB an area of high air pollution potential. A warm air mass frequently descends over the cool, moist marine layer produced by the interaction between the ocean's surface and the lowest layer of the atmosphere. The warm upper layer forms a cap over the cooler surface layer, which traps the pollutants near the ground. Light winds can further limit ventilation. Additionally, abundant sunlight triggers the photochemical reactions that produce ozone and the majority of particulate matter (SCAQMD, 2017a).

The normal annual precipitation in Orange County, which occurs primarily from October through April, is approximately 13 inches (WRCC, 2003). Normal January temperatures range from an average minimum of 40 degrees Fahrenheit (°F) to an average maximum of 67°F, and August temperatures range from an average minimum of 60°F to an average maximum of 85°F (WRCC, 2003).

3.1.1 Criteria Pollutants

Individual air pollutants at certain concentrations may adversely affect human or animal health, reduce visibility, damage property, and reduce the productivity or vigor of crops and natural vegetation. Six air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) as being of concern on both nationwide and statewide levels: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead, and particulate matter (PM). PM is subdivided into two classes based on particle size: PM equal to or less than 10 micrometers in diameter (PM₁₀) and PM equal to or less than 2.5 micrometers in diameter (PM_{2.5}). Because the air quality standards for these air pollutants are regulated using human health and environmentally based criteria, they are commonly referred to as "criteria air pollutants."

Ozone. Ozone is the principal component of smog and is formed in the atmosphere through a series of reactions involving reactive organic gases (ROGs) or volatile organic compounds (VOC), and nitrogen oxides

 (NO_x) in the presence of sunlight. ROG/VOC and NO_x are called precursors of ozone. NO_x includes various combinations of nitrogen and oxygen, including nitric oxide (NO), NO₂, and others. Significant ozone concentrations are usually produced only in the summer, when atmospheric inversions are greatest, and temperatures are high. ROG/VOC and NO_x emissions are both considered critical in ozone formation.

Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered the most susceptible sub-groups for ozone effects. Short-term exposure (lasting for a few hours) to ozone can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in sports and live in communities with high ozone levels.

Carbon Monoxide. CO is a colorless and odorless gas that, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicle traffic emissions can cause localized CO impacts, and severe vehicle congestion at major signalized intersections can generate elevated CO levels, called "hot spots," which can be hazardous to human receptors adjacent to the intersections. Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of decreased oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs but exerts its effect on tissues by interfering with oxygen transport. Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include fetuses, patients with diseases involving heart and blood vessels, and patients with chronic hypoxemia (oxygen deficiency) as seen at high altitudes.

Nitrogen Dioxide. NO₂ is a product of combustion and is generated in vehicles and in stationary sources, such as power plants and boilers. It is also formed when ozone reacts with NO in the atmosphere. As noted above, NO₂ is part of the NO_x family and is a principal contributor to ozone and smog generation. Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children, is associated with long-term exposure to NO₂ at levels found in homes with gas stoves, which are higher than ambient levels found in Southern California. Airway contraction and increased resistance to air flow are observed after short-term exposure to NO₂ in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups.

Sulfur Dioxide. SO_2 is a combustion product, with the primary source being power plants and heavy industries that use coal or oil as fuel. SO_2 is also a product of diesel engine combustion. SO_2 in the atmosphere contributes to the formation of acid rain. SO_2 can irritate lung tissue and increase the risk of acute and chronic respiratory disease. In asthmatics, increased resistance to air flow and a reduction in

breathing capacity leading to severe breathing difficulties are observed after acute exposure to SO₂. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO₂. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO₂ levels. In these studies, efforts to separate the effects of SO₂ from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically, or one pollutant alone is the predominant factor.

Lead. Lead is a highly toxic metal that may cause a range of human health effects. Previously, the lead used in gasoline anti-knock additives represented a major source of lead emissions to the atmosphere from mobile and industrial sources. EPA began working to reduce lead emissions soon after its inception, issuing the first reduction standards in 1973. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically. Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure. Lead poisoning can cause anemia, lethargy, seizures, and death, although it appears that there are no direct effects of lead on the respiratory system.

Particulate Matter. PM is a complex mixture of extremely small particles that consists of dry solid fragments, solid cores with liquid coatings, and small liquid droplets. PM is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soot, and soil or dust particles. Natural sources of PM include windblown dust and ocean spray. The size of PM is directly linked to the potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller, because these particles generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Health studies have shown a significant association between exposure to PM and premature death. Other important effects include aggravation of respiratory and cardiovascular disease, lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and irregular heartbeat (EPA, 2016). Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children. A consistent correlation between elevated PM levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks, and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in lifespan, and an increased mortality from lung cancer. EPA groups PM into two categories, which are described below.

 PM_{10} PM₁₀ includes both fine and coarse dust particles; the fine particles are PM_{2.5}. Coarse particles, such as those found near roadways and dust-producing industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter. Sources of coarse particles include crushing or grinding operations and dust from paved or unpaved roads. Control of PM₁₀ is primarily achieved through the control of dust at

construction and industrial sites, the cleaning of paved roads, and the wetting or paving of frequently used unpaved roads.

*PM*_{2.5}. Fine particles, such as those found in smoke and haze, are PM_{2.5}. Sources of fine particles include all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. PM_{2.5} is also formed through reactions of gases, such as SO₂ and NO_x, in the atmosphere. PM_{2.5} is the major cause of reduced visibility (haze) in California.

3.1.2 Air Quality Standards

Health-based air quality standards have been established for these criteria pollutants by EPA at the national level and by CARB at the state level. These standards were established to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. Table 3.1-1 presents the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS).

Both EPA and CARB use ambient air quality monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. An "attainment" designation for an area signifies that pollutant concentrations did not exceed the established standard. In most cases, areas designated or redesignated as attainment must develop and implement maintenance plans (i.e., an area that was previously in nonattainment but now attains the standard). These areas are designated as "maintenance" areas and are currently under a maintenance plan to ensure continued compliance with the standard.

In contrast to attainment, a "nonattainment" designation indicates that a pollutant concentration has exceeded the established standard. Nonattainment may differ in severity. To identify the severity of the problem and the extent of planning and actions required to meet the standard, nonattainment areas are assigned a classification that is commensurate with the severity of their air quality problem (e.g., moderate, serious, severe, extreme).

Finally, an unclassified designation indicates that insufficient data exist to determine attainment or nonattainment. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment. As shown in Table 3.1-1, the SCAB is designated as a maintenance area for CO and PM₁₀, as a nonattainment area for ozone and PM_{2.5}, and as an unclassifiable or attainment area for NO₂ and SO₂ under the NAAQS. Additionally, the SCAB is designated as a partial nonattainment area for the Los Angeles County portion of the SCAB for near-source monitors for the lead NAAQS. The SCAB is designated as an attainment area for all criteria air pollutants except ozone, PM₁₀, and PM_{2.5} under the CAAQS. The most current monitoring station data and attainment designations for the area surrounding the Project Site are shown in Table 3.1-2.

| | | CAAQS | | | NAAQS | |
|--------------------|------------------------------------|----------------------------------|-----------------|------------------------|--------------------------|--|
| Criteria Pollutant | Averaging Time | Averaging Time | Designation | Averaging Time | Designation | |
| | 1-Hour | 0.09 ppm | Neretteinment | _ | _ | |
| Ozone (O₃) | 8-Hour | 0.070 ppm | Nonattainment | 0.070 ppm | Nonattainment (Extrem | |
| 514 | 24-Hour | 50 μg/m³ | Negette | 150 μg/m³ | Attainment (Maintenan | |
| PM10 | Annual | 20 μg/m ³ | - Nonattainment | - | — | |
| DNA | 24-Hour | _ | Negetteingenet | 35 μg/m³ | Nonattainment (Seriou | |
| PM _{2.5} | Annual | 12.0 μg/m³ | Nonattainment | 12.0 μg/m ³ | Attainment | |
| 60 | 1-Hour | 20 ppm | Attainment | 35 ppm | Attainment (Maintenance) | |
| CO | 8-Hour | 9 ppm | Attainment | 9 ppm | | |
| NO | 1-Hour | 0.18 ppm | Attainment | 0.10 ppm | Unclassifiable/Attainme | |
| NO ₂ | Annual | 0.030 ppm | Attainment | 0.053 ppm | Attainment | |
| | 1-Hour | 0.25 ppm (655 μg/m³) | | 75 ppb | Designations Pending | |
| SO ₂ | 24-Hour | 0.04 ppm (105 μg/m³) | Attainment | 0.14 ppm | Unclassifiable/Attainme | |
| | Annual Arithmetic Mean | _ | | 0.03 ppm | Unclassifiable/Attainme | |
| | 30-Day Average | 1.5 μg/m³ | | - | — | |
| Lead | Rolling 3-Month Average 24 Hour | _ | Attainment | 1.5 μg/m³ | Nonattainment (Partia | |
| Sulfates | 24-Hour | 25 μg/m³ | Attainment | No National Standards | | |
| Hydrogen Sulfides | 1-Hour | 0.03 ppm (42 μg/m ³) | Attainment | | | |
| Vinyl Chloride | 24-Hour | 0.01 ppm (26 μg/m ³) | Attainment | | | |

Table 3.1-3.1-1 NAAQS and CAAQS Attainment Status - South Coast Air Basin

Notes: NO_2 = nitrogen dioxide; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; SO_2 = sulfur dioxide; ppm = parts per million; ppb = parts per billion; $\mu g/m^3$ = micrograms per cubic meter. Source: SCAQMD 2016

3.1.3 South Coast Air Basin Existing Air Quality

The South Coast Air Quality Management District (SCAQMD) is responsible for enforcing the rules and regulations protecting air quality in the SCAB. Ambient air pollutant concentrations in the SCAB are measured at air quality monitoring stations operated by CARB and the SCAQMD. The closest SCAQMD air quality monitoring station to the Project is the Mission Viejo monitoring station, located at 26081 Via Pera, Mission Viejo, California, approximately 5 miles southeast of the Project Site. This station monitors ozone, PM₁₀, and PM_{2.5}. Air quality monitoring data for CO were obtained from the SCAQMD Historical Data by Year tables for the Saddleback Valley source receptor area. Air quality data for NO₂ was obtained from the Costa Mesa monitoring station, located at 2850 Mesa Verde Drive, Costa Mesa, California, approximately 10 miles west of the Project Site. Table 3.1-2 presents 3 years of the most recent information available, summarizing the exceedances of standards and the highest recorded pollutant. These concentrations represent the existing, or baseline, conditions for the area surrounding the Project Site and are based on the most recent information that is available.

As shown in Table 3.1-2, ambient air concentrations of NO_2 did not exceed the NAAQS or CAAQS in 2017 through 2019. The 1-hour and 8-hour ozone standards were exceeded in 2017 through 2019. PM_{10} and $PM_{2.5}$ concentrations also exceeded the standards between 2017 and 2019.

3.2 TOXIC AIR CONTAMINANTS

In addition to criteria pollutants, both federal and state air quality regulations also focus on toxic air contaminants (TACs). TACs can be separated into carcinogens and noncarcinogens based on the nature of the effects associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts would not occur. Any exposure to a carcinogen poses some risk of contracting cancer. Noncarcinogens differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

TACs may be emitted by stationary, area, or mobile sources. Common stationary sources of TAC emissions include gasoline stations, dry cleaners, and diesel backup generators, which are subject to local air district permit requirements. The other, often more significant, sources of TAC emissions are motor vehicles on freeways, high-volume roadways, or other areas with high numbers of diesel particulate matter-emitting activities, such as distribution centers and railyards. Off-road mobile sources are also major contributors of TAC emissions and include construction equipment, ships, and trains.

3.2.1 Diesel Particulate Matter

Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a TAC by CARB in 1998. Federal and state efforts to reduce diesel PM emissions have focused on the use of improved fuels, adding particulate filters to engines, and requiring the production of new-technology engines that emit fewer exhaust particulates.

Table 3.2-1 Ambient Air Quality Summary

| Pollutant Standards | 2017 | 2018 | 2019 |
|--|-------|-------|-------|
| Ozone | | | |
| State maximum 1-hour concentration (0.09 ppm) | 0.103 | 0.121 | 0.106 |
| National maximum 8-hour concentration (0.070 ppm) | 0.083 | 0.088 | 0.087 |
| State maximum 8-hour concentration (0.070 ppm) | 0.084 | 0.088 | 0.088 |
| CAAQS Exceeded? | Yes | Yes | Yes |
| NAAQS Exceeded? | Yes | Yes | Yes |
| Number of Days Standard Exceeded | | | |
| CAAQS 1-hour | 3 | 2 | 3 |
| CAAQS 8- hour /NAAQS 8-hour | 27/25 | 10/9 | 11/11 |
| Carbon Monoxide (CO) ^a | | | |
| National/State Maximum 8-hour concentration (9 ppm/9.0 ppm) | 0.9 | 0.9 | 0.8 |
| National/State Maximum 1-hour concentration (35 ppm/20 ppm) | 1.4 | 1.2 | 1.0 |
| NAAQS/CAAQS Exceeded? | No | No | No |
| Nitrogen Dioxide (NO2) | | | |
| National/State maximum 1-hour concentration (0.18 ppm/100 ppb) | 0.045 | * | * |
| National/State Annual Average (0.053 ppm/0.030 ppm) | * | * | * |
| NAAQS/CAAQS Exceeded? | * | * | * |
| Number of Days Standard Exceeded | | | |
| NAAQS 1-hour | 0 | 0 | 0 |
| CAAQS 1-hour | 0 | 0 | 0 |
| Particulate Matter (PM10) | | | |
| National maximum 24-hour concentration (150 µg/m ³) | 58.2 | 55.6 | 45.1 |
| State maximum 24-hour concentration (50 μ g/m ³) | 58.2 | 55.6 | 44.2 |
| State annual average concentration (20 μ g/m ³) | 18.8 | 19.1 | 16.7 |
| CAAQS Exceeded? | Yes | Yes | No |
| NAAQS Exceeded? | No | No | No |
| Measured Number of Days Standard Exceeded | | | |
| NAAQS 24-hour | 0 | 0 | 0 |
| CAAQS 24-hour | 1 | 1 | 0 |
| Particulate Matter (PM _{2.5}) | | | |
| National maximum 24-hour concentration (35 µg/m ³) | 19.5 | 38.9 | 20.8 |
| National annual average concentration (12.0 μ g/m ³) | * | * | 7.1 |
| State annual average concentration (12 μ g/m ³) | * | * | * |
| NAAQS Exceeded? | No | Yes | No |
| Measured Number of Days Standard Exceeded | | | |
| NAAQS 24-hour (>35 μg/m³) | 0 | 1 | 0 |

Notes: µg/m³ = micrograms per cubic meter; CAAQS = California Ambient Air Quality Standards;

NAAQS = National Ambient Air Quality Standards; ppb = parts per billion; ppm = parts per million

^a Data obtained from the SCAQMD Historical Data by Year.

*Insufficient data to determine the value.

Source: CARB 2020a; SCAQMD 2020

Diesel engines tend to produce a much higher ratio of fine particulates than other types of internal combustion engines. The fine particles that make up diesel PM tend to penetrate deep into the lungs and the rough surfaces of these particles makes it easy for them to bind with other toxins within the exhaust, thus increasing the hazards of particle inhalation. Long-term exposure to diesel PM is known to lead to chronic, serious health problems, including cardiovascular disease, cardiopulmonary disease, and lung cancer.

In 2015, the SCAQMD published the Multiple Air Toxics Exposure Study IV (MATES IV), a monitoring and evaluation study conducted in the SCAB. The MATES IV consists of a monitoring program, an updated emissions inventory of TACs, and a modeling effort to characterize risk across the SCAB. The study focuses on the carcinogenic risk from exposure to air toxics. The MATES IV estimated population weighted risk in the SCAB is 897 per million, a decrease of about 57 percent compared to the previous study (MATES III). The study also showed that diesel exhaust emissions had declined by about 70 percent, but diesel PM continued to account for about two-thirds of the cancer risk from air toxics (SCAQMD, 2017b). MATES IV also extrapolated excess cancer risk levels throughout the SCAB by modeling specific grids. MATES IV estimates an excess cancer risk of 626 per million for the area surrounding the Project Site (SCAQMD, 2015). SCAQMD has begun the MATES V, which will include an updated emissions inventory of TACs and updated modeling effort to characterize risk across the SCAB.

3.2.2 Asbestos

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos was identified as a hazardous air pollutant by EPA in 1971 and identified as a TAC by CARB in 1986 (EPA, 2019a; Van Gosen, 2011). Subsequently, CARB adopted two Airborne Toxic Control Measures (ATCM) to address some of the health concerns associated with exposure to asbestos: ATCM for Surfacing Applications and ATCM for Construction, Grading, Quarrying, and Surface Mining Operations (discussed in more detail in Section 5.2.3 below).

Asbestos can be released from serpentine and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos-bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed.

Serpentine may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, a rock closely related to serpentinite, may also contain asbestos minerals. Asbestos can also be associated with other rock types in California, though much less frequently than serpentinite and/or ultramafic rock. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in counties of the Sierra Nevada foothills, the Klamath Mountains, and

Coast Ranges. The California Department of Conservation, Division of Mines and Geology has developed a map showing the general location of ultramafic rock in the state. According to the General Location Guide for Ultramafic Rocks in California, Orange County and the Project Site are not identified as areas likely to contain natural occurrences of asbestos (CDMG, 2000; Van Gosen, 2011).

3.3 ODOR

Odors are considered an air quality issue both at the local level (e.g., odor from wastewater treatment) and at the regional level (e.g., smoke from wildfires). Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

The ability to detect odors varies considerably among the population and is subjective. Some individuals have the ability to smell minute quantities of specific substances, while others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person (e.g., from a fast-food restaurant or bakery) may be perfectly acceptable to another. Unfamiliar odors may be more easily detected and likely to cause complaints than familiar ones.

Offensive odors can potentially affect human health in several ways. First, odorant compounds can irritate the eyes, nose, and throat, which can reduce respiratory volume. Second, the ROGs that cause odors can stimulate sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects, such as stress.

Several examples of common land use types that generate substantial odors include wastewater treatment plants, landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants. There are no wastewater treatment plants, landfills, composting facilities, refineries, or chemical plants in the vicinity of the Project Site.

3.4 SENSITIVE RECEPTORS

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. The SCAQMD considers a sensitive receptor to be a receptor such as residence, hospital, or convalescent facility where it is possible that an individual could remain for 24 hours (SCAQMD, 2008a).

Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the

enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution because exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time.

The Project Site is adjacent to the Great Park which serves outdoor recreational activities for the community. The nearest sensitive receptors to the Project Site are the residences in the senior housing community located approximately 650 feet north of the Project Site on Ridge Valley.

4 GREENHOUSE GAS EMISSIONS ENVIRONMENTAL SETTING

4.1 SCIENTIFIC BASIS OF CLIMATE CHANGE

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters the earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This infrared radiation (i.e., thermal heat) is absorbed by GHGs within the earth's atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on the earth.

GHGs are present in the atmosphere naturally, are released by natural and anthropogenic sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals, and plants; decomposition of organic matter; and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels, waste treatment, and agricultural processes. The following are GHGs that are widely accepted as the principal contributors to human-induced global climate change:

• Carbon dioxide (CO₂)

Hydrofluorocarbons (HFCs)

- Methane (CH₄)
- Nitrous oxide (N₂O)

- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF₆)

The majority of anthropogenic CO_2 emissions are byproducts of fossil fuel combustion. CH_4 is the main component of natural gas and is associated with agricultural practices and landfills. N_2O is a colorless GHG that results from industrial processes, vehicle emissions, and agricultural practices. HFCs are synthetic chemicals used as a substitute for chlorofluorocarbons in automobile air conditioners and refrigerants. PFCs are produced as a byproduct of various industrial processes associated with aluminum production and the manufacturing of semiconductors. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable GHG used for insulation in electric power transmission and distribution equipment, and in semiconductor manufacturing. The primary GHGs that would be emitted during construction and operation of the Project are CO_2 , CH_4 , and N_2O .

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO₂. The GWP of a GHG is based on several factors, including the relative

effectiveness of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere ("atmospheric lifetime"). The reference gas for GWP is CO_2 ; therefore, CO_2 has a GWP of 1. The other main GHGs that have been attributed to human activity include CH_4 , which has a GWP of 25, and N₂O, which has a GWP of 298 (EPA, 2017a). For example, 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 25 tons of CO_2 . GHGs with lower emissions rates than CO_2 may still contribute to climate change because they are more effective at absorbing outgoing infrared radiation than CO_2 (i.e., high GWP). The concept of CO_2 -equivalents (CO_2e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation.

Although the exact lifetime of any particular GHG molecule is dependent on multiple variables, it is understood by scientists who study atmospheric chemistry that more CO₂ is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. GHG emissions related to human activities have been determined as "extremely likely" to be responsible (indicating 95 percent certainty) for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (CARB, 2014).

4.2 GHG INVENTORIES

GHG emissions contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, electric utility, residential, commercial, and agricultural categories. Emissions of CO₂ are byproducts of fossil fuel combustion and CH₄ is the primary component in natural gas and is associated with agricultural practices and landfills. N₂O is also largely attributable to agricultural practices and soil management.

4.2.1 National

EPA prepares the official United States Inventory of Greenhouse Gas Emissions and Sinks to comply with existing commitments under the United Nations Framework Convention on Climate Change (UNFCCC). In 2018, the United States generated 6,676 million metric tons (MMT) CO₂e (EPA, 2020). The transportation sector was the single largest source of GHG emissions in 2018, accounting for 29 percent of total GHG emissions. The transportation sector was followed by the electric power and industry sectors, which account for 27 and 22 percent of the total GHG emissions, respectively (EPA, 2020).

4.2.2 California

CARB performs an annual GHG inventory for emissions and sinks of the six major GHGs. California produced 425 MMT CO₂e in 2018 (CARB, 2020b). Combustion of fossil fuel in the transportation category was the single largest source of California's GHG emissions in 2018, accounting for 40 percent of total GHG emissions in the state. The transportation category was followed by the industrial and electric power (including in-state and out-of-state sources) categories, which account for 21 and 15 percent of the state's total GHG emissions, respectively (CARB, 2020b).

5 AIR QUALITY REGULATORY FRAMEWORK

Air quality in the SCAB is regulated by EPA, CARB, and the SCAQMD. Each of these agencies develops rules, regulations, or policies, and/or goals to attain the directives imposed through legislation. Although EPA regulation may not be superseded, both state and local regulations may be more stringent.

5.1 FEDERAL STANDARDS

EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970 and amended in 1977 and 1990. The CAA requires EPA to establish the NAAQS and requires each state with regions that have not attained the NAAQS to prepare a State Implementation Plan (SIP), detailing how these standards are to be met in each local area. The SIP is a legal agreement between each state and the federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analysis. The SIP is not a single document, but a compilation of new and previously submitted attainment plans, emissions reduction programs, district rules, state regulations, and federal controls.

The CAA Amendments also require that states and local air quality agencies develop a Title V Operating Permit Program, which requires all "major sources" of pollutants to obtain Title V permits. The program is designed to ensure compliance with all applicable requirements of the CAA and to enhance EPA's ability to enforce the CAA. Air pollution sources subject to the program must obtain an operating permit; states must develop and implement the program; and EPA must issue permit program regulations, review each state's proposed program, and oversee the state's efforts to implement any approved program.

Before 1994, there were no standards to limit the amount of emissions from off-road equipment. In 1994, EPA established emission standards for hydrocarbons, NO_x, CO, and PM to regulate new pieces of off-road equipment. These emission standards came to be known as Tier 1. Since that time, increasingly more stringent Tier 2, Tier 3, and Tier 4 (interim and final) standards were adopted by EPA, as well as by CARB. Tier 1 emission standards became effective in 1996. The more stringent Tier 2 and Tier 3 emission standards became effective between 2001 and 2008, with the effective date dependent on engine horsepower. Tier 4 interim standards became effective between 2008 and 2012, and Tier 4 final standards became effective in 2014 and 2015. Each adopted emission standard was phased in over time. New engines built in and after 2015 across all horsepower sizes must meet Tier 4 final emission standards. In other words, new manufactured engines cannot exceed the emissions established for Tier 4 final emissions standards.

5.1.1 Locomotive Emissions Standards

In March 2008, EPA adopted a three-part emissions standard program to reduce emissions from diesel locomotives over time. The regulation tightens emission standards for existing remanufactured locomotives and sets exhaust emission standards for newly built locomotives of model years 2011-2014 (Tier 3) and 2015 and beyond (Tier 4). The regulation is expected to reduce PM emissions from

applicable engines by as much as 90% and NO_X emissions by as much as 80 percent when fully implemented.

5.1.2 Code of Federal Regulations 49 Parts 200-299

Metrolink operations are subject to Federal Regulations that dictate the frequency and nature of mechanical inspections. The following rules describe the federal requirements:

- <u>229.21 Daily Inspections</u> Requires locomotives to be inspected and tested daily.
- <u>238.303 Exterior Inspections</u> Exterior mechanical inspection of passenger equipment each calendar day.
- <u>238.305 Interior Inspections</u> Interior mechanical inspection of passenger equipment each calendar day.
- <u>232.205 Class 1 Brake Test Initial Terminal Inspection</u> Functional air brake test at location where train is assembled.
- <u>238.313 Class 1 Air Brake Test</u> Functional air brake test required each calendar day.

5.2 STATE STANDARDS

CARB is the lead agency responsible for developing the SIP in California. Local air districts and other agencies prepare air quality attainment plans or air quality management plans, and submit them to CARB for review, approval, and incorporation into the applicable SIP.

5.2.1 California Clean Air Act

CARB is also responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA was adopted in 1988 and requires CARB to establish CAAQS. In most cases, CAAQS are more stringent than NAAQS. Other CARB responsibilities include, but are not limited to, overseeing local air district compliance with state and federal laws; approving local air quality plans; submitting SIPs to EPA; monitoring air quality; determining and updating area designations and maps; and setting emission standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels. CARB maintains air quality monitoring stations throughout the state in conjunction with local air districts. Data collected at these stations are used by CARB to classify air basins as being in attainment or nonattainment with respect to each pollutant and to monitor progress in attaining air quality standards.

The CCAA requires that each area exceeding the CAAQS for ozone, CO, SO₂, and NO₂ develop a plan aimed at achieving those standards. California Health and Safety Code Section 40914 requires air districts to design a plan that achieves an annual reduction in district-wide emissions of 5 percent or more, averaged every consecutive 3-year period. To satisfy this requirement, the local air districts have to develop and implement air pollution reduction measures, which are described in their air quality attainment plans, and outline strategies for achieving the CAAQS for any criteria pollutants for which the region is classified as nonattainment.

CARB has established emission standards for vehicles sold in California and for various types of equipment. California gasoline specifications are governed by both state and federal agencies. During the past decade, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB has also adopted control measures for diesel PM and more stringent emissions standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators).

5.2.2 Tanner Toxics Act

TACs in California are regulated primarily through the Tanner Air Toxics Act (Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act (Chapter 1252, Statutes of 1987). Assembly Bill (AB) 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before CARB can designate a substance as a TAC. The Air Toxics Hot Spots Information and Assessment Act requires that TAC emissions from stationary sources be quantified and compiled into an inventory according to criteria and guidelines developed by CARB, and if directed to do so by the local air district, a health risk assessment (HRA) must be prepared to determine the potential health impacts of such emissions.

The CARB adopted a Diesel Risk Reduction Plan, which recommends control measures to achieve a diesel PM reduction of 85 percent by 2020 from year 2000 levels. Recent regulations and programs include the low-sulfur diesel fuel requirement and more stringent emission standards for heavy-duty diesel trucks and off-road in-use diesel equipment. As emissions are reduced, it is expected that the risks associated with exposure to the emissions will also be reduced.

The CARB has also developed the Air Quality and Land Use Handbook: A Community Health Perspective to provide guidance on land use compatibility with sources of TACs (CARB, 2005). These sources include freeways and high-traffic roads, commercial distribution centers, rail yards, refineries, dry cleaners, gasoline stations, and industrial facilities. The handbook is not a law or adopted policy but offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs. The handbook indicates that land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues. The recommendations relevant to the Project include to avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. In response to new research demonstrating benefits of compact, infill development along transportation corridors, CARB released a technical supplement, Technical Advisory: Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways (Technical Advisory; CARB 2017a), to the 2005 Air Quality and Land Use Handbook. This Technical Advisory was developed to identify strategies that can be implemented to reduce exposure at specific developments or as recommendations for policy and planning documents. It is important to note that it is not intended as guidance for a specific project and does not discuss the feasibility of mitigation measures for the purposes of compliance with the California Environmental Quality Act (CEQA). Some of the strategies

identified in the Technical Advisory include implementation design that promotes air flow and pollutant dispersion along street corridors, solid barriers, vegetation for pollutant dispersion, and indoor high efficiency filtration (CARB, 2017a).

5.2.3 Airborne Toxic Control Measures Related to Address Asbestos Exposure

The EPA requires specific work practices to control the release of asbestos fibers relating to a renovation and/or demolition activity. The EPA delegates enforcement authority to state and local agencies for renovation and/or demolition activities that involve the handling of asbestos. After identifying asbestos as a TAC in 1986, CARB adopted two ATCMs to address some of the health concerns associated with exposure to asbestos: ATCM for Surfacing Applications (adopted in 1990) and ATCM for Construction, Grading, Quarrying, and Surface Mining Operations (adopted in 2001). The two asbestos regulations address minimizing the placement of asbestos-containing materials on unpaved surfaces and requiring work practices to minimize asbestos emissions from such activities where naturally-occurring asbestos is found or is likely to be found. The ATCMs were intended to minimize the release of asbestos fibers during activities involving the handling of asbestos.

5.3 REGIONAL AND LOCAL STANDARDS

In Orange County, the SCAQMD is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws and policies. Included in the SCAQMD's tasks are monitoring of air pollution, preparation of air quality plans, and promulgation of rules and regulations.

The SCAQMD monitors air quality within the Project Site and the SCAB, which includes Orange County and portions of Los Angeles, Riverside, and San Bernardino Counties. The SCAB is bounded by the Pacific Ocean to the west; the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east; and the San Diego County line to the south.

Under the CCAA, the SCAQMD is required to develop an air quality attainment plan for nonattainment criteria pollutants within the air district. The most recent air quality plan developed by the SCAQMD is the 2016 Air Quality Management Plan (AQMP). The 2016 AQMP is the legally enforceable blueprint for how the region will meet and maintain the NAAQS and CAAQS. The 2016 AQMP identifies strategies and control measures needed to achieve attainment of the 8-hour ozone standard and federal annual and 24-hour standard for PM2.5 in the SCAB (SCAQMD, 2017a). The future emission forecasts are primarily based on demographic and economic growth projections provided by Southern California Association of Governments (SCAG).

SCAQMD rules relevant to the Project include, but are not limited to:

- Regulation IV: Prohibitions; Rule 401: Visible Emissions. Prohibits the generation of particulate matter emissions that exceed the visible emissions threshold.
- Regulation IV: Prohibitions; Rule 402: Nuisance. Prohibits the discharge, from any source, of such quantities of air contaminants or other materials that cause or have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property.
- Regulation IV: Prohibitions; Rule 403: Fugitive Dust. Regulates fugitive dust emissions from any commercial construction or demolition activity capable of generating fugitive dust emissions, including active operations, open storage piles, and inactive disturbed areas, as well as track-out and carry-out onto paved roads beyond a project site.
- Regulation XI: Source Specific Standards; Rule 1113: Architectural Coatings. Requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.
- Regulation XIV: Toxics and Other Non-Criteria Pollutants; Rule 1403: Requires notification and work practice standards to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials.
- Regulation XIV: Toxics and Other Non-Criteria Pollutants; Rule 1470: Requires all internal combustion engines (ICEs) greater than 50 brake horsepower to obtain a permit to construct from the SCAQMD prior to installation of the engines at a site.

The Project is required to comply with these rules, and conformance would be incorporated into Project specifications and procedures.

6 GREENHOUSE GAS REGULATORY FRAMEWORK

6.1 FEDERAL STANDARDS

EPA is the federal agency responsible for implementing the federal CAA. The Supreme Court of the United States ruled on April 2, 2007, that CO₂ is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs.

6.1.1 Greenhouse Gas Findings Under the Federal Clean Air Act

On December 7, 2009, EPA signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these wellmixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industries or other entities, this action was a prerequisite to finalizing EPA's *Proposed Rulemaking to Establish Light Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards* (EPA, 2009). On May 7, 2010, the final *Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards were published in the Federal Register (EPA, 2010). Phase 1 of the emissions standards required model year 2012 through 2016 vehicles to meet an estimated combined average emissions level of 250 grams of CO₂ per mile, which is equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO₂ level solely through fuel economy improvements.*

On August 28, 2012, the U.S. Department of Transportation (USDOT) and EPA issued a joint Final Rulemaking requiring additional federal GHG and fuel economy standards for Phase 2 of the emissions standards for model year 2017 through 2025 passenger cars and light-duty trucks. The standards would require these vehicles to meet an estimated combined average emissions level of 163 grams of CO₂ per mile in model year 2025, which is equivalent to 54.5 miles per gallon if the improvements were made solely through fuel efficiency. However, on April 2, 2018, EPA issued a Mid-term Evaluation Final Determination, which finds that the model year 2022 through 2025 emissions standards are not appropriate and should be revised. This Mid-term Evaluation is not a final agency action; rather, this determination led to the rule making of the Safer Affordable Fuel Efficient (SAFE) Vehicles Rule (EPA, 2018).

In addition to the standards for light-duty vehicles, USDOT and EPA adopted complementary standards to reduce GHG emissions and improve the fuel efficiency of heavy-duty trucks and buses on September 15, 2011. The Phase 1 standards together form a comprehensive heavy-duty national program for all on-road vehicles rated at a gross vehicle weight at or above 8,500 pounds for model years 2014 through 2018. The standards were phased in with increasing stringency in each model year from 2014 through 2018. The EPA standards adopted for 2018 represent an average per-vehicle reduction in GHG emissions of 17 percent for diesel vehicles and 12 percent for gasoline vehicles (EPA, 2011). Building on the success of the Phase 1 standards, EPA and the National Highway Traffic Safety Administration finalized Phase 2 standards for medium- and heavy-duty vehicles through model year 2027. The Phase 2 standards are expected to lower CO₂ emissions by approximately 1.1 billion MT. On November 16, 2017, EPA released a proposed rule to repeal the emission standards for heavy-duty glider vehicles, glider engines, and glider kits (EPA, 2017b).

6.1.2 Safer Affordable Fuel Efficient Vehicles Rule

In September 2019, the National Highway Traffic Safety Agency (NHTSA) and the EPA published the SAFE Vehicles Rule Part One: One National Program. The SAFE Part One Rule revokes California's authority and vehicle waiver to set its own emissions standards and set zero emission vehicle mandates in California for passenger cars and light trucks and establish new standards, covering model years 2021 through 2026. In April 2020, the EPA and NHTSA issued the second part of the proposed SAFE Vehicles Rule. This final rule became effective on June 29, 2020. The Final SAFE Rule relaxed the federal GHG emissions and fuel economy standards to increase in stringency at only about 1.5 percent per year from model year 2020 levels over model years 2021–2026. The previously established emission standards and related "augural" fuel economy standards would have achieved about 4 percent per year improvements through MY 2025 (CARB, 2020c). During the period the federal action is in effect, the CARB will administer the affected portions of its program on a voluntary basis. On January 20, 2021, President Joseph Biden signed an Executive Order directing consideration of labor unions, States, and industry views to propose suspension, revision, or rescindment of the SAFE Vehicles Rule (The White House, 2021).

6.1.3 Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, EPA published the Final Mandatory Greenhouse Gas Reporting Rule (Reporting Rule) in the Federal Register. The Reporting Rule requires reporting of GHG data and other relevant information from fossil fuel and industrial GHG suppliers, vehicle and engine manufacturers, and all facilities that would emit 25,000 MT or more of CO₂e per year. Facility owners are required to submit an annual report with detailed calculations of facility GHG emissions on March 31 for emissions from the previous calendar year. The Reporting Rule also mandates recordkeeping and administrative requirements to enable EPA to verify the annual GHG emissions reports.

6.2 STATE STANDARDS

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the CCAA.

6.2.1 Assembly Bill 1493

AB 1493, signed in July 2002, requires CARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. In June 2009, the EPA Administrator granted a CAA waiver of preemption to California. This waiver allowed California to implement its own GHG emissions standards for motor vehicles beginning with model year 2009. California agencies worked with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger car model years 2017 through 2025. However, this waiver was revoked and the GHG emission standards were relaxed with the passage of the SAFE Rule, as discussed above.

6.2.2 Executive Order S-3-05

Executive Order (EO) S-3-05, signed in June 2005, proclaimed that California is vulnerable to the impacts of climate change. EO S-3-05 declared that increased temperatures could reduce the Sierra Nevada's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established total GHG emissions targets. Specifically, emissions were to be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below the 1990 levels by 2050. The statewide GHG emissions in 2000 were approximately 466 MMT CO₂e (CARB, 2012). In 2010, overall statewide GHG emissions were approximately 453 MMT CO₂e, exceeding the 2010 goal established by Executive Order S-3-05 (CARB, 2012).

6.2.3 Assembly Bill 32

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in Executive Order S-3-05: reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies CARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target. AB 32 also established several programs to achieve GHG emission reductions, including the Low Carbon Fuel Standard and the Cap-and-Trade program. As of 2017, the state has reduced emissions below the revised AB 32 limit of 427 MMT CO_2e^{1}

6.2.4 Senate Bill 32

In 2016, the California State Legislature adopted Senate Bill (SB) 32 and its companion bill AB 197, and both were signed by Governor Edmund Brown (California Legislative Information). SB 32 establishes a new climate pollution reduction target of 40 percent below 1990 levels by 2030 (California Legislative Information, 2015-2016).

6.2.5 CARB Climate Change Scoping Plans

In December 2008, CARB adopted its *Climate Change Scoping Plan. A Framework for Change* (Scoping Plan), which contains the main strategies California will implement to achieve the required GHG reductions required by AB 32 (CARB, 2008). The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of California's GHG inventory. CARB further acknowledges that decisions about how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors.

CARB is required to update the Scoping Plan at least once every 5 years to evaluate progress and develop future inventories that may guide this process. CARB approved *First Update to the Climate Change Scoping Plan: Building on the Framework* in June 2014 (CARB, 2014). The Scoping Plan update

¹ For more detail, please see <u>https://ww2.arb.ca.gov/ghg-2020-limit</u> and <u>https://ww2.arb.ca.gov/ghg-inventory-graphs</u>.

includes a status of the 2008 Scoping Plan measures and other federal, state, and local efforts to reduce GHG emissions in California, and potential actions to further reduce GHG emissions by 2020.

In November 2017, CARB released the 2017 Climate Change Scoping Plan, which establishes a framework of action for California to reduce statewide emissions by 40 percent by 2030, compared to 1990 levels (CARB, 2017b). The 2017 Scoping Plan builds upon the framework established by the 2008 Scoping Plan and the 2014 Scoping Plan Update, while also identifying new, technologically feasible and cost-effective strategies to ensure that California meets its GHG reduction targets.

6.2.6 Executive Order S-1-07

EO S-1-07, which was signed by then California governor Arnold Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at more than 40 percent of statewide emissions. EO S-1-07 establishes a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10 percent by 2020. CARB adopted the low carbon fuel standard (LCFS) on April 23, 2009. In November 2015, the Office of Administrative Law approved re-adoption of the LCFS.

6.2.7 Executive Order B-30-15

In April 2015, Governor Edmund Brown issued an EO establishing a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. The emission reduction target acts as an interim goal between the AB 32 goal (i.e., achieve 1990 emission levels by 2020) and Governor Brown's EO S-03-05 goal of reducing statewide emissions 80 percent below 1990 levels by 2050. In addition, the EO aligns California's 2030 GHG reduction goal with the European Union's reduction target (i.e., 40 percent below 1990 levels by 2030) that was adopted in October 2014.

6.2.8 Senate Bill 350

California's Renewables Portfolio Standard (RPS) was established in 2002 under SB 1078 and accelerated in 2006 under SB 107, by requiring that 20 percent of electricity retail sales be served by renewable energy sources by 2010. Subsequent recommendations in California energy policy reports advocated a goal of 33 percent by 2020, and on November 17, 2008, then governor Arnold Schwarzenegger signed EO S-14-08 requiring retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020. In April 2011, SB X1-2 codified EO S-14-08, setting the new RPS targets at 20 percent by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020 for all electricity retailers. In October 2015, Governor Edmund Brown signed SB 350, which extended the RPS target by requiring retail sellers to procure 50 percent of their electricity from renewable energy resources by 2030. This was followed by SB 100 in 2018, which further increased the RPS target to 60 percent by 2030 along with the requirement that all of the state's electricity come from carbon-free resources by 2045.

6.3 REGIONAL AND LOCAL STANDARDS

CARB acknowledges that local governments have broad influence and, in some cases, exclusive jurisdiction over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations.

6.3.1 Southern California Association of Governments

On September 23, 2020, the SCAG adopted Connect SoCal, the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategies. As a plan with the goal of accelerating the region's progress toward transportation and GHG reduction targets, programs within the Regional Transportation Plan/Sustainable Communities Strategy(RTP/SCS) focus on shifting travel to active transportation modes, expanding the transit network, and efficient movement of goods (SCAG, 2020a).

6.3.2 City of Irvine

On July 9, 2020, City Council voted to develop a City Climate Action Plan. The Climate Action Plan has not been prepared at the time of this analysis.

7 EMISSION ESTIMATES METHODOLOGY

Construction-related and operational activities associated with the Project will include emissionsgenerating sources. These emissions were estimated in accordance with SCAQMD and CARB guidelines, and as detailed below for construction and operations. Maximum potential emissions for construction and operations were each compared to the SCAQMD's thresholds of significance. The regional thresholds of significance were designed to identify those projects that would result in significant levels of air pollution and to assist the region in attaining the applicable state and federal ambient air quality standards, which were established using health-based criteria to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution. Because regional air quality standards have been established for these criteria pollutants to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution, these thresholds of significance can also be used to assess the Project's emissions and inform the Project's impacts to regional air quality and health risks under CEQA. The SCAQMD's thresholds of significance are shown in Table 9.1-1 in this memo. In addition, the SCAQMD has established localized thresholds of significance.

Project-related criteria air pollutant emissions may have the potential to exceed the CAAQS and NAAQS in the area surrounding the Project Site, even though these pollutant emissions may not be significant enough to create a regional impact to the SCAB. In order to assess local air quality impacts, the SCAQMD has developed Localized Significance Thresholds (LSTs) and supporting LST Methodology to assess the Project-related emissions in the project vicinity (SCAQMD, 2008a). The LST Methodology found that the primary emissions of concern are NO₂, CO, PM₁₀, and PM_{2.5}.

The LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards and are developed based on the ambient concentrations of that pollutant for each source receptor area. Since the LSTs consider the ambient air quality, LSTs can also be used to identify those projects that would result in significant levels of air pollution and impact sensitive receptors.

The LST Methodology provides Look-Up Tables with different thresholds based on the location and size of the project site and distance to the nearest sensitive receptors. The Look-Up Tables provide thresholds for 1, 2, and 5-acre projects sites. Since the Project Site is approximately 21.3 acres, the 5-acre project site threshold was utilized in order to provide a conservative analysis for CO and PM₁₀ emissions. Since the region is in nonattainment for ozone and PM_{2.5} and the Project Site is larger than 5 acres, consistent with SCAQMD guidance, project-specific localized dispersion modeling was performed for NO₂ (an ozone precursor) and PM_{2.5}. The Project Site is located within Source Receptor Area 19, Saddleback Valley.

As described previously, the nearest sensitive receptors are the residences in the senior housing community located approximately 650 feet (200 meters) north of the Project Site. As such, the applicable LST for PM₁₀ was determined assuming a receptor distance of 200 meters. In addition, since it is reasonable to assume that offsite workers located at the nursery to the west of the Project Site and buildings along Technology Drive could be present for periods of one to eight hours, the LST analysis was also performed for these worker receptors for pollutants with shorter averaging times, such as CO. The LST for CO was based on a 5-acre Project Site and 25-meter receptor distance. Since Project-specific localized dispersion modeling was performed for NO₂ and PM_{2.5}, the LSTs were based on the SCAQMD ambient air quality thresholds for these criteria pollutants. The applicable LSTs are summarized in Table 9.1-2in this memo.

7.1 CONSTRUCTION

Construction-related activities are temporary, short-term sources of emissions. Sources of constructionrelated criteria air pollutant and GHG emissions include construction equipment exhaust; constructionrelated trips by workers, delivery and hauling truck trips; fugitive dust from site preparation activities; and off-gassing from traffic coating and paving activities.

Construction of Phase 1 was assumed to begin in 2023 and last approximately 30 months. Construction of Phase 2 is anticipated to begin in 2025 and last approximately 23 months. Emissions generated by construction activities were modeled using emission factors from the CARB's OFFROAD 2017² and

² OFFROAD2017 is CARB's emissions inventory database for off-road diesel engines, used to quantify the amount of pollutants from thousands of engines in equipment used in industrial applications, agriculture, construction, mining, oil drilling, power generation, and many other industries. OFFROAD2017 was used to generate emission factors for the different types of equipment anticipated to be used by the project. To develop the emission factors associated with each piece of off-road construction equipment that would be needed for the project, OFFROAD2017 was first used to generate an emissions inventory for Orange County. Equipment was aggregated to include all model years. This approach allows for the identification of typical characteristics for off-road vehicle equipment in Orange County (since the specific fleet that would be used for the project is unknown). The emissions inventory provided the total pollutant emissions (in tons per day) and equipment activity in Orange

EMFAC 2017³ inventory models. Construction emissions from the operation of diesel-fueled off-road equipment were estimated by multiplying construction equipment usage information by the equipmentspecific emissions factors, based on aggregate model years and horsepower provided in OFFROAD. Construction equipment usage was provided by the Project engineers and include a range of equipment including, but not limited to, backhoes, concrete saws, dump trucks, excavators, generators, graders, rubber tired dozers, and electric/pneumatic equipment such as nail guns and power wrenches. Additional details on equipment types, counts, and estimated usage per day by construction phase are available in Appendix A.

Emissions from on-site and off-site on-road motor vehicles were estimated using vehicle trips, vehicle miles travelled (VMT), and EMFAC 2017 mobile source emission factors. The emission factors represent the fleet-wide average emission factors in Orange County. On-road emissions estimates also considered PM from break wear, tire wear, and re-entrained roadway dust. On-road motor vehicle usage was based on construction crew size and estimated number of haul truck trips provided by the Project engineers. The construction crew size ranged from approximately 10 to 57 workers per day depending on the individual construction subphases. It was assumed each construction worker would travel to and from the site each day (two one-way trips) and each trip length was assumed to be 14.7 miles based on the California Emissions Estimator Model (CalEEMod) default trip length for workers in Orange County. The analysis also assumed approximately 120,000 cubic yards (CY) of material import would be required, resulting in 7,500 loaded truck trips, during the earthwork subphase during construction of Phase 1. Material import truck trip lengths were assumed to be 20 miles based on the CalEEMod default for haul trucks. In addition, the analysis accounted for concrete truck deliveries based on the anticipated concrete needs as identified by the Project engineers and an assumed concrete truck capacity of 9 CY. The analysis assumed 163 and 204 concrete trucks trips would be required during construction of Phase 1 and Phase 2, respectively. Concrete truck trip lengths were assumed to be 6.9 miles based on the CalEEMod default trip length for vendor trips. Additionally, the analysis assumed three delivery options for track material (i.e., rail, turnouts, ballast, and other track materials) deliveries. One option for delivery of these materials is delivery by haul trucks. It is estimated that approximately 1,224 and 333 truckloads of material would be required during construction of Phase 1 and Phase 2, respectively. The other option includes the use of two welded rail trains. Based on information provided by the Project engineers, the analysis assumed the flash butt welding machine is electric-powered and available in truck-design which was assumed to have a 599-horsepower diesel engine and require two full days of operation. The third material delivery option includes delivery by rail car. The analysis assumed one hour of train travel within the SCAB to deliver materials to the Project Site and an additional hour of idling to

County (in annual horsepower-hours (hp-hrs). Total daily pollutant emissions were then multiplied by 365 (to convert to tons per year), converted to grams, and then divided by total hp-hrs to derive an emissions rate in terms of grams per horsepower hour (g/hp-hr) for each vehicle classification and horsepower bin (e.g., 100 hp to 175 hp). To estimate the total daily mass of criteria air pollutant emissions from a piece of off-road construction equipment, the equipment's emissions factor (g/hp-hr) for each pollutant was multiplied by the equipment's horsepower, engine load factor, and maximum daily runtime hours. To estimate total mass emissions over the duration of construction, the daily mass emissions were multiplied by the maximum duration of use (days).

³ The EMFAC 2017 factors, as applicable to vehicle categories, were adjusted off-model to account for the impacts of the "Safer Affordable Fuel-Efficient Vehicles Rule Part One: One National Program" adopted by the USEPA and the National Highway Traffic Safety Administration.

unload materials. It was assumed that the local work train delivering the materials would be a Tier-4 locomotive. Additional details regarding trip counts, trip lengths, and phasing are available in Appendix A.

Fugitive dust emissions were estimated using the U.S. EPA Compilation of Air Pollutant Factors (AP 42) and CalEEMod methodology for activities including material loading into haul trucks, vehicle miles traveled, earthwork quantities and activities including graders, scrapers, and dozers leveling land or moving dirt. Fugitive dust emission estimates of PM₁₀ and PM_{2.5} include reductions associated with implementation of fugitive dust control practices per SCAQMD Rule 403 (e.g., watering disturbed surface areas at least twice per day). Additional details are available in Appendix A.

The analysis also estimated VOC emissions associated with architectural coatings of the buildings and painting of stripes, handicap symbols, directional arrows, and car space descriptions in parking lots using CalEEMod version 2016.3.2 methodology and the anticipated building and parking lot square footages. The analysis also estimated off-gassing emissions associated with asphalt paving of the parking lot and paved access road using CalEEMod methodology. Additional details are available in Appendix A.

7.2 OPERATIONS

After construction of the Project, operations would generate long-term emissions of criteria air pollutants and GHGs from a variety of sources. Emissions generated by operational activities were modeled for locomotive operations, heavy-duty equipment used on-site (such as cranes and forklifts), emergency generator operations, sand silo refilling and use, fuel tank emissions, natural gas consumption, and on-road vehicle travel for worker, delivery, and haul trips to and from the Project Site. Indirect emissions were also modeled for indirect sources associated with electricity use, water demand, and waste generation. Operation of Phase 1 was assumed to begin in 2026 and emission factors used were based on anticipated equipment and vehicle fleets for this earliest possible operational year.

Locomotive emissions were estimated for on-site activity, which would include idling during service and inspection activities as well travel through the wash bay. Diesel locomotive engine power is controlled by "notched" throttles. Idling, braking, and moving the locomotive is conducted by placing the throttle in one of several available "notch" settings. A locomotive's duty cycle is a description of how much, on average, the locomotive spends in each notch setting while operating. Emission factors for calculations were based on EPA's 2009 Emission Factors for Locomotives Technical Highlights (EPA-240-F-09-025) and the conversion factors for CH₄ and N₂O from EPA's 2018 Emission Factors for Greenhouse Gas Inventories guide. Emission standards are defined per unit of activity (in grams per horsepower-hour) for both Tier 2 and Tier 4 engines that would be serviced by the Project. Based on information provided by OCTA, the current fleet mix includes approximately 27 percent Tier 2 engines and approximately 73 percent Tier 4 engines. Per information provided by OCTA, it is anticipated that all locomotives would be Tier 4 by 2028. Since the first operational year of Phase 1 is anticipated to be 2026, the analysis assumed the fleet mix would be 8 percent Tier 2 and 92 percent Tier 4 locomotives by 2026 (using a linear conversion schedule based on the existing fleet mix and future 100 percent Tier 4 fleet). Emissions were estimated using the estimated on-site idling and operational time per train per day during service

at the Project Site. To estimate annual GHG emissions, daily emissions were annualized assuming 365 operating days per year. Additional details are available in Appendix A.

Train fueling and sanding would also occur on the Project Site. Fuel would be stored in four aboveground storage tanks with 30,000-gallon capacity and one aboveground storage tank with a 10,000-gallon capacity. Fugitive emissions associated with fueling were estimated using TankESP modeling software, based on the projected fuel daily throughput of approximately 13,000 gallons per day. Fugitive dust emissions associated with the sand silos were also estimated. The sand silos are used to store and distribute sand to locomotives as needed. Sand is used to provide traction and prevent wheel slip when moving locomotives. Sand throughput for the Project was estimated based on the throughput for a reference project (Los Angeles Commerce Railyard Maintenance Facility) and scaled based on facility operations. Emissions were estimated using EPA AP 42 Table 11.12-2 methodology. Additional details are available in Appendix A.

Emissions from the operation of diesel-fueled off-road yard equipment were estimated using emission factors from CARB's OFFROAD 2017 emissions database. Emissions were estimated by multiplying estimated daily equipment usage information (the number of each equipment type and hours of daily use) by the equipment-specific emissions factors, based on aggregate model years and horsepower provided in OFFROAD 2017. It was assumed the yard equipment would include four cranes and four forklifts. Emissions associated with limited testing and use of the on-site backup generator were also estimated and accounted for using emission factors and load factor from CalEEMod, and assuming up to 50 hours of use per year. On-road vehicle emissions were modeled using emission factors from the CARB EMFAC 2017⁴ emissions inventory database. Emissions from on-road motor vehicles were estimated using vehicle trips per day, estimated trip distances, and EMFAC 2017 mobile source emission factors specific to the range of vehicle categories serving the Project for worker trips, delivery trips (including sand and fuel deliveries), and haul trips. The emission factors represent the fleet-wide average emission factors in Orange County for each vehicle category. On-road emissions estimates also considered particulate matter from break wear, tire wear, and re-entrained roadway dust. Re-entrained roadway dust emissions were estimated using the AP 42 Section 13.2.1 methodology for paved roads. Based on information provided by OCTA, the analysis assumed 40 workers would travel to and from the site each day and that 10 delivery haul trucks and 2 fuel trucks would travel to and from the site to represent a maximum daily emissions scenario. Additional details are available in Appendix A.

The Project would not result in an increase in commuter rail service or additional locomotive train travel in the region. Therefore, regional emissions associated with in-transit locomotive operations were assumed to remain like existing conditions. However, as described in more detail in Section 8.0 below, for the purposes of localized emissions and health risk assessment, emissions associated with on-site idling and train travel within one mile of the proposed Project Site were estimated. As described in Section 2, a maintenance facility located along the Metrolink route through Orange County, such as the

⁴ The EMFAC 2017 factors, as applicable to vehicle categories, were adjusted off-model to account for the impacts of the "Safer Affordable Fuel-Efficient Vehicles Rule Part One: One National Program" adopted by the USEPA and the National Highway Traffic Safety Administration.

Project, would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and San Bernardino. The Project would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. The storage and maintenance activities that would occur operationally at this facility would be a shift in these operations from the existing storage and maintenance facilities to the proposed Project Site. As such, due to the optimal location of the proposed Project Site, the Project is also anticipated to result in reduced locomotive travel in the region and a reduction in the emissions associated with locomotive and rail car travel in the region. It is also anticipated that total regional emissions associated with train idling would decrease at the existing maintenance facilities due to more efficient operations and logistics.

Natural gas would be consumed by on-site building operations. Monthly forecasted natural gas use for the facility was based upon default CalEEMod data for a general office building, and adjusted for the size of the proposed facility; this land use was selected as the most conservative assumption for units of natural gas consumption per 1,000 square feet of land use.

Indirect emissions associated with electricity generation, water use and waste disposal were calculated to estimate GHG emissions. Emission factors for electricity use were based on the utility-specific data for Southern California Edison (the electricity provider) and EPA eGrid data. Although GHG emissions associated with electricity production are anticipated to decline over time due to state regulations and the Renewables Portfolio Standards, emissions were estimated using the most current (2018) emissions factors which is estimated to be approximately 474 pounds per megawatt-hour. Monthly forecasted electricity use for the facility was based upon default CalEEMod data for a general office building and adjusted for the size of the proposed facility; this land use was selected as the most conservative assumption for units of electricity consumption per 1,000 square feet of land use. Estimated waste generation and emission factors for waste disposal were based upon default emissions factors available from the CalEEMod emissions estimating tool for Climate Zone 8. Water demand associated with train washes was estimated for the Project, and typical operational water demand for building operations was added to this using water demand estimates from CalEEMod for a general office building; this land use was selected as the most conservative assumption for units of water demand per 1,000 square feet of land use. Electricity demand associated with water supply, treatment and disposal were based on CalEEMod default data inputs. Using the same emission factors as previously described for Southern California Edison electricity, the indirect emissions associated with water demand were estimated using the Project specific water usage estimates and CalEEMod estimates of electricity consumption per gallon of water use. Additional details are available in Appendix A.

Consistent with CalEEMod methodology, emissions associated with periodic architectural coatings were also accounted for in the operational emissions estimates. The analysis assumed up to 10 percent of building and parking surface areas are repainted annually.

8 HEALTH RISK ASSESSMENT METHODOLOGY

8.1 DISPERSION MODELING

The American Meteorological Society/U.S. EPA Regulatory Model (AERMOD) dispersion model (Version 19191) (EPA, 2019b) was used to estimate pollutant concentrations at specific distances from Project emission sources, in conjunction with representative meteorological data from nearby John Wayne International Airport. AERMOD was applied with the regulatory default options and the urban modeling option (dispersion coefficients) with a population of 3,010,323 (Orange County), consistent with SCAQMD modeling guidance (SCAQMD, 2021a). Information regarding other model inputs are provided in the following sections.

8.1.1 Meteorological Data

AERMOD requires a sequential hourly record of dispersion meteorology representative of the region within which the Project would be located. AERMOD was supplied with 5 years (2012 to 2016) of hourly meteorological data consisting of surface observations from the John Wayne International Airport meteorological station in Santa Ana, the nearest station to the Project Site. Upper air data for this 5-year period was from San Diego, California. SCAQMD provides AERMOD-ready meteorological files on their website (SCAQMD, 2021b) to use for HRAs. This meteorological dataset was processed with the regulatory-approved low wind option (adjusted u-star). A wind rose of the 5 years of data is shown in Figure 8.1-1. The wind rose indicates that the predominant wind direction is onshore, from the southwest.

John Wayne International Airport is located approximately 6.2 miles west from the Project Site. An inspection of aerial imagery and topographic maps indicates there are no significant elevated terrain features between the two sites. Both sites are located at similar distances from the coastline and have higher terrain to the north and east. Therefore, the John Wayne International Airport data is the most representative meteorological dataset available for dispersion modeling.

8.1.2 Terrain and Receptor Data Processing

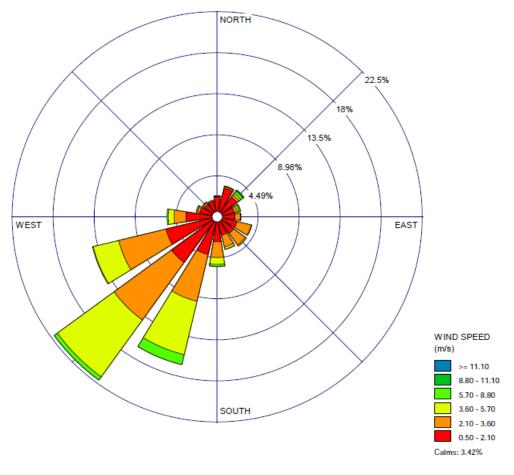
Terrain elevations were obtained from commercially available digital terrain elevations in the National Elevation Dataset (NED) developed by the U.S. Geological Survey (USGS, 2021). The NED data provide terrain elevations with 1-meter vertical resolution and 10-meter (1/3 arc-second) horizontal resolution based on a Universal Transverse Mercator (UTM) coordinate system. The U.S. Geological Survey specifies coordinates in North American Datum 83, UTM Zone 11. EPA's terrain pre-processor, AERMAP (Version 18081), was used to process the NED data and assign elevations to the receptor locations and sources.

As shown in Figure 8.1-2, construction-related pollutant concentrations were estimated for nearby receptors located within 1,000 feet of the Project and 500 feet on either side of roadways to account for Project-related traffic. Receptor spacing within 1,000 feet of the Project and 500 feet of roadways are set at 20-meter intervals. Pollutant concentrations for operations were estimated for nearby receptors

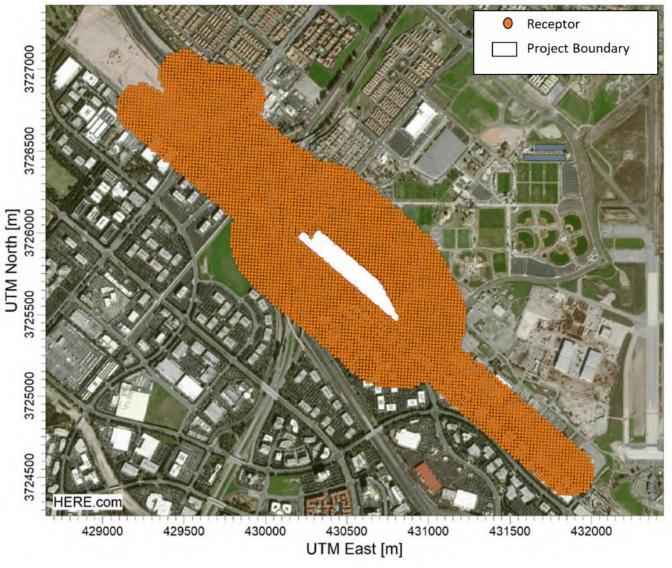
located within 1¼ miles of the Project Site. Figure 8.1-3 shows a map of the nested receptor grid used in assessing impacts from operations. The nested receptor grid used the following interval spacing:

- Receptors within 500 meters of the Project boundary are spaced 20-meters apart,
- Receptors located between 500 meters and 970 meters are at 50-meter intervals, and
- Receptors beyond 970 meters to 1 ¼ mile are spaced 100 meters apart.

Figure 8.1-8.1-1 Wind Rose for John Wayne International Airport 2012-2016



Source: OCTA (2021)





Source: OCTA (2021)

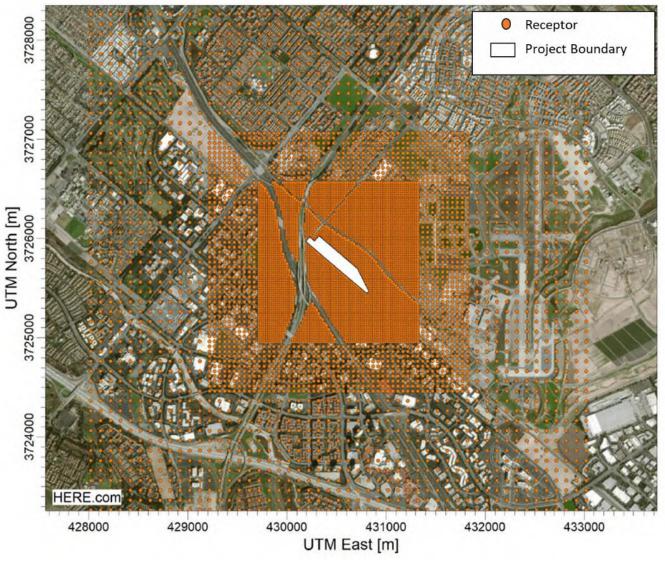


Figure 8.1-8.1-3 HRA Receptor Locations for Operational Impact Analysis

Source: OCTA (2021)

8.1.3 Construction Sources

Off-road construction equipment utilized for on-site Project activities were modeled as multiple adjacent volume sources over the areas of construction-related activity. The locations of the volume sources vary by construction phase (Phase 1 and Phase 2). Phase 1 consists of construction activities in 2023 through first half of 2025. Phase 2 involves construction from July 2025 through June 2027. To account for potential turbulent mixing that can occur with engine exhaust from construction equipment, an initial vertical dimension of 1.4 meters for each volume source was used. Table 8.1-1 lists the volume source parameters used for construction-related activities, consistent with SCAQMD guidance (SCAQMD, 2008a).

| Parameter | Adjacent Volume Sources |
|------------------------------------|-------------------------|
| Release Height (m) | 5.0 |
| Lateral Dimension (m) ¹ | 20 by 20 |
| Initial Vertical Height (m) | 1.4 |

Table 8.1-8.1-1 SCAQMD Adjacent Volume Source Parameters

Notes: m = meters.

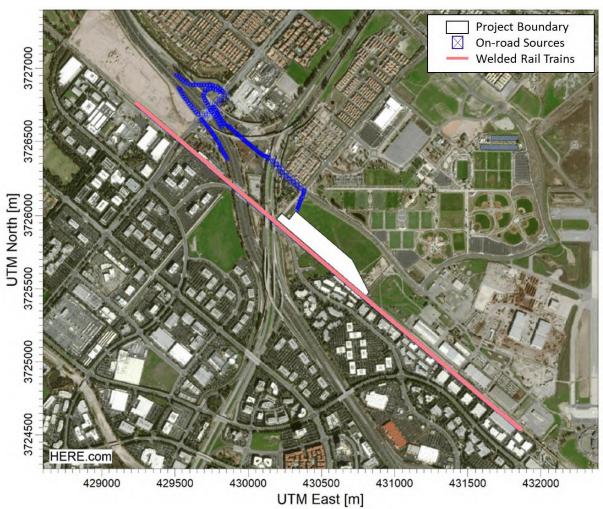
¹ For projects areas \geq 5 acres.

Source: SCAQMD 2008a

On-road emissions from construction worker vehicles, haul trucks, material delivery trucks, and Projectrelated work trucks traveling to and from the Project Site were modeled as adjacent volume sources. The release height of these sources was set to 2 meters and the initial vertical dimension was set to 2.3 meters. The initial lateral dimensions vary depending on roadway width. All construction-related traffic would access the Project Site from Marine Way. As shown in Figure 8.1-4, traffic was modeled from the intersection of Marine Way and Ridge Valley to the on/off ramps of I-5 (with access from Sand Canyon Avenue). On-road traffic within 4,000 feet of the Project Site was included in the model. Modeling parameters for the area and roadway sources are summarized in Appendix B.

As discussed in Section 7.1, track materials delivered on site may arrive by two welded rail trains. These emission sources were modeled as adjacent volume sources along the existing rail line located adjacent to the southern boundary of the Project Site. The volume sources extended out approximately 4,000 feet in either direction from the Project Site. Figure 8.1-4 illustrates the segments of track included in the model for the welded rail trains. A release height of 5 meters and an initial vertical dimension of 1.40 meters were used, based on similar analyses (SJRRC, 2018) for rail sources.

Construction would occur Monday through Friday from 7 a.m. to 5 p.m. (2,607 hours per year); therefore, those hours were modeled in AERMOD using the EMISFACT HRDOW keywords to account for these Project-specific weekdays and hours.





Source: OCTA (2021)

8.1.4 Operational Sources

Operational emission sources evaluated as part of the HRA include locomotive operations, heavy-duty equipment used on-site (such as cranes and forklifts), fuel tank emissions, emergency generator, sand silos, and on-road vehicle travel to and from the site. Operation of Phase 1 was assumed to begin in July 2025 and operation of Phase 2 was assumed to begin in January 2028 (at the completion of construction of Phase 2).

Locomotive operations (including in-transit and idling) were modeled as adjacent volume sources along each section of track to be built on the site. Phase 1 includes 11 segments of track with Phase 2 adding another 5 segments for a total of 16 segments by 2028. For exhaust parameters, a similar methodology was used to that presented in the HRA conducted for the Central Maintenance Facility (Metrolink, 2014). This methodology included using EPA's SCREEN3 (EPA, 2013) screening-level dispersion model to estimate plume rise for the locomotives for daytime and nighttime hours. Table 8.1-2 summarizes the inputs to SCREEN3. Based on the results from SCREEN3, separate daytime and nighttime model parameters for the locomotives were used, as listed in Table 8.1-3.

| Parameter | Locomotives (Daytime) ⁴ | Locomotives (Nighttime) ⁴ |
|--|------------------------------------|--------------------------------------|
| Release Height (m) ¹ | 4.6 | 4.6 |
| Stack Diameter (m) ¹ | 0.666 | 0.666 |
| Exit Velocity (m/s) ² | 7.03 | 7.03 |
| Exit Temperature (K) ² | 422.38 | 422.38 |
| Average Wind Speed (m/s) ³ | 3.59 | 2.47 |
| Average Air Temperature (K) ³ | 294.89 | 290.64 |
| Stability Class ¹ | D | F |

Table 8.1-8.1-2 Inputs to SCREEN3 for Locomotive Plume Rise Calculations

Notes: m = meters, m/s = meters per second, K = Kelvin

¹ Values obtained from Metrolink HRA (2014)

² Weighted average of idling, brake test, and in-transit velocity or temperature presented in Metrolink HRA. Assumed 10 minutes of idling and 1 hour of additional on-site engine operations (locomotive movement, maintenance, and testing) per train per day. ³ Based on 2012-2016 meteorology from John Wayne International Airport.

⁴ Included building information to account for downwash. Height (4.57 m), width (3 m), and length (20 m), consistent with Metrolink HRA.

| Parameter | Daytime | Nighttime |
|------------------------------------|---------|-----------|
| Release Height (m) | 10.64 | 23.76 |
| Lateral Dimension (m) ¹ | 9.1 | 9.1 |
| Initial Vertical Height (m) | 13.79 | 10.84 |

Notes: m = meters.

¹ Width of track (3 m) plus wake zone (6 m) for a total width of 9.1 meters

Daytime locomotive emissions were modeled from 9 a.m. to 6 p.m. with nighttime emissions occurring from 6 p.m. until 9 a.m. Eighty percent of daily emissions were allocated to occur at night and the remaining 20 percent were assumed to occur during the day, given the majority of on-site activity that is anticipated to occur overnight.

In addition to open track areas, on-site train movement and idling would occur for short periods of time in the train wash or the maintenance buildings. Emissions from these locations were modeled as volume sources located at the height of the roof for each building. The parameters for these emissions sources are provided in Appendix B.

On-road emissions from operational vehicles associated with the Project Site were modeled as adjacent volume sources. The release height of these sources was set to 2 meters and the initial vertical dimension was set to 2.3 meters. The initial lateral dimensions vary depending on roadway width. Project-generated on-road traffic up to 6,500 feet of the Project Site was modeled. Fuel and sand deliveries were also accounted for in the on-road emissions. The on-site delivery routes are shown in Figure 8.1-5 with the on-road sources located within the Project Site. Figure 8.1-5 also illustrates the on-road vehicle routes modeled for Project operations (located off site), which aligns with traffic turn data from Figure 4.2-1 of the Traffic Technical Memorandum (AECOM, 2021). The source parameters are summarized in Appendix B.

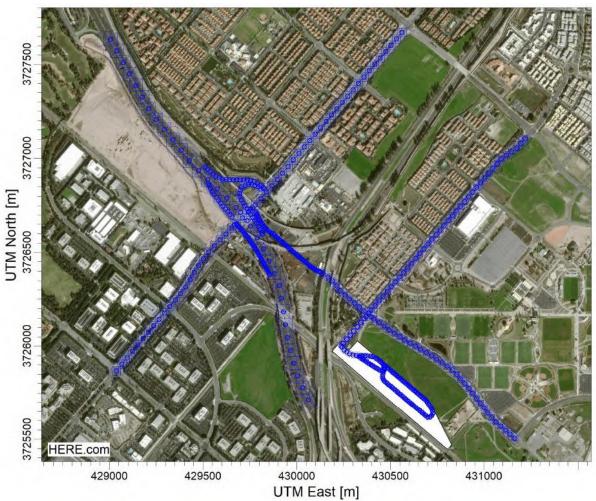


Figure 8.1-8.1-5 On-Road Vehicles Routes for Operations

Source: OCTA (2021)

The on-site generator, sand silos, fuel tanks and dispenser were all modeled as stationary sources as shown in Figure 8.1-6. The generator and fuel tanks were modeled as vertical, uncapped point sources. Tank filling and silos were modeled as individual volume sources. Details on the source parameters for these stationary sources included in the model are provided in Appendix B.

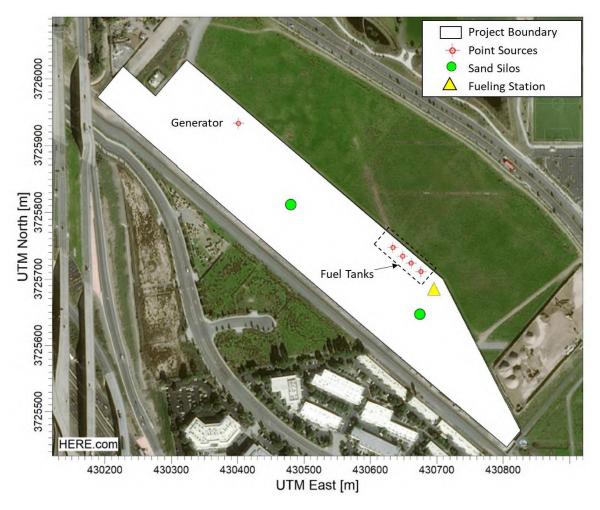


Figure 8.1-8.1-6 Stationary Source Locations for Project Operations

Source: OCTA (2021)

Note: Fuel tanks were modeled both as point sources and as volume sources to account for fueling/spillage.

8.2 HEALTH RISK CHARACTERIZATION AND ESTIMATION

Risk characterization integrates exposure information provided by the dispersion modeling with potential health effects associated with specific TACs. This step provides quantitative estimates of potential health risks associated with TACs to which the potential existing off-site receptors of the Project would be exposed. AERMOD was run using unit emissions. Each source was modeled assuming emissions of 1 gram per second (g/s) for point sources, 1 g/s divided by the number of volume sources in a road segment, or 1 g/s divided by the area source in square meters. The unitized AERMOD results for each source are output in micrograms per cubic meter (μ g/m³) per g/s [(μ g/m³)(g/s)⁻¹]. Maximum hourly and period-average plot files generated by AERMOD as described above were input to HARP2 with corresponding TAC emission rates for each phase of construction as well as the Project's operational emissions to calculate the Project's concentration contributions. The HARP2 (Version 21081) (CARB, 2005) model was created by CARB and is used to estimate carcinogenic and noncarcinogenic health risks from proposed projects. The HARP2 model uses the equations and algorithms contained in the Office of Environmental Health Hazard Assessment's

(OEHHA) Air Toxics Hot Spots Program Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015 Risk Assessment Guidelines) to calculate health risks based on input parameters such as emissions, "unit" ground-level concentrations, and toxicological data based on the OEHHA 2015 Risk Assessment Guidelines. These concentrations were then used to estimate the long-term effects of TACs on nearby receptors.

The assessment was performed in accordance with the OEHHA 2015 Risk Assessment Guidelines, CAPCOA Guidance Document: Health Risk Assessments for Proposed Land Use Projects (CAPCOA, 2009), and SCAQMD guidance (Table 9.1-3). Based on the guidance above, the maximum cancer risk associated with the Project's on- and off-site sources was assessed for the following exposure scenarios:

- **MEIR** Maximally-exposed individual resident (MEIR) based on a 30-year lifetime exposure period. The MEIR assumes an exposure of 24 hours per day, and 350 days per year.
- **MEIW** Maximally-exposed individual worker (MEIW) based on a 25-year lifetime exposure period. The MEIW assumes an exposure of 8 hours per day, and 245 days per year and a starting age of 16 years.
- **Recreational** Considering the proximity to recreational facilities, a maximally-exposed individual located at a recreational site (outdoor fields, running/walking paths, training facility, park, etc.) based on a 40-year lifetime exposure. An exposure of 2 hours per day for 245 days and an elevated breathing rate of 1,097 liters per kilogram per day (L/kg/day) were assumed.

Table 8.2-1 summarizes the HARP2 options selected for the HRA.

| Option | Cancer – Resident | Cancer – Worker | Cancer – Recreation |
|--|---------------------------|----------------------|--------------------------|
| Exposure Duration | 30 years | 25 years | 40 years |
| Exposure Frequency (hours/day, days/year) | 24, 350 | 8, 245 | 2, 245 |
| Start Age | 3 rd Trimester | 16 years | 0 years |
| Method | RMP using Derived Method | OEHHA Derived Method | RMP using Derived Method |

Table 8.2-1 Summary of HARP2 Options

In addition to cancer risk, non-cancer chronic (long-term) and acute (short-term) exposure to TACs were assessed. Since only diesel PM was assessed for the construction modeling, only cancer and chronic risk were evaluated for construction emissions.

8.3 CRITERIA AIR POLLUTANTS LOCALIZED DISPERSION MODELING METHODOLOGY

As shown in Section 10.1 below, construction and operational-related activities would result in emissions of criteria air pollutants, but at levels that would not exceed the SCAQMD localized thresholds of significance. However, considering that the region is in nonattainment for ozone and PM_{2.5} and since the Project Site is larger than 5 acres (mass-rate LSTs developed by SCAQMD are for project sites up to 5 acres, as detailed in Section 7 and presented in Table 9.1-2), criteria pollutant modelling specific to the Project was performed to determine localized impacts for NO₂ (an ozone precursor) and PM_{2.5}.

 NO_2 and $PM_{2.5}$ emissions were provided as inputs to AERMOD for all project-related operational sources. Similar to the TAC analysis, there were two phases of operations: Phase 1 (2025-2027) and Phase 2 (2028). The model output was then compared against the applicable thresholds listed in Table 9.1-2 below.

9 THRESHOLDS OF SIGNIFICANCE

9.1 AIR QUALITY

| Table 9.1-9.1-1 | SCAQMD Regional | I Thresholds of Significance |
|-----------------|-----------------|------------------------------|
|-----------------|-----------------|------------------------------|

| Pollutant | Daily Emissions lbs/day (Construction) | Daily Emissions lbs/day (Operation) |
|-------------------|---|--|
| NOx | 100 | 55 |
| PM ₁₀ | 150 | 150 |
| PM2.5 | 55 | 55 |
| CO | 550 | 550 |
| VOC | 75 | 55 |
| SOx | 150 | 150 |
| Lead ¹ | 3 | 3 |

Notes: NO_X = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter;

PM_{2.5} = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; VOC = volatile organic

compounds; SO_x = sulfur oxides; lbs/day = pounds per day.

¹This analysis does not directly evaluate lead because little to no quantifiable and foreseeable emissions of these substances would be generated by the Project. Lead emissions have significantly decreased due to the near elimination of leaded fuel use. Source: SCAQMD 2019

| Threshold ¹ | ΝΟχ | CO | PM 10 | PM2.5 |
|--|--|--------|--------------|-----------------------|
| Mass-Rate Look Up Tables for LSTs for a 5-Acre Project Site Construction (lbs/day) | 197 | 1,804 | 74 | 30 |
| Mass-Rate Look Up Tables for LSTs for a 5-Acre Project Site Operations (Ibs/day) | 197 | 1,804 | 18 | 8 |
| Operational Ambient Air Quality Standards for Criteria Pollutants | 0.18 ppm(338.4 μg/m³) 0.03 ppm (56.4 μg/m³) | 20 ppm | 2.5 μg/m³ | 2.5 μg/m ³ |

Notes: LST = localized significance threshold; NO_x = nitrogen oxides; PM₁₀ = suspended particulate matter less than 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day; ppm = parts per million; μ g/m³ = micrograms per cubic meter.

¹ The mass-rate LSTs developed by SCAQMD are for a 5-acre project site. As detailed in Section 8.3 above, due to the region's nonattainment status for ozone and PM2.5 and the Project Site size, criteria pollutant modeling was performed for NO₂ (an ozone precursor) and PM_{2.5}.

Source: SCAQMD 2008a, 2019

| Threshold |
|-----------------|
| 10 in 1 million |
| 1.0 |
| |

Table 9.1-9.1-3 SCAQMD Health Risk Assessment Thresholds

Notes: TAC = toxic air contaminant Source: SCAQMD 2019

9.2 GREENHOUSE GAS EMISSIONS

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, no single project alone is expected to measurably contribute to a noticeable incremental change in the global average temperature, or to a global, local, or micro climate. Therefore, the geographic scope of consideration for GHG emissions is on a global scale as such emissions contribute, on a cumulative basis, to global climate change. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies evaluate the cumulative impacts of GHGs, even relatively small additions, on a global basis. By their nature, GHG evaluations under CEQA are a cumulative study. (See *Center for Biological Diversity v. California Department of Fish and Wildlife* [2015] 62 Cal.4th 204.)

The CEQA Guidelines encourage but do not require lead agencies to adopt thresholds of significance (CEQA Guidelines, §15064.7). When developing these thresholds, and consistent with the December 2018 CEQA and Climate Change Advisory published by the California Office of Planning and Research (OPR, 2018), the Guidelines allow lead agencies to develop their own significance threshold and/or to consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence. Individual lead agencies may also undertake a case-by-case approach for the use of significance thresholds for projects consistent with available guidance and current CEQA practice (OPR, 2018).

As the City of Irvine has not established screening thresholds for GHG emissions, the analysis reviewed the applicable significance thresholds developed by the SCAQMD. The SCAQMD has adopted a significance threshold of 10,000 MT of CO_2e per year for industrial (stationary source) projects (SCAQMD, 2008b).

The SCAQMD recommends that construction emissions associated with a project be amortized over the life of the Project (typically assumed to be 30 years). Therefore, this analysis includes a quantification of the total modeled construction-related GHG emissions. Those emissions are then amortized and evaluated over the life of the project (assumed to be 30 years). The Project's type is closest to an industrial project (i.e., doesn't include residential or commercial land uses). The 10,000 MT CO₂e threshold was developed in 2008 and was intended to ensure at least 90 percent of new GHG emissions would be reviewed and assessed for mitigation, thereby contributing to GHG emissions reduction goals of AB 32. However, the Project would begin construction in 2023; thus, construction-related GHG emissions should also be analyzed in the SB 32 statewide framework (which established a 2030 GHG emissions reduction target of 40 percent below 1990 levels). However, the SCAQMD has not adopted a threshold of significance consistent

with SB 32 goals. To provide this additional information to put the Project-generated GHG emissions in the appropriate statewide context, this analysis presumes that a 40 percent reduction in the SCAQMD's existing threshold (resulting in 6,000 MT CO_2e) is necessary to achieve the State's 2030 GHG reduction goal (which is a 40 percent reduction below 1990 GHG emissions levels).

It is not the intent of this CEQA document to cause the adoption of these thresholds as mass emissions limits for this or other projects, but rather to provide this additional information to put the Project-generated GHG emissions in the appropriate statewide context.

10 AIR QUALITY IMPACTS

10.1 CRITERIA AIR POLLUTANTS

10.1.1 Construction Emissions

Tables 10.1-1 and 10.1-2 present the maximum daily emissions associated with Project construction of Phase 1 for comparison to the SCAQMD regional and localized thresholds of significance, respectively.

| Description | VOC | СО | NOx | SOx | PM 10 | PM2.5 |
|---|-------|-------|-------|------|--------------|-------|
| Phase 1 Maximum Daily Emissions (lbs/day) ¹ | 38.06 | 77.07 | 75.20 | 0.25 | 41.47 | 22.82 |
| SCAQMD Threshold (lbs/day) | 75 | 550 | 100 | 100 | 150 | 55 |
| Exceeds Threshold? | No | No | No | No | No | No |

Table 10.1-10.1-1 Phase 1 Construction-Related Maximum Daily Emissions

Notes: VOC = volatile organic compounds; SO_x = sulfur oxides; NO_x = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day.

¹ Phase 1 emissions are based on the overlap of subphases per the anticipated construction schedule. Maximum daily emissions for NOx and SOx occur during the overlap of site utilities/electric, earthwork, foundations, bridge, and roadways/paving construction activities. Maximum daily emissions of VOC and CO occur during the overlap of site utilities/electric, foundations, bridge, roadways/paving, and building construction activities. Maximum daily emissions for PM₁₀ and PM_{2.5} occur during the overlap of clear and grub, site utilities/electric, demolition, and earthwork construction activities.

Table 10.1-10.1-2 Phase 1 Localized Construction-Related Maximum Daily Emissions

| Description | NOx | СО | PM 10 | PM2.5 |
|--|-------|-------|--------------|-------|
| Maximum Daily On-Site Emissions (lbs/day) ¹ | 63.96 | 69.49 | 38.63 | 21.98 |
| SCAQMD Localized Threshold (lbs/day) | 197 | 1,804 | 74 | 30 |
| Exceeds Threshold? | No | No | No | No |

Notes: NO_x = nitrogen oxides; PM₁₀ = suspended particulate matter less than 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day. ¹ Maximum daily localized emissions account for on-site activities including off-road equipment use, fugitive dust, and on-site on-road vehicle travel. It was assumed that approximately 7% of the total on-road vehicles would occur on site (estimated portion of vehicle emissions occurring on site compared to the CalEEMod average trip length). As shown in Tables 10.1-1 and 10.1-2, Phase 1 construction activities would not exceed the SCAQMD regional and localized thresholds of significance. Tables 10.1-3 and 10.1-4 summarize the maximum daily emissions associated with Phase 2 construction for comparison to the SCAQMD regional and localized thresholds of significance, respectively.

| Description | VOC | СО | NO _x | SOx | PM ₁₀ | PM _{2.5} |
|---|-------|-------|-----------------|------|-------------------------|-------------------|
| Phase 2 Maximum Daily Emissions (lbs/day) ¹ | 80.36 | 57.92 | 45.32 | 0.12 | 14.22 | 8.02 |
| SCAQMD Threshold (lbs/day) | 75 | 550 | 100 | 100 | 150 | 55 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

Notes: VOC = volatile organic compounds; SO_x = sulfur oxides; NO_x = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day.

¹ Phase 2 emissions are based on the overlap of subphases per the anticipated construction schedule. Maximum daily emissions for all pollutants except PM_{10} and $PM_{2.5}$ occur during the overlap of site utilities/electric, building, trackwork-direct fixation, and major equipment construction activities. Maximum daily emissions for PM_{10} and $PM_{2.5}$ occur during the overlap of site utilities/electric and earthwork construction activities.

| Table 10.1-10.1-4 Phase 2 Localized Construction-Related Maximum Daily Emissions |
|--|
|--|

| Description | NOx | СО | PM ₁₀ | PM _{2.5} |
|--|-------|-------|-------------------------|-------------------|
| Maximum Daily On-Site Emissions (lbs/day) ¹ | 44.91 | 51.99 | 13.32 | 7.76 |
| SCAQMD Localized Threshold (lbs/day) | 197 | 1,804 | 74 | 30 |
| Exceeds Threshold? | No | No | No | No |

Notes: NO_x = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day. ¹ Maximum daily localized emissions account for on-site activities including off-road equipment use, fugitive dust, and on-site on-road vehicle travel. It was assumed that approximately 7% of the total on-road vehicles would occur on-site (estimated portion of vehicle emissions occurring on-site compared to the CalEEMod average trip length).

As shown in Tables 10.1-3 and 10.1-4, Phase 2 construction activities would not exceed any of the localized thresholds of significance or regional thresholds of significance for any pollutant except VOC. Therefore, this impact would be potentially significant, and mitigation would be required. Project construction of Phase 2 would overlap with Phase 1 operational activities. Therefore, the maximum daily emissions associated with overlapping activities of Phase 1 operations and Phase 2 construction are summarized in Tables 10.1-7 and 10.1-8 below.

10.1.2 Operational Emissions

Tables 10.1-5 and 10.1-6 present the maximum daily emissions associated with Project operations for comparison to the SCAQMD regional and localized thresholds of significance, respectively. As detailed in Section 7.2 of this Technical Memorandum, on-site idling of trains for storage and maintenance purposes

would not result in a regional increase in emissions, as these activities (and related emissions) currently occur at the existing storage and maintenance facilities, and would simply shift these emissions sources to the proposed Project Site. However, these emissions are considered for the purposes of localized emissions impacts in Table 10.1-6.

Table 10.1-10.1-5 Operational Maximum Daily Increase in Regional Emissions

| Description | VOC (lbs/day) | CO (lbs/day) | NOx (Ibs/day) | SOx (Ibs/day) | PM10 (lbs/day) | PM _{2.5} (lbs/day) |
|---|------------------|-----------------|------------------|------------------|-------------------|--------------------------------|
| Yard Equipment | 0.83 | 3.48 | 2.53 | 0.01 | 0.11 | 0.15 |
| Staff and Truck Vehicles | 0.06 | 2.00 | 1.58 | 0.02 | 2.26 | 0.01 |
| Architectural Coatings | 0.13 | - | - | - | - | - |
| Natural Gas Consumption | 0.04 | 0.32 | 0.39 | 0.002 | 0.03 | 0.03 |
| Train Fueling | 0.41 | - | - | - | - | - |
| Sand Silos | - | - | - | - | 0.04 | 0.06 |
| Total Maximum Daily Increase in Regional Emissions | 1.48 | 5.80 | 4.50 | 0.03 | 2.44 | 0.25 |
| SCAQMD Threshold | 55 | 550 | 55 | 100 | 150 | 55 |
| Exceeds Threshold? | No | No | No | No | No | No |

Notes: VOC = volatile organic compounds; SO_x = sulfur oxides; NO_x = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day.

| Table 10.1-10.1-6 Localized Operational Maximum Daily Emis | sions |
|--|-------|
|--|-------|

| Description | NOx (lbs/day) | CO (lbs/day) | PM10 (lbs/day) | PM _{2.5} (lbs/day) |
|--|------------------|-----------------|-------------------|--------------------------------|
| On-Site Locomotive Operations (Maintenance and Testing) | 98.30 | 101.85 | 1.98 | 1.92 |
| Yard Equipment | 2.53 | 3.48 | 0.11 | 0.15 |
| Staff and Truck Vehicles ¹ | 0.11 | 0.14 | 0.16 | <0.01 |
| Natural Gas Consumption | 0.39 | 0.32 | 0.03 | 0.03 |
| Sand Silos | - | - | 0.04 | 0.06 |
| Total Maximum Daily Localized Emissions (lbs/day) | 101.34 | 105.80 | 2.32 | 2.16 |
| SCAQMD Localized Threshold | 197 | 1,804 | 18 | 8 |
| Exceeds Threshold? | No | No | No | No |

Notes: NO_X = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day.

¹ Maximum daily localized emissions account for on-site activities including on-site locomotive operations, on-site off-road equipment use (e.g., forklifts, cranes), and on-road vehicle travel. It was assumed that approximately 7% of the total on-road vehicles would occur on site (estimated portion of vehicle emissions occurring on site compared to the CalEEMod average trip length). As shown in Tables 10.1-5 and 10.1-6, Project operational emissions would not exceed the SCAQMD regional and localized thresholds of significance. As described previously, since construction of Phase 2 may overlap with operation of Phase 1, the overlapping emissions are summarized in Tables 10.1-7 and 10.1-8. Consistent with SCAQMD guidance, these overlapping emissions are compared to the SCAQMD thresholds of significance applicable to operations. As explained previously, on-site idling of trains for storage and maintenance purposes would not result in a regional increase in emissions, as these activities (and related emissions) currently occur at the existing storage and maintenance facilities, and would simply shift these emissions sources to the proposed Project Site. However, note that these emissions are considered for the purposes of localized emissions impacts in Table 10.1-8.

 Table 10.1-10.1-7 Overlapping Construction and Operational Maximum Daily Increase in Regional

 Emissions

| Description | VOC (lbs/day) | CO (lbs/day) | NOx (Ibs/day) | SOx (Ibs/day) | PM10 (lbs/day) | PM2.5 (lbs/day) |
|---|------------------|-----------------|------------------|------------------|-------------------|--------------------|
| Phase 2 Construction Emissions | 80.36 | 57.92 | 45.32 | 0.12 | 14.22 | 8.02 |
| Yard Equipment | 0.83 | 3.48 | 2.53 | 0.01 | 0.11 | 0.15 |
| Staff and Truck Vehicles | 0.06 | 2.00 | 1.58 | 0.02 | 2.28 | 0.60 |
| Architectural Coatings | 0.13 | - | - | - | - | - |
| Natural Gas Consumption | 0.04 | 0.32 | 0.39 | 0.00 | 0.03 | 0.03 |
| Train Fueling | 0.41 | - | - | - | - | - |
| Sand Silos | - | - | - | - | 0.04 | 0.06 |
| Total Maximum Daily Increase in Regional Emissions (Ibs/day) | 81.83 | 63.72 | 49.82 | 0.15 | 16.66 | 8.27 |
| SCAQMD Threshold | 55 | 550 | 55 | 100 | 150 | 55 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

Notes: VOC = volatile organic compounds; SO_x = sulfur oxides; NO_x = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day.

| Description | NOx | со | PM ₁₀ | PM2.5 |
|--|--------|--------|-------------------------|------------------|
| Phase 2 Localized Construction Emissions | 44.91 | 51.99 | 13.32 | 7.76 |
| On-Site Locomotive Operations (Maintenance and Testing) | 98.30 | 101.85 | 1.98 | 1.92 |
| Yard Equipment | 2.53 | 3.48 | 0.11 | 0.15 |
| Staff and Truck Vehicles ¹ | 0.11 | 0.14 | 0.17 | 0.04 |
| Natural Gas Consumption | 0.39 | 0.32 | 0.03 | 0.03 |
| Sand Silos | - | - | 0.04 | 0.06 |
| Total Maximum Daily Localized Emissions (lbs/day) | 146.25 | 157.79 | 15.64 | 9.92 |
| SCAQMD Localized Threshold | 197 | 1,804 | 18 | 8 |
| Exceeds Threshold? | No | No | No | Yes ² |

Table 10.1-10.1-8 Overlapping Construction and Operational Localized Operational Maximum Daily Emissions

Notes: NO_X = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day.

¹ Maximum daily localized emissions account for on-site activities including on-site locomotive operations, on-site off-road equipment use (e.g., forklifts, cranes), and on-road vehicle travel. It was assumed that approximately 7% of the total on-road vehicles would occur on site (estimated portion of vehicle emissions occurring on site compared to the CalEEMod average trip length).

²As described in Table 9.1-2, the mass-rate LSTs are based on a 5-acre project site and thus, exceedance of this threshold does not represent a significant impact. Project-specific dispersion modeling was performed for $PM_{2.5}$ for comparison to the SCAQMD's ambient air quality thresholds as described below and shown in Table 10.1-9.

As described above, due to the Project size, the exceedance of the mass-rate screening LST for PM_{2.5}, and the region's nonattainment status for ozone and PM_{2.5}, Project-specific dispersion modeling was performed for NO₂ and PM_{2.5} for comparison to the SCAQMD's ambient air quality thresholds. The results of the criteria pollutant modeling analysis for 1-hour and annual NO₂ and 24-hour PM_{2.5} are summarized in Table 10.1-9 for both phases of operations (2025-2027 and 2028⁵). As shown in Table 10.1-9, the maximum modeled concentration at the point of maximum exposure (PMI) for both pollutants and averaging periods modeled were less than their respective SCAQMD ambient air quality thresholds. Therefore, this impact would be less than significant.

⁵ Phase 2 of construction would be completed at the end of 2027 and result in additional operational emissions sources beyond Phase 1. Furthermore, all trains serviced at the facility are assumed to be Tier 4 by 2028. Based on these changes, the dispersion analysis was conducted for the initial operational period from July 2025 through end of 2027, followed by years of operation from 2028 and later.

| Criteria Pollutant | Averaging Period | Rank | Maximum Modeled Concentration (µg/m ³) ¹ 2025-2027 ² 2028+ ³ | | Concentration (µg/m ³) ¹ SCAQN Thresh | | SCAQMD Threshold (µg/m³) | Exceeds Threshold? |
|-----------------------|---------------------|-----------------|---|-------|---|----|--------------------------------|-----------------------|
| | 1-hour | 1 st | 103.1 | 102.3 | 338.4 | No | | |
| NO ₂ | Annual | 1 st | 5.7 | 3.8 | 56.4 | No | | |
| PM _{2.5} | 24-hour | 8 th | 1.3 | 1.2 | 2.5 | No | | |

Table 10.1-10.1-9 NO₂ and PM_{2.5} Localized Dispersion Modeling Results

Notes:

 NO_2 = nitrogen dioxide; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; $\mu g/m^3$ =

micrograms per meter cubed; SCAQMD = South Coast Air Quality Management District.

¹ The point of maximum exposure (unoccupied land near OCTA boundary, to the north).

² Period when train fleet mix includes both Tier 2 and Tier 4 locomotive engines.

³ Period when trains are all Tier 4.

As shown in Table 10.1-7, VOC emissions during construction of Phase 2 would exceed the SCAQMD threshold of significance. Overlapping activities associated with construction and operation of the Project would not exceed the SCAQMD regional thresholds of significance for any of the other pollutants. Therefore, VOC emissions associated with construction of the Project are potentially significant. As shown in Tables 10.1-8 and 10.1-9, localized emissions associated with the overlapping activities would not exceed the SCAQMD localized thresholds of significance and ambient air quality thresholds.

10.2 TOXIC AIR CONTAMINANTS AND HEALTH RISK ASSESSMENT RESULTS

10.2.1 Construction

The greatest potential for TAC emissions during construction would be related to diesel PM emissions associated with heavy-duty equipment operations. According to OEHHA methodology, health effects from carcinogenic TACs are usually described in terms of individual cancer risk, which is based on a 30-year exposure duration (or residency time) to TACs as the basis for public notification and risk reduction audits and plans.

CARB has adopted the In-Use Off-Road Diesel-Fueled Fleets Regulation and ATCMs applicable to off-road diesel equipment and portable diesel engines. The In-Use Off-Road Diesel-Fueled Fleets Regulation require diesel engines to comply with emission limits on a fleet-average basis. The purpose of ATCMs is to reduce emissions of TAC emissions, including diesel PM, from engines subject to the rule. CARB has also adopted an ATCM that limits diesel-fueled commercial motor vehicles idling. The rule restricts vehicles from idling for more than 5 minutes at any location with exceptions for idling that may be necessary in the operation of the vehicle. All off-road diesel equipment, on-road heavy-duty diesel trucks, and portable diesel equipment used for the Project would be subject to CARB's regulations and ATCMs.

A quantified HRA was performed to evaluate the Project's construction-related TAC emissions on existing nearby off-site sensitive receptors. Table 10.2-1 summarizes the results of the construction-related health

risks. The maximum incremental cancer risk exposure during the 4.5-year period of construction is less than 0.5 in a million. The chronic hazard index is also well below the SCAQMD threshold of 1.0. Therefore, sensitive receptors would not be exposed to substantial TAC concentrations during construction of the Project and this impact would be less than significant.

| Construction Period | Project Construction Incremental Cancer Risk (in a million) | Chronic Hazard Index |
|---|---|-------------------------|
| 2023 | 0.20 | 2.24E-04 |
| 2024 | 0.18 | 2.21E-04 |
| 2025 | 0.01 | 8.48E-05 |
| 2026 | 0.01 | 5.14E-05 |
| 2027 | 0.004 | 3.07E-05 |
| Total Project Construction (4.5 years) | 0.40 | 0.001 |
| SCAQMD Threshold | 10 | 1.0 |
| Exceeds Threshold? | No | No |

Table 10.2-1: Summary of Construction-Related Health Risks

Note: SCAQMD = South Coast Air Quality Management District

As described above in Section 3.2, asbestos is also a listed TAC; however, the Project Site is not located in an area known to contain naturally occurring asbestos. Further, demolition activities associated with Project construction are minimal and limited to an abandoned road, stormwater drains, and underground bunker with a network of pipelines, valves, and associated vents that are currently not in use. Prior to Project Site demolition activities, building materials must be carefully assessed for the presence of asbestos-containing materials (ACM), and removal of this material, where necessary, must comply with state and federal regulations, including SCAQMD Rule 1403. SCAQMD Rule 1403 specifies work practices with the goal of minimizing asbestos emissions during building demolition activities, including the removal and associated disturbance of ACMs. The requirements for demolition and renovation activities include asbestos surveying; notification; ACM removal procedures and time schedules; ACM handling and cleanup procedures; and storage, disposal, and landfill disposal requirements for asbestos-containing waste materials. If ACM are found during construction, the Project would comply with the requirements of SCAQMD Rule 1403. Therefore, exposure to asbestos during construction would be less than significant.

10.2.2 Operation

As discussed previously, following construction of the Project, operations would generate long-term emissions, including TACs, from a variety of sources. Diesel PM would be the dominant TAC generated at the Project Site. Sources of diesel PM at the Project Site include: locomotive usage (used during fueling, servicing, inspection, brake testing, train washing, load testing, yard switching, idling, and train movement throughout the yard), on-site equipment (emergency generator, cranes, and forklifts used for maintenance activities), refueling, and on-road trucks (fuel and vendor delivery trucks). The majority of the diesel PM emissions would be generated along the tracks, maintenance building, fueling/sanding pit, and the service and inspection facility which are located at distances of approximately 1,100 feet from the nearest residential receptors. As discussed in Section 5.2.2, the CARB recommends a 1,000-foot buffer between sensitive receptors and major service and maintenance rail yards based on a study which found that the area of highest impact is within 1,000 feet of the yard (CARB, 2005); the next highest impact was found to be between a half to one mile of the maintenance rail yards. As described previously, the nearest sensitive receptors are the residences in the senior housing community located approximately 650 feet (200 meters) north of the Project Site. The closest recreational fields and walking/running paths to the Project Site are located approximately 700 feet from maintenance buildings. The nearest worker receptors are located at the nursery to the west of the Project Site and buildings along Technology Drive. As such, a quantified HRA was performed to evaluate the Project's operational TAC emissions on existing nearby off-site receptors, including the nearby residences, recreational facilities, and adjacent workers located at the buildings along Technology Drive and at the nearby nursery.

The results of the HRA for operations are summarized in Table 10.2-1. The operational period would begin in July 2025, upon the completion of Phase 1 construction. Phase 2 of construction would be completed at the end of 2027 and result in additional operational emissions sources. Furthermore, all trains serviced at the facility are assumed to be Tier 4 by 2028. Based on these changes, the HRA for operations includes an initial operational period from July 2025 through end of 2027, followed by years of operation from 2028 and later. The total of these two operational periods are compared against the SCAQMD threshold of 10 in a million.

Maximum modeled excess cancer exposure was estimated for residential, worker, and recreation receptors within the modeled domain. The closest residential receptor was at the intersection of Marine Way and Ridge Valley, which is part of a 55 and older housing community. The closest residential receptor that was not part of this community was located at Ridge Valley and Pinehurst. The location of the maximum worker receptor is to the west of the Project at a nursery. The closest recreation area is the OCGP, located to the north of the Project Site on the other side of Marine Way.

As shown in Tables 10.2-2 and Table 10.2-3, the maximum incremental cancer risk, and chronic and acute hazard index, respectively, for the maximally exposed individual resident and maximally exposed individual worker would not exceed the SCAQMD thresholds of significance. Therefore, receptors would not be exposed to substantial pollutant concentrations of TACs during operations and this impact would be less than significant.

Figure 10.2-1 illustrates the locations of the PMI, MEIR, MEIW and MEI Recreation (maximally exposed individual at recreation area) for the maximum incremental cancer risk associated with operations of the Project. Figure 10.2-2 through Figure 10.2-4 provide maps of the cancer risk zones using contour plots.

| Receptor | Years of Age | Maximum Mo | odeled Excess in a million) | SCAQMD | Exceeds | |
|----------------|--|------------------------|--------------------------------|--------|-----------|------------|
| | | 2025-2027 ¹ | 2028+ ² | Total | Threshold | Threshold? |
| MEIR<50 | 3 rd Trimester – 30 (30 years) | 5.85 | 3.40 | 9.25 | 10 | No |
| MEIR≥50 | 50 - 80 (30 years) | 0.24 | 1.45 | 1.68 | 10 | No |
| MEIW | 16 – 41 (25 years) | 0.94 | 4.37 | 5.31 | 10 | No |
| MEI Recreation | 0 – 39 (40 years) | 1.29 | 2.05 | 3.33 | 10 | No |

Table 10.2-2: Summary of Excess Cancer Risks

Notes: MEIR<50 = maximally exposed individual resident in non-55+ age restricted communities;

MEIR≥50 = maximally exposed individual resident in 55+ age restricted communities; MEIW = maximally exposed individual worker; MEI Recreation = maximally exposed individual at recreation area; SCAQMD = South Coast Air Quality Management District.

¹ Period when train fleet mix includes both Tier 2 and Tier 4 locomotive engines.

² Period when trains are all Tier 4.

Table 10.2-3: Summary of Chronic and Acute Risks

| Risk | Years of Age | Maxim | um Modeled | SCAQMD | Exceeds | |
|---------|--------------|------------------------|--------------------|--------|-----------|------------|
| | | 2025-2027 ¹ | 2028+ ² | Total | Threshold | Threshold? |
| Chronic | PMI | 0.05 | 0.01 | 0.06 | 1.0 | No |
| Acute | | 0.0006 | 0.0004 | 0.001 | 1.0 | No |

Notes: PMI = point of maximum exposure (unoccupied land near OCTA boundary, to the north);

SCAQMD = South Coast Air Quality Management District.

¹ Period when train fleet mix includes both Tier 2 and Tier 4 locomotive engines.

² Period when trains are all Tier 4.

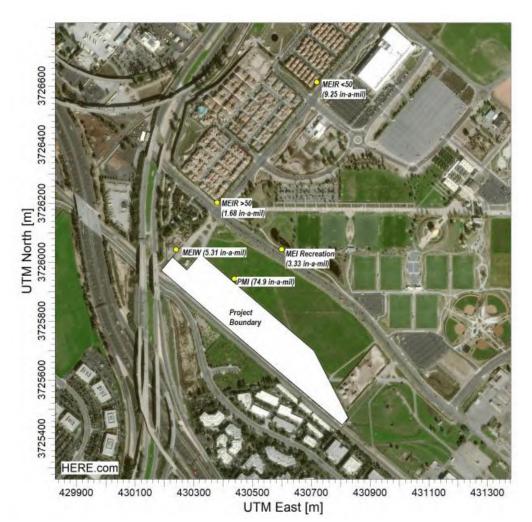


Figure 10.2-1: Location of PMI, MEIR, MEIW and MEI Recreation for Cancer Risk

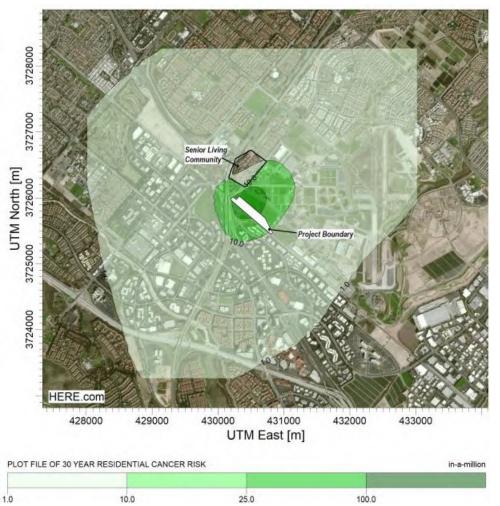


Figure 10.2-2: Contour Map of 30-Year Residential Cancer Risk

Notes: Receptors within Senior Living Community use starting age of 50-years old. All other receptors use starting age of 3rd trimester.

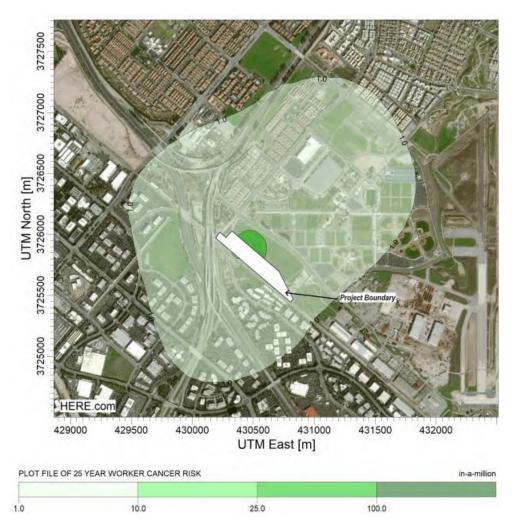
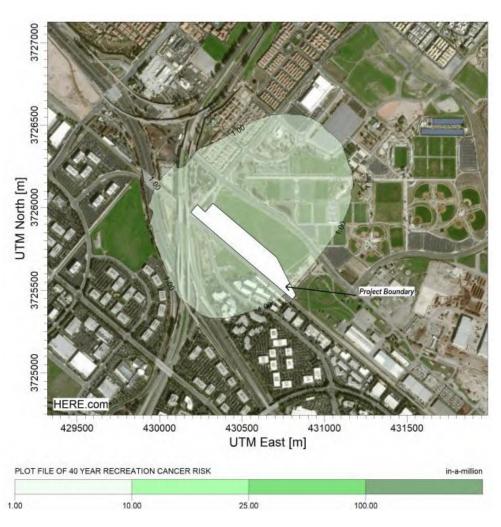


Figure 10.2-3: Contour Map of 25-Year Worker Cancer Risk





10.3 CUMULATIVE EFFECTS

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development within the SCAB, and this regional impact is cumulative rather than being attributable to any one source. A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. The thresholds identified in Table 9.1-1 are designed to identify those projects that would result in significant levels of air pollution and to assist the region in attaining the applicable state and federal ambient air quality standards. Projects that would not exceed the thresholds of significance would not contribute a considerable amount of criteria air pollutant emissions to the region's emissions profile and would not impede attainment and maintenance of ambient air quality standards.

As shown in Table 10.1-1, the maximum daily emissions associated with construction of Phase 1 would not exceed the SCAQMD regional thresholds of significance. However, since construction of Phase 2 would result in a potentially significant impact due to the exceedance of the VOC threshold, Project construction

may result in a cumulative impact. The SCAB is classified as a nonattainment area for ozone, and VOC is a precursor pollutant to ozone. As such, the Project may contribute to a considerable amount of criteria air pollutant emissions to the region's emissions profile.

As shown in Table 10.1-5, operational emissions are not anticipated to result in any exceedances of the SCAQMD thresholds of significance. However, as shown in Table 10.1-7, the overlapping activities of Phase 2 construction and operation may result in a potentially cumulative impact for VOC emissions. Therefore, mitigation would be required.

10.4 ODORS

The occurrence and severity of other emissions, such as those leading to odor impacts, depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies. Projects with the potential to frequently expose individuals to objectionable odors are deemed to have a significant impact. Typical facilities that generate odors include wastewater treatment facilities, sanitary landfills, composting facilities, petroleum refineries, chemical manufacturing plants, and food processing facilities.

Construction activities associated with the Project could result in short-term odor emissions from diesel exhaust associated with construction equipment. The Project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature.

Project operations would not include any land uses identified by the CARB as being associated with the generation of objectionable odors. However, the locomotive rail operations on the tracks that access the maintenance facility and locomotive idling and refueling activities may increase the potential for generation of odors from locomotive diesel fuel combustion. However, these odors would be intermittent and of short duration. Any odors resulting from diesel fuel combustion along rail alignment would be intermittent and short-term and not considered a significant odor-generating source (CARB, 2005).

11 GREENHOUSE GAS EMISSIONS IMPACTS

GHG emissions generated during construction and operation of the Project are summarized in Table 11-1. As detailed in Section 7.2 of this Technical Memorandum, on-site idling of trains for storage and maintenance purposes would not result in a regional increase in emissions, as these activities (and related emissions) currently occur at the existing storage and maintenance facilities, and would simply shift these emissions sources to the proposed Project Site. Thus, these emissions are not included in Table 11-1.

| Source | GHG Emissions (MT CO₂e/year) |
|---------------------------------------|------------------------------|
| Total Construction | 2,185 |
| Amortized Construction ¹ | 73 |
| Yard Equipment | 98 |
| Staff and Truck Vehicles | 0.13 |
| Natural Gas Consumption | 85 |
| Electricity Consumption | 329 |
| Water and Wastewater Consumption | 24 |
| Solid Waste Generation | 279 |
| Operations Subtotal ² | 815 |
| Total (Construction and Operations) | 888 |
| SCAQMD Threshold | 10,000 |
| SCAQMD Threshold (Adjusted for SB 32) | 6,000 |
| Exceeds Threshold? | No |
| | |

Table 10.4-1: Annual GHG Emissions

Notes: MT CO₂e = metric tons carbon dioxide equivalent. GHG = greenhouse gas; SCAQMD = South Coast Air Quality Management District.

¹ Assumed amortization period is 30 years, based on the typically assumed project lifetime (SCAQMD 2008b), which recommends amortizing GHG emissions from construction activities over a project's operational lifetime.

As shown in Table 11-1, GHG emissions would not exceed SCAQMD's adopted significance threshold of 10,000 MT CO₂e per year nor the adjusted SB 32 threshold of 6,000 MT CO₂e per year. Therefore, this impact would be less than cumulatively considerable.

12 MITIGATION MEASURES

12.1 AIR QUALITY MITIGATION MEASURES

As described in Section 10.1.2, Phase 2 construction activities exceed the SCAQMD threshold of significance for VOC emissions. The exceedance of the VOC threshold is primarily related to architectural coating activities of the maintenance building. As such, implementation of Mitigation Measure AQ-1 would be required to reduce VOC emissions below the threshold of significance.

MM-AQ-1. Utilize low VOC paint for architectural coating activities during Phase 2 construction.

To reduce VOC emissions during construction, the Project contractor shall utilize waterbased or low VOC interior and exterior paints. The VOC content of the architectural coatings shall comply with the VOC content limits in SCAQMD Rule 1113 or not exceed 100 grams per liter, whichever is lower. To ensure that low VOC paint will be used during Project construction, this requirement will be included in applicable bid documents, purchase orders, and contracts. Successful contractor(s) must demonstrate the ability to supply the compliant architectural coatings for use prior to any coating activities. A copy of each proposed architectural coating Material Safety Data Sheet and VOC content shall be available upon request. Alternatively, the contractor may utilize tilt-up concrete buildings that do not require the use of architectural coatings.

Section 13 below summarizes the Project's impacts after implementation of Mitigation Measure AQ-1.

12.2 GREENHOUSE GAS MITIGATION MEASURES

Impacts related to GHG emissions are less than cumulatively considerable. As such, Mitigation Measures are not proposed.

13 IMPACTS AFTER MITIGATION MEASURES

13.1 AIR QUALITY IMPACTS AFTER MITIGATION

Table 13.1-1 demonstrates the maximum daily emissions associated with construction of Phase 2 with implementation of Mitigation Measure AQ-1.

| Description | VOC | CO | NOx | SOx | PM10 | PM2.5 |
|---|-------|-------|-------|------|-------|-------|
| Phase 2 Maximum Daily Emissions (lbs/day) ¹ | 35.78 | 57.92 | 45.32 | 0.12 | 14.22 | 8.02 |
| SCAQMD Threshold (lbs/day) | 75 | 550 | 100 | 100 | 150 | 55 |
| Exceeds Threshold? | No | No | No | No | No | No |

Table 13.1-13.1-1: Phase 2 Mitigated Construction-Related Maximum Daily Emissions

Notes: VOC = volatile organic compounds; SO_x = sulfur oxides; NO_x = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

¹ Phase 2 emissions are based on the overlap of subphases per the anticipated construction schedule. Maximum daily emissions for all pollutants occur during the overlap of site utilities/electric, building, trackwork-direct fixation, and major equipment construction activities.

As shown in Table 13.1-1, with implementation of Mitigation Measure AQ-1, emissions of VOC would no longer exceed the SCAQMD threshold of significance. Since construction of Phase 2 of the Project would overlap with operational activities of Phase 1, overlapping emissions were also identified to be potentially significant.

| Description | VOC (lbs/day) | CO (lbs/day) | NOx (lbs/day) | SOx (lbs/day) | PM10 (lbs/day) | PM2.5 (lbs/day) |
|---|------------------|-----------------|------------------|------------------|-------------------|--------------------|
| Mitigated Phase 2 Construction Emissions | 35.78 | 57.92 | 45.32 | 0.12 | 14.22 | 8.02 |
| Yard Equipment | 0.83 | 3.48 | 2.53 | 0.01 | 0.11 | 0.15 |
| Staff and Truck Vehicles | 0.06 | 2.00 | 1.58 | 0.02 | 2.26 | 0.01 |
| Architectural Coatings | 0.13 | - | - | - | - | - |
| Natural Gas Consumption | 0.04 | 0.32 | 0.39 | 0.00 | 0.03 | 0.03 |
| Train Fueling | 0.41 | - | - | - | - | - |
| Sand Silos | - | - | - | - | 0.04 | 0.06 |
| Total Maximum Daily Increase in Regional Emissions (Ibs/day) | 37.25 | 63.72 | 49.82 | 0.15 | 16.66 | 8.27 |
| SCAQMD Threshold | 55 | 550 | 55 | 100 | 150 | 55 |
| Exceeds Threshold? | No | No | No | No | No | No |

Table 13.1-13.1-2: Overlapping Mitigated Construction and Operational Maximum Daily Increase in Regional Emissions

Notes: VOC = volatile organic compounds; SO_x = sulfur oxides; NO_x = nitrogen oxides; PM_{10} = suspended particulate matter less than 10 micrometers in diameter; $PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in diameter; CO = carbon monoxide; lbs/day = pounds per day; SCAQMD = South Coast Air Quality Management District.

As shown in Table 13.1-2, with implementation of Mitigation Measure AQ-1, the maximum daily emissions associated with overlapping activities of Phase 1 operations and Phase 2 construction would also not exceed the SCAQMD threshold of significance. Therefore, this impact would be less than significant with mitigation.

In addition, with implementation of Mitigation Measure AQ-1, the Project is also not anticipated to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment. Further, one of the Project objectives is to provide equipment to inspect, clean, and maintain existing cars and locomotives on a regular and efficient basis. The storage and maintenance activities that would occur operationally at this facility would be a shift in these operations from the existing storage and maintenance facilities to the proposed Project Site. As such, due to the optimal location of the proposed Project Site, the Project is also anticipated to result in reduced locomotive travel in the region and a reduction in the emissions associated with locomotive and rail car travel in the region.

13.2 GREENHOUSE GAS EMISSIONS IMPACTS AFTER MITIGATION

Impacts related to GHG emissions are less than cumulatively considerable. As such, mitigation measures are not proposed.

14 **REFERENCES**

AECOM. 2021. Metrolink Orange County Maintenance Facility: Traffic Technical Memorandum. March.

- California Air Resources Board (CARB). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. Available at: http://www.arb.ca.gov/ch/landuse.htm. Accessed January 2021.
- ———.2008. Climate Change Scoping Plan. Available at: https://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed January 2021.
- ———.2012. California Greenhouse Gas Emission Inventory 2000–2012. Available at: https://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf. Accessed January 2021.
- — . 2014. First Update to the Climate Change Scoping Plan: Building on the Framework. Pursuant to AB 32, the California Global Warming Solutions Act of 2006. Available at: https://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.
 pdf. Accessed January 2021.
- ———. 2017a. Technical Advisory: Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways. Available at: https://www.arb.ca.gov/ch/rd_technical_advisory_final.PDF. Accessed January 2021.
- ———. 2017b. California's 2017 Climate Change Scoping Plan. Available at: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed January 2021.
- ———. 2020a. Air Quality Data Statistics. Available at: https://arb.ca.gov/adam. Accessed January 2021.
- — . 2020b. California Greenhouse Gas Inventory for 2000–2018. Available at: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf. Accessed January 2021.
- ———. 2020c. EMFAC Off-Model Adjustment Factors for Carbon Dioxide Emissions to Account for the SAFE Vehicles Rule Part One and the Final SAFE Rule. Available at: https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf. Accessed January 2021.
- California Air Pollution Control Officers Association (CAPCOA). 2009 (July). *Health Risk Assessments for Proposed Land Use Projects.*
- California Department of Conservation, Division of Mines and Geology (CDMG). 2000. A General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos. Available at: <u>https://ww2.arb.ca.gov/sites/default/files/classic//toxics/asbestos/ofr_2000-019.pdf</u>. Accessed February 2021.

- California Environmental Quality Act, *Center for Biological Diversity v. California Department of Fish and Wildlife* [2015] 62 Cal.4th 204. 2015. Available at: https://ceqaportal.org/ceqacase.cfm?cq_id=1612
- California Legislative Information 2015-2016. Available at:

https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=201520160SB32. Accessed January 2021

- City of Irvine, City of Irvine General Plan, Land Use Element, 2015:https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=20687
- Metrolink. 2014. Health Risk Assessment for the Central Maintenance Facility. Available: https://metrolinktrains.com/globalassets/community/hra.pdf.
- Office of Environmental Health Hazard Assessment (OEHHA). 2015. *Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments*. Available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed January 2021.
- Office of Planning and Research (OPR). 2018. CEQA and Climate Change Advisory. Available at: http://opr.ca.gov/docs/20181228-Discussion_Draft_Climate_Change_Adivsory.pdf. Accessed January 2021.
- San Joaquin Regional Rail Commission (SJRRC). 2018 (April). ACE Extension Lathrop to Ceres/Merced Draft EIR Section 4.3. ICF 00509.17. Available: https://acerail.com/projects-initiatives/.
- South Coast Air Quality Management District (SCAQMD). 2008a. Localized Significance Thresholds. Available at: <u>http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-</u> <u>thresholds/final-lst-methodology-document.pdf?sfvrsn=2</u>. Accessed January 2021.
- ———. 2015. Multiple Air Toxics Exposure Study IV. Available at: <u>http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-jul7-009.pdf?sfvrsn=7</u>. Accessed October 2020.
- ———. 2016. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf. Accessed January 2021.
- ———. 2017a. 2016 Air Quality Management Plan. Available at: https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15. Accessed January 2021.

- ———. 2017b. Board Meeting Funding for Multiple Air Toxics Exposure Study V. Available at: <u>http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2017/2017-jul7-009.pdf?sfvrsn=7</u>. Accessed January 2021.
- ———. 2019. South Coast AQMD Air Quality Significance Thresholds. Available at: <u>http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf</u>. Accessed January 2021.
- ———. 2020. Historical Air Quality Data by Year. Available at: <u>https://www.aqmd.gov/home/air-guality/historical-air-guality-data/historical-data-by-year</u>. Accessed January 2021.
- ———. 2021a. South Coast AQMD Modeling Guidance for AERMOD. Available: <u>https://www.aqmd.gov/home/air-quality/meteorological-data/modeling-guidance</u>.
- ———. 2021b. South Coast AQMD Meteorological Data for AERMOD Applications. Available: http://www.aqmd.gov/home/air-quality/meteorological-data/data-for-aermod.
- Southern California Association of Governments (SCAG). 2020a. Connect SoCal: 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy. Available at: <u>https://www.connectsocal.org/Documents/Adopted/0903fConnectSoCal-Plan.pdf. Accessed</u> January 2021.
- Southern California Regional Rail Authority (SCRRA), Metrolink System Map, October 2019, Available at: https://metrolinktrains.com/about/agency/The White House. 2021. Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. Available at: https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-orderprotecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/. Accessed January 2021.
- U.S. Environmental Protection Agency (EPA). 2009. Proposed Rulemaking to Establish Light Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards. Available at: <u>https://www.govinfo.gov/content/pkg/FR-2009-09-28/pdf/E9-22516.pdf</u>. Accessed January 2021.
- ------.SCREEN3. Available: <u>https://www.epa.gov/scram/air-quality-dispersion-modeling-screening-</u> models#screen3.
- — . 2010. Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards. Available at: https://www.govinfo.gov/content/pkg/FR-2010-05-07/pdf/2010-8159.pdf. Accessed January 2021.
- ———. 2011. EPA and NHTSA Adopt First-Ever Program to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium- and Heavy-Duty Vehicles. Available at: https://www.eesi.org/files/420f11031.pdf. Accessed January 2021.

- ———. 2016. Health and Environmental Effects of Particulate Matter. Available at: <u>https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm</u>. Accessed January 2021.
- ———. 2017a. Understanding Global Warming Potentials. Available at <u>https://www.epa.gov/ghgemissions/understanding-global-warming-potentials</u>. Accessed January 2021.
- ———. 2017b. Proposed Rule for Repeal of Emission Requirements for Glider Vehicles, Glider Engines, and Glider Kits. Available at: <u>https://www.govinfo.gov/content/pkg/FR-2017-11-16/pdf/2017-24884.pdf</u>. Accessed January 2021.
- ——. 2018. Mid-Term Evaluation of Greenhouse Gas Emission Standards for Model Year 2022–2025. Available at: <u>https://www.govinfo.gov/content/pkg/FR-2018-04-13/pdf/2018-07364.pdf</u>. <u>Accessed</u> <u>January 2021</u>.
- — . 2019a. Overview of the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP). Available at: https://www.epa.gov/asbestos/overview-asbestos-national-emissionstandards-hazardous-air-pollutants-neshap. Accessed February 2021.
- ----.2019b. AERMOD Modeling System. Available: https://www.epa.gov/scram/air-quality-dispersionmodeling-preferred-and-recommended-models#aermod.
- ———. 2020. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018. Available at https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf. Accessed January 2021.
- U.S. Geological Society (USGS). 2021. Multi-Resolution Land Characteristics Consortium. Available: <u>https://www.mrlc.gov/viewer/</u>.
- Western Regional Climate Center (WRCC). 2003. Period of Record Monthly Climate Summary: Tustin Irvine Ranch, California (049087). Available at: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9087. Accessed January 2021.
- Van Gosen, B.S., and Clinkenbeard, J.P., 2011, Reported historic asbestos mines, historic asbestos prospects, and other natural occurrences of asbestos in California: U.S. Geological Survey Open-File Report 2011-1188, 22 p., 1 pl.

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Appendix B Attachments Air Quality and Greenhouse Gases Technical Memorandum

Metrolink Orange County Maintenance Facility

Prepared for: Orange County Transportation Authority

> 550 S. Main St. Orange, CA 92868

> > And

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

AECOM

Kaiser Center 300 S.Grand Ave Los Angeles, CA 90071

June 2022

Attachment A

Construction and Operational Emission Estimates

Orange County Maintenance Facility - Construction Emissions Summary

| Phases | | ROG | CO | NOx | SOx | PM ₁₀ | PM _{2.5} |
|--------|---|------|-------|-------|------|------------------|-------------------|
| | Survey, Clear and Grub | 1.54 | 12.00 | 13.12 | 0.03 | 0.54 | 0.49 |
| | Clear and Grub, Site Util/Electric, Demo, Earthwork | 6.53 | 69.20 | 53.72 | 0.13 | 2.17 | 1.99 |
| | Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving | 7.30 | 61.31 | 63.08 | 0.15 | 2.52 | 2.3 |
| | Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings | 7.84 | 68.90 | 63.63 | 0.16 | 2.55 | 2.3 |
| | Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip | 6.55 | 59.15 | 52.32 | 0.14 | 2.05 | 1.89 |
| | Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 5.97 | 52.56 | 46.05 | 0.11 | 1.87 | 1.73 |

| | Phase 1 - Daily Maximum On-Road Emissions (lbs/day) | | | | | | | | | |
|--------|---|------|------|-------|------|-------------------|------|--|--|--|
| Phases | | ROG | CO | NOx | SOx | PM _{2.5} | | | | |
| | Survey, Clear and Grub | 0.02 | 0.72 | 0.05 | 0.00 | 0.23 | 0.06 | | | |
| | Clear and Grub, Site Util/Electric, Demo, Earthwork | 0.18 | 3.82 | 11.75 | 0.09 | 3.05 | 0.90 | | | |
| | Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving | 0.27 | 6.87 | 12.12 | 0.10 | 4.04 | 1.17 | | | |
| | Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings | 0.26 | 8.17 | 0.72 | 0.03 | 2.61 | 0.72 | | | |
| | Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip | 0.24 | 7.53 | 0.87 | 0.03 | 2.45 | 0.67 | | | |
| | Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 0.20 | 6.40 | 0.44 | 0.02 | 2.03 | 0.56 | | | |

| Phase 1 - Maximum Daily Emissions (lbs/day) | | | | | | | | |
|---|--|-------|-------|-------|------|------------------|-------------------|--|
| Phases | | ROG | CO | NOx | SOx | PM ₁₀ | PM _{2.5} | |
| | Survey, Clear and Grub | 1.56 | 12.71 | 13.17 | 0.03 | 6.79 | 3.8 | |
| | Clear and Grub, Site Util/Electric, Demo, Earthwork | 6.70 | 73.02 | 65.47 | 0.22 | 41.47 | 22.8 | |
| Site | Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving | 7.95 | 68.17 | 75.20 | 0.25 | 39.79 | 21.7 | |
| Sit | e Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings | 38.06 | 77.07 | 64.35 | 0.18 | 14.19 | 8.0 | |
| | Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip | 36.37 | 66.68 | 53.19 | 0.16 | 10.52 | 5.8 | |
| | Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 35.75 | 58.96 | 46.49 | 0.13 | 9.93 | 5.6 | |
| | Maximum Daily Emissions | 38.06 | 77.07 | 75.20 | 0.25 | 41.47 | 22.8 | |
| | SCAQMD Threshold | 75 | 550 | 100 | 150 | 150 | 5 | |

| | Phase 1 - Maximum Daily On-Site Emissions (lbs/day) | | | | | | | | | |
|--------|---|-------|-------|-------|------|------------------|-------------------|--|--|--|
| Phases | | ROG | CO | NOx | SOx | PM ₁₀ | PM _{2.5} | | | |
| | Survey, Clear and Grub | 1.54 | 12.05 | 13.12 | 0.03 | 6.58 | 3.82 | | | |
| | Clear and Grub, Site Util/Electric, Demo, Earthwork | 6.54 | 69.48 | 54.58 | 0.13 | 38.63 | 21.98 | | | |
| | Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving | 7.70 | 61.80 | 63.96 | 0.16 | 36.05 | 20.68 | | | |
| | Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings | 37.82 | 69.49 | 63.68 | 0.16 | 11.77 | 2.39 | | | |
| | Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip | 36.15 | 59.69 | 52.38 | 0.16 | 8.25 | 5.26 | | | |
| | Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 35.56 | 53.03 | 46.09 | 0.13 | 8.04 | 7.79 | | | |
| | Maximum Daily Emissions | 37.82 | 69.49 | 63.96 | 0.16 | 38.63 | 21.98 | | | |

Percent on-road emisions on/around project site: 7%

| Daily Fugitive Dust Emissions (Ibs/day) | | |
|---|------------------|-------------------|
| Phase | PM ₁₀ | PM _{2.5} |
| Clear and Grub | 6.022 | 3.319 |
| Site Utilities | 6.022 | 3.319 |
| Earthwork | 24.196 | 13.290 |
| Roadway Paving | 3.011 | 1.659 |

| Daily VOC Emissions (lbs/day) - Phase 1 | |
|--|-------|
| Phase | VOC |
| Buildings (Interior and Exterior) | 29.51 |
| Paved Areas (Painting) | 0.07 |
| Paved Areas (Asphalt Paving Off-Gassing) | 0.382 |

| GHG Emissions - Phase 1 | | | | | |
|-------------------------|---------|--|--|--|--|
| Project Component | MT CO2e | | | | |
| Off-Road Emissions | 761 | | | | |
| On-Road Emissions | 943 | | | | |
| Total GHG Emissions | 1,704 | | | | |

| | Phase 2 - Daily Maximum Off-Road Emissions (lbs/day) | | | | | | | | |
|--------|--|------|-------|-------|------|------------------|-------------------|--|--|
| Phases | | ROG | CO | NOx | SOx | PM ₁₀ | PM _{2.5} | | |
| | Survey | 0.07 | 0.47 | 0.51 | 0.00 | 0.02 | 0.02 | | |
| | Site Util/Electric, Demo | 3.55 | 46.70 | 25.71 | 0.07 | 1.04 | 0.95 | | |
| | Site Util/Electric, Earthwork | 3.20 | 28.58 | 27.51 | 0.06 | 1.20 | 1.10 | | |
| | Earthwork, Foundations | 1.82 | 16.84 | 17.25 | 0.04 | 0.78 | 0.71 | | |
| | Foundations, Roadway/Paving | 2.11 | 18.22 | 18.26 | 0.05 | 0.73 | 0.67 | | |
| | Buildings, Trackwork-Ballasted, Major Equip | 3.98 | 39.92 | 34.48 | 0.09 | 1.29 | 1.19 | | |
| | Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 5.85 | 51.53 | 44.88 | 0.10 | 1.84 | 1.69 | | |
| | Major Equip, Commissioning | 0.76 | 6.13 | 6.05 | 0.01 | 0.29 | 0.26 | | |

| Phase 2 - Daily Maximum On-Re | oad Emissio | ns (lbs/day | r) | | | |
|--|-------------|-------------|------|------|------------------|-------------------|
| Phases | ROG | CO | NOx | SOx | PM ₁₀ | PM _{2.5} |
| Survey | 0.01 | 0.17 | 0.01 | 0.00 | 0.05 | 0.0 |
| Site Util/Electric, Demo | 0.04 | 1.43 | 0.10 | 0.00 | 0.46 | 0.13 |
| Site Util/Electric, Earthwork | 0.07 | 1.95 | 2.34 | 0.02 | 0.97 | 0.2 |
| Earthwork, Foundations | 0.09 | 2.41 | 2.77 | 0.02 | 1.16 | 0.3 |
| Foundations, Roadway/Paving | | 2.18 | 0.55 | 0.01 | 0.73 | 0.2 |
| Buildings, Trackwork-Ballasted, Major Equip | 0.21 | 6.63 | 0.58 | 0.02 | 2.13 | 0.5 |
| Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 0.20 | 6.40 | 0.44 | 0.02 | 2.03 | 0.5 |
| Major Equip, Commissioning | 0.06 | 1.99 | 0.14 | 0.01 | 0.63 | 0.1 |

| Phase 2 - Maximu | n Daily Emissions | (lbs/day) | | | | |
|--|-------------------|-----------|-------|------|------------------|-------------------|
| Phases | ROG | CO | NOx | SOx | PM ₁₀ | PM _{2.5} |
| | Survey 0.0 | 8 0.64 | 0.53 | 0.00 | 0.07 | 0.0 |
| Site Util/Electri | c, Demo 3.5 | 9 48.13 | 25.81 | 0.07 | 7.52 | 4.4 |
| Site Util/Electric, Ea | rthwork 3.2 | 8 30.52 | 29.85 | 0.08 | 14.22 | 8.0 |
| Earthwork, Four | idations 1.9 | 1 19.25 | 20.01 | 0.06 | 7.96 | 4.3 |
| Foundations, Roadway | /Paving 2.1 | 8 20.40 | 18.81 | 0.06 | 4.47 | 2.5 |
| Buildings, Trackwork-Ballasted, Maj | or Equip 78.5 | 0 46.55 | 35.05 | 0.11 | 3.41 | 1.7 |
| Site Util/Electric, Buildings, Trackwork-DF, Maj | or Equip 80.3 | 6 57.92 | 45.32 | 0.12 | 9.89 | 5.5 |
| Major Equip, Commi | ssioning 0.8 | 2 8.11 | 6.18 | 0.02 | 0.92 | 0.4 |
| Maximum Daily E | nissions 80.3 | 6 57.92 | 45.32 | 0.12 | 14.22 | 8.0 |
| SCAQMD TH | reshold 7 | 5 550 | 100 | 150 | 150 | Į |

| Phase 2 - Maximum Daily On-S | ite Emissior | ns (lbs/day) | | | | |
|--|--------------|--------------|-------|------|------------------|-------------------|
| Phases | ROG | CO | NOx | SOx | PM ₁₀ | PM _{2.5} |
| Survey | 0.07 | 0.48 | 0.51 | 0.00 | 0.02 | 0.0 |
| Site Util/Electric, Demo | 3.55 | 46.80 | 25.72 | 0.07 | 7.10 | 4.2 |
| Site Util/Electric, Earthwork | 3.21 | 28.72 | 27.68 | 0.06 | 13.32 | 7.7 |
| Earthwork, Foundations | 1.83 | 17.01 | 17.45 | 0.04 | 6.88 | 4.0 |
| Foundations, Roadway/Paving | 2.12 | 18.38 | 18.30 | 0.05 | 3.79 | 2.3 |
| Buildings, Trackwork-Ballasted, Major Equip | 78.31 | 40.40 | 34.52 | 0.09 | 1.44 | 1.2 |
| Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 80.18 | 51.99 | 44.91 | 0.10 | 8.01 | 5.0 |
| Major Equip, Commissioning | 0.76 | 6.27 | 6.06 | 0.01 | 0.33 | 0.2 |
| Maximum Daily Emissions | 80.18 | 51.99 | 44.91 | 0.10 | 13.32 | 7.7 |

Percent on-road emisions on/around project site: 7%

| Daily Fugitive Dust Emissions (lbs/day) | | |
|---|------------------|-------------------|
| Phase | PM ₁₀ | PM _{2.5} |
| | | |
| Site Utilities | 6.0221 | 3.3185 |
| Earthwork | 6.0221 | 3.3185 |
| Roadway Paving | 3.0110 | 1.6593 |

Unmitigated Daily VOC Emissions (lbs/day) - Phase 2

| Phase | VOC |
|--|-------|
| Buildings (Interior and Exterior) | 74.31 |
| Paved Areas (Painting) | - |
| Paved Areas (Asphalt Paving Off-Gassing) | - |

| GHG Emissions | - Phase 2 |
|---------------------|-----------|
| Project Component | MT CO2e |
| Off-Road Emissions | 207 |
| On-Road Emissions | 274 |
| Total GHG Emissions | 481 |

| Phases |
|-----------------------------|
| |
| |
| |
| |
| |
| Buildings, Tra |
| Site Util/Electric, Buildin |
| |
| |

| Phase 2 - MItigated Maxin | num Daily E | missions (I | bs/day) | | | |
|----------------------------------|-------------|-------------|---------|------|------------------|-------------------|
| | ROG | CO | NOx | SOx | PM ₁₀ | PM _{2.5} |
| Survey | 0.08 | 0.64 | 0.53 | 0.00 | 0.07 | 0.03 |
| Site Util/Electric, Demo | 3.59 | 48.13 | 25.81 | 0.07 | 7.52 | 4.40 |
| Site Util/Electric, Earthwork | 3.28 | 30.52 | 29.85 | 0.08 | 14.22 | 8.02 |
| Earthwork, Foundations | 1.91 | 19.25 | 20.01 | 0.06 | 7.96 | 4.36 |
| Foundations, Roadway/Paving | 2.18 | 20.40 | 18.81 | 0.06 | 4.47 | 2.53 |
| Trackwork-Ballasted, Major Equip | 33.91 | 46.55 | 35.05 | 0.11 | 3.41 | 1.78 |
| dings, Trackwork-DF, Major Equip | 35.78 | 57.92 | 45.32 | 0.12 | 9.89 | 5.57 |
| Major Equip, Commissioning | 0.82 | 8.11 | 6.18 | 0.02 | 0.92 | 0.44 |
| Maximum Daily Emissions | 35.78 | 57.92 | 45.32 | 0.12 | 14.22 | 8.02 |

| Mitigated Daily VOC Emissions (Ibs/day) - Phase 2 | |
|---|-------|
| | VOC |
| nterior and Exterior) | 29.73 |

ORANGE COUNTY MAINTENANCE FACILITY - Phase 1 Construction Schedule Phase 1

| | Jan-23 | Feb-23 | Mar-23 | Apr-23 | May-23 | Jun-23 | Jul-23 | Aug-23 | Sep-23 | Oct-23 | Nov-23 | Dec-23 | Jan-24 | Feb-24 | Mar-24 | Apr-24 | May-24 | Jun-24 | Jul-24 | Aug-24 | Sep-24 | Oct-24 | Nov-24 | Dec-24 | Jan-25 | Feb-25 | Mar-25 | Apr-25 | May-25 | Jun-25 |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|--------|--------|--------|--------|--------|--------|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| Survey | х | х | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clear and grub | | х | х | х | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Site Util/Electric | | | х | х | х | х | х | х | х | х | х | х | х | x | (X | | x | х | х | х | х | X) | t i i i i i i i i i i i i i i i i i i i | х | х | х | | | | |
| Demo | | | х | х | х | | | | | | | | | | | | | | | | | | | | | | | | | |
| Earthwork | | | | х | х | х | x | х | х | | | | | | | | | | | | | | | | | | | | | |
| Foundations | | | | | | | | х | х | х | х | | | | | | | | | | | | | | | | | | | |
| Roadways/Paving | | | | | | | | | х | х | х | х | | | | | | | | | | | | | | | | | | |
| Buildings Bridge | | | | | | | | | | х | х | х | х | x | (X | | x | х | х | х | х | X) | t i i i i i i i i i i i i i i i i i i i | х | х | х | x) | C | | |
| Bridge | | | | | | х | х | х | х | х | х | | | | | | | | | | | | | | | | | | | |
| Trackwork-Ballasted | | | | | | | | | | | | | | | c x | | x | х | х | х | х | x > | t i | х | | | | | | |
| Trackwork -DF | | | | | | | | | | | | | | | | | | | | | | | | | х | х | x | | | |
| Major equip Commisioning | | | | | | | | | | | | | | | | | | | | | | > | t i i i i i i i i i i i i i i i i i i i | х | х | х | x) | C | | |
| Commisioning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | () | |

ORANGE COUNTY MAINTENANCE FACILITY - PHASE 2 Construction Schedule Phase 2

| · · · · · · · · · · · · · · · · · · · | Jul-25 | Aug-25 | Sep-25 | Oct-25 | Nov-25 | Dec-25 | Jan-26 | Feb-26 | Mar-26 | Apr-26 | May-26 | Jun-26 | Jul-26 | Aug-26 | Sep-26 | Oct-26 | Nov-26 | Dec-26 | Jan-27 | Feb-27 | Mar-27 | Apr-27 | May-27 | Jun-27 | Jul-27 | Aug-27 | Sep-27 | Oct-27 | Nov-27 |
|---------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| Survey | (| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Site Util/Electric | | x x | (| | | | | | | | | | | | | | | | | x | ĸ | | | | | | | | |
| Demo | | х | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Earthwork | | 2 | () | (| | | | | | | | | | | | | | | | | | | | | | | | | |
| Foundations | | | 2 | (| x | | | | | | | | | | | | | | | | | | | | | | | | |
| Roadways/Paving | | | | | x | ĸ | | | | | | | | | | | | | | | | | | | | | | | |
| Buildings | | | | | | | x b | (| k X | | () | x |) | () | (X |) | K I | x | (| x | ĸ | | | | | | | | |
| Trackwork-Ballasted | | | | | | | | | | | | | |) | (X |) | K I | x | | | | | | | | | | | |
| Trackwork -DF | | | | | | | | | | | | | | | | | | | (| x | K . | | | | | | | | |
| Major equip | | | | | | | | | | | | | | | | | | x | (| x | K I | x | x | | | | | | |
| Commisioning | | | | | | | | | | | | | | | | | | | | | | x | x | | | | | | |

Off-Road Construction Emissions - Phase 1

| | | | | Tetal Devil | Horsepower | otal Runtime | 2 | | | | | . . | | Total | | | | | | | |
|--|--|--|--|------------------------|----------------------|-----------------------|--|---|--------------|---|----------------------------|------------------------------|--|-------------------------|-------------------|---------------|---|----------------------|--|--------------|--|
| ject Phase/Equipment vey bact hammer ver drill | Notes electric/hand-held electric/hand-held | Other Construction Equipment Other Construction Equipment | Number Hours per Day 1 0 1 0 | Total Days' 42 0 | 0 | ÷ . | 0.00 0.00 0.00 | CO NOx 0.00 0.00 0.00 0.00 | | M10 PM2.5 0.00 0.00 0.00 0.00 | CO2 CH | 0.00 0.00 | 20 gal/hp-hr 0.00 0.00 0.00 0.00 | | 9 1.25 0 0.00 | 1.37 0.00 | Dx PM10 0.01 0.05 0.00 0.00 0.00 0.00 | 0.00 | CO ₂ 10.41 0.00 0.00 | 0.00 | I ₂ O 0.00 0.00 0.00 |
| ver drift ol truck ar and Grub sh cutter /Brush hog | assumes skid steer attachment (ht | Off-Highway Trucks | 1 8 | 42 63 | | - | | 0.00 0. | 0.00 | 0.00 0. | | 0.57 | 0.26 0.00034 | 5 47 0.1 1.3 | 9 1.25 5 10.74 | 1.37 11.75 | 0.00 0.00 0.01 0.05 0.02 0.49 0.00 0.01 | 0.05 | 10.41 7.10 0.23 | 0.00 0.00 | 0.00 |
| ain saw Dozer avator-Track hoe | assumes diesel | Concrete/Industrial Saws Rubber Tired Dozers Excavators | | 3 | 81 247 158 | 25 | 0.73 0.37 0.40 0.18 0.38 0.07 | 1.20 0.75 3.19 2.78 1.04 1.95 1.18 0.56 | 0.01 | 0.03 0.02 0.10 0.09 0.09 0.08 0.03 0.03 | 414.36 209.04 201.69 | 0.57 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 0.26 0.0 | 4 697 0.3 3 626 0.3 | 8 3.33 1 1.81 | 2.90 3.40 | 0.00 0.01 0.00 0.10 0.00 0.15 0.00 0.01 | 0.09 | 0.23 0.62 2.08 0.15 | 0.00 | 0.00 0.00 0.00 |
| nt end loader (rubber) ntice / Log Loader | http://s7d2.scene7.com/is/conten | Rubber Tired Loaders Tractors/Loaders/Backhoes | | 32 32 | | 6 | 0.38 0.07 0.36 0.08 0.37 0.07 0.42 0.30 | 0.43 0.73 1.14 0.56 1.74 2.93 | 0.00 | 0.03 0.03 0.02 0.02 0.03 0.03 0.21 0.19 | 190.49 193.81 | 0.57 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 0.26 0.00 | 0 10 0.0 0 1 0.0 | 5 0.28 2 0.30 | 0.47 0.15 | 0.00 0.01 0.00 0.02 0.00 0.01 0.00 0.06 | 0.01 | 0.15 | 0.00 | 0.00 0.00 0.00 |
| mp Grinder ctor trailer e shear axle Dump Trucks | assumes attachment to skid steer | Other Construction Equipment Off-Highway Trucks Skid Steer Loaders Off-Highway Trucks | 1 4 1 8 1 8 | 6 1 | 402 65 402 | 50 5 | 0.42 0.30 0.38 0.07 0.37 0.06 0.38 0.07 | 1.74 2.95 0.46 0.51 1.20 0.75 0.46 0.51 | 0.00 | 0.02 0.02 0.03 0.02 0.02 0.02 | 201.86 194.50 | 0.57 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 0.26 0.0 | 0 7 0.1 0 0 0.0 | 9 1.25 2 0.51 | 1.37 0.32 | 0.00 0.00 0.01 0.05 0.00 0.01 0.01 0.05 | 0.05 | 0.08 1.56 0.02 0.31 | 0.00 0.00 | 0.00 0.00 0.00 |
| od chipper e Utilities | https://www.stumpcutters.com/w | Other Construction Equipment | | 504 | 116 | 19 | 0.42 0.11 | 1.31 1.13 | 0.00 | 0.06 0.05 | 218.42 | 0.57 | 0.26 0.0 | 1 19 0.0 2.2 | 4 0.42 7 19.53 | 0.36 18.19 | 0.00 0.02 0.05 0.73 | 0.02 0.68 | 0.20 366.28 | 0.00 0.01 | 0.00 |
| asive/demo saw khoe .ket Truck | assumes diesel | Concrete/Industrial Saws Tractors/Loaders/Backhoes Off-Highway Trucks | 1 2 1 8 1 8 | 50 403 126 | 97 402 | 3226 1008 | | 3.19 2.78 1.29 0.85 0.46 0.51 | 0.00 | 0.10 0.09 0.04 0.04 0.02 0.02 | 195.21 201.86 | 0.57 0.57 0.57 | 0.26 0.3 0.26 0.0 0.26 0.0 | 0 62 0.0 0 140 0.1 | 5 0.81 9 1.25 | 0.54 1.37 | 0.00 0.03 0.00 0.03 0.01 0.05 | 0.05 | 2.47 22.60 31.24 | 0.00 | 0.00 0.00 0.00 |
| npressor ncrete mixer ncrete pump | | Air Compressors Cement and Mortar Mixers Pumps | 1 8 1 4 1 5 | 252 50 202 | 9 9 84 | 202 1008 | 0.48 0.30 0.56 0.31 0.74 0.03 | 2.35 1.90 1.82 2.35 1.01 0.53 | 0.00 | 0.07 0.07 0.09 0.08 0.03 0.03 | 159.70 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.1 0.26 0.0 | 0 184 0.0 1 853 0.0 | 1 0.08 2 0.69 | 0.10 0.36 | 0.00 0.05 0.00 0.00 0.00 0.02 | 0.00 | 20.59 0.32 10.01 | 0.00 | 0.00 0.00 0.00 |
| ncrete saw ncrete truck ncrete vibrator | https://www.indiamart.com/prod | Concrete/Industrial Saws Off-Highway Trucks Other Construction Equipment | 1 8 1 5 1 5 | 50 202 202 | 402 | 1008 | 0.73 0.37 0.38 0.07 0.42 0.34 | 3.19 2.78 0.46 0.51 2.02 2.59 | 0.00 | 0.10 0.09 0.02 0.02 0.10 0.09 | 201.86 | 0.57 0.57 0.57 | 0.26 0.3 0.26 0.0 0.26 0.0 | 0 140 0.1 | 2 0.78 | 0.86 | 0.01 0.10 0.00 0.03 0.00 0.00 | 0.03 | 9.88 31.24 0.81 | 0.00 | 0.00 0.00 0.00 |
| avator-Track hoe nt end loader (rubber) nerator | | Excavators Tractors/Loaders/Backhoes Generator Sets | 1 8 1 8 1 8 | 252 252 302 | 97 | 2016 | 0.38 0.07 0.37 0.08 0.74 0.06 | 1.180.561.290.851.170.48 | 0.00 | 0.03 0.03 0.04 0.04 0.04 0.04 | 201.69 195.21 420.53 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 39 0.0 | 5 0.81 | 0.54 | 0.00 0.03 0.00 0.03 0.00 0.04 | | 24.53 14.12 63.24 | 0.00 | 0.00 0.00 0.00 |
| dall nder izontal Boring /Jacking machine | https://www.essexequipment.com | Graders Other Construction Equipment Bore/Drill Rias | | 126 252 25 | 9 187 ! 11 | 1008 504 | 0.41 0.12 0.42 0.34 0.50 0.06 | 0.53 1.32 2.02 2.59 0.53 0.60 | 0.00 | 0.04 0.04 0.10 0.09 0.02 0.02 | 215.93 | 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 | 0 179 0.1 5 297 0.0 | 6 0.71 1 0.04 | 1.78 0.05 | 0.00 0.06 0.00 0.00 0.00 0.04 | 0.05 | 16.63 0.81 5.89 | 0.00 | 0.00 0.00 0.00 |
| ler-vibratory ctor trailer | | Rollers Off-Highway Trucks | 1 0 1 2 1 2 | 101 403 | 80 402 | 202 806 | 0.38 0.10 0.38 0.07 | 1.28 1.09 0.46 0.51 | 0.00 | 0.06 0.05 0.02 0.02 | 198.12 201.86 | 0.57 0.57 | 0.26 0.0 | 0 51 0.0 0 112 0.0 | 1 0.17 5 0.31 | 0.14 0.34 | 0.00 0.01 0.00 0.01 | 0.01 | 1.20 24.99 | 0.00 0.00 | 0.00 |
| nching machine (Ditch witch) axle Dump Trucks :uum excavator truck | | Trenchers Off-Highway Trucks Off-Highway Trucks | 1 4 2 8 1 4 | 151 252 50 | 402 402 | 2016 202 | | 1.86 2.26 0.46 0.51 0.46 0.51 | 0.00 | 0.16 0.14 0.02 0.02 0.02 0.02 | 201.86 201.86 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 280 0.3 28 0.1 | 8 2.50 0 0.63 | 2.74 0.69 | 0.00 0.05 0.01 0.10 0.00 0.02 | 0.02 | 6.30 62.48 6.25 | 0.00 | 0.00 0.00 0.00 |
| lder nolition rasive/demo saw | | Welders Concrete/Industrial Saws | 1 8 | 252 63 13 | | | 0.45 0.26 | 2.06 1.74 3.19 2.78 | | 0.07 0.06 | 255.73 414.36 | 0.57 | 0.26 0.0 | 1.4 | 0 28.21 | 8.70 | 0.00 0.02 0.02 0.35 0.00 0.05 | 0.31 | 10.67 26.21 1.23 | 0.01 | 0.00 0.00 0.00 |
| halt/Concrete crusher khoe npressor | | Crushing/Proc. Equipment Tractors/Loaders/Backhoes Air Compressors | 1 6 1 8 1 8 | 21 21 32 | 97 | 166 | 0.37 0.08 | 21.52 1.66 1.29 0.85 2.35 1.90 | 0.00 | 0.05 0.03 0.04 0.04 0.07 0.07 | 655.82 195.21 272.77 | 0.57 0.57 0.57 | 0.26 0.9 0.26 0.0 0.26 0.0 | 3 0.0 | 5 0.81 | 0.54 | 0.01 0.04 0.00 0.03 0.00 0.05 | 0.02 | 5.42 1.17 2.57 | 0.00 | 0.00 0.00 0.00 |
| avator-Track hoe nt end loader (rubber) nerator | | Excavators Rubber Tired Loaders Generator Sets | 1 8 1 4 | 32 50 32 | 158 203 | 252 202 | 0.38 0.07 0.36 0.08 0.74 0.06 | 1.18 0.56 0.43 0.73 1.17 0.48 | 0.00 | 0.03 0.03 0.02 0.02 0.04 0.04 | 201.69 190.49 159.70 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 0 42 0.0 0 16 0.0 | 7 1.25 5 0.28 | 0.60 0.47 | 0.00 0.03 0.00 0.02 0.00 0.04 | 0.03 0.01 | 3.07 2.82 2.50 | 0.00 | 0.00 0.00 0.00 |
| e Ram | https://www.essexequipment.com attachment to tractor, backhoe | Other Construction Equipment Tractors/Loaders/Backhoes | 1 2 1 8 | 13 | 11 97 | 25 76 | 0.42 0.34 0.37 0.08 | 2.02 2.59 1.29 0.85 | 0.01 | 0.10 0.09 0.04 0.04 | 352.40 195.21 | 0.57 0.57 | 0.26 0.0 | 5 15 0.0 0 1 0.0 | 1 0.04 5 0.81 | 0.05 0.54 | 0.00 0.00 0.00 0.03 | 0.00 | 0.04 0.53 | 0.00 | 0.00 |
| k hammers ctor trailer axle Dump Trucks | https://www.edisons.com.au/bau | Other Construction Equipment Off-Highway Trucks Off-Highway Trucks | 2 5 1 2 2 4 | 47 | 402 | 95 | 0.42 0.34 0.38 0.07 0.38 0.07 | 2.02 2.59 0.46 0.51 0.46 0.51 | 0.00 | 0.10 0.09 0.02 0.02 0.02 0.02 | 201.86 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 0 13 0.0 0 17 0.1 | 5 0.31 9 1.25 | 0.34 1.37 | 0.00 0.00 0.00 0.01 0.01 0.05 | 0.01 0.05 | 0.02 2.93 3.90 | 0.00 | 0.00 0.00 0.00 |
| thwork Dozer avator-Track hoe | | Rubber Tired Dozers Excavators | 1 8 1 8 | 126 63 13 | 247 | | 0.40 0.18 0.38 0.07 | 1.04 1.95 1.18 0.56 | | 0.09 0.08 0.03 0.03 | 209.04 201.69 | 0.57 | 0.26 0.0 0.26 0.0 | | 1 1.81 | 3.40 | 0.03 0.60 0.00 0.15 0.00 0.03 | 0.14 | 48.43 10.41 1.23 | 0.00 | 0.00 |
| nt end loader (rubber) Idall | | Rubber Tired Loaders Graders Scrapers | 1 5 1 8 1 8 | 101 42 6 | 203 | 504 333 | 0.36 0.08 0.41 0.12 0.48 0.11 | 0.43 0.73 0.53 1.32 0.85 1.19 | 0.00 | 0.02 0.02 0.04 0.04 0.05 0.04 | 190.49 215.93 255.22 | 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 | 0 40 0.0 0 59 0.1 | 6 0.35 6 0.71 | 0.59 1.78 | 0.00 0.02 0.00 0.06 0.01 0.14 | 0.02 0.05 | 7.05 5.49 2.28 | 0.00 | 0.00 0.00 0.00 |
| d Grader ler-sheepsfoot ler-vibratory | | Graders Rollers Rollers | 1 8 1 8 1 0 | 6 25 25 | 187 80 | 50 | 0.41 0.12 | 0.63 1.17 0.53 1.32 1.28 1.09 1.28 1.09 | 0.00 | 0.04 0.04 0.06 0.05 0.06 0.05 | 215.93 198.12 | 0.57 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 0.26 0.00 | 0 9 0.1 0 51 0.0 | 6 0.71 5 0.68 | 1.78 0.58 | 0.00 0.06 0.00 0.03 0.00 0.03 | 0.05 | 0.83 1.20 1.20 | 0.00 | 0.00 |
| axle Dump Trucks indations | | Off-Highway Trucks | 2 6 | 101 | 402 | 605 | 0.38 0.07 | 0.46 0.51 | 0.00 | 0.02 0.02 | 201.86 | 0.57 | 0.26 0.0 | 0 84 0.2 0.7 | 9 1.88 7 6.75 | 2.06 6.75 | 0.01 0.07 0.02 0.27 | 0.07 0.25 | 18.74 28.19 | 0.00 | 0.00 |
| ikhoe ncrete mixer ncrete pump | | Tractors/Loaders/Backhoes Cement and Mortar Mixers Pumps | 1 8 1 8 1 4 | 67 8 42 | 9 84 | 67 168 | 0.37 0.08 0.56 0.31 0.74 0.03 | 1.29 0.85 1.82 2.35 1.01 0.53 | 0.00 | 0.04 0.04 0.09 0.08 0.03 0.03 | 318.42 159.70 | 0.57 0.57 0.57 | 0.26 0.00 0.26 0.10 0.26 0.0 | 0 61 0.0 1 142 0.0 | 3 0.16 2 0.55 | 0.21 0.29 | 0.00 0.03 0.00 0.01 0.00 0.02 | | 3.77 0.11 1.67 | 0.00 | 0.00 0.00 0.00 |
| ncrete truck ncrete vibrator ne | https://www.indiamart.com/prod | Off-Highway Trucks Other Construction Equipment Cranes | 1 4 1 4 1 8 | 42 42 8 | | 168 168 | 0.38 0.07 0.42 0.34 0.29 0.09 | 0.46 0.51 2.02 2.59 0.52 1.00 | 0.00 | 0.02 0.02 0.10 0.09 0.04 0.04 | 352.40 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 0 23 0.1 5 49 0.0 | 0 0.63 | 0.69 0.05 | 0.00 0.02 0.00 0.00 0.00 0.05 | | 5.21 0.14 0.68 | 0.00 | 0.00 0.00 0.00 |
| avator-Track hoe nt end loader (rubber) driver | | Excavators Rubber Tired Loaders Bore/Drill Rigs | 1 8 1 8 | 21 67 8 | 158 | 168 538 | 0.29 0.09 0.38 0.07 0.36 0.08 0.50 0.06 | 0.52 1.00 1.18 0.56 0.43 0.73 0.53 0.60 | 0.00 | 0.04 0.04 0.03 0.03 0.02 0.02 0.02 0.02 | 201.69 190.49 263.10 | 0.57 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 0.26 0.00 | 0 28 0.0 0 43 0.1 | 7 1.25 0 0.56 | 0.60 0.95 | 0.00 0.03 0.00 0.03 0.00 0.03 | 0.03 0.03 | 2.04 7.52 1.47 | 0.00 | 0.00 |
| ler-vibratory-walk behind ctor Trailer | https://www.doosanportablepow | Rollers Off-Highway Trucks | 1 2 1 2 | 8 25 42 42 | 6 402 | 50 84 | 0.38 1.51 0.38 0.07 | 4.14 2.87 0.46 0.51 | 0.00 | 0.39 0.36 0.02 0.02 | 220.05 201.86 | 0.57 0.57 0.57 0.57 | 0.26 38.6 0.26 0.0 | 3 11681 0.0 0 12 0.0 | 1 0.04 5 0.31 | 0.03 0.34 | 0.00 0.00 0.00 0.01 | | 0.02 2.60 | 0.01 0.00 | 0.00 0.00 0.00 0.00 |
| axle Dump Trucks Ider adway Paving | | Off-Highway Trucks Welders | 2 2 1 4 | 42 17 84 | 46 | | 0.38 0.07 0.45 0.26 | 0.46 0.51 2.06 1.74 | | 0.02 0.02 0.07 0.06 | | 0.57 | 0.26 0.00 | | 5 0.38 | 0.32 | 0.00 0.02 0.00 0.01 0.03 0.46 | | 2.60 0.36 17.62 | 0.00 | 0.00 |
| vhalt Pavers ikhoe ncrete trucks | | Pavers Tractors/Loaders/Backhoes Off-Highway Trucks | 2 6 1 8 2 4 | 13 42 17 | 97 | 336 | 0.42 0.08 0.37 0.08 0.38 0.07 | 1.25 0.83 1.29 0.85 0.46 0.51 | 0.00 | 0.04 0.04 0.04 0.04 0.02 0.02 | | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 0.0 6 0.0 | 5 0.81 | 0.54 | 0.00 0.06 0.00 0.03 0.01 0.05 | 0.02 | 0.96 2.35 2.08 | 0.00 | 0.00 0.00 0.00 |
| ncrete vibrator e drill machine (testing) mo/Concrete saws | https://www.indiamart.com/prod | Other Construction Equipment Bore/Drill Rigs Concrete/Industrial Saws | 1 4 1 4 2 4 | 17 2 4 | 5.5 221 81 | 7 | 0.42 0.34 0.50 0.06 0.73 0.37 | 2.02 2.59 0.53 0.60 3.19 2.78 | 0.00 | 0.10 0.09 0.02 0.02 0.10 0.09 | 263.10 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.3 | 2 27 0.0 | 6 0.52 | 0.59 | 0.00 0.00 0.00 0.02 0.01 0.10 | 0.02 | 0.05 0.20 0.41 | 0.00 | 0.00 0.00 0.00 |
| ter n tend loader (rubber) ler-smooth drum | | Rubber Tired Dozers Rubber Tired Loaders | | 8 | 247 203 | 202 | 0.40 0.18 0.36 0.08 | 1.04 1.95 0.43 0.73 | 0.00 | 0.09 0.08 0.02 0.02 | 209.04 190.49 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 | 3 209 0.1 0 16 0.1 | 6 0.90 0 0.56 | 1.70 0.95 | 0.00 0.08 0.00 0.03 | 0.07 0.03 | 0.69 2.82 | 0.00 | 0.00 |
| lers-vibratory axle Dump Trucks | | Rollers Rollers Off-Highway Trucks | 1 8 1 4 2 4 | 25 25 50 | 80 402 | 101 | 0.38 0.10 0.38 0.10 0.38 0.07 | 1.28 1.09 1.28 1.09 0.46 0.51 | 0.00 | 0.06 0.05 | 198.12 198.12 201.86 | 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 | 0 25 0.0 0 28 0.1 | 3 0.34 9 1.25 | 0.29 1.37 | 0.00 0.02 0.01 0.05 | 0.05 | 1.20 0.60 6.25 | 0.00 | 0.00 |
| lding rasive/demo saw rkhoe | | Concrete/Industrial Saws Tractors/Loaders/Backhoes | 1 2 | 399 20 200 | 81 | | 0.73 0.37 0.37 0.08 | 3.19 2.78 1.29 0.85 | | 0.10 0.09 0.04 0.04 | 414.36 195.21 | 0.57 0.57 | 0.26 0.3 0.26 0.0 | | 0 0.83 | 0.73 | 0.03 0.62 0.00 0.03 0.00 0.03 | 0.02 | 88.45 0.98 11.18 | 0.00 | 0.01 0.00 0.00 |
| cular saws mpressor ncrete finisher | | Concrete/Industrial Saws Air Compressors Paving Equipment | 2 4 1 8 1 4 | 120 200 80 | 78 | 1596 | 0.73 0.37 0.48 0.30 0.36 0.08 | 3.19 2.78 2.35 1.90 1.10 0.75 | 0.00 | 0.10 0.09 0.07 0.07 0.04 0.04 | 414.36 272.77 187.02 | 0.57 0.57 0.57 | 0.26 0.3 0.26 0.0 0.26 0.0 | 1 944 0.2 | 0 1.55 | 1.25 | 0.01 0.10 0.00 0.05 0.00 0.02 | 0.05 | 11.73 16.30 2.80 | 0.00 | 0.00 0.00 0.00 |
| ncrete pump ncrete saw ncrete truck | | Pumps Concrete/Industrial Saws Off-Highway Trucks | 1 4 1 8 1 4 | 20 8 20 | 81 | 64 | 0.74 0.03 0.73 0.37 0.38 0.07 | 1.010.533.192.780.460.51 | 0.01 | 0.03 0.03 0.10 0.09 0.02 0.02 | 159.70 414.36 201.86 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.3 0.26 0.0 | 4 1765 0.3 | 8 3.33 | 2.90 | 0.00 0.02 0.01 0.10 0.00 0.02 | 0.09 | 0.79 1.56 2.47 | 0.00 | 0.00 0.00 0.00 |
| ncrete vibrator ne | https://www.indiamart.com/prod | Other Construction Equipment Cranes | | 20 20 8 200 | 5.5 231 | 80 48 | 0.42 0.34 0.29 0.09 0.36 0.08 | 0.40 0.31 2.02 2.59 0.52 1.00 0.43 0.73 | 0.01 | 0.02 0.02 0.10 0.09 0.04 0.04 0.02 0.02 | 352.40 151.96 190.49 | 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 | 5 23 0.0 0 20 0.0 | 1 0.04 8 0.46 | 0.05 0.88 | 0.00 0.02 0.00 0.00 0.00 0.04 0.00 0.02 | 0.00 | 0.06 0.48 11.16 | 0.00 | 0.00 0.00 0.00 |
| nt end loader (rubber) nerator nder | https://www.essexequipment.con | Rubber Tired Loaders Generator Sets Other Construction Equipment | 1 4 1 8 1 4 | 200 200 80 | 84 0 11 | 1596 319 | 0.74 0.06 0.42 0.34 | 1.170.482.022.59 | 0.00 0.01 | 0.04 0.04 0.10 0.09 | 159.70 352.40 | 0.57 0.57 | 0.26 0.0 | 0 235 0.0 5 188 0.0 | 6 1.29 1 0.08 | 0.53 0.10 | 0.00 0.04 0.00 0.00 | 0.04 | 15.84 0.51 | 0.00 | 0.00 |
| k hammers rtar mixer | https://www.edisons.com.au/bau | Other Construction Equipment Forklifts Cement and Mortar Mixers | 2 4 1 4 1 4 | 8 120 120 | 9 | 479 479 | 0.42 0.34 0.20 0.06 0.56 0.31 | 2.02 2.59 0.73 0.60 1.82 2.35 | 0.00 | 0.10 0.09 0.04 0.03 0.09 0.08 | 352.40 105.95 318.42 | 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.10 | 0 4 0.0 0 438 0.0 | 1 0.12 1 0.08 | 0.09 | 0.00 0.00 0.00 0.01 0.00 0.00 | 0.01 | 0.02 0.91 0.77 | 0.00 | 0.00 0.00 0.00 |
| l guns nt sprayers ele saw | electric/hand-held assumes powered by air compress | Other Construction Equipment Air Compressors Concrete/Industrial Saws | 2 4 2 8 1 2 | 80 8 40 | 8 78 81 | 64 80 | 0.00 0.00 0.48 0.30 0.73 0.37 | 0.00 0.00 2.35 1.90 3.19 2.78 | 0.00 | 0.00 0.00 0.07 0.07 0.10 0.09 | 0.00 272.77 414.36 | 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.3 | 1 38 0.3 4 2206 0.1 | 9 3.10 0 0.83 | 2.51 0.73 | 0.00 0.00 0.00 0.10 0.00 0.03 | 0.09 | 0.00 0.65 1.96 | 0.00 | 0.00 0.00 0.00 |
| ctor trailer Ider dge(assume precast) | | Off-Highway Trucks Welders | 1 2 1 2 | 120 80 126 | 46 | 207 | 0.38 0.07 0.45 0.26 | 0.46 0.51 2.06 1.74 | | 0.02 0.02 0.07 0.06 | | 0.57 0.57 | 0.26 0.0 | | 2 0.19 | 0.16 | 0.00 0.01 0.00 0.01 0.03 0.46 | 0.01 | 7.42 0.84 37.88 | 0.00 | 0.00 0.00 0.00 |
| asive/demo saw khoe cular saws | | Concrete/Industrial Saws Tractors/Loaders/Backhoes Concrete/Industrial Saws | 1 4 | 6 63 25 | 81 8 97 | 25 504 50 | 0.73 0.37 0.37 0.08 0.73 0.37 | 3.19 2.78 1.29 0.85 3.19 2.78 | 0.00 | 0.10 0.09 0.04 0.04 0.10 0.09 | 414.36 195.21 414.36 | 0.57 0.57 0.57 | 0.26 0.3 0.26 0.0 0.26 0.3 | 4 697 0.1 0 10 0.0 | 9 1.66 5 0.81 | 1.45 0.54 | 0.00 0.05 0.00 0.03 0.00 0.05 | 0.05 | 0.62 3.53 1.23 | 0.00 | 0.00 |
| npressor ncrete drill | assumes powered by air compress | Air Compressors Air Compressors | 2 2 1 6 1 4 | 63 6 | 78 78 | 378 25 | 0.48 0.30 0.48 0.30 | 2.35 1.90 2.35 1.90 | 0.00 | 0.07 0.07 0.07 0.07 | 272.77 272.77 | 0.57 0.57 | 0.26 0.0 0.26 0.0 | 1 224 0.1 1 15 0.1 | 5 1.16 0 0.78 | 0.94 0.63 | 0.00 0.04 0.00 0.02 | 0.02 | 3.86 0.26 | 0.00 | 0.00 |
| ncrete finisher ncrete mixer ncrete pump | | Paving Equipment Cement and Mortar Mixers Pumps | 1 4 1 4 1 4 | 13 13 25 | 9 | 50 | 0.36 0.08 0.56 0.31 0.74 0.03 | 1.10 0.75 1.82 2.35 1.01 0.53 | 0.00 | 0.04 0.04 0.09 0.08 0.03 0.03 | 187.02 318.42 159.70 | 0.57 0.57 0.57 | 0.26 0.01 0.26 0.11 0.26 0.0 | 46 0.0 | 1 0.08 | 0.10 | 0.00 0.02 0.00 0.00 0.00 0.02 | | 0.44 0.08 1.00 | 0.00 | 0.00 0.00 |
| ncrete saw ncrete truck ncrete vibrator | https://www.indiamart.com/prod | Concrete/Industrial Saws Off-Highway Trucks Other Construction Equipment | 1 0 1 4 1 4 | 0 25 25 | 81 402 5.5 | 0 0 101 0 101 0 | 0.73 0.37 0.38 0.07 0.42 0.34 | 3.19 2.78 0.46 0.51 2.02 2.59 | 0.00 | 0.10 0.09 0.02 0.02 0.10 0.09 | 414.36 201.86 352.40 | 0.57 0.57 0.57 | 0.26 0.3 0.26 0.0 0.26 0.0 | 0 14 0.1 | 0 0.63 | 0.69 | 0.00 0.00 0.00 0.02 0.00 0.00 | 0.00 0.02 0.00 | 0.00 3.12 0.08 | 0.00 | 0.00 0.00 |
| ne avator nt end loader (rubber) | | Cranes Excavators Rubber Tired Loaders | 1 8 1 8 | 25 25 50 | 158 | 202 | 0.29 0.09 0.38 0.07 0.36 0.08 | 0.52 1.00 1.18 0.56 0.43 0.73 | 0.00 | 0.04 0.04 0.03 0.03 0.02 0.02 | 151.96 201.69 190.49 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 33 0.0 | 7 1.25 | 1.17 0.60 | 0.00 0.05 0.00 0.03 0.00 0.03 | 0.03 | 2.04 2.45 5.64 | 0.00 | 0.00 |
| nerator | https://www.essexequipment.con | Generator Sets Other Construction Equipment | 1 4 | 101 | 84 11 | 403 | 0.74 0.06 0.42 0.34 | 1.17 0.48 2.02 2.59 | 0.00 0.01 | 0.04 0.04 0.10 0.09 | 159.70 352.40 | 0.57 0.57 | 0.26 0.00 0.26 0.01 | 0 59 0.0 5 119 0.0 | 3 0.64 3 0.16 | 0.27 0.21 | 0.00 0.02 0.00 0.01 | 0.03 | 4.00 0.32 | 0.00 0.00 | 0.00 |
| k hammers I guns 9 Driver | https://www.edisons.com.au/bau electric/hand-held | Other Construction Equipment Other Construction Equipment Bore/Drill Rigs | 2 2 2 4 1 8 | 6 25 19 | 221 | 151 | 0.42 0.34 0.00 0.00 0.50 0.06 | 2.02 2.59 0.00 0.00 0.53 0.60 | 0.00 | 0.10 0.09 0.00 0.00 0.02 0.02 | 0.00 263.10 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 0 0.0 2 616 0.1 | 0 0.00 2 1.04 | 0.00 | 0.00 0.00 0.00 0.00 0.00 0.04 | 0.03 | 0.01 0.00 4.42 | 0.00 | 0.00 0.00 0.00 |
| ctor trailer ratory Plate tamper Ider | | Off-Highway Trucks Plate Compactors Welders | 1 2 1 2 1 4 | 63 38 38 | 8 | 76 | 0.38 0.07 0.43 0.24 0.45 0.26 | 0.46 0.51 1.49 1.78 2.06 1.74 | 0.00 | 0.02 0.02 0.07 0.06 0.07 0.06 | | 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 | 9 53 0.0 | 0.02 | 0.03 | 0.00 0.01 0.00 0.00 0.00 0.01 | | 3.90 0.06 0.80 | 0.00 | 0.00 0.00 0.00 |
| c <mark>kwork- Ballasted- (top of sub ballast up)</mark> Compressor khoe | | Air Compressors Tractors/Loaders/Backhoes | 1 8 1 8 | 210 168 168 | 78 | 1011 | 0.48 0.30 0.37 0.08 | 2.35 1.90 1.29 0.85 | | 0.07 0.07 0.04 0.04 | 272.77 195.21 | 0.57 0.57 | 0.26 0.0 0.26 0.0 | | 0 1.55 | 1.25 | 0.02 0.37 0.00 0.05 0.00 0.03 | 0.05 | 81.18 13.73 9.42 | 0.00 | 0.00 0.00 0.00 |
| last cars (dump) last Compactor last Regulator | | Other Material Handling Equipment Plate Compactors Other General Industrial Equipment | 2 6 1 4 | 42 42 42 42 | 0 | 252 168 | 0.37 0.08 0.40 0.00 0.43 0.24 0.34 0.07 | 1.27 0.03 0.00 0.00 1.49 1.78 0.40 0.67 | 0.00 | 0.04 0.04 0.00 0.00 0.07 0.06 0.02 0.02 | 0.00 | 0.57 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 0 0.0 9 117 0.0 | 0 0.00 | 0.00 0.05 | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.02 | 0.00 | 0.00 0.14 2.59 | 0.00 | 0.00 |
| nt end loader (rubber) nerator | | Rubber Tired Loaders Generator Sets | | 168 52.5 | 203 84 | 672 210 | 0.36 0.08 0.74 0.06 | 0.43 0.73 1.17 0.48 | 0.00 | 0.02 0.02 0.04 0.04 | 190.49 159.70 | 0.57 0.57 | 0.26 0.0 | 0 53 0.0 0 31 0.0 | 5 0.28 3 0.64 | 0.47 0.27 | 0.00 0.02 0.00 0.02 | 0.01 | 9.40 2.08 | 0.00 | 0.00 |
| ver wrench ntice Loader (hi rail log loader) I drill | assumes powered by air compress http://s7d2.scene7.com/is/conten assumes powered by air compress | Air Compressors Tractors/Loaders/Backhoes Other Construction Equipment | 1 4 1 4 1 2 | 21 63 42 | 160 78 | 252 84 | | 2.35 1.90 1.14 0.56 2.35 1.90 | 0.00 | 0.07 0.07 0.03 0.03 0.07 0.07 | 272.77 193.81 272.77 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 0 45 0.0 1 50 0.0 | 4 0.59 4 0.34 | 0.29 | 0.00 0.02 0.00 0.01 0.00 0.01 | | 0.86 2.89 0.74 | 0.00 | 0.00 |
| Profile Grinder saw Train ** | https://www.pandrol.com/us/pro modeled in deliveries tab | Other Construction Equipment Concrete/Industrial Saws Other General Industrial Equipment | 1 4 1 1 1 8 | 21 157.5 10.5 | 81 | 158 | 0.42 0.34 0.73 0.37 0.34 | 2.02 2.59 3.19 2.78 | | 0.10 0.09 0.10 0.09 | 352.40 414.36 | 0.57 | 0.26 0.0 | | 5 0.42 | 0.36 | 0.00 0.00 0.00 0.01 0.00 0.00 | 0.01 | 0.08 3.86 0.00 | 0.00 | 0.00 |
| heater/vibrator edswing (360 on track crane) king gun* | assumes to be powered by air com assumes to not be used per notes | Air Compressors Cranes Other Construction Equipment | 1 2 1 8 | 126 168 126 | 231 | 1344 | 0.48 0.30 0.29 0.09 0.42 0.00 | 2.35 1.90 0.52 1.00 0.00 0.00 | 0.00 | 0.07 0.07 0.04 0.04 0.00 0.00 | | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 549 0.1 | 1 0.61 | 1.17 | 0.00 0.01 0.00 0.05 0.00 0.00 | | 2.57 13.59 0.00 | 0.00 | 0.00 |
| nper/Liner Drill | assumes nax 100 hp electric/hand-held | Other Construction Equipment Other Construction Equipment | | 42 126 21 | 2 100 0 0 | 252 756 | 0.42 0.16 0.42 0.00 0.38 0.07 | 1.49 1.47 0.00 0.00 | 0.00 | 0.10 0.09 0.00 0.00 | 219.44 0.00 | 0.57 0.57 | 0.26 0.0 0.26 0.0 | 1 130 0.0 0 0 0.0 | 9 0.82 0 0.00 | 0.81 0.00 | 0.00 0.05 0.00 0.00 | 0.05 | 2.30 0.00 1.30 | 0.00 | 0.00 |
| ctor Trailer Axle dump trucks ckwork- Direct Fixation | | Off-Highway Trucks Off-Highway Trucks | 2 4 | 126 | 402 | 504 | 0.38 0.07 | 0.46 0.51 0.46 0.51 | 0.00 | 0.02 0.02 0.02 0.02 0.02 0.02 | | 0.57 | 0.26 0.00 | 0 70 0.1 1.0 | 9 1.25 9 9.92 | 1.37 8.17 | 0.00 0.01 0.01 0.05 0.02 0.34 | 0.05 0.32 | 15.62 15.63 | 0.00 | 0.00 |
| Compressor khoe Jular / Table saw | | Air Compressors Tractors/Loaders/Backhoes Concrete/Industrial Saws | 1 8 1 8 1 2 | 32 13 6 | 97 81 | 101 13 | | 2.35 1.90 1.29 0.85 3.19 2.78 | 0.00 0.01 | 0.04 0.04 0.10 0.09 | 414.36 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.3 | 0 2 0.0 4 348 0.1 | 5 0.81 0 0.83 | 0.54 0.73 | 0.00 0.05 0.00 0.03 0.00 0.03 | 0.02 0.02 | 2.57 0.71 0.31 | 0.00 | 0.00 |
| crete drill crete grinder crete mixer | assumes powered by air compress https://hupshenghardware.com/p | Air Compressors Other Construction Equipment Cement and Mortar Mixers | 1 4 1 2 1 4 | 32 32 32 | 6 9 | 63 | 0.48 0.30 0.42 0.34 0.56 0.31 | 2.35 1.90 2.02 2.59 1.82 2.35 | 0.01 | 0.07 0.07 0.10 0.09 0.09 0.08 | 318.42 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.1 | 5 20 0.0 0 115 0.0 | 0 0.02 | 0.03 0.10 | 0.00 0.02 0.00 0.00 0.00 0.00 | 0.00 | 1.29 0.06 0.20 | 0.00 | 0.00 |
| crete pump crete truck crete vibrator | https://www.indiamart.com/prod | Pumps Off-Highway Trucks Other Construction Equipment | 1 2 1 2 1 2 | 6 6 6 | 84 402 5.5 | 13 13 | 0.74 0.03 0.38 0.07 0.42 0.34 | 1.01 0.53 0.46 0.51 2.02 2.59 | 0.00 | 0.03 0.03 0.02 0.02 0.10 0.09 | 159.70 201.86 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 1 11 0.0 0 2 0.0 | 1 0.28 5 0.31 | 0.15 0.34 | 0.00 0.01 0.00 0.01 0.00 0.00 | 0.01 | 0.13 0.39 0.01 | 0.00 0.00 | 0.00 |
| nt end loader (rubber) erator | | Rubber Tired Loaders Generator Sets | 1 4 1 8 | 32 32 6 | 203 | 126 252 | 0.36 0.08 0.74 0.06 0.48 0.30 | 2.02 2.39 0.43 0.73 1.17 0.48 2.35 1.90 | 0.00 | 0.10 0.09 0.02 0.02 0.04 0.04 0.07 0.07 | 190.49 | 0.57 0.57 0.57 0.57 | 0.26 0.0 | 0 10 0.0 0 37 0.0 | 5 0.28 6 1.29 | 0.47 0.53 | 0.00 0.00 0.00 0.02 0.00 0.04 0.00 0.01 | 0.01 | 1.76 2.50 0.13 | 0.00 | 0.00 |
| guns (air) ver wrench titce Loader (hi rail log loader) | assumes powered by air compress assumes powered by air compress http://s7d2.scene7.com/is/conten | Air Compressors Air Compressors Tractors/Loaders/Backhoes | 1 2 1 2 1 2 | 6 3 32 | 78 78 160 | 6 63 | 0.48 0.30 0.37 0.07 | 2.35 1.90 1.14 0.56 | 0.00 | 0.07 0.07 0.03 0.03 | 272.77 193.81 | 0.57 0.57 | 0.26 0.0 0.26 0.0 | 1 4 0.0 0 11 0.0 | 5 0.39 2 0.30 | 0.31 0.15 | 0.00 0.01 0.00 0.01 | 0.01 | 0.06 | 0.00 | 0.00 |
| ssure washer drill Profile Grinder | http://www.ultimatewasher.com/ assumes powered by air compress https://www.pandrol.com/us/pro | Other Construction Equipment Other Construction Equipment Other Construction Equipment | 1 1 1 2 1 2 | 32 38 38 | 78 6.4 | 76 76 | 0.42 0.16 0.42 0.30 0.42 0.34 | 0.97 1.31 2.35 1.90 2.02 2.59 | 0.00 0.01 | 0.06 0.05 0.07 0.07 0.10 0.09 | | 0.57 0.57 0.57 | 0.26 0.2 0.26 0.0 0.26 0.0 | 0 0 0.0 5 26 0.0 | 4 0.34 0 0.02 | 0.27 0.03 | 0.00 0.00 0.00 0.01 0.00 0.00 | 0.01 | 0.02 0.67 0.07 | 0.00 | 0.00 |
| l saw heater/vibrator eedswing (360 on track crane) | assumes to be powered by air com | Concrete/Industrial Saws Air Compressors Cranes | | 38 13 32 | 81 8 78 | 50 | 0.73 0.37 | 3.19 2.78 2.35 1.90 0.52 1.00 | 0.01 | 0.10 0.09 0.07 0.07 0.04 0.04 | | 0.57 0.57 0.57 | 0.26 0.3 0.26 0.0 0.26 0.0 | 4 2090 0.1 1 30 0.1 | 0 0.83 0 0.78 | 0.73 0.63 | 0.00 0.03 0.00 0.02 0.00 0.02 | 0.02 | 1.85 0.51 1.27 | 0.00 | 0.00 |
| ctor Trailer jor Equipment | | Off-Highway Trucks | 1 2 | 6 126 | 402 | 13 | 0.38 0.07 | 0.46 0.51 | 0.00 | 0.02 0.02 | 201.86 | 0.57 | 0.26 0.0 | 0 2 0.0 0.5 | 5 0.31 5 4.81 | 0.34 4.06 | 0.00 0.01 0.01 0.17 | 0.01 <i>0.16</i> | 0.39 7.51 | 0.00 | 0.00 |
| crete drill crete grinder ne | assumes powered by air compress https://hupshenghardware.com/p | Air Compressors Other Construction Equipment Cranes | 1 3 1 3 1 4 | 13 13 13 | 6 231 | 38 50 | 0.48 0.30 0.42 0.34 0.29 0.09 | 2.35 1.90 2.02 2.59 0.52 1.00 | 0.01 | 0.07 0.07 0.10 0.09 0.04 0.04 | 352.40 151.96 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 0.26 0.0 | 5 12 0.0 0 21 0.0 | 1 0.03 5 0.30 | 0.04 0.59 | 0.00 0.02 0.00 0.00 0.00 0.02 | 0.00 | 0.39 0.03 0.51 | 0.00 | 0.00 |
| k lift nt end loader eerator | | Forklifts Tractors/Loaders/Backhoes Generator Sets | 1 4 1 4 1 4 | 63 63 76 | 89 97 84 | 252 302 | 0.20 0.06 0.37 0.08 0.74 0.06 | 0.73 0.60 1.29 0.85 1.17 0.48 | 0.00 | 0.04 0.03 0.04 0.04 0.04 0.04 | 159.70 | 0.57 0.57 0.57 | 0.26 0.00 0.26 0.00 0.26 0.00 | 0 5 0.0 0 45 0.0 | 3 0.41 3 0.64 | 0.27 0.27 | 0.00 0.01 0.00 0.01 0.00 0.02 | 0.01 0.02 | 0.48 1.77 3.00 | 0.00 | 0.00 |
| vact guns el drill el grinder | assumes powered by air compress assumes to be powered by air com https://www.essexequipment.com | Air Compressors Air Compressors Other Construction Equipment | 2 4 1 4 1 4 | 6 6 6 | > 78 > 78 > 11 | 25 | 0.48 0.30 0.48 0.30 0.42 0.34 | 2.351.902.351.902.022.59 | 0.00 | 0.07 0.07 0.10 0.09 | 272.77 272.77 352.40 | 0.57 0.57 0.57 | 0.26 0.0 0.26 0.0 0.26 0.0 | 1 15 0.1 | 0 0.78 | 0.63 | 0.00 0.05 0.00 0.02 0.00 0.00 | 0.02 | 0.26 0.26 0.04 | 0.00 | 0.00 |
| ctor Trailer nmissioning | | Off-Highway Trucks | 1 2 | 13 42 | 402 | 25 | 0.38 0.07 | 0.46 0.51 | 0.00 | 0.02 0.02 | 201.86 | 0.57 | 0.26 0.0 | 0 3 0.0 0.2 | 5 0.31 1 1.32 | 0.34 1.99 | 0.00 0.01 0.00 0.11 | 0.01 <i>0.10</i> | 0.04 0.78 5.23 0.00 | 0.00 | 0.00 |
| Wash p Table | Assumes no diesel engine Assumes no diesel engine | Air Compressors Forklifts | 0 8 | 42 | | 336 336 | | 0.00 0.00 0.00 | | 0.00 0.00 0.00 | 0.00 | 0.57 | 0.26 0.0 | | | | 0.00 0.00 0.00 | | 0.00 | | 0.00 |

| ROG CO | NOX | SO _X | PM ₁₀ | PM _{2.5} |
|--------|-----|-----------------|------------------|-------------------|
|--------|-----|-----------------|------------------|-------------------|

| Maximum Daily Scenarios - Off-Road Equipment Emissions | | | lbs/d | ay | | |
|---|------|-------|-------|------|------|------|
| Survey, Clear and Grub | 1.54 | 12.00 | 13.12 | 0.03 | 0.54 | 0.49 |
| Clear and Grub, Site Util/Electric, Demo, Earthwork | 6.53 | 69.20 | 53.72 | 0.13 | 2.17 | 1.99 |
| Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving | 7.30 | 61.31 | 63.08 | 0.15 | 2.52 | 2.32 |
| Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings | 7.84 | 68.90 | 63.63 | 0.16 | 2.55 | 2.34 |
| Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip | 5.98 | 51.83 | 46.60 | 0.11 | 1.90 | 1.75 |
| Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 5.97 | 52.56 | 46.05 | 0.11 | 1.87 | 1.72 |
| | | | | | | |

On-Road Construction Emissions - Phase 1

| On-Road Construction Emissions - Phase 1 | | | | | | | | Emissions Factors (g/mi for RunEx, BW, TW and g/trip for Sta | artEx) | | | | | | Emissions (Ibs/d | ay) | Emissions (MT/phase) MT |
|--|------|-------------|---------------------|-----------|---|---------------------|------------|--|--|---|---|---------------|--|---------------|--|---|---|
| | | | Trip Distance | | ROG CO | NOx NOx SO | (SOx | | PM _{2.5} PM _{2.5} | CO ₂ CH ₄ | CH ₄ N ₂ O N ₂ O | ROG x RunE | OG ROG CO CO NOx NOx | SOx SOx | PM ₁₀ PM ₁₀ PM ₁₀ | W) PM2.5 PM2.5 CO2 CH4 CH4 N2O N RunEx StartEx BW, TW CO2 RunEx StartEx RunEx StartEx< |) |
| Project Component/On-Road Vehicles | Days | Daily Trips | (One-way) Total VMT | ROG RunEx | StartEx CO RunEx StartEX | RunEx StartEx Run | Ex StartEx | PM10 RunEx PM10 StartEx PM10 BW, TW PM25 | RunEx StartEx BW, TW | CO ₂ RunEx StartEx RunEx | StartEx RunEx StartEx | x RunE | INEX StartEX RUNEX StartEX RUNEX StartEX | RunEx StartEx | RunEx StartEx TW | W, PM25 PM25 PM25 CO2 CH4 CH4 N2O N RunEx StartEx BW, TW CO2 RunEx StartEx RunEx | Ex CO ₂ CH ₄ N ₂ O CO ₂ e |
| Subvery Contract of Contract o | | | | | | | | | | | | 0.00 | 0.0021 0.0031 0.1359 0.0296 0.0086 0.0027 | 0.0005 0.0000 | 0,0003,0,000,0,0 | | 003 1.0711 0.0000 0.0000 1.0792 |
| Concrete Trucks | 42 | _ | | 0.019 | 0.0000 0.1675 0.000 | 2 0777 4 4 297 0 0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 1341 5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | | 0.0000 0.0000 | | | |
| HaulTucks | 42 | | 20.0 | 0.013 | | 1 61/3 3 5026 0.0 | 127 0.0000 | | 0.0108 0.0000 0.090 | 4 1324 3272 0.0000 0.0006 | 0.0000 0.2107 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0000 0.0000 0.0 | 0.000 0.00000 0.00000 0.0000 0.000000 | |
| Workers (| 42 | 6 | 14.7 89 | 0.010 | 36 0.0000 0.1484 0.000 07 0.2346 0.6991 2.234 | | 0.0000 | | 0.0014 0.0016 0.072 | 7 285 0792 59 6848 0.0028 | 0.0520 0.0051 0.02 | 261 0.00 | 0.0021 0.0031 0.1359 0.0296 0.0086 0.0027 | 0.0005 0.0000 | 0.0003 0.0000 0.0 | 000 0.0000 <td>003 1.07 0.00 0.00 1.079223</td> | 003 1.07 0.00 0.00 1.079223 |
| Clear and Grub | 12 | ů | 11.7 | 0.010 | 0.2010 0.0771 2.201 | 0.0111 0.1010 0.0 | 0.0000 | 0.0010 0.0010 0.2000 | 0.0010 0.012 | | 0.0020 0.0001 0.020 | 0.00 | 0.0070 0.0103 0.4531 0.0985 0.0288 0.0089 | 0.0018 0.0000 | | | 012 5.3554 0.0001 0.0001 5.3961 |
| Concrete Trucks | 63 | | | 0.019 | 0 0000 0 1675 0 000 | 2 0777 4 4297 0 0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341 5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | | 0.0000 0.0000 | 0.0000 0.0000 0.0 | | |
| Haul Trucks | 63 | | 20.0 - | 0.013 | 36 0.0000 0.1484 0.000 | 1 6143 3 5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 4 1324 3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | | 0.00000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000 | |
| | 63 | 20 | 14.7 294 | 1 0.010 | 0 2346 0 6991 2 234 | 0.0444 0.2026 0.0 | 0.0006 | 0.0016 0.0018 0.2686 | 0.0014 0.0016 0.072 | 7 285 0792 59 6848 0.0028 | 0.0520 0.0051 0.020 | 261 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0070 0.0103 0.4531 0.0985 0.0288 0.0089 | 0.0018 0.0000 | 0.0010 0.0001 0.1 | 741 0.0009 0.0001 0.0471 184.7766 2.6316 0.0018 0.0023 0.0033 (| 012 5.36 0.00 0.00 5.396116 |
| Workers Site Utilities | 05 | 20 | 14.7 274 | 0.010 | 0.2340 0.0771 2.234 | 0.0444 0.2020 0.0 | 0.0000 | 0.0010 0.0010 0.2000 | 0.0010 0.072 | 203.0772 37.0040 0.0020 | 0.0320 0.0031 0.020 | 0.00 | | | | 786 0.0015 0.0001 0.0754 295.6426 4.2106 0.0029 0.0037 0.0053 0 | |
| Concrete Trucks | 504 | | - 96 | 0.019 | 0 000 0 1675 0 000 | 2 0777 4 4297 0 0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341 5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | | 0.0000 0.0000 | | | |
| HaulTucks | 504 | | 20.0 | 0.013 | | 1 61/3 3 5026 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 1324 3272 0.0000 0.0006 | 0.0000 0.2107 0.000 | 000 0.00 | | 0.0000 0.0000 | | 000000000000000000000000000000000000000 | |
| Workers (| 504 | 32 | 14.7 470 | 0.010 | 86 0.0000 0.1484 0.000 07 0.2346 0.6991 2.234 | 0.0444 0.2026 0.0 | 0.0000 | 0.0016 0.0018 0.2686 | 0.0016 0.0006 0.072 | 7 285 0792 59 6848 0.0028 | 0.0520 0.0051 0.020 | 261 0.01 | | 0.0029 0.0000 | 0.0016 0.0001 0.2 | 786 0.0015 0.0001 0.0754 295.6426 4.2106 0.0029 0.0037 0.0053 0 | 018 68.55 0.00 0.00 69.07029 |
| Demolition | 001 | 02 | 110 110 | 0.010 | 0.2010 0.0771 2.201 | 0.0111 0.1010 0.0 | 0.0000 | 0.0010 0.0010 0.2000 | 0.0010 0.012 | | 0.0020 0.0001 0.020 | 0.00 | 0.0070 0.0103 0.4531 0.0985 0.0288 0.0089 | 0.0018 0.0000 | | 741 0.0009 0.0001 0.0471 184.7766 2.6316 0.0018 0.0023 0.0033 0 | |
| Concrete Trucks | 63 | | | 0.019 | 0.0000 0.1675 0.000 | 2 0777 4 4297 0 0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 1341 5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | | 0.0000 0.0000 | | | |
| Haul Trucks | 63 | | 20.0 - | 0.013 | 36 0.0000 0.1484 0.000 | 1.6143 3.5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 14 1324.3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | | 0.0000 0.0000 | 0.0000 0.0000 0.0 | 0.00000 0.00000 0.00000 0.00000 0.00000 0.0000 0.0000 0.0000 0.00000 0.000000 | |
| | 63 | 20 | 14.7 294 | 4 0.010 | 0.2346 0.6991 2.234 | 0.0444 0.2026 0.0 | 028 0.0006 | 0.0016 0.0018 0.2486 | 0.0014 0.0016 0.072 | 7 285.0792 59.6848 0.0028 | 0.0520 0.0051 0.02 | 261 0.00 | 0.0070 0.0103 0.4531 0.0985 0.0288 0.0089 | 0.0018 0.0000 | | 741 0.0009 0.0001 0.0471 184.7766 2.6316 0.0018 0.0023 0.0033 0 | 012 5.36 0.00 0.00 5.396116 |
| Workers Earthwork | 05 | 20 | | . 0.010 | 0.0771 2.234 | 0.2020 0.0 | 0.0000 | 0.0010 0.2000 | 0.0010 0.072 | 200.0772 07.0040 0.0020 | 0.0020 0.0001 0.020 | 0.00 | 0.0989 0.0166 1.6805 0.1576 10.4418 1.1710 | 0.0835 0.0000 | 0.0742 0.0001 2.3 | 195 0.0710 0.0001 0.6576 8823 7771 4.2106 0.0069 0.0037 1.3458 (| 018 471.6464 0.0006 0.0718 493.0719 |
| Concrete Trucks | 126 | | - 96 | 0.019 | 0 000 0 1675 0 000 | 2 0777 4 4297 0 0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341 5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | | 0.0000 0.0000 | | | |
| Haul Trucks | 126 | 119 | 20.0 2.381 | 0.013 | 36 0.0000 0.1484 0.000 | 1 6143 3 5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 4 1324 3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | 0.0715 0.0000 0.7789 0.0000 8.4739 0.9429 | 0.0657 0.0000 | 0.0592 0.0000 1.6 | 81 0.0566 0.0000 0.4745 6951.5279 0.0000 0.0033 0.0000 1.0927 0 | 000 397.30 0.00 0.06 415.9129 |
| Haul Trucks - Ballast Delivery (Occurs over 80 days months 4 through 6 and 9) | 80 | 27 | 20.0 540 | 0.013 | 36 0.0000 0.1484 0.000 | 1 6143 3 5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 1324 3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.01 | | 0.01/9 0.0000 | | | 000 57.21 0.00 0.01 59.89145 |
| Markers | 126 | 32 | 14.7 470 | 0.010 | 0 2346 0 6991 2 234 | 0.0444 0.2026 0.0 | 0.0006 | 0.0016 0.0018 0.2686 | 0.0016 0.0006 0.072 | 7 285 0792 59 6848 0.0028 | 0.0520 0.0051 0.020 | 261 0.01 | 0.0111 0.0166 0.7250 0.1576 0.0461 0.0143 | 0.0029 0.0000 | 0.0016 0.0001 0.2 | 329 0.0128 0.0000 0.1076 1576.6065 0.0000 0.0008 0.0000 0.2478 (786 0.0015 0.0001 0.0754 295.6426 4.2106 0.0029 0.0037 0.0053 (| 018 17.14 0.00 0.00 17.26757 |
| Foundations | 120 | 02 | 110 110 | 0.010 | 0.2010 0.0771 2.201 | 0.0111 0.1010 0.0 | 0.0000 | 0.0010 0.0010 0.2000 | 0.0010 0.012 | | 0.0020 0.0001 0.020 | 0.01 | 0.0178 0.0248 1.0073 0.2364 0.1016 0.0503 | 0.0051 0.0001 | | | |
| Concrete Trucks (conservatively included during foundations phase [shorter than building phase]) | 84 | 4 | 69 27 | 7 0.019 | 21 0.0000 0.1675 0.000 | 2 0777 4 4297 0 0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341.5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | 0.0011 0.0000 0.0099 0.0000 0.1225 0.0379 | 0.0007 0.0000 | 0.0008 0.0002 0.4 | 190 0.0008 0.0000 0.0053 79.0954 0.0000 0.0001 0.0000 0.0124 (| 000 3.01 0.00 0.00 3.154887 |
| Hall Tricks | 84 | | 20.0 | 0.013 | 36 0.0000 0.1484 0.000 | 1 6143 3 5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 4 1324.3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | 0.0011 0.0000 0.0099 0.0000 0.1225 0.0379 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0008 0.0000 0.0 0 0.0000 0.0000 0.0 | | |
| Norices | 84 | /8 | 14.7 704 | 0.010 | 0 2346 0 6991 2 234 | 0.0444 0.2026 0.0 | 0.0000 | 0.0016 0.0018 0.2686 | 0.0010 0.0000 0.072 | 7 285 0792 59 6848 0.0028 | 0.0520 0.0051 0.02 | 261 0.01 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0044 0.0001 | 1 0.0024 0.0002 0.4 | 178 0.0022 0.0002 0.1131 443.4639 6.3160 0.0043 0.0055 0.0079 (| 028 17.14 0.00 0.00 17.26757 |
| Roadway Paving | 04 | 40 | 14.7 700 | 0.010 | 0.2340 0.0771 2.234 | 0.0444 0.2020 0.0 | 0.0000 | 0.0010 0.0010 0.2000 | 0.0010 0.072 | 203.0772 37.0040 0.0020 | 0.0320 0.0031 0.020 | 0.01 | 0.0104 0.0155 0.6797 0.1478 0.0432 0.0134 | 0.0027 0.0000 | | 0.0014 0.0001 0.0707 277.1650 3.9475 0.0027 0.0034 0.0049 0 | 017 10.7109 0.0002 0.0003 10.7922 |
| Concrete Trucks | 84 | | - 96 | 0.019 | 0.0000 0.1675 0.000 | 2 0777 4 4297 0 0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341.5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | | 0.0000 0.0000 | 0.0000 0.0000 0.0 | | |
| Haul Tucks | 84 | | 20.0 - | 0.013 | | 1.6143 3.5926 0.0 | 125 0.0000 | | 0.0108 0.0000 0.090 | 4 1324.3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | | 0.0000 0.0000 | | | |
| Workers 6 | 84 | 30 | 14.7 441 | 1 0.010 | 36 0.0000 0.1484 0.000 07 0.2346 0.6991 2.234 | 0.0444 0.2026 0.0 | 0.0006 | 0.0113 0.0000 0.3216 0.0016 0.0018 0.2686 | 0.0014 0.0016 0.072 | 7 285.0792 59.6848 0.0028 | 0.0520 0.0051 0.026 | 261 0.01 | 0.0104 0.0155 0.6797 0.1478 0.0432 0.0134 | 0.0027 0.0000 | 0.0015 0.0001 0.2 | 511 0.0014 0.0001 0.0707 277.1650 3.9475 0.0027 0.0034 0.0049 (| 000 0.00 0.00 0.00 0 017 10.71 0.00 0.00 10.79223 |
| Vones | 01 | | | 0.010 | 0.2010 0.0771 2.201 | 0.0111 0.2020 0.0 | 0.0000 | 0.0010 0.0010 0.2000 | 0.0010 0.012 | | 0.0020 0.0001 0.020 | 0.01 | 0.0397 0.0590 2.5827 0.5615 0.1642 0.0509 | 0.0104 0.0001 | | 23 0.0053 0.0004 0.2686 1053.2268 15.0004 0.0102 0.0131 0.0187 0 | 066 193.3313 0.0042 0.0046 194.7998 |
| Concrete Trucks | 399 | | 6.9 - | 0.019 | 21 0.0000 0.1675 0.000 | 2 0777 4 4297 0 0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341.5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | | 0.0000 0.0000 | | | |
| Concrete Trucks Haul Trucks | 399 | | 20.0 - | 0.013 | | 1.6143 3.5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | | 0.0000 0.2082 0.000 | 000 0.00 | | 0.0000 0.0000 | 0.0000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000 | 0000 0.0000 <td>000 0.00 0.00 0.00 0</td> | 000 0.00 0.00 0.00 0 |
| Morkers | 399 | 114 | 14.7 1.676 | 5 0.010 | 86 0.0000 0.1484 0.000 07 0.2346 0.6991 2.234 | 0.0444 0.2026 0.0 | 0.0006 | 0.0016 0.0018 0.2686 | 0.0014 0.0016 0.072 | 14 1324.3272 0.0000 0.0006 17 285.0792 59.6848 0.0028 | 0.0520 0.0051 0.020 | 261 0.03 | 0.0397 0.0590 2.5827 0.5615 0.1642 0.0509 | 0.0104 0.0001 | 1 0.0057 0.0004 0.9 | 23 0.0053 0.0004 0.2686 1053.2268 15.0004 0.0102 0.0131 0.0187 (| 066 193.33 0.00 0.00 194.7998 |
| Workers Bridge(assume precast) | 077 | | 1117 11070 | 0.010 | 0.2010 0.0771 2.201 | 0.0111 0.2020 0.0 | 0.0000 | | 0.0010 0.072 | | 0.0020 0.0001 0.020 | 0.02 | 0.0251 0.0372 1.6312 0.3547 0.1037 0.0322 | 0.0066 0.0001 | | 267 0.0033 0.0003 0.1696 665.1959 9.4739 0.0064 0.0083 0.0118 0 | |
| Concrete Trucks | 126 | | 6.9 - | 0.019 | 0.0000 0.1675 0.000 | 2.0777 4.4297 0.0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341.5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | | | |
| Haul Trucks | 126 | | 20.0 - | 0.013 | 86 0.0000 0.1484 0.000 | 1.6143 3.5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 4 1324.3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | 0,0000 0,0000 0,0000 0,0000 0,0000 | 0.0000 0.0000 | 0,0000 0,0000 0,000 | | 000 0.00 0.00 0.00 0 |
| Workers | 126 | 72 | 14.7 1.058 | 3 0.010 | 07 0.2346 0.6991 2.234 | 0.0444 0.2026 0.0 | 0.0006 | 0.0016 0.0018 0.2686 | 0.0014 0.0016 0.072 | 7 285.0792 59.6848 0.0028 | 0.0520 0.0051 0.026 | 261 0.02 | 0.0251 0.0372 1.6312 0.3547 0.1037 0.0322 | 0.0066 0.0001 | 1 0.0036 0.0003 0.6 | 267 0.0033 0.0003 0.1696 665.1959 9.4739 0.0064 0.0083 0.0118 (| |
| Trackwork- Ballasted- (top of sub ballast up) | | | | | | | | | | | | 0.02 | 0.0236 0.0310 1.3892 0.2955 0.4118 0.0630 | 0.0080 0.0001 | 1 0.0053 0.0002 0.5 | 371 0.0050 0.0002 0.1596 821.2686 7.8949 0.0055 0.0069 0.0518 0 | |
| Concrete Trucks Haul Trucks | 210 | | 6.9 - | 0.019 | 0.0000 0.1675 0.000 | 2.0777 4.4297 0.0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341.5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0000 0.0000 0.0 | | |
| Haul Trucks | 63 | | 20.0 91 | 1 0.013 | 0.0000 0.1675 0.000 0.0000 0.1484 0.000 | 1.6143 3.5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 4 1324.3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | 0.0027 0.0000 0.0299 0.0000 0.3254 0.0362 | 0.0025 0.0000 | 0 0.0023 0.0000 0.0 | 548 0.0022 0.0000 0.0182 266.9387 0.0000 0.0001 0.0000 0.0420 (| |
| Workers | 210 | 60 | 14.7 882 | 2 0.010 | 0.2346 0.6991 2.234 | 0.0444 0.2026 0.0 | 0.0006 | 0.0016 0.0018 0.2686 | 0.0014 0.0016 0.072 | 7 285.0792 59.6848 0.0028 | 0.0520 0.0051 0.026 | 261 0.02 | 0.0209 0.0310 1.3593 0.2955 0.0864 0.0268 | 0.0055 0.0001 | 1 0.0030 0.0002 0.5 | 223 0.0028 0.0002 0.1414 554.3299 7.8949 0.0054 0.0069 0.0098 (| 035 53.55 0.00 0.00 53.96116 |
| Trackwork- Direct Fixation | | | | | | | | | | | | 0.00 | 0.0070 0.0103 0.4531 0.0985 0.0288 0.0089 | 0.0018 0.0000 | 0.0010 0.0001 0.1 | 741 0.0009 0.0001 0.0471 184.7766 2.6316 0.0018 0.0023 0.0033 (| 012 5.3554 0.0001 0.0001 5.3961 |
| Concrete Trucks | 63 | - | 6.9 - | 0.019 | 0.0000 0.1675 0.000 | 2.0777 4.4297 0.0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341.5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0000 0.0000 0.0 | 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 | 000 0.00 0.00 0.00 |
| Haul Trucks | 63 | | 20.0 - | 0.013 | 36 0.0000 0.1484 0.000 | 1.6143 3.5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0137 0.0000 0.090 0.0108 0.0000 0.090 | 14 1341.5330 0.0000 0.0009 14 1324.3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0000 0.0000 0.0 | 000 0.00000 | 000 0.00 0.00 0 |
| Workers | 63 | 20 | 14.7 294 | 4 0.010 | 0.0000 0.1675 0.000 0.0000 0.1484 0.000 0.2346 0.6991 2.234 | 0.0444 0.2026 0.0 | 028 0.0006 | 0.0016 0.0018 0.2686 | 0.0014 0.0016 0.072 | 7 285.0792 59.6848 0.0028 | 0.0520 0.0051 0.020 | 261 0.00 | 0.0070 0.0103 0.4531 0.0985 0.0288 0.0089 | 0.0018 0.0000 | 0.0010 0.0001 0.1 | 741 0.0009 0.0001 0.0471 184.7766 2.6316 0.0018 0.0023 0.0033 (| 012 5.36 0.00 0.00 5.396116 |
| Major Equipment | 00 | 20 | | 2.010 | | | 2.2000 | | 0.072 | 0.0020 | 0.02 | 0.02 | 0.0230 0.0341 1.4952 0.3251 0.0950 0.0295 | 0.0060 0.0001 | 1 0.0033 0.0003 0.5 | 745 0.0031 0.0002 0.1555 609.7629 8.6844 0.0059 0.0076 0.0108 0 | 038 35.3459 0.0008 0.0008 35.6144 |
| Concrete Trucks | 126 | - | 6.9 - | 0,019 | 0.0000 0.1675 0.000 | 2.0777 4.4297 0.0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341.5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0000 0.0000 0.0 | 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 | 0.00 0.00 0.00 0.00 |
| Concrete Trucks Haul Trucks | 126 | - | 20.0 - | 0.013 | | 1.6143 3.5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | 4 1324.3272 0.0000 0.0006 | 0.0000 0.2082 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0000 0.0000 0.0 | 0,00000 0,0000 0,0000 0,0000 0,00000 0,000000 | 000 0.00 0.00 0.00 |
| Workers Control Contro | 126 | | 14.7 970 | 0.010 | 86 0.0000 0.1484 0.000 07 0.2346 0.6991 2.234 | | | | 0.0014 0.0016 0.072 | 7 285.0792 59.6848 0.0028 | 0.0520 0.0051 0.020 | 261 0.02 | 0.0230 0.0341 1.4952 0.3251 0.0950 0.0295 | 0.0060 0.0001 | 1 0.0033 0.0003 0.5 | | 038 35.35 0.00 0.00 35.61437 |
| Commissioning | | | | | | | | | | | | 0.00 | 0.0021 0.0031 0.1359 0.0296 0.0086 0.0027 | 0.0005 0.0000 | 0.0003 0.0000 0.0 | 522 0.0003 0.0000 0.0141 55.4330 0.7895 0.0005 0.0007 0.0010 0 | 003 1.0711 0.0000 0.0000 1.0792 |
| Concrete Trucks | 42 | - | 6.9 - | 0.019 | 0.0000 0.1675 0.000 | 2.0777 4.4297 0.0 | 127 0.0000 | 0.0144 0.0000 0.3216 | 0.0137 0.0000 0.090 | 4 1341.5330 0.0000 0.0009 | 0.0000 0.2109 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0000 0.0000 0.0 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | 000 0.00 0.00 0.00 0 |
| Haul Trucks | 42 | - | 20.0 - | 0.013 | 86 0.0000 0.1484 0.000 | 0 1.6143 3.5926 0.0 | 125 0.0000 | 0.0113 0.0000 0.3216 | 0.0108 0.0000 0.090 | | 0.0000 0.2082 0.000 | 000 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 | 0.0000 0.0000 | 0.0000 0.0000 0.0 | 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.000000 | 000 0.00 0.00 0.00 0 |
| Workers | 42 | 6 | 14.7 88 | 3 0.010 | 07 0.2346 0.6991 2.234 | 0.0444 0.2026 0.0 | 028 0.0006 | 0.0016 0.0018 0.2686 | 0.0014 0.0016 0.072 | 7 285.0792 59.6848 0.0028 | 0.0520 0.0051 0.020 | 261 0.00 | 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0021 0.0031 0.1359 0.0296 0.0086 0.0027 | 0.0005 0.0000 | 0.0003 0.0000 0.0 | 000 0.0000 <td>003 1.07 0.00 0.00 1.079223</td> | 003 1.07 0.00 0.00 1.079223 |
| | .= | - | | | | | | | | | | | | | | | 942.92 |
| | | | | | | | | | | | | - | | | | | |

Maximum Daily Scenarios - On-Road Equipment Emissions Survey, Clear and Grub Clear and Grub, Site Util/Electric, Demo, Earthwork Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip Site Util/Electric, Buildings, Trackwork-DF, Major Equip

Maximum Daily Scenarios - On-Road Equipment Emissions Survey, Clear and Grub Clear and Grub, Site Util/Electric, Demo, Earthwork Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip Site Util/Electric, Buildings, Trackwork-DF, Major Equip

Maximum Daily Scenarios - On-Road and Off-Road Equipment Emissions Survey, Clear and Grub Clear and Grub, Site Util/Electric, Demo, Earthwork Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip Site Util/Electric, Buildings, Trackwork-DF, Major Equip

| Co | onstants | | |
|------------------------------------|---|--|-----|
| lb | grams | | |
| 1 | 453.59237 | | |
| on | lbs | | |
| 1 | 2000 | | |
| netric ton | grams | | |
| 1 | 100000 | | |
| GWP CO2e | CH4 | | |
| 25 | 1 | | |
| GWP CO2e | N2O | | |
| 298 | 1 | | |
| on | lbs | | |
| 1 | 2000 | | |
| netric ton | lbs | | |
| 1 | 2204.623 | | |
| netric ton | ton | | |
| 0.907185 | 1 | | |
| | | | 0.5 |
| Trip Length Assumptions - CalEEMod | miles | Source | 3% |
| Vorkers | | CalEEMod default for Orange County | 7% |
| /endor | | CalEEMod default for Orange County | 3% |
| laul Trucks | 20 | CalEEMod default | |
| Sources: | 2 Equipment types, quantities, usage from | completion year of 2028 and 4.5-year total construct Orange County Maintenance Facility- Activities and ult tables (Appendix D), unless indicated otherwise. | |

Work Days Per Month 21

Maximum Daily Scenarios - On-Ro

Clear and Gr Site Util/Electric, Earthwork, Site Util/Electric, Foundation Site Util/Electric, Build Site Util/Electric

| | ROG | ROG | CO | CO | NOx | NOx | SOx | SOx | PM ₁₀ | PM ₁₀ | PM ₁₀ BW, | PM _{2.5} | PM _{2.5} | PM _{2.5} |
|---|--------|---------|-----------------|-----------------|------------------|-------------------|--------|---------|------------------|------------------|----------------------|-------------------|-------------------|-------------------|
| Maximum Daily Scenarios - On-Road Equipment Emissions | RunEx | StartEx | RunEx | StartEX | RunEx | StartEx | RunEx | StartEx | RunEx | StartEx | TW | RunEx | StartEx | BW, TW |
| Survey, Clear and Grub | 0.0091 | 0.0134 | 0.5890 | 0.1281 | 0.0374 | 0.0116 | 0.0024 | 0.0000 | 0.0013 | 0.0001 | 0.2263 | 0.0012 | 0.0001 | 0.061 |
| Clear and Grub, Site Util/Electric, Demo, Earthwork | 0.1240 | 0.0538 | 3.3117 | 0.5123 | 10.5455 | 1.2032 | 0.0901 | 0.0001 | 0.0779 | 0.0004 | 2.9762 | 0.0743 | 0.0004 | 0.827 |
| Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving | 0.1634 | 0.1107 | 5.8136 | 1.0541 | 10.8264 | 1.2902 | 0.1009 | 0.0003 | 0.0843 | 0.0008 | 3.9527 | 0.0802 | 0.0008 | 1.091 |
| Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings | 0.1042 | 0.1531 | 6.7158 | 1.4580 | 0.5487 | 0.1700 | 0.0278 | 0.0004 | 0.0158 | 0.0012 | 2.5956 | 0.0145 | 0.0011 | 0.702 |
| Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip | | 0.1407 | 6.1921 | 1.3398 | 0.7171 | 0.1577 | | 0.0003 | 0.0160 | 0.0011 | 2.4325 | 0.0148 | 0.0010 | |
| Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 0.0808 | 0.1200 | 5.2560 | 1.1428 | 0.3341 | 0.1036 | 0.0212 | 0.0003 | 0.0117 | 0.0009 | 2.0195 | 0.0108 | 0.0008 | 0.546 |
| | | | | | | | | | | | | | | |
| Maximum Daily Scenarios - On-Road Equipment Emissions | ROG | CO | NO _X | SO _X | PM ₁₀ | PM _{2.5} | | | | | | | | |
| Survey, Clear and Grub | 0.0225 | 0.7171 | 0.0490 | 0.0024 | 0.2277 | 0.0626 | | | | | | | | |
| Clear and Grub, Site Util/Electric, Demo, Earthwork | 0.1777 | 3.8239 | 11.7487 | 0.0902 | 3.0545 | 0.9019 | | | | | | | | |
| Site Util/Electric, Earthwork, Foundations, Bridge, Roadways/Paving | 0.2741 | 6.8677 | 12.1166 | 0.1011 | 4.0378 | 1.1727 | | | | | | | | |
| Site Util/Electric, Foundations, Bridge, Roadways/Paving, Buildings | 0.2573 | 8.1738 | 0.7187 | 0.0282 | 2.6125 | 0.7183 | | | | | | | | |
| Site Util/Electric, Buildings, Trackwork-Ballasted, Major Equip | 0.2381 | 7.5319 | 0.8747 | 0.0277 | 2.4496 | 0.6748 | | | | | | | | |
| Site Util/Electric, Buildings, Trackwork-DF, Major Equip | 0.2008 | 6.3988 | 0.4377 | 0.0215 | 2.0321 | 0.5582 | | | | | | | | |

| -Road and Off-Road Equipment Emissions | ROG | CO | NO _X | SO _x | PM ₁₀ | PM _{2.5} |
|---|--------|---------|-----------------|-----------------|------------------|-------------------|
| Survey, Clear and Grub | 1.5624 | 12.7128 | 13.1662 | 0.0318 | 0.7655 | 0.5573 |
| d Grub, Site Util/Electric, Demo, Earthwork | 6.7043 | 73.0223 | 65.4729 | 0.2163 | 5.2252 | 2.8923 |
| ork, Foundations, Bridge, Roadways/Paving | 7.5704 | 68.1739 | 75.1981 | 0.2531 | 6.5621 | 3.4950 |
| ations, Bridge, Roadways/Paving, Buildings | 8.0948 | 77.0711 | 64.3515 | 0.1836 | 5.1590 | 3.0611 |
| uildings, Trackwork-Ballasted, Major Equip | | 59.3638 | 47.4754 | 0.1369 | 4.3545 | 2.4273 |
| ctric, Buildings, Trackwork-DF, Major Equip | 6.1661 | 58.9623 | 46.4912 | 0.1284 | 3.9070 | 2.2830 |
| Maximum Daily Emissions | 8.0948 | 77.0711 | 75.1981 | 0.2531 | 6.5621 | 3.4950 |
| | | | | | | |

Off-Road Construction Emissions - Phase 2

| Construction Year ¹ | 2026 | | | | Emissions Factors (g/bhp-hr) | | Emission Factor (g/gal) | | Emissions (lbs/day) | | metric tons/phase |
|---|--|---|--|---|---|--|---|--|---|--|---|
| Project Phase/Equipment | Notes | Number | Hours per Day Total Days ¹ Horsepower Total Runtime Hours | Load Factor ² ROG | G CO NOX SOX PM ₁₀ PM | M _{2.5} CO ₂ CH | I ₄ N ₂ O gal/hp-hr | Total Gallons | ROG CO NO _X SO _X | PM ₁₀ PM _{2.5} | CO ₂ CH ₄ N ₂ O CO ₂ e |
| Survey Impact hammer Power drill | electric/hand-held electric/hand-held | Other Construction Equipment 1 Other Construction Equipment 1 | | | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 | 0.00 | 0.00 0.00 0.00 0.00 0.00 0.00 | | 0.07 0.47 0.51 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 | 0.00 | 1.95 0.00 0.00 1.9 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |
| Tool truck Site Utilities/Electric | | Off-Highway Trucks 1 | 3 21 402 63 84 | 0.38 0. | 0.07 0.46 0.51 0.00 0.02 | 0.02 201.86 | 0.57 0.26 0.0 | 0 9 | 0.07 0.47 0.51 0.00 2.15 18.49 17.02 0.04 | 0.02 0.02 0.70 0.64 | 1.95 0.00 0.00 1.9 27.25 0.00 0.00 27.4 |
| Abrasive/demo saw Backhoe Bucket Truck | assumes diesel | Concrete/Industrial Saws 1 Tractors/Loaders/Backhoes 1 Off-Highway Trucks 1 | 2 8 81 17 8 17 97 134 8 21 402 168 | 0.37 0. | 0.37 3.19 2.78 0.01 0.10 0.08 1.29 0.85 0.00 0.04 0.07 0.46 0.51 0.00 0.02 | 0.09 414.36 0.04 195.21 0.02 201.86 | 0.57 0.26 0.3 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 3 | 0.10 0.83 0.73 0.00 0.05 0.81 0.54 0.00 0.19 1.25 1.37 0.01 | 0.03 0.02 | 0.41 0.00 0.00 0.4 0.94 0.00 0.00 0.9 5.21 0.00 0.00 5.2 |
| Compressor Concrete mixer | | Air Compressors 1 Cement and Mortar Mixers 1 | 8 42 78 336 4 8 9 34 | 0.48 0. | | 0.07 272.77 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.1 | 1 199 | | 0.05 0.05 | 3.43 0.00 0.00 3.4 0.05 0.00 0.00 0.00 |
| Concrete pump Concrete saw Concrete truck | | Pumps 1 Concrete/Industrial Saws 1 Off-Highway Trucks 1 | 5 17 84 84 8 4 81 34 5 17 402 84 | 0.73 0. | | 0.09 414.36 | 0.57 0.26 0.0 0.57 0.26 0.3 0.57 0.26 0.0 | 4 929 | 0.02 0.69 0.36 0.00 0.38 3.33 2.90 0.01 0.12 0.78 0.86 0.00 | 0.10 0.09 | 0.83 0.00 0.01 0.82 0.00 0.00 0.9 2.60 0.00 0.00 2.6 |
| Concrete vibrator Excavator-Track hoe | https://www.indiamart | Other Construction Equipment 1 Excavators 1 | 5 17 402 84 5 17 5.5 84 8 8 158 67 | 0.42 0. | 0.01 0.40 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.07 1.18 0.56 0.00 0.03 | 0.09 352.40 0.03 201.69 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 5 25 | 0.12 0.78 0.80 0.00 0.01 0.05 0.07 0.00 0.07 1.25 0.60 0.00 | 0.00 0.00 | 2.80 0.00 0.00 2.00 0.07 0.00 0.00 0.00 0.82 0.00 0.00 0.8 |
| Front end loader (rubber) Generator | | Tractors/Loaders/Backhoes 1 Generator Sets 1 | 8 8 97 67 8 17 84 134 | 0.74 0. | 0.08 1.29 0.85 0.00 0.04 0.06 1.17 0.48 0.00 0.04 | 0.04 195.21 0.04 420.53 | 0.57 0.26 0.0 0.57 0.26 0.0 | 1 73 | 0.05 0.81 0.54 0.00 0.06 1.29 0.53 0.00 | 0.04 0.04 | 0.47 0.00 0.00 0.4 3.51 0.00 0.00 3.5 |
| Gradall Grinder Horizontal Boring /Jacking machine | https://www.essexequ | Graders 1 Other Construction Equipment 1 Bore/Drill Rigs 1 | 8 4 187 34 2 42 11 84 0 0 221 0 | 0.42 0. | | 0.09 352.40 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 5 49 | 0.16 0.71 1.78 0.00 0.01 0.04 0.05 0.00 0.00 0.00 0.00 0.00 | 0.00 0.00 | 0.55 0.00 0.01 0.14 0.00 0.00 0.01 0.00 0.00 0.00 0.00 |
| Roller-vibratory Tractor trailer | | Rollers 1 Off-Highway Trucks 1 | 2 17 80 34 2 17 402 34 | 0.38 0. | 0.07 0.46 0.51 0.00 0.02 | 0.02 201.86 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 5 | 0.01 0.17 0.14 0.00 0.05 0.31 0.34 0.00 | 0.01 0.01 | 0.20 0.00 0.00 0.2 1.04 0.00 0.00 1.0 0.72 0.00 0.00 1.0 |
| Trenching machine (Ditch witch) Tri-axle Dump Trucks Vacuum excavator truck | | Trenchers 1 Off-Highway Trucks 2 Off-Highway Trucks 1 | 4 17 78 67 8 17 402 134 4 2 402 7 | 0.38 0. | | 0.14 265.84 0.02 201.86 0.02 201.86 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 19 | 0.08 0.64 0.78 0.00 0.38 2.50 2.74 0.01 0.10 0.63 0.69 0.00 | 0.10 0.09 | 0.70 0.00 0.00 0.1 4.17 0.00 0.00 4.1 0.21 0.00 0.00 0.2 |
| Welder Demolition | | Welders 1 | 8 25 46 202 21 | | | | 0.57 0.26 0.0 | | 0.09 0.75 0.64 0.00 1.40 28.21 8.70 0.02 | 0.35 0.31 | 1.07 0.00 0.00 1.0 8.74 0.00 0.00 9.0 |
| Abrasive/demo saw Asphalt/Concrete crusher Backhoe | | Concrete/Industrial Saws 1 Crushing/Proc. Equipment 1 Tractors/Loaders/Backhoes 1 | 4 4 81 17 6 7 85 42 8 7 97 55 | 0.78 0. | 0.37 3.19 2.78 0.01 0.10 0.53 21.52 1.66 0.01 0.05 0.08 1.29 0.85 0.00 0.04 | 0.03 655.82 | 0.57 0.26 0.3 0.57 0.26 0.9 0.57 0.26 0.9 | 4 3309 | 0.19 1.66 1.45 0.00 0.46 18.88 1.46 0.01 0.05 0.81 0.54 0.00 | 0.04 0.03 | 0.41 0.00 0.00 0.4 1.81 0.00 0.00 2.1 0.39 0.00 0.00 0.3 |
| Compressor Excavator-Track hoe | | Air Compressors 1 Excavators 1 | 8 11 78 84 8 11 158 84 | 0.48 0. 0.38 0. | 0.30 2.35 1.90 0.00 0.07 0.07 1.18 0.56 0.00 0.03 | 0.07 272.77 0.03 201.69 | 0.57 0.26 0.0 0.57 0.26 0.0 | 1 50 0 14 | 0.20 1.55 1.25 0.00 0.07 1.25 0.60 0.00 | 0.05 0.05 0.03 0.03 | 0.86 0.00 0.00 0.8 1.02 0.00 0.00 1.0 |
| Front end loader (rubber) Generator Grinder | https://www.essexequi | Rubber Tired Loaders 1 Generator Sets 1 Other Construction Equipment 1 | 4 17 203 67 8 11 84 84 2 4 11 8 | 0.74 0. | | 0.02 190.49 0.04 159.70 0.09 352.40 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 12 | 0.05 0.28 0.47 0.00 0.06 1.29 0.53 0.00 0.01 0.04 0.05 0.00 | 0.04 0.04 | 0.94 0.00 0.00 0.9 0.83 0.00 0.00 0.8 0.01 0.00 0.00 0.0 |
| Hoe Ram Jack hammers | attachment to tractor, https://www.edisons.c | Tractors/Loaders/Backhoes 1 Other Construction Equipment 2 | 8 3 97 25 5 3 3.5 16 | 0.37 0. 0.42 0. | 0.08 1.29 0.85 0.00 0.04 0.34 2.02 2.59 0.01 0.10 | 0.04 195.21 0.09 352.40 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 0 5 3 | 0.05 0.81 0.54 0.00 0.01 0.06 0.08 0.00 | 0.03 0.02 0.00 0.00 | 0.18 0.00 0.00 0.1 0.01 0.00 0.00 0.0 |
| Tractor trailer Tri-axle Dump Trucks Earthwork | | Off-Highway Trucks 1 Off-Highway Trucks 2 | 2 16 402 32 4 11 402 42 42 | | 0.07 0.46 0.51 0.00 0.02 0.07 0.46 0.51 0.00 0.02 | 0.02 201.86 0.02 201.86 | 0.57 0.26 0.0 0.57 0.26 0.0 | | 0.05 0.31 0.34 0.00 0.19 1.25 1.37 0.01 1.05 10.09 10.49 0.02 | 0.05 0.05 | 0.98 0.00 0.00 0.93 1.30 0.00 0.00 1.33 10.77 0.00 0.00 10.83 |
| D5 Dozer Excavator-Track hoe | | Rubber Tired Dozers 1 Excavators 1 | 8 21 247 168 8 4 158 34 | 0.40 0. | 0.18 1.04 1.95 0.00 0.09 0.07 1.18 0.56 0.00 0.03 | 0.08 209.04 0.03 201.69 | 0.57 0.26 0.0 0.57 0.26 0.0 | | 0.31 1.81 3.40 0.00 0.07 1.25 0.60 0.00 | 0.15 0.14 | 3.47 0.00 0.00 3.5 0.41 0.00 0.00 0.4 |
| Front end loader (rubber) Roller-sheepsfoot | | Rubber Tired Loaders 1 Graders 1 | 5 34 203 168 8 8 187 67 9 9 267 47 | 0.41 0. | 0.08 0.43 0.73 0.00 0.02 0.10 1.28 1.09 0.00 0.06 | 0.02 190.49 0.05 198.12 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 13 0 40 | 0.06 0.35 0.59 0.00 0.14 1.73 1.47 0.00 | 0.02 0.02 0.08 0.07 | 2.35 0.00 0.00 2.3 1.02 0.00 0.00 1.0 |
| Roller-vibratory Tri-axle Dump Trucks Foundations | | Scrapers 1 Graders 2 | 8 8 367 67 6 13 187 76 42 | | 0.10 1.28 1.09 0.00 0.06 0.07 0.46 0.51 0.00 0.02 | 0.05 198.12 0.02 201.86 | 0.57 0.26 0.0 0.57 0.26 0.0 | | 0.32 4.01 3.41 0.01 0.14 0.93 1.02 0.00 0.77 6.75 6.75 0.02 | | 2.36 0.00 0.00 2.3 1.17 0.00 0.00 1.1 14.09 0.00 0.00 14.6 |
| Backhoe Concrete mixer | | Tractors/Loaders/Backhoes 1 Cement and Mortar Mixers 1 | 8 34 97 269 8 4 9 34 | 0.56 0. | 0.31 1.82 2.35 0.00 0.09 | 0.08 318.42 | 0.57 0.26 0.0 0.57 0.26 0.1 | 0 31 | 0.05 0.81 0.54 0.00 0.03 0.16 0.21 0.00 | 0.03 0.02 0.01 0.01 | 1.88 0.00 0.00 1.8 0.05 0.00 0.00 0.0 |
| Concrete pump Concrete truck Concrete vibrator | https://www.indiamart | Pumps 1 Off-Highway Trucks 1 Other Construction Equipment 1 | 4 21 84 84 4 21 402 84 4 21 5.5 84 | 0.38 0. | 0.03 1.01 0.53 0.00 0.03 0.07 0.46 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 | 0.03 159.70 0.02 201.86 0.09 352.40 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | | 0.02 0.55 0.29 0.00 0.10 0.63 0.69 0.00 0.01 0.04 0.05 0.00 | 0.02 0.02 | 0.83 0.00 0.01 2.60 0.00 0.00 2.6 0.07 0.00 0.00 0.0 |
| Crane Excavator-Track hoe | | Cranes 1 Excavators 1 | 8 4 231 34 8 11 158 84 | 0.29 0. 0.38 0. | 0.09 0.52 1.00 0.00 0.04 0.07 1.18 0.56 0.00 0.03 | 0.04 151.96 0.03 201.69 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 14 | 0.11 0.61 1.17 0.00 0.07 1.25 0.60 0.00 | 0.05 0.05 0.03 0.03 | 0.34 0.00 0.00 0.3 1.02 0.00 0.00 1.0 |
| Front end loader (rubber) Pile driver Roller-vibratory-walk behind | https://www.doosanpc | Rubber Tired Loaders 1 Bore/Drill Rigs 1 Rollers 1 | 8 34 203 269 6 4 221 25 2 13 6 25 | 0.50 0. | | 0.02 190.49 0.02 263.10 0.36 220.05 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 38.6 | 2 103 | 0.10 0.56 0.95 0.00 0.09 0.78 0.88 0.00 0.01 0.04 0.03 0.00 | 0.03 0.03 | 3.76 0.00 0.00 3.7 0.74 0.00 0.00 0.7 0.01 0.00 0.00 0.5 |
| Tractor Trailer Tri-axle Dump Trucks | https://www.uoosanpc | Off-Highway Trucks 1 Off-Highway Trucks 2 | 2 21 402 42 2 21 402 42 | 0.38 0. 0.38 0. | 0.07 0.46 0.51 0.00 0.02 0.07 0.46 0.51 0.00 0.02 | 0.02 201.86 0.02 201.86 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 6 0 6 | 0.05 0.31 0.34 0.00 0.10 0.63 0.69 0.00 | 0.01 0.01 0.02 0.02 | 1.30 0.00 0.00 1.3 1.30 0.00 0.00 1.3 |
| Welder Roadway Paving | | Welders 1 | 4 8 46 34 42 | 0.45 0. | 0.26 2.06 1.74 0.00 0.07 | 0.06 255.73 | 0.57 0.26 0.0 | 0 2 | 0.05 0.38 0.32 0.00 1.34 11.47 11.51 0.03 | 0.01 0.01 0.46 0.42 | 0.18 0.00 0.00 0.1 8.81 0.00 0.00 8.8 |
| Asphalt Pavers Backhoe Concrete trucks | | Pavers 2 Tractors/Loaders/Backhoes 1 Off-Highway Trucks 2 | 6 7 130 40 8 21 97 168 4 8 402 34 | 0.37 0. | 0.08 1.29 0.85 0.00 0.04 | 0.04 195.21 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 3 | 0.12 1.78 1.18 0.00 0.05 0.81 0.54 0.00 0.19 1.25 1.37 0.01 | 0.03 0.02 | 0.48 0.00 0.00 0.4 1.18 0.00 0.00 1.1 1.04 0.00 0.00 1.0 |
| Concrete vibrator Core drill machine (testing) | https://www.indiamart | Other Construction Equipment 1 Bore/Drill Rigs 1 | 4 8 5.5 34 4 1 221 3 | 0.42 0. 0.50 0. | 0.34 2.02 2.59 0.01 0.10 0.06 0.53 0.60 0.00 0.02 | 0.09 352.40 0.02 263.10 | 0.57 0.26 0.0 0.57 0.26 0.0 | 5 10 2 14 | 0.01 0.04 0.05 0.00 0.06 0.52 0.59 0.00 | 0.00 0.00 0.02 0.02 | 0.03 0.00 0.00 0.0 0.10 0.00 0.00 0.1 |
| Demo/Concrete saws Dozer Front end loader (rubber) | | Concrete/Industrial Saws 2 Rubber Tired Dozers 1 Rubber Tired Loaders 1 | 4 2 81 8 4 4 247 17 8 13 203 101 | 0.40 0. | 0.37 3.19 2.78 0.01 0.10 0.18 1.04 1.95 0.00 0.09 0.08 0.43 0.73 0.00 0.02 | 0.09 414.36 0.08 209.04 0.02 190.49 | 0.57 0.26 0.3 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 3 104 | 0.38 3.33 2.90 0.01 0.16 0.90 1.70 0.00 0.10 0.56 0.95 0.00 | 0.08 0.07 | 0.21 0.00 0.02 0.35 0.00 0.00 0.33 1.41 0.00 0.00 1.43 |
| Roller-smooth drum Rollers-vibratory | | Rollers 1 Rollers 1 | 8 13 80 101 4 13 80 50 | 0.38 0. 0.38 0. | 0.101.281.090.000.060.101.281.090.000.06 | 0.05 198.12 0.05 198.12 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 25 0 13 | 0.05 0.68 0.58 0.00 0.03 0.34 0.29 0.00 | 0.03 0.03 0.02 0.01 | 0.60 0.00 0.00 0.6 0.30 0.00 0.00 0.3 |
| Tri-axle Dump Trucks Building Abrasive/demo saw | | Off-Highway Trucks 2 Concrete/Industrial Saws 1 | 4 25 402 101 315 2 16 81 32 | | | | 0.57 0.26 0.0 | | 0.19 1.25 1.37 0.01 2.06 18.31 15.65 0.03 0.10 0.83 0.73 0.00 | 0.62 0.57 | 3.12 0.00 0.00 3.1 69.83 0.01 0.00 71.3 0.77 0.00 0.00 0.8 |
| Backhoe Circular saws | | Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 2 | 2 16 61 32 8 158 97 1260 4 95 81 378 | 0.37 0. | 0.08 1.29 0.85 0.00 0.04 | 0.04 195.21 | 0.57 0.26 0.3 0.57 0.26 0.0 0.57 0.26 0.3 | 0 24 | 0.05 0.81 0.54 0.00 | 0.03 0.02 | 0.77 0.00 0.00 0.00 8.83 0.00 0.00 8.8 9.26 0.01 0.00 10.2 |
| Compressor Concrete finisher Conserte summ | | Air Compressors 1 Paving Equipment 1 | 8 158 78 1260 4 63 132 252 4 16 84 63 | 0.36 0. | 0.08 1.10 0.75 0.00 0.04 | 0.04 187.02 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 2 533 | 0.03 0.46 0.31 0.00 | 0.02 0.01 | 12.87 0.00 0.00 12.9 2.21 0.00 0.00 2.2 0.63 0.00 0.00 0.6 |
| Concrete pump Concrete saw Concrete truck | | Pumps 1 Concrete/Industrial Saws 1 Off-Highway Trucks 1 | 4 10 84 63 8 6 81 50 4 16 402 63 | 0.73 0. | | 0.03 159.70 0.09 414.36 0.02 201.86 | 0.57 0.26 0.0 0.57 0.26 0.3 0.57 0.26 0.3 | 4 1393 | 0.02 0.55 0.29 0.00 0.38 3.33 2.90 0.01 0.10 0.63 0.69 0.00 | 0.10 0.09 | 0.83 0.00 0.00 0.00 1.23 0.00 0.00 1.3 1.95 0.00 0.00 1.9 |
| Concrete vibrator Crane | https://www.indiamart | Other Construction Equipment 1 Cranes 1 | 4 16 5.5 63 6 6 231 38 | 0.29 0. | 0.09 0.52 1.00 0.00 0.04 | 0.04 151.96 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 15 | 0.01 0.04 0.05 0.00 0.08 0.46 0.88 0.00 0.05 0.28 0.47 0.00 | 0.04 0.03 | 0.05 0.00 0.00 0.0 0.38 0.00 0.00 0.3 |
| Front end loader (rubber) Generator Grinder | https://www.essexequi | Rubber Tired Loaders 1 Generator Sets 1 Other Construction Equipment 1 | 4 158 203 630 8 158 84 1260 4 63 11 252 | 0.74 0. | | | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 186 | | 0.04 0.04 | 8.81 0.00 0.00 8.8 12.51 0.00 0.00 12.5 0.41 0.00 0.00 0.4 |
| Jack hammers Lull | https://www.edisons.c | Other Construction Equipment 2 Forklifts 1 | 4 6 3.5 25 4 95 89 378 | 0.20 0. | 0.06 0.73 0.60 0.00 0.04 | 0.09 352.40 0.03 105.95 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 3 | 0.01 0.05 0.07 0.00 0.01 0.12 0.09 0.00 | 0.01 0.01 | 0.01 0.00 0.00 0.0 0.72 0.00 0.00 0.7 |
| Mortar mixer Nail guns Paint sprayers | electric/hand-held assumes powered by ai | Cement and Mortar Mixers 1 Other Construction Equipment 2 Air Compressors 2 | 4 95 9 378 4 63 0 252 8 6 78 50 | 0.00 0. | | 0.08 318.42 0.00 0.00 0.07 272.77 | 0.57 0.26 0.1 0.57 0.26 0.0 0.57 0.26 0.0 | 0 0 | 0.01 0.08 0.10 0.00 0.00 0.00 0.00 0.00 0.39 3.10 2.51 0.00 | 0.00 0.00 | 0.61 0.00 0.00 0.6 0.00 0.0 |
| Table saw Tractor trailer | | Concrete/Industrial Saws 1 Off-Highway Trucks 1 | 2 32 81 63 2 95 402 189 | 0.38 0. | 0.07 0.46 0.51 0.00 0.02 | 0.02 201.86 | 0.57 0.26 0.3 0.57 0.26 0.0 | 0 26 | 0.05 0.31 0.34 0.00 | 0.01 0.01 | 1.54 0.00 0.00 1.7 5.86 0.00 0.00 5.8 |
| Welder Trackwork- Ballasted- (top of sub ballast up) Air Compressor | | Air Compressors 1 | 2 63 46 126 84 8 67 78 538 | | 0.26 2.06 1.74 0.00 0.07 0.30 2.35 1.90 0.00 0.07 | 0.06 255.73 | 0.57 0.26 0.0 | | 0.02 0.19 0.16 0.00 1.13 9.49 9.06 0.02 0.20 1.55 1.25 0.00 | 0.40 0.37 | 0.67 0.00 0.00 0.6 33.00 0.00 0.00 33.2 5.49 0.00 0.00 5.5 |
| Backhoe Ballast cars (dump) | assumes no separate er | Tractors/Loaders/Backhoes 1 Other Material Handling Equipment 2 | 8 67 97 538 6 17 0 101 | 0.37 0. 0.40 0. | 0.08 1.29 0.85 0.00 0.04 0.00 0.00 0.00 0.00 0.00 | 0.04 195.21 0.00 0.00 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 10 0 0 | 0.05 0.81 0.54 0.00 0.00 0.00 0.00 0.00 | 0.03 0.02 0.00 0.00 | 3.77 0.00 0.00 3.7 0.00 0.00 0.00 0.00 |
| Ballast Compactor Ballast Regulator Front end loader (rubber) | https://www.progressr | Plate Compactors 1 Other General Industrial Equipment 1 Rubber Tired Loaders 1 | 4 17 8 67 4 17 250 67 4 67 203 269 | 0.34 0. | 0.24 1.49 1.78 0.00 0.07 0.07 0.40 0.67 0.00 0.02 0.08 0.43 0.73 0.00 0.02 | 0.06 244.37 0.02 180.73 0.02 190.49 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 75 | 0.01 0.05 0.05 0.00 0.05 0.30 0.51 0.00 0.05 0.28 0.47 0.00 | 0.02 0.01 | 0.06 0.00 0.00 0.0 1.04 0.00 0.00 1.0 3.76 0.00 0.00 3.7 |
| Generator Power wrench | assumes powered by a | Generator Sets1Aerial Lifts1 | 4 21 84 84 4 8 78 34 | 0.74 0. 0.31 0. | 0.06 1.17 0.48 0.00 0.04 0.30 2.35 1.90 0.00 0.07 | 0.04 159.70 0.07 272.77 | 0.57 0.26 0.0 0.57 0.26 0.0 | 0 12 1 20 | 0.03 0.64 0.27 0.00 0.06 0.50 0.40 0.00 | 0.02 0.02 0.02 0.01 | 0.83 0.00 0.00 0.6 0.22 0.00 0.00 0.2 |
| Prentice Loader (hi rail log loader) Rail drill Rail Profile Grinder | http://s7d2.scene7.con assumes powered by a https://www.pandrol.c | Tractors/Loaders/Backhoes 1 Other Construction Equipment 1 Other Construction Equipment 1 | 4 25 160 101 2 17 78 34 4 8 6.4 34 | 0.42 0. | | 0.03 193.81 0.07 272.77 0.09 352.40 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 1 20 | 0.04 0.59 0.29 0.00 0.04 0.34 0.27 0.00 0.01 0.05 0.06 0.00 | 0.01 0.01 | 1.16 0.00 0.01 1.7 0.30 0.00 0.00 0.3 0.03 0.00 0.00 0.0 |
| Rail saw Rail Train** | modeled in deliveries ta | Other Construction Equipment I Concrete/Industrial Saws 1 Other General Industrial Equipment 1 | 4 8 6.4 34 1 63 81 63 8 4 0 34 | 0.73 0. 0.34 0. | 0.37 3.19 2.78 0.01 0.10 0.00 0.00 0.00 0.00 0.00 | 0.09 414.36 0.00 0.00 | 0.57 0.26 0.3 0.0 | 4 1742 0 0 | 0.05 0.42 0.36 0.00 0.00 0.00 0.00 0.00 | 0.01 0.01 0.00 0.00 | 1.54 0.00 0.00 1.7 0.00 0.00 0.00 0.00 |
| Ral heater/vibrator Speedswing (360 on track crane) Spiking gun * | assumes to be powered | Air Compressors 1 Cranes 1 Other Construction Equipment 0 | 2 50 78 101 8 67 231 538 6 50 171 302 | 0.29 0. | 0.30 2.35 1.90 0.00 0.07 0.09 0.52 1.00 0.00 0.04 0.00 0.00 0.00 0.00 0.00 | 0.07 272.77 0.04 151.96 0.00 0.00 | 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 220 | 0.05 0.39 0.31 0.00 0.11 0.61 1.17 0.00 0.00 0.00 0.00 0.00 | 0.05 0.05 | 1.03 0.00 0.00 1.0 5.44 0.00 0.00 5.4 0.00 0.00 0.00 0.0 |
| Spiking gun * Tamper/Liner Tie Drill | assumes to not be used assumes max 100 hp electric/hand-held | Other Construction Equipment 0 Other Construction Equipment 1 Other Construction Equipment 1 | 6 17 171 101 6 50 0 302 | 0.42 0. | 0.16 1.49 1.47 0.00 0.10 | 0.09 219.44 | 0.57 0.26 0.0 0.57 0.26 0.0 | 1 89 0 0 | 0.00 0.00 0.00 0.00 0.15 1.40 1.38 0.00 0.00 0.00 0.00 0.00 | 0.09 0.09 | 0.00 0.00 0.00 0.00 1.57 0.00 0.00 1.5 0.00 0.00 0.00 0.00 |
| Tractor Trailer Tri Axle dump trucks | | Off-Highway Trucks 1 Off-Highway Trucks 2 | 2 8 402 17 | 0.38 0. | | 0.02 201.86 0.02 201.86 | 0.57 0.26 0.0 0.57 0.26 0.0 | | 0.05 0.31 0.34 0.00 0.19 1.25 1.37 0.01 | 0.01 0.01 0.05 0.05 | 0.52 0.00 0.00 0.5 6.25 0.00 0.00 6.2 15.62 0.00 0.00 15.6 |
| | | off-flighway flucks 2 | 4 50 402 202 | 0.50 0. | 0.07 0.40 0.31 0.00 0.02 | | | | 1.09 9.92 8.17 0.02 | 0.34 0.32 | 15.63 0.00 0.00 15.9 |
| Trackwork- Direct Fixation Air Compressor Backhoe | | Air Compressors 1 Tractors/Loaders/Backhoes 1 | 4 50 402 202 63 8 32 78 252 8 13 97 101 | 0.48 0. | 0.30 2.35 1.90 0.00 0.07 | | 0.57 0.26 0.0 0.57 0.26 0.0 | | 0.20 1.55 1.25 0.00 0.05 0.81 0.54 0.00 | | 2.57 0.00 0.00 2.5 0.71 0.00 0.00 0.7 |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw Concrete drill | assumes powered by ai | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 Air Compressors 1 | 63 8 32 78 252 8 13 97 101 2 6 81 13 4 32 78 126 | 0.48 0. 0.37 0. 0.73 0. 0.48 0. | 0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 | 0.04 195.21 0.09 414.36 0.07 272.77 | 0.57 0.26 0.0 0.57 0.26 0.3 0.57 0.26 0.0 | 0 2 4 348 1 75 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 | 0.03 0.02 0.03 0.02 0.02 0.02 | 0.71 0.00 0.00 0.1 0.31 0.00 0.00 0.3 1.29 0.00 0.00 1.2 |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw | assumes powered by a https://hupshenghardv | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 | 63 8 32 78 252 8 13 97 101 2 6 81 13 | 0.48 0. 0.37 0. 0.73 0. 0.48 0. 0.42 0. 0.56 0. | 0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.31 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 | 0.04 195.21 0.09 414.36 0.07 272.77 0.09 352.40 0.08 318.42 | 0.57 0.26 0.0 0.57 0.26 0.3 | 0 2 4 348 1 75 5 20 0 115 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 | 0.03 0.02 0.03 0.02 0.02 0.02 0.00 0.00 0.00 0.00 | 0.71 0.00 0.00 0.7 0.31 0.00 0.00 0.3 |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw Concrete drill Concrete drill Concrete mixer Concrete nixer Concrete truck Concrete truck Concrete truck | | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 Air Compressors 1 Other Construction Equipment 1 Cement and Mortar Mixers 1 Pumps 1 Off-Highway Trucks 1 Other Construction Equipment 1 | 63 8 32 78 252 8 13 97 101 2 6 81 13 4 32 78 126 2 32 6 63 4 32 78 126 2 32 6 63 4 32 9 126 2 6 84 13 2 6 402 13 2 6 5.5 13 | 0.48 0 0.37 0 0.73 0 0.48 0 0.42 0 0.56 0 0.74 0 0.38 0 0.42 0 | 0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 0.03 1.01 0.53 0.00 0.03 0.07 0.46 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 | 0.04 195.21 0.09 414.36 0.07 272.77 0.09 352.40 0.08 318.42 0.03 159.70 0.02 201.86 0.09 352.40 | 0.57 0.26 0.0 0.57 0.26 0.3 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.1 0.57 0.26 0.1 0.57 0.26 0.1 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 2 4 348 1 75 5 20 0 115 1 11 0 2 5 4 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 0.00 0.02 0.03 0.00 0.01 0.08 0.10 0.00 0.01 0.28 0.15 0.00 0.05 0.31 0.34 0.00 0.00 0.02 0.03 0.00 | 0.03 0.02 0.03 0.02 0.00 0.00 0.00 0.00 0.01 0.01 0.01 0.01 0.00 0.00 | 0.71 0.00 0.00 0.01 0.31 0.00 0.00 0.31 1.29 0.00 0.00 1.2 0.06 0.00 0.00 0.0 0.20 0.00 0.00 0.2 0.13 0.00 0.00 0.7 0.39 0.00 0.00 0.3 0.01 0.00 0.00 0.3 |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw Concrete drill Concrete grinder Concrete grinder Concrete grinder Concrete truck Concrete vibrator Front end loader (rubber) Generator | https://hupshenghardv | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 Air Compressors 1 Other Construction Equipment 1 Cement and Mortar Mixers 1 Pumps 1 Off-Highway Trucks 1 | 63 8 32 78 252 8 13 97 101 2 6 81 13 4 32 78 126 2 32 6 63 4 32 78 126 2 32 6 63 4 32 9 126 2 6 84 13 2 6 402 13 | 0.48 0 0.37 0 0.73 0 0.48 0 0.56 0 0.74 0 0.38 0 0.36 0 0.74 0 | 0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.38 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 0.03 1.01 0.53 0.00 0.03 0.07 0.46 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.33 1.01 0.53 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.34 2.02 2.59 0.01 0.10 0.08 0.43 0.73 0.00 0.02 0.06 1.17 0.48 0.00 0.04 | 0.04 195.21 0.09 414.36 0.07 272.77 0.09 352.40 0.03 159.70 0.02 201.86 0.09 352.40 0.03 159.70 0.09 352.40 0.09 352.40 0.09 352.40 0.09 352.40 0.02 190.49 0.04 159.70 | 0.57 0.26 0.0 0.57 0.26 0.3 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.1 0.57 0.26 0.1 0.57 0.26 0.0 0.57 0.26 0.0 | 0 2 4 348 1 75 5 20 0 115 1 11 0 2 5 4 0 10 0 37 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 0.00 0.02 0.03 0.00 0.01 0.08 0.10 0.00 0.01 0.28 0.15 0.00 0.05 0.31 0.34 0.00 | 0.03 0.02 0.03 0.02 0.00 0.00 0.00 0.00 0.01 0.01 0.01 0.01 0.00 0.00 0.01 0.01 0.02 0.01 0.04 0.04 | 0.71 0.00 0.00 0.7 0.31 0.00 0.00 0.3 1.29 0.00 0.00 1.2 0.06 0.00 0.00 0.0 0.20 0.00 0.00 0.2 0.13 0.00 0.00 0.2 0.39 0.00 0.00 0.3 |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw Concrete drill Concrete drill Concrete grinder Concrete niker Concrete niker Concrete truck Concrete vibrator Front end loader (rubber) Generator Nail guns (air) Power wrench Prentice Loader (hi rail log loader) | https://hupshenghardv https://www.indiamart electric/hand-held electric/hand-held http://s7d2.scene7.cor | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 Air Compressors 1 Other Construction Equipment 1 Cement and Mortar Mixers 1 Off-Highway Trucks 1 Other Construction Equipment 1 Off-Highway Trucks 1 Other Construction Equipment 1 Rubber Tired Loaders 1 Generator Sets 1 Air Compressors 1 Air Compressors 1 Air Compressors 1 Tractors/Loaders/Backhoes 1 | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | 0.48 0. 0.37 0. 0.73 0. 0.48 0. 0.42 0. 0.56 0. 0.74 0. 0.38 0. 0.42 0. 0.36 0. 0.36 0. 0.74 0. 0.36 0. 0.42 0. 0.36 0. 0.48 0. 0.37 0. | 0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.33 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 0.03 1.01 0.53 0.00 0.02 0.04 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.07 0.46 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.08 0.43 0.73 0.00 0.02 0.36 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 0.07 0.37 0.30 0.35 1.90 0.00 0.07 | 0.04 195.21 0.09 414.36 0.07 272.77 0.08 318.42 0.03 159.70 0.02 201.86 0.09 352.40 0.02 201.86 0.09 352.40 0.02 190.49 0.04 159.70 0.07 272.77 0.07 272.77 0.03 193.81 | 0.57 0.26 0.0 0.57 0.26 0.3 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.1 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 0.57 0.26 0.0 | 0 2 4 348 5 20 0 115 1 1 1 1 1 1 1 1 1 1 1 1 1 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 0.00 0.02 0.03 0.00 0.01 0.08 0.10 0.00 0.01 0.28 0.15 0.00 0.05 0.31 0.34 0.00 0.05 0.28 0.47 0.00 0.05 0.28 0.47 0.00 0.06 1.29 0.53 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 | 0.03 0.02 0.03 0.02 0.02 0.02 0.00 0.00 0.01 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.03 0.04 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw Concrete drill Concrete grinder Concrete nixer Concrete nixer Concrete nixer Concrete truck Concrete vibrator Front end loader (rubber) Generator Riguns (air) Power wrench Pressure washer Rail drill | https://hupshenghardv https://www.indiamart electric/hand-held electric/hand-held http://s7d2.scene7.cor http://www.ultimatew electric/hand-held | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 Air Compressors 1 Other Construction Equipment 1 Cement and Mortar Mixers 1 Pumps 1 Off-Highway Trucks 1 Other Construction Equipment 1 Rubber Tired Loaders 1 Generator Sets 1 Air Compressors 1 Air Compressors 1 Tractors/Loaders/Backhoes 1 Other Construction Equipment 1 | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | 0.48 0 0.37 0 0.73 0 0.48 0 0.42 0 0.56 0 0.74 0 0.38 0 0.42 0 0.36 0 0.74 0 0.36 0 0.74 0 0.36 0 0.74 0 0.36 0 0.37 0 0.42 0 0.42 0 | 3.00 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.33 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.03 0.07 0.46 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.03 0.44 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.06 1.17 0.48 0.00 0.02 0.06 1.17 0.48 0.00 0.04 0.30 2.35 1.90 0.00 0.07 0.33 2.35 1.90 0.00 | 0.04 195.21 0.09 414.36 0.07 272.77 0.09 352.40 0.03 159.70 0.02 201.86 0.09 352.40 0.03 159.70 0.02 201.86 0.09 352.40 0.02 190.49 0.04 159.70 0.07 272.77 0.03 193.81 0.05 170.09 0.05 70.09 0.07 272.77 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 0 2 4 348 1 75 5 20 0 115 1 111 0 2 5 4 0 10 0 37 1 7 1 4 0 11 2 70 0 0 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 0.00 0.02 0.03 0.00 0.01 0.88 0.15 0.00 0.01 0.28 0.15 0.00 0.05 0.31 0.34 0.00 0.05 0.28 0.47 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.00 0.01 0.01 0.00 0.00 0.01 0.01 0.00 | 0.03 0.02 0.03 0.02 0.00 0.00 0.00 0.00 0.01 0.01 0.01 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.04 0.04 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.00 0.00 0.01 0.01 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw Concrete drill Concrete grinder Concrete grinder Concrete nixer Concrete tuck Concrete vibrator Front end loader (rubber) Generator Nail guns (air) Power wrench Prentice Loader (hi rail log loader) Pressure washer | https://hupshenghardv https://www.indiamart electric/hand-held electric/hand-held http://s7d2.scene7.cor http://www.ultimatew | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 Air Compressors 1 Other Construction Equipment 1 Cement and Mortar Mixers 1 Pumps 1 Off-Highway Trucks 1 Other Construction Equipment 1 Other Construction Equipment 1 Rubber Tired Loaders 1 Air Compressors 1 Air Compressors 1 Air Compressors 1 Air Compressors 1 Other Construction Equipment 1 | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 3.00 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 0.31 1.82 2.59 0.01 0.10 0.31 0.53 0.00 0.02 0.33 0.07 0.46 0.51 0.00 0.02 0.34 0.73 0.00 0.02 0.03 0.06 1.17 0.48 0.00 0.04 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 0.07 0.31 1.17 0.48 0.00 0.04 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 | 0.04 195.21 0.09 414.36 0.07 272.77 0.09 352.40 0.08 318.42 0.03 159.70 0.02 201.86 0.09 352.40 0.02 190.49 0.04 159.70 0.07 272.77 0.03 193.81 0.05 170.09 0.07 272.77 0.03 193.81 0.05 272.77 0.07 272.77 0.03 193.81 0.05 170.09 0.07 272.77 0.09 352.40 0.09 414.36 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 0 2 4 348 1 75 5 20 0 115 1 11 0 2 5 4 0 10 0 37 1 4 0 11 2 70 0 0 5 26 4 2090 1 30 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 0.00 0.02 0.03 0.00 0.01 0.08 0.10 0.00 0.01 0.08 0.10 0.00 0.01 0.28 0.15 0.00 0.05 0.31 0.34 0.00 0.05 0.28 0.47 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.02 0.30 0.15 0.00 0.00 0.01 0.01 0.00 0.02 0.30 0.15 0.00 0.00 0.01 0.01 0.00 0.04 0.34 0.27 0.00 0.01 0.83 0.73 0.00 | 0.03 0.02 0.03 0.02 0.02 0.02 0.00 0.00 0.01 0.01 0.01 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.00 0.00 0.01 0.01 0.01 0.01 0.00 0.00 0.01 0.01 0.01 0.01 0.02 0.02 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw Concrete drill Concrete drill Concrete grinder Concrete nixer Concrete truck Concrete truck Concrete vibrator Front end loader (rubber) Generator Nail guns (air) Power wrench Pressure washer Rail Profile Grinder Rail Saw Ral heater/vibrator Speedswing (360 on track crane) Tractor Trailer | https://hupshenghardv https://www.indiamart electric/hand-held electric/hand-held http://s7d2.scene7.cor http://www.utlimatew electric/hand-held https://www.pandrol.c | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 Air Compressors 1 Other Construction Equipment 1 Cement and Mortar Mixers 1 Other Construction Equipment 1 Cement and Mortar Mixers 1 Off-Highway Trucks 1 Other Construction Equipment 1 Rubber Tired Loaders 1 Air Compressors 1 Air Compressors 1 Air Compressors 1 Tractors/Loaders/Backhoes 1 Other Construction Equipment 1 Concrete/Industrial Saws 1 | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | 0.48 0 0.37 0 0.73 0 0.48 0 0.42 0 0.56 0 0.74 0 0.38 0 0.42 0 0.36 0 0.74 0 0.36 0 0.42 0 0.48 0 0.42 0 0.48 0 0.48 0 0.42 0 0.42 0 0.42 0 0.42 0 0.42 0 0.42 0 0.42 0 0.42 0 0.73 0 0.73 0 0.29 0 | 0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.03 0.07 0.46 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.03 0.44 0.51 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.06 1.17 0.48 0.00 0.04 0.30 2.35 1.90 0.00 0.07 0.33 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 | 0.04 195.21 0.09 414.36 0.07 272.77 0.09 352.40 0.03 159.70 0.02 201.86 0.09 352.40 0.02 190.49 0.04 159.70 0.02 190.49 0.04 159.70 0.07 272.77 0.03 193.81 0.05 170.09 0.07 272.77 0.09 352.40 0.09 414.36 0.07 272.77 0.09 414.36 0.07 272.77 0.04 151.96 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 0 2 4 348 1 75 5 20 0 115 1 111 0 2 5 4 0 10 0 37 1 7 1 4 0 11 2 70 0 0 5 266 4 2090 0 30 0 5 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 0.00 0.02 0.03 0.00 0.01 0.08 0.10 0.00 0.01 0.08 0.10 0.00 0.01 0.28 0.15 0.00 0.05 0.31 0.34 0.00 0.05 0.28 0.47 0.00 0.05 0.28 0.47 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.02 0.30 0.15 0.00 0.00 0.01 0.01 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00 | 0.03 0.02 0.03 0.02 0.02 0.02 0.00 0.00 0.01 0.01 0.01 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.02 0.02 0.03 0.02 0.02 0.02 0.02 0.02 0.01 0.01 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
| Trackwork- Direct Fixation Air Compressor Backhoe Circular / Table saw Concrete drill Concrete grinder Concrete grinder Concrete nuker Concrete truck Concrete vibrator Front end loader (rubber) Generator Nail guns (air) Power wrench Pressure washer Rail drill Rail Pofile Grinder Rail saw Rail heater/vibrator Speedswing (360 on track crane) | https://hupshenghardv https://www.indiamart electric/hand-held electric/hand-held http://s7d2.scene7.cor http://www.utlimatew electric/hand-held https://www.pandrol.c | Air Compressors 1 Tractors/Loaders/Backhoes 1 Concrete/Industrial Saws 1 Air Compressors 1 Other Construction Equipment 1 Cement and Mortar Mixers 1 Other Construction Equipment 1 Other Construction Equipment 1 Other Construction Equipment 1 Other Construction Equipment 1 Rubber Tired Loaders 1 Generator Sets 1 Air Compressors 1 Tractors/Loaders/Backhoes 1 Other Construction Equipment 1 Air Compressors 1 </td <td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td> <td>0.48 0 0.37 0 0.73 0 0.48 0 0.56 0 0.74 0 0.38 0 0.36 0 0.37 0 0.38 0 0.37 0 0.42 0 0.37 0 0.48 0 0.37 0 0.42 0 0.73 0 0.42 0 0.73 0 0.42 0 0.73 0 0.43 0 0.73 0 0.48 0 0.29 0 0.38 0 0.48 0</td> <td>0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 0.31 1.82 2.55 0.00 0.02 0.31 1.82 2.55 0.00 0.02 0.31 1.01 0.53 0.00 0.02 0.34 0.73 0.00 0.02 0.02 0.34 0.73 0.00 0.02 0.04 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 0.07 0.31 1.17 0.48 0.00 0.00 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00</td> <td>0.04 195.21 0.09 414.36 0.07 272.77 0.09 352.40 0.08 318.42 0.03 159.70 0.09 352.40 0.03 159.70 0.02 201.86 0.09 352.40 0.02 190.49 0.04 159.70 0.07 272.77 0.03 193.81 0.05 170.09 0.07 272.77 0.09 352.40 0.09 352.40 0.09 143.36 0.07 272.77 0.04 151.96 0.02 201.86 0.02 201.86</td> <td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td> <td>0 2 4 348 1 75 5 20 0 115 1 11 0 2 5 4 0 10 0 37 1 4 0 11 2 70 0 0 5 26 4 2090 1 30 0 52 0 2 1 30 0 52 0 2 1 30</td> <td>0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 0.00 0.02 0.03 0.00 0.01 0.28 0.15 0.00 0.05 0.31 0.34 0.00 0.05 0.31 0.34 0.00 0.05 0.28 0.47 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.00 0.01 0.01 0.00 0.00 0.01 0.01 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00</td> <td>0.03 0.02 0.03 0.02 0.02 0.02 0.00 0.00 0.01 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.00 0.00 0.01 0.01 0.02 0.01 0.04 0.04 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.00 0.00 0.01 0.01 0.01 0.01 0.02 0.02 0.03 0.02 0.02 0.02 0.01 0.01 0.01 0.01 0.01 0.01 0.02 0.02 0.01 0.01 0.01 0.01</td> <td>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</td> | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | 0.48 0 0.37 0 0.73 0 0.48 0 0.56 0 0.74 0 0.38 0 0.36 0 0.37 0 0.38 0 0.37 0 0.42 0 0.37 0 0.48 0 0.37 0 0.42 0 0.73 0 0.42 0 0.73 0 0.42 0 0.73 0 0.43 0 0.73 0 0.48 0 0.29 0 0.38 0 0.48 0 | 0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 0.31 1.82 2.55 0.00 0.02 0.31 1.82 2.55 0.00 0.02 0.31 1.01 0.53 0.00 0.02 0.34 0.73 0.00 0.02 0.02 0.34 0.73 0.00 0.02 0.04 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 0.07 0.31 1.17 0.48 0.00 0.00 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 | 0.04 195.21 0.09 414.36 0.07 272.77 0.09 352.40 0.08 318.42 0.03 159.70 0.09 352.40 0.03 159.70 0.02 201.86 0.09 352.40 0.02 190.49 0.04 159.70 0.07 272.77 0.03 193.81 0.05 170.09 0.07 272.77 0.09 352.40 0.09 352.40 0.09 143.36 0.07 272.77 0.04 151.96 0.02 201.86 0.02 201.86 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 0 2 4 348 1 75 5 20 0 115 1 11 0 2 5 4 0 10 0 37 1 4 0 11 2 70 0 0 5 26 4 2090 1 30 0 52 0 2 1 30 0 52 0 2 1 30 | 0.05 0.81 0.54 0.00 0.10 0.83 0.73 0.00 0.10 0.78 0.63 0.00 0.00 0.02 0.03 0.00 0.01 0.28 0.15 0.00 0.05 0.31 0.34 0.00 0.05 0.31 0.34 0.00 0.05 0.28 0.47 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.05 0.39 0.31 0.00 0.00 0.01 0.01 0.00 0.00 0.01 0.01 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00 0.00 0.02 0.03 0.00 | 0.03 0.02 0.03 0.02 0.02 0.02 0.00 0.00 0.01 0.01 0.02 0.01 0.01 0.01 0.02 0.01 0.00 0.00 0.01 0.01 0.02 0.01 0.04 0.04 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.00 0.00 0.01 0.01 0.01 0.01 0.02 0.02 0.03 0.02 0.02 0.02 0.01 0.01 0.01 0.01 0.01 0.01 0.02 0.02 0.01 0.01 0.01 0.01 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
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Construction Equipment 1 Off-Highway Trucks 1 Air Compressors 1 Other Construction Equipment 1 | 63 8 32 78 252 8 13 97 101 2 6 81 13 4 32 78 126 2 32 6 63 4 32 78 126 2 32 6 63 4 32 9 126 2 6 84 13 2 6 5.5 13 4 32 203 126 8 32 284 252 2 6 78 13 2 3 78 6 2 32 160 63 1 32 10 32 2 38 6.4 76 2 38 81 76 2 38 81 76 2 38 81 76 2 3 | 0.48 0 0.37 0 0.73 0 0.48 0 0.42 0 0.38 0 0.38 0 0.37 0 0.38 0 0.37 0 0.38 0 0.42 0 0.37 0 0.48 0 0.42 0 0.42 0 0.42 0 0.42 0 0.42 0 0.42 0 0.42 0 0.73 0 0.42 0 0.38 0 0.29 0 0.37 0 0.48 0 0.74 0 0.48 0 0.48 0 0.48 0 0.48 0 0.48 0 0.448 0 | 0.30 2.35 1.90 0.00 0.07 0.08 1.29 0.85 0.00 0.04 0.37 3.19 2.78 0.01 0.10 0.30 2.35 1.90 0.00 0.07 0.34 2.02 2.59 0.01 0.10 0.31 1.82 2.35 0.00 0.09 0.31 1.82 2.59 0.01 0.10 0.31 1.82 2.59 0.01 0.10 0.03 1.01 0.53 0.00 0.02 0.34 2.02 2.59 0.01 0.10 0.06 1.17 0.48 0.00 0.04 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 0.07 0.30 2.35 1.90 0.00 0.07 0.33 2.92 2.59 0.01 | 0.04 195.21 0.09 414.36 0.07 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| | ROG | CO | NO _X | SO _X | PM ₁₀ | PM _{2.5} |
|--|------|-------|-----------------|-----------------|------------------|-------------------|
| cenarios - Off-Road Equipment Emissions | | | lbs/d | ау | | |
| Survey | 0.07 | 0.47 | 0.51 | 0.00 | 0.02 | 0.02 |
| Site Util/Electric, Demo | 3.55 | 46.70 | 25.71 | 0.07 | 1.04 | 0.95 |
| Site Util/Electric, Earthwork | 3.20 | 28.58 | 27.51 | 0.06 | 1.20 | 1.10 |
| Earthwork, Foundations | 1.82 | 16.84 | 17.25 | 0.04 | 0.78 | 0.71 |
| Foundations, Roadway/Paving | 2.11 | 18.22 | 18.26 | 0.05 | 0.73 | 0.67 |
| ildings, Trackwork-Ballasted, Major Equip | 3.74 | 32.61 | 28.76 | 0.06 | 1.20 | 1.10 |
| tric, Buildings, Trackwork-DF, Major Equip | 5.85 | 51.53 | 44.88 | 0.10 | 1.84 | 1.69 |
| | | | | | | |

Maximum Daily Scenarios - Off-Road Equipment Emission Site Util/Electric, Demo Site Util/Electric, Demo Site Util/Electric, Demo Site Util/Electric, Foundations Foundations, Roadway/Paving Buildings, Trackwork-Ballasted, Major Equip Site Util/Electric, Buildings, Trackwork-DF, Major Equip Major Equip, Commissioning

18.26 28.76 44.88 6.05 3.74 0.0 1.

32.61 51.53 5.85 0.

0.76 6.13 0.26 0.0 0.29

| Project Component/On-Road Vehicles Survey Concrete Trucks | | | | | | | | | | | Emissions I | Factors (g/mi for Ru | | | for StartEx) | | | | | | | | | | | | l | Emissions (lbs/o | day) | | | Emissions (MT/phase) |
|--|----------|----------------------|-------------|------------|-----------|------------|----------|-----------|----------------------|-----------|--------------------------------|--------------------------|--------------------|-----------------------|--------------|------------------------------------|------------------------|-----------------|-----------|-----------------|----------|--------------------|--|------------|-----------|-----------|------------------|-----------------------------------|---------------------|---------------------|---|--|
| jurvey | | Trip Distan | | | | | | | | | SOx PM ₁₀ | | PM ₁₀ B | BW, | PM | 1 _{2.5} PM _{2.5} | .5 | CO ₂ | CH4 | CH ₄ | | N ₂ O R | ROG ROG CO CO | NOx N | Ox SO | SOx | PM ₁₀ | PM ₁₀ PM ₁₀ | BW, PM ₂ | 5 PM _{2.5} | 5 PM _{2.5} CO ₂ CH ₄ CH ₄ N ₂ O N ₂ O | |
| urvey | Days | Daily Trips (One-way | ay) Tot | otal VMT F | RunEx Sta | rtEx RunEx | StartEX | RunEx | StartEx | RunEx Sta | artEx RunEx | PM ₁₀ StartEx | TW | V PM _{2.5} F | RunEx Star | TEX BW, T | W CO ₂ RunE | Ex StartEx | x RunEx | StartEx | RunEx St | | | RunEx Sta | rtEx Runi | x StartE | RunEx | StartEx TV | V RunE | x StartEx | x BW, TW CO ₂ RunEx StartEx RunEx StartEx RunEx StartI | |
| oncrete Trucks | | | | | | | | | | | | | | | | | | | | | | (| 0.0021 0.0031 0.1359 0.029 | 6 0.0086 0 | .0027 0.0 | 0.00 | 0 0.0003 | 0.0000 0.0 | 0522 0.00 | 0.000 0.000 | 00 0.0141 55.4330 0.7895 0.0005 0.0007 0.0010 0.0 | 003 0.5355 0.0000 0.00 |
| | 21 | i - | 6.9 | - | | 0000 0.167 | 5 0.0000 | 2.0777 | 4.4297 | | 0.0000 0.0144 | 0. | 000 0.3 | | 0.0137 0.0 | | 904 1341.533 | | | | 0.2109 | | 0.0000 0.0000 0.0000 0.000 | | | 000.0 000 | 0.0000 | | 0.00 | | | |
| łaul Trucks | 21 | | 20.0 | - | 0.0136 0 | 0000 0.148 | 4 0.0000 | 1.6143 | | 0.0125 0 | 0.0000 0.0113 0.0006 0.0016 | | | .3216 0 | 0.0108 0.0 | 0000 0.09 | 904 1324.32 | .000 | 0.0006 | 0.0000 | 0.2082 | | 0.0000 0.0000 0.0000 0.000 0.0021 0.0031 0.1359 0.029 | 0.0000 0 | .0000 0.0 | 000.0 000 | 0.0000 | | | 0.000 | | 0.00 00.0 000 |
| Vorkers | 21 | . 6 | 14.7 | 88 | 0.0107 0 | 2346 0.699 | 1 2.2343 | 0.0444 | 1 0.2026 | 0.0028 | 0.0006 0.0016 | 0. | 018 0.2 | .2686 0 | 0.0014 0.0 | 0016 0.07 | 727 285.079 | 92 59.684 | 48 0.0028 | 0.0520 | 0.0051 | | | 6 0.0086 0 | .0027 0.0 | 0.000 | 0.0003 | 0.0000 0.0 | 0522 0.00 | 0.000 | 00 0.0141 55.4330 0.7895 0.0005 0.0007 0.0010 0.0 | 0.00 0.00 0.00 0 |
| Site Utilities/Electric | | | | | | | | | | | | | | | | | | | | | | | 0.0111 0.0166 0.7250 0.157 | 5 0.0461 0 | .0143 0.0 | 0.000 | 0 0.0016 | 0.0001 0.2 | 2786 0.00 | 0.000 | 01 0.0754 295.6426 4.2106 0.0029 0.0037 0.0053 0.0 | 018 11.4249 0.0002 0.00 |
| Concrete Trucks | 84 | | 6.9 | | 0.0171 0 | 0000 0.167 | | 2.0777 | 4.4297 | | 0.0000 0.0144 | 0. | | .5210 0 | 0.0137 0.0 | | 904 1341.533 | | | 0.0000 | 0.2109 | 0.0000 | 0.0000 0.0000 0.0000 0.000 | 0.0000 | | 000.0 | 0.0000 | 0.0000 0.0 | 0000 0.00 | 0.000 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00 | |
| Haul Trucks | 84 | | 20.0 | | 0.0136 0 | 0000 0.148 | 4 0.0000 | 1.6143 | | | 0.0000 0.0113 | 0. | 000 0.3 | | 0.0100 0.0 | 0000 0.09 | 904 1324.32 | .000 | | 0.0000 | 0.2082 | 0.0000 | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0000 0.0 | 000 0.000 | 0.0000 | | 0000 0.00 | 0.000 | | 000 0.00 0.00 0 018 11.42 0.00 0 |
| Workers | 84 | , 32 | 14.7 | 470 | 0.0107 0 | 2346 0.699 | 1 2.2343 | 0.0444 | 0.2026 | 0.0028 | 0.0006 0.0016 | 0. | 018 0.2 | .2686 0 | 0.0014 0.0 | 0016 0.07 | 727 285.079 | 92 59.684 | 48 0.0028 | 0.0520 | 0.0051 | 0.0261 0 | 0.0111 0.0166 0.7250 0.157 | 5 0.0461 0 | | | 0 0.0016 | | 2786 0.00 | | | |
| Demolition | | 4 | | | | | | | | | | | | | | | | | | | | | 0.0070 0.0103 0.4531 0.098 | | | | | | | | 01 0.0471 184.7766 2.6316 0.0018 0.0023 0.0033 0.00 | |
| Concrete Trucks | 21 | | 6.9 | - | | 0000 0.167 | 5 0.0000 | 2.0777 | 4.4297 | 0.0127 0 | 0.0000 0.0144 | 0. | 000 0.3 | .3216 0 | 0.0137 0.0 | 0000 0.09 | | 0.000 | | 0.0000 | 0.2109 | 0.0000 | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0000 0.0 | | 0.0000 | 0.0000 0.0 | 0.00 | 0.000 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000 | 0.00 0.00 000 |
| Haul Trucks | 21 | | 20.0 | - | 0.0136 0 | 0000 0.148 | 4 0.0000 | 1.6143 | 3 3.5926 | 0.0125 0 | 0.0000 0.0113 | 0. | 000 0.3 | .3216 0 | 0.0108 0.0 | 0000 0.09 | | .000 | | 0.0000 | 0.2082 | 0.0000 | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0000 0.0 | 000.0 | 0.0000 | 0.0000 0.0 | 0.00 | 0.000 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00 | 0.00 0.00 0.00 0 |
| Workers | 21 | 20 | 14.7 | 294 | 0.0107 0 | 2346 0.699 | 1 2.2343 | 0.0444 | 0.2026 | 0.0028 | 0.0006 0.0016 | 0. | 018 0.2 | .2686 0 | 0.0014 0.0 | 0016 0.07 | 727 285.079 | 92 59.684 | 48 0.0028 | 0.0520 | 0.0051 | 0.0261 | 0.0070 0.0103 0.4531 0.098 | 5 0.0288 0 | .0089 0.0 | 0.000 | 0 0.0010 | 0.0001 0.1 | 1741 0.00 | 0.000 | 01 0.0471 184.7766 2.6316 0.0018 0.0023 0.0033 0.00 | 012 1.79 0.00 0 |
| Earthwork | | 4 | | | | | - | | | | | - | | | | | | | | | | (| 0.0280 0.0166 0.9082 0.157 | 5 2.0391 0 | .2361 0.0 | 184 0.000 | 0 0.0155 | 0.0001 0.6 | 6756 0.01 | 148 0.000 | 01 0.1870 1930.6420 4.2106 0.0036 0.0037 0.2623 0.0 | 016 21.6044 0.0001 0.00 |
| Concrete Trucks | 42 | - | 6.9 | - | | 0000 0.167 | | 2.0777 | 4.4297 | | 0.0000 0.0144 | 0. | | .3216 0 | 0.0137 0.0 | 0000 0.09 | | 0.000 | | 0.0000 | 0.2109 | 0.0000 | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0000 0.0 | 0.00 | 0.0000 | 0.0000 0.0 | 0000 0.00 | 0.000 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000 | |
| Haul Trucks | 42 | <u> </u> | 20.0 | - | | 0000 0.148 | | 1.6143 | 3.5926 | 0.0125 0 | 0.0000 0.0113 | 0. | 000 0.3 | .3216 0 | 0.0108 0.0 | 0000 0.09 | | | | 0.0000 | 0.2082 | 0.0000 0 | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0000 0.0 | 000.0 000 | 0.0000 | 0.0000 0.0 | 0.00 0.00 | 0.000 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000 | |
| Haul Trucks - Ballast Delivery (Occurs over over 21 days months 2 through 3 and 4) | 21 | 28 | 20.0 | 560 | 0.0136 0 | 0000 0.148 | | 1.6143 | 3.5926 | 0.0125 0 | 0.0000 0.0113 | 0. | 000 0.3 | .3216 0 | 0.0108 0.0 | 0000 0.09 | | 0.000 | 0.0000 | 0.0000 | 0.2082 | 0.0261 | 0.0168 0.0000 0.1832 0.000 | 1.9931 (| .2218 0.0 | 154 0.000 | 0 0.0139 | 0.0000 0.3 | 3970 0.01 | 0.000 | 00 0.1116 1634.9994 0.0000 0.0008 0.0000 0.2570 0.0 | 016 15.89 0.00 0 |
| Workers | 42 | . 32 | 14.7 | 470 | 0.0107 0 | 2346 0.699 | 1 2.2343 | 0.0444 | 1 0.2026 | 0.0028 0 | 0.0006 0.0016 | 0. | 018 0.3 | .2686 0 | 0.0014 0.0 | 0016 0.07 | 727 285.079 | 92 59.684 | 48 0.0028 | 0.0520 | 0.0051 | 0.0000 0 | 0.0111 0.0166 0.7250 0.157 | 5 0.0461 0 | | 0.000 | | | 2786 0.00 | 015 0.000 | 01 0.0754 295.6426 4.2106 0.0029 0.0037 0.0053 0.00 | |
| Foundations | | | | | | | - | | | | | - | | | | | | | | | | | 0.0195 0.0248 1.1123 0.236 | | | | | | 4655 0.00 | 0.000 | 02 0.1265 642.1791 6.3160 0.0044 0.0055 0.0391 0.0 | 028 12.3544 0.0002 0.00 |
| Concrete Trucks (conservatively included during foundations phase [shorter than building phase]) | 42 | | 6.9 | 67 | | 0000 0.167 | | 2.0777 | 4.4297 | | 0.0000 0.0144 | 0. | 000 0.3 | .3216 0 | 0.0137 0.0 | 0000 0.09 | | 0.000 | | 0.0000 | 0.2109 | | 0.0028 0.0000 0.0248 0.000 | 0.3078 | .0951 0.0 | 0.000 | 0 0.0021 | 0.0000 0.0 | 0476 0.00 | 0.000 | 00 0.0134 198.7151 0.0000 0.0001 0.0000 0.0312 0.0 | 000 3.79 0.00 0 |
| Haul Trucks | 42 | | 20.0 | | | 0000 0.148 | 4 0.0000 | 1.6143 | | | 0.0000 0.0113 | 0. | 000 0.3 | .3216 0 | 0.0108 0.0 | 0000 0.09 | | 0.000 | | 0.0000 | 0.2082 | | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0000 0.0 | 000.00 | 0.0000 | 0.0000 0.0 | 0.00 0.00 | 0.000 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00 | 0.00 0.00 0.00 |
| Workers | 42 | . 48 | 14.7 | 706 | 0.0107 0 | 2346 0.699 | 1 2.2343 | 0.0444 | 1 0.2026 | 0.0028 0 | 0.0006 0.0016 | 0. | 018 0.2 | .2686 0 | 0.0014 0.0 | 0016 0.07 | 727 285.079 | 92 59.684 | 48 0.0028 | 0.0520 | 0.0051 | 0.0261 | 0.0167 0.0248 1.0874 0.236 | 4 0.0691 0 | .0214 0.0 | 0.000 | 0.0024 | 0.0002 0.4 | 4178 0.00 | 0.000 | 02 0.1131 443.4639 6.3160 0.0043 0.0055 0.0079 0.0 | |
| Roadway Paving | | 4 | | | | | - | | | | | - | | | | | | | | | | (| 0.0104 0.0155 0.6797 0.147 | B 0.0432 0 | .0134 0.0 | 0.000 | 0 0.0015 | 0.0001 0.2 | 2611 0.00 | 0.000 | 01 0.0707 277.1650 3.9475 0.0027 0.0034 0.0049 0.00 | 017 5.3554 0.0001 0.00 |
| Concrete Trucks | 42 | | 6.9 | | 0.0191 0 | 0000 0.167 | | 2.0777 | 4.4297 | 0.0127 0 | 0.0000 0.0144 | 0. | 000 0.3 | .3216 0 | 0.0137 0.0 | 0000 0.09 | 1011.000 | 30 0.000 | 0.0007 | 0.0000 | 0.2109 | 0.0000 | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0000 0.0 | 000.00 | 0 0.0000 | 0.0000 0.0 | 0.00 | 0.000 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000 | 0.00 0.00 0.00 0 |
| Haul Trucks | 42 | | 20.0 | | 0.0136 0 | 0000 0.148 | | 0.0444 | 3 3.5926 | 0.0125 0 | 0.0000 0.0113 | 0. | 000 0. | .3216 0 | 0.0108 0.0 | 0000 0.09 | | 0.000 | | 0.0000 | 0.2082 | 0.0000 0 | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0000 0.0 | 000 0.000 | 0.0000 | 0.0000 0.0 | 0.00 0.00 | 0.000 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000 | |
| Workers | 42 | . 30 | 14.7 | 441 | 0.0107 0 | 2346 0.699 | 1 2.2343 | 0.0444 | 1 0.2026 | 0.0028 | 0.0006 0.0016 | 0. | 018 0.2 | .2686 0 | 0.0014 0.0 | 0016 0.07 | 727 285.079 | 92 59.684 | 48 0.0028 | 0.0520 | 0.0051 | 0.0261 | 0.0104 0.0155 0.6797 0.147 | | .0134 0.0 | | | 0.0001 0.2 | | | | 017 5.36 0.00 0 |
| Building | | | | | | | | | | | | | | | | | | | | | 0.0100 | | | 5 0.1642 0 | | | | | | | 04 0.2686 1053.2268 15.0004 0.0102 0.0131 0.0187 0.0 | |
| Concrete Trucks | 315 | 4 | 6.9 | | 0.0191 0 | 0000 0.167 | | 2.0/// | 4.4297 | 0.0127 0 | 0.0000 0.0144 | 0. | 000 0. | .3216 0 | 0.0137 0.0 | 0000 0.09 | | 30 0.000 | 0.0007 | 0.0000 | 0.2109 | 0.0000 0 | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | | 000.00 | 0.0000 | | 0.00 | | | 0.00 0.00 0.00 |
| Haul Trucks | 315 | | 20.0 | - | 0.0136 0 | 0000 0.148 | 4 0.0000 | 1.6143 | | 0.0125 0 | 0.0000 0.0113 0.0006 0.0016 | 0. | 000 0 | .3216 0 | 0.0108 0.0 | 0000 0.09 | | | | 0.0000 | 0.2082 | 0.0000 0 | 0.0000 0.0000 0.0000 0.000 0.000 0.000 | 0.0000 0 | .0000 0.0 | 0.00 | 0 0.0000 | | | 0.000 0.000 | | 000 0.00 0.00 0 066 152.63 0.00 0 |
| Trackwork- Ballasted- (top of sub ballast up) | 315 | 5 114 1 | 14.7 | 1,676 | 0.0107 0 | 2346 0.699 | 1 2.2343 | 0.0444 | 1 0.2026 | 0.0028 | 0.0006 0.0016 | 0. | 018 0 | .2686 U | 0.0014 0.0 | 0016 0.07 | 727 285.079 | 92 59.684 | 48 0.0028 | 0.0520 | 0.0051 | | | 0.1642 | .0509 0.0 | 104 0.000 | 0.0057 | 0.0004 0.9 | 9923 0.00 | 0.000 | | 000 000 000 000 000 000 000 000 000 00 |
| | | 4 | | | 0.0101 | 0000 0.1/7 | F 0.0000 | 0.0777 | 1 4 4007 | 0.0107 | 0.0000 | | 000 | 201/ | 0.0107 0.0 | 0000 0.00 | 004 4044 50 | 0.000 | 00 0.0000 | 0.0000 | 0.0100 | | 0.0218 0.0310 1.3695 0.295 | 0.19// 0 | .0392 0.0 | 0.000 | 0.0038 | 0.0002 0.5 | 5445 0.00 | 0.000 | 02 0.1476 645.6267 7.8949 0.0054 0.0069 0.0242 0.0 | |
| Concrete Trucks Haul Trucks (occurs during first two months of track construction | 84 42 | | 6.9 20.0 | | | 0000 0.167 | 4 0.0000 | 2.0777 | 7 4.4297 3 3.5926 | | 0.0000 0.0144 | | | .3216 0 | 0.0137 0.0 | 0000 0.09 | | 0.000 | | 0.0000 | 0.2109 | | 0.0000 0.0000 0.0000 0.000 0.0009 0.0000 0.0102 0.000 | | | 000.00 | 0.0000 | 0.0000 0.0 | 0.00 | 0.000 | | |
| Haui indexs (occurs during first two months of track construction | 42 | | 20.0 | 31 | 0.0136 0 | 0000 0.148 | 4 0.0000 | 0 0444 | | 0.0125 0 | 0.0000 0.0113 | 0. | | | | 0000 0.09 | | | | 0.0000 | 0.2082 | 0.0000 0 | 0.0009 0.0000 0.0102 0.000 | 5 0.0864 0 | | 0.000 | 0 0.0008 | 0.0000 0.0 | | 0.000 | | |
| Trackwork- Direct Fixation | 84 | 00 | 14.7 | 882 | 0.0107 0 | 2340 0.095 | 1 2.2343 | 0.0444 | 1 0.2026 | 0.0028 | 0.0006 0.0016 | 0. | 018 0.2 | .2080 U | 0.0014 0.0 | 0016 0.07 | 727 285.07 | 92 59.084 | 48 0.0028 | 0.0520 | 0.0051 | 0.0261 | 0.0209 0.0310 1.3593 0.295 | 0.0864 | .0208 0.0 | 0.000 | 0.0030 | 0.0002 0.3 | 1741 0.00 | 0.000 | 02 0.1414 554.3299 7.8949 0.0054 0.0069 0.0098 0.0 | 012 5.3554 0.0001 0.00 |
| Concrete Trucks | 63 | | 6.9 | | 0.0191 0 | 0000 0.167 | F 0.0000 | 2 0 7 7 7 | 4.4297 | 0.0107 | 0.0000 0.0144 | 0 | 000 0.3 | .3216 0 | 0.0137 0.0 | 0000 0.00 | 904 1341.53 | 30 0.000 | 00 0.0000 | 0.0000 | 0.0100 | | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | .0089 0.0 | | 0.0000 | 0.0001 0. | 0,00 0,00 | 0.00 | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 | |
| Haul Trucks | 63 | - | 20.0 | | | 0000 0.148 | | 1 6143 | | | 0.0144 | 0. | 000 0. | 2210 0 | 0.0137 0.0 | | | 72 0.000 | | 0.0000 | 0.2109 | 0.0000 0 | 0.0000 0.0000 0.0000 0.000 | | .0000 0.0 | | 0.0000 | 0.0000 0.0 | | 0.000 | | |
| Workers | 63 | | 20.0 | | 0.0130 0 | 2346 0.699 | | 0.0444 | 0.0720 | 0.0125 | 0.0006 0.0016 | 0. | 000 0. | .3210 | 0.0108 0.0 | 0000 0.09 | 727 285 079 | 0.000 | 0.0000 | 0.0000 | 0.2062 | 0.0000 0 | 0.0070 0.0103 0.4531 0.098 | | .0000 0.0 | | 0 0.0000 | 0.0000 0.0 | 1741 0.00 | 000.0 000 | 00 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.00000 0.000000 | 012 5.36 0.00 0 |
| Major Equipment | 03 | 20 | 14.7 | 294 | 0.0107 0 | 2340 0.095 | 1 2.2343 | 0.0444 | 1 0.2026 | 0.0028 | J.0006 0.0016 | 0. | 018 0.2 | .2080 U | 0.0014 0.0 | 0016 0.07 | 121 285.07 | 92 59.084 | 48 0.0028 | 0.0520 | 0.0051 | 0.0261 | 0.0230 0.0341 1.4952 0.325 | 0.0288 | 0205 0.0 | 0.000 | 0.0010 | 0.0001 0. | 1741 0.00 | 0.000 | 01 0.0471 184.7700 2.0310 0.0018 0.0023 0.0033 0.0 | 012 5.36 0.00 0 038 35.3459 0.0008 0.00 |
| | 126 | 6 | 6.9 | | 0.0101 0 | 0000 0.167 | 5 0.0000 | 2 0777 | 4.4297 | 0.0127 (| 0.0000 0.0144 | 0. | 000 0.3 | .3216 0 | 0.0127 0.0 | 0000 0.09 | 004 1241 523 | 30 0.000 | 00 0.0000 | 0.0000 | 0.2100 | 0.0000 (| 0.0000 0.0000 0.0000 0.000 | 0.0000 (| .0293 0.0 | | 0.0000 | 0.0000 0.0 | 0000 0.00 | | 00 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.00000 0.000000 | |
| | 120 | - | 20.0 | | 0.0191 0 | | | 1.6143 | | 0.0127 0 | 0.0000 0.0144 | 0. | 000 0. | 2216 0 | 0.0137 0.0 | 0000 0.09 | | 272 0.000 | | 0.0000 | 0.2109 | 0.0000 0 | 0.0000 0.0000 0.0000 0.000 | | | 0.00 | 0.0000 | 0.0000 0.0 | | | | |
| | 120 | | 20.0 | 070 | 0.0130 0 | 0000 0.148 | 4 0.0000 | 0.0444 | | 0.0125 | 0.0006 0.0016 | 0. | 000 0. | .2686 0 | 0.00108 0.0 | 0000 0.09 | | | | 0.0520 | 0.2062 | 0.0000 0 | 0.0000 0.0000 0.0000 0.000 | 1 0.0950 0 | | 0.000 | 1 0.0000 | 0.0003 0.5 | 5745 0.00 | 0.000 | 02 0.1555 609.7629 8.6844 0.0059 0.0076 0.0108 0.0 | 0.00 0.00 0.00 0 |
| Haul Trucks | 1201 | 00 | 14.7 | 970 | 0.0107 0 | 2340 0.095 | 1 2.2343 | 0.0444 | 0.2020 | 0.0028 | 0.0016 | 0. | 010 0.2 | .2000 0 | 0.0014 0.0 | 0010 0.07 | 203.07 | 92 39.004 | 40 0.0020 | 0.0520 | 0.0051 | 0.0201 | 0.0021 0.0031 0.1359 0.029 | 0.0950 | .0293 0.0 | | 0.0033 | 0.0003 0.3 | 0.00 | 0.000 | 02 0.1555 009.7829 8.0844 0.0059 0.0078 0.0108 0.0 | 003 1.0711 0.0000 0.00 |
| | | | | | 0.0191 0 | 0000 0.167 | 5 0.0000 | 2.0777 | 4.4297 | 0.0127 (| 0.0000 0.0144 | 0 | 000 0.3 | .3216 0 | 0.0137 0.0 | 0000 0.09 | 904 1341 533 | 30 0.000 | 00 0 0009 | 0.0000 | 0.2100 | | 0.0000 0.0000 0.0000 0.000 | | 0000 0.0 | | 0 0.0003 | 0.0000 0.0 | | | 00 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000 | |
| Haul Trucks Vorkers Commissioning Commission | 42 | | | | | | | | | | | | | | 0.0107 0.0 | 0000 0.09 | | | | 0.0000 | 0.2109 | | 0.0000 0.0000 0.0000 0.000 | 0.0000 0 | 0000 0.0 | | 0.0000 | 0.0000 0.0 | | | 00 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 | |
| Haul Trucks // Workers // Commissioning // Concrete Trucks // Concrete | 42 | _ | 6.9 | | 0.0124 0 | | | | | | | | | | | | | | | | 0.2002 | | | J 0.0000 (| | 0.00 | 0.0000 | | | | | |
| Concrete Trucks Haul Trucks Workers Commissioning Concrete Trucks Haul Trucks Workers | 42 | 2 - 2 | 6.9 20.0 | | 0.0136 0 | 0000 0.148 | | 1.6143 | 3.5926 | | 0.0000 0.0113 | | 000 0. | .3216 0 | 0.0108 0.0 | 0016 0.07 | | | | 0.0520 | 0.0051 | 0.0241 (| 0.0021 0.0021 0.1250 0.020 | 0.0004 (| 0027 0.0 | 0.00 | 0 0002 | 0.0000 0.0 | 0522 0.00 | 0.000 | 00 0.0141 55.4330 0.7895 0.0005 0.0007 0.0010 0.0 | |

Buildings, Tr Site Util/Electric, Buildin

Maximum Daily Scenarios -

Buildings, Tra Site Util/Electric, Buildin

Maximum Daily Scenarios - On-Road and O

Buildings, Trac Site Util/Electric, Building

| Constants | nts | | | |
|------------------------------------|---|--|--|--|
| | grams | | | |
| 1 | 453.59237 | | | |
| | lbs | | | |
| 1 | 2000 | | | |
| on | grams | | | |
| 1 | 1000000 | | | |
| 02e | CH4 | | | |
| 25 | 1 | | | |
| 02e | N2O | | | |
| 298 | 1 | | | |
| | lbs | | | |
| 11 | 2000 | | | |
| on | lbs | | | |
| 1 | 2204.623 | | | |
| on | ton | | | |
| 0.907185 | 1 | | | |
| | | | 0.5 | |
| Trip Length Assumptions - CalEEMod | miles | Source | 3% | |
| 5 | | alEEMod default for Orange County | 7% | |
| | | | 3% | |
| icks | 20 C | alEEMod default | | |
| s | 6.9 C 20 C 1 Start year assumed to be 2026 based on cc 2 Equipment types, quantities, usage from O | altEMod default for Orange County altEEMod default for Orange County altEMod default ompletion year of 2028 and 4.5-year total cons range County Maintenance Facility- Activities. | 3% truction period for Phases and equipmentPhase 2-v | |

Work Days Per Month 21

| Site Oth/Electric, Editivolit | 0.0371 | 0.0331 | 1.0331 | 0.0102 | 2.0052 | 0.2304 | 0.0215 | 0.0001 | 0.0171 | 0.0005 | 0.7541 | 0.0105 | 0.0002 | 0.2024 | |
|------------------------------------|--------|--------|-----------------|--------|------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| Earthwork, Foundations | 0.0475 | 0.0414 | 2.0204 | 0.3941 | 2.4160 | 0.3526 | 0.0246 | 0.0001 | 0.0201 | 0.0003 | 1.1411 | 0.0191 | 0.0003 | 0.3135 | |
| Foundations, Roadway/Paving | 0.0300 | 0.0403 | 1.7919 | 0.3842 | 0.4201 | 0.1299 | 0.0090 | 0.0001 | 0.0061 | 0.0003 | 0.7266 | 0.0057 | 0.0003 | 0.1972 | |
| Trackwork-Ballasted, Major Equip | 0.0845 | 0.1241 | 5.4475 | 1.1822 | 0.4569 | 0.1196 | 0.0228 | 0.0003 | 0.0129 | 0.0009 | 2.1113 | 0.0119 | 0.0009 | 0.5716 | |
| ildings, Trackwork-DF, Major Equip | 0.0808 | 0.1200 | 5.2560 | 1.1428 | 0.3341 | 0.1036 | 0.0212 | 0.0003 | 0.0117 | 0.0009 | 2.0195 | 0.0108 | 0.0008 | 0.5466 | |
| Major Equip, Commissioning | 0.0251 | 0.0372 | 1.6312 | 0.3547 | 0.1037 | 0.0322 | 0.0066 | 0.0001 | 0.0036 | 0.0003 | 0.6267 | 0.0033 | 0.0003 | 0.1696 | |
| | | | | | | | | | | | | | | | |
| s - On-Road Equipment Emissions | ROG | CO | NO _X | SOX | PM ₁₀ | PM _{2.5} | | | | | | | | | |

| Survey | 0.0052 | 0.1655 | 0.0113 | 0.0006 | 0.0526 | 0.0144 |
|----------------------------------|--------|---------|-----------------|--------|--------|-------------------|
| Site Util/Electric, Demo | 0.0450 | 1.4342 | 0.0981 | 0.0048 | 0.4555 | 0.1251 |
| Site Util/Electric, Earthwork | 0.0722 | 1.9484 | 2.3356 | 0.0214 | 0.9715 | 0.2789 |
| Earthwork, Foundations | 0.0889 | 2.4145 | 2.7686 | 0.0247 | 1.1614 | 0.3328 |
| Foundations, Roadway/Paving | 0.0703 | 2.1761 | 0.5500 | 0.0091 | 0.7330 | 0.2031 |
| Trackwork-Ballasted, Major Equip | 0.2086 | 6.6296 | 0.5764 | 0.0231 | 2.1251 | 0.5844 |
| dings, Trackwork-DF, Major Equip | 0.2008 | 6.3988 | 0.4377 | 0.0215 | 2.0321 | 0.5582 |
| Major Equip, Commissioning | 0.0623 | 1.9858 | 0.1358 | 0.0067 | 0.6307 | 0.1732 |
| | | | | | | |
| d Off-Road Equipment Emissions | | CO | NO _X | SOX | PM10 | PM _{2.5} |
| Survey | 0.0774 | 0.6350 | 0.5252 | | 0.0711 | 0.0315 |
| Site Util/Electric, Demo | 3.5939 | 48.1311 | 25.8100 | 0.0728 | 1.5002 | 1.0796 |
| | | | | | | |

| Site Util/Electric, Demo | 3.5939 | 48.1311 | 25.8100 | 0.0728 | 1.5002 | 1.0796 |
|----------------------------------|--------|---------|---------|--------|--------|--------|
| Site Util/Electric, Earthwork | 3.2761 | 30.5238 | 29.8461 | 0.0838 | 2.1720 | 1.3833 |
| Earthwork, Foundations | 1.9114 | 19.2530 | 20.0136 | 0.0623 | 1.9365 | 1.0459 |
| Foundations, Roadway/Paving | 2.1820 | 20.3969 | 18.8137 | 0.0556 | 1.4631 | 0.8748 |
| rackwork-Ballasted, Major Equip | 3.9444 | 39.2387 | 29.3401 | 0.0841 | 3.3262 | 1.6893 |
| lings, Trackwork-DF, Major Equip | 6.0502 | 57.9246 | 45.3209 | 0.1237 | 3.8695 | 2.2486 |
| Major Equip, Commissioning | 0.8218 | 8.1117 | 6.1846 | 0.0175 | 0.9158 | 0.4355 |
| Maximum Daily Emissions | 6.0502 | 57.9246 | 45.3209 | 0.1237 | 3.8695 | 2.2486 |
| | | | | | | |

| Rail, OTM and Turnouts-Ballasted Track | Assume 144 truckloads del | ivered evenly spread o | over first three mon | nths of tra | ack construction | | | | | | | | | | | | | | | | | | | | | | |
|---|--|------------------------|----------------------|--------------|-------------------------|-------------------|----------|--------------------|-------------|------------|--------------------------|----------------------------|---------|-----------------------------|------------------------------------|---|--|--|--|---|--|---|---|--|---|---|--|
| Ballast | Assume 1080 loads ballast | delivered (14/day) eve | enly over 80 days m | nonths 4 th | hrough 6 and mont | th 9 | | | | | | | | | | | | | | | | | | | | | |
| Options | Car Loads @ 100 tn/car | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rail deliver by railcar (100 tons/ car) ** | | Assume 4 round tri | ps trips with 2 cars | s each. | (Yard type locomot | tive (4000 HP + | /-, Туре | EMD SD40 | 1-2) in and | d out four | two times ea | ch) | | | | | | | | | | | | | | | |
| ** Quantity could be delivred on a welded | rail train with one delivery if suffic | ient storage available | Assume 2 road engi | ines (5000 |) HP) in at start of da | y, running all da | ay while | unloading a | and out at | end of day | y for two days | | | | | | | | | | | | | | | | |
| | | | | | ,, | | | | | | | | | | | | | | | | | | | | | | |
| | Davs | Quantity | Horsepo | | Hrs Per Dav | Load Factor | | ROG | 00 | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N20 | ROG | co | NOX | SO2 | PM10 | PM2.5 | ROG | co | NOX | SO2 | PM10 PM2 |
| Rail Delivery Options | Days | - | - | | - | | | ROG | CO | NOX | S02 | PM10 g/bhp-hr | PM2.5 | CO2 | CH4 | N20 | ROG | CO | NOX Ib/d | | PM10 | PM2.5 | ROG | CO | NOX | | PM10 PM2 |
| | Days | - | - | | - | | 0.4 | 0.04212 | 1.2 | В | 1 0.004615 | g/bhp-hr 0.015 | 0.01455 | 490.6731 | 0.038462 | 0.0125 | 0.148574 | 4.515067 | lb/d 3.527396 | ay 0.01628 | 0.052911 | 0.051324 | 0.594296 | 18.06027 | tota 14.10958 | l lbs 0.065121 | 0.211644 0.2052 |
| Rail Delivery Options | Days | - | - | ower | - | | 0.4 | | 1.2 | В | | g/bhp-hr 0.015 | 0.01455 | 490.6731 | | 0.0125 | 0.148574 | 4.515067 | lb/d 3.527396 | ay 0.01628 | 0.052911 | 0.051324 | 0.594296 | 18.06027 | tota 14.10958 | l lbs 0.065121 | |
| Rail Delivery Options Onsite Idling During Rail Delivery | Days | Quantity 4 | - | ower 4000 | - | | 0.4 | 0.04212 | 1.2 | В | 1 0.004615 | g/bhp-hr 0.015 | 0.01455 | 490.6731 | 0.038462 | 0.0125 | 0.148574 | 4.515067 | lb/d 3.527396 2.186986 | ay 0.01628 0.010094 | 0.052911 | 0.051324 | 0.594296 | 18.06027 11.19737 | tota 14.10958 8.747943 | 0.065121 0.040375 | 0.211644 0.2052 |
| Rail Delivery Options Onsite Idling During Rail Delivery In Transit Rail Delivery | Days | Quantity 4 | - | ower 4000 | - | | 0.4 | 0.04212 | 1.2 | В | 1 0.004615 | g/bhp-hr 0.015 | 0.01455 | 490.6731 | 0.038462 | 0.0125 | 0.148574 | 4.515067 | lb/d 3.527396 2.186986 | ay 0.01628 0.010094 | 0.052911 | 0.051324 | 0.594296 | 18.06027 11.19737 | tota 14.10958 8.747943 | 0.065121 0.040375 | 0.211644 0.2052 |
| Rail Delivery Options Onsite Idling During Rail Delivery In Transit Rail Delivery In transit rail delivery includes emissions as | Days | Quantity 4 | - | ower 4000 | - | | 0.4 | 0.04212 | 1.2 | В | 1 0.004615 | g/bhp-hr 0.015 | 0.01455 | 490.6731 | 0.038462 | 0.0125 | 0.148574 | 4.515067 | lb/d 3.527396 2.186986 | ay 0.01628 0.010094 | 0.052911 | 0.051324 | 0.594296 | 18.06027 11.19737 | tota 14.10958 8.747943 | 0.065121 0.040375 | 0.211644 0.2052 |
| Rail Delivery Options Onsite Idling During Rail Delivery In Transit Rail Delivery In transit rail delivery includes emissions as | Days | Quantity 4 | - | ower 4000 | - | | 0.4 | 0.04212 0.04212 | 1.2 | В | 1 0.004615 1 0.004615 | g/bhp-hr 0.015 0.015 | 0.01455 | 490.6731 490.6731 CO2 | 0.038462 0.038462 CH4 g/g | 0.0125 0.0125 Total N2O gal | 0.148574 0.092116 0.24069 ROG | 4.515067 2.799342 7.314409 CO | lb/d 3.527396 2.186986 5.714382 NOX lbs/d | ay 0.01628 0.010094 0.026374 SO2 day | 0.052911 0.032805 0.085716 PM10 | 0.051324 0.031821 0.083144 PM2.5 | 0.594296 0.368463 0.962754 ROG | 18.06027 11.19737 29.25763 CO | tota 14.10958 8.747943 22.85753 NOX tota | 0.065121 0.040375 0.105496 SO2 | 0.211644 0.2052 0.131219 0.1272 0.342863 0.332 |

 2]/Weided fail Train(Off-Highway Truck)
 2]
 2]
 599
 8]
 0.33
 0.07

 Assumptions:
 0.074 Highway truck (gal/tp-hr)
 6.422045827 total Gallost
 0.61
 6.422045827 total Gallost
 6.422045827 total Gallost
 6.422045827 total Gallost
 0.61
 6.422045827 total Gallost
 6.422045827 total Gallost
 6.422045827 total Gallost
 0.61
 6.422045827 total Gallost
 6.422045827 t

| Locomotives | | Emission Factors (g/bhp- | | | | | Emiss | ion Factors (| g/bhp-hr) | | | | | |
|---|-------------|--------------------------|-----|------|------|---------|-------|---------------|------------|-------|---------|----------|----------|--------|
| | PM10 | HC | NOx | CO | HC | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O |
| Tier 4 | 0.015 | 0.04 | 1 | 1.28 | 0.04 | 0.04212 | 1.28 | | 1 0.004615 | 0.015 | 0.01455 | 490.6731 | 0.038462 | 0.0125 |
| Assumes Tier 4 work train is performing the local | I delivery. | | | | | | | | | | | | | |

| | Constants | |
|------------|-----------|-----------|
| lb | | grams |
| 1 | | 453.59237 |
| ton | | lbs |
| 1 | | 2000 |
| metric ton | | grams |
| 1 | | 1000000 |
| GWP CO2e | | CH4 |
| 25 | | 1 |
| GWP CO2e | | N2O |
| 298 | | 1 |
| ton | | lbs |
| 1 | | 2000 |
| metric ton | | lbs |
| 1 | | 2204.623 |
| metric ton | | ton |
| 0.907185 | | 1 |

Phase 1 Deli

| 2S - | | | | |
|------|--|-------------------------------|---|--|
| | Rail, OTM and Turnouts-Ballasted Track | Assume 33 truckloads deliv | ered evenly spread over first two months of track cor | onstruction |
| | Ballast | Assume 300 loads ballast de | elivered (14/day) evenly over 21 days months 2 throu | ugh 3 and 4 |
| | Options | Car Loads @ 100 to/car | | |
| | Rail deliver by railcar (100 tons/ car) ** | 2 | Assume 1 round trips trips with 2 cars each. | (Yard type locomotive (4000 HP +/-, Type EMD SD40-2) in and out one time) |
| | ** Rail delivery would be more economical it | f purchased with Phase 1 mate | rial. | |

| Rail Delivery Options | Days | Quantity | Horsepower | 8 | Hrs Per Da | Load Fac | te ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N20 | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N20 | CO2e |
|--|------|----------------|------------------------------|------|------------|----------|-------------------|------------|-----|---------------|------------|---------|----------|----------|--------|----------|----------|----------|----------|----------|----------|----------|-----------------|----------|----------|
| | | | | | | | | | | | g/bhp-hr | | | | | | | lb/c | day | | | | Total Metric To | ns | MT |
| Onsite Idling During Rail Delivery | | 1 | 1 | 4000 | 1 | 0. | .4 0.04212 | 1.28 | 1 | 1 0.004615 | 0.015 | 0.01455 | 490.6731 | 0.038462 | | | | 3.527396 | | | | | 6.15385E-05 | 2E-05 | 0.792575 |
| In Transit Rail Delivery | | 1 | 1 | 4000 | 1 | 0.24 | 8 0.04212 | 1.28 | 1 | 1 0.004615 | 0.015 | 0.01455 | 490.6731 | 0.038462 | 0.0125 | 0.092116 | | 2.186986 | | | | | 3.81538E-05 | 1.24E-05 | 0.491397 |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Total | 0.24069 | /.314405 | 5.714382 | 0.026374 | 0.085/16 | 0.083144 | 1.271824 | 9.96923E-05 | 3.24E-05 | 1.283972 |
| | | | | | | | | | | | | | | | lotal | 0.24065 | 7.314405 | 5./14382 | 0.026374 | 0.085716 | 0.083144 | 1.271824 | 9.96923E-05 | 3.24E-05 | 1.283972 |
| Locomotives | | Emission | Factors (g/bhp-hr)* | | | 1 | | | En | mission Facto | rs (g/bhp- | ¥) | | | lotal | 0.24065 | /.314405 | 5.714382 | 0.026374 | 0.085716 | 0.083144 | 1.271824 | 9.96923E-05 | 3.24E-05 | 1.283972 |
| Locomotives | PM10 | Emission HC | Factors (g/bhp-hr)* | k | 0 | HC | ROG | CO | En | | | | CO2 | | N2O | 0.24065 | 7.314405 | 5.714382 | 0.026374 | 0.085716 | 0.083144 | 1.271824 | 9.96923E-05 | 3.24E-05 | 1.283972 |
| Locomotives Tier 4 *Source: EPA Emission Factors for Locon | | HC 0.015 | Factors (g/bhp-hr)* NOx 0.04 | 1 | CO 1.28 | HC 0.0 | ROG 14 0.04212 | CO 1.28 | NOX | | PM10 | PM2.5 | | | N2O | I | 7.314405 | 5./14382 | 0.026374 | 0.085716 | 0.083144 | 1.271824 | 9.96923E-05 | 3.24E-05 | 1.283972 |

| | Constants |
|------------|-----------|
| lb | grams |
| 1 | 453.59237 |
| ton | lbs |
| 1 | 2000 |
| metric ton | grams |
| 1 | 100000 |
| GWP CO2e | CH4 |
| 25 | |
| GWP CO2e | N20 |
| 298 | |
| ton | lbs |
| 1 | 2000 |
| metric ton | lbs |
| 1 | 2204.623 |
| metric ton | ton |
| 0.907185 | 1 |

Phase 2 Deliveri

EMFAC2017 (v1.0.2) Emission Rates Region Type: County Region: ORANCE Calendar Year: 2023 Season: Annual Vehicle Classification: EMFAC2011 Cal Units: miles/day for VMT, trips/day for for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vohide/day for IDLEX, RESTL and DURN. Note 'day' in the unit is operation day.

| Region | Calendar Year Vehicle Category | Model Year | Speed | Fuel | Population VMT | | SVMT TO | 5 | STrips F | OG RUNEX | ROG STREX | CO RUNEX | CO STREX | NOx RUNEX | NOx STREX | SOx RUNEX | SOX STREX | PM10 RUNEX | PM10 STREX | PM10 PMTW | PM10 PMBW | PM2.5 RUNEX | PM2.5 STREX | PM2.5 PMTW | PM2.5_PMBW | CO2 RUNEX | CD2 STREX | CH4 RUNEX (| DH4 STREX | N2O RUNEX M | AZO STREX |
|--------|--------------------------------|------------|------------|------|------------------------|------------------|------------------|----------------------|----------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ORANGE | 2023 LDA | Aggregated | Appropated | GAS | 1317264 | 49965793.64 | | 6248383.008 | 58% | 0.007743836 | | 0.606543885 | | | 0.169590934 | 0.002540209 | | 0.00149995 | | | | | | | | | 53.53810958 | | | | 0.024384848 |
| ORANCE | 2023 LDA | Aggregated | Aggrogated | D5L | 13431.01 | 521944.8541 | 0.61% | 63854.3682 | 1% | 0.013569946 | 0 | 0.227182921 | | 0.048567852 | 0 | 0.001882379 | 0 | 0.005609463 | 0 | 0.008000002 | 0.036750011 | 0.0053668 | 0 | 0.002000001 | 0.015750005 | 199.117743 | 0 | 0.000630298 | 0 | 0.031298536 | 0 |
| ORANCE | 2023 LDA | Aggregated | Aggrogated | ELEC | 33012.03 | 1363745.619 | 1.59% | 164035.8627 | 2% | 0 | 0 | 0 | | 0 0 | 0 | 0 | 0 | 0 | 0 | 0.008000002 | 0.036750011 | 0 | 0 | 0.002000001 | 0.015750005 | 0 | 0 | 0 | 0 | 0 | 0 |
| ORANCE | 2023 LDT1 | Aggregated | Aggrogated | GAS | 145926 | 5324604.48 | 6.20% | 676933.8582 | 6% | 0.020442622 | 0.299527348 | 1.037043845 | 2.191511003 | 0.077597393 | 0.228974772 | 0.002962779 | 0.000615855 | 0.001978943 | 0.00233687 | 0.008000002 | 0.036750011 | 0.001819608 | 0.002148737 | 0.002000001 | 0.015750005 | | | 0.004787653 | 0.06188013 | 0.006505475 | 0.027172949 |
| ORANCE | 2023 LDT1 | Aggregated | Aggrogated | D5L | 46.29688 | 970.2407912 | 0.00% | 157.1623518 | 0% | 0.173929598 | 0 | 0.970366346 | | 0.850017124 | 0 | 0.003757056 | 0 | 0.136007381 | 0 | 0.008000002 | 0.036750011 | 0.130123762 | 0 | 0.002000001 | 0.015750005 | 397.420837 | 0 | 0.008078697 | 0 | 0.062469021 | 0 |
| ORANCE | 2023 LDT1 | Aggregated | Aggrogated | ELEC | 1366.204 | 58816.77113 | 0.07% | 6870.769993 | 0% | 0 | 0 | 0 | | 0 0 | 0 | 0 | 0 | 0 | 0 | 0.008000002 | 0.036750011 | 0 | 0 | 0.002000001 | 0.015750005 | 0 | 0 | 0 | 0 | 0 | 0 |
| ORANCE | 2023 LDT2 | Aggregated | Aggrogated | GAS | 459128.1 | 16860833.77 | 19.65% | 2151241.261 | 20% | 0.013032857 | 0.276732518 | 0.803616066 | 2.574979449 | 0.0578555547 | 0.24813429 | 0.003178729 | 0.000671197 | 0.001502955 | 0.001736807 | 0.008000002 | 0.036750011 | 0.001381922 | 0.001596948 | 0.002000001 | 0.015750005 | 321.2197143 | 68.6810073 | 0.003349111 | 0.061292995 | 0.005421704 | 0.03012684 |
| ORANCE | 2023 LDT2 | Aggregated | Aggrogated | D5L | 3171.576 | 131714.3685 | 0.15% | 15530.20474 | 0% | 0.017675285 | 0 | 0.157636728 | | 0.038163309 | 0 | 0.002584973 | 0 | 0.004938616 | 0 | 0.008000002 | 0.036750011 | 0.004724973 | 0 | 0.002000001 | | | 0 | 0.000820983 | 0 | 0.04298065 | 0 |
| ORANCE | 2023 LDT2 | Aggregated | Aggrogated | ELEC | 5547.578 | 177681.564 | 0.21% | 27961.08308 | 0% | 0 | 0 | 0 | | 0 0 | 0 | 0 | 0 | 0 | 0 | 0.008000002 | 0.036750011 | 0 | 0 | 0.002000001 | 0.015750005 | 0 | 0 | 0 | 0 | 0 | 0 |
| ORANCE | 2023 MDV | Aggregated | Aggrogated | GAS | 313407.7 | 11014472.81 | 12.84% | 1450734.231 | 13% | 0.017533478 | 0.353870453 | 0.929801761 | 2.934181691 | 0.077587328 | 0.309678232 | 0.003936807 | 0.000829199 | 0.001558009 | 0.00186252 | 0.008000002 | 0.036750011 | 0.001432615 | | 0.002000001 | 0.015750005 | 397.8255985 | 84.84868518 | 0.004357919 | 0.073940782 | 0.006786742 | 0.033157254 |
| ORANCE | 2023 MDV | Aggregated | Aggrogated | D5L | 7459.366 | 293854.6559 | 0.34% | 36276.35582 | 0% | 0.012459134 | 0 | 0.235878164 | | 0.041879477 | 0 | 0.003405794 | 0 | 0.004379732 | 0 | 0.008000002 | 0.036750011 | 0.004190267 | 0 | 0.002000001 | 0.015750005 | 360.2643448 | 0 | 0.000578703 | 0 | 0.056628538 | 0 |
| ORANCE | 2023 MDV | Aggregated | Aggrogated | ELEC | 3044.279 | 101132.5162 | 0.12% | 15528.53705 | 0% | 0 | 0 | 0 | | 0 0 | 0 | 0 | 0 | 0 | 0 | 0.008000002 | 0.036750011 | 0 | 0 | 0.002000001 | 0.015750005 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | 85,815,565.29 | | 10,857,506.70 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Worker Vehicle Weighte | d Average Emissi | ion Factors (acc | ounts for SAFE Rule) | | 0.010743 | 0.234611 | 0.699061 | 2.234266 | 0.044431 | 0.202557 | 0.002820 | 0.000583 | 0.001555 | 0.001790 | 0.008000 | 0.036750 | 0.001432 | 0.001646 | 0.002000 | 0.015750 | 265.079162 | 59.684785 | 0.002758 | 0.052038 | 0.005064 | 0.026127 |

EMFAC2017 Off-Model Adjustment Factors for Gasoline Light Duty Vehicle Emissions

 Varia
 Notified and the one water of point of years interview constraints of the one of point of the one of point of the one of point of the one of

| Haul Truck Emission | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---|--------------|------------|-----|----------|-------------|------|-------------|-------------|---------------|---------------------------------|---------|---------------|--------------|-------------|-------------|------------|----------------------------|---------------|---------------|---|
| ORANCE | 2023 T7 Single | Aggregated | Aggrogated | DSL | 2446.304 | 171547.3811 | 100% | 28230.00459 | 0.01362657 | 0 0.148382097 | 0 1.614349314 3.592637291 0.012 | 2511587 | 0 0.011277582 | 0 0.03600001 | 0.061740018 | 0.010789719 | 0 0.009000 | 13 0.026460008 1324.327211 | 0 0.000632919 | 0 0.208165795 | 0 |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| Concents Truck Emil | reine Easter | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| ORANCE | 2023 17 single construction | n Aggregated | Appropried | D5L | 722.5048 | 50137.89549 | 100% | 3266.415907 | 0.019116717 | 0 0.167473405 | 0 2.077703851 4.429731006 0.012 | 2674139 | 0 0.014351546 | 0 0.03600001 | 0.061740018 | 0.013730705 | 0 0.009000 | 0.026460008 1341.533024 | 0 0.000887922 | 0 0.210870309 | 0 |
| | 2023 T7 single construction nale construction vehicle category (based on | | | | | | 100% | 3266.415907 | 0.019116717 | 0 0.167473405 | 0 2.077703851 4.429731006 0.012 | 2674139 | 0 0.014351546 | 0 0.03600001 | 0.061740018 | 0.013730705 | 0 0.009000 | 0.026460008 1341.533024 | 0 0.000887922 | 0 0.210670309 | 0 |

Fugitive Dust Emissions

Truck Loading and Stockpiling Material Import/Excavation Quantities

Material Import/Excavation Quantities

| Excavation (CY) | Excavation (tons) | Import (CY) | Import (tons) |
|-----------------|-------------------------|---|--|
| | - | 120,000 | 151,700 |
| | | | |
| Earti | hwork | Eart | hwork |
| PM10 (lbs/day) | PM2.5 (lbs/day) | PM10 (total lbs) | PM2.5 (total lbs) |
| 0.11 | 0.02 | 13.55 | 2.05 |
| | Eartl PM10 (lbs/day) | Earthwork PM10 (bs/day) PM2.5 (bs/day) | - 120,000 Earthwork Eart PM10 (/bs/day) PM2.5 (/bs/day) PM10 (/otal 1bs) |

Fugitive Dust Emission Factors

Storage Pile and Truck Loading Fugitive Dust Emission Factors $EF_0 = k \times (0.0032) \times ((U/5)^{1.5})/((M/2)^{1.6})$

| Variable | Amount | Units | Notes |
|---|----------|----------|--|
| EF (PM ₁₀) for soil | 0.00089 | lb/ton | |
| EF (PM _{2.5}) for soil | 0.000014 | lb/ton | |
| k (PM ₁₀) | 0.35 | factor | |
| k (PM _{2.5}) | 0.053 | factor | |
| U (mean wind speed) | 4.92 | miles/hr | Based on CalEEMod Default Data for Orange County 2.2 m/s |
| M (moisture content) of saturated soil | 12.00 | percent | Based on default moisture content in CalEEMod User's Guide (Appendix A |
| Soil density (CalEEMod default) | 1.26 | tons/cy | |
| M (moisture content) of demolition debris | 2.00 | percent | Based on CalEEMod default using MRI report (Appendix A) |

| | | | | | | Unmitigated Emi | ssions (Ibs/day) | Controlled Emis | isions (lbs/day) | Unmitigated Emiss | ions (total lbs) |
|-------------------------|-------------|-------------------------------------|-------------------------|-------------------------|-------------------|-----------------|------------------|-----------------|------------------|-------------------|------------------|
| Phase 1 - Subphase | Equipment | Number of Earthworking Equipment | Daily Activity Level | Total Activity Level | Days | PM10 | PM2.5 | PM10 | PM2.5 | PM10 | PM2.5 |
| Clear and Grub | D5 Dozer | 1 | 8 | 8 8 | 13 | 6.02209 | 3.31852 | 2.70994 | 1.49334 | 75.87828 | 18.81603 |
| Site Utilities | Gradall | 1 | 8 | 8 8 | 126 | 6.02209 | 3.31852 | 2.70994 | 1.49334 | 758.78285 | 188.16030 |
| | D5 Dozer | 1 | 8 | 8 8 | 63 | 6.02209 | 3.31852 | 2.70994 | 1.49334 | 379.39142 | 94.08015 |
| Earthwork | Gradall | 1 | 8 | 8 8 | 42 | 6.02209 | 3.31852 | 2.70994 | 1.49334 | 250.39834 | 62.09290 |
| Earthwork | Pan | 1 | ٤ | 8 8 | 6 | 6.02209 | 3.31852 | 2.70994 | 1.49334 | 37.93914 | 9.40801 |
| | Road Grader | 1 | 8 | 8 8 | 6 | 6.02209 | 3.31852 | 2.70994 | 1.49334 | 37.93914 | 9.40801 |
| Roadway Paving | Dozer | 1 | 6 | 4 | 8 | 3.01104 | 1.65926 | 1.35497 | 0.74667 | 25.29276 | 6.27201 |
| | | Daily and Total Fugi | tive Dust Emission | s from Bulldozing, Scra | ping, and Grading | 39.14356 | 21.57040 | 17.61460 | 9.70668 | 1565.62194 | 388.23741 |
| | | | | | | | | | | | - |
| Phase 2 - Subphase | Equipment | Number of Earthworking Equipment | Daily Activity Level | Total Activity Level | Days | PM10 | PM2.5 | PM10 | PM2.5 | PM10 | PM2.5 |
| Site Utilities/Electric | Gradall | 1 | 8 | 8 8 | 4 | 6.02209 | 3.31852 | 2.70994 | 1.49334 | 25.2927615 | 13.9377997 |
| Earthwork | D5 Dozer | 1 | 8 | 8 8 | 21 | 6.02209 | 3.31852 | 2.70994 | 1.49334 | 126.4638076 | 69.6889983 |
| Roadway Paving | Dozer | 1 | 4 | 4 | 4 | 3.01104 | 1.65926 | 1.35497 | 0.74667 | 12.6463808 | 6.9688998 |
| | | Daily and Total Fugi | tive Dust Emission | s from Bulldozing, Scra | ping, and Grading | 15.05522 | 8.29631 | 6.77485 | 3.73334 | 164.40295 | 90.59570 |

Bulldozing, Scraping and Grading Emission Factors

$$\label{eq:philosof} \begin{split} & \mathsf{PM10} \ \mathsf{Emission} \ \mathsf{Factor} \left[\mathsf{lb/hr}\right] = 0.75 \times (\mathsf{silt} \ \mathsf{content} \ [\%])^{1.5} \ / \ (\mathsf{moisture})^{1.4} \\ & \mathsf{PM2.5} \ \mathsf{Emission} \ \mathsf{Factor} \left[\mathsf{lb/hr}\right] = 0.60 \times (\mathsf{silt} \ \mathsf{content} \ [\%])^{1.2} \ / \ (\mathsf{moisture})^{1.3} \\ & \mathsf{Reference:} \ \mathsf{AP-42}, \ \mathsf{Table} \ \mathsf{11.9-1}, \ \mathsf{July} \ \mathsf{1986} \end{split}$$

 Parameter
 Value
 Basis

 Sill Contert
 6.9
 USEPA, AP-42, July 1988, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predicine Emission Moniture
 7.9
 USEPA, AP-42, July 1988, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predicine Emission

PM10 Emission Factor PM2.5 Emission Factor

0.75 lb/hr 0.41 lb/hr

Emissions [pounds per day] = Controlled emission factor [pounds per hour] x Bulldozing, scraping or grading time [hours/day]

Paved Roads Fugitive Dust Emissions

Paved Roads

Paved Road Dust

 $EF_{DUST} = [(k(sL)^{0.91} x (W)^{1.02}](1 - P/4N))$

100%

Source: AP-42 Section 13.2.1 (Paved Roads) - http://www.epa.gov/ttnchie1/ap42/ch13/final/c13s0201.pdf

| Variable | Value | Description |
|-----------|---------|---|
| k (PM10) | 0.0022 | particle size multiplier for particle size range and units of interest (lb/VMT) |
| k (PM2.5) | 0.00054 | particle size multiplier for particle size range and units of interest (lb/VMT) |
| sL | 0.032 | road surface silt loading (g/m ²) based on EPA 2011 default for collector streets (https://ww |
| W | 5.20 | average weight of all vehicles based on weighted average of trip types |
| W | 5.20 | haul truck tons |
| Ρ | 64 | number of "wet" days with at least 0.254 mm of precipitation during the averaging period |
| Ν | 365 | number of days in averaging period |

All Vehicle Trip Types

| All vehicle http://www.all.com/ | | |
|---------------------------------|----------------|---|
| EF (PM10) | 0.000494 lb/VM | Т |
| EF (PM2.5) | 0.000121 lb/VM | T |

| Conversion Units | |
|------------------|------|
| lbs | tons |
| 2000 | 1 |

| Vehicle Type | Total Trips | Percent | Weight (tons) |
|--------------|-------------|----------------|---------------|
| Worker | 526 | 77.3% | 2.4 |
| Trucks | 154 | 22.7% | 14.75 |
| Total | 680 | Average Weight | 5.20 |

Architectural Coatings

| 239.62 |
|--------|
| |
| 187.27 |
| 29.58 |
| 74.31 |
| |

Mitigated Emissions

| Phase 2 Max Daily Arch Coating and Parking Related VOC Emissions (lbs) | 29.73 | |
|--|---------------|-------------|
| Phase 1 | Total Sq. Ft. | Source/Note |
| Train Wash | 11,110 | |
| S&I (Pump House) | 750 | |
| Utility Building | 961 | 1 |
| Transportation Building | 7,495 | |
| Total | 20,316 | |
| | | |
| Phase 2 | Total Sq. Ft. | Source/Note |
| Maintenance Building | 40,392 | 1 |

| | Architectural Coatings | |
|---|---------------------------|-------------------------|
| | Total VOC Emissions (lbs) | VOC Emissions (lbs/day) |
| Phase 1 Buildings - Exterior Surface Area (A) | 58.87 | 7.38 |
| Phase 1 Buildings - Interior Surface Area (A) | 176.61 | 22.13 |
| Phase 2 Buildings - Exterior Surface Area (A) | 117.04 | 18.58 |
| Phase 2 Buildings - Interior Surface Area (A) | 351.13 | 55.74 |
| MITIGATED 2 Buildings - Exterior Surface Area (A) | 46.82 | 7.43 |
| MITIGATED Phase 2 Buildings - Interior Surface Area (A) | 140.45 | 22.29 |

Assumptions: Default value based on SCAQMD methods used in coating rules are 25% for exterior shell and 75% for interior surfaces. Assumes architectural coating occurs for 2% of the Building Phase duration (consistent with paint sprayers estimated duration)

| CalEEMod Default Assumptions | Unmitigated | Mitigated | Unit | Sources/Notes: | |
|---|-------------|---------------------|-------------------------|---------------------|---------------|
| NonResidential Interior | 25 | 100 | g/L | CalEEMod Appendix |) |
| NonResidential Exterior | 25 | 0 100 |) g/L | CalEEMod Appendix E |) |
| | | I | 7 | | |
| | Unmitigated | Mitigated | | | |
| Interior EF _{AC} (Ib/sq.ft) | 0.01159084 | 4 0.004636337 | 7 | | |
| Exterior EF AC (Ib/sq.ft) | 0.01159084 | 4 0.004636337 | 1 | | |
| Painting of Stripes, Handicap Symbols, Directional Arrows, etc. | | | | | |
| | 140/ | 6t | Othe | Co. Et. ann atu | Sources/Notes |
| Total | | 9 square feet | Qty | Sq. Ft. per qty. | Sources/Notes |
| ADA Parking Spaces | | 3 square feet | 2 | 209 | 1 |
| Parking Spaces | | l square feet | 81 | 171 | 1 |
| Golf Cart Spaces | 60 |) square feet | 12 | 50 | 1 |
| | | Parking-Relate | ad Daint | 1 | |
| | | | | - | |
| | square feet | VOC Emissions (lbs) | VOC Emissions (lbs/day) | | |
| A Paint | 892 | 4.14 | 0.07 | | |
| | | | | | |

Assumes paint sprayers during building construction also paint the paved are CalEEMod Default Assumptions Parking Lot Paint

100 g/L 0.004636337

Parking EF AC (lb/sq.ft)

| Conversion Factors | |
|--------------------|--------|
| tons | pounds |
| 1 | 2000 |
| sq. ft. | acre |
| 43560 | 1 |
| grams | lb |
| 453.592 | 1 |
| L | gal |
| 3.78541 | 1 |
| L | OZ |
| 1 | 33.814 |

Asphalt Paving Off-Gassing Emissions

| | lbs VOC | lbs/day | |
|---|---------------|------------|------------------------------|
| Asphalt Paving Off-Gassing | 5.128668 | 0.381597 | |
| Assumes asphalt paying occurs for 16% o | f the readway | naving nha | so (consistent with estimate |

Assumes asphalt paving occurs for 16% of the roadway paving phase (consistent with estimated usage of pavers)

| Project Information | | | Source/Notes | |
|---------------------|---------------|-------|--------------|---|
| Paved Area Total | 85269 sq. ft. | 1.958 | | 1 |

Note: Includes parking lot paved area and Ridge Valley Road paving, assuming 1,600 feet by 44 feet wide

CalEEMod Assumption (Ib VOC/acre) Source: CalEEMod User's Guide Appendix A 2.62

| | Conversion Factors | |
|---------|--------------------|--------|
| | | |
| tons | | pounds |
| | 1 | 2000 |
| sq. ft. | | acre |
| | 43560 | 1 |

CalEEMod Equipment HP and Load Factors

| OFFROAD Equipment Type | Horsepower | Load Factor |
|-----------------------------------|------------|-------------|
| Aerial Lifts | 63 | 0.31 |
| Air Compressors | 78 | 0.48 |
| Bore/Drill Rigs | 221 | 0.50 |
| Cement and Mortar Mixers | 9 | 0.56 |
| Concrete/Industrial Saws | 81 | 0.73 |
| Cranes | 231 | 0.29 |
| Crawler Tractors | 212 | 0.43 |
| Crushing/Proc. Equipment | 85 | 0.78 |
| Dumpers/Tenders | 16 | 0.38 |
| Excavators | 158 | 0.38 |
| Forklifts | 89 | 0.201 |
| Generator Sets | 84 | 0.74 |
| Graders | 187 | 0.41 |
| Off-Highway Tractors | 124 | 0.44 |
| Off-Highway Trucks | 402 | 0.38 |
| Other Construction Equipment | 171 | 0.42 |
| Other General Industrial Equipmen | 88 | 0.34 |
| Other Material Handling Equipmen | 168 | 0.40 |
| Pavers | 130 | 0.42 |
| Paving Equipment | 132 | 0.36 |
| Plate Compactors | 8 | 0.43 |
| Pressure Washers | 13 | 0.3 |
| Pumps | 84 | 0.74 |
| Rollers | 80 | 0.38 |
| Rough Terrain Forklifts | 100 | 0.40 |
| Rubber Tired Dozers | 247 | 0.4 |
| Rubber Tired Loaders | 203 | 0.36 |
| Scrapers | 367 | 0.48 |
| Signal Boards | 6 | 0.82 |
| Skid Steer Loaders | 65 | 0.37 |
| Surfacing Equipment | 263 | 0.30 |
| Sweepers/Scrubbers | 64 | 0.46 |
| Tractors/Loaders/Backhoes | 97 | 0.37 |
| Trenchers | 78 | 0.50 |
| Welders | 46 | 0.45 |

Operational Emissions Summary

Project Operational Emissions:

| | Daily Emissions (lb/day) | | | Total Emissions (metric tons) | | | |
|--------------------------------------|--------------------------|--------|-------|----------------------------------|--------|-------|--------|
| | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2e |
| On-Site Equipment + Backup Generator | 0.83 | 3.48 | 2.53 | 0.01 | 0.11 | 0.15 | 98 |
| On-site Fueling | 0.41 | - | - | - | - | - | - |
| On-site Sand Silo | - | - | - | - | 0.04 | 0.064 | - |
| On-Road Vehicles | 0.06 | 2.00 | 1.58 | 0.02 | 2.26 | 0.01 | 0.13 |
| Architectural Coatings | 0.13 | - | - | - | - | - | - |
| Facility Natural Gas | 0.04 | 0.32 | 0.39 | 0.002 | 0.03 | 0.03 | 85 |
| Facility Electricity | - | - | - | - | - | - | 329 |
| Facility Water | - | - | - | - | - | - | 24 |
| Facility Waste | - | - | - | - | - | - | 279 |
| Total | 1.48 | 5.80 | 4.50 | 0.03 | 2.44 | 0.25 | 815 |
| Air District Threshold | 55.00 | 550.00 | 55.00 | 150.00 | 150.00 | 55.00 | 10,000 |
| Exceed Threshold? | No | No | No | No | No | No | No |

| On-Site Emissions Sources | ROG | CO | NOX | SO2 | PM10 | PM2.5 |
|--------------------------------------|-------|--------|--------|------|------|-------|
| Locomotive Operations (On-site) | 4.45 | 101.85 | 98.30 | 0.37 | 1.98 | 1.92 |
| On-Site Equipment + Backup Generator | 0.83 | 3.48 | 2.53 | 0.01 | 0.11 | 0.15 |
| On-Road Vehicles | 0.004 | 0.14 | 0.11 | 0.00 | 0.16 | 0.00 |
| Architectural Coatings | 0.13 | - | - | - | - | - |
| On-site Fueling | 0.41 | - | - | - | - | - |
| Facility Natural Gas | 0.04 | 0.32 | 0.39 | 0.00 | 0.03 | 0.03 |
| On-site Sand Silo | - | - | - | - | 0.04 | 0.06 |
| Total | 5.88 | 105.80 | 101.34 | 0.38 | 2.32 | 2.16 |

| Locomotive Operational Emissions | |
|----------------------------------|--|
| | |

| | M1/ | T/Year |
|------------|---------------|---------------|
| CH4 N2O | CO2e CO2 | J2e |
| .59 3.06 (| 0.99 39316.50 | 6509.29 |
| .59 3.06 | | 0.99 39316.50 |

| Maintenance Facility On-Site Emissions | | | | | | | Daily | Idling Emission | ns (Ibs/day) | | | | |
|---|--------------------|------|-------------|--------|--------|---------|--------|-----------------|--------------|-----------|--------|--------|------|
| | Daily Idling Hours | HP | Load Factor | ROG | CO | NOX | SO2 | PM10 | PM2.5 | CO2 | CH4 | N2O | CO2e |
| Arrival and Departure Idling Emissions per Tier 2 train per day | 0.166666667 | 3000 | 0.40 | 0.1207 | 0.5644 | 2.1826 | 0.0020 | | 0.0770 | 215.7986 | 0.0170 | 0.0055 | 218 |
| Arrival and Departure Idling Emissions per Tier 4 train per day | 0.166666667 | 4000 | 0.40 | 0.0248 | 0.7525 | 0.5879 | 0.0027 | 0.0088 | 0.0086 | 287.7315 | 0.0226 | 0.0073 | 290 |
| | | | | | | | | | | | | | |
| Other on-site engines operations per Tier 2 train per day | 1 | 3000 | 0.70 | 1.2679 | 5.9277 | 22.9236 | 0.0214 | 0.8336 | 0.8086 | 2266.5331 | 0.1781 | 0.0579 | 2288 |
| Other on-site engines operations per Tier 4 train per day | 1 | 4000 | 0.70 | 0.2601 | 7.9036 | 6.1747 | 0.0285 | 0.0926 | 0.0898 | 3022.0441 | 0.2375 | 0.0772 | 3051 |

*Daily idling time estimated as up to 5 minutes upon arrival and departure (10 minutes total) per train per day. Additional on-site engine operations for movement, maintenance, testing bsaed upon project engineer input.

| - | - | |
|---|---|--|

| | | nission Factors (g/bhp-hr |)* | | | | | Emission Factors (g/bl | | | |
|--|-------------------|---------------------------|----------------------------|-----------------------|-------------|---------|------|------------------------|-------|---------------------------------|------|
| ocomotives | PM10 H | C NOx | co | HC | ROG | co | NOx | SO2 PM10 | PM2.5 | CO2 CH4 N2O | |
| Fier 2 | 0.18 | 0.26 | 4.95 | 1.28 | 0.26 | 0.27378 | 1.28 | 4.95 0.004615385 | 0.18 | 0.1746 489.4230769 0.038461538 | 0.01 |
| Fier 4 | 0.015 | 0.04 | 1 | 1.28 | 0.04 | 0.04212 | 1.28 | 1 0.004615385 | 0.015 | 0.01455 489.4230769 0.038461538 | 0.01 |
| Source: EPA Emission Factors for Locomotives - Technical Highlights (EPA-420-F-09-025) | | | | | | | | | | | |
| Notes: | | | | | | | | | | | |
| Assumes Line-Haul Locomotives with Tier 4 Engines | | | | | | | | | | | |
| Emission Factors Calculations: | Conversion Factor | | | | | | | | | | |
| ROG is estimated as 1.053 times the EF for HC | 1.053 | | | | | | | | | | |
| PM10 = PM | | | | | | | | | | | |
| PM2.5 as a 97% of PM10 | 97% | | | | | | | | | | |
| SO2 Emission Factor (g/gal) = (fuel density) * (64 g SO2 / 32 g S) * (S content of fuel) | | | | | | | | | | | |
| Fuel density | 3200 | | | | | | | | | | |
| 2281) | 15 | | | | | | | | | | |
| SO2 EF (g/gal) | 0.096 | | | | | | | | | | |
| 2021 is defined by U.S. EPA as 10.180 g CO2(gal diese) fuel https://www.spa.gov/energy/gwenhoxe-gases-equivalences-calculator-and-velorencesiti-text-of%20dese/%20consume/ nfc20th/bf0ywambe/20th/b20te/tb20perfb20P/M20Texperfect/20th/20Texperfect/20th/20text/20gal/nf20des/%20th/20text/ set) | 10180 | CO2 (g/gal) | = (fuel density) * (44 g C | 02/12 g C) * (C conte | nt of fuel) | | | | | | |
| CH4 and N2O Emission Factors per EPA: Table 5 in https://www.epa.gov/sites/production/files/2018- 33/documents/emission-factors mar 2018 0.pdf | | | ent of renewable diesel = | | | | | | | | |
| CH4 g/gal | 0.8 | density of fu | | | | | | | | | |
| N2O g/gal | 0.26 | 39.33 gCO2e | | | | | | | | | |
| Conversion for g/gal to g/hp-hr (divide by) per EPA 2009 Technical Highlights | 0.26 | 38.33 gCO2 | 9M3 | | | | | | | | |
| Line Haul and Passenger | 20.8 | | | | | | | | | | |
| Switch | 15.2 | | | | | | | | | | |
| | | | | | | | | | | | |
| Operational Variables | | | | | | | | | | | |
| Operational Days per Year | 365 | | | | | | | | | | |
| | | | | | | | | | | | |
| Number of Trains Serviced at Facility Daily | 12 | | | | | | | | | | |
| | | | | | | | | | | | |
| Engine Tier | | | | | | | | | | | |
| Engine HP | 3000 | | | | | | | | | | |
| Engine Tier | 4 | | | | | | | | | | |
| Engine HP | | | | | | | | | | | |
| | | | | | | | | | | | |

acomotive Engine Mix

| Locomotive Engine Mix | | | |
|-----------------------|------|------|-------|
| | 2026 | 2021 | 2028 |
| Percent Tier 2 | 8% | 27% | 0.00% |
| Percent Tier 4 | 92% | 73% | 100% |

Horsepower and Load Factor Calculations

| | | | Notch Power Level as |
|---------------|---------------------------|-----------------|----------------------|
| | Percent Operating Time at | (split idle and | a Percent of Rated |
| lotch | Each Notch Power Level | moving time) | Power ² |
| lormal Idle | 47.40% | 100.00% | 0.40% |
| lynamic Break | 6.20% | 11.79% | 2.10% |
| lotch 1 | 7.00% | 13.31% | 4.50% |
| lotch 2 | 5.10% | 9.70% | 11.50% |
| lotch 3 | 5.70% | 10.84% | 23.50% |
| lotch 4 | 4.70% | 8.94% | 35.00% |
| lotch 5 | 4.00% | 7.60% | 48.50% |
| lotch 6 | 2.90% | 5.51% | 64.00% |
| lotch 7 | 1.40% | 2.66% | 85.00% |
| lotch 8 | 15.60% | 29.66% | 100.00% |

| Time-weighted engine Load Factor | |
|---|-------------------------|
| Idle | 0.40% |
| In-transit | 46.8% |
| Idling and In-Transit | 24.8% |
| Idling and In-Transit | 70.0% |
| Conversion Factors (per EPA 2009 Emission Factors for Locomotives Technical Hig | phlights - Table 3) |
| | Conversion Factor (bhp- |
| Locomotive Application | hr/gal) |

| Locomotive Application | hr/gal) |
|-------------------------------|------------|
| Large Line-Haul and Passenger | 20.8 |
| Small Line-Haul | 18.2 |
| Switching | 15.2 |
| Conversion Factors | |
| grams per pound | 453.59237 |
| pounds per ton | 2000 |
| pounds per metric ton | 2204.62262 |
| Global Warming Potential | |
| CO2 | 1 |
| Ch4 | 25 |
| N20 | 298 |

On-Site Equipment Exhaust Emissions

| Project-Specific Equipment (CalEEMod equivalent) ¹ | # / Day | Operational hours / day | Horsepower ² | Load Factor | | Emissio | Factors (g/hp-hr) | 3 | | Emissi | on Factors (g/gal) | gal/hp-hr | | | | Daily E | missions (lb. | iday) | | | | Annual Emissions (metric tons/year) |
|---|---------|----------------------------|-------------------------|-------------|-----------|-------------------|-------------------|----------|-----------|--------|--------------------|-------------|------|------|------|---------|---------------|-------|-----|--------|--------|--|
| | | | | | ROG | CO NO | X SO2 | PM10 | PM2.5 CO | 2 CH4 | N2O | | ROG | CO 1 | NOX | SO2 | PM10 1 | PM2.5 | CO2 | CH4 | N20 | CO2e |
| Crane | 4 | 6 | 231 | 0.29 | 0.035984 | 0.23724301 0.155 | 3145 0.0009742 | 0.002854 | 0.0026 10 | 0.57 | 0.26 | 7.22227E-05 | 0.13 | 0.84 | 0.55 | 0.00 | 0.01 | 0.01 | 374 | 0.0001 | 0.0001 | 61.90 |
| Forklift | 4 | 6 | 89 | 0.2 | 0.0475337 | 1.014356664 0.148 | 7462 0.0015081 | 0.00548 | 0.005 16 | 0.57 | 0.26 | 0.002415779 | 0.04 | 0.96 | 0.14 | 0.00 | 0.01 | 0.00 | 154 | 0.0013 | 0.0006 | 25.49 |
| Total | | | | | | | | | | | | | 0.17 | 1.80 | 0.69 | 0.00 | 0.02 | 0.01 | 528 | 0.00 | 0.00 | 87.39 |

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Equipment types is based on project-specific list of anticipated equipment requirements provided by project engineers.
 Used CallEEMod default horsepower and loadfactors of off-road equipment.
 Emission factors based on CARB OFFROAD2017 emissions database for year 2028.

| Conversion Factors | | | |
|--|--------------------------|--|---|
| grams per pound | 453.59237 | Average Operational Days per Year: | 6 |
| pounds per metric ton | 2204.62262 | - | |
| Global Warming Potential | | | |
| CO2 | 1 | | |
| Ch4 | 25 | | |
| N20 | 298 | | |
| Note: GWP are the 100-year GWPs from the IPCC fourth assessment report (AR4), consistent with the Board 2019 GHG emissions inventory. | California Air Resources | | |

On-Site Emergency Generator Exhaust Emissions

| | | | | | | Emissions (lbs/day) | | | | | | | | | Emissions (to | ns/year) | | | | | | | | |
|---|---------------------|-------------|----------------------------|-----------------|---------------|---------------------|-------------|-----------------|-------------|-----------------------------|------------------------------|-------|------------|------------------|---------------|----------|-----------------|------|-----------------------------|------------------------------|-------|------|---------------------|--------------------------------|
| Equipment Type | Horsepower | Load Factor | Hours of Operation per Day | Number of Units | Days per Year | ROG | co | NO _X | SO2 | PM ₁₀ Exhaust | PM _{2.5} Exhaust | CO2 | CH4 | N ₂ O | ROG | CO | NO _X | SO2 | PM ₁₀ Exhaust | PM _{2.5} Exhaust | CO2 | CH4 | N ₂ O (1 | CO ₂ e //T/year) |
| 300KV Backup Generator | 402 | 0.73 | 1 | 1 | 50 | 0.660285 | 1.682118242 | 1.843860381 | 0.003196025 | 0.09704528 | 0.13293874 | 462.3 | 0.06469686 | 0 | 0.02 | 0.04 | 0.05 | 0.00 | 0.00 | 0.00 | 11.56 | 0.00 | 0.00 | 10.52 |
| Emission factors and load power based upon CalE | EMod modeling facto | Irs. | | | | | | | | | | | | | | | | | | | | | | |

| Conversion Factors | | |
|--------------------|----------|----------------|
| lb | | grams |
| 1 | | 453.59237 |
| metric ton | | grams |
| | 1 | 1000000 |
| ton | | lbs |
| | 1 | 2000 |
| metric ton | | lbs |
| | 1 | 2204.623 |
| metric ton | | ton |
| | 0.907185 | 1 |
| CO2 grams | | gallons diesel |
| | 10180 | 1 |
| CO2 grams | | gallons diesel |
| | 8890 | 1 |
| GWP CO2e | | CH4 |
| | 25 | 1 |
| GWP CO2e | | N2O |
| | 298 | 1 |

| CalEEMod Emission Factors | | | | Diesel Emergency G | enerator Emission Fa | ctors | | | |
|---------------------------|----------------|----------------|--------------|--------------------|----------------------|----------------|-----------------|----------------|---------------|
| Horsepower Bin | TOG (lb/hp-hr) | ROG (lb/hp-hr) | CO (g/hp-hr) | NOX (g/hp-hr) | SO2 (g/hp-hr) | PM10 (g/hp-hr) | PM2.5 (g/hp-hr) | CO2 (lb/hp-hr) | CH4 (g/hp-hr) |
| 175-300 | 0.00247 | 0.00225 | 2.6 | 2.85 | 0.00494 | 0.15 | 0.15 | 1.15 | 0.073 |
| 300-600 | 0.00247 | 0.00225 | 2.6 | 2.85 | 0.00494 | 0.15 | 0.15 | 1.15 | 0.073 |

Offsite On-Road Vehicle Emissions (Exhaust)

| | | | | Daily Emissions ³ (Ib/day) | | | | | | | | Daily Emissions (metric tons/day) | Annual Emissions (metric tons) | | | | |
|-------------------------|--------------------------|--------------------------|-------|---------------------------------------|-------|-------|---------------------------------------|-----------------|---------------|-------------------------------------|------------------|--------------------------------------|-----------------------------------|-------|-------|-------|-------|
| Vehilcle Type | Trips / Day ¹ | Miles / Day ² | ROG | со | NOX | SO2 | PM10 Fugitive Dust ⁴ | PM10 Exhaust | PM10 Total | PM2.5 Fugitive Dust ⁴ | PM2.5 Exhaust | PM2.5 Total | CO2 | CH4 | N2O | CO2e | CO2e |
| Fuel Trucks | 2 | 33.2 | 0.001 | 0.011 | 0.134 | 0.001 | 0.117 | 0.001 | 0.117 | 0.029 | 0.001 | 0.030 | 91.236 | 0.000 | 0.014 | 0.041 | 0.007 |
| Delivery Haul Trucks | 20 | 332 | 0.010 | 0.112 | 1.341 | 0.009 | 1.165 | 0.009 | 1.175 | 0.294 | 0.007 | 0.301 | 912.362 | 0.000 | 0.143 | 0.414 | 0.069 |
| Worker Trips | 80 | 1328 | 0.044 | 1.877 | 0.105 | 0.007 | 0.978 | 0.0 | 0.986 | 0.260 | 0.003 | 0.267 | 718.540 | 0.011 | 0.015 | 0.326 | 0.054 |
| Total On-Road Emissions | | | 0.056 | 2.001 | 1.580 | 0.017 | 2.260 | 0.014 | 2.278 | 0.584 | 0.011 | 0.598 | 1722 | 0.012 | 0.173 | 0.781 | 0.129 |

Operational Days per Year:

365

1. Trip per day reflex estantial maximu daily workers, delivory tracks, and field tracks. Topa are non-way trips.
2. Mike per day based on the lupth data from CaEEBade for Gauge Course for commercial-water (CNW) and counselial-watered are constrained as equivalent and the CAUST arguing the test for large 200 attentionation completion (operational yar), and paoline high day while (ILDAT). (LIDT and MMV) missional taken were adjusted using the CAUB COS Model (Adjustante Factors for the same yare.
4. Kahaka researcial-test for displars or mattered taken data metision for perform (Ar-QAC) and (Ar-QAC).

| Assumptions | |
|---|------------|
| Fuel Truck Trip length (miles) (CalEEMod default C-NW for Orange County Urban) | 6.9 |
| Delivery Truck Trip length (miles) (CalEEMod default C-NW for Orange County Urban) | 6.9 |
| Worker Trip length (miles) (CalEEMod default C-W for Orange County Urban) | 16.6 |
| | |
| | |
| Conversion Factors | |
| grams per pound | 453.59237 |
| pounds per ton | 2000 |
| pounds per metric ton | 2204.62262 |
| Global Warming Potential | |
| C02 | 1 |
| Ch4 | 25 |
| N20 NOC: OWF are the 100-year OWFS from the IFCC routin assessment report | 298 |
| Colifornia Air Barranno Barrel 2010 CUC aminine insustant | |

| | | | | | | | | | | Emissi | on Factors (g/mi | le) ' | | | | | | | | | |
|---------------|-------------------------|---|---|---|---|---|---|---|--|---|--|--|--|--|---|--|---|---|---|---|--|
| ROG_ RUNEX | ROG_ STREX | CO_ RUNEX | CO_ STREX | NOX_ RUNEX | NOX_ STREX | SO2_ RUNEX | SO2_ STREX | PM10 Fugitive Dust ⁴ | PM10_ RUNEX | PM10_ STREX | PM10 Total | PM2.5 Fugitive Dust ⁴ | PM2.5_ RUNEX | PM2.5_ STREX | PM2.5 Total | CO2_ RUNEX | CO2_ STREX | CH4_ RUNEX | CH4_ STREX | N2O_ RUNEX | N2O_ STREX |
| 0.014 | 0.000 | 0.154 | 0.000 | 1.614 | 3.606 | 0.012 | 0.000 | 1.592 | 0.013 | 0.000 | 1.605 | 0.402 | 0.009 | 0.000 | 0.411 | 1246.507 | 0.000 | 0.001 | 0.000 | 0.196 | 0.000 |
| 0.014 | 0.000 | 0.154 | 0.000 | 1.614 | 3.606 | 0.012 | 0.000 | 1.592 | 0.013 | 0.000 | 1.605 | 0.402 | 0.009 | 0.000 | 0.411 | 1246.507 | 0.000 | 0.001 | 0.000 | 0.196 | 0.000 |
| 0.006 | 0.153 | 0.530 | 1.853 | 0.027 | 0.146 | 0.002 | 0.000 | 0.334 | 0.001 | 0.001 | 0.337 | 0.089 | 0.001 | 0.001 | 0.091 | 242.415 | 49.957 | 0.002 | 0.036 | 0.004 | 0.021 |
| | RUNEX 0.014 0.014 | RUNEX STREX 0.014 0.000 0.014 0.000 | RUNEX STREX RUNEX 0.014 0.000 0.154 0.014 0.000 0.154 | RUNEX STREX RUNEX STREX 0.014 0.000 0.154 0.000 0.014 0.000 0.154 0.000 | RUNEX STREX RUNEX STREX RUNEX 0.014 0.000 0.154 0.000 1.614 0.014 0.000 0.154 0.000 1.614 | RUNEX STREX RUNEX STREX RUNEX STREX 0.014 0.000 0.154 0.000 1.614 3.606 0.014 0.000 0.154 0.000 1.614 3.606 | RUNEX STREX RUNEX STREX RUNEX STREX RUNEX 0.014 0.000 0.154 0.000 1.614 3.606 0.012 0.014 0.000 0.154 0.000 1.614 3.606 0.012 | RUNEX STREX RUNEX STREX RUNEX STREX RUNEX STREX 0.014 0.000 0.154 0.000 1.614 3.606 0.012 0.000 0.014 0.000 0.154 0.000 1.614 3.606 0.012 0.000 | ROG_ ROG_ CO_ NOX_ NOX_ NOX_ SO2_ Fugitive RUNEX STBELX RUNX_ STBELX RUNX_ STBELX STBELX Dast ⁴ 0014 0000 0.154 0.000 1.614 3.606 0.012 0.000 1.592 0.014 0.000 0.154 0.606 1.612 3.606 0.012 0.000 1.592 | ROG_ RUNXT ROG_ STREAX CO_ RUNX STREAX RUNX STREAX RUNXT STREAX RUNXT STREAX RUNTX STREAX RUNXT STREAX RUNXT STREAX RUNXT STREAX RUNXT STREAX RUNXT STREAX RUNXT STREAX RUNTX STREAX RUNXT STREAX RUNXT STREAX RUNXT STREAX RUNXT STREAX RUNXT STREAX RUNXT </td <td>ROG_ RUNEX ROG_ STREX CO_ RUNEX CO_ STREX NOX, RUNEX NOX, STREX SO2, RUNEX SO2, STREX PM0 Featⁱⁿ RUNEX PM10, STREX 0.014 0.000 0.154 0.000 1.614 3.606 0.012 0.000 1.52 0.010 0.014 0.000 0.154 0.000 1.614 3.606 0.012 0.000 1.592 0.013 0.000</td> <td>ROG_ RUNEX ROG_ STREX CO_ RUNEX CO_ STREX NOX. RUNEX NOX. STREX SO2 RUNEX SO2 STREX PM10 Pagitive Dust PM10 STREX PM10 STREX PM10 STREX 0.014 0.000 0.154 0.000 1.641 3.666 0.012 0.000 1.922 0.013 0.000 1.645 0.014 0.000 0.154 0.001 1.641 3.666 0.002 0.000 1.922 0.013 0.000 1.645</td> <td>ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. STREX NOX. RUNEX SO2 STREX SO2 RUNEX SO2 STREX PM10 RUNEX PM10 Total PM10 Total PM10 Total PM10 Total PM10 Total PM10 RUNEX PM10 Total PM10 RUNEX PM10 Total PM10 RUNEX PM10 RUNEX<</td> <td>ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. STREX SO2. RUNEX SO2. STREX PM09 RUNEX PM19 RUNEX PM19 RUNEX PM19 RU</td> <td>ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. STREX NOX. RUNEX SO2. STREX SO2. RUNEX SO2. STREX PM0. STREX PM0. RUNEX PM0. STREX PM1.9 PM2.5 Fuglity: Data PM2.5 RUNEX PM1.2.5 RUNEX PM1.9 0.014 0.000 0.154 0.000 1.044 3.066 0.012 0.000 1.592 0.013 0.000 1.665 0.402 0.009 0.000 0.014 0.000 0.154 0.001 0.000 1.592 0.013 0.000 1.665 0.402 0.009 0.000</td> <td>ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. STREX NOX. RUNEX SO2. STREX SO2. RUNEX SO2. STREX PAID STREX PAID RUNEX PAID STREX PAID STREX PAID STREX PAID STREX PAID STR</td> <td>ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. RUNEX SO2 STREX SO2 RUNEX SO2 STREX SO2 RUNEX SO2 STREX PAID RUNEX PAID STREX PAID Fuglity RUNEX PAID STREX PAILS Fuglity RUNEX PAILS STREX PAILS Fuglity RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS Fuglity RUNEX PAILS STREX PAILS Fuglity RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS RUNEX</td> <td>ROG_ RUNEX ROG_ STREX CO. RUNEX CO. STREX ROX RUNEX SO2 RUNEX SO2 RUNEX SO2 STREX FM10 Full FM10 RUNEX FM10 STREX PM12.5 Fugitive Dust PM12.5 RUNEX PM12</td> <td>ROG_ RUNEX ROG_ STREX CO. RUNEX ROX. STREX NOX. RUNEX SO2. RUNEX PM19 STREX PM19 RUNEX PM19 STREX PM19 PM19 PM125 Fugitive bast PM155 RUNEX PM155 STREX PM155 RUNEX <</td> <td>ROG_ RUNEX ROG_ STREX CO. RUNEX ROX. STREX NOX. RUNEX SO2. RUNEX FM10 STREX PM10 RUNEX PM10 STREX PM10 Fuglity PM12.5 RUNEX PM15.5 RUNEX PM16.5 RUNEX PM</td> <td>BÓG, RÍNX BÓG, STREX CO. STREX CO. STREX NOX. STREX NOX. STREX SO2. STREX PAID ROME PAID STREX PAID STREX<</td> | ROG_ RUNEX ROG_ STREX CO_ RUNEX CO_ STREX NOX, RUNEX NOX, STREX SO2, RUNEX SO2, STREX PM0 Feat ⁱⁿ RUNEX PM10, STREX 0.014 0.000 0.154 0.000 1.614 3.606 0.012 0.000 1.52 0.010 0.014 0.000 0.154 0.000 1.614 3.606 0.012 0.000 1.592 0.013 0.000 | ROG_ RUNEX ROG_ STREX CO_ RUNEX CO_ STREX NOX. RUNEX NOX. STREX SO2 RUNEX SO2 STREX PM10 Pagitive Dust PM10 STREX PM10 STREX PM10 STREX 0.014 0.000 0.154 0.000 1.641 3.666 0.012 0.000 1.922 0.013 0.000 1.645 0.014 0.000 0.154 0.001 1.641 3.666 0.002 0.000 1.922 0.013 0.000 1.645 | ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. STREX NOX. RUNEX SO2 STREX SO2 RUNEX SO2 STREX PM10 RUNEX PM10 Total PM10 Total PM10 Total PM10 Total PM10 Total PM10 RUNEX PM10 Total PM10 RUNEX PM10 Total PM10 RUNEX PM10 RUNEX< | ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. STREX SO2. RUNEX SO2. STREX PM09 RUNEX PM19 RUNEX PM19 RUNEX PM19 RU | ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. STREX NOX. RUNEX SO2. STREX SO2. RUNEX SO2. STREX PM0. STREX PM0. RUNEX PM0. STREX PM1.9 PM2.5 Fuglity: Data PM2.5 RUNEX PM1.2.5 RUNEX PM1.9 0.014 0.000 0.154 0.000 1.044 3.066 0.012 0.000 1.592 0.013 0.000 1.665 0.402 0.009 0.000 0.014 0.000 0.154 0.001 0.000 1.592 0.013 0.000 1.665 0.402 0.009 0.000 | ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. STREX NOX. RUNEX SO2. STREX SO2. RUNEX SO2. STREX PAID STREX PAID RUNEX PAID STREX PAID STREX PAID STREX PAID STREX PAID STR | ROG_ RUNEX ROG_ STREX CO. RUNEX NOX. RUNEX SO2 STREX SO2 RUNEX SO2 STREX SO2 RUNEX SO2 STREX PAID RUNEX PAID STREX PAID Fuglity RUNEX PAID STREX PAILS Fuglity RUNEX PAILS STREX PAILS Fuglity RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS Fuglity RUNEX PAILS STREX PAILS Fuglity RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS STREX PAILS RUNEX PAILS RUNEX | ROG_ RUNEX ROG_ STREX CO. RUNEX CO. STREX ROX RUNEX SO2 RUNEX SO2 RUNEX SO2 STREX FM10 Full FM10 RUNEX FM10 STREX PM12.5 Fugitive Dust PM12.5 RUNEX PM12 | ROG_ RUNEX ROG_ STREX CO. RUNEX ROX. STREX NOX. RUNEX SO2. RUNEX PM19 STREX PM19 RUNEX PM19 STREX PM19 PM19 PM125 Fugitive bast PM155 RUNEX PM155 STREX PM155 RUNEX < | ROG_ RUNEX ROG_ STREX CO. RUNEX ROX. STREX NOX. RUNEX SO2. RUNEX FM10 STREX PM10 RUNEX PM10 STREX PM10 Fuglity PM12.5 RUNEX PM15.5 RUNEX PM16.5 RUNEX PM | BÓG, RÍNX BÓG, STREX CO. STREX CO. STREX NOX. STREX NOX. STREX SO2. STREX PAID ROME PAID STREX PAID STREX< |

Architectural Coatings

Max Daily Arch Coating and Parking Related VOC Emissions (lbs) 0.13

| Phase 1 | Total Sq. Ft. | Source/Note |
|--|---------------|-------------|
| Train Wash | 11,110 | |
| S&I (Pump House) | 750 | |
| Utility Building | 961 | 1 |
| Transportation Building | 7,495 | |
| Total (assumes 10% of total area per year) | 2,032 | |

| | Architectu | ural Coatings | |
|---------------------------------------|---------------------------|-------------------------|------|
| | Total VOC Emissions (lbs) | VOC Emissions (lbs/day) | |
| Buildings Exterior Surface Area (A) | 5.89 | | 0.03 |
| Buildings - Interior Surface Area (A) | 17.66 | | 0.10 |

Assumptions: Surface for painting is 2 times the nonresidential square footage. Default value based on SCAQMD methods used in coating rules are 25% for exterior shell and 75% for interior surfaces.

Assumes architectural coating occurs for 2% of the Building Phase duration (consistent with paint sprayers estimated duration)

| CalEEMod Default Assumptions | Unit | Sources/Notes: |
|--------------------------------------|-------------|---------------------|
| NonResidential Interior | 250 g/L | CalEEMod Appendix D |
| NonResidential Exterior | 250 g/L | CalEEMod Appendix D |
| | | |
| Interior EF _{AC} (lb/sq.ft) | 0.011590844 | |
| Exterior EF _{AC} (lb/sq.ft) | 0.011590844 | |

Painting of Stripes, Handicap Symbols, Directional Arrows, etc.

| Total (assumes 10% of total area per year) | 1486.9 | square feet | Qty | Sq. Ft. per qty. | Sources/Notes |
|--|--------|-------------|-----|------------------|---------------|
| ADA Parking Spaces | 418 | square feet | 2 | 209 | 1 |
| Parking Spaces | 13851 | square feet | 81 | 171 | 1 |
| Golf Cart Spaces | 600 | square feet | 12 | 50 | 1 |

| | | Parkir | g-Related Paint | |
|---------|-------------|---------------------|-------------------------|-------|
| | square feet | VOC Emissions (lbs) | VOC Emissions (lbs/day) | |
| A Paint | 89 | 0. | 11 | 0.002 |

Assumes paint sprayers during building construction also paint the paved areas. CalEEMod Default Assumptions

100 g/L

Parking EF AC (lb/sq.ft)

Parking Lot Paint

0.004636337

| | Conversion Factors | |
|---------|--------------------|--------|
| tons | | pounds |
| | 1 | 2000 |
| sq. ft. | | acre |
| | 43560 | 1 |
| grams | | lb |
| | 453.592 | 1 |
| L | | gal |
| | 3.78541 | 1 |
| L | | OZ |
| | 1 | 33.814 |

Sources/Notes

1 Square footages from AQ Request - GF Responses

Architectural Coatings

The emission factor (EF) is based on the VOC content of the surface coatings and is calculated estimated using the equation below:

$$EF_{AC} = C_{VOC} / 454(g/lb) \times 3.785(L/Gal) / 180(sqft)$$

Where:

EF = emission factor (lb/sq. ft.)

C = VOC content (g/L). This varies by location and year.

$$E_{AC} = EF_{AC} \times F \cdot A_{paint}$$

Where:

E = emissions (lb VOC)

EF = emission factor (lb/sq. ft.)

A = building surface area (sq. ft.).

CalEEMod also calculates the VOC emissions from the painting of stripes, handicap symbols, directional arrows and car space descriptions in parking lots. Please refer to Appendix E for the studies conducted to determine a default percent of parking lot square footage that is painted. The equation for striping emission is the same as that for E_{AC} above, but A_{paint} is:

$$A_{paint} = A_{PL} \times P\%$$

Where:

A_{PL} = Parking lot area (sq. ft.)

P% = Default percent of parking lot area that is painted (6%)

The VOC content limit for parking lot area is either provided by local air districts or based on the exterior coating VOC limit of the region where the project is located. If the user has more specific VOC content limit on the coating being applied the default can be overridden but the user is expected to explain and justify the change in the "Remarks" box at the bottom of the screen.

Fuel Tank Emissions

| | | | | | | 1,2,4- |
|--------------------|--|---|--|--|---|---|
| | | Benzene | Toluene | | | Trimethylbenzene |
| Total Losses (tpy) | Hexane (-n) tpy | (tpy) | (tpy) | Ethylbenzene (tpy) | Xylene (-m) (tpy) | (tpy) |
| 1.48E-02 | 0.00E+00 | 0.00E+00 | 3.23E-04 | 3.48E-05 | 8.81E-04 | 7.15E-04 |
| 1.48E-02 | 0.00E+00 | 0.00E+00 | 3.23E-04 | 3.48E-05 | 8.81E-04 | 7.15E-04 |
| 1.48E-02 | 0.00E+00 | 0.00E+00 | 3.23E-04 | 3.48E-05 | 8.81E-04 | 7.15E-04 |
| 1.48E-02 | 0.00E+00 | 0.00E+00 | 3.23E-04 | 3.48E-05 | 8.81E-04 | 7.15E-04 |
| 1.44E-02 | 0.00E+00 | 0.00E+00 | 3.14E-04 | 3.37E-05 | 8.54E-04 | 6.92E-04 |
| | 1.48E-02 1.48E-02 1.48E-02 1.48E-02 1.48E-02 | 1.48E-02 0.00E+00 1.48E-02 0.00E+00 1.48E-02 0.00E+00 1.48E-02 0.00E+00 1.48E-02 0.00E+00 | Total Losses (tpy) Hexane (-n) tpy (tpy) 1.48E-02 0.00E+00 0.00E+00 1.48E-02 0.00E+00 0.00E+00 | Total Losses (tpy) Hexane (-n) tpy (tpy) (tpy) 1.48E-02 0.00E+00 0.00E+00 3.23E-04 1.48E-02 0.00E+00 0.00E+00 3.23E-04 | Total Losses (tpy) Hexane (-n) tpy (tpy) (tpy) Ethylbenzene (tpy) 1.48E-02 0.00E+00 0.00E+00 3.23E-04 3.48E-05 1.48E-02 0.00E+00 0.00E+00 3.23E-04 3.48E-05 | Total Losses (tpy) Hexane (-n) tpy (tpy) (tpy) Ethylbenzene (tpy) Xylene (-m) (tpy) 1.48E-02 0.00E+00 0.00E+00 3.23E-04 3.48E-05 8.81E-04 1.48E-02 0.00E+00 0.00E+00 3.23E-04 3.48E-05 8.81E-04 |

Speciated TACs from SCAQMD storage tank guidance document for diesel.

http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/supplemental-instructions-for-liquid-organic-storage-tanks.pdf

Supplemental Instructions for Liquid Organic Storage Tanks South Coast AQMD Annual Emissions Reporting Program

APPENDIX 3: Default TAC Profile for Select Petroleum Products

| | Crude | Oil | |
|------------------------|------------|----------------------|------------------|
| Chemical Name | CAS Number | Liquid Weight (%) | Molecular Weight |
| Hexane (-n) | 110543 | 0.40 | 86.17 |
| Benzene | 71432 | 0.60 | 78.11 |
| Isooctane | 26635643 | 0.10 | 114.22 |
| Toluene | 108883 | 1.00 | 92.13 |
| Ethylbenzene | 100414 | 0.40 | 106.17 |
| Xylene (-m) | 1330207 | 1.40 | 106.17 |
| Isopropyl benzene | 98828 | 0.10 | 120.20 |
| 1,2,4-Trimethylbenzene | 95636 | 0.33 | 120.19 |
| Cyclohexane | 110827 | 0.70 | 84.16 |

| Distillate Fuel Oil #2 (Diesel) | | | | | | | | |
|---------------------------------|------------|----------------------|------------------|--|--|--|--|--|
| Chemical Name | CAS Number | Liquid Weight (%) | Molecular Weight | | | | | |
| Hexane (-n) | 110543 | 0.00 | 86.17 | | | | | |
| Benzene | 71432 | 0.00 | 78.11 | | | | | |
| Toluene | 108883 | 0.03 | 92.13 | | | | | |
| Ethylbenzene | 100414 | 0.01 | 106.17 | | | | | |
| Xylene (-m) | 1330207 | 0.29 | 106.17 | | | | | |
| 1,2,4-Trimethylbenzene | 95636 | 1.00 | 120.19 | | | | | |

Sand Silo Fugitive Dust *Note that exhaust emissions assoiated with truck delivery is captured under "On-Road Vehicle Emissions"

| Estimated Sand Throughput | Pneumatic Transfer Emission Factor | Gravity Transfer Emission Factor | Pneumatic Transfer Emissions | Gravity Transfer Emissions | Total PM10 |
|---------------------------|------------------------------------|----------------------------------|------------------------------|----------------------------|------------|
| (tons per year) | (pounds PM10 per ton) | (pounds PM10 per ton) | (pounds PM10 per year) | (pounds PM10 per year) | (pounds) |
| 1243 | 0.00034 | 0.00099 | 0.42254 | 1.23033 | 1.65287 |

Notes: 1. Sand throughput based on estimated throughput of reference Los Angeles Commerce Railyard Maintenance Facility sand throughput. Throughput is scaled based on facility operations. 2. Emission factors based on AP-42, Table 11.12-2.

Facility Natural Gas Emissions (Direct)

| | | | Emissi | ons (lbs/day) | | | | | | Emissions (to | ons/year) | | | | | | | | |
|--|---|------------------------------------|-----------------|---------------|--------------------------|---------------------------|---------|-------|------------------|---------------|-----------|-----------------|-------|-----------------------------|------------------------------|--------|-------|------------------|--------------------------------|
| kBTU/yr | ROG | со | NO _X | SO2 | PM ₁₀ Exhaust | PM _{2.5} Exhaust | CO2 | CH4 | N ₂ O | ROG | CO | NO _X | SO2 | PM ₁₀ Exhaust | PM _{2.5} Exhaust | CO2 | CH4 | N ₂ O | CO ₂ e (MT/year) |
| 327 | 0.042 | 0.324 | 0.385 | 0.002 | 0.029 | 0.029 | 462.111 | 0.009 | 0.008 | 0.008 | 0.059 | 0.070 | 0.000 | 0.005 | 0.005 | 84.335 | 0.002 | 0.002 | 84.86 |
| this was an experimentary and shells an | union ColEEMed Connert Office Duilding of a | he cannot be a frate on the second | e en la et | | | | | | | | | | | | | | | | |

Operational Days per Year: 365

*Natural gas consumption and daily emissions estimate using CalEEMod General Office Building of the same square footage as the proposed project.

| Conversion Factors | |
|------------------------------------|-------------------------------|
| kWh to MWh | 0.001 |
| pounds per ton | 2000 |
| pounds per metric ton | 2204.62262 |
| average days per month | 30.5 |
| days per year | 365 |
| Global Warming Potential | |
| CO2 | 1 |
| Ch4 | 25 |
| N20 | 298 |
| Note: GWP are the 100-year GWPs fr | om the IPCC fourth assessment |

Facility Electricity Emissions (Indirect)

| | - | | Emissions (lb/d | ay) | | Emissio | ons (metric | tons per y | ear) |
|-----------|----------------------|---------|-----------------|------|---------|---------|-------------|------------|--------|
| kWh/month | Electricity Provider | CO2 | CH4 | N2O | CO2e | CO2 | CH4 | N2O | CO2e |
| 128,011 | SCE | 1961.63 | 0.14 | 0.08 | 1989.52 | 324.77 | 0.02 | 0.01 | 329.39 |

*Electricity estimate based upon CalEEMod General Office Building of the same square footage as the proposed project (this is a conservative estimate resulting in higher electricity consumption compared to industrial uses).

Emission Factors

| | CO2 (MT/MWh) | CH4 (MT/MWh) | N2O (MT/MWh | CO2 (lb/MWh) | CH4 (lb/MWh) | N2O (lb/MWh) |
|-----|--------------|--------------|-------------|--------------|--------------|--------------|
| SCE | 0.21 | - | 8.82179E-06 | 467.38 | 0.034 | 0.019 |

Notes:

Southern California Edison emission factors for CO2 and N2O based upon EEI Metrics produced by Edison International for Southern California Edison

(https://www.edison.com/content/dam/eix/documents/sustainability/eix-esg-pilot-quantitative-section-sce.xlsx). Emission factor for CH4 based upon U.S. EPA eGrid for

CAMX subregion (https://www.epa.gov/sites/production/files/2020-01/documents/egrid2018_summary_tables.pdf)

| Conversion Factors | |
|---|------------|
| kWh to MWh | 0.001 |
| pounds per ton | 2000 |
| pounds per metric ton | 2204.62262 |
| average days per month | 30.5 |
| days per year | 365 |
| Global Warming Potential | |
| CO2 | 1 |
| Ch4 | 25 |
| N20 | 298 |
| Note: GWP are the 100-year GWPs from the (AR4), consistent with the California Air R emissions inventory. | 1 |

Operational Days per Year: 365

Facility Waste Emissions (Indirect)

| | - | Emissions (metric tons per year) | | | |
|------------------------------|--|----------------------------------|------|------|--------|
| Average Annual Waste Tonnage | Average Annual Waste Tonnage (tons/year) | CO2 | CH4 | N2O | CO2e |
| 3.82 | 599.2052 | 124.43 | 6.17 | 0.00 | 278.69 |

*Anticipated waste based on CalEEMod data for Automobile Care Center (note this is more conservative than data for Heavy Industrial) in Climate Zone 8.

Emission Factors

| CO2 (tons/ton waste) | CH4 (tons/ton waste) | N2O (tons/ton waste) |
|----------------------|----------------------|----------------------|
| 0.23 | 0.011350894 | 0 |

Source: CalEEMod

| Conversion Factors | |
|--|-------------------------|
| metric tons per ton | 0.907185 |
| Global Warming Potential | |
| CO2 | 1 |
| Ch4 | 25 |
| N20 | 298 |
| Note: GWP are the 100-year GWPs fr assessment report (AR4), consistent w Resources Board 2019 GHG emission | vith the California Air |

Facility Water Emissions (Indirect)

| | | | | Emiss | sions (metric tons | s per year) | | | |
|--------------------------------|------------------|-------------------|----------------------|--------------------|--------------------|-------------|-----|------|-------|
| | | | Building General | | | | | | |
| | Single Wash | | Operational Water | | Daily Reclaim | | | | |
| Single Wash Fresh Water Demand | Reclaim Water | Trains Washed per | Demand (per 1,000 sq | Annual Fresh Water | Water Demand | | | | |
| (gallons) | Demand (gallons) | Day | ft) | Demand (mgd) | (mgd) | CO2 | CH4 | N2O | CO2e |
| 1,101.00 | 1,220.00 | 10.00 | 177,734 | 31.90 | 4.45 | 23.77 | 0 | 0.00 | 24.07 |

*Anticipated water use provided by project engineering team for train washes, also added typical building water demand for staff and general operations based on CalEEMod default data for a General Office Building.

| Energy Demand | kWhr/million gallons | MWh/million gallons | |
|--|----------------------|---------------------|---|
| Fresh Water | 3500 | 3. | 5 |
| Reclaimed Water | 111 | 0.11 | 1 |
| Source: CalEEMod energy demand for water supply, treater | at, and distribute. | | |

| Conversion Factors | |
|--------------------------|------------|
| pounds per ton | 2000 |
| pounds per metric ton | 2204.62262 |
| average days per month | 30.5 |
| days per year | 365 |
| Global Warming Potential | |
| CO2 | 1 |
| Ch4 | 25 |
| N20 | 298 |

| | | · · | ,, | |
|-----------|-------|------|---------------|------------|
| Resources | Board | 2019 | GHG emissions | inventory. |

| | CO2 (MT/MWh) | CH4 (MT/MWh) | N2O (MT/MWh) |
|-----|--------------|--------------|--------------|
| SCE | 0.21 | 0 | 8.82179E-06 |

Notes:

Notes: Southern California Edison emission factors for CO2 and N2O based upon EEI Metrics produced by Edison International for Southern California Edison (https://www.edison.com/content/dam/eix/documents/sustainability/eix-esg-pilot-quantitative-section-sce.xlsx). Emission factor for CH4 based upon U.S. EPA eGrid for CAMX subregion (https://www.epa.gov/sites/production/files/2020-01/documents/egrid2018_summary_tables.pdf)

EIC Code:

| SCC/EIC | YEAR | PM PROFILE NUMBER | PM2.5/TPM | PM10/TPM | (| DG PROFILE F | ROG/TOG | VOC/TOG | | |
|----------------|----------|-------------------------|-----------------|-----------------|--------|--------------|------------|-------------|-----------|-------|
| 4304227078000 | 00 | 0 37 | 1 C | .075 | 0.5 | 600 | 0.6986 | 0.6986 | | |
| https://www.ar | b.ca.gov | /app/emsinv/2017/emseic | query.php?F YR= | 2020&F DIV=-4&F | SEASON | =A&SP=SIP1 | 05ADJ&SPN= | SIP105ADJ&F | AREA=CA&F | EICSU |
| | | | | | | | | | | |
| | | PM10 (lb/yr) | 1.65287 | 0894 | | | | | | |
| | | PM10 (lb/hr) | 0.00075 | 4736 | | | | | | |
| | | PM10/PM2.5 (g/s) | | | | | | | | |
| I | | - | | | | | | | | |
| PM PROFILE | | WEIGHT FRACTION O | WEIGHT FRACT | ON WEIGHT FRA | CTION | | | | | |

| ROFILE | | WEIGHT FRACTION OF | WEIGHT FRACTION | WEIGHT FRACTION | | | | |
|--------|---|---|---|---|--|---|--|---|
| MBER | SAROAD | PM2.5 | OF PM10 | OF TPM | CAS | TAC | lb/yr | lb/hr |
| 371 | 12114 | 0.0005 | 0.0005 | 0.0005 | 7440508 | Copper | 8.26E-04 | 3.77E-07 |
| 371 | 12126 | 0.0055 | 0.0055 | 0.0055 | N/A | Iron | 9.09E-03 | 4.15E-06 |
| 371 | 12136 | 0.0005 | 0.0005 | 0.0005 | 7440020 | Nickel | 8.26E-04 | 3.77E-07 |
| 371 | 12165 | 0.4 | 0.4 | 0.4 | 1175 | Silica, crystln | 6.61E-01 | 3.02E-04 |
| 371 | 12403 | 0.0055 | 0.0055 | 0.0055 | 9960 | Sulfates | 9.09E-03 | 4.15E-06 |
| 871 | 12999 | 0.588 | 0.588 | 0.588 | N/A | Other | 9.72E-01 | 4.44E-04 |
| | PROFILE MBER 371 371 371 371 371 371 371 371 | arr arr <td>MBER SAROAD PM2.5 371 12114 0.0005 371 12126 0.0055 371 12136 0.0005 371 12165 0.4 371 12403 0.0055</td> <td>MBER SAROAD PM2.5 OF PM10 371 12114 0.0005 0.0005 371 12126 0.0055 0.0055 371 12136 0.0005 0.0005 371 12165 0.4 0.4 371 12403 0.0055 0.0055</td> <td>MBER SAROAD PM2.5 OF PM10 OF TPM 371 12114 0.0005 0.0005 0.0005 371 12126 0.0055 0.0055 0.0055 371 12136 0.0005 0.0005 0.0005 371 12165 0.4 0.4 0.4 371 12403 0.0055 0.0055 0.0055</td> <td>MBER SAROAD PM2.5 OF PM10 OF TPM CAS 371 12114 0.0005 0.0005 0.0005 7440508 371 12126 0.0055 0.0055 0.0055 N/A 371 12136 0.0005 0.0005 0.0005 744020 371 12136 0.0005 0.0005 0.0005 744020 371 12165 0.4 0.4 0.4 1175 371 12403 0.0055 0.0055 0.0055 9960</td> <td>MBER SAROAD PM2.5 OF PM10 OF TPM CAS TAC 371 12114 0.0005 0.0005 0.0005 7440508 Copper 371 12126 0.0055 0.0055 0.0055 N/A Iron 371 12136 0.0005 0.0005 0.0005 7440020 Nickel 371 12165 0.4 0.4 0.4 1175 Silica, crystin 371 12403 0.0055 0.0055 0.0055 9960 Sulfates</td> <td>MBER SAROAD PM2.5 OF PM10 OF TPM CAS TAC Ib/yr 371 12114 0.0005 0.0005 0.0005 7440508 Copper 8.26E-04 371 12126 0.0055 0.0055 0.0055 N/A Iron 9.09E-03 371 12136 0.0005 0.0005 0.0005 7440020 Nickel 8.26E-04 371 12165 0.4 0.4 0.4 1175 Silica, crystin 6.61E-01 371 12403 0.0055 0.0055 0.0055 9960 Sulfates 9.09E-03</td> | MBER SAROAD PM2.5 371 12114 0.0005 371 12126 0.0055 371 12136 0.0005 371 12165 0.4 371 12403 0.0055 | MBER SAROAD PM2.5 OF PM10 371 12114 0.0005 0.0005 371 12126 0.0055 0.0055 371 12136 0.0005 0.0005 371 12165 0.4 0.4 371 12403 0.0055 0.0055 | MBER SAROAD PM2.5 OF PM10 OF TPM 371 12114 0.0005 0.0005 0.0005 371 12126 0.0055 0.0055 0.0055 371 12136 0.0005 0.0005 0.0005 371 12165 0.4 0.4 0.4 371 12403 0.0055 0.0055 0.0055 | MBER SAROAD PM2.5 OF PM10 OF TPM CAS 371 12114 0.0005 0.0005 0.0005 7440508 371 12126 0.0055 0.0055 0.0055 N/A 371 12136 0.0005 0.0005 0.0005 744020 371 12136 0.0005 0.0005 0.0005 744020 371 12165 0.4 0.4 0.4 1175 371 12403 0.0055 0.0055 0.0055 9960 | MBER SAROAD PM2.5 OF PM10 OF TPM CAS TAC 371 12114 0.0005 0.0005 0.0005 7440508 Copper 371 12126 0.0055 0.0055 0.0055 N/A Iron 371 12136 0.0005 0.0005 0.0005 7440020 Nickel 371 12165 0.4 0.4 0.4 1175 Silica, crystin 371 12403 0.0055 0.0055 0.0055 9960 Sulfates | MBER SAROAD PM2.5 OF PM10 OF TPM CAS TAC Ib/yr 371 12114 0.0005 0.0005 0.0005 7440508 Copper 8.26E-04 371 12126 0.0055 0.0055 0.0055 N/A Iron 9.09E-03 371 12136 0.0005 0.0005 0.0005 7440020 Nickel 8.26E-04 371 12165 0.4 0.4 0.4 1175 Silica, crystin 6.61E-01 371 12403 0.0055 0.0055 0.0055 9960 Sulfates 9.09E-03 |

EMFAC2017 (v1.0.2) Emission Rates Region Type: County Region: ORANGE Calender Year: 2028 Season: Aerual Vehicle Classification: EMFAC2011 Caleg Units: Indexiday for VMT, tripsiday for Tri

ITW, ghtp for STREX, HTSK and RUNLS, givehicle/day for IDLEX, RESTL and DURN. Note 'day in the unit is operation day.

| ORANGE | 2028 LDA | Apprepaled | Appregated | GAS | 1411674.912 | 50878519.1 5 | 57.71% 6 | | | | 0.131529841 | 0.480052055 | 1.728090108 | 0.020555771 | | | | | 0.001471991 | 0.005000002 | 0.035750011 | 0.001079357 | 0.001353441 | | | | | | | 0.003139936 | 0.020365464 |
|--------|-----------|------------|------------|------|-------------|---------------|----------|--------------|------|-------------|-------------|--------------|-------------|-------------|---|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---|-------------|---|-------------|-------------|
| ORANGE | 2028 LDA | Apprepated | | | | 502226.2677 | | | | 0.008498971 | 0 | 0.195887456 | | 0.020555547 | | 0.001665124 | | 0.002468205 | | | | 0.002361431 | | | | 176.1365845 | 0 | 0.000394761 | 0 | 0.027686218 | 0 |
| ORANGE | 2028 LDA | Apprepated | Appregated | ELEC | | 2456904.286 | | | | 0 | 0 | 0 | | 0 | | | | 0 | | 0.005000002 | | | | 0.002000001 | | | 0 | 0 | 0 | 0 | 0 |
| ORANGE | 2028 LDT1 | | | | 163763.9552 | 5651024.535 | 6.41% 1 | | | | 0.188108592 | | | | | | | | | | | | 0.001602832 | | | | | | | | 0.022649518 |
| ORANGE | 2026 LDT1 | Apprepated | | | 24.64592637 | 736.2971993 | | | | 0.053453782 | 0 | 0.45651042 | | 0.247150389 | | 0.00319413 | | 0.035351113 | | | | 0.033821839 | | | | 337.8745965 | 0 | 0.002947307 | 0 | 0.053109181 | 0 |
| ORANGE | 2026 LDT1 | Apprepated | Appregated | ELEC | 3304.208074 | | | 15405.6098 | | 0 | 0 | 0 | | 0 | | 0 | | | | 0.005000002 | | | | 0.002000001 | | | 0 | 0 | 0 | 0 | 0 |
| ORANGE | 2028 LDT2 | | | | 479335.0185 | | | | | | | | | | | | | | | | | 0.001129066 | | | | | | | | | 0.024082926 |
| ORANGE | 2026 LDT2 | | | | | 155300.4458 | | | | 0.017172368 | 0 | 0.167659441 | 0 | 0.03257795 | 0 | 0.002275403 | 0 | 0.004338879 | | | | 0.004151181 | | | | 240.0918359 | 0 | 0.000797624 | 0 | 0.037833405 | 0 |
| ORANGE | 2028 LDT2 | Apprepaled | Appregated | ELEC | 12010.15439 | 349262.4991 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0.005000002 | | | | 0.002000001 | | | 0 | 0 | 0 | 0 | 0 |
| ORANGE | 2028 MDV | | | | 315682.2972 | 10621237.82 1 | | | | | | 0.6655554182 | | | | | | | | | | | | | | 339.6307051 | | | | | 0.025584364 |
| ORANGE | 2028 MDV | | | | | 338224.9396 | 0.38% 4 | 4718.51654 | 0% 0 | 0.009487418 | 0 | 0.220270272 | 0 | 0.023826779 | 0 | 0.002989891 | 0 | 0.002773437 | | 0.005000002 | | | 0 | | | 315.270205 | 0 | 0.000440672 | 0 | 0.049713272 | 0 |
| ORANGE | 2028 MDV | Apprepaled | Appregated | ELEC | 7944.433907 | 236534.5432 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.005000002 | 0.035750011 | 0 | 0 | 0.002000001 | 0.015750005 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | 88,169,389.59 | 1.00 1 | 1,692,983.05 | 1.00 | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

or Gasoline Light Duty Vehicle Emissions

 DMI/CD100 Motion approximation approximation measurement

 Test
 Test Status
 <thTest Status</th>
 Test Status

Fugitive Dust Emission Factors

| Paved Road Dust | $EF_{DUST} = [(k(sL)^{C})$ | ^{0.91} x (W) ^{1.02}](1 - P/4N)) |
|---|--|---|
| Source: AP-42 Section 13.2.1 (Paved Roads) - http://www.apace.com/apa | p://www.epa.gov/ttnchie1/ap42/ch13/final/c13s0 |)201.pdf |
| Variable | Value | escription |
| | | article size multiplier for particle size rangeand |
| k (PM10) | 0.0022 ur | nits of interest (Ib/VMT) |
| | | article size multiplier for particle size rangeand |
| k (PM2.5) | 0.00054 ur | nits of interest (Ib/VMT) |
| sL | 0.1 ro | bad surface silt loading (g/m ²) |
| W | 2.4 av | verage weight (tons) of vehicles (2.4 tons) |
| W | 12 ha | aul truck tons |
| | | |
| | | umber of "wet" days with at least 0.254 mm (0.1 |
| P | | nches) of precipitation during the averaging period |
| Ν | | umber of days in averaging period |
| Pickup and Worker | | |
| EF (PM10) | 0.000637964 lb/ | J/VMT |
| EF (PM2.5) | 0.000156591 lb/ | |
| Haul Truck | | |
| EF (PM10) | 0.003294168 lb/ |)/VMT |
| EF (PM2.5) | 0.000808568 lb/ | VMT |

OFFROAD Tons Per Year and Gallons Per Horsepower-Hour Calculation

| | ams 453.5924 | CH4 Emissions Factor (g/gallon diesel): N2O Emissions Factor (g/gallon diesel): | 0.57 0.26 | | | | | | | | | | | | |
|------------------|------------------------------|--|------------------|-------------------|-------------|------------|------------|-------------|-------------|--------------|-------------------|------------|-------------|---------------|-------------|
| Region Ca | IYr VehClass | MdlYr HP_ | Bin Fuel | HC_g_hp-hr ROG_g_ | hp-hr TOG_g | hp-hr CO_g | _g_hp-hr_N | Ox_g_hp-hr | CO2_g_hp-hr | PM10_g_hp-hr | PM2_5_g_hp-hr_PM, | _g_hp-hr_S | SOx_g_hp-hr | NH3_g_hp-hr g | al/hp-hr |
| South Coast AQMD | 2028 CHE - Rail RTG Cran | ne AggregaterAgg | regate: Diesel | 0.0297389 0.0359 | 84038 0.042 | 82398 0. | 0.237243 0 | 0.155314526 | 105.470878 | 0.002854091 | 0.002625764 0.0 | 0285409 | 0.00097424 | 0.00086084 | 7.22227E-05 |
| South Coast AQMD | 2028 CHE - Rail Forklift | AggregaterAg | regate: Diesel | 0.0392841 0.0475 | 33723 0.056 | 56906 1.0 | 0143567 0 | .148746164 | 163.249337 | 0.005479709 | 0.005041333 0.0 | 0547971 | 0.00150814 | 0.00133242 | 0.002415779 |
| South Coast AQMD | 2028 OFF - Industrial - Aeri | ial Lifts Aggregate Agg | regate: Gasoline | 0.6523443 0.6000 | 26265 0.717 | 86508 33. | 8.779709 0 | 0.754440462 | 335.070377 | 0.231449201 | 0.17487273 0.2 | 5716578 | 0.00393045 | 0.00517929 | 0.001767678 |
| South Coast AQMD | 2028 OFF - Industrial - Aeri | ial Lifts Aggregate Agg | regate: Diesel | 0.2165427 0.2577 | 03711 0.311 | 82149 1.2 | 2458643 1 | .965178752 | 261.426991 | 0.074904968 | 0.06891257 0.0 | 7490497 | 0.0035618 | 0.00218849 | 0.004997523 |
| South Coast AQMD | 2028 OFF - Industrial - Aeri | ial Lifts Aggregate Agg | regate: Nat Gas | 0 | 0 0.197 | 48075 52. | 2.726227 | 1.4509006 | 310.335024 | 0 | 0 0.1 | 5939052 | 0 | 0 | 0.012648857 |
| South Coast AQMD | 2028 OFF - Industrial - Fork | klifts Aggregate(Agg | regate: Gasoline | 0.2431377 0.2236 | 38068 0.267 | 55822 24. | 1.625827 1 | .018190829 | 232.291908 | 0.016210581 | 0.012247994 0.0 | 1801176 | 0.00232723 | 0.00360408 | 2.81879E-05 |
| South Coast AQMD | 2028 OFF - Industrial - Fork | | regate: Nat Gas | 0 | 0 0.018 | 87453 8.2 | 2085885 0 | 0.886377026 | 202.398041 | 0 | 0 0.0 | 1800889 | 0 | 0 | 1.35055E-05 |
| South Coast AQMD | 2028 OFF - Industrial - Othe | er General Industrial EcAggregatecAge | | 0.9981045 0.9180 | 56541 1.098 | 35314 69. | .488677 1 | .513604764 | 360.713457 | 0.055085962 | 0.041620504 0.0 | 6120662 | 0.00515933 | 0.00628188 | 0.00441549 |
| South Coast AQMD | | er General Industrial Er Aggregater Agg | | 0.2347298 0.2793 | 47844 0.338 | 01089 1.3 | 3300849 | 2.18657337 | 289.833446 | 0.082558925 | 0.075954211 0.0 | 8255892 | 0.00387491 | 0.00242538 | 0.00485907 |
| South Coast AQMD | | er Material Handling EcAggregatecAge | | 0.2823722 0.2597 | 25989 0.310 | 73343 18. | 3.776703 1 | .448620842 | 410.757795 | 0.028633529 | 0.021634222 0.0 | 3181503 | 0.00398599 | 0.00584591 | 0.019803423 |
| South Coast AQMD | 2028 OFF - Industrial - Swe | | regate: Gasoline | | 79475 0.68 | 43102 45. | 428046 1 | .655059377 | 532,488381 | 0.046635848 | 0.035235974 0.0 | 5181761 | 0.00603441 | 0.00803572 | 0.00239064 |
| South Coast AQMD | 2028 OFF - Industrial - Swe | | | 0.3064518 0.3647 | | | | .896232509 | 386.31212 | 0.110040831 | 0.101237564 0.1 | | 0.00532149 | 0.00323403 | 0.042474795 |
| | | | • | | | | | | | | | | | | |

OFFROAD Tons Per Year and Gallons Per Horsepower-Hour Calculation

 Constants

 year
 days

 1
 365

| Region CalYr | VehClass | MdIYr | HP_Bin Fue | el H | IC_tpy I | ROG_tpy | TOG_tpy | CO_tpy | NOx_tpy | CO2_tpy | PM10_tpy | PM2_5_tpy | PM_tpy | SOx_tpy | NH3_tpy | gal/hp-hr |
|--------------------|---|-------------|----------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| South Coast AQMD 2 | 2028 CHE - Rail RTG Crane | Aggregated | Aggregated Die | esel | 4.255279 | 5.1488876 | 6.1276017 | 33.946651 | 22.22366 | 15091.627 | 0.4083865 | 0.3757156 | 0.4083865 | 0.1394019 | 0.1231758 | 0.0103342 |
| South Coast AQMD 2 | 2028 CHE - Rail Forklift | Aggregated | Aggregated Die | esel | 0.2601088 | 0.3147316 | 0.3745567 | 6.7162873 | 0.9848823 | 1080.9112 | 0.0362824 | 0.0333798 | 0.0362824 | 0.0099858 | 0.0088223 | 0.0159954 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Aerial Lifts | Aggregated | Aggregated Ga | asoline | 16.477303 | 15.155824 | 18.132267 | 853.22817 | 19.05611 | 8463.4087 | 5.8460829 | 4.4170404 | 6.4956476 | 0.0992776 | 0.1308217 | 0.0446491 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Aerial Lifts | Aggregated | Aggregated Die | esel | 1.1383845 | 1.3547716 | 1.6392736 | 6.5496204 | 10.331121 | 1374.3452 | 0.3937822 | 0.3622796 | 0.3937822 | 0.0187247 | 0.0115051 | 0.0262724 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Aerial Lifts | Aggregated | Aggregated Na | at Gas | 0 | 0 | 0.9779558 | 261.10859 | 7.1850886 | 1536.828 | 0 | 0 | 0.789327 | 0 | 0 | 0.0626391 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Forklifts | Aggregated | Aggregated Ga | asoline | 267.99528 | 246.50206 | 294.91245 | 27143.487 | 1122.2872 | 256040.63 | 17.867895 | 13.500187 | 19.853216 | 2.565162 | 3.9725529 | 0.0310697 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Forklifts | Aggregated | Aggregated Na | at Gas | 0 | 0 | 47.204143 | 20529.222 | 2216.7795 | 506186.21 | 0 | 0 | 45.039241 | 0 | 0 | 0.0337765 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Other General Industrial Eq | Aggregated | Aggregated Ga | asoline | 12.241324 | 11.25957 | 13.470831 | 852.24885 | 18.563714 | 4423.996 | 0.6756057 | 0.5104577 | 0.750673 | 0.0632769 | 0.0770445 | 0.0541541 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Other General Industrial Eq | Aggregated | Aggregated Die | esel | 1.4065327 | 1.6738901 | 2.025407 | 7.9700489 | 13.102244 | 1736.7213 | 0.4947043 | 0.4551279 | 0.4947043 | 0.023219 | 0.0145332 | 0.0291162 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Other Material Handling Eq | LAggregated | Aggregated Ga | asoline | 0.7185806 | 0.6609505 | 0.7907542 | 47.782938 | 3.6864491 | 1045.2961 | 0.0728666 | 0.0550547 | 0.0809629 | 0.0101435 | 0.0148767 | 0.0503957 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Sweepers/Scrubbers | Aggregated | Aggregated Ga | asoline | 18.01937 | 16.574217 | 19.829218 | 1316.3659 | 47.958561 | 15429.886 | 1.3513643 | 1.0210308 | 1.5015159 | 0.1748587 | 0.2328506 | 0.0692734 |
| South Coast AQMD 2 | 2028 OFF - Industrial - Sweepers/Scrubbers | Aggregated | Aggregated Die | iesel | 0.2801105 | 0.3333546 | 0.4033591 | 1.7195947 | 2.6472845 | 353.10635 | 0.1005822 | 0.0925356 | 0.1005822 | 0.0048641 | 0.002956 | 0.0388238 |

OFROAD2017 (v1.0.1) Emissions Inventory Region Targe County Region Charge Careford Ince: 2023 Science All Apple Black - Ethanol Science All Apple Black - Ethanol Vehick Emission: Emilday, Fuel Consumption: gallonu/year, Activity: hours/year, HP-Hours; HP-H

| Region Cally | r VehClass | MdlYr HP_Bin | Fuel HC | _tpd ROG | tpd TOG_tp | d CO_tpd | NOx_tpd | CO2_tpd | PM10_tpd | PM2_5_tpd | PM_tpd | SOx_tpd | NH3_tpd | Fuel_gpy | Total_Activity_hp1 | Total_PopulaHo | rsepower_Hours_hhpy |
|------------------|--|--------------------------|------------|-------------|------------|-------------|------------|----------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------|----------------|---------------------|
| South Coast AQMD | 2028 CHE - Rall RTG Crane | Aggregated Aggregated | Diesel 0 | .011658 0.0 | 4107 0.016 | 788 0.09300 | 5 0.060887 | 41.34692 | 0.001118867 | 0.001029358 | 0.001118867 | 0.000381923 | 0.000337468 | 1341455.424 | 456416.8269 | 94.71014 1 | .3E+08 |
| South Coast AQMD | 2028 CHE - Rall Forklift | Aggregated Aggregated | Diesel 0 | .000713 0.0 | 0862 0.00 | 026 0.01840 | 1 0.002698 | 2.9614 | 9.94039E-05 | 9.14516E-05 | 9.94039E-05 | 2.73582E-05 | 2.41706E-05 | 96079.37611 | 45140.98014 | 17.40261 E | 006678 |
| South Coast AQMD | 2028 OFF - Industrial - Aerial Lifts | Aggregated Aggregated | Gasoline 0 | .045143 0.0 | 1523 0.049 | 677 2.33761 | 1 0.052209 | 23.18742 | 0.016016665 | 0.01210148 | 0.017796295 | 0.000271993 | 0.000358416 | 1023098.65 | 564939.7 | 1545.94 22 | 914218 |
| South Coast AQMD | 2028 OFF - Industrial - Aerial Lifts | Aggregated Aggregated | | .003119 0.0 | 3712 0.004 | 491 0.01794 | 4 0.028304 | 3.765329 | 0.001078855 | 0.000992547 | 0.001078855 | 5.13005E-05 | 3.15208E-05 | | 272826.55 | 683.06 4 | 769152 |
| South Coast AQMD | 2028 OFF - Industrial - Aerial Lifts | Aggregated Aggregated | Nat Gas | 0 | 0 0.002 | 679 0.71536 | 6 0.019685 | 4.210488 | 0 | 0 | 0.00216254 | 0 | 0 | 281407.7 | 238162.5 | 634.51 4 | 492522 |
| South Coast AQMD | 2028 OFF - Industrial - Forklifts | Aggregated Aggregated | Gasoline 0 | .734234 0.6 | 5348 0.807 | 979 74.3657 | 2 3.074759 | 701.4812 | 0.048953136 | 0.036986814 | 0.054392373 | 0.007027841 | 0.010883707 | 31067580.9 | 15191471.55 | 8437.66 | 1E+09 |
| South Coast AQMD | 2028 OFF - Industrial - Forklifts | Aggregated Aggregated | Nat Gas | 0 | 0 0.129 | 326 56.2444 | 4 6.073368 | 1386.812 | 0 | 0 | 0.123395181 | 0 | 0 | 76632764.7 | 34458241.1 | 19128.77 2. | 27E+09 |
| South Coast AQMD | 2028 OFF - Industrial - Other General Industrial Equ | p Aggregated Aggregated | Gasoline 0 | .033538 0.0 | 0848 0.036 | 906 2.33492 | 8 0.050859 | 12.12054 | 0.001850975 | 0.001398514 | 0.002056638 | 0.000173361 | 0.000211081 | 602531.05 | 499422.2 | 1088.43 11 | 126233 |
| South Coast AQMD | 2028 OFF - Industrial - Other General Industrial Equ | p Aggregated Aggregated | Diesel 0 | .003854 0.0 | 4586 0.005 | 549 0.02183 | 6 0.035897 | 4.75814 | 0.001355354 | 0.001246926 | 0.001355354 | 6.36137E-05 | 3.9817E-05 | 158274.95 | 301705.35 | 211.49 5 | 435974 |
| South Coast AQMD | 2028 OFF - Industrial - Other Material Handling Equi | or Aggregated Aggregated | Gasoline 0 | .001969 0.0 | 1811 0.002 | 166 0.13091 | 2 0.0101 | 2.863825 | 0.000199634 | 0.000150835 | 0.000221816 | 2.77905E-05 | 4.0758E-05 | 116343.75 | 42975.1 | 111.29 2 | 308603 |
| South Coast AQMD | 2028 OFF - Industrial - Sweepers/Scrubbers | Aggregated Aggregated | Gasoline 0 | .049368 0.0 | 5409 0.054 | 327 3.60648 | 2 0.131393 | 42.27366 | 0.003702368 | 0.002797345 | 0.004113742 | 0.000479065 | 0.000637947 | 1821021.5 | 643301.55 | 1531.09 26 | 287442 |
| South Coast AQMD | 2028 OFF - Industrial - Sweepers/Scrubbers | Aggregated Aggregated | Diesel 0 | .000767 0.0 | 0913 0.00 | 105 0.00471 | 1 0.007253 | 0.967415 | 0.000275568 | 0.000253522 | 0.000275568 | 1.33262E-05 | 8.09875E-06 | 32193 | 44822 | 68.86 | 829207 |

Tank ESP Inputs Key

Fixed roof tank type

| Column-supported (cone) | A |
|--------------------------|---|
| Horizontal Tank | D |
| No fixed roof (open top) | C |
| Self-supporting (dome) | В |

Shell/roof finish

| aluminum-colored paint (diffuse) | В |
|-----------------------------------|---|
| aluminum-colored paint (specular) | A |
| beige/cream-colored paint | C |
| black | G |
| brown paint | D |
| light gray paint | E |
| medium gray paint | F |
| mill finish aluminum (unpainted) | L |
| red primer or dark green paint | н |
| rust (unpainted iron oxide) | I |
| tan paint | J |
| white paint | ĸ |

Shell/roof condition

| Aged (Ag) | Ag |
|--------------|----|
| Average (Av) | Av |
| New (N) | N |

Tank insulation

| Fully insulated (shell and roof insulated) | F |
|--|---|
| Not insulated | N |
| Partially insulated (Shell only) | P |

Inside shell condition

| dense rust | D |
|--------------|---|
| gunite lined | G |
| light rust | L |

Shell construction

| riveted | R |
|---------|---|
| welded | W |

Stock data

| Name | Abbry. |
|---------------------|-----------|
| Out of Service | OUT |
| Crude Oil RVP_X | CRUDE_X |
| Gasoline RVP_X | GAS_X |
| Jet kerosene | JET |
| Kerosene | KERO |
| Diesel | DIESEL |
| No. 2 Oil | 201L |
| No. 6 Oil | 60IL |
| Vacuum Residual Oil | STR_RESID |
| Propylene glycol | PROPGLY |
| Methanol | METHANOL |
| Triethylene glycol | TRIGLY |

Tank ESP Tank Info

Required entry Not required - can leave blank if N/A

| Defaults will be use | d if unknown | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---------------|------------|----------|--------------|--------|--------|-----------|--------|-----------|---------------|----------|----------------|--------------|---------|--------|------|---|-----------|------------|---------------------|---------|---------|------------|--------------|--------------|------------|----------|------|-------------|-------|-----------|------------|--------------|------------|
| | | | | HEIGHT | | | | | | Min | Vent M | ax vent | | | | | | | | | | | | | | | | | | | | | | |
| | | | | (Vert tanks) | | | | | | | eving re | | | | | Dome | | | | | | | | | | | Assoc. | Sump | | | Emission | | L | ocation |
| | | | | | | | | | | | | | | | | | | | | Max Pump Combo | | | | Inside Shell | | | | | | | Point No. | | Control ID (| coordinate |
| Closest Met Station | USER ID | Start Date | DIAMETER | (Horz tanks) |) Type | Finish | Condition | Finish | Condition | Pressure PSIC | 6 PS | ilG Max L (ft) |) Min L (ft) | (in/ft) | Bottom | HT | s | Condition | Efficiency | Rate (gal/hr) Vents | P Vents | V Vents | Open Vents | Condition | Construction | Build Date | Category | (ft) | Height (ft) | (FIN) | (EPN) | Is Closed? | No, (CIN) s | s) |
| Santa Ana, CA | Tank 1-30,000 |) 1/1/2023 | 10 | 48 | D | K | Av | K | Av | 0 | -0.03 | 0.03 | | | | | | N | | | | | | L | W | | | | | | | N | | |
| Santa Ana, CA | Tank 2-30,000 |) 1/1/2023 | 10 | 48 | D | K | Av | K | Au | 0 | -0.03 | 0.03 | | | | | | N | | | | | | L | W | | | | | | | N | | |
| Santa Ana, CA | Tank 3-30,000 |) 1/1/2023 | 10 | 48 | D | K | Av | K | Au | 0 | -0.03 | 0.03 | | | | | | N | | | | | | L | W | | | | | | | N | | |
| Santa Ana, CA | Tank 4-30,000 |) 1/1/2023 | 10 | 48 | D | K | Av | K | Au | 0 | -0.03 | 0.03 | | | | | | N | | | | | | L | W | | | | | | | N | | |
| Santa Ana, CA | Tank 5-10,000 |) 1/1/2023 | 10 | 18 | В | K | Av | K | Au | | | | | | | | | N | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Tank ESP Tank Service

| | | | | | | | | | Max | | |
|---------------|--------------|-------------|------------|--------|-----------|--------------|----------|------------|----------|---------------|-----------|
| | | | Throughput | t | | Bulk Storage | | Min Heated | Heated | Heating Cycle | |
| Tank ID | Start Date 1 | [hroughtput | Unit | Stock | Stock RVP | Temp (degF) | Comments | Temp (F) | Temp (F) | Length (days) | Flash Gas |
| Tank 1-30,000 | 1/1/2023 | 1,186,250 | gallons | DIESEL | | | | | | | |
| Tank 2-30,000 | 1/1/2023 | 1,186,250 | gallons | DIESEL | | | | | | | |
| Tank 3-30,000 | 1/1/2023 | 1,186,250 | gallons | DIESEL | | | | | | | |
| Tank 4-30,000 | 1/1/2023 | 1,186,250 | gallons | DIESEL | | | | | | | |
| Tank 5-10,000 | 1/1/2023 | 4,745,000 | gallons | DIESEL | | | | | | | |

TankSummaries for Every month between Jan and Dec 2023 Site: OCTA,

| ank 1-30,00 | Row label | Jan-23 | Feb-23 | Mar-23 | Apr-23 | May-23 | Jun-23 | Jul-23 | Aug-23 | Sep-23 | Oct-23 | Nov-23 | Dec-23 |
|-------------|---|--|---|--|---|---|--|---|--|---|---|--|--|
| | Diameter (ft) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | | D | D | D | D | D | D | D | D | D | | | D |
| | Inside Shell Condition | L | L | L | L | L | L | L | L | L | L | L | L |
| | | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av |
| | Shell Finish | к | к | к | к | к | к | к | к | к | к | к | К |
| | | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av |
| | Roof Finish | ĸ | ĸ | ĸ | к | к | ĸ | ĸ | ĸ | ĸ | ĸ | к | к |
| | | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel |
| | Throughput (gal) | 100749.999 | 91000.0014 | 100749.999 | 97500.0012 | 100749.999 | 97500.0012 | 100749.999 | 100749.999 | 97500.0012 | 100749.999 | 97500.0012 | |
| | Bulk Liquid Temperature (degF) | 57.96184 | 58.622082 | 60.736128 | 63.113753 | 66.438912 | 69.363065 | 72.94733 | 74.241485 | 72.714272 | 68.300468 | 62.584563 | 57.439 |
| | | 58.825504 | 59.682387 | 62.206889 | 64.986839 | 68.375535 | 71.412614 | 75.014948 | 76.219366 | 74.347351 | 69.523393 | 62.564565 | 58.235 |
| | Avg. Liquid Surface Temp. (degF) | 0.006235178 | 0.00641443 | | | 0.008507021 | 0.009368503 | | | | | 0.007285117 | |
| | Avg. TVP (psia) Estimated standing losses (lbs) | 0.2566938 | | 0.30469824 | 0.35631705 | 0.37805837 | 0.40107392 | 0.010489212 | 0.010889372 | | | 0.30237473 | |
| | | | 0.2334849 | | | | | | | 0.43417246 | 0.35460892 | | 0.2480 |
| | Estimated working losses (lbs) | 1.6610115 | 1.5403807 | 1.8428117 | 1.9406263 | 2.2216069 | 2.353754 | 2.7048025 | 2.8020802 | 2.5684975 | 2.301937 | 1.8607732 | 1.6308 |
| | Total estimated emissions (lbs) | 1.9177053 | 1.7738656 | 2.1475099 | 2.2969434 | 2.5996653 | 2.7548279 | 3.1820769 | 3.3074364 | 3.0026699 | 2.6565459 | 2.1631479 | 1.8789 |
| | Benzene | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | | no data | no data | no data | no data | no data | | no data | no data | no data | no data | | no data |
| | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | | no data |
| | Cyclohexane | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | | no data |
| | Ethylbenzene | 0.004428053 | 0.004102685 | 0.004990159 | 0.005363312 | 0.006103533 | 0.006497218 | 0.007541971 | 0.007851198 | 0.007110506 | 0.006248035 | 0.005038611 | 0.00433 |
| | Hexane (n-) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Iso-octane {2,2,4 trimethylpentane | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Total loss components in the "Cho | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | | no data |
| | Toluene | 0.042588038 | 0.039329299 | | 0.050399213 | 0.056649331 | 0.059651286 | | 0.070882616 | | 0.057751305 | 0.047598342 | 0.04177 |
| | Trimethylbenzene (1,2,4) | 0.086695928 | 0.080685409 | 0.099427399 | 0.108385786 | 0.125455255 | 0.135557802 | | 0.16764468 | | 0.129156483 | 0.101092537 | 0.08458 |
| | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Xylene (m-) | 0.111806969 | 0.103616533 | | 0.13565817 | | 0.164640472 | | 0.199225282 | | | | |
| 2-30,00 | | 2.111300707 | 5.100010000 | 2.120120201 | 0.10000017 | 2.101000100 | 5.101040472 | 5.171312307 | 5.177225202 | 5.100000020 | 5.155240505 | 2.12.7373003 | 0.10740 |
| | Diameter (ft) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | | D | D | D 10 | D | D 10 | D | D | D | D | D | | D |
| | 21 | - | 5 | | 0 | | | | 5 | 5 | 5 | 0 | J |
| | | L | L | L | L | L | L | L | L | L . | L | L | L |
| | | Av | Av | Av | Av | Av | Av | Av | Av | Av | | | Av |
| | | K | K | K | K | ĸ | K | K | | K | | | K |
| | | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | | Av |
| | | К | к | к | к | к | K | К | К | К | к | | К |
| | | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | | Diesel |
| | Throughput (gal) | 100749.999 | 91000.0014 | 100749.999 | 97500.0012 | 100749.999 | 97500.0012 | 100749.999 | 100749.999 | 97500.0012 | 100749.999 | 97500.0012 | 100749 |
| | Bulk Liquid Temperature (degF) | 57.96184 | 58.622082 | 60.736128 | 63.113753 | 66.438912 | 69.363065 | 72.94733 | 74.241485 | 72.714272 | 68.300468 | 62.584563 | 57.43 |
| | Avg. Liquid Surface Temp. (degF) | 58.825504 | 59.682387 | 62.206889 | 64.986839 | 68.375535 | 71.412614 | 75.014948 | 76.219366 | 74.347351 | 69.523393 | 63.565675 | 58.23 |
| | Avg. TVP (psia) | 0.006235178 | 0.00641443 | 0.006969278 | 0.007628905 | 0.008507021 | 0.009368503 | 0.010489212 | 0.010889372 | 0.010273029 | 0.008824036 | 0.007285117 | 0.00611 |
| | Estimated standing losses (lbs) | 0.2566938 | 0.2334849 | 0.30469824 | 0.35631705 | 0.37805837 | 0.40107392 | 0.47727438 | 0.50535619 | 0.43417246 | 0.35460892 | 0.30237473 | 0.248 |
| | Estimated working losses (lbs) | 1.6610115 | 1.5403807 | 1.8428117 | 1.9406263 | 2.2216069 | 2.353754 | 2.7048025 | 2.8020802 | 2.5684975 | 2.301937 | 1.8607732 | 1.630 |
| | Total estimated emissions (lbs) | 1.9177053 | 1.7738656 | 2.1475099 | 2.2969434 | 2.5996653 | 2.7548279 | | 3.3074364 | | 2.6565459 | 2.1631479 | |
| | Benzene | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | | no data |
| | | | no data | | | no data | | | | | | | |
| | cumone (isopropyibenzene) | | no data | no data | | no data | no data | no data | no data | | | | no data |
| | Cyclobovano | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | | no data | no data | no data | no data no data | no data | no data | no data | no data | no data no data | no data no data | no data no data | no data |
| | Ethylbenzene | | | | no data | | | | | no data no data | no data | no data | no data |
| | Ethylbenzene Hexane (n-) | no data 0.004428053 0 | no data 0.004102685 0 | no data 0.004990159 0 | no data no data 0.005363312 0 | no data 0.006103533 0 | no data 0.006497218 0 | no data 0.007541971 0 | no data 0.007851198 0 | no data no data 0.007110506 0 | no data no data 0.006248035 0 | no data no data 0.005038611 0 | no data 0.00433 |
| | Ethylbenzene Hexane (n-) Iso-octane {2,2,4 trimethylpentane | no data 0.004428053 0 no data | no data 0.004102685 0 no data | no data 0.004990159 0 no data | no data no data 0.005363312 0 no data | no data 0.006103533 0 no data | no data 0.006497218 0 no data | no data 0.007541971 0 no data | no data 0.007851198 0 no data | no data no data 0.007110506 0 no data | no data no data 0.006248035 0 no data | no data no data 0.005038611 0 no data | no data 0.00433 no data |
| | E Hylbenzene Hexane (n-) Iso-octane {2,2,4 trimethylpentane Total loss components in the "Cho: | no data 0.004428053 0 no data no data | no data 0.004102685 0 no data no data | no data 0.004990159 0 no data no data | no data no data 0.005363312 0 no data no data | no data 0.006103533 0 no data no data | no data 0.006497218 0 no data no data | no data 0.007541971 0 no data no data | no data 0.007851198 0 no data no data | no data no data 0.007110506 0 no data no data | no data no data 0.006248035 0 no data no data | no data no data 0.005038611 0 no data no data | no data 0.00433 no data no data |
| | Ethylbenzene Hexane (n-) Iso-octane {2,2,4 trimethylpentane | no data 0.004428053 0 no data | no data 0.004102685 0 no data | no data 0.004990159 0 no data | no data no data 0.005363312 0 no data | no data 0.006103533 0 no data | no data 0.006497218 0 no data | no data 0.007541971 0 no data | no data 0.007851198 0 no data | no data no data 0.007110506 0 no data | no data no data 0.006248035 0 no data | no data no data 0.005038611 0 no data | no data 0.00433 no data |
| | E Hylbenzene Hexane (n-) Iso-octane {2,2,4 trimethylpentane Total loss components in the "Cho: | no data 0.004428053 0 no data no data | no data 0.004102685 0 no data no data no data no data | no data 0.004990159 0 no data no data no data no data | no data no data 0.005363312 0 no data no data no data no data | no data 0.006103533 0 no data no data | no data 0.006497218 0 no data no data | no data 0.007541971 0 no data no data no data no data | no data 0.007851198 0 no data no data no data no data no data | no data no data 0.007110506 0 no data no data | no data no data 0.006248035 0 no data no data no data no data | no data no data 0.005038611 0 no data no data no data no data | no data 0.00433 no data no data no data no data |
| | Ethylbenzene Hexane (n.) Iso-octane (2.2,4 trimethylpentane Total loss components in the "Chos PACs (Chrysene) Phenanthrene Toluene | no data 0.004428053 0 no data no data no data no data 0.042588038 | no data 0.004102685 0 no data no data no data no data 0.039329299 | no data 0.004990159 0 no data no data no data no data 0.047381077 | no data no data 0.005363312 0 no data no data no data no data 0.050399213 | no data 0.006103533 0 no data no data no data no data 0.056649331 | no data 0.006497218 0 no data no data no data | no data 0.007541971 0 no data no data no data no data 0.068374507 | no data 0.007851198 0 no data no data no data no data 0.070882616 | no data no data 0.007110506 0 no data no data no data 0.064612509 | no data no data 0.006248035 0 no data no data no data 0.057751305 | no data no data 0.005038611 0 no data no data no data no data 0.047598342 | no data 0.00433 no data no data no data no data 0.04177 |
| | Ethylbenzene Hexane (n-) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Cho: PACs (Chrysene) Phenanthrene | no data 0.004428053 0 no data no data no data no data | no data 0.004102685 0 no data no data no data no data | no data 0.004990159 0 no data no data no data no data | no data no data 0.005363312 0 no data no data no data no data | no data 0.006103533 0 no data no data no data no data no data | no data 0.006497218 0 no data no data no data no data | no data 0.007541971 0 no data no data no data no data | no data 0.007851198 0 no data no data no data no data | no data no data 0.007110506 0 no data no data no data 0.064612509 | no data no data 0.006248035 0 no data no data no data no data | no data no data 0.005038611 0 no data no data no data no data | no data 0.00433 no data no data no data no data 0.04177 |
| | Ethylbenzene Hexane (n.) Iso-octane (2.2.4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1.2.4) | no data 0.004428053 0 no data no data no data no data 0.042588038 | no data 0.004102685 0 no data no data no data no data 0.039329299 | no data 0.004990159 0 no data no data no data no data 0.047381077 | no data no data 0.005363312 0 no data no data no data no data 0.050399213 | no data 0.006103533 0 no data no data no data no data 0.056649331 | no data 0.006497218 0 no data no data no data no data 0.059651286 | no data 0.007541971 0 no data no data no data no data 0.068374507 | no data 0.007851198 0 no data no data no data no data 0.070882616 | no data no data 0.007110506 0 no data no data no data 0.064612509 | no data no data 0.006248035 0 no data no data no data 0.057751305 | no data no data 0.005038611 0 no data no data no data no data 0.047598342 | no data 0.00433 no data no data no data no data 0.04177 |
| | Ethylbenzene Hexane (n.) Iso-octane (2.2.4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1.2.4) | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data | no data no data 0.005363312 0 no data no data no data 0.050399213 0.108385786 | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data | no data no data 0.006248035 0 no data no data no data 0.057751305 0.129156483 | no data no data 0.005038611 0 no data no data 0.047598342 0.101092537 no data | no data 0.00433 no data no data no data 0.04177 0.08458 no data |
| | Ethylbenzene Hexane (n.) Iso-octane (2.2,4 trimethylpentane Total loss components in the "Cho: PACs (Chrysene) Phenanthrene Tolluene Trimethylbenzene (1.2,4) Xylene Xylene | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 no data | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 no data | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data | no data no data 0.005363312 0 no data no data no data 0.050399213 0.108385786 no data | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 no data | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data | no data no data 0.006248035 0 no data no data no data 0.057751305 0.129156483 no data | no data no data 0.005038611 0 no data no data 0.047598342 0.101092537 no data | no data 0.00433 no data no data no data 0.04177 0.08458 no data |
| 3-30,00 | Ethylbenzene Hexane (n.) Iso-octane (2.2,4 trimethylpentane Total loss components in the "Cho: PACs (Chrysene) Phenanthrene Tolluene Trimethylbenzene (1.2,4) Xylene Xylene | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 no data | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 no data | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data | no data no data 0.005363312 0 no data no data no data 0.050399213 0.108385786 no data | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 no data | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data 0.084333023 | no data no data 0.006248035 0 no data no data no data 0.057751305 0.129156483 no data | no data no data 0.005038611 0 no data no data 0.047598342 0.101092537 no data | no data 0.00433 no data no data no data 0.04177 0.08458 no data |
| 3-30,00 | Ethylbenzene Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Xylene (m-) D Diameter (ft) | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 no data 0.111806969 | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 no data 0.103616533 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 | no data no data 0.005363312 0 no data no data no data 0.050399213 0.108385786 no data 0.13565817 | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data 0.154530188 | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.164640472 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.191312307 | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 no data 0.199225282 | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data 0.084333023 | no data no data 0.006248035 0 no data no data no data 0.057751305 0.129156483 no data 0.158240565 | no data no data 0.005038611 0 no data no data no data 0.047598342 0.101092537 no data 0.127393865 | no data 0.00433 no data no data no data 0.04177 0.08458 no data |
| 3-30,00 | Ethylbenzene Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Xylene (m-) D Diameter (ft) | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 no data 0.111806969 | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 no data 0.103616533 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 | no data no data 0.005363312 0 no data no data no data 0.050399213 0.108385786 no data 0.13565817 10 | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data 0.154530188 | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.164640472 10 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.191312307 | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 no data 0.199225282 | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data 0.084333023 | no data no data 0.006248035 0 no data no data no data 0.057751305 0.129156483 no data 0.158240565 | no data no data 0.005038611 0 no data no data no data 0.047598342 0.101092537 no data 0.127393865 | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 |
| 3-30,00 | Ehytheraene Hexane (n.) Iso-ottane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Xylene (m.) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 no data 0.111806969 10 D L | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 no data 0.103616533 10 D L | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 10 D L | no data no data 0.005363312 0 no data no data no data 0.050399213 0.108385786 no data 0.13565817 10 D L | no data 0.006103533 0 no data no data no data 0.056649331 0.12545255 no data 0.154530188 10 D L | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.164640472 10 D L | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.191312307 10 D L | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 no data 0.199225282 10 D L | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data no data 0.180333023 10 D L | no data no data 0.006248035 0 no data no data no data 0.057751305 0.129156483 no data 0.158240565 L | no data no data 0.005038611 0 no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 L | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 D L |
| 3-30,00 | Ethylbenzene Hexane (n-) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Xylene (m-) D Diameter (ft) Fixed Roof Type Inside Shell Condition (post-19) | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 no data 0.111806969 | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 no data 0.103616533 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 | no data no data 0.005363312 0 no data no data no data 0.050399213 0.108385786 no data 0.13565817 10 | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data 0.154530188 | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.164640472 10 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.191312307 | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 no data 0.199225282 | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data 0.084333023 | no data no data 0.006248035 0 no data no data no data 0.057751305 0.129156483 no data 0.158240565 | no data no data 0.005038611 0 no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 L | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 |
| 3-30,00 | Ehylbenzene Hexane (n-) Isso-otane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Molecone Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish | no data 0.00428053 0 no data no data no data 0.042588038 0.086695928 no data 0.111806969 10 D L Av K | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 no data 0.103616533 10 D L Av K | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 10 D L Av K | no data no data 0.005363312 0 data no data no data no data 0.05039213 0.108385786 no data 0.108385786 no data 0.108365817 10 D L Åv K | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data 0.154530188 10 D L Av K | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 10 data 0.164640472 10 D L Av K | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.191312307 10 D L Av K | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 0.199225282 10 D L Av K | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data 0.150476398 no data 0.180333023 10 D L Av K | no data no data 0.006248030 no data no data no data no data 0.057751305 0.12915483 no data 0.158240565 10.158240565 L L Av K | no data no data 0.005038611 0 data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D L Av K | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 D L Av K |
| 3-30,00 | Ehylbenzene Hexane (n.) Iso-ottane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Xylene (m.) 00 Diameter (ft) Fixed Roof Type Iniside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 no data 0.111806969 10 D L | no data 0.004102685 0 no data no data no data 0.039329299 0.080685409 no data 0.103616533 10 D L | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 10 D L | no data no data 0.005363312 0 no data no data no data 0.050399213 0.108385786 no data 0.13565817 10 D L | no data 0.006103533 0 no data no data no data 0.056649331 0.12545255 no data 0.154530188 10 D L | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.164640472 10 D L | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.191312307 10 D L | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 no data 0.199225282 10 D L | no data no data 0.007110506 0 no data no data no data 0.064612509 0.150476398 no data no data 0.180333023 10 D L | no data no data 0.006248035 0 no data no data no data 0.057751305 0.129156483 no data 0.158240565 L | no data no data 0.005038611 0 data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D L Av K | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 D L |
| 3-30,00 | Ethylbenzene Hexane (n) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m) O Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) | no data 0.004428053 0 no data no data no data 0.042588038 0.086695928 no data 0.111806969 10 D L L Av K K | no data 0.004102685 0 no data no data no data 0.033292299 0.080685409 no data 0.103616533 10 D L L Av K K | no data 0.004990159 0 no data no data no data 0.047381077 0.099427339 no data 0.126120261 L Av K K Av | no data no data 0.005363312 0.005363312 0.005363312 0.005399213 0.108385786 no data 0.10365817 10 D L Av K K | no data 0.006/03533 0 no data no data no data 0.056649331 0.125455255 no data 0.1254530188 10 D L L Av K K | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.13557802 no data 0.1364640472 L L Av K K | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.160119039 no data 0.191312307 10 D L L Av K K | no data 0.007851198 0 no data no data no data 0.070882616 0.16764468 no data 0.199225282 10 D L L Av K K | no data no data 0 007110506 0 007110506 0 00411 no data no data 0 1064612509 0 150476398 no data 0 180333023 10 D L Av K K | no data no data no data no data no data no data no data 0.057751305 0.12915483 0.057751305 0.12915483 0.158240565 10 L Av K K | no data no data no data no data no data no data no data 0.047598342 0.101092537 no data 0.127393865 L L Av K K | no data 0.00433 no data no data no data no data 0.04177 0.08458 no data 0.10940 D L Av K Av K |
| 3-30,00 | Ehylbenzene Hexane (n-) Isso-ottane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m-) 00 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product | no data 0.004428053 00 no data no data 0.0data 0.042580380 0.042588038 0.042588038 0.042588038 0.042588038 0.042588038 0.04258903 0.04258903 0.04258803 0.04258803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425803 0.0425800 0.042580 0.045800 0.04580000000000000000000000000000000000 | no data 0.004102685 0 o data no data 0.033922092 0.039322092 0.030585409 no data 0.103616533 10 D L L Av K K K K Diesel | no data 0.004990159 0 no data no data no data 0.047381077 0.047381077 0.047381077 0.099427399 no data 0.126120261 10 D L L Av K K Av K Diesel | no data no data 0.005363312 0 data no data no data no data 0.05039213 0.108385786 no data 0.108385786 no data 0.13565817 10 D L K K K K Disesel Disesel | no data 0.006103533 no data no data no data 0.056649331 0.125455255 no data 0.125455255 no data 0.1254530188 10 D L L Av K K K Diesel | no data 0.006497218 0.00647218 0.00478 0.00478 0.00478 0.0059651286 0.05965000000000000000000000000000000000 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.160119039 no data 0.191312307 10 D L L Av K K K Diesel | no data 0.007851198 0 no data no data no data 0.070882261 0 0.16764468 no data 0.199225282 10 D L L Av K K K K Dieseel | no data no data o 0.007110506 o data no data no data no data 0.04612509 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 No data V L K K K K D D D Eseel Diesel | no data no data no data 0 006248035 0 no data no data no data no data 0.057751305 0.129156483 no data 0.158240565 10 L L Av K K Av K DDesel Disesel | no data no data 0.005038611 0 no data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D L Av K K Av K Diesel | no data 0.00433 no data no data no data no data 0.04177 0.08458 no data 0.10940 D L L Av K Av K Diesel |
| 3-30,00 | Ehylbenzene Hexane (n.) Iso-ottane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Xylene (m.) 00 Diameter (ft) Fixed Roof Type Iniside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) | no data 0.004428053 0 no data no data no data 0.042588038 0.042588038 0.042588038 0.006695922 no data 0.011806969 10 L L L Av K K Av E E Diesel 100749.999 | no data 0.004102685 0.004102685 0.004102685 0.00412 0.00412 0.039329299 0.039329299 0.039329299 0.030685409 no data 0.103616533 10 D L Av K Av K Dlesel 91000.0014 | no data 0.004990159 0 no data no data no data 0.047381077 0.09427399 no data 0.126120261 10 D L L Av K K Av K K Diesel 100749.999 | no data no data no data no data no data no data 0.05039213 0.10838786 no data 0.10838786 no data 0.13565817 10 D L Av K Av K Diesel 97500.0012 | no data 0.006/103533 0 no data no data no data 0.056649931 0.12545525 no data 0.154530188 10 D L L Av K K Av K K Diesel 100749.999 | no data 0.006497218 0 no data no data no data 0.059651286 0.135557800 no data 0.13557800 no data 0.13557800 no data 0.13567800 No 13557800 No 1355780 No 1357780 No 13577800 No 1357780 No 13577800000000000000000000000000000000000 | no data 0.007541971 0 no data no data no data 0.068374507 0.16011903 no data 0.16011903 no data 0.1601903 no data 0.160190 no data 0.1601900 no data 0.160190 no data 0.1601900 no data 0.1601900 no data 0.1601900 no data 0.1601900 no data 0.1601900 no data 0.1601900 no data 0. | no data 0.007851198 0 data no data no data no data 0.070882616 0.16764486 no data 0.16764486 no data 0.16764486 No D L L Av K K Av K K Diesel 100749.999 | no data no data no data no data no data no data no data 0.064612509 0.150476398 no data 0.180333023 10 D L L Av K K Diesel 97500.0012 | no data no data no data no data no data no data no data 0.057751305 0.129156483 no data 0.158240565 10 D L K K K Diesel 100749.999 | no data no data no data no data no data no data no data 0.47598342 0.101092537 no data 0.127393865 10 D L Av K K Av Elseel 97500.0012 | no data 0.00433 no data no data no data no data 0.04177 0.08458 no data 0.10940 D L L Av K K Diesel 100749 |
| 3-30,00 | Ehylbenzene Hexane (n-) Isso-otane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysen Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m-) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Finish Roof Finish Roof Finish Product Throughput (gal) Buik Liquid Temperature (degF) | no data 0.004428053 no data no data no data 0.04258038 0.04258038 0.04258038 0.04258038 0.04258038 0.04258038 0.0425803 0.045900 0.0425803 0.04458000000000000000000000000000000000 | no data 0.004102685 0 no data no data no data 0.03922929 0.03922929 0.03932929 0.03932929 0.03932929 0.039326540 0.03932105 0.0392105533 0.0392105533 0.0392105533 0.039210553 0.039210553 0.039210553 0.039210553 0.039210553 0.039210553 0.039210553 0.03921055 0.0392105 0.0392105 0.03921055 0.03921055 0.0392100000000000000000000000000000000000 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 10 D L L Av K K Diesel 100749.999 60.736128 | no data no data 0.005363312 0.005363312 0.005363012 0.005399213 0.108385786 no data 0.050399213 0.108385786 no data 0.13565817 10 L L Av K Av K Av K Seel 97500.0012 63.113753 | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data 0.0566493310 0.154530188 0.1545300000000000000000000000000000000000 | no data 0.006497218 0 no data no data no data 0.059651266 0.135557802 0.059651266 0.164640472 0.164640472 L D L Av K K Diesel 97500.0012 69.3630051 | no data 0.007541971 on data no data no data no data 0.068374507 0.160119039 no data 0.08374507 0.160119039 no data 0.0191312307 10.019132307 L Av K K Diesel 100749.999 72.94733 | no data 0.007851198 0 no data no data no data no data 0.01892264 0.01892264 0.0199225282 0.0199225282 0.0199225282 0.0199244 0.019924 0.019944 0.019944 0.019944 0.019944 0.019944 0.019944 0.019944 0.019944 0.019944 0.019944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.001944 0.0019444 0.0019444 0.0019444 0.0019444 0.0019444 0.0019444 0.0019444 0.0019444 0.0019444 0.0019444 0.0019444 0.0019444 0.00194 | no data no data 0 007110506 0 007110506 0 no data no data no data no data no data 0 0.064612509 0 .150476398 no data 0 .064612509 0 .150476398 no data 10 0.0804302 10 0.18033023 10 0.18033023 10 0.18033023 10 0.1804 10 0.1804 | no data no data no data 0 006248053 no data no data no data no data 0 057751305 0 12915483 no data 0 05874540565 10 12915483 No 158240565 10 0154240565 Xv K Av K Dlesel 100749.999 68.300468 | no data no data no data no data no data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 L L Av K Av K Av K Seel Dissel Dissel | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 D L Av K Av K Diesel 100744 57.43 |
| 3-30,00 | Erhytheraene Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Xylene (m.) 0 Diameter (th) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throupput (gal) Bulk Liquid Temperature (degF) Aye, Liquid Surface Temp. (degF) | no data 0.004428053 0 on data no data 0.042588038 0.042588038 0.0462588038 0.08669592 10 0.0869592 10 0.0869592 10 0.0869592 10 0.0869592 10 0.0869592 10 0.0869592 10 0.0869592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.08659592 10 0.0859592 10 0.0959500 10 0.095950 10 0.0959500 10 0.0959500 00 0.09595000000000000000000 | no data 0.004102685 0 of data no data no data 0.0393292299 no data 0.103616533 10 0.080685400 0.080685400 0.080685400 100 0.080685400 0.080685400 0.080685400 0.0806854000000000000000000000000000000000 | no data 0.004990159 0 no data no data no data 0.047381077 0.09427399 no data 0.126120261 10 D L Av K K K Dissel 100749 999 60.736128 62.206889 | no data no data no data no data no data no data no data 0.05309213 0.108385786 no data 0.13565817 10 D L L Av K K Av K Djesel 97500.0012 64.98639 | no data 0.006103533 no data no data no data 0.056649331 0.125455255 no data 0.125455255 no data 0.125453255 no data 0.154530188 100 L Av K K Av K Dibesel 100743999 66.385353 | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.13557802 no data 0.13557802 no data 0.13557802 No 1255780 No 125578 No 12557878 No 125578 No 12557878 No 12557878 No 1255788 No 1255788 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.160119039 no data 0.160119039 no data 0.160119039 no data 0.160119039 No L Av K K Av K Diesel 100749.999 72.94733 75.014948 | no data 0.007851198 0 no data no data no data 0.070882616 0.16764486 no data 0.16764486 no data 0.16764486 No 1070822882 10.1676448 K K K K Diesel 100749.999 74.241485 76.213366 | no data no data no data no data no data no data no data 0.06412509 0.150476398 no data 0.150476398 no data 0.180333023 10 D L L Av K K Av K Disesel 97500.0012 7.2,714272 74.347351 | no data no data no data no data no data no data no data no data 0.057751305 0.129156483 no data 0.158240565 10 D L L Av K K Dissel 100749.999 68.300468 69.52339 | no data no data no data no data no data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D L L Av K K Av K Disesel 97500.0012 62.584563 63.566575 | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 D L Av K Diesel 100744 57.43 58.23 |
| 3-30,00 | Ethylbenzene Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m.) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Bukk Liquid Surface Temp. (degF) Avg. Liquid Surface Temp. (degF) | no data 0.004428053 0 no data no data no data 0.04258030 0.04258030 0.04258030 0.04258030 0.04258030 0.04258030 0.04258030 0.042580 0.042580 0.0004235178 0.006235178 0.006235178 | no data 0.004102685 0 no data no data no data no data 0.039329299 0.030685409 no data 0.030365433 10 0.030416533 10 0.030416533 10 0.03041653 10 0.0304144 58 62082 59.662387 0.00641443 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 L L Av K K Av K K Diesel 100749.999 60.736128 62.206889 0.006969278 | no data no data no data o (005363312 0 0 (005363312 0 0 (005383786 no data 0.105385786 no data 0.105385786 no data 0.13565817 10 D L Av K Diesel 97500.0012 63.113753 64.986839 0.007628905 0.007628905 | no data 0.006103533 on odata no data no data no data 0.056649331 0.12545255 no data 0.015453018 L D L L Av K K Diesel 100749.999 66.438912 68.37553 0.008507021 | no data 0.006497218 0.006497218 0.006497218 0.00645128 0.00418 0.013557802 0.059651280 0.059651280 0.059651280 0.0164640472 0.0164640472 0.0164640472 0.0164640472 0.0164640472 0.0164640472 0.0164640472 0.0164640472 0.0056850 71.412614 0.009368503 0.009561280 0.009561280 0.009551280 0.0005551280 0.0005551280 0.0005551280 0.00055551200000000000000000000000000000 | no data 0.007541971 0.00714971 0.008145 0.04814500 0.068374507 0.160119039 no data 0.0191312307 0.191312307 0.19131230 0.19131230 0.19131230 0.1913423 0.00148929 7.5.014948 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.001489210 0.00149110 0.00149110 0.00149110 0.00149110 0.00149110 0.00149110 0.001400 0.001400 0.001400 0.001400 0.001400 0.001400 0.001400 0.001400 0.001400 0.00140000000000 | no data 0.007851198 0.007851198 0.007851198 0.007882616 0.00482616 0.01402 0.070882616 0.070882616 0.0199225282 100 D L L Av K K Av K K Diesel 100749.999 7.4.241485 7.6.219366 0.010889372 0.010889372 | no data no data no data no data no data no data no data 0.064612509 0.150476398 no data 0.180333023 10 D L Av K K Diesel 97500.0012 72.714272 74.347351 0.01027309 | no data no data no data no data no data no data 0.057751305 0.129156483 no data 0.158240565 10 D L Av K Diesel 100749.999 68.300468 69.523393 0.008824036 | no data no data no data o 0.005038611 0 0 data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D D L Av K Diesel 97500.0012 62.584563 6.3.565675 0.007285117 | no data 0.00433 no data no data no data no data 0.04177 0.08458 no data 0.10940 D L Av K Diesel 100749 57.43 58.23 0.00611 |
| 3-30,00 | Erhytheraene Hexane (n-) Isso-ottane (2,2,4 trimethylpentane Total loss components in the "Chor PAcs (Chrysene Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m-) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Product Throughput (gal) Buk Liquid Temperature (degF) Avg. Liquid Surface Temp. (degF) Avg. Liquid Surface Temp. (degF) Avg. Liquid Surface Temp. (degF) | no data 0.004428053 no data no data no data 0.042580380 0.0425880380 0.0425880380 0.0425880380 10.042580380 100749.999 57.96134 58.825504 0.066235178 0.02566938 | no data 0.004102685 00 no data no data 0.039322920 0.039322920 0.039322920 0.039322920 0.039322920 0.03932420 0.03932420 0.0393420 0.0393420 0.039420 0.0234480 0.02334480 0.2334480 0.2334480 0.2334480 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 10 D L Av K Diesel 100749.999 60.736128 0.068669278 0.030669278 | no data no data 0 0005363312 0 nodata no data no data no data 0 108385786 no data 0 108385786 no data 0 108385786 no data 0 108385786 no data 0 108385786 no data 0 1085817 0 D L K K K K S Dissel 97500 0012 63.113753 64.986833 0.007628905 0.035631705 | no data 0.006103533 0 no data no data no data 0.05649331 0.125455255 no data 0.056649331 0.125455255 no data 0.056649331 0.0 D L D L Av K K Diesel 100749.999 66.433921 0.008507021 0.3750350 | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.1646404722 10 D L Av K Diesel 97500.0012 69.363065 71.142614 0.009368503 0.40017392 | no data 0.007541971 0 no data no data no data 0.048374507 0.160119039 no data 0.049314507 0.191312307 10 D L L Av K Diesel 100749.999 72,94733 75.014948 0.010489212 0.04722438 | no data 0.007851198 0 no data no data no data 0.0070882616 0.070882616 0.070882616 0.070882616 0.070882610 0.070882610 0.07082610 0.0708907 74.241485 76.219366 0.010889372 0.05035610 | no data no data no data no data no data no data no data no data 0.04612509 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 No U L K K K V D D D D D Sesel 97500.0012 72.714272 74.347351 0.010273029 0.03311246 | no data no data no data 0 006248035 0 data no data no data no data 0 10751305 0 129156483 no data 0 158240565 10 L Av K K K DD D D Sesel 10074999 68340486 69523393 0.008824036 0.035460822 | no data no data 0.005038611 0 no data no data no data no data 0.127393842 0.101092537 no data 0.101092537 no data 0.127393865 10 0.101092537 No 10 D L K K K K D D D D D D D D D D D D D D | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 D L Av K Av K Diesel 100745 \$7.43 58.23 0.00611 0.248 |
| 3-30,00 | Erhytherenen Hexane (n.) Iso-ottane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (Marcol (1,2,4) Xylene (Marcol (1,2,4) Xylene (Marcol (1,2,4) Xylene (Marcol (1,2,4) Diameter (ft) Diameter (ft) Diameter (ft) Diameter (ft) Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Buik Liquid Temperature (degF) Avg. Liquid Surface Temp. (degF) Stilmated vorking losses (lbs) | no data 0.004428053 0.00428053 on o data no data no data 0.042588038 0.086695928 0.086695928 0.086695928 0.04258038 0.086695928 0.042580 0.040680 0.0425 | no data 0.004102685 0.004102685 0.004102685 0.00412 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.030685409 no data 0.03316533 0.0064540 K Diesel 91000.0014 58.622082 59.662387 0.00641443 0.2334849 1.5403807 1.5403807 | no data 0.004990159 0.004990159 0.00478 0.004784 0.047381077 0.099427399 no data 0.126120261 100 D L Av K Diesel 100749.999 60.736128 62.206889 0.006969278 0.30469824 1.8428175 | no data no data no data o 0.005363312 0 no data no data no data 0 no data 0 .108385786 no data 0 .108385786 no data 0 .13565817 10 D L Av K K Av K Biesel 97500.0012 6.317353 0 .007628905 1.9406263 | no data 0.006103533 0.006103533 0.006103533 0.00414 0.00414 0.056649331 0.056649331 0.056649331 0.0564530188 100749.999 66.438912 68.375535 0.008507021 0.37805837 2.2216069 | no data 0.006497218 0.006497218 0.00481 no data no data no data 0.059651286 0.135557802 no data 0.164640472 10 D D L Av K K Diesel 97500.0012 69,363065 71.412641 0.09385833 0.40107392 2.353754 | no data 0.007541971 on data no data no data no data 0.068374507 0.160119039 no data 0.191312307 D D L Av K BDiesel 100749.999 72.04733 75.01494 0.010489212 0.47727438 2.7048025 | no data 0.007851198 0.007851198 0.007851198 0.007854198 no data 0.0070882616 0.070882616 0.070882616 0.070882616 0.070882617 0.0749.999 74.241485 76.219360 0.010889372 0.50535619 2.8020802 | no data no data no data o 0.007110504 0 0.007110504 no data no data no data 0 0.64612509 0 0.150476396 no data 0 1.80333023 10 D L L Av K K K Diesel 97500.0012 7.2.714272 7.4.347351 0 .010273029 0.43417246 2.5668975 | no data no data no data no data no data no data no data 0.052751305 0.129156483 no data 0.158240565 100 D L L Av K K Diesel 100749.999 68.300488 69.52339 0.00824036 0.35460892 2.301937 | no data no data no data no data no data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D L L Av K K Av K S Diesel 97500.0012 6.3.566575 0.007285117 0.30237473 1.8607732 | no data 0.00433 no data no data no data 10.04177 0.08458 no data 0.10940 D L Av K Diesel 100745 57.43 58.23 0.00611 0.248 1.630 |
| 3-30,00 | Ehylbenzene Hexane (n-) Isso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysen Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Market (1,1) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Roof Condition (post-19) Roof Finish Roof Finish Roof Finish Product Throughput (gal) Buik Liquid Surface Temp. (degF) Avg. TVP (psia) Estimated vorking losses (lbs) Estimated emissions (lbs) | no data 0.004428053 no data no data no data 0.042580380 0.0425880380 0.0425880380 0.0425880380 10.042580380 100749.999 57.96134 58.825504 0.066235178 0.02566938 | no data 0.004102685 00 no data no data 0.039322920 0.039322920 0.039322920 0.039322920 0.039322920 0.03932420 0.03932420 0.0393420 0.0393420 0.039420 0.0234480 0.02334480 0.2334480 0.2334480 0.2334480 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 10 D L Av K Diesel 100749.999 60.736128 0.068669278 0.030669278 | no data no data 0 0005363312 0 nodata no data no data no data 0 108385786 no data 0 108385786 no data 0 108385786 no data 0 108385786 no data 0 108385786 no data 0 1085817 0 D L K K K K S Dissel 97500 0012 63.113753 64.986833 0.007628905 0.035631705 | no data 0.006103533 0 no data no data no data 0.05649331 0.125455255 no data 0.056649331 0.125455255 no data 0.056649331 0.0 D L D L Av K K Diesel 100749.999 66.433921 0.008507021 0.3750350 | no data 0.006497218 0 no data no data no data 0.059651286 0.135557802 no data 0.1646404722 10 D L Av K Diesel 97500.0012 69.363065 71.142614 0.009368503 0.40017392 | no data 0.007541971 0 no data no data no data 0.048374507 0.160119039 no data 0.049314507 0.191312307 10 D L L Av K Diesel 100749.999 72,94733 75.014948 0.010489212 0.04722438 | no data 0.007851198 0 no data no data no data 0.0070882616 0.070882616 0.070882616 0.070882616 0.070882610 0.070882610 0.07082610 0.0708907 74.241485 76.219366 0.010889372 0.05035610 | no data no data no data no data no data no data no data no data 0.04612509 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 No U L K K K V D D D D D Sesel 97500.0012 72.714272 74.347351 0.010273029 0.03311246 | no data no data no data 0 006248035 0 data no data no data no data 0 10751305 0 129156483 no data 0 158240565 10 L Av K K K DD D D Sesel 10074999 68340486 69523393 0.008824036 0.035460822 | no data no data 0.005038611 0 no data no data no data no data 0.127393842 0.101092537 no data 0.101092537 no data 0.127393865 10 0.101092537 No 10 D L K K K K D D D D D D D D D D D D D D | no data 0.00433 no data no data no data 10.04177 0.08458 no data 0.10940 D L Av K Diesel 100745 57.43 58.23 0.00611 0.248 1.630 |
| 3-30,00 | Erhytherenen Hexane (n.) Iso-ottane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (Marcol (1,2,4) Xylene (Marcol (1,2,4) Xylene (Marcol (1,2,4) Xylene (Marcol (1,2,4) Diameter (ft) Diameter (ft) Diameter (ft) Diameter (ft) Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Buik Liquid Temperature (degF) Avg. Liquid Surface Temp. (degF) Stilmated vorking losses (lbs) | no data 0.004428053 0.00428053 on o data no data no data 0.042588038 0.086695928 0.086695928 0.086695928 0.04258038 0.086695928 0.042580 0.040680 0.0425 | no data 0.004102685 0.004102685 0.004102685 0.00412 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.030685409 no data 0.03316533 0.0064540 K Diesel 91000.0014 58.622082 59.662387 0.00641443 0.2334849 1.5403807 1.5403807 | no data 0.004990159 0.004990159 0.00478 0.0047881077 0.099427399 no data 0.126120261 100 D L Av K Diesel 100749.999 60.736128 62.206889 0.006969278 0.30469824 1.8428175 | no data no data no data o 0.005363312 0 no data no data no data 0 no data 0 .108385786 no data 0 .108385786 no data 0 .13565817 10 D L Av K K Av K Biesel 97500.0012 6.317353 0 .007628905 1.9406263 | no data 0.006103533 0.006103533 0.006103533 0.00414 0.00414 0.056649331 0.056649331 0.056649331 0.0564530188 100749.999 66.438912 68.375535 0.008507021 0.37805837 2.2216069 | no data 0.006497218 0.006497218 0.00481 no data no data no data 0.059651286 0.135557802 no data 0.164640472 10 D D L Av K K Diesel 97500.0012 69,363065 71.412641 0.09385833 0.40107392 2.353754 | no data 0.007541971 on data no data no data no data 0.068374507 0.160119039 no data 0.191312307 D D L Av K BDiesel 100749.999 72.04733 75.01494 0.010489212 0.47727438 2.7048025 | no data 0.007851198 0.007851198 0.007851198 0.007854198 no data 0.0070882616 0.070882616 0.070882616 0.070882616 0.070882617 0.0749.999 74.241485 76.219360 0.010889372 0.50535619 2.8020802 | no data no data no data o 0.007110504 0 0.007110504 no data no data no data 0 0.64612509 0 0.150476396 no data 0 1.80333023 10 D L L Av K K K Diesel 97500.0012 7.2.714272 7.4.347351 0 .010273029 0.43417246 2.5668975 | no data no data no data no data no data no data no data 0.052751305 0.129156483 no data 0.158240565 100 D L L Av K K Diesel 100749.999 68.300488 69.52339 0.00824036 0.35460892 2.301937 | no data no data no data no data no data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D L L Av K K Av K S Diesel 97500.0012 6.3.566575 0.007285117 0.30237473 1.8607732 | no data 0.00433 no data no data no data 10.04177 0.08458 no data 0.10940 D L Av K Diesel 100745 57.43 58.23 0.00611 0.248 1.630 |
| 3-30,00 | Erhytheraene Hexane (n.) Isso-ottane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene Toluene Trimethythezene (1,2,4) Xylene (m.) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Buik Liquid Furgerature (degF) Avg. Liquid Surface Temp. (degF) Avg. Liquid Surface Temp. (degF) Avg. Liquid Starface Temp. (degF) Avg. Liquid Starface Stanbild Estimated standing losses (lbs) Estimated standing losses (lbs) Benzene | no data 0.004428053 0.00428053 on o data no data no data 0.042588038 0.086695928 0.086695928 0.086695928 0.04258038 0.086695928 0.042580 0.040680 0.0425 | no data 0.004102685 0.004102685 0.004102685 0.00412 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.030685409 no data 0.03316533 0.00645404 K Diesel 91000.0014 58.622082 59.662387 0.00641443 0.2334849 1.5403807 1.5403807 | no data 0.004990159 0.004990159 0.00478 0.0047881077 0.099427399 no data 0.126120261 100 D L Av K Diesel 100749.999 60.736128 62.206889 0.006969278 0.30469824 1.8428175 | no data no data no data o 0.005363312 0 no data no data no data 0 no data 0 .108385786 no data 0 .108385786 no data 0 .13565817 10 D L Av K K Av K Biesel 97500.0012 6.317353 0 .007628905 1.9406263 | no data 0.006103533 0.006103533 0.006103533 0.00414 0.00414 0.056649331 0.056649331 0.056649331 0.0564530188 100749.999 66.438912 68.375535 0.008507021 0.37805837 2.2216069 | no data 0.006497218 0.006497218 0.00481 no data no data no data 0.059651286 0.135557802 no data 0.164640472 10 D D L Av K K Diesel 97500.0012 69,363065 71.412641 0.09385833 0.40107392 2.353754 | no data 0.007541971 on data no data no data no data 0.068374507 0.160119039 no data 0.191312307 D D L Av K BDiesel 100749.999 72.04733 75.01494 0.010489212 0.47727438 2.7048025 | no data 0.007851198 0.007851198 0.007851198 0.007854198 no data 0.0070882616 0.070882616 0.070882616 0.070882616 0.070882617 0.0749.999 74.241485 76.219360 0.010889372 0.50535619 2.8020802 | no data no data no data o 0.007110504 0 0.007110504 no data no data no data 0 0.64612509 0 0.150476396 no data 0 1.80333023 10 D L L Av K K K Diesel 97500.0012 7.2.714272 7.4.347351 0 .010273029 0.43417246 2.5668975 | no data no data no data no data no data no data no data 0.052751305 0.129156483 no data 0.158240565 100 D L L Av K K Diesel 100749.999 68.300488 69.52339 0.00824036 0.35460892 2.301937 | no data no data no data no data no data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D L L Av K K Av K S Diesel 97500.0012 6.3.566575 0.007285117 0.30237473 1.8607732 | no data 0.00433 no data no data no data 10.04177 0.04177 0.04177 0.04177 0.04177 0.04177 0.0458 no data 0.10940 D L Av K Diesel 100745 57.43 58.23 0.00611 0.248 1.630 |
| 3-30,00 | Ehylbenzene Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene Xylene (m.) 00 Diameter (ft) Fixed Roof Type Iniside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Bulk Liquid Temperature (degF) Avg. TVP (psia) Estimated varking losses (lbs) Estimated varking losses (lbs) Benzo(g.h.)berylene | no data 0.004428053 no data no data 0.04528038 0.046595928 no data 0.040528038 0.040528038 0.040528038 1.0011800969 100749.099 57.96184 58.825504 0.006235178 0.02566938 1.6610115 1.9177053 0 00 | no data 0.004102685 0 0 no data no data 0.03922929 0.080685409 0.080685409 0.039322920 0.039322920 0.03932429 0.0393242 0.0393242 0.0393242 0.039324 0.034143 0.0233449 1.5403807 1.75403807 1.75403807 0.004143 0.0233449 1.5403807 1.75403807 0.0233449 0.0233449 0.23345 0.2345 0.2345 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 10 D L Av K K Diesel 100749.999 60.736128 62.20689 0.00669278 0.03469224 1.8428177 2.1475099 0 0 | no data no data no data no data no data no data no data 0.05363212 no data 0.108385786 no data 0.13565817 10 D L L Av K K Av S D Disesel 97500.0012 6.4.986439 0.007628905 1.9406263 2.2969434 0 0 | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data 0.056649331 0.056649331 0.056649331 0.056649331 0.02545255 no data 0.056643391 0.02545255 0.008507021 0.037805337 2.2216069 2.5996653 0 0 0 | no data 0.006497218 0.006497218 0.006412 0.006451280 0.005451280 0.005451280 0.005451280 0.005451280 0.005451280 0.005451280 0.001280 0.0010739 2.353754754 2.3537547547547547547547547547547547547547547 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.091312307 1000 D L Av K K Diesel 100749.999 75.014948 0.01049212 0.047727438 2.7048025 3.1820769 0 0 | no data 0.007851198 0 no data no data no data 0.070882616 0.070882616 0.070882616 0.070882616 10070882616 0.070882610 0.070882610 0.010863932 0.05035619 2.8020802 3.3074364 0 0 | no data no data no data no data no data no data no data no data 0.06412509 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 No D L L Av K K K K S D D D D D D D D D D D D D D D | no data no data no data no data no data no data no data no data 0.057751305 0.129156483 no data 0.158240565 10 D L L Av K K K K K S D D D D D D D D D D D D Seel 100749.999 68.300468 69.52339 0.00824036 0.035460499 0.035665459 0.035665459 0.0556459 0.0556459 0.0556459 0.05565459 0.05565459 0.05565459 0.056565459 0.056565459 0.056565459 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.056565 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.0565655 0.05656555 0.05656555 0.056565555 0.056565555 0.05656555 0.05656555 0.056565555 0.056565555 0.0565655555 0.056565555555555 | no data no data no data no data no data no data no data 0.47598342 0.101092537 no data 0.127393865 10 D L Av K K Diesel 97500.0012 6.356675 0.007285117 0.30237473 1.860732 2.1631479 0 no data | no data 0.00433 no data no data no data 0.04177 0.08458 no data 0.10940 D L Av K Diesel 100745 57.43 58.232 0.006111 0.0428 1.6300 1.878 |
| 3-30,00 | Erhytheraene Hexane (n-) Isso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PAcs (Chrysene Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m-) O Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Condition (post-19) Roof Condition (post-19) Roof Condition (post-19) Roof Finish Product Throughput (gal) Bulk Liquid Surface Temp. (degF) Avg. TVP (psia) Estimated standing losses (bs) Estimated standing losses (bs) Estimated standing losses (bs) Estimated standing losses (bs) Benzo(g.h.)perylene Benzo(g.h.)perylene Biphenyl | no data 0.004428053 0 no data no data no data 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 1.01115 0.04254 8 Xv K Diesel 1.00749,999 5.7,96184 5.8,825504 0.006235178 0.00625178 0.006258 0.006458 0.006458 0.00768 0.0 | no data 0.004102685 0 0 no data no data no data 0.03922929 0.03922929 0.039265409 0.039265409 0.039265409 0.039265409 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926540 0.03926555 0.03926555 0.0392655 0.0392655 0.0392655 0.0392655 0.0392655 0.0392655 0.03926555 0.0392655 0.0392655 0.03926555 0.0392655 0.0392655 0.0392655 0.03926555 0.03926555 0.03926555 0.03926555 0.03926555 0.03926555 0.039265555 0.039265555 0.039265555 0.039265555 0.0392655555 0.03926555555555555555555555555555555555555 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 0.047381077 0.099427399 no data 0.126120261 0.04738107 K Av K Diesei 0.100749.999 60.736128 62.206889 0.006969274 1.8428117 2.1475099 no data 0.006969274 0.00696274 0.00696274 0.00696274 0.00696274 0.00696274 0.00696274 0.00696274 0.00696274 0.00696274 0.00696274 0.0074810 0.0074810 0.0074810 0.0074810 0.007481077 0.007481077 0.007481077 0.00748107 0.007481077 0.007481077 0.0074810 0.0074810 0.00748107 0.00748107 0.0074810000000000000000000000000000000000 | no data no data 0 0005363312 0 no data no data no data no data 0 108385786 no data 0 108385786 no data 0 108385786 no data 0 108385786 no data 0 007628905 0 007628905 1.9406263 2.2966434 no data no data no data no data | no data 0.006103533 0 no data no data no data 0.056649331 0.125455255 no data 0.154530188 100749,999 66.438912 0.005507021 0.3750350 0.008507021 0.3750530 0.008507021 0.3750533 0.0085070200 0.0085070200000000000000000000000000000000 | no data 0.006497218 0 no data no data no data 0.059651266 0.135557802 no data 0.164640472 0.164640472 L D L L Av K K Diesei 97500.0012 97500.0012 97500.0012 97500.0013 0.009368503 0.40107392 2.255427 0.009364500 0.009561200 0.00956120 0.0000000000000000000000000000000000 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.0191312307 0.191312307 0.191312307 0.191312307 0.191312307 0.1913423 Xv K Av K K Diesei 100749.999 72.94733 75.014948 0.010489212 0.0149212 0.01489212 0.01489212 0.014921200200000000000000000 | no data 0.007851198 0 no data no data no data 0.0078822616 0.0078822616 0.0078922617 0.007892617 0.0199225282 0.00789297 0.00789297 Xv K K Diesel 100749,999 7.4.241485 7.6.219366 0.001889372 0.010889372 0.010889372 0.010889372 0.010889372 0.010889437 0.010889372 0.010889437 0.010889437 0.010889437 0.010889437 0.010889437 0.010889437 0.010889437 0.0108844 0.010889437 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.0108844 0.010844 0.010844 0.010844 0.010844 0.010844 0.01084 0.00084 | no data no data no data no data no data no data no data no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data no data 0.341724 2.5684975 3.0026090 no data no data | no data no data no data o 0.006248035 o 1006248035 o 1006248035 o 1006248035 no data no data no data no data 0.129156483 no data 0.129156483 no data 0.129156483 no data 0.129156483 no data 0.0584086 0.05824036 0.008824036 0.035460892 2.301937 2.6565450 no data no data | no data no data 0.005038611 0 data no data no data no data 0.101092537 no data 0.101092537 no data 0.101092537 no data 0.127393865 0.101092537 0.101092537 0.101092537 0.0012 do K K Av K Diesel 97500.0012 do:S8453 63.565675 0.007285117 1.8607732 2.1631479 no data no data no data | no data 0.00433 no data no data no data 0.010747 D D L L Av K K Av K K Diesel 100745 57.43 30.00611 0.00458 1.878 no data n.00417 no data n.00458 1.00745 1.00 |
| 3-30,00 | Erhytherenen Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbezene (1,2,4) Xylene (Xylene (m.) D Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Bulk Llquid Temperature (degF) Avg. Liquid Surface Temp. (degF) | no data 0.004428053 0.00428053 on o data no data no data 0.042588038 0.086695928 0.086695928 0.086695928 0.04258038 0.086695928 0.04258 0.04258 0.04258 0.04258 0.04258 0.05999 0.02566938 1.6610115 1.9177053 0.02566938 1.6610115 1.9177053 0.0506938 0.0256938 0.0256938 0.017639 0.00000 0.0000 0.0000 0.0000 0.00000 0.0 | no data 0.004102685 0.004102685 0.004102685 0.00412 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.03932929 0.039329 0.00041443 0.0332929 0.00041443 0.0332929 0.00041443 0.0332929 0.00041443 0.039329 0.00041443 0.00041443 0.00041443 0.00041443 0.00041443 0.00041443 0.0004144 0.000410 | no data 0.004990159 on o data no data no data 0.047381077 0.099427399 no data 0.126120261 L Av K Diesel 100749.999 60.736128 62.206889 0.00696278 0.30469824 1.8428117 2.1475099 0.034469824 0.30469824 0.30469827 0.30469824 0.30469827 0.30469824 0.30469827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.30468827 0.3046887 0.3046887 0.304687 0.30 | no data no data no data o 0.005363312 0 no data no data no data 0 no data 0 .13865817 10 D L L Av K K V V K B Desel 97500.0012 63.113753 64.986439 2.096434 2.906434 2.906434 0.03633170 0.07628905 0.35631705 | no data 0.006103533 0.006103533 0.006103533 0.006449331 0.056649331 0.056649331 0.056649331 0.0564530188 0.005455255 0.008547021 0.0749.999 66.438912 68.375535 0.008507021 0.37805837 2.2216069 2.5996653 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.00810 0.037805837 0.00810 0.037805837 0.00056857 0.0005685 | no data 0.006497218 0.006497218 0.no data no data no data 0.059651286 0.13557802 no data 0.164640472 10 D D L Av K Diesel 97500.0012 69,363065 71.412644 2.353754 2.7548279 0 no data no data no data | no data 0.007541971 on odata no data no data no data no data 0.068374507 0.160119039 no data 0.0191312307 D D L Av K K Diesel 100749.999 72.94733 75.01494 0.010489212 0.47727438 2.7048025 3.1820769 0 no data no data no data | no data 0.007851198 0.007851198 0.007851198 0.007854198 no data no data 0.070882616 0.070882616 0.070882616 0.070882617 0.07049.999 74.241485 76.219360 0.010889372 0.50535619 2.8020802 3.074364 0.0108439372 0.050535619 2.8020802 3.074364 0.0108439372 0.050535619 2.8020802 3.074364 0.0108439372 0.055535619 0.05555619 0.055535619 0.0555555619 0.0555555619 0.0555555655555555555555555555555555555 | no data no data no data no data no data no data no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 97500.0012 7.2,714272 7.4,347351 0.010273029 0.03411246 2.5684975 3.0026699 0.00 data no data no data no data | no data no data no data no data no data no data no data 0.057751305 0.129156483 no data 0.158240565 100 D L L Av K K Dissel 100749.999 68.300468 69.52339 0.00824036 0.336460824 0.3364665459 0.035665459 0.00824036 0.336460824 0.336460840084084008400840084008400840084008 | no data no data no data no data no data no data no data no data 0.47598342 0.101092537 no data 0.127393865 0.101092537 no data 0.127393865 0.101092537 no data xv K D D L L Av K K Av K D Desel 97500.0012 2.163479 0.0323473 1.8607732 2.1631479 0 no data no data no data no data | no data 0.00433 no data no data 0.04177 0.08458 no data 0.10940 D L L Av K K S D0sel 10074 5.43 8.23 0.00611 10074 5.43 0.10940 D D L L Av K K N N N S R S R S R S R S R S R S R S R S |
| 3-30,00 | Ehytheraene Hexane (n-) Isso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (M-) Quanter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Roof Condition (post-19) Roof Finish Roof Finish Roof Finish Roof Finish Roof Finish Product Throughput (gal) Buik Liquid Surface Temp. (degF) Avg. TVP (psia) Estimated standing losses (bs) Estimated standing losses (bs) Estimated working losses (bs) Estimated working losses (bs) Estimated missions (bs) Benzoe (ba), h)perylene Biphenyl Cumene (isopropylbenzene) Cyclohexane | no data 0.004428053 0 on data no data no data 0.042580360 0.042580360 0.042580360 0.042580360 0.042580360 0.042580360 0.0425807 0.0425807 0.0425807 0.006235178 0.2566938 1.6610115 0.006235178 0.006235178 0.006325179 0.007575179 0.007575179 0.007575179 0.007575179 0.007575179 0.007575179 0.007575179 0.007575179 0.007575179 0.007575179 0.007575179 0.00757575757575757575757575757575757575 | no data 0.004102685 0 no data no data no data 0.039229290 0.0390685409 no data 0.0304533 10.03916533 0.0392685409 no data 0.03916533 0.039268540 0.039268540 0.039268540 0.0392645454 0.0392645454 0.0392645454545454545454545454545454545454545 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 L L L L Av K K Av K K Diesel 100749.999 60.736128 62.20689 0.006969278 0.30469824 1.8428117 0.006969279 0.0078100 0.00781000000000000000000000000000000000 | no data no data no data o 0.005363312 0 0.005363312 0 0.005363312 0 0.05385786 no data 0 .1058387786 no data 0 .1058387786 no data 0 .13565817 10 D D L Av K K DIesel 97550.0012 6.3113753 6.4.986839 0.007628905 0.35631705 1.9406263 2.2969434 0 no data no data no data no data no data | no data 0.006103533 0 0 0 data no data no data no data 0.056649331 0.12545255 no data 0.154530188 10.0154530188 10.0154530188 10.0154530188 K Av K Av K Biesel 100749.999 66.438912 68.375535 0.008507021 0.3705837 2.2216069 2.25996653 0.008507021 0.3705837 0.008507021 0.3705837 0.008507021 0.008507020 0.008507020 0.008507020 0.00000000000000000000000000000000 | no data 0.006497218 0 no data no data no data no data 0.059651286 0.135557802 no data 0.1646404727 0.1646404727 0.1646404727 0.164640472 0.164640472 0.164640472 0.164640472 0.005968503 0.40107392 2.353754 2.25348279 0 no data no data no data no data no data | no data 0.007541971 on data no data no data no data 0.068374507 0.160119039 no data 0.0191312307 L D L L Av K Av K K Av K Biesel 100749.999 72.94733 75.014948 0.010489212 0.47727438 2.7048025 0.010489210 0.010489210 7.5014948 0.010489210 7.5014948 0.010489210 0.010489210 0.010489210 0.01048120 0.0104820 0.01048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.00048120 0.0004812000000000000000000000000000000000 | no data 0.007851198 0.007851198 0.007882616 0.007882616 0.007882616 0.070882616 0.070882616 0.070882616 0.070882616 0.0708426 0.019225282 0.019225282 0.0192572 0.01088937 0.01088937 0.01088937 0.01088937 0.01088937 0.01088937 0.01088937 0.01088937 0.01088937 0.01088937 0.01088937 0.010840 0.010841 0.00084100000000000000000000000000000000 | no data no data no data 0 007110506 0 007110506 0 007107607 0 data no data 0 0064612509 0 150476398 no data 0 18033023 10 D D L Av K K Av K Diesel 97500.0012 72.714272 74.347351 0.010273029 0.3417246 2.5684975 3.0026699 0 no data no data no data no data no data | no data no data no data o 0.006240035 0 0.006240035 0 0.006240035 0 0.0057751305 0 1.29156483 no data 0 .158240565 100 D D L Av K K Av K Diesel 100749.999 68.300468 69.523393 0.008824036 0.035460892 2.301937 2.6565459 0 no data no data no data no data | no data no data no data o 0.005038611 0 0.005038611 0 0 data no data 0.047598342 0.101092537 no data 0.127393865 0.10729537 0.00728511 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | no data 0.00433 no data no data no data no data no data 0.04177 0.04458 no data 100744 K K Av K K Diesel 100744 S7.43 8.22 0.00611 0.24458 no data no data no data no data no data no data data data 1.878 no data no data no data no data data data data data data data data |
| 3-30,00 | Erhytherenen Hexane (n-) Isso-ottane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysen Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m-) O Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Product Throughput (gal) Buki Liquid Temperature (degF) Avg. Liquid Surface Temp. (degF) Avg. TyP (psia) Estimated standing losses (lbs) Estimated standing losses (lbs) Benzene Benzo(g.h.)perylene Biphenyl Cumene (Isopropylbenzene) Cyclohexane | no data 0.004428053 0.00428053 on o data no data no data 0.042588038 0.086695928 0.086695928 0.086695928 0.04258038 0.086695928 0.04258 0.04258 0.04258 0.04258 0.04258 0.05999 0.02566938 1.6610115 1.9177053 0.02566938 1.6610115 1.9177053 0.0506938 0.0256938 0.0256938 0.017639 0.00000 0.0000 0.0000 0.0000 0.00000 0.0 | no data 0.004102685 0.004102685 0.004102685 0.00412 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.039329299 0.03932929 0.039329 0.00041443 0.033329 0.00041443 0.03329 0.00041443 0.039329 0.00041443 0.039329 0.00041443 0.00041443 0.00041443 0.00041443 0.00041443 0.00041443 0.0004144 0.000414 0. | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 L L L L Av K K Av K K Diesel 100749.999 60.736128 62.20689 0.006969278 0.30469824 1.8428117 0.006969279 0.0078100 0.00781000000000000000000000000000000000 | no data no data no data o 0.005363312 0 no data no data no data 0 no data 0 .13865817 10 D L L Av K K V V K B Desel 97500.0012 63.113753 64.986439 2.096434 2.906434 2.906434 0.03633170 0.07628905 0.35631705 | no data 0.006103533 0.006103533 0.006103533 0.006449331 0.056649331 0.056649331 0.056649331 0.0564530188 0.005455255 0.008547021 0.0749.999 66.438912 68.375535 0.008507021 0.37805837 2.2216069 2.5996653 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.00810 0.037805837 0.00810 0.037805837 0.00056857 0.0005685 | no data 0.006497218 0.006497218 0.no data no data no data 0.059651286 0.13557802 no data 0.164640472 10 D D L Av K Diesel 97500.0012 69,363065 71.412644 2.353754 2.7548279 0 no data no data no data | no data 0.007541971 on odata no data no data no data no data 0.068374507 0.160119039 no data 0.0191312307 D D L Av K K Diesel 100749.999 72.94733 75.01494 0.010489212 0.47727438 2.7048025 3.1820769 0 no data no data no data | no data 0.007851198 0 no data no data no data 0.01882264 0.018922582 0.018922582 0.018922582 0.0199225282 0.0199225282 0.0199225282 0.0199295 0.0199295 0.0199295 0.0199295 0.0199295 0.0199295 0.0199295 0.01989397 2.8020802 3.3074364 0.00889372 3.3074364 0.00889372 0.007851198 | no data no data no data 0 007110506 0 007110506 0 007107607 0 data no data 0 0064612509 0 150476398 no data 0 18033023 10 D D L Av K K Diesel 97500.0012 72.714272 74.347351 0.010273029 0.33117246 2.5684975 3.0026699 0 no data no data no data no data no data | no data no data no data 0 006248035 0 006248035 0 1006248035 0 1006248035 0 129156483 no data 0 158240565 100 D L Av K K Av K DDesel 10074999 68.300486 69.523393 0.008824036 0.35460892 2.301937 2.6565459 0 no data no data no data no data no data | no data no data no data no data no data no data no data no data 0.47598342 0.101092537 no data 0.127393865 0.101092537 no data 0.127393865 0.101092537 no data xv K D D L L Av K K Av K D Desel 97500.0012 2.163479 0.0323473 1.8607732 2.1631479 0 no data no data no data no data | no data 0.00433 no data no data no data no data 0.0475 no data 0.0455 no data 0.0456 No No K K Av K Diesel 1.0074/ 5.8.22 0.00611 1.636 1.6377 1.637 1.6377 1.6377 1.6377 1.6377 1.6377 1.6377 1.6377 |
| 3-30,00 | Erhytherenen Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (N,2) Diameter (th) Diameter (th) Diameter (th) Ned Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Bulk Liquid Temperature (degF) Avg. Liquid Surface Temp. (degF) Avg. (deg | no data 0.004428053 0.00428053 no data no data no data 0.042588038 0.086095928 no data 0.045288038 0.086095928 no data 0.0111806969 1.00749.999 58.825504 0.006235178 0.2566938 1.6610115 1.9177053 0 no data no data no data no data 0.04248053 0.00428055 0.00428055 0.004280555 0.00428055555 0.0042805555 | no data 0.004102685 0.004102685 0.004102685 0.039329299 0.039329299 0.039329299 0.03085409 no data 0.103616533 10 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.0041443 0.2334849 1.5403807 1.5403807 0.00641443 0.034184 0.04182 0.004102685 0.004182 | no data 0.004990159 on odata no data no data no data no data 0.047381077 0.099427399 no data 0.126120261 L Av K Diesel 100749.999 60.736128 62.206889 0.006969278 0.3046924 1.8428117 2.1475099 0 no data no data no data no data no data 0.00490159 0.00 | no data no data no data 0.005363312 0 no data no data no data 0.108385786 no data 0.108385786 no data 0.13565817 10 D L Av K K Av K K Diesel 97500.0012 6.31705 1.940628 2.2969434 0.07628905 1.940628 2.2969434 0.07628905 1.940628 0.07628905 0.07628905 0.07628905 0.07628905 0.03563170 0.00 data no data no data 0.00536312 0.00563312 | no data 0.006103533 0.006103533 0.006103533 0.0041a no data no data 0.056649331 0.15455255 no data 0.154530188 0.154530188 Av K Diesel 100749.999 66.438912 68.375535 0.008507021 0.37805837 2.2210606 2.5996653 0.008507021 0.37805837 0.2210409 2.2210405 0.008507021 0.37805837 0.008507021 0.008507020 0.00850700000000000000000000000000000000 | no data 0.006497218 0.006497218 0.00412 no data no data no data 0.059651280 0.059651280 0.059651280 0.059651280 0.0164640472 10 D D L Av K Diesel 97500.0012 69.363065 71.412641 0.009368503 0.40107392 2.353754 2.353754 2.353754 0.00418 0 | no data 0.007541971 on odata no data no data no data no data no data no data 0.068374507 0.100119039 no data 0.191312307 D D L Av K K Diesel 100749.999 72.94733 75.01448 0.010489212 0.47727438 2.7048025 3.1820769 0 no data no data no data no data no data no data no data no data no data no data 10.07419711 0.07519710 0.0751971000000000000000000000000000000000 | no data 0.007851198 0.007851198 0.007851198 0.007851198 0.00484 0.00484 0.0070882616 0.0199225282 0.007925282 0.00749299 7.4241485 7.621936 0.010889372 0.0033619 2.8802002 3.3074364 0.010889372 0.00336519 2.8802002 3.3074364 0.007851198 0.007851198 0.007851198 0.007851198 | no data no data no data no data no data no data no data 0.064612509 0.150476398 no data 0.180333023 10 D L Av K K Diesel 97500.0012 7.2,714272 7.4,34735 0.010273029 0.100273029 0.100273029 0.010273029 0.0001273029 0.00041200400000000000000000000000000000 | no data no data no data no data no data no data no data no data 0.152751305 0.129156483 no data 0.158240565 100 D L Av K K Av K K Diesel 100749.999 68.300468 69.52339 0.00824036 0.35460892 2.301937 2.6565459 0 no data no data no data no data no data 0.0484035 0.00248035 | no data no data no data no data no data no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D L Av K K Av K K Diesel 97500.0012 6.3.56675 0.007285117 0.00728517 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 0.0072857 | no data 0.00433 no data no data no data no data no data 0.04177 0.04458 no data 0.010940 L L Av K K Diesel 100744 57.43 2000611 0.04457 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.63000 1.63000 1.63000 1.63000000000000000000000000000000000000 |
| 3-30,00 | Ehylbenzene Hexane (n-) Isso-octane (2,2,4 trimethylpentane Total loss components in the "Chor Acks (Chrysene Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m-) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Roof Finish Roof Finish Roof Finish Roof Finish Shell Kondition (post-19) Roof Finish Roof Finish Stall Action (post-19) Stell Condition (post-19) Roof Finish Stell Condition (post-19) Roof Finish Stall Action (post-19) Roof Finish Stall Action (post-19) Roof Finish Condition (post-19) Roof Finish Condition (post-19) Roof Finish Condition (post-19) Roof (post) Estimated standing losses (bs) Estimated standing losses (bs) Estimated emissions (bs) Benzene Benzo(g,h.)perylene Biphenyl Cumene (Isopropylbenzene) Cyclohexane Ethylbenzene Ethylbenzene Ling (n-) Iso-octane (2,2,4 trimethylpentane | no data 0.004428053 0 0 data no data no data 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 1.00149 999 057.96184 58.825504 0.002432182 0.002432182 0.002432182 0.002432182 0.004428053 0 no data 0.004428053 0 no data | no data 0.004102685 0 0 no data no data no data 0.03922929 0.080685409 no data 0.1036105533 0.1036105533 0.1036105533 0.1036105533 0.1036105533 0.1036105533 0.103610553 0.103610553 0.00641143 0.0064143 0.004102685 0 004102685 0 0041000000000000000000000000000000000 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 U D D L Av K Av K Av K Av K Biesel 100749.999 60.736128 62.20689 0.006969278 0.30469824 1.8428117 2.1475099 0 no data no data 0.004990159 0 no data | no data no data no data o 0.005363312 o 1043a no data no data no data 0.108385786 no data 0.108385786 no data 0.108385786 no data 0.108385786 no data 0.007628905 0.007628905 0.007628905 0.35631705 1.9406263 2.2966434 no data no data no data 0.005363312 0.005555555555555555555555555555555555 | no data 0.006103533 0 0 0 no data no data no data 0.056649331 0.12545255 no data 0.0154530188 0.0154530188 0.0154530188 0.0154530188 0.0154530188 0.015453018 0.015453018 0.015453018 0.015453018 0.005507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.008507020 0.0095070200000000000000000000000000000000 | no data 0.006497218 0 00 data no data no data 0.059651264 0.035557802 no data 0.164640472 L L D L L Av K K Av K K Av K Biesel Dissel 77500.0012 69.363065 71.412614 0.0093648503 0.40107392 2.353754 2.7548279 0 0 data no data 0.004497218 0.004497218 0.004497218 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.0191312307 0.10119039 no data 0.0191312307 0.191312307 0.191312307 0.191312307 0.191312307 0.1913120 0.01048212 0.0104822 0.0104822 0.01048212 0.01048212 0.01048212 0.01048212 0.01048212 0.01048212 0.0104821 0.0104821 0.007541971 0 no data | no data 0.007851198 0 no data no data no data 0.070882264 0.070882264 0.070882264 0.07088264 0.07082264 0.0708297 0.0708297 7.6.219366 0.0708897 7.6.219366 0.07088937 0.070853619 2.8020802 3.3074346 0.0708535619 2.8020802 3.3074346 0.0708535619 2.8020802 3.3074345 0.0708535619 0.070851198 0.07851 | no data no data no data no data no data no data no data no data no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.0341724 2.5684975 3.0026699 no data no data no data 0.0431 | no data no data no data o 0.006248035 0 data no data no data no data 0.129156483 no data 0.129156483 no data 0.12915483 no data 0.12915483 0.12915483 0.12915483 0.12915483 0.12915483 0.02824036 0.03840365 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.006248035 0.0082403 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.0082400 0.00824000000000000000000000000000000000 | no data no data 0.005038611 0 data no data no data no data 0.101092537 no data 0.101092537 no data 0.127393865 0.101092537 no data 0.127393865 0.101092537 0.0012 6.258453 6.3565075 0.007285117 0.007285117 1.8607732 2.1631479 no data no data 0.005038611 0.005038612000000000000000000000000000000000000 | no data 0.00433 no data no data no data no data no data 0.04177 0.08458 D L L Av K K Av K K Av K K Diesel 10074' 57.43 58.23 0.00611 0.0428 1.878 no data no data |
| 3-30,00 | Erhytherenen Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Choo PACs (Chrysene) Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (N,2) Diameter (th) Diameter (th) Diameter (th) Ned Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Bulk Liquid Temperature (degF) Avg. Liquid Surface Temp. (degF) Avg. (deg | no data 0.004428053 0 0 data no data no data 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 1.00149 999 057.96184 58.825504 0.002432182 0.002432182 0.002432182 0.002432182 0.004428053 0 no data 0.004428053 0 no data | no data 0.004102685 0.004102685 0.004102685 0.039329299 0.039329299 0.039329299 0.03085409 no data 0.103616533 10 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.0041443 0.2334849 1.5403807 1.5403807 0.00641443 0.034184 0.0412685 0.004102685 0.0041268 | no data 0.004990159 on odata no data no data no data no data 0.047381077 0.099427399 no data 0.126120261 L Av K Diesel 100749.999 60.736128 62.206889 0.006969278 0.3046924 1.8428117 2.1475099 0 no data no data no data no data no data 0.00490159 0.00 | no data no data no data 0.005363312 0 no data no data no data 0.108385786 no data 0.108385786 no data 0.13565817 10 D L Av K K Av K K Diesel 97500.0012 6.31705 1.940628 2.2969434 0.07628905 1.940628 2.2969434 0.07628905 1.940628 2.2969434 0.07628905 1.940628 0.07628905 1.940628 2.2969434 0.07628905 1.940628 0.07628905 1.940628 0.07628905 0 | no data 0.006103533 0.006103533 0.006103533 0.0041a no data no data 0.056649331 0.15455255 no data 0.154530188 0.154530188 Av K Diesel 100749.999 66.438912 68.375535 0.008507021 0.37805837 2.2210606 2.5996653 0.008507021 0.37805837 0.2210409 2.2210405 0.008507021 0.37805837 0.008507021 0.008507020 0.00850700000000000000000000000000000000 | no data 0.006497218 0 00 data no data no data 0.059651264 0.035557802 no data 0.164640472 L L D L L Av K K Av K K Av K Biesel Dissel 77500.0012 69.363065 71.412614 0.0093648503 0.40107392 2.353754 2.7548279 0 0 data no data 0.004497218 0.004497218 0.004497218 | no data 0.007541971 0.007541971 0.no data no data no data 0.068374507 0.160119039 no data 0.191312307 100 D L Av K Diesel 100749.999 72.94733 75.014948 0.010489212 0.47727438 2.7048025 3.1820769 0 no data no data no data no data no data 0.0631 0.07537473 0.100749.999 75.014948 0.007547473 0.100749.999 75.014948 0.007547473 0.100749.999 75.014948 0.007547473 0.100749.999 0.04727438 0.0075474747 0.00754747 0.0075474747 0.0075474747 0.0075474747 0.0075474747 0.00754747474747 0.0075474747474747474747474747474747474747 | no data 0.007851198 0 no data no data no data 0.070882264 0.070882264 0.070882264 0.07088264 0.07082264 0.0708297 0.0708297 7.6.219366 0.0708897 7.6.219366 0.07088937 0.070853619 2.8020802 3.3074346 0.0708535619 2.8020802 3.3074346 0.0708535619 2.8020802 3.3074345 0.0708535619 0.070851198 0.07851 | no data no data no data no data no data no data no data 0.064612509 0.150476398 no data 0.180333023 10 D L Av K K Diesel 97500.0012 7.2,714272 7.2,714272 7.4,347351 0.010273029 0.100273029 0.010273029 0.0001273000000000000000000000000000000000 | no data no data no data o 0.006248035 0 adata no data no data no data 0.129156483 no data 0.129156483 no data 0.129156483 no data 0.129156483 0.129156483 0.129156483 0.02824036 0.02824036 0.035460892 2.301937 2.6565459 no data no data no data 0.0428035 0.006248035 0.007577 0.00757 0.00757 0.007577 0.007577 0.007577 0.0075777 0.00757777 0.00757777777777 | no data no data 0.005038611 0 data no data no data no data 0.101092537 no data 0.101092537 no data 0.127393865 0.101092537 no data 0.127393865 0.101092537 0.0012 6.258453 6.3565075 0.007285117 0.007285117 1.8607732 2.1631479 no data no data 0.005038611 0.005038612000000000000000000000000000000000000 | no data 0.00433 no data no data no data no data no data 0.04177 0.04456 no data 0.01940 D L L Av K K Diesel 100745 7.42 3 0.00611 0.04457 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.6300 1.63000 1.63000 1.63000 1.63000000000000000000000000000000000000 |
| 3-30,00 | Erhylbenzene Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene Toluene Trimethylbeznene (1,2,4) Xylene (m.) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Buik Liquid Temperature (degF) Avg. Liquid Surface Temp. (degF) Avg. TyP (psia) Estimated standing losses (lbs) Estimated standing losses (lbs) Benzene Benzo(g.h.i)perylene Biphenyl Cumene (isopropylbenzene) Cyclohexane Ethylbenzene Hexane (n-) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor | no data 0.004428053 0 0 data no data no data 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 1.00149 999 057.96184 58.825504 0.002432182 0.002432182 0.002432182 0.002432182 0.004428053 0 no data 0.004428053 0 no data | no data 0.004102685 0 0 no data no data no data 0.03922929 0.080685409 no data 0.03056533 0.03056553 0.03056553 0.0305765 0.0305765 0.0305765 0.0305776 0.0305776 0.0305776 0.0305776 0.0305776 0.0315776 0.031577777577 0.0315777775777777777777777777777777777777 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 L D L D L Av K Av K Av K Biesel 100749.999 60.736128 6.2.20689 0.006969278 0.30469824 1.8428117 2.1475099 0 no data no data 0.004990159 0 no data | no data no data no data o 0.005363312 o 1043a no data no data no data 0.108385786 no data 0.108385786 no data 0.108385786 no data 0.108385786 no data 0.007628905 0.007628905 0.007628905 0.35631705 1.9406263 2.2966434 no data no data no data 0.005363312 0.005555555555555555555555555555555555 | no data 0.006103533 0 0 0 no data no data no data 0.056649331 0.12545255 no data 0.0154530188 0.0154530188 0.0154530188 0.0154530188 0.0154530188 0.015453018 0.015453018 0.015453018 0.015453018 0.005507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.0085070200000000000000000000000000000000 | no data 0.006497218 0 00 data no data no data 0.059651264 0.035557802 no data 0.164640472 L L D L L Av K K Av K K Av K Biesel Dissel 77500.0012 69.363065 71.412614 0.0093648503 0.40107392 2.353754 2.7548279 0 0 data no data 0.004497218 0.004497218 0.004497218 | no data 0.007541971 0 no data no data no data 0.068374507 0.160119039 no data 0.0191312307 0.10119039 no data 0.0191312307 0.191312307 0.191312307 0.191312307 0.191312307 0.1913120 0.01048212 0.0104822 0.0104822 0.01048212 0.01048212 0.01048212 0.01048212 0.01048212 0.01048212 0.0104821 0.0104821 0.007541971 0 no data | no data 0.007851198 0 no data no data no data 0.070882264 0.070882264 0.070882264 0.07088264 0.07082264 0.0708297 0.0708297 7.6.219366 0.0708897 7.6.219366 0.07088937 0.070853619 2.8020802 3.3074346 0.0708535619 2.8020802 3.3074346 0.0708535619 2.8020802 3.3074345 0.0708535619 0.070851198 0.0788210 0.07851198 0.0788210 0.0788210 0.0788210 0.0788210 0.0788210 0.0788210 0.0788210 0.0788210 0.0788210 0.0788210 0.0785119 0.0788210000000000000000000000000000000000 | no data no data no data no data no data no data no data no data no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data 0.0341724 2.5684975 3.0026699 no data no data no data 0.0431 | no data no data no data o 0.006248035 0 data no data no data no data 0.129156483 no data 0.129156483 no data 0.12915483 no data 0.12915483 0.12915483 0.12915483 0.12915483 0.12915483 0.02824036 0.03840365 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.0384036 0.006248035 0.0082403 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.008240 0.0082400 0.00824000000000000000000000000000000000 | no data no data no data no data no data no data no data no data 0.127393842 0.101092537 no data 0.127393865 0.0012 k k k k k k k k k k k k k k k k k k k | no data 0.00433 no data no data no data no data 0.04177 0.08458 no data 0.04177 L L Av K K Av K K Diesel Diesel Diesel 0.00611 0.0464 3.87 8.82 0.00611 0.0464 1.878 no data 0.00611 0.0465 1.878 no data 0.00611 0.0465 1.878 no data 0.00611 0.0465 1.878 no data 0.00611 0.0465 1.878 no data 0.00611 0.0465 1.878 no data 0.0045 1.878 no data 0.0045 1.878 no data 0.0417 1.878 no data 0.0417 1.878 no data 0.0417 1.878 no data 0.0417 1.878 no data 0.00417 1.878 no data 0.00417 1.878 no data 0.00611 0.0045 1.878 no data 0.00611 0.0045 1.878 no data 0.0061 0.0061 1.878 no data 0.0061 1.878 no data |
| 3-30,00 | Ehylbenzene Hexane (n-) Isso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (M-) Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Roof Finish Roof Finish Roof Finish Roof Finish Roof Finish Roof Finish Stell Condition (post-19) Roof Finish Roof Finish Roof Finish Broughput (gal) Bukk Liquid Temperature (degF) Avg. TVP (psia) Estimated standing losses (tbs) Estimated working losses (tbs) Estimated standing losses (tbs) Estimated working losses (tbs) Estimated standing losses (tbs) Estimated standing losses (tbs) Estimated composition (tbs) Benzog (h.1)perylene Biphenyl Cumene (isopropylbenzene) Ethylbenzene Hexane (n-) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) | no data 0.004428053 0 no data no data no data 0.04258053 0.04258053 0.04258053 0.04258053 0.0111806969 1.011806969 0.011806969 0.0118069528 0.0118069528 0.0118069528 0.0118069528 0.0118069528 0.0118069528 0.00235178 0.006235178 0.007258 0.00758 0.00758 0.00758 | no data 0.004102685 0 no data no data no data 0.039322920 0.039322920 0.039322920 0.039322920 0.03932429 0.03932420 0.03932420 0.0393245 | no data 0.004990159 no data no data no data 0.047381077 0.099427399 no data 0.126120261 L Av K Diesel 100749.999 60.736128 6.2206889 0.006969278 0.30469824 1.8428117 2.1475099 0 no data no data no data 0.04290159 0 no data no data | no data no data no data o 0.005363312 0 no data no data 0.050392213 0.10838786 no data 0.10838786 no data 0.13565817 10 D L Av K K Diesel 97500.0012 6.4 98683 2.2969434 0.007628905 0.35631705 1.9406263 2.2969434 0 no data no data | no data 0.006103533 0 no data no data no data no data 0.056649331 0.125452255 no data 0.154530188 K Diesel 100749.999 66.438912 68.375535 0.008567021 0.37805837 2.2210606 2.5996653 0 no data no data no data no data no data 0.0641 0.055 0.075 | no data 0.006497218 0.006497218 0.00481 no data no data no data 0.059651286 0.135557802 no data 0.164640472 L Av K Diesel 97500.0012 69.363065 71.412614 0.009368503 0.40107392 2.353754 2.7548279 0 no data no data no data 0.00647218 0.00647218 | no data 0.007541971 0.00741971 0.008374507 0.160119039 no data 0.068374507 0.160119039 no data 0.0191312307 D D L Av K K Diesel 100749.999 72.94733 74.94733 74.94733 74.94733 72.94737 | no data 0.007851198 0.007851198 0.00184 0.00182616 0.001882616 0.070882616 0.070882616 0.070882616 0.0199225282 0.0199225282 0.019925282 0.019925282 0.019927 0.001992 0.00189937 0.001889372 0.001889372 0.001889372 0.001889372 0.001889372 0.001889372 0.001889372 0.001889372 0.001889372 0.00185198 0.001810 0.001851198 | no data no data no data o 0.007110506 0 0.007110506 0 0.0071107 0 data no data no data 0 180333023 10 D D L Av K K Diesel 97500.0012 72,714272 74,347351 0 010273029 0.3417246 2.5684975 3.0026699 0 no data no data no data no data no data no data no data no data | no data no data no data no data no data no data 0.057751305 0.12915483 no data 0.158240565 100 D L Av K K Diesel 100749.999 68.300468 69.52339 0.008824036 0.35460892 2.301937 2.6565459 0 no data no data | no data no data no data o 0.005038611 0 no data no data no data 0.047598342 0.101092537 no data 0.127393865 10 D D L Av K K Diesel 97500.0012 6.356675 0.007285117 0.30237473 1.8607322 2.1631479 0 no data no data | no data 0.00433 no data no data no data no data 0.04177 0.04458 no data 0.04077 L L Av K K Diesel 100749 57.43 30.00611 1.63000 1.63000 1.63000 1.63000 1.63000 1.63000 1.63000 1.63000000000000000000000000000000000000 |
| 3-30,00 | Ehylbenzene Hexane (n-) Isso-otane (2,2,4 trimethylpentane Total loss components in the "Chor AcS (Chrysene Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m-) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Bukk Liquid Surface Temp. (degF) Avg. TVP (psia) Estimated standing losses (bs) Estimated working losses (bs) Estimated w | no data 0.004428053 0 on data no data no data 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 1.04510950 No D D D D D D D D D D D D D D D D D D | no data 0.004102685 0 on data no data no data no data 0.03922929 0.030265409 0.030265409 0.030265409 0.030216533 0.030216533 0.030216533 0.03216533 0.0324249 0.0324249 0.0324424 0.0324849 0.0324849 0.0324849 1.5403807 1.573656 0 no data 0.04102685 0 no data 0.04102685 0 no data 0.04102685 0 0 0 0 0 0 0 0 0 0 0 0 0 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 0.126120261 0.126120261 0.126120261 0.126120261 0.126120261 0.0478924 K Av K Biesel 0.126120261 0.00549278 0.30469824 1.8428117 0.006496278 0.30469824 1.8428117 0.00649629 0 no data no data 0.004990159 0 no data 0.00490159 0 no data 0.00490159 0 0 no data 0.00490159 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | no data no data no data 0.005363312 0 no data no data no data 0.103365786 no data 0.103365786 no data 0.13365817 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | no data 0.006103533 0 no data no data no data 10 data 0.056649331 0.125455255 no data 0.154530188 10 D D L Av K Av K Diesel 100749,999 66.438912 68.375535 0.008507021 0.037805837 2.216069 2.5996653 0.008507021 0.037805837 2.216069 2.5996653 0.008507021 0.008507020 0.008507020 0.0085070200000000000000000000000000000000 | no data 0.006497218 0.006497218 0.00418 0.00418 0.00418 0.005451266 0.059651266 0.059651266 0.059651266 0.059651260 0.0546126 0.0546126 0.009368503 0.00936850 0.00936850 0.00955126 0.00956126 0.009565126 0.009565500 0.000565550 0.000565550 0.000565550 0.000565550 0.0005655500 0.0005655500 0.000565550000000000 | no data 0.007541971 0 no data no data no data no data 0.068374507 0.160119039 no data 0.0191312307 0.191312307 0.191312307 0.191312307 0.191312307 0.191312307 0.19132307 0.19132307 0.19132307 0.19132307 0.19132307 0.19132307 0.014825 0.0104825 0.0104825 0.0104825 0.0104825 0.0104825 0.0104825 0.0104810 0.01541971 0 no data 0.003541971 0 no data 0.003541971 0 no data 0.003541971 0 no data | no data 0.007851198 0 no data no data no data no data 0.070882261 0.070882261 0.070882261 0.07089261 0.07082261 0.070825282 0.070825282 0.070825282 0.078535619 2.8020802 3.3074346 0.010889372 0.010889372 0.010889372 0.010889372 0.010889372 0.010889372 0.010889372 0.010889372 0.010889372 0.010889372 0.0108810 0.010810 0.010810 0.010810 0.010810 0.007851198 0 no data 0.007851198 0 no data 0.007851198 0 no data 0.007851198 | no data no data no data no data no data no data no data no data 0.160476398 no data 0.150476398 no data 0.150476398 no data 0.150476398 no data no data 2.160475302 0.00271029 0.00271029 0.00273029 0.03417246 2.5684975 3.0026699 no data no data | no data no data no data no data no data no data no data no data no data 0.1592/46433 0.129156483 no data 0.1592/40565 100 D L Av K K Av K DDesel 100749.999 68.300486 69.523393 0.00824036 0.035460892 2.301937 2.6565459 0.00824036 0.03624036 0.03624030 0.006248035 no data no data | no data no data 0.005038611 0 no data no data no data 0.127393845 0.101092537 no data 0.127393865 0.101092537 0.101092537 0.101092537 0.101092537 0.101092537 0.101092537 0.0023473 0.807322 2.1631479 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.00234511 0.005038612 0.005038612000000000000000000000000000000000000 | no data 0.00433: no data no data no data no data 0.04177: 0.08458: no data 0.10940 D L Av K D Desel 0.057.43 58.232, 0.06111 0.0418 1.878' no data no data |
| 3-30,00 | Ehylbenzene Hexane (n.) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) PACs (Chrysene) PACs (Chrysene) PACs (Chrysene) Trimethylbeznen (1,2,4) Xylene (1,2,4) Xylene (1,2,4) Xylene (1,2,4) Xylene (1,2,4) Xylene (1,2,4) Xylene (1,2,4) Diameter (ft) Fixed Roof Type Inside Shell Condition (post-19) Shell Finish Product Throughput (gal) Bulk Llquid Temperature (degF) Avg. Liquid Surface Temp. (degF) Avg. TyP (psia) Estimated standing losses (lbs) Estimated standing losses (lbs) Estimated atomisions (lbs) Benzene Benzon(p.1)perylene Biphenyl Cumene (isopropylbenzene) Cyclohexane Ethylbenzene Hexane (n-) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene Toluene | no data 0.004428053 0.004288038 no data no data no data 0.042588038 0.086095928 no data 0.04258038 0.086095928 no data 0.04258038 Xv K Dissel 100749.999 57.96184 58.825504 0.006235178 0.0265938 1.6610115 1.9177053 0 no data no data no data 0.00428053 0.00428053 0.00428053 0.00428053 0.00428053 0.00428053 0.00428053 0.00428053 0.00428053 0.00428053 0.004288038 | no data 0.004102685 0 od 4102685 0 od 41a no data no data 0.039329299 0.030685409 no data 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.103616533 0.10361653 0.003710 0.00410 0.004102685 0.0004100000000000000000000000000000000 | no data 0.004990159 on data no data no data no data no data no data 0.047381077 0.099427399 no data 100749247399 no data 100749.999 60.736128 62.206889 0.006969278 0.3046924 1.8428117 2.1475099 0 no data no data | no data no data no data o 0.005363312 o 1005363312 o 1005363312 o 1008385786 no data o .13565817 10 D L L Av K K V V K K V V V S UBesel 97500.0012 6.3.113753 6.4.986439 0.007628905 0.3.563170 0 no data no data | no data 0.006103533 0.006103533 0.006103533 0.0041a no data no data 0.056649331 0.12545255 no data 0.154530188 0.154530188 K Diesel 100749.999 66.438912 68.375535 0.008507021 0.37805837 2.2210606 2.5996653 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.37805837 0.008507021 0.0085042 0.00850420 0.00850420 0.006420 0.006449331 | no data 0.006497218 0.006497218 0.00412 no data no data no data 0.059651286 0.135557802 0.059651286 0.135557802 0.0164640472 K K Diesel 97500.0012 69.363065 71.412641 0.009368503 0.40107392 2.353754 2.7548279 0 no data no | no data 0.007541971 on data no data no data no data no data 0.068374507 0.160119039 no data 0.191312307 D D L Av K K Diesel 100749.999 72.04408 4 V K Biesel 100749.999 72.04733 75.01448 0.010489212 0.47727438 2.7044025 3.1820769 0 no data no data | no data 0.007851198 0.007851198 0.007851198 0.007851198 0.007882616 0.01764468 no data 0.0199225282 1.00749.999 7.4,241485 76.219366 0.010889372 0.00535619 2.8802002 3.3074364 0.010889372 0.00535619 0.010889372 0.00535619 0.007851198 0.007851198 0.007851198 0.007851198 0.007851198 0.007851198 | no data no data no data no data no data no data no data no data 0.064612509 0.150476398 no data 0.180333023 10 D L L Av K K V V S V S V Usesel 97500.0012 7.2.714272 7.4.347351 0.010273029 0.0.43417246 2.5664975 3.0002609 0 no data no data | no data no data no data o 0.006248035 0 0.006248035 0 1.00 data no data no data 0.1579751305 0.12915483 no data 0.158240565 100 D L L Av K K D Desel 100749.999 68.300468 69.52339 0.00824036 0.35460824036 0.0354665459 0.00824036 0.035460824035 0.006248035 0.006248035 0.006248035 0.006248035 0.006248035 0.006248035 0.006248035 0.006248035 0.006412 0.006248035 0.006412 0.006248035 0.006412 0.006248035 0.006412 0.006248035 0.006412 0.006248035 0.006412 0.006248035 0.006412 0.006248035 0.006412 0.0062751305 0.0057751305 | no data no data no data no data no data no data no data no data 0.127393842 0.101092537 no data 0.127393865 0.007284543 63.56657 0.007285117 0.002785117 0.002785117 0.002785117 0.007385147 0.005038611 no data no data no data no data no data no data no data no data no data 0.047598342 | no data 0.00433 no data no data no data no data no data 0.04177 0.04456 no data 0.01940 D L L Av K K Diesel 100745 58.23 0.00611 1.6300 1.630 1.630 1.630 1.630 1. |
| 3-30,00 | Ehylbenzene Hexane (n-) Isso-otane (2,2,4 trimethylpentane Total loss components in the "Chor AcS (Chrysene Phenanthrene Toluene Trimethylbenzene (1,2,4) Xylene (m-) 0 Diameter (ft) Fixed Roof Type Inside Shell Condition Shell Condition (post-19) Shell Finish Roof Condition (post-19) Roof Finish Product Throughput (gal) Bukk Liquid Surface Temp. (degF) Avg. TVP (psia) Estimated standing losses (bs) Estimated working losses (bs) Estimated w | no data 0.004428053 0 on data no data no data 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 0.04258033 1.04510950 0.0413 0.00431 0.004328053 0 odata 0.043428053 0 odata 0.004428053 0 odata 0.00428000000000000000000000000000000000 | no data 0.004102685 0 on data no data no data no data 0.03922929 0.030265409 0.030265409 0.030265409 0.030216533 0.030216533 0.030216533 0.03216533 0.0324249 0.0324249 0.0324424 0.0324849 0.0324849 0.0324849 1.5403807 1.573656 0 no data 0.04102685 0 no data 0.04102685 0 no data 0.04102685 0 0 0 0 0 0 0 0 0 0 0 0 0 | no data 0.004990159 0 no data no data no data 0.047381077 0.099427399 no data 0.126120261 0.126120261 0.126120261 0.126120261 0.126120261 0.126120261 0.0478924 K Av K Biesel 0.126120261 0.00549278 0.30469824 1.8428117 0.006496278 0.30469824 1.8428117 0.00649629 0 no data no data 0.004990159 0 no data 0.00490159 0 no data 0.00490159 0 0 no data 0.00490159 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | no data no data no data 0.005363312 0 no data no data no data 0.103365786 no data 0.103365786 no data 0.13365817 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | no data 0.006103533 0 no data no data no data 10 data 0.056649331 0.125455255 no data 0.154530188 10 D D L Av K Av K Diesel 100749,999 66.438912 68.375535 0.008507021 0.037805837 2.216069 2.5996653 0.008507021 0.037805837 2.216069 2.5996653 0.008507021 0.008507020 0.008507020 0.0085070200000000000000000000000000000000 | no data 0.006497218 0.006497218 0.00418 0.01412 0.00418 0.005451266 0.015557802 0.059651266 0.015557802 0.05965126 0.059657802 0.014640472 NV K Av K Av K C Diesei 7.01426 0.003648503 0.040107392 2.0548270 0.003648503 0.040107392 2.0548270 0.003648503 0.0046497218 0.00481 0.0048 | no data 0.007541971 0 no data no data no data no data 0.068374507 0.160119039 no data 0.0191312307 0.191312307 0.191312307 0.191312307 0.191312307 0.19132307 0.19132307 0.19132307 0.19132307 0.19132307 0.19132307 0.0149499 0.01048921 0.01048921 0.01048921 0.01048921 0.01048921 0.0104802 0.0104802 0.0104810 0.007541971 0 no data 0.003741971 0 no data | no data 0.007851198 0 no data no data no data no data 0.070882261 0.070882261 0.070882261 0.07089261 0.07082261 0.070825282 0.070825282 0.070825282 0.070825361 0.074241485 7.6.219366 0.0708535619 2.8020802 3.3074346 0.0708535619 0.0708535619 0.0708535619 0.070851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.04084 0.077851198 0.0 | no data no data no data no data no data no data no data no data 0.064612509 0.150476398 no data 0.180333023 10 D L L Av K K V V S V S V Usesel 97500.0012 7.2.714272 7.4.347351 0.010273029 0.0.43417246 2.5664975 3.0002609 0 no data no data | no data no data no data no data no data no data no data no data no data 0.1592/46433 0.129156483 no data 0.1592/40565 100 D L Av K K Av K DDesel 100749.999 68.300486 69.523393 0.00824036 0.035460892 2.301937 2.6565459 0.00824036 0.03624036 0.03624030 0.006248035 no data no data | no data no data 0.005038611 0 no data no data no data 0.127393845 0.101092537 no data 0.127393865 0.101092537 0.101092537 0.101092537 0.101092537 0.101092537 0.101092537 0.0023473 0.807322 2.1631479 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.002345117 0.00234511 0.005038612 0.005038612000000000000000000000000000000000000 | no data 0.00433 no data no data no data no data 0.04177 0.08458 no data 0.10940 L L Av K K Diesel Disel Disel 0.04177 K K V K Diesel 0.04178 Nov K Diesel 0.04178 Nov K Nov K Diesel 0.04170 Nov K Nov Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov K Nov Nov Nov Nov Nov Nov Nov Nov Nov Nov |

TankSummaries for Every month between Jan and Dec 2023 Site: OCTA, Equations for this site: After 2019 AP-42 revisions H/D ratio: Default 0.5

| Tank ID | Row label | Jan-23 | Feb-23 | Mar-23 | Apr-23 | May-23 | Jun-23 | Jul-23 | Aug-23 | Sep-23 | Oct-23 | Nov-23 | Dec-23 |
|------------|--|---|---|--|--|--|--|--|--|--|--|--|--|
| ank 4-30,0 | 00 | | | | | | | | | | | | |
| | Diameter (ft) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | Fixed Roof Type | D | D | D | D | D | D | D | D | D | D | D | D |
| | Inside Shell Condition | L | L | L | L | L | L | L | L | L | L | L | L |
| | Shell Condition (post-19) | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av |
| | Shell Finish | К | к | к | К | к | К | К | к | К | к | К | К |
| | Roof Condition (post-19) | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av |
| | Roof Finish | К | к | к | к | к | к | к | к | к | к | к | К |
| | Product | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel |
| | Throughput (gal) | 100749.999 | 91000.0014 | 100749.999 | 97500.0012 | 100749.999 | 97500.0012 | 100749.999 | 100749.999 | 97500.0012 | 100749.999 | 97500.0012 | 100749.9 |
| | Bulk Liquid Temperature (degF) | 57.96184 | 58.622082 | 60.736128 | 63.113753 | 66.438912 | 69.363065 | 72.94733 | 74.241485 | 72.714272 | 68.300468 | 62.584563 | 57.4390 |
| | Avg. Liquid Surface Temp. (degF) | 58.825504 | 59.682387 | 62.206889 | 64.986839 | 68.375535 | 71.412614 | 75.014948 | 76.219366 | 74.347351 | 69.523393 | 63.565675 | 58.2358 |
| | Avg. TVP (psia) | 0.006235178 | 0.00641443 | 0.006969278 | 0.007628905 | 0.008507021 | 0.009368503 | 0.010489212 | 0.010889372 | 0.010273029 | 0.008824036 | 0.007285117 | 0.0061144 |
| | Estimated standing losses (lbs) | 0.2566938 | 0.2334849 | 0.30469824 | 0.35631705 | 0.37805837 | 0.40107392 | 0.47727438 | 0.50535619 | 0.43417246 | 0.35460892 | 0.30237473 | 0.24806 |
| | Estimated working losses (lbs) | 1.6610115 | 1.5403807 | 1.8428117 | 1.9406263 | 2.2216069 | 2.353754 | 2.7048025 | 2.8020802 | 2.5684975 | 2.301937 | 1.8607732 | 1.63086 |
| | Total estimated emissions (lbs) | 1.9177053 | 1.7738656 | 2.1475099 | 2.2969434 | 2.5996653 | 2.7548279 | 3.1820769 | 3.3074364 | 3.0026699 | 2.6565459 | 2.1631479 | 1.87893 |
| | Benzene | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Benzo(g,h,i)perylene | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Biphenyl | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Cumene {isopropylbenzene} | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Cyclohexane | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Ethylbenzene | 0.004428053 | 0.004102685 | 0.004990159 | 0.005363312 | 0.006103533 | 0.006497218 | 0.007541971 | 0.007851198 | 0.007110506 | 0.006248035 | 0.005038611 | 0.004333 |
| | Hexane (n-) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Iso-octane {2,2,4 trimethylpentane | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Total loss components in the "Cho | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | PACs (Chrysene) | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Phenanthrene | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Toluene | 0.042588038 | 0.039329299 | 0.047381077 | 0.050399213 | 0.056649331 | 0.059651286 | 0.068374507 | 0.070882616 | 0.064612509 | 0.057751305 | 0.047598342 | 0.041773 |
| | Trimethylbenzene (1,2,4) | 0.086695928 | 0.080685409 | 0.099427399 | 0.108385786 | 0.125455255 | 0.135557802 | 0.160119039 | 0.16764468 | 0.150476398 | 0.129156483 | 0.101092537 | 0.084583 |
| | Xylene | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Xylene (m-) | 0.111806969 | 0.103616533 | 0.126120261 | 0.13565817 | 0.154530188 | 0.164640472 | 0.191312307 | 0.199225282 | 0.180333023 | 0.158240565 | 0.127393865 | 0.109401 |
| ink 5-10,0 | 00 | | | | | | | | | | | | |
| | Diameter (ft) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | Fixed Roof Type | В | В | В | В | В | В | В | В | В | В | В | В |
| | Inside Shell Condition | L | L | L | L | L | L | L | L | L | L | L | L |
| | Shell Condition (post-19) | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av |
| | Shell Finish | к | к | к | к | к | к | к | к | к | к | к | К |
| | Roof Condition (post-19) | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av | Av |
| | Roof Finish | к | к | к | к | к | к | к | к | к | к | к | К |
| | Product | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel | Diesel |
| | Throughput (gal) | 403000.0002 | 364000.0014 | 403000.0002 | 390000.0006 | 403000.0002 | 390000.0006 | 403000.0002 | 403000.0002 | 390000.0006 | 403000.0002 | 390000.0006 | 403000.0 |
| | Bulk Liquid Temperature (degF) | 57.96184 | 58.622082 | 60.736128 | 63.113753 | 66.438912 | 69.363065 | 72.94733 | 74.241485 | 72.714272 | 68.300468 | 62.584563 | 57.439 |
| | Avg. Liquid Surface Temp. (degF) | 58.825504 | 59.682387 | 62.206889 | 64.986839 | 68.375535 | 71.412614 | 75.014948 | 76.219366 | 74.347351 | 69.523393 | 63.565675 | 58.235 |
| | Avg. TVP (psia) | 0.006235178 | 0.00641443 | 0.006969278 | 0.007628905 | 0.008507021 | 0.009368503 | 0.010489212 | 0.010889372 | 0.010273029 | 0.008824036 | 0.007285117 | 0.006114 |
| | Estimated standing losses (lbs) | 0.098946289 | 0.089995337 | 0.1174249 | 0.13729116 | 0.14563061 | 0.15445724 | 0.18374224 | 0.19453039 | 0.16715937 | 0.13658499 | 0.11651864 | 0.095623 |
| | Estimated working losses (lbs) | 1.7719724 | 1.6432831 | 1.9659174 | 2.0702663 | 2.3700173 | 2.5109923 | 2.8854919 | 2.9892681 | 2.7400813 | 2.4557137 | 1.9850787 | 1.7398 |
| | Total estimated emissions (lbs) | 1.8709186 | 1.7332784 | 2.0833423 | 2.2075575 | 2.5156479 | 2.6654495 | 3.0692342 | 3.1837985 | 2.9072407 | 2.5922987 | 2.1015974 | 1.8354 |
| | Benzene | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Benzo(g,h,i)perylene | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Biphenyl | no data | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Cumene (isopropylbenzene) | | | no data | no data | no data | no data | no data | no data | no data | no data | no data | no data |
| | Cumene {isopropylbenzene} Cvclohexane | no data | no data | | | | 0.006286421 | 0.007274518 | 0.007557706 | 0.006884524 | 0.006096929 | 0.004895242 | |
| | Cyclohexane | no data 0.004320021 | no data 0.004008813 | 0.004841053 | 0.005154598 | 0.005906276 | | | | | | | |
| | Cyclohexane Ethylbenzene | | | | 0.005154598 | 0.005906276 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Cyclohexane Ethylbenzene Hexane (n-) | 0.004320021 | 0.004008813 0 | 0.004841053 0 | 0 | 0 | 0 no data | no data |
| | Cyclohexane Ethylbenzene Hexane (n-) Iso-octane (2,2,4 trimethylpentane | 0.004320021 0 no data | 0.004008813 0 no data | 0.004841053 0 no data | 0 no data | 0 no data | 0 no data no data | 0 no data no data | 0 no data no data | 0 no data no data | 0 no data no data | 0 no data no data | |
| | Cyclohexane Ethylbenzene Hexane (n-) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Cho | 0.004320021 0 no data no data | 0.004008813 0 no data no data | 0.004841053 0 no data no data | 0 no data no data | 0 no data no data | no data |
| | Cyclohexane Ethylbenzene Hexane (n-) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) | 0.004320021 0 no data no data no data | 0.004008813 0 no data no data no data | 0.004841053 0 no data no data no data | 0 no data no data no data | 0 no data no data no data | no data no data |
| | Cyclohexane Ethylbenzene Hexane (n) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene | 0.004320021 0 no data no data no data no data | 0.004008813 0 no data no data no data no data | 0.004841053 0 no data no data no data no data | 0 no data no data no data no data | 0 no data no data no data no data | no data no data no data |
| | Cyclohexane Ethylbenzene Hexane (n-) Iso octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene Toluene | 0.004320021 0 no data no data no data no data 0.041549009 | 0.004008813 0 no data no data no data no data 0.038429419 | 0.004841053 0 no data no data no data no data 0.04596533 | 0 no data no data no data no data 0.048437921 | 0 no data no data no data no data 0.054818508 | no data no data no data 0.057715943 | no data no data no data 0.065949813 | no data no data no data 0.068232897 | no data no data no data 0.062559028 | no data no data no data 0.056354619 | no data no data no data 0.046243973 | no data no data no data 0.0408065 |
| | Cyclohexane Ethylbenzene Hexane (n) Iso-octane (2,2,4 trimethylpentane Total loss components in the "Chor PACs (Chrysene) Phenanthrene | 0.004320021 0 no data no data no data no data | 0.004008813 0 no data no data no data no data | 0.004841053 0 no data no data no data no data 0.04596533 | 0 no data no data no data no data | 0 no data no data no data no data | no data no data no data 0.0408065 |

Attachment B

Construction and Operational Emission Estimates

Table B-1: Modeling Parameters for On-Road Construction Sources

| | | Road | | | Line | Release | Initial | Initial | | | |
|---|------------|-------|--------------------|----------|------------|---------|----------------------|----------|----------|---------------------|-------------|
| | Road Width | Width | Base | | Volume Src | Height | Lateral | Vertical | # Volume | Total Length | g/s per vol |
| Road | (ft) | (m) | Elevation | SourceID | Туре | from | Dimensio | Dimensio | Sources | (m) | (1 g/s) |
| Marine Way (West of Perimeter Rd and East of Rt-133) | 89.47 | 27.27 | varies - AERMAP | MARINE1 | Adjacent | 2.00 | varies - based on | 2.30 | 10 | 395 | 1.0000E-01 |
| Marine Way (West of Rt-133 and East of Sand Canyon Ave) | 26.90 | 8.20 | varies - AERMAP | MARINE2 | Adjacent | 2.00 | varies - based on | 2.30 | 34 | 236.7 | 2.9412E-02 |
| Perimeter Road (Project Site to Marine Way) | 24.67 | 7.52 | varies - AERMAP | PERIM1 | Adjacent | 2.00 | varies - based on | 2.30 | 12 | 155.7 | 8.3333E-02 |
| Sand Canyon Ave (North of Marine Way and South of I-5 on ramp Westbound) | 126.64 | 38.60 | varies - AERMAP | SAN1 | Adjacent | 2.00 | varies - based on | 2.30 | 3 | 173 | 3.3333E-01 |
| Sand Canyon Ave (South of Marine Way and North of I-5 on ramp Eastbound) | 126.64 | 38.60 | varies - AERMAP | SAN2 | Adjacent | 2.00 | varies - based on | 2.30 | 3 | 90.8 | 3.3333E-01 |
| I-5 on ramp Westbound | 42.65 | 13.00 | varies - AERMAP | I50N1 | Adjacent | 2.00 | varies - based on | 2.30 | 19 | 370.4 | 5.2632E-02 |
| I-5 on ramp Eastbound | 24.93 | 7.60 | varies - AERMAP | 150N2 | Adjacent | 2.00 | varies - based on | 2.30 | 24 | 596 | 4.1667E-02 |
| I-5 off ramp from Westbound | 43.64 | 13.30 | varies - AERMAP | I5OFF1 | Adjacent | 2.00 | varies - based on | 2.30 | 12 | 172.7 | 8.3333E-02 |
| I-5 off ramp from Eastbound | 41.67 | 12.70 | varies - AERMAP | I5OFF2 | Adjacent | 2.00 | varies - based on | 2.30 | 22 | 408.3 | 4.5455E-02 |
| Entrance Road to Site South of Marine Way | 76.35 | 23.27 | varies - AERMAP | ENT1 | Adjacent | 2.00 | varies - based on | 2.30 | 7 | 208.7 | 1.4286E-01 |
| Entrance Road Turning East | 76.35 | 23.27 | varies - AERMAP | ENT2 | Adjacent | 2.00 | varies - based on | 2.30 | 7 | 122 | 1.4286E-01 |

| | 2023-2 | 2025 | 2026-2 | 2027 |
|-----------------------------|--------|----------|--------|----------|
| Route Length | meters | miles | meters | miles |
| Outbound West | 1330.8 | 0.826921 | 1505.8 | 0.935661 |
| Outbound East | 1474.2 | 0.916025 | 1649.2 | 1.024765 |
| Inbound West | 1330.5 | 0.826734 | 1505.5 | 0.935474 |
| Inbound East | 1791.7 | 1.113311 | 1966.7 | 1.222051 |
| | | | | |
| Route 1 (out west, in east) | 3122.5 | 1.940232 | 3472.5 | 2.157711 |
| Route 2 (out east, in west) | 2804.7 | 1.74276 | 3154.7 | 1.96024 |

Table B-2: Modeling Parameters On-Site Sources

| Model ID | Description | Source Type | Ht. (ft) | Ht. (m) | Init. Lateral (m) | Init. Vert (m)² | No. of Volumes | Exit Temperature (K) | Exit Velocity (m/s) | Stack Diameter (m) |
|------------|-------------------------------------|----------------|-------------------|---------|-----------------------|--------------------|-------------------|----------------------------|---------------------------|--------------------------|
| FUEL_D1-4 | Fuel Dispensing | Volume | 3.38 ¹ | 1.03 | 3.4571 ^{1,3} | 1.4295 | 1 | | | |
| DISPEN | Fuel Delivery | Volume | 3.38 ¹ | 1.03 | 3.4571 ^{1,3} | 2.5518 | 1 | | | |
| DEFTNK | Def Tank | Volume | 18 | 5.49 | 3.4571 ^{1,3} | 2.5518 | 1 | | | |
| SAND1-2 | Sand Silos (2) | Volume | 30 | 9.14 | 2.7907 ¹ | 1.4295 | 1 | | | |
| SKID | Pump Skid Def Tank | Volume | 3.38 | 1.03 | 1.8605 ¹ | 0.4792 | 1 | | | |
| WASH | Train Wash | Volume | 55 | 16.76 | 5.58 ² | 7.80 | 6 | | | |
| MAINT | Maintenance | Volume | 75 | 22.86 | 13.02 ² | 10.63 | 4 | | | |
| CRANE | Crane/Forklift | Volume | 75 | 22.86 | 13.02 ² | 10.63 | 4 | | | |
| GEN1 | Emergency Generator ¹ | Point | 12 | 3.66 | | | | 739.8 | 45.3 | 0.183 |
| TNKVENT1-4 | Fuel Tank Vent (4) | Point | 12 | 3.66 | | | | ambient | 0.001 | 0.0762 |

¹ Based on SF 2020 Citywide HRA (Table 7).

² Based on building height/2.15 (EPA 2017).

³ Assumes 1 dispenser.

Table B-3: Building Inputs

| Building ID | Description | Height (ft) | Height (m) |
|-------------|----------------------------|-------------|------------|
| TRANS | Transportation Building | 75 | 22.86 |
| MAINT1 | Maintenance Building | 75 | 22.86 |
| UTILITY | Utility Building | 55 | 16.76 |
| TRN_WASH | Train Wash Building | 55 | 16.76 |
| PUMP | Pump House | 18 | 5.49 |
| WATER | Water Treatment Room | 30 | 9.14 |
| MATERIAL | Materials Storage Building | 30 | 9.14 |
| DEF_TNK | Def Fuel Tank | 18 | 5.49 |
| TANK1-4 | Fuel Tanks | 10.08 | 3.07 |
| SILO1-2 | Sand Silos | 30 | 9.14 |

Table B-4: Modeling Parameters for On-Road Operation Sources

| | Road | | | Line | Release Height from | | Initial Vertical Dimension (m) | | Total | |
|---|-------|--------------------|----------|------------|------------------------|----------------------------------|-----------------------------------|----------|--------|---------------------|
| | Width | Base | | Volume Src | CRRP-HRA | Initial Lateral | from CRRP- | # Volume | Length | |
| Road | (m) | Elevation | SourceID | Туре | (m) | Dimension (m) | HRA | Sources | (m) | g/s per vol (1 g/s) |
| Marine Way (West of Perimeter Rd and East of Rt-133) | 27.27 | varies - AERMAP | MARINE1 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 10 | 395 | 1.0000E-01 |
| Marine Way (West of Rt-133 and East of Sand Canyon Ave) | 8.20 | varies - AERMAP | MARINE2 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 34 | 236.7 | 2.9412E-02 |
| Sand Canyon Ave (North of Marine Way and South of Great Park Blvd) | 38.60 | varies - AERMAP | SAN4 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 29 | 1271.2 | 3.4483E-02 |
| Sand Canyon Ave (South of Marine Way and North of I-5 on ramp Eastbound) | 38.60 | varies - AERMAP | SAN2 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 3 | 90.8 | 3.3333E-01 |
| I-5 on ramp Westbound | 13.00 | varies - AERMAP | I50N1 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 20 | 428.2 | 5.0000E-02 |
| I-5 on ramp Eastbound | 7.60 | varies - AERMAP | 150N2 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 24 | 596 | 4.1667E-02 |
| I-5 off ramp from Westbound | 13.30 | varies - AERMAP | I50FF1 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 12 | 172.7 | 8.3333E-02 |
| I-5 off ramp from Eastbound | 12.70 | varies - AERMAP | I5OFF2 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 22 | 408.3 | 4.5455E-02 |
| Entrance Road to Site South of Marine Way | 23.27 | varies - AERMAP | ENT1 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 7 | 208.7 | 1.4286E-01 |
| Entrance Road Turning East | 23.27 | varies - AERMAP | ENT2 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 7 | 122 | 1.4286E-01 |
| Sand Canyon Ave (South of I-5 on ramp Eastbound and North of Irvine Center Dr) | 38.60 | varies - AERMAP | SAN3 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 23 | 1010.3 | 4.3478E-02 |
| Marine Way (East of Perimeter Rd and West of Skyhawk) | 27.27 | varies - AERMAP | MARINE3 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 31 | 1033.6 | 3.2258E-02 |
| Ridge Valley (North of Marine Way and South of Great Park Blvd) | 27.27 | varies - AERMAP | RVAL | Adjacent | 2.00 | varies - based on plume width | 2.30 | 39 | 1281.6 | 2.5641E-02 |
| I-5 (South of Sand Canyon Ave) | 64.40 | varies - AERMAP | EASTI5 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 15 | 1075.6 | 6.6667E-02 |
| I-5 (North of Sand Canyon Ave) | 64.40 | varies - AERMAP | WESTI5 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 17 | 1216.9 | 5.8824E-02 |
| Entrance Onsite | 7.62 | varies - AERMAP | ENT3 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 10 | 138.8 | 1.0000E-01 |
| Fuel/Sand Loop | 7.62 | varies - AERMAP | LOOPA1 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 59 | 801.3 | 1.6949E-02 |
| Delivery Loop | 7.62 | varies - AERMAP | LOOPB1 | Adjacent | 2.00 | varies - based on plume width | 2.30 | 13 | 183.6 | 7.6923E-02 |

Table B-5: HARP2 Emissions for Construction Years

| | | | | 20 | 23 | 20 | 24 | 20 | 25 | 20 | 26 | 20 | 27 |
|----------|----|------|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | | | | lb/yr | lb/hr |
| CONST | 1 | 9901 | DieselExhPM | 1.23E+02 | 0.00E+00 | 1.25E+02 | 0.00E+00 | 3.33E+01 | 0.00E+00 | 4.38E+01 | 0.00E+00 | 2.64E+01 | 0.00E+00 |
| MARINE1 | 2 | 9901 | DieselExhPM | 1.48E-01 | 0.00E+00 | 5.04E-02 | 0.00E+00 | 3.40E-02 | 0.00E+00 | 2.94E-02 | 0.00E+00 | 1.40E-02 | 0.00E+00 |
| MARINE2 | 3 | 9901 | DieselExhPM | 8.87E-02 | 0.00E+00 | 3.02E-02 | 0.00E+00 | 2.04E-02 | 0.00E+00 | 1.76E-02 | 0.00E+00 | 8.41E-03 | 0.00E+00 |
| PERIM1 | 4 | 9901 | DieselExhPM | 5.83E-02 | 0.00E+00 | 1.99E-02 | 0.00E+00 | 1.34E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| SAN1 | 5 | 9901 | DieselExhPM | 6.48E-02 | 0.00E+00 | 2.21E-02 | 0.00E+00 | 1.49E-02 | 0.00E+00 | 1.29E-02 | 0.00E+00 | 6.14E-03 | 0.00E+00 |
| SAN2 | 6 | 9901 | DieselExhPM | 3.40E-02 | 0.00E+00 | 1.16E-02 | 0.00E+00 | 7.83E-03 | 0.00E+00 | 6.77E-03 | 0.00E+00 | 3.22E-03 | 0.00E+00 |
| 150N1 | 7 | 9901 | DieselExhPM | 3.12E-02 | 0.00E+00 | 1.06E-02 | 0.00E+00 | 7.17E-03 | 0.00E+00 | 6.27E-03 | 0.00E+00 | 2.99E-03 | 0.00E+00 |
| 150N2 | 8 | 9901 | DieselExhPM | 5.58E-02 | 0.00E+00 | 1.90E-02 | 0.00E+00 | 1.28E-02 | 0.00E+00 | 1.11E-02 | 0.00E+00 | 5.29E-03 | 0.00E+00 |
| I5OFF1 | 9 | 9901 | DieselExhPM | 1.62E-02 | 0.00E+00 | 5.51E-03 | 0.00E+00 | 3.72E-03 | 0.00E+00 | 3.22E-03 | 0.00E+00 | 1.53E-03 | 0.00E+00 |
| I5OFF2 | 10 | 9901 | DieselExhPM | 3.44E-02 | 0.00E+00 | 1.17E-02 | 0.00E+00 | 7.90E-03 | 0.00E+00 | 6.91E-03 | 0.00E+00 | 3.29E-03 | 0.00E+00 |
| ENT1 | 11 | 9901 | DieselExhPM | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.56E-02 | 0.00E+00 | 7.41E-03 | 0.00E+00 |
| ENT2 | 12 | 9901 | DieselExhPM | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.09E-03 | 0.00E+00 | 4.33E-03 | 0.00E+00 |
| RAIL_WEL | 13 | 9901 | DieselExhPM | 2.71E-01 | 0.00E+00 | 2.71E-01 | 0.00E+00 |
| RAIL_DEL | 13 | 9901 | DieselExhPM | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.18E-02 | 0.00E+00 | 3.18E-02 | 0.00E+00 | 3.18E-02 | 0.00E+00 |
| RAIL_IDL | 14 | 9901 | DieselExhPM | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.13E-02 | 0.00E+00 | 5.13E-02 | 0.00E+00 | 5.13E-02 | 0.00E+00 |
| CONSTP2 | 15 | 9901 | DieselExhPM | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.19E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Notes: In 2025, source CONST represents final 6 months of Phase 1 construction (Jan. through Jun.). CONSTP2 represents initial 6 months (Jul. through Dec.) of Phase 2 construction. DPM lb/hr emissions are listed as zero since it does not have an acute risk threshold.

Table B-6: Fuel Tank Emissions

| Tank | Total Losses (tpy) | Hexane (-n) tpy | Benzene | Toluene | Ethylbenzene (tpy) | Xylene (-m) (tpy) | 1,2,4-Trimethylbenzene (tpy) |
|---------------------|--------------------------|------------------------|----------------|----------------|------------------------------|----------------------|------------------------------|
| | | | (tpy) | (tpy) | | | |
| Tank 1-30,000 | 1.48E-02 | 0.00E+00 | 0.00E+00 | 3.23E-04 | 3.48E-05 | 8.81E-04 | 7.15E-04 |
| Tank 2-30,000 | 1.48E-02 | 0.00E+00 | 0.00E+00 | 3.23E-04 | 3.48E-05 | 8.81E-04 | 7.15E-04 |
| Tank 3-30,000 | 1.48E-02 | 0.00E+00 | 0.00E+00 | 3.23E-04 | 3.48E-05 | 8.81E-04 | 7.15E-04 |
| Tank 4-30,000 | 1.48E-02 | 0.00E+00 | 0.00E+00 | 3.23E-04 | 3.48E-05 | 8.81E-04 | 7.15E-04 |
| Tank 5-10,000 | 1.44E-02 | 0.00E+00 | 0.00E+00 | 3.14E-04 | 3.37E-05 | 8.54E-04 | 6.92E-04 |
| Speciated TACs from | n SCAQMD storage tank g | uidance document for | diesel. | | | | |
| http://www.agmd. | gov/docs/default-source/ | planning/annual-emissi | on-reporting/s | upplemental-ii | nstructions-for-liquid-organ | ic-storage-tanks.pdf | |

Table B-7: Sand Silo Emission Estimates

| | | PM PROFILE | | | | OG PROFILE | | |
|----------------|------|------------|-----|-----------|----------|------------|---------|---------|
| SCC/EIC | YEAR | NUMBER | | PM2.5/TPM | PM10/TPM | NUMBER | ROG/TOG | VOC/TOG |
| 43042270780000 | 0 | | 371 | 0.075 | 0.5 | 600 | 0.6986 | 0.6986 |

https://www.arb.ca.gov/app/emsinv/2017/emseic_query.php?F_YR=2020&F_DIV=-4&F_SEASON=A&SP=SIP105ADJ&SPN=SIP105ADJ&F_AREA=CA&F_EICSUM=430

| PM10 (lb/yr) | 1.652870894 | |
|--------------|-------------|-----------|
| | | Assumes 6 |
| PM10 (lb/hr) | 0.000754736 | hours/day |
| PM10/PM2.5 | | |
| (g/s) | 9.50951E-05 | per silo |

| | | | WEIGHT | | | | | |
|------------|-------|-----------------|-------------|--------------------|---------|-----------------|----------|----------|
| PM PROFILE | SAROA | WEIGHT FRACTION | FRACTION OF | WEIGHT FRACTION OF | | | | |
| NUMBER | D | OF PM2.5 | PM10 | ТРМ | CAS | TAC | lb/yr | lb/hr |
| 371 | 12114 | 0.0005 | 0.0005 | 0.0005 | 7440508 | Copper | 8.26E-04 | 3.77E-07 |
| 371 | 12136 | 0.0005 | 0.0005 | 0.0005 | 7440020 | Nickel | 8.26E-04 | 3.77E-07 |
| 371 | 12165 | 0.4 | 0.4 | 0.4 | 1175 | Silica, crystln | 6.61E-01 | 3.02E-04 |
| 371 | 12403 | 0.0055 | 0.0055 | 0.0055 | 9960 | Sulfates | 9.09E-03 | 4.15E-06 |

Table B-8: Onsite Locomotive Emission Estimates for HRA

| Daily Locomotive Operational Emissions | Daily In-Transit Emissions (lbs/day) | | | | |
|--|---|------|-------|--|--|
| Operational Activity | NOx | PM10 | PM2.5 | | |
| On-site (2025-2027) | 98.30 | 1.98 | 1.92 | | |
| On-site (2028+) | 81.15 | 1.22 | 1.18 | | |

| Day/Night Percentage | | % |
|----------------------|-------|-----|
| | Day | 20% |
| | Night | 80% |

| | | | | | | | | Phase 2 | L (2025 – 20 |)27) | | | | | | |
|--|---------------|-------|--|--------------------------|---|-------------------------------------|-------------------------------------|---------------|-----------------|----------------|------------------|------|-------------------|--------------------|-------------|------------------|
| | % Alloc | Hours | Daily | In-Transit E (Ibs/hr) | | Daily In-Transit Emissions (lbs/yr) | | | | | # of | Dail | y In-Transit Emis | sions per source (| g/s) | |
| Source | Alloc ated | / Day | NOx | PM10 | PM2.5 | NOx (Day) | NOx (Night) | PM10 (Day) | PM10 (Night) | PM2.5 (Day) | PM2.5 (Night) | Vol | NOx (Day) | NOx (Night) | PM2.5 (Day) | PM2.5 (Night) |
| Tracks (Idling & In- Transit) | 55% | 24 | 2.253 | 0.05 | 0.04 | 3.95E+03 | 1.58E+04 | 7.93E+01 | 3.17E+02 | 7.70E+01 | 3.08E+02 | 682 | 8.32396E-05 | 3.32959E-04 | 1.62307E-06 | 6.49229E-06 |
| Mainte nance Shop | 0% | 24 | 0.00 | 0.00 | 0.00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4 | 0.00000E+0 0 | 0.00000E+0 0 | 0.00000E+00 | 0.00000E+0 0 |
| Wash Station | 45% | 24 | 1.84 | 0.04 | 0.04 | 3.23E+03 | 1.29E+04 | 6.49E+01 | 2.60E+02 | 6.30E+01 | 2.52E+02 | 6 | 7.74129E-03 | 3.09651E-02 | 1.50946E-04 | 6.03783E-04 |
| Phase 2 (2028+) | | | | | | | | | | | | | | | | |
| | % Alloc | Hours | Daily In-Transit Emissions (lbs/hr) | | In-Transit Emissions (Ibs/hr) Daily In-Transit Emissions (Ibs/yr) | | Daily In-Transit Emissions (lbs/yr) | | | | # of | Dail | y In-Transit Emis | sions per source (| g/s) | |
| Source | ated | / Day | NOx | PM10 | PM2.5 | NOx (Day) | NOx (Night) | PM10 (Day) | PM10 (Night) | PM2.5 (Day) | PM2.5 (Night) | Vol | NOx (Day) | NOx (Night) | PM2.5 (Day) | PM2.5 (Night) |

| Jource | | | NOA | 1 10110 | 1 1412.5 | NOA (Day) | (116111) | (Day) | (11616110) | (Day) | (11611) | | NOX (Day) | NOA (Night) | 1 W12.5 (Day) | (1416111) |
|-------------------|-----|----|------|---------|----------|-----------|----------|----------|------------|----------|----------|-----|-------------|-------------|---------------|-------------|
| Tracks (Idling | | | | | | | | | | | | | | | | |
| & In- | | | | | | | | | | | | | | | | |
| Transit) | 40% | 24 | 1.35 | 0.02 | 0.02 | 2.37E+03 | 9.48E+03 | 3.55E+01 | 1.42E+02 | 3.45E+01 | 1.38E+02 | 781 | 4.36402E-05 | 1.74561E-04 | 6.34964E-07 | 2.53986E-06 |
| Mainte | | | | | | | | | | | | | | | | |
| nance | | | | | | | | | | | | | | | | |
| Shop | 30% | 24 | 1.01 | 0.02 | 0.01 | 1.78E+03 | 7.11E+03 | 2.67E+01 | 1.07E+02 | 2.59E+01 | 1.03E+02 | 4 | 6.39056E-03 | 2.55622E-02 | 9.29826E-05 | 3.71930E-04 |
| Wash | | | | | | | | | | | | | | | | |
| Station | 30% | 24 | 1.01 | 0.02 | 0.01 | 1.78E+03 | 7.11E+03 | 2.67E+01 | 1.07E+02 | 2.59E+01 | 1.03E+02 | 6 | 4.26037E-03 | 1.70415E-02 | 6.19884E-05 | 2.47954E-04 |

Table B-9: Onsite Point Sources

| Faulian ant Turns | Emissions (lbs/year) | | | Ar | nual Emissions | (g/s) | Short-term Emissions (g/s) | | | |
|---------------------------------------|----------------------|--------------------------|---------------------------|-------------|--------------------------|---------------------------|----------------------------|--------------------------|---------------------------|--|
| Equipment Type | NOx | PM ₁₀ Exhaust | PM _{2.5} Exhaust | NOx | PM ₁₀ Exhaust | PM _{2.5} Exhaust | NOx | PM ₁₀ Exhaust | PM _{2.5} Exhaust | |
| 300KV Backup Generator | 9.22E+01 | 4.85E+00 | 6.65E+00 | 1.32604E-03 | 6.97916E-05 | 9.56049E-05 | 2.32323E-01 | 1.22275E-02 | 1.67500E-02 | |
| Crane | 2.01E+02 | 3.69E+00 | 3.40E+00 | | | | | | | |
| Forklift | 5.11E+01 | 1.88E+00 | 1.73E+00 | | | | | | | |
| Crane + Forklift (Model ID: CRANE) | 2.52E+02 | 5.58E+00 | 5.13E+00 | 9.06402E-04 | 2.0051E-05 | 1.84469E-05 | 0.01450 | 0.00032 | 0.00030 | |

Table B-10: HARP2 Emissions for Operations – Phase 1 (2025 – 2027) & Phase 2 (2028+)

| | | | | 2025 | -2027 | 201 | 28+ |
|---------------|--------|--------------|----------------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | | -2027 lb/hr | 20. Ib/yr | lb/hr |
| CEN | 1 | 0001 | | lb/yr | - | - | - |
| GEN RAIL D | 1 2 | 9901 9901 | DieselExhPM DieselExhPM | 6.65E+00 7.70E+01 | 0.00E+00 0.00E+00 | 6.65E+00 3.45E+01 | 0.00E+00 0.00E+00 |
| RAIL_D | | | | | | | |
| RAIL_N | 3 4 | 9901 | DieselExhPM | 3.08E+02 6.30E+01 | 0.00E+00 | 1.38E+02 | 0.00E+00 |
| WASH_D | | 9901 | DieselExhPM DieselExhPM | 2.52E+01 | 0.00E+00 | 2.59E+01 | 0.00E+00 |
| WASH_N | 5 | 9901 | | | 0.00E+00 | 1.03E+02 | 0.00E+00 |
| MARINE1 | 6 | 9901 | DieselExhPM | 5.77E-02 | 0.00E+00 | 5.77E-02 | 0.00E+00 |
| MARINE2 | 7 | 9901 | DieselExhPM | 3.46E-02 | 0.00E+00 | 3.46E-02 | 0.00E+00 |
| MARINE3 | 8 | 9901 | DieselExhPM | 8.89E-03 | 0.00E+00 | 8.89E-03 | 0.00E+00 |
| ENT1 | 9 | 9901 | DieselExhPM | 3.59E-02 | 0.00E+00 | 3.59E-02 | 0.00E+00 |
| ENT2 | 10 | 9901 | DieselExhPM | 2.10E-02 | 0.00E+00 | 2.10E-02 | 0.00E+00 |
| SAN2 | 11 | 9901 | DieselExhPM | 1.56E-03 | 0.00E+00 | 1.56E-03 | 0.00E+00 |
| SAN3 | 12 | 9901 | DieselExhPM | 1.74E-02 | 0.00E+00 | 1.74E-02 | 0.00E+00 |
| SAN4 | 13 | 9901 | DieselExhPM | 1.09E-02 | 0.00E+00 | 1.09E-02 | 0.00E+00 |
| 150N1 | 14 | 9901 | DieselExhPM | 1.84E-02 | 0.00E+00 | 1.84E-02 | 0.00E+00 |
| 150N2 | 15 | 9901 | DieselExhPM | 2.56E-02 | 0.00E+00 | 2.56E-02 | 0.00E+00 |
| I5OFF1 | 16 | 9901 | DieselExhPM | 7.43E-03 | 0.00E+00 | 7.43E-03 | 0.00E+00 |
| I5OFF2 | 17 | 9901 | DieselExhPM | 1.76E-02 | 0.00E+00 | 1.76E-02 | 0.00E+00 |
| RVAL | 18 | 9901 | DieselExhPM | 2.20E-02 | 0.00E+00 | 2.20E-02 | 0.00E+00 |
| EASTI5 | 19 | 9901 | DieselExhPM | 4.63E-02 | 0.00E+00 | 4.63E-02 | 0.00E+00 |
| WESTI5 | 20 | 9901 | DieselExhPM | 9.42E-02 | 0.00E+00 | 9.42E-02 | 0.00E+00 |
| ENT3 | 21 | 9901 | DieselExhPM | 2.39E-02 | 0.00E+00 | 2.39E-02 | 0.00E+00 |
| LOOPA1 | 22 | 9901 | DieselExhPM | 3.03E-02 | 0.00E+00 | 3.03E-02 | 0.00E+00 |
| LOOPB1 | 23 | 9901 | DieselExhPM | 2.46E-02 | 0.00E+00 | 2.46E-02 | 0.00E+00 |
| TNKVENT1 | 24 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| TNKVENT1 | 24 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| TNKVENT1 | 24 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| TNKVENT1 | 24 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| TNKVENT2 | 25 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| TNKVENT2 | 25 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| TNKVENT2 | 25 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| TNKVENT2 | 25 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| TNKVENT3 | 26 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| TNKVENT3 | 26 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| TNKVENT3 | 26 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| TNKVENT3 | 26 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| TNKVENT4 | 27 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| TNKVENT4 | 27 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| TNKVENT4 | 27 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| TNKVENT4 | 27 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| DEFTNK | 28 | 108883 | Toluene | 6.27E-01 | 7.16E-05 | 6.27E-01 | 7.16E-05 |
| DEFTNK | 28 | 100414 | Ethyl benzene | 6.75E-02 | 7.70E-06 | 6.75E-02 | 7.70E-06 |

| DEFTNK | 28 | 108383 | m-Xylene | 1.71E+00 | 1.95E-04 | 1.71E+00 | 1.95E-04 |
|---------------|-------|--------------|----------------------|--------------|----------|----------|----------|
| DEFTNK | 28 | 95636 | 1,2,4TriMeBenze | 1.38E+00 | 1.58E-04 | 1.38E+00 | 1.58E-04 |
| FUEL_D1 | 29 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| FUEL_D1 | 29 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| FUEL_D1 | 29 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| FUEL_D1 | 29 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| FUEL_D2 | 30 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| FUEL_D2 | 30 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| FUEL_D2 | 30 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| FUEL_D2 | 30 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| FUEL_D3 | 31 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| FUEL_D3 | 31 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| FUEL_D3 | 31 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| FUEL_D3 | 31 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| FUEL_D4 | 32 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| FUEL_D4 | 32 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| FUEL_D4 | 32 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| FUEL_D4 | 32 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| SKID | 33 | 108883 | Toluene | 6.27E-01 | 7.16E-05 | 6.27E-01 | 7.16E-05 |
| SKID | 33 | 100414 | Ethyl benzene | 6.75E-02 | 7.70E-06 | 6.75E-02 | 7.70E-06 |
| SKID | 33 | 108383 | m-Xylene | 1.71E+00 | 1.95E-04 | 1.71E+00 | 1.95E-04 |
| SKID | 33 | 95636 | 1,2,4TriMeBenze | 1.38E+00 | 1.58E-04 | 1.38E+00 | 1.58E-04 |
| DISPEN | 34 | 108883 | Toluene | 6.47E-01 | 7.39E-05 | 6.47E-01 | 7.39E-05 |
| DISPEN | 34 | 100414 | Ethyl benzene | 6.96E-02 | 7.95E-06 | 6.96E-02 | 7.95E-06 |
| DISPEN | 34 | 108383 | m-Xylene | 1.76E+00 | 2.01E-04 | 1.76E+00 | 2.01E-04 |
| DISPEN | 34 | 95636 | 1,2,4TriMeBenze | 1.43E+00 | 1.63E-04 | 1.43E+00 | 1.63E-04 |
| SAND1 | 35 | 7440508 | Copper | 8.26E-04 | 3.77E-07 | 8.26E-04 | 3.77E-07 |
| SAND1 | 35 | 7440020 | Nickel | 8.26E-04 | 3.77E-07 | 8.26E-04 | 3.77E-07 |
| SAND1 | 35 | 1175 | Silica, crystln | 6.61E-01 | 3.02E-04 | 6.61E-01 | 3.02E-04 |
| SAND1 | 35 | 9960 | Sulfates | 9.09E-03 | 4.15E-06 | 9.09E-03 | 4.15E-06 |
| SAND2 | 36 | 7440508 | Copper | 8.26E-04 | 3.77E-07 | 8.26E-04 | 3.77E-07 |
| SAND2 | 36 | 7440020 | Nickel | 8.26E-04 | 3.77E-07 | 8.26E-04 | 3.77E-07 |
| SAND2 | 36 | 1175 | Silica, crystln | 6.61E-01 | 3.02E-04 | 6.61E-01 | 3.02E-04 |
| SAND2 | 36 | 9960 | Sulfates | 9.09E-03 | 4.15E-06 | 9.09E-03 | 4.15E-06 |
| MAINT_D | 37 | 9901 | DieselExhPM | N/A | 0.00E+00 | 2.59E+01 | 0.00E+00 |
| MAINT_N | 38 | 9901 | DieselExhPM | N/A | 0.00E+00 | 1.03E+02 | 0.00E+00 |
| CRANE | 39 | 9901 | DieselExhPM | N/A | 0.00E+00 | 5.13E+00 | 0.00E+00 |
| Notes: Grev-s | haded | sources only | evist in the Phase 2 | (2028+) scer | nario | | |

Notes: Grey-shaded sources only exist in the Phase 2 (2028+) scenario.

DPM lb/hr emissions are listed as zero since it does not have an acute risk threshold.

Appendix C Technical Memorandum Biological Resources

Metrolink Orange County Maintenance Facility

Prepared for:

Orange County Transportation Authority 550 S. Main St. Orange, CA 92868

and

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

Prepared by:

AECOM 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| Revision | Description | Date |
|----------|--|----------|
| 0 | Draft Biological Resources Technical Memorandum | 01/06/21 |
| 1 | Draft Biological Resources Technical Memorandum Rev 1 (Incorporating OCTA's comments) | 02/25/21 |
| 2 | Draft Biological Resources Technical Memorandum Rev 2 (Incorporating OCTA's comments) | 06/17/21 |
| 3 | Draft Biological Resources Technical Memorandum Rev 3 (Incorporating OCTA's comments) | 08/04/21 |

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- Attachment A Project Site Photos
- Attachment B Regional Special-Status Plant Species and Sensitive Natural Communities Regional Special-Status Wildlife Species

1. INTRODUCTION

The Southern California Regional Railroad Authority (SCRRA) Metrolink Commuter Rail System (Metrolink) is proposing to construct a new Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project"). The Project would include several facilities including a transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth, sand silos, a maintenance facility, a maintenance facility extension, and 11 tracks. Approximately 80 employees would report to the Project. The Project consists of buildings that would have a total building area of approximately 90,000 square feet when combined. Metrolink currently operates two maintenance facilities across its service area: Central Maintenance Facility (CMF) in Los Angeles and Eastern Maintenance Facility (EMF) in San Bernardino County. Due to projected population expansion within its service area and the agency's goal to be prepared for the 2028 Los Angeles Summer Olympic Games, Metrolink will require an increased number of commuter rail services, as well as additional train storage and maintenance facilities associated with an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the Project would provide an optimal location for a new Metrolink maintenance facility. Metrolink's member agency, the Orange County Transportation Authority (OCTA), proposes to build this facility on an OCTA-owned parcel in the City of Irvine. OCTA is the lead agency under the California Environmental Quality Act (CEQA). The City of Irvine and SCRRA are the responsible agencies under CEQA.

The Biological Resource Technical Memorandum was prepared for the Project in support of CEQA review process. This memorandum summarizes the results of biological resource database reviews and a site survey conducted for the Project to document existing biological conditions at the site (Project Site), a discussion of potential impacts to biological resources, and mitigation measures identified to minimize and avoid potential impacts to biological resources.

2. PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

As a result of the projected population expansion within the five-county area (Orange County, Los Angeles County, San Bernardino County, Riverside County, and Ventura County) currently served by the SCRRA, Metrolink will require an increased number of commuter rail services to support the growth. Consequently, the Metrolink system (Figure 2.1-1) would require additional train storage and maintenance facilities to support an increased fleet size.



Figure 2.1-1 Metrolink System Map

Source: SCRRA (2019)

Metrolink's CMF facility is located on the east bank of the Los Angeles River near the Interstate 5 (I-5) and Interstate 10 (I-10) highways, just south of the location of the former Southern Pacific Taylor Yard. The CMF is currently near capacity, which will impact the ability to provide the necessary train servicing for planned service-expansion of various Metrolink lines throughout the system under the Southern California Optimized Rail Expansion (SCORE) program. By transferring a portion of the current fleet from CMF to the proposed OCMF (specifically the Orange County Line trains), capacity for the non-Orange County trains will be increased at CMF. The Orange County Line has the highest ridership within the Metrolink system; therefore, a maintenance facility to serve the Orange County area with sufficient storage and servicing capabilities for both locomotives and rail cars is critical to controlling operating costs. In order to optimize rail service in the region, the proposed facility development would need to be completed by 2028. The SCORE program may also require heavy overhaul capabilities at OCMF, subject to pending decisions regarding fleet technology and management.

The expansion of Orange County and overall Metrolink commuter rail service will ultimately require additional or expanded equipment servicing capabilities for both locomotives and rail cars. Since a significant portion of the fleet will be in Orange County, a maintenance facility located along the Metrolink route through Orange County would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and San Bernardino. The proposed maintenance facility would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Much of the inspection and maintenance activity is federally mandated and must be performed at specific intervals. The OCMF will also provide refueling services thus reducing fuel costs, reducing fuel consumption, and will reduce emissions. Currently trains operating in the Orange County Region must travel either the CMF or EMF for refueling, which are sometimes non-revenue runs. The location of the Project is on a 21.3-acre OCTA-owned parcel on Ridge Valley south of Marine Way in the City of Irvine (Project Site). The Project Site is located within the boundaries of a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was guitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City of Irvine that same year. OCTA then purchased the fee ownership of the Project Site from the City of Irvine. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley.

Prior to the current construction of the storage/set-out track, the Project Site was mostly vacant. The site currently includes 1,000-foot-long storage for miscellaneous rail equipment including temporary railroad bridges, signal houses, railroad ties, and signal components. Although not part of the Project, OCTA is currently installing a single 1,000-foot-long, single-ended storage track and fencing of the perimeter of the property to provide temporary storage of two trainsets and/or track maintenance equipment when necessary.

2.2 PROJECT DESCRIPTION

The OCMF would be located in the City of Irvine, on a 21.3-acre parcel owned by OCTA and adjacent to Marine Way and the Metrolink Orange subdivision between mileposts 183.50 and 184.00 on Metrolink's "Orange" Subdivision (Figure 2.2-1). The Project Site is located within Planning Area 51 of the updated City of Irvine General Plan, adopted in June 2015, and designated for the Great Park (formerly known as the Orange County Great Park (OCGP)) land use under the General Plan. Per the City's zoning ordinance, the proposed use is a conditionally allowable use under the existing zone; therefore, OCTA is submitting a Conditional Use Permit to the City of Irvine for approval.

The Project would be developed in two phases with an anticipated completion date of 2028. Phase 1 focuses on developing facilities needed for the storage and routine cleaning, inspection and servicing of the anticipated trainsets. The total area of the Phase 1 buildout would be approximately 20,996 square feet and would be comprised of the following facilities: the transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth and sand silos (Table 0-1). A total of 11 tracks would be built. The Phase 1 layout situates the train wash, fueling/sanding, and service and inspection tracks on the two tracks with the greatest tangent length, which are the ones nearest the railroad right of way ("ROW"). This is important in fitting a second fueling/sanding facility so that there is one at each end of the service and inspection platform to support having the locomotive at either end, all within tangent track. Additionally, six storage tracks and appurtenant features (air, water, head end power and toilet dump facilities) would be constructed. The storage tracks would be built near the middle of the site east of the service and inspection tracks. Phase 1 of the buildout would anticipate approximately 52 employees total throughout the entire day, split across three eight-hour shifts.

| Building/Facility/Item | Building Area | Building Height |
|--------------------------------|----------------|------------------------|
| Transportation Building | 7,495 sq. ft. | 20 ft |
| Train Wash Building | 11,110 sq. ft. | 21 ft |
| Maintenance Building | 40,392 sq. ft. | 48 ft |
| Maintenance Building Expansion | 27,880 sq. ft. | |
| Utility Building | 981 sq. ft. | 20 ft |
| Pump House | 750 sq. ft. | 14 ft |
| Guard Booth | 36 sq. ft. | |
| Equipment Booth | 48 sq. ft. | |
| Sand Silos (2 Total) | 576 sq. ft. | |
| Total | 89,268 sq. ft. | |

Table 0-1 Building Specifications

Source: Gannett Fleming, Metrolink (February 2022)

Note: sq. ft. = square feet; ft = feet

A runaround track would be provided between the service and inspection tracks and storage tracks. Additionally, two temporary stub-ended set out tracks would be provided in the Phase 1 layout that occupies the footprint of the future shop tracks (one at the north and one at the south end of the yard). These set out tracks would be converted to shop access tracks in Phase 2 and therefore, would no longer be available as set out tracks. A new set out track would then be provided as part of Phase 2.

A transportation building that would be utilized for administrative purposes is also included in Phase 1. This building would house managerial offices, welfare spaces for train crews and on-site personnel. This facility would include restrooms, showers, locker rooms, a break/day room, vending space and a kitchenette. Approximately 120 automobile parking spaces would be provided for staff reporting to the site. Fire department compliant roadways would be developed to permit circulation of the site for Metrolink vehicles as well as delivery trucks (sand and fuel).

Phase 2 completes the full buildout of the Project. It would include development of the maintenance shop building and its future extension that would comprise of a total buildout area of 68,272 square feet (Table 0-1). The shop would have capabilities to perform regular three-month, six-month, and one-year preventive maintenance cycles on trainsets. Phase 2 of the buildout would consist of approximately 28 employees. With the full buildout of Phase 1 and Phase 2, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts.

Access to the OCMF would require a roadway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The Project includes the southern extension of Ridge Valley Road from Marine Way and associated traffic signal improvements to provide access to the OCMF.

The 11 new east and west lead tracks, as discussed in this section above, would be constructed within the existing railroad corridor between MP 183.0 and MP 184.00 on Metrolink's "Orange" Subdivision to connect the existing mainline railroad to the proposed OCMF rail yard. A new single span concrete bridge over the Bee Canyon Channel (Channel) would be built for the east lead track. A segment of the Channel and utilities that are found to be in conflict would be lowered by approximately 2.5 feet to facilitate the construction of the bridge.

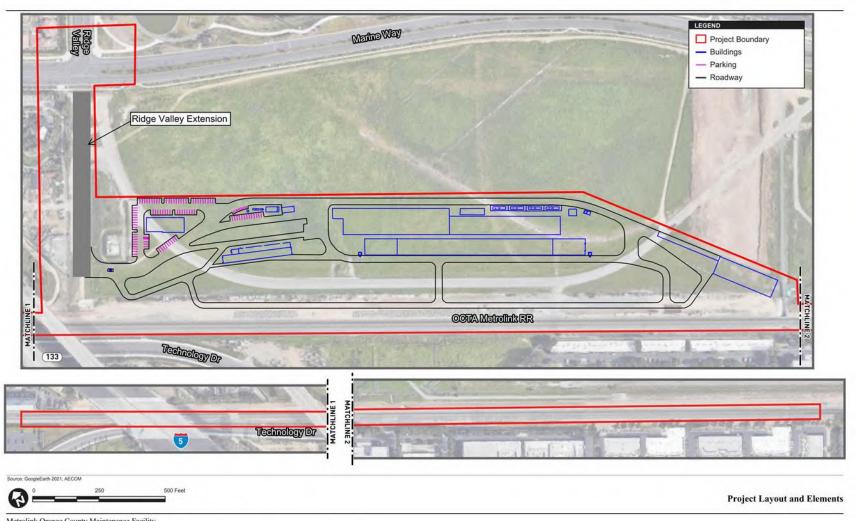


Figure 2.2-1 Project Layout and Elements

Metrolink Orange County Maintenance Facility Path: The accounts Conf (IV. MER. SunDiego USSDG) DCS Projects 1663 66632397 (GF_OCTA_MSP 900-CAD-GIS 910 Graphics 2.2-2 Proj Layout Domonta at 1209/2021, BradyD

Source: ESRI (2021), OCTA (2021)

3. METHODS FOR ASSESSING BIOLOGICAL RESOURCES

A search of relevant regional databases for special-status biological resources in the vicinity of the project area was conducted prior to conducting a field survey. The Project Site is located in the City of Irvine, with most of the Project Site located in the southwest corner of the U.S. Geological Survey's El Toro, California quadrangle and a smaller portion located in the southeast corner of the Tustin, California quadrangle. A search of the El Toro and surrounding eight quadrangles including Tustin, Orange, Black Star Canyon, Corona South, Santiago Peak, Laguna Beach, San Juan Capistrano, and Canada Gobernadora were made of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2020a), California Native Plant Society's (CNPS) on-line Inventory of Rare and Endangered Plants of California (CNPS 2020), and National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) California Species List Tool (NMFS 2016). Additionally, the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) (USFWS 2020) environmental review process was queried. These desktop reviews provided a list of special-status species, sensitive natural communities, and protected areas known from the project vicinity and are referenced and discussed further in this memorandum.

The area evaluated for biological resources includes the Project Site and a 500-foot survey buffer, known as the Biological Survey Areas (BSA). A buffer around the Project Site was evaluated in order to capture potential indirect effects to biological resources from implementation of the Project. Indirect effects could include elevated noise and dust levels and increased human activity within the BSA. A 500-foot survey buffer is appropriate for capturing potential indirect impacts from a project on biological resources. It is anticipated that indirect impacts beyond 500 feet for this Project are generally diffuse and would not significantly impact biological resources.

Prior to conducting a field survey, aerial imagery of the BSA was reviewed for the presence of areas that could potentially support special-status biological resources. Since most of the BSA is developed by hardscape features (i.e. buildings and a paved lot), the desktop review focused on identifying any significant green or otherwise open spaces in the vicinity of the Project. On July 30, 2020, a field survey of the Project Site and survey buffer was conducted by AECOM biologist Chris Hargreaves to document existing biological resources that occur or have the potential to occur within and adjacent to the BSA, and to evaluate the potential for special-status plant and wildlife species to occur within the BSA. Binoculars were utilized to scan for evidence of wildlife activity in the BSA. Seasonal, species-specific botanical or wildlife surveys were not conducted as part of this evaluation; however, based on the survey conducted and an assessment of conditions in the BSA, it is apparent that special-status plant and wildlife species are not anticipated within the urbanized environment of the BSA.

4. ENVIRONMENTAL SETTING

4.1 EXISTING CONDITIONS

The Project occurs on a 21.3-acre OCTA-owned parcel in the City of Irvine, Orange County. The entire BSA is urbanized or has otherwise been previously disturbed and includes roadways, rail tracks, commercial development, and undeveloped areas covered by weeds and grass. Athletic fields in the Great Park lie to the east and north and commercial development lies to the west and south. Vegetation within the Project Site consists primarily of non-native herbaceous mustard and grass species. The surrounding BSA includes similar ruderal vegetation and ornamental trees and shrubs associated with surrounding commercial and recreational uses. The Project Site is moderately sloped in a southeast to northwest direction, with an elevation of approximately 240 feet above mean sea level (amsl) in the far southern portion of the BSA, to 220 amsl in the northern portion. Bee Canyon Wash flows within an underground concrete box channel northeast to southwest at the southern perimeter of the Project Site. A short, isolated reach of the channel at the southern edge of the Project Site is open. Photographs of the Project Site are included in Attachment A.

4.2 VEGETATION COMMUNITIES AND PLANTS

Vegetation communities are assemblages of plant species that commonly coexist. The classification of vegetation communities is based on the life form of the dominant species within that community and the associated species. No natural vegetation communities exist within the BSA. The nearest areas of natural communities occur approximately four miles to both the northeast in foothills of the Santa Ana Mountains, and to the southwest in the San Joaquin Hills.

Project Site

Onsite habitat can be characterized as upland mustards and other ruderal forbs, as described in A Manual of California Vegetation (MCV) (Sawyer et al. 2009). Plant species within the proposed Project Site consist primarily of non-native herbaceous species, including: wild mustard (*Hirschfeldia incana*), black mustard (*Brassica nigra*), yellow starthistle (*Centaurea solsticialis*), red brome (*Bromus madritensis* spp. *rubens*), and wild oat (*Avena* sp.), with one native herb, doveweed (*Croton setigera*). (Photos 1-4, Attachment A). Some areas of the Project Site containing only patchy vegetative growth composed primarily of black mustard (Photo 5), and areas of bare ground where railroad equipment is currently being stored (Photo 6). It appears that most of the Project Site, at the bends in Marine Way, appear to be mowed less frequently and contain additional non-native herbaceous plant species (Photo 7). No trees or shrubs exist within the Project Site. A list of the plant species identified during the field survey of the site are provided in Table 4.2-1.

| Common Name | Scientific Name | Native/Non-Native Species |
|--------------------|--------------------------------|---------------------------|
| Ragweed | Ambrosia psilostachya | Native |
| Wild oat | Avena sp. | Non-Native |
| Black mustard | Brassica nigra | Non-Native |
| Red brome | Bromus madritensis spp. rubens | Non-Native |
| Yellow starthistle | Centaurea solsticialis | Non-Native |
| Doveweed | Croton setigera | Native |
| Bermuda grass | Cynodon dactylon | Non-Native |
| Jimsonweed | Datura wrightii | Native |
| Canada horseweed | Erigeron canadensis | Native |
| Spotted spurge | Euphorbia maculata | Non-Native |
| Prickly lettuce | Lactuca seriola | Non-Native |
| Telegraph weed | Heterotheca grandiflora | Native |
| White sweetclover | Melilotus albus | Non-Native |
| Fountain grass | Pennisetum setaceum | Non-native |
| Castor bean | Ricinus communis | Non-native |

A short, open reach of Bee Canyon Wash occurs at the southern edge of the Project Site, where a bridge carrying rail tracks is proposed over the channel. At this location, the channel is a concrete box, with some rip-rap above the channel on the banks (Photo 8). The channel is underground north (upstream) of this reach. There is no vegetative growth in the channel.

Stormwater runoff drains from the Project Site via an open concrete channel that occurs in the northwest corner of the site (Photo 9). From this point, stormwater is further conveyed downstream to the Marshburn Channel, which occurs outside the BSA to the northwest.

Surrounding BSA

The 500-foot survey buffer around the Project Site includes roadways, rail tracks, commercial development to the southwest and athletic fields in Great Park to the northeast. Vegetation within the BSA consists of ornamental pine (*Pinus* sp.), fig (*Ficus* sp.), and sweet gum (*Liquidambar styraciflua*) trees within landscaped areas in the commercial development. These trees are visible in the background of Photos 5-8. Vacant land covered by herbaceous habitat similar to that on the Project Site occurs in the BSA to the east around Voyager Drive and to the south of the Project Site.

A soft-bottom, vegetated stormwater channel drains into the open portion of Bee Canyon channel from the southeast in the BSA. Some growth of native riparian species including willow (*Salix* sp.) and mulefat (*Baccharis salicifolia*) are present in this channel; however, it occurs just outside the Project Site and would not be impacted by the Project.

4.3 WILDLIFE

With most vegetation being less than a foot in height, the Project is generally unsuitable for wildlife nesting and cover. Wildlife activity was minimal during the field survey. Species observed include western fence lizard (*Sceloporus occidentalis*), and observations of mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), and common raven (*Corvus corax*) flying across the Project Site. No active or old bird nests were observed within the Project Site; however, killdeer (*Charadrius vociferous*), a common ground-nester could potentially nest on site.

4.4 WILDLIFE CORRIDORS

In an urban context, a wildlife migration corridor can be defined as a linear landscape feature of sufficient width and buffer to allow animal movement between two comparatively undisturbed habitat fragments, or between a habitat fragment and some vital resource that encourages population growth and diversity. Habitat fragments are isolated patches of habitat separated by otherwise foreign or inhospitable areas, such as urban tracts or highways. Two types of wildlife migration corridors seen in urban settings are regional corridors, defined as those linking two or more large areas of natural open space, and local corridors, defined as those allowing resident wildlife to access critical resources (food, cover, and water) in a smaller area that might otherwise be isolated by urban development.

The BSA occurs within an urbanized area and does not occur within or intersect a recognized or established regional wildlife corridor. Vegetative growth within the Project Site and ornamental trees and shrubs within landscaped areas within the surrounding BSA provide some opportunities for cover, resting, foraging, and nesting to localized bird populations; however, they do not provide functions as a significant wildlife movement corridor.

5. SPECIAL-STATUS SPECIES

5.1 SPECIAL-STATUS PLANT SPECIES

Special-status plant species include those listed as Endangered, Threatened, Rare or those species proposed for listing by the USFWS under the federal Endangered Species Act (FESA), those listed by CDFW under the California Endangered Species Act (CESA), and the CNPS.^{1,2,3} The CNPS inventory is sanctioned by the CDFW and essentially serves as the list of candidate plant species for state listing. CNPS's California Rare Plant Ranks (CRPR) 1B and 2 species are considered eligible for state listing as endangered or threatened.

A total of 76 special-status plant species were identified from the El Toro and surrounding eight quadrangles in the CNDDB and CNPS, and from a search of IPaC for the vicinity of the Project Site, including 10 federal and/or state-listed species:

- Munz's onion (Allium munzii), federal-listed endangered and state-listed threatened
- Braunton's milk-vetch (Astragalus brauntonii), federal-listed endangered
- Thread-leaved brodiaea (Brodiaea filifolia), federal-listed threatened and state-listed endangered
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), federal candidate for listing and state-listed endangered
- Slender-horned spineflower (Dodecahema leptoceras), federal and state-listed endangered
- Santa Monica dudleya (Dudleya cymosa ssp. ovatifolia), federal-listed threatened
- Laguna Beach dudleya (Dudleya stolonifera), federal and state-listed threatened
- Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*), federal and state-listed endangered
- Gambel's water cress (Nasturtium gambellii), federal-listed endangered and state-listed threatened
- Big-leaved crownbeard (Verbesina dissita), federal and state-listed threatened

The 76 special-status plant species identified during the database reviews, their status, and habitat requirements are provided in Attachment B, Table A.

No special-status plant species were observed during the field survey and no records of special-status plant species were found during the database reviews to coincide with the BSA. Due to the developed nature of the BSA and lack of natural habitats that are potentially suitable to support special-status plants, none are

¹ Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (Title 50 Code of Federal Regulations [CFR] 17.12 [listed plants], Title 50 CFR 17.11 [listed animals] and includes notices in the Federal Register for proposed species).

² Species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (Title 14 California Code of Regulations 670.5).

³ Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 *et seq.*).

expected to occur in the BSA. The nearest special-status plant species identified during database reviews are primarily recorded from native habitats two plus miles southwest of the BSA, in the vicinity of Sand Canyon Reservoir.

5.2 SPECIAL-STATUS WILDLIFE SPECIES

Special-status wildlife species include those listed by USFWS under FESA and by CDFW under CESA. USFWS and CDFW officially list species as either threatened, endangered, or as candidates for listing. Additional species receive federal protection under the Bald Eagle Protection Act (e.g., bald eagle, golden eagle), the Migratory Bird Treaty Act (MBTA), and state protection under CEQA Section 15380(d).

All birds, except European starlings, English house sparrows, rock doves (pigeons), and non-migratory game birds such as quail, pheasant, and grouse are protected under the MBTA. However, the nests and eggs of non-migratory game birds are protected under California Fish and Game Code (CFGC) Section 3503. Many other species are considered by CDFW to be California Species of Special Concern (SSC) and others are on a CDFW Watch List (WL). The CNDDB tracks species within California for which there is conservation concern, including many that are not formally listed, and assigns them a CNDDB Rank (CDFW 2020b). Although CDFW SSC and WL species and species that are tracked by the CNDDB but not formally listed are afforded no official legal status, they may receive special consideration during the environmental review process. CDFW further classifies some species as "Fully Protected" (FP), indicating that the species may not be taken or possessed except for scientific purposes, under special permit from CDFW. Additionally, CFGC Sections 3503, 3505, and 3800 prohibit the take, destruction, or possession of any bird, nest, or egg of any bird except English house sparrows and European starlings unless authorization is obtained from CDFW.

A total of 66 special-status wildlife species were identified during a search of the El Toro and surrounding eight quadrangles in the CNDDB and NMFS databases, and from a search of IPaC for the vicinity of the Project, including 20 federal and/or State-listed wildlife species:

- Tricolored blackbird (Agelaius tricolor), state-listed threatened
- Arroyo toad (Anaxyrus californicus), federal-listed endangered
- Crotch bumble bee (Bombus crotchii), state candidate-endangered
- San Diego fairy shrimp (Branchinecta sandiegonensis), federal-listed endangered
- Santa Ana sucker (Catostomus santaanae), federal-listed threatened
- Western snowy plover (Charadrius alexandrinus nivosus), federal-listed threatened
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), federal-listed threatened and statelisted endangered
- Stephens' kangaroo rat (*Dipodomys stephensi*), federal-listed endangered and state-listed threatened
- Southwestern willow flycatcher (*Empidonax traillii extimus*), federal and state-listed endangered
- Tidewater goby (Eucyclogobius newberryi), federal-listed endangered
- Quino checkerspot butterfly (Euphydryas editha quino), federal-listed endangered
- Bald eagle (Haliaeetus leucocephalus), state-listed endangered
- California black rail (Laterallus jamaicensis coturniculus), state-listed threatened
- Steelhead southern California DPS (Oncorhynchus mykiss pop. 10), federal-listed endangered
- Belding's savannah sparrow (Passerculus sandwichensis beldingi), state-listed endangered
- Pacific pocket mouse (Perognathus longimembris pacificus), federal-listed endangered
- Coastal California gnatcatcher (Polioptila californica californica), federal-listed threatened
- Light-footed Ridgway's rail (*Rallus obsoletus levipes*), federal and state-listed endangered
- California least tern (Sternula antilarum browni), federal and state-listed endangered
- Least Bell's vireo (Vireo bellii pusillis), federal and state-listed endangered

The 66 special-status wildlife species identified during the database reviews, their status, and habitat requirements are provided in Attachment B, Table B.

No special-status wildlife species were detected during the field survey and no historical records of specialstatus wildlife were identified to coincide with the BSA during database reviews. Records of burrowing owl (*Athena cunicularia*), a CDFW SSC, are known from 1-2 miles east of the BSA from 2010, within the former El Toro Air Station, where adults were found overwintering. It was determined at the time that these individuals were not nesting and burrows were collapsed to prohibit reuse (CDFW 2020a). No records of burrowing owl have been made in the vicinity of the Project Site since 2010 and no individuals of this species or burrows suitable for this species were observed onsite during the field survey. Although this species prefers open grassland habitat with low plant growth similar to that within the Project Site, a lack of recent records and absence of any indication of the species occurrence in the Project Site indicate the species is likely no longer present in the vicinity. CNDDB records from 1999 of tricolored blackbird are known from 1-2 miles west and southwest of the BSA, on the other (west) side of I-5 from the Project Site. Subsequent surveys for this species in 2014 noted it was no longer present and the area had been developed (CDFW 2020a). Due to the developed nature of the BSA, native habitats suitable to support these and other special-status wildlife species are generally absent from the BSA. No special-status invertebrates, reptiles, amphibians, fish, or mammals are expected to occur within the BSA.

Two CDFW WL species, Cooper's hawk (*Accipiter cooperii*) and California horned lark (*Eremphila alpestris actia*) have some potential to occur within the BSA; California horned lark as a potential ground-nester within the Project Site and Cooper's hawk as a transient migrant or forager across the BSA (refer to Attachment B, Table B).

6. SENSITIVE NATURAL COMMUNITIES

Sensitive natural communities are those that are designated as rare in the region by CDFW in the CNDDB, support special-status plant or wildlife species, or are aquatic communities such as wetlands, rivers, streams, and riparian areas that fall under regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE), CDFW, and/or the Regional Water Quality Control Board (RWQCB). Tidal waters around the peninsula are considered sensitive natural communities, falling under the jurisdiction of NMFS. Regulations applicable to sensitive natural communities are discussed further in Section 7 of this memorandum.

Fourteen sensitive vegetative communities were identified during a search of the CNDDB for the El Toro and surrounding eight quadrangles, including the following:

- California Walnut Woodland
- Canyon Live Oak Ravine Forest
- Riversidian Alluvial Fan Sage Scrub
- Southern California Arroyo Chub/Santa Ana Sucker Stream
- Southern Coast Live Oak Riparian Forest
- Southern Coastal Salt Marsh
- Southern Cottonwood Willow Riparian Forest
- Southern Interior Cypress Forest
- Southern Mixed Riparian Forest
- Southern Riparian Forest
- Southern Riparian Scrub
- Southern Sycamore Alder Riparian Woodland
- Southern Willow Scrub
- Valley Needlegrass Grassland

These communities are absent from the BSA and are known from inland mountain ranges and coastal canyons generally occurring within 3-4 miles northeast and southwest of the BSA. No USFWS-designated critical habitats for federally-listed species or any other sensitive, protected, or managed communities or habitats were identified during a review of IPaC to coincide with the Project Site.

As identified in Section 4.1, Bee Canyon Wash (Lower San Diego Creek; Hydrologic Unit Code [HUC] 12 = 180702040102) occurs as a mostly underground channel along the southeastern perimeter of the Project Site, with a short, isolated open portion of the channel at the southern edge of the Project Site. Bee Canyon Wash originates as a headwater channel in the Santa Ana Mountains five to six miles northeast of the BSA in the vicinity of the Frank R. Bowerman Landfill. Round Canyon Wash, a tributary of Bee Canyon Wash, originates to the southeast of Bee Canyon in Limestone Canyon Regional Park. From their source, these streams flow southwest (under the 241 Toll Road) and confluence just south of the Portola Springs area of the City of Irvine. Bee Canyon Wash then flows under the former El Toro Marine Air Station and daylights along the southeast perimeter of the Project Site, before flowing into an underground storm drain system which eventually enters San Diego Creek, approximately one mile southwest of the BSA.

The San Diego Creek watershed drains roughly 112 square miles, most of which is located in the City of Irvine. From its confluence with Bee Canyon Wash, San Diego Creek continues through urbanized portions of the City for approximately eight miles before flowing into Newport Bay, where it contributes nearly all of the freshwater inflow to Newport Bay.

7. BIOLOGICAL RESOURCES REGULATORY FRAMEWORK

Several regulations and standards have been established by federal, state, and local agencies to protect and conserve biological resources. The Project's compliance with the regulations and standards listed below were assessed.

Federal

Federal Endangered Species Act

Enacted in 1973, the FESA provides for the conservation of threatened and endangered species and their ecosystems (United States Code [U.S.C.] Title 16, Chapter 35, Sections 1531–1544). The ESA prohibits the "take" of threatened and endangered species except under certain circumstances and only with authorization from USFWS through a permit under Section 4(d), 7 or 10(a) of the ESA. "Take" under the FESA is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Formal consultation under the FESA would be required if the Project had the potential to affect a federallylisted species that has been detected within or adjacent to the BSA. No federally-listed species were detected during the field survey and suitable habitats for such species do not occur in the BSA. Therefore, formal consultation is not expected for the Project.

Migratory Bird Treaty Act (MBTA)

Under the MBTA, it is unlawful at any time, by any means or manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests occupied by migratory birds during the breeding season. The MBTA (16 U.S.C. 703-71 1), 50 CPR Part 10, protects migratory birds, their occupied nests, and their eggs from disturbance or destruction.

Although unlikely due to the absence of trees and shrubs on site, native migratory bird species protected under the MBTA may nest on site. No permit is issued under the MBTA; therefore, the Project would need to employ measures that would avoid take of protected migratory birds, their occupied nests and their eggs.

Bald and Golden Eagle Protection Act (Eagle Act)

The Eagle Act was originally implemented for the protection of bald eagles. In 1962, Congress amended the Eagle Act to also cover golden eagles, a move that was partially an attempt to strengthen protection of bald eagles, since the latter were often killed by people mistaking them for golden eagles. This act makes it illegal to import, export, take (which includes molest or disturb), sell, purchase, or barter any bald eagle or golden eagle or part thereof.

Although known from the region, bald and golden eagles are not known from the vicinity of the Project, and habitat in the BSA is not suitable for these species. As a result, the Project is not expected to take a bald or golden eagle.

Clean Water Act (CWA)

Under Section 404 of the CWA, the USACE regulates the discharge of dredged or fill material into jurisdictional waters of the U.S., which include those waters listed in 33 CFR 328.3 (Definitions) (U.S.C. Title 33, Chapter 26, Sections 101–607). In June of 2020, the Navigable Waters Protection Rule became effective. The Final Rule modified the definition of Waters of the U.S. 33 CFR 328 3(b)(3) indicates that ephemeral features are not regulated by the CWA. The definitions of intermittent and perennial require surface water flowing continuously for weeks or months during certain times of the year and more than in direct response to precipitation (e.g., ephemeral drainages). The final rule preamble Section III.A.2 does clarify that features with effluent-derived intermittent or perennial flows may be considered jurisdictional as well.

As described in Section 6, Bee Canyon Wash occurs along the southeastern perimeter of the Project Site. Although Bee Canyon Wash's hydrologic regime is not currently known, the analysis assumes that the wash is jurisdictional due to the size of the watershed and urban influence located upstream. This feature constitutes a potential jurisdictional water of the U.S. per USACE regulations. Potential permitting requirements pursuant to Section 404 and 401 of the CWA are discussed in Section 8.

Section 401 of the CWA requires a Water Quality Certification from the state for all permits issued by the USACE under Section 404 of the CWA. The RWQCB is the state agency in charge of issuing a CWA Section 401 Water Quality Certification or waiver.

Magnuson-Stevens Fisher Conservation and Management Act (Magnuson-Stevens Act)

Under the purview of NMFS, amendments in 1996 to the Magnuson-Stevens Act set forth a number of mandates for NMFS, Regional Fishery Management Councils, and federal action agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate Essential Fish Habitat (EFH) in fishery management plans for all managed species. As defined by this act, EFH is necessary for fish to spawn, breed, feed, or grow to maturity, and includes subsets of habitats known as Habitat Areas of Particular Concern (HAPC), which are high-priority areas for conservation, management, and research and are necessary for healthy ecosystems and sustainable fisheries. HAPC include estuaries, kelp canopies, rocky reefs, and beds of seagrass, habitats that are rare, stressed by development, provide important ecological functions for federally managed species, and/or are especially vulnerable to anthropogenic (or human impact) degradation. They can cover a specific location (a bank or ledge, spawning location) or a habitat that is found over a wider area, such as coral, nearshore nursery areas, or pupping grounds. The HAPC designation does not provide additional protection or restrictions on an area but helps prioritize conservation efforts (NMFS 2020a).

As described in Section 6, Bee Canyon Wash occurs within the BSA and flows into San Diego Creek and further into Newport Bay. Waters in Newport Bay are identified by NMFS as EFH and a review of HAPC

occurring along and off the coast of Newport Bay indicates the presence of estuary habitat in the Bay (NMFS 2020b). However, due to the distance from the BSA to Newport Bay, coordination with NMFS regarding potential impacts to EFH and HAPC are not anticipated for the Project.

State

California Environmental Quality Act (CEQA)

CEQA requires that biological resources be considered when assessing the environmental impacts resulting from proposed actions. CEQA does not specifically define what constitutes an "adverse effect" on a biological resource. Instead, lead agencies are charged with determining what specifically should be considered an impact. This memorandum has been prepared in support of a review of biological resource pursuant to CEQA.

California Fish and Game Code (CFGC)

CFGC regulates the taking or possession of birds, mammals, fish, amphibians, and reptiles, as well as impacts to natural resources such as wetlands and waters of the state. It includes CESA (Sections 2050–2115) and Lake and Streambed Alteration Agreement (LSAA) regulations (Section 1600 et seq.).

Wildlife "take" is defined by CDFW as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Protection extends to the animals, dead or alive, and all their body parts. Section 2081 of CESA allows CDFW to issue an incidental take permit for state-listed threatened or endangered species, should the Project have the potential to "take" a state-listed species that has been detected within or adjacent to the Project Site. Certain criteria are required under CESA prior to the issuance of such a permit, including the requirement that impacts of the take are minimized and fully mitigated.

Additionally, CFGC Sections 3503, 3505, and 3800 mirror the MBTA, but also prohibit the take, destruction, or possession of any bird, nest, or egg of <u>any</u> bird species except English house sparrows and European starlings unless authorization is obtained from CDFW.

No state-listed species are anticipated to be affected by the Project as habitat potentially suitable for such species does not occur within the BSA, or the species' known distribution does not coincide with the BSA. As a result, a permit under Section 2081 is not anticipated for the Project.

Bee Canyon Wash may constitute a regulated streambed under the jurisdiction of CDFW. As a result, an LSAA will be required for the Project.

Porter-Cologne Water Quality Control Act

Under Section 13000 et seq., of the Porter-Cologne Water Quality Act (Porter-Cologne), the RWQCB is the agency that regulates discharges of waste and fill material within any region that could affect a water of the state (CWC 13260[a]) (including wetlands and isolated waters) as defined by CWC Section 13050(e).

Waste Discharge Requirements (WDR) pursuant to Porter-Cologne may be required if water quality certification pursuant to Section 401 of the CWA is not required. General Waste Discharge Order 2004-2004-DWQ may apply if Bee Canyon Wash would be subject to discharge of fill and is not regulated under CWA.

Local

Orange County Central and Coastal Subregion Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP)

The NCCP/HCP (County of Orange 1996a) was prepared by the County of Orange in cooperation with California Department of Fish and Game (CDFG, now CDFW) and USFWS. The document was prepared in accordance with the provisions of the state Natural Community Conservation Planning Act of 1991 (NCCP Act), Sections 1600 *et seq.* of the CFGC and FESA. The 208,00-acre Central and Coastal Subregion is part of a five-county NCCP Study Area established by the state as part of the Southern California Coastal Sage Scrub NCCP Program. The Project falls within the Central Subregion of the NCCP/HCP.

In addition, a Joint Programmatic Environmental Impact Report and Environmental Impact Statement (Joint EIR/EIS) (County of Orange 1996b) that addresses the effects related to the NCCP/HCP was prepared in accordance with the CEQA, and National Environmental Policy Act (NEPA). The County is the lead agency responsible for preparation of the NCCP/HCP and the EIR. The USFWS is the lead agency responsible for preparation of the HCP and EIS.

The NCCP/HCP focuses on creating a multiple-species, multiple-habitat subregional Reserve System and implementing a long-term "adaptive management" program that will protect coastal sage scrub and other habitats and species located within the coastal sage scrub habitat mosaic, while providing for economic uses that will meet the social and economic needs of the people of the subregion. The primary goal is to protect and manage habitat supporting a broad range of plant and animal populations that are found within the Central and Coastal subregions of Orange County. To accomplish this goal, the NCCP/HCP creates a subregional habitat Reserve System for coastal sage scrub and related habitats and implements a program that manages biological resources within the habitat reserve. The Reserve System would be established by incorporating existing parklands and open space and additional dedications that would occur over 25 years or more.

Two categories of landowners are identified by the NCCP/HCP including, *participating landowners* and *non-participating landowners*. Each of these landowner categories is offered different endangered species habitat mitigation opportunities under the NCCP/HCP. Non-participating landowners, such as OCTA, are those public and private landowners that are not contributing significant land and/or funding toward implementation of the Reserve System and adaptive management program. For non-participating landowners, development activities are required under current law to assure that impacts to listed species resulting from activities on their lands are fully mitigated consistent with the FESA and CESA. Consistency with the FESA and CESA is achieved by 1) onsite avoidance of impacts to listed species; 2) satisfying

applicable FESA and CESA provisions under the consultation and permit provisions of these acts; or 3) payment of a Mitigation Fee to the non-profit management corporation as provided for in the NCCP/HCP.

As presented in Section 8 below, significant impacts to federally and/or State-listed species and non-listed special-status-species and sensitive community will be avoided. Listed species are not expected onsite, sensitive communities are absent from the site, and avoidance and minimization measures would be implemented to reduce potential impacts to nesting birds protected under the MBTA and CFGC. As a result, the Project is not anticipated to conflict with the NCCP/HCP and payment of a Mitigation Fee per the NCCP/HCP is not expected.

8. IMPACTS ON BIOLOGICAL RESOURCES

Biological resources may be either directly or indirectly impacted by a project. Direct and indirect impacts may be either permanent or temporary in nature. These impact categories are defined below.

- **Direct**: Any alteration, physical disturbance, or destruction of biological resources that would result from project-related activities is considered a direct impact. Examples include clearing vegetation, encroaching into wetlands or a stream, and the loss of individual species and/or their habitats.
- Indirect: As a result of project-related activities, biological resources may also be affected in a manner that is ancillary to physical impacts. Examples include elevated noise and dust levels, increased human activity, decreased water quality, and the introduction of invasive wildlife (domestic cats and dogs) and plants.
- **Permanent**: All impacts that result in the long-term or irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources.
- **Temporary**: Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction; or removing vegetation for the preparation of stream bank stabilization activities, and either allowing the natural vegetation to recolonize or actively revegetating the impact area. Surface disturbance that removes vegetation and disturbs the soil is considered a long-term temporary impact because of slow natural recovery in arid ecosystems.

8.1 CONSTRUCTION

The anticipated impacts of Project construction on biological resources are described below.

Vegetation

Herbaceous vegetation composed primarily of non-native mustard and grass species occur within the Project Site; no trees or shrubs occur on site. The removal of such vegetation during implantation of the Project does not constitute a significant direct impact.

Indirect impacts to vegetation during the Project's construction could include the accumulation of fugitive dust and further colonization of non-native, invasive plant species. Other indirect impacts could include the potential for surface runoff, increased erosion, and sediment deposition beyond the footprint of disturbance as a result of the use of heavy construction equipment and general construction-related activities. However, standard construction practices related to fugitive dust and erosion control would be implemented. As a result, no significant indirect impacts to vegetation are anticipated.

Special-Status Plant Species

No federal- or state-listed plant species were identified during the field survey and special-status plants are not expected to occur in the BSA due to a lack of potentially suitable habitat. As a result, direct impacts to special-status plant species would not occur.

Likewise, suitable habitat for special-status plants is not present in the urbanized environment surrounding the Project Site. As a result, significant indirect impacts to special-status plant species are not anticipated.

Wildlife

No federal- or state-listed wildlife species were identified during the field survey or are expected to occur in the BSA due to a lack of potentially suitable habitat. As a result, direct impacts to federal- or state-listed wildlife species would not occur.

Although no trees or shrubs occur within the Project Site, the low and sometimes sparse vegetative growth present is potentially suitable for ground-nesting bird species such as California horned lark, a CDFW WL, and killdeer (*Charadrius vociferus*). Additionally, trees in ornamental landscapes within the surrounding BSA at the athletic fields to the northeast and in commercial development to the southwest provide potentially suitable nesting opportunities for birds protected under CFGC. By implementing avoidance and minimization measures outlined in Mitigation Measure BIO-1 in Section 9, direct impacts to any birds protected under the MBTA and by CFGC that may occur in the BSA would be less than significant.

Indirect impacts to nesting birds within the BSA could occur during construction as a result of noise, dust, increased human presence, and vibrations resulting from construction activities. Such disturbances could result in increased nestling mortality due to nest abandonment or decreased feeding frequency; mortalities resulting from such indirect effects would be considered significant. However, implementing and adhering to avoidance and minimization measures outlined in Mitigation Measure BIO-1 in Section 9 would reduce potential indirect impacts to nesting birds protected under the MBTA and by CFGC to a level that is less than significant.

Special-Status Wildlife Species

No federal- or state-listed wildlife species have been identified in the BSA, and potentially suitable habitat for such species is absent from the BSA. However, as presented in Section 5.2, two non-listed special-status bird species identified as CDFW WL species, Cooper's hawk and California horned lark, have some potential to occur within the BSA. As a result, direct and indirect impacts to special-status wildlife could occur. However, by implementing and adhering to avoidance and minimization measures outlined in Mitigation Measure BIO-1 in Section 9, potential impacts to nesting individuals of these special-status birds and any other bird species that could occur on site, would be reduced to a level that is less than significant.

Wildlife Movement Corridor

The BSA does not serve as a regional wildlife corridor and as a result, impacts to a regional wildlife movement corridor would not occur.

Sensitive Natural Communities

No sensitive natural vegetation communities occur within the BSA; however, Bee Canyon Wash, an aquatic feature under regulatory jurisdiction of the USACE, CDFW, and RWQCB, occurs within the BSA. Under the current design, construction of the bridge over Bee Canyon Wash would require a discharge of fill (e.g. soil, concrete) as the channel must be modified (e.g. widened, deepened, realigned, storm drain outlets added or modified) to accommodate the new bridge structure. Such impacts would require permits from USACE, CDFW and RWQCB. The Project occurs within the San Diego Creek (SDC) Watershed Special Area Management Plan (SAMP) area and is located outside of any pre-defined Aquatic Resource Integrity Area. Additionally, this segment of Bee Canyon Wash is not located within the "major streams" category. Construction of the Project would meet the terms and conditions of a Letter of Permission (LOP), and operation and maintenance would potentially meet the criteria for authorization under Regional General Permit (RGP) No. 74.

Construction of a bridge to carry rail tracks over an isolated, open portion of Bee Canyon Wash may be eligible to obtain an LOP from the USACE as a "Road Crossing," which includes construction and/or maintenance of new and existing bridges and culverts. The LOP application process would require:

- Pre-application coordination meeting with USACE to address:
 - CWA Section 404(b)(1) Guidelines alternatives analysis;
 - How avoidance and minimization of discharges to jurisdictional waters were achieved for the Project;
 - Compensatory mitigation plan consistent with the SAMP mitigation framework to address any unavoidable impacts to jurisdictional waters and the program goal of no net loss of wetlands.
- Coordination with RWQCB regarding a Section 401 Water Quality Certification that demonstrates the Project's compliance with water quality standards.

Alternatively, it may be determined during coordination with USACE that the proposed bridge over Bee Canyon Wash would qualify for RGP No. 74 to fulfill CWA Section 404 requirements. A RGP 74 would be issued by the USACE, Los Angeles District. This RGP authorizes discharges of dredged or fill material resulting in temporary impacts up to 0.5 acre of jurisdictional waters of the U.S. in eligible areas, no more than 0.1 acre of which may be vegetated with native riparian and/or wetland vegetation. No permanent impacts to waters of the U.S., including impacts from fills, flooding, excavation beyond a Corps Regulatory Division-approved maintenance baseline, or drainage are permitted under this RGP.

Construction of the proposed bridge over Bee Canyon Wash would require the Project applicant to obtain a permit pursuant to Sections 404 and 401 of the CWA and to Section 1600 et seq of CFGC. The Project would comply with the regulatory framework set forth by the USACE, RWQCB, and CDFW. Following the permitting process and SAMP requirements described below would further reduce the impacts of bridge installation over Bee Canyon Wash at a level less than significant. For CEQA purposes, potentially significant impacts would include those impacts that require mitigation.

Permitting Process:

- If discharge of fill to Bee Canyon Wash cannot be avoided and it is determined to meet the definition of a Water of the U.S., then prior to the start of the Project's construction, the Project Applicant shall coordinate with the USACE to obtain authorization pursuant to Section 404 of the CWA (i.e. LOP or RGP 74 per SAMP permit procedures) and the RWQCB to obtain a Water Quality Certification pursuant to Section 401 of the CWA.
- If discharge of fill to Bee Canyon Wash cannot be avoided and it is determined to NOT meet the definition of a Water of the U.S., then prior to the start of the Project's construction, the Project Applicant shall submit a Notice of Intent to be enrolled under and to comply with General Water Quality Order No. 2004-2004-DWQ.
- If the Project results in substantial modification of the bed or banks of Bee Canyon Wash, then, the Project Applicant shall coordinate with CDFW to determine the need to obtain a LSAA pursuant to Section 1600 et seq. of CFGC.

SAMP Requirements:

- The applicant shall comply with the SAMP Mitigation Framework (see Section 9 below) applicable to the LOP or RGP 74 permit procedures.
- If a permanent loss of regulated waters or streambed occurs because of the Project, compensatory mitigation (purchase of credit at an in-lieu fee or mitigation bank approved by the resource agencies), or applicant proposed enhancement or establishment of waters or streambed) shall be provided at a minimum ratio of 1:1. Temporary impacts shall be restored to pre-Project conditions to the extent practicable.

Local Plans

Although the Project Site falls within the boundary of the Orange County Central/Coastal NCCP/HCP, OCTA is not a participating landowner and as a result, the Project is not eligible for coverage under the NCCP/HCP for impacts to federally and/or state listed species. However, since no federally and/or State-listed species are expected to be impacted, no sensitive communities occur on site, and avoidance and minimization measures will be implemented to reduce impacts to nesting birds protected under the MBTA and CFGC, the Project does not conflict with the NCCP/HCP and will not require payment of a Mitigation Fee per the NCCP/HCP for such impacts.

8.2 OPERATION

Impacts to biological resources during operation and maintenance of the Project are not anticipated as such activities would be conducted within previously disturbed and developed surfaces containing non-native vegetation and would generally not change biological conditions from those present prior to and after the Project's construction. Special-status plant species are not expected to occur due to a lack of suitable habitat within the Project Site and surrounding BSA, and impacts to common wildlife, special-status wildlife species, and wildlife movement are not anticipated. Maintenance activities would be conducted at the Project Site and therefore Impacts would be less than significant.

9. AVOIDANCE AND MINIMIZATION MEASURES

With the potential for ground-nesting birds protected under the MBTA and CFGC to occur within the Project Site and other bird species to occur in the surrounding BSA, implementation of Mitigation Measure BIO-1 presented below would mitigate potential impacts to nesting birds should construction overlap the bird breeding season (February 15 through September 1).

- MM-BIO-1 Ground-disturbing activities during construction shall occur outside of the nesting bird season (generally February 15 through September 1). If avoiding the nesting season is not practicable, the following additional measures shall be employed:
 - A pre-construction nesting survey shall be conducted by a qualified biologist within three days prior to the start of construction activities to determine whether active nests are present within or directly adjacent to the construction zone. All nests found shall be recorded.
 - If construction activities must occur within 300 feet of an active nest of any passerine bird or within 500 feet of an active nest of any raptor, with the exception of an emergency, a qualified biologist shall monitor the nest on a weekly basis, and the activity shall be postponed until the biologist determines that the nest is no longer active.
 - If the recommended nest avoidance zone is not feasible, the qualified biologist shall determine whether an exception is possible and obtain concurrence from the resource agencies before construction work can resume within the avoidance buffer zone. All work shall cease within the avoidance buffer zone until either agency concurrence is obtained or the biologist determines that the adults and young are no longer reliant on the nest site.

Additionally, construction of the proposed bridge over Bee Canyon Wash would require the project applicant to obtain a permit pursuant to Sections 404 and 401 of the CWA and to Section 1600 et seq of CFGC. The Project Applicant shall coordinate with the USACE to obtain authorization pursuant to Section 404 of the CWA (i.e. LOP or RGP 74 per SAMP permit procedures) and the RWQCB to obtain a Water Quality Certification pursuant to Section 401 of the CWA. Additionally, If the Project results in any modification of the bed or banks of Bee Canyon Wash, then, the Project Applicant shall coordinate with CDFW to determine the need to obtain a LSAA pursuant to Section 1600 et seq. of CFGC. Mitigation Measure Bio-2 presented below would mitigate potential impacts of the proposed bridge to Bee Canyon Wash, reducing impacts to this jurisdictional feature to less than significant.

• MM-BIO-2 Pursuant to SAMP requirements, if a permanent loss of regulated waters or streambed occurs because of the Project, compensatory mitigation (purchase of credit at an in-lieu fee or mitigation bank approved by the resource agencies), or applicant proposed enhancement or establishment of waters or streambed) shall be provided at a minimum ratio of 1:1. Temporary impacts shall be restored to pre-Project conditions to the extent practicable.

10.CONCLUSIONS

No direct impacts to special-status plant species are anticipated, as none were observed during the field survey and the BSA lacks habitat suitable for such species. As a result, the Project would not result in a significant impact on any federally listed or state-listed threatened, endangered, or candidate plant species, or any non-listed special-status plant species occurring or potentially occurring within the Project.

No special-status wildlife species were observed during the field survey; however, as presented in Section 5.2, two CDFW WL bird species have some potential to occur within the BSA. In addition, bird species protected by the MBTA and CFGC have the potential to occur and nest in the BSA. Potential direct impacts to these species or their nests could occur during construction or during the use or transport of the Project's equipment or materials, on which common bird species may nest. Potential indirect impacts are associated with noise, dust, vibration, and increased human activity, which could cause adults to change their behavior, move out of the area, and abandon the nest or conduct less feedings, resulting in nestling mortality. Implementation of the avoidance and minimization measures in Section 9 would avoid disturbance of these species, resulting in less than significant impacts to special-status wildlife species and nesting birds.

Construction and operation of the Project would not affect a wildlife movement corridor. The Project Site itself does not serve as a wildlife movement corridor and vegetation removed during construction does not provide the functions and values to support wildlife movement compared to native vegetation communities. No impacts to a wildlife movement corridor would occur.

The Project would have no impact on any sensitive native vegetation community, USFWS-designated critical habitat, NMFS-managed habitat, or any other managed or protected habitat or community. However, construction of the Project includes a bridge over Bee Canyon Wash, which could result in impacts to a potential jurisdictional aquatic feature under the jurisdiction of USACE, RWQCB, and CDFW. However, by adhering to the avoidance and minimization measures in Section 9 related to coordination with regulatory agencies pursuant to CWA Section 404 and 401 and CFGC Section 1600, impacts to potential jurisdictional features would be less than significant.

11.REFERENCES

California Department of Fish and Wildlife (CDFW), 2020a, California Natural Diversity Data Base (CNDDB). Full condensed report for the El Toro, Tustin, Orange, Black Star Canyon, Corona South, Santiago Peak, Laguna Beach, San Juan Capistrano, and Canada Gobernadora quadrangles. Generated December 21, 2020.

______, 2020b, Special Animals List. Biogeographic Data Branch. California Natural Diversity Database. November. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline.

- California Native Plant Society (CNPS), 2020, Rare Plant Program. Inventory of Rare and Endangered Plants (online edition, v8-02). Available at: <u>http://www.rareplants.cnps.org/</u>. Report generated December 21, 2020 for the El Toro, Tustin, Orange, Black Star Canyon, Corona South, Santiago Peak, Laguna Beach, San Juan Capistrano, and Canada Gobernadora quadrangles.
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), 2016, West Coast Region. California Species List Tools. Available at:

<u>https://www.co.mendocino.ca.us/planning/pdf/pia_eir2019/096_NOAA%20Fisheries%20West%20Co</u> ast%20Region_California%20Species%20List%20Tools.pdf. Accessed December 21, 2020.

_____, 2020a, Essential Fish Habitat Mapper. Available at: https://www.habitat.noaa.gov/protection/efh/efhmapper/. Accessed December 23, 2020.

______, 2020b, Habitat Areas of Particular Concern within Essential Fish Habitat. Available at: <u>https://www.fisheries.noaa.gov/southeast/habitat-conservation/habitat-areas-particular-concern-</u> <u>within-essential-fish-habitat</u>. Accessed December 23, 2020.

County of Orange, Natural Community Conservation Plan & Habitat Conservation Plan, Parts I &II, 1996a, Available at: <u>https://occonservation.org/wp-content/uploads/2015/04/NCCP-Parts-I-II-Plan.pdf</u>

______, Natural Community Conservation Plan & Habitat Conservation Plan, Part III Joint Programmatic EIR/EIS. 1996b, <u>https://occonservation.org/wp-content/uploads/2015/04/NCCP-Part-</u> III-EIR.pdf

- Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens (Sawyer et al.), 2009, A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, CA. 1300 pp.
- Southern California Regional Rail Authority (SCRRA), Metrolink System Map, October 2019, Available at: https://metrolinktrains.com/about/agency/
- U.S. Fish and Wildlife Service (USFWS), 2020, Information for Planning and Consultation (IPaC). Available at: <u>https://ecos.fws.gov/ipac/</u>. Accessed December 21, 2020.

Appendix C Attachments Technical Memorandum Biological Resources

Metrolink Orange County Maintenance Facility

Prepared for:

Orange County Transportation Authority

550 S. Main St. Orange, CA 92868

Gannett Fleming

20 Pacifica, Suite 430 Irvine, CA 92618

ΑΞϹΟΜ

Kaiser Center 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

Attachment A

Project Site Photos



Photo 1. Southeast-facing view from the northwest corner across Project Site. Marine Way is visible at left, with miscellaneous rail equipment and materials stored onsite and rail tracks at right.



Photo 2. Southwest-facing view across the Project Site. Marine Way is visible at right.



Photo 3. Northwest-facing view across the Project Site, with Marine Way at left.



Photo 4. North-facing view from the southwest corner of the Project Site. Vehicles in background are parked on Marine Way. Miscellaneous rail equipment and materials stored onsite are visible at left.



Photo 5. South-facing view across patchy vegetative cover in the southern portion of the Project Site.



Photo 6. South-facing view of railroad equipment and materials stored onsite.



Photo 7. South-facing view of unmowed vegetation along Marine Way at the north end of the Project Site.



Photo 8. Southwest-facing view of portion of Bee Canyon Wash at southern edge of the Project Site.



Photo 9 A bridge carrying rail tracks into the site from rail tracks visible in the background would cross over this portion of the Bee Canyon channel.

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Attachment B

Regional Special-Status Plant Species and Sensitive Natural Communities Regional Special-Status Wildlife Species

Table A Special-Status Plant Species and Natural Vegetation Communities¹

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|---|--|--|--|
| PLANTS | | | |
| chaparral sand-verbena Abronia villosa var. aurita | Federal: None State: None CRPR: 1B.1 | Prefers sandy soils in chaparral, coastal scrub, and desert dune habitats. Occurs between 75-1,500 meters (250-5,250 feet). Blooms (January) March-September. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Munz's onion Allium munzii | Federal: FE State: ST CRPR: 1B.1 | Prefers mesic or clay soils in chaparral, cismontane woodland, coastal scrub, pinyon and juniper woodland, and valley and foothill grassland habitats. Occurs between 295-1,070 meters (965-3,510 feet). Blooms March-May. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| aphanisma Aphanisma blitoides | Federal: None State: None CRPR: 1B.2 | Prefers sandy or gravelly soils in coastal bluff scrub, coastal dunes, and coastal scrub habitats. Occurs between 0-305 meters (0-1,000 feet). Blooms February-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| western spleenwort Asplenium vespertinum | Federal: None State: None CRPR: 4.2 | Found in rocky habitats, including chaparral, cismontane woodland, and coastal scrub. Occurs between 180-1,000 meters (590-3,280 feet). Blooms February-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| Braunton's milk-vetch Astragalus brauntonii | Federal: FE State: None CRPR 1B.1 | Prefers recent burns or disturbed areas, in stiff gravelly clay soils overlying granite or limestone. Found in closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland habitats. Occurs between 5-640 meters (10-2,100 feet). Blooms January-August. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Coulter's saltbush <i>Atriplex coulteri</i> | Federal: None State: None CRPR 1B.2 | Prefers alkaline areas or clay soils in coastal bluff scrub, coastal dune, coastal scrub, and valley and foothill grassland habitats. Occurs between 0-460 meters (10-1,510 feet). Blooms March-October. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|---|---|---|---|
| south coast saltscale Atriplex pacifica | Federal: None State: None CRPR 1B.2 | Found in alkali sink, coastal sage scrub, wetland-riparian playas and coastal habitats. Occurs between 0-140 meters (0-460 feet). Blooms March- October. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Parish's brittlescale Atriplex parishii | Federal: None State: None CRPR 1B.1 | Found in alkaline chenopod scrub, playa, and vernal pool habitats. Occurs between 25-1,900 meters (80-6,230 feet). Blooms June-October. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Davidon's saltscale Atriplex serenana var. davidsonii | Federal: None State: None CRPR 1B.2 | Found in areas with alkaline soils in coastal bluff scrub and coastal scrub habitats. Occurs between 10-200 meters (30-660 feet). Blooms April- October. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Malibu baccharis Baccharis malibuensis | Federal: None State: None CRPR 1B.1 | Found in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats. Occurs between 150–305 meters (500-1,000 feet). Blooms in August. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| thread-leaved brodiaea Brodiaea filifolia | Federal: FT State: SE CRPR: 1B.1 | Prefers clay soils in chaparral (openings), cismontane woodland, coastal scrub, playa, valley and foothill grassland, and vernal pool habitats. Occurs between 25-1,120 meters (85-3,675 feet). Blooms March-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Brewer's calandrinia Calandrinia breweri | Federal: None State: None CRPR: 4.2 | Prefers sandy or loamy soils, disturbed sites, and burns in chaparral and coastal scrub habitats. Occurs between 10-1,220 meters (35-4,000 feet). Blooms (Jan) March- June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Catalina mariposa lily Calochortus catalinae | Federal: None State: None CRPR: 4.2, NCCP | Found in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Occurs between 15-700 meters (50-2,300 feet). Blooms February-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|--|---|---|---|
| Plummer's mariposa-lily Calochortus plummerae | Federal: None State: None CRPR 4.2 | Prefers rocky or sandy soils in coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest habitats. Occurs between 100–1,700 meters (330-5,580 feet). Blooms May-July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| intermediate mariposa lily Calochortus weedii var. intermedius | Federal: None State: None CRPR: 1B.2, NCCP | Found in chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest and valley and foothill grassland. Occurs between 30-1,500 meters (100-4,920 feet). Blooms April- June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Lewis' evening-primrose Camissoniopsis lewisii | Federal: None State: None CRPR: 3 | Prefers sandy or clay soils in coastal bluff-scrub, cismontane woodland, coastal dune, coastal scrub, and valley and foothill grassland habitats. Occurs between 0-300 meters (0-985 feet). Blooms March- May (June). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Payson's jewelflower Caulanthus simulans | Federal: None State: None Other: 4.2 | Prefers sandy or granitic soils in chaparral and coastal scrub habitats. Occurs between 90-2,200 meters (295-7,215 feet). Blooms (February) March-May (June). | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| southern tarplant Centromadia parryi ssp. australis | Federal: None State: None CRPR: 1B.1 | Found in margins of marshes and swamps, valley and foothill grassland, and vernal pool habitats. Occurs between 0-480 meters (0-1,570 feet). Blooms May-November. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| smooth tarplant <i>Centromadia pungens</i> ssp. <i>laevis</i> | Federal: None State: None CRPR: 1B.1 | Prefers alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodland, and valley and foothill grassland habitats. Occurs between 0-640 meters (0-2,100 feet). Blooms April- September. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Orcutt's pincushion Chaenactis glabriuscula var. orcuttiana | Federal: None State: None CRPR: 1B.1 | Found in sandy coastal bluff scrub and coastal dune habitats. Occurs between 0-100 meters (0-330 feet). Blooms January-August. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|---|---|--|---|
| Peninsular spineflower Chorizanthe leptotheca | Federal: None State: None CRPR: 4.2 | Prefers alluvial fan or granitic areas in chaparral, coastal scrub, and lower montane coniferous forest habitats. Occurs 300-1,900 (980-6,230 | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range |
| San Fernando Valley spineflower Chorizanthe parryi var. fernandina | Federal: FC State: SE CRPR 1B.1 | feet). Blooms May-August. Found in sandy coastal scrub and valley and foothill grassland habitats. Occurs 150-1,220 meters (490-4,000 feet). Blooms April – July. | known for this species. Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| long-spined spineflower Chorizanthe polygonoides var. longispina | Federal: None State: None CRPR: 1B.2 | Prefers clay soils in chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, and vernal pool habitats. Occurs between 30-1,530 meters (100-5,020 feet). Blooms between April-July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| white-bracted spineflower Chorizanthe xanti var. Ieucotheca | Federal: None State: None CRPR: 1B.2 | Prefers sandy or gravelly soils in coastal scrub (alluvial fans), Mojavean desert scrub, and pinyon and juniper woodland habitats. Occurs between 300-1,200 meters (980-3,940 feet). Blooms April-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| seaside cisanthe Cistanthe maritima | Federal: None State: None CRPR: 4.2 | Prefers sandy habitats in coastal bluff scrub, coastal scrub, and valley and foothill grassland habitats. Occurs between 5-300 meters (15-985 feet). Blooms February-August. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| San Miguel savory Clinopodium chandleri | Federal: None State: None CRPR: 1B.2 | Prefers rocky, gabbroic, or metavolcanic soils in chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland habitats. Occurs between 120-1,075 meters (390-3,525 feet). Blooms March-July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| summer holly Comarostaphylis diversifolia ssp. diversifolia | Federal: None State: None Other: 1B.2 | Found in chaparral and cismontane woodland habitats. Occurs between 30-790 meters (95-2,595 feet). Blooms April-July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|--------------------------------|---------------------|--|--|
| small-flowered morning glory | Federal: None | Prefers clay soils and | Not Expected. Potentially |
| Convolvulus simulans | State: None | serpentine seeps in chaparral, | suitable habitat for this |
| | CRPR: 4.2 | coastal scrub, and valley and | species is absent from the |
| | | foothill grassland habitats. | BSA. |
| | | Occurs between 30-700 | |
| | | meters (100-2,300 feet). | |
| | | Blooms March-July. | |
| paniculate tarplant | Federal: None | Usually prefers vernally mesic, | Not Expected. Potentially |
| Deinandra paniculata | State: None | sometimes sandy coastal | suitable habitat for this |
| | CRPR: 4.2 | scrub, valley foothill grassland, | species is absent from the |
| | - | and vernal pool habitats. | BSA. |
| | | Occurs between 25-940 | |
| | | meters (80-3,085 feet). | |
| | | Blooms (March) April- | |
| | | November. | |
| western dichondra | Federal: None | Found in chaparral, | Not Expected. Potentially |
| Dichondra occidentalis | State: None | cismontane woodland, coastal | suitable habitat for this |
| | CRPR: 4.2, NCCP | scrub, and valley and foothill | species is absent from the |
| | | grassland habitats. Occurs | BSA. |
| | | between 50-500 meters | b 5A. |
| | | (160-1,640 feet). Blooms | |
| | | (January) March-July. | |
| Cleveland's bush monkeyflower | Federal: None | Found in gabbroic or rocky | Not Expected. Potentially |
| Diplacus clevelandii | State: None | soils, disturbed areas, and | suitable habitat for this |
| Dipideus cieveidindii | CRPR: 4.2 | openings in chaparral, | species is absent from the |
| | CNF N. 4.2 | cismontane woodland, and | BSA and the project falls |
| | | lower montane coniferous | outside the elevation range |
| | | forest habitats. Occurs | known for this species. |
| | | between 450-2,000 meters | known for this species. |
| | | (1,475-6,565 feet). Blooms | |
| | | April-July. | |
| clander berned spineflower | Federal: FE | | Net Expected Detentially |
| slender-horned spineflower | | Found in sandy chaparral, cismontane woodland, and | Not Expected. Potentially suitable habitat for this |
| Dodecahema leptoceras | State: SE | | |
| | CRPR 1B.1 | alluvial fan coastal scrub | species is absent from the |
| | | habitats. Occurs between | BSA and the project falls |
| | | 200-760 meters (890-2,510 | outside the elevation range |
| Canta Maniar du diana | Fadaval, FT | feet). Blooms April-June. | known for this species. |
| Santa Monica dudleya | Federal: FT | Prefers volcanic or | Not Expected. Potentially |
| cymosa ssp. ovatifolia | State: None | sedimentary rocky soils in | suitable habitat for this |
| | CRPR 1B.1, NCCP | chaparral and coastal scrub | species is absent from the |
| | | habitats. Occurs between | BSA and the project falls |
| | | 150-1675 meters (495-5,525 | outside the elevation range |
| | | feet). Blooms March–June. | known for this species. |
| many-stemmed dudleya | Federal: None | Prefers clay soils in chaparral, | Not Expected. Potentially |
| Dudleya multicaulis | State: None | coastal scrub, and valley and | suitable habitat for this |
| | CRPR 1B.2 | foothill grassland habitats. | species is absent from the |
| | | Occurs between 15-790 | BSA. |
| | | meters (50-2,520 feet). | |
| | | Blooms April-July. | |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|---|--|--|---|
| Laguna Beach dudleya Dudleya stolonifera | Federal: FT State: ST CRPR:1B.1, NCCP | Prefers rocky areas in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Occurs between 10-260 meters (30-855 feet). Blooms May-July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| sticky dudleya Dudleya viscida | Federal: None State: None CRPR: 1B.2 | Prefers rocky areas in coastal bluff scrub, chaparral, cismontane woodland, and coastal scrub habitats. Occurs between 10-550 meters (30-1,805 feet). Blooms May-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Santa Ana River woollystar Eriastrum densifolium ssp. sanctorum | Federal: FE State: SE CRPR:1B.1 | Prefers sandy or gravelly soils in chaparral and coastal scrub (alluvial fan) habitats. Occurs between 90-610 meters (300-2,000 feet). Blooms April-September. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| Palomar monkeyflower Erythranthe diffusa | Federal: None State: None CRPR: 4.3 | Prefers sandy or gravelly soils in chaparral and lower montane coniferous forest habitats. Occurs between 1,220-1,830 meters (4,000- 6,000 feet). Blooms April-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| cliff spurge Euphorbia misera | Federal: None State: None CRPR: 2B.2 | Prefers rocky areas in coastal bluff scrub, coastal scrub, and Mojavean desert scrub habitats. Occurs between 10-550 meters (30-1,810 feet). Blooms December-August (October). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Palmer's grapplinghook Harpagonella palmeri | Federal: None State: None CRPR 4.2, NCCP | Prefers clay soils in open grassy areas within chaparral, coastal scrub, and valley and foothill grassland habitats. Occurs between 20-955 meters (65-3,130 feet). Blooms March-May. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Los Angeles sunflower Helianthus nuttallii ssp. parishii | Federal: None State: None CRPR: 1A | Found in coastal salt and freshwater marshes and swamps. Occurs between 10-1,525 meters (30-5,005 feet). Blooms August-October. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|---|---|---|---|
| Tecate cypress Hesperocyparis forbesii | Federal: None State: None CRPR: 1B.1, NCCP | Prefers clay, gabbroic or metavolcanic soils in closed- cone coniferous forest and chaparral habitats. Occurs between 80-1,500 meters (260-4,920 feet). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| vernal barley Hordeum intercedens | Federal: None State: None CRPR: 3.2 | Found in coastal dune, coastal scrub, valley and foothill grassland (saline flats and depressions), and vernal pool habitats. Occurs between 5-1,000 meters (15-3,280 feet). Blooms March-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| mesa horkelia <i>Horkelia cuneata</i> var. puberula | Federal: None State: None CRPR 1B.1 | Prefers sandy or gravelly soils in chaparral, cismontane woodland, and coastal scrub habitats. Occurs between 70-810 meters (230-2,660 feet). Blooms February- September. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| California satintail Imperata brevifolia | Federal: None State: None CRPR: 2B.1 | Prefers mesic areas in chaparral, coastal scrub, Mojavean desert scrub, alkali meadows and seeps, and riparian scrub habitats. Occurs between 0-1,215 meters (0-3,990 feet). Blooms September-May. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| decumbent goldenbush Isocoma menziesii var. decumbens | Federal: None State: None CRPR 1B.2 | Prefers sandy soils or disturbed areas in chaparral and coastal scrub habitats. Occurs between 10-135 meters (30-450 feet). Blooms April-November. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Coulter's goldfields Lasthenia glabrata ssp. coulteri | Federal: None State: None CRPR 1B.1 | Found in coastal salt marsh, playa, and vernal pool habitats. Occurs between 0-1,220 meters (0-4,000 feet). Blooms February-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| heart-leaved pitcher sage Lepechinia cardiophylla | Federal: None State: None CRPR: 1B.2, NCCP | Found in closed-cone coniferous forest, chaparral, and cismontane woodland habitats. Occurs between 520-1370 meters (1,705-4,495 feet). Blooms April-July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|--------------------------------|---------------------|--|--|
| Robinson's pepper-grass | Federal: None | Found in chaparral and coastal | Not Expected. Potentially |
| Lepidium virginicum var. | State: None | scrub habitats. Occurs | suitable habitat for this |
| robinsonii | CRPR: 4.3 | between 0-885 meters | species is absent from the |
| | | (5-2,905 feet). Blooms | BSA. |
| | | January-July. | |
| ocellated Humboldt lily | Federal: None | Prefers openings in chaparral, | Not Expected. Potentially |
| <i>Lilium humboldtii</i> ssp. | State: None | cismontane woodland, coastal | suitable habitat for this |
| ocellatum | CRPR: 4.2 | scrub, lower montane | species is absent from the |
| | | coniferous forest, and riparian | BSA. |
| | | woodland habitats. Occurs | |
| | | between 30-1,800 meters | |
| | | (100-6,000 feet). Blooms | |
| | | March-July (August). | |
| California box-thorn | Federal: None | Found in coastal bluff scrub | Not Expected. Potentially |
| Lycium californicum | State: None | and coastal scrub habitats. | suitable habitat for this |
| | CRPR: 4.2 | Occurs between 5-150 meters | species is absent from the |
| | | (15-495 feet). Blooms | BSA. |
| | | December-August. | |
| cliff malacothrix | Federal: None | Found in coastal bluff scrub | Not Expected. Potentially |
| Malacothrix saxatilis var. | State: None | and coastal scrub habitats. | suitable habitat for this |
| saxatilis | CRPR: 4.2 | Occurs between 0-200 meters | species is absent from the |
| | | (0-660 feet). Blooms | BSA. |
| | | March-September. | |
| intermediate monardella | Federal: None | Prefers chaparral, cismontane | Not Expected. Potentially |
| Monardella hypoleuca ssp. | State: None | woodland, and sometimes | suitable habitat for this |
| lanata | CRPR: 1B.3 | lower montane coniferous | species is absent from the |
| | | forest habitats. Occurs | BSA and the project falls |
| | | between 400-1,250 meters | outside the elevation range |
| | | (1,310-4,100 feet). Blooms | known for this species. |
| | | April-September. | |
| felt-leaved monardella | Federal: None | Found in chaparral and | Not Expected. Potentially |
| Monardella hypoleuca ssp. | State: None | cismontane woodland | suitable habitat for this |
| lanata | CRPR: 1B.2 | habitats. Occurs between | species is absent from the |
| | | 300-1,575 meters (980-5,170 | BSA and the project falls |
| | | feet). Blooms June-August. | outside the elevation range |
| | | | known for this species. |
| Hall's monardella | Federal: None | Found in broadleafed upland | Not Expected. Potentially |
| Monardella macrantha ssp. | State: None | forest, chaparral, cismontane | suitable habitat for this |
| hallii | CRPR: 1B.3 | woodland, lower montane | species is absent from the |
| | | coniferous forest, and valley | BSA and the project falls |
| | | and foothill grassland habitats. | outside the elevation range |
| | | Occurs between 730-2,195 | known for this species. |
| | | meters (2,395-7,200 feet). | |
| | | Blooms June-October. | |
| mud nama | Federal: None | Prefers marches and swamps | Not Expected. Potentially |
| Nama stenocarpa | State: None | along lake margins and | suitable habitat for this |
| • | CRPR: 2B.2 | riverbanks. Occurs between | species is absent from the |
| | | 5-500 meters (15-1,640 feet). | BSA. |
| | | Blooms January-July. | |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|--|--|---|--|
| Gambel's water cress Nasturtium gambellii | Federal: FE State: ST CRPR: 1B.1 | Found in freshwater or brackish marshes and swamps. Occurs between 5-330 meters (15-1,085 feet). Blooms April-October. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| prostrate vernal pool navarretia Navarretia prostrata | Federal: None State: None CRPR: 1B.1 | Found in mesic areas in coastal scrub, meadows and seeps, valley and foothill grassland, and vernal pool habitats. Occurs between 0-1,210 meters (5-3,970 feet). Blooms April- July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| chaparral nolina cismontana | Federal: None State: None CRPR 1B.2 | Prefers sandstone or gabbro soils in chaparral and coastal scrub habitats. Occurs between 140-1,275 meters (460-4,180 feet). Blooms (March) May-July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| California beardtongue Penstemon californicus | Federal: None State: None CRPR: 1B.2 | Prefers sandy areas in chaparral, lower montane coniferous forest, or pinyon and juniper woodland habitats. Occurs between 1,170-2,300 meters (3,840- 7,545 feet). Blooms May-June (August). | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| Allen's pentachaeta Pentachaeta aurea ssp. allenii | Federal: None State: None CRPR: 1B.1 | Prefers openings in coastal scrub and valley and foothill grassland habitats. Occurs between 75-520 meters (245-1,706 feet). Blooms March-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Santiago Peak phacelia Phacelia keckii | Federal: None State: None CRPR: 1B.3 | Found in closed-cone coniferous forest and chaparral habitats. Occurs between 545-1,600 meters (1,785-5,250 feet). Blooms May-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| south coast branching phacelia Phacelia ramosissima var. austrolitoralis | Federal: None State: None CRPR: 3.2 | Prefers sandy or rocky areas in chaparral, coastal dune, coastal scrub, and coastal salt marsh and swamp habitats. Occurs between 5-300 meters (15-985 feet). Blooms March- August. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|---|---|---|--|
| woolly chaparral-pea Pickeringia montana var. tomentosa | Federal: None State: None CRPR: 4.3 | Prefers gabbroic, granitic, and clay soils in chaparral habitats. Occurs 0-1,700 meters (0-5,575 feet). Blooms May-August. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| chaparral rein orchid Piperia cooperi | Federal: None State: None CRPR: 4.2 | Found in chaparral, cismontane woodland, and valley and foothill grassland habitats. Occurs 15-1,585 meters (50-5,200 feet). Blooms March-June. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| narrow-petaled rein orchid Piperia leptopetala | Federal: None State: None CRPR: 4.3 | Found in cismontane woodland, lower montane coniferous forest, and upper montane coniferous forest habitats. Occurs 380-2,225 meters (1,245-7,300 feet). Blooms May-July. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| Fish's milkwort Polygala cornuta var. fishiae | Federal: None State: None CRPR: 4.3 | Found in chaparral, cismontane woodland, and riparian woodland habitats. Occurs between 100-1,000 meters (330-3,280 feet). Blooms May-August. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the project falls outside the elevation range known for this species. |
| white rabbit-tobacco Pseudognaphalium leucocephalum | Federal: None State: None CRPR: 2B.2 | Prefers sandy, gravelly areas in chaparral, cismontane woodland, coastal scrub, or riparian woodland habitats. Occurs between 0-2,100 meters (0-6,890 feet). Blooms (July) August-November (December). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Nuttall's scrub oak <i>Quercus dumosa</i> | Federal: None State: None CRPR 1B.1, NCCP | Prefers sandy or clay loam soils in closed-cone coniferous forest, chaparral, and coastal scrub habitats. Occurs between 15-400 meters (50-1,310 feet). Blooms February-August. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Coulter's matilija poppy Romneya coulteri | Federal: None State: None CRPR: 4.2, NCCP | Found in chaparral or coastal scrub habitats. Occurs between 20-1,200 meters (65-3,940 feet). Blooms March-July (August). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| chaparral ragwort Senecio aphanactis | Federal: None State: None CRPR: 2B.2 | Prefers alkaline sites in chaparral, cismontane woodland, and coastal scrub habitats. Occurs 15-800 | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|---|---------------------|--|--|
| | | meters (50-2,625 feet). | |
| | | Blooms January-April (May). | |
| salt spring checkerbloom | Federal: None | Prefers alkaline or mesic sites | Not Expected. Potentially |
| Sidalcea neomexicana | State: None | in chaparral, coastal scrub, | suitable habitat for this |
| | CRPR: 2B.2 | lower montane coniferous | species is absent from the |
| | | forest, Mojavean desert scrub, | BSA. |
| | | and playas. Occurs between 15-1,530 meters (50-5,020 | |
| | | feet). Blooms March-June. | |
| estuary seablite | Federal: None | Found in coastal salt marshes | Not Expected. Potentially |
| Suaeda esteroa | State: None | and swamps. Occurs between | suitable habitat for this |
| | CRPR: 1B.2 | 0-5 meters (0-20 feet). Blooms | species is absent from the |
| | 0 | May-January. | BSA. |
| San Bernardino aster | Federal: None | Prefers sites near ditches, | Not Expected. Potentially |
| Symphyotrichum defoliatum | State: None | streams, and springs in coastal | suitable habitat for this |
| | CRPR: 1B.2 | scrub, meadows and seeps, | species is absent from the |
| | | cismontane woodland, lower | BSA. |
| | | montane coniferous forest, | |
| | | and valley and foothill | |
| | | grassland habitats. Occurs | |
| | | between 0-2,040 meters | |
| | | (0-6,690 feet). Blooms | |
| Parry's tetracoccus | Federal: None | July-November. Found in chaparral and coastal | Not Expected. Potentially |
| Tetracoccus dioicus | State: None | scrub habitats. Occurs | suitable habitat for this |
| | CRPR: 1B.2 | between 165-1,000 meters | species is absent from the |
| | 0 | (540-3,280 feet). Blooms | BSA and the project falls |
| | | April-May. | outside the elevation range |
| | | | known for this species. |
| big-leaved crownbeard | Federal: FT | Found in maritime chaparral | Not Expected. Potentially |
| Verbesina dissita | State: ST | and coastal scrub habitats. | suitable habitat for this |
| | CRPR: 1B.1 | Occurs between 45-205 | species is absent from the |
| | | meters (145-675 feet). Blooms | BSA. |
| | | (March) April-July. | |
| Sensitive Natural Communities California Walnut Woodland | 1 | | Absent |
| Canyon Live Oak Ravine Forest | | | Absent |
| Riversidian Alluvial Fan Sage | | | Absent |
| Scrub | | | |
| Southern California Arroyo | | | Absent |
| Chub/Santa Ana Sucker Stream | | | |
| Southern Coast Live Oak | | | Absent |
| Riparian Forest | | | |
| Southern Coastal Salt Marsh | | | Absent |
| Southern Cottonwood Willow | | | Absent |
| Riparian Forest | | | Abcost |
| Southern Interior Cypress | | | Absent |
| Forest Southern Mixed Riparian Forest | | | Absent |
| Southern wixed Riparian Forest | | | ADSEIIL |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA |
|--------------------------------|---------------------|--|--|
| Southern Riparian Forest | | | Absent |
| Southern Riparian Scrub | | | Absent |
| Southern Sycamore Alder | | | Absent |
| Riparian Woodland | | | |
| Southern Willow Scrub | | | Absent |
| Valley Needlegrass Grassland | | | Absent |

¹ Special-status plant species and sensitive natural communities known from the CNDDB and CNPS to occur on the El Toro, Tustin, Orange, Black Star Canyon, Corona South, Santiago Peak, Laguna Beach, San Juan Capistrano, and Canada Gobernadora quadrangles, and from a search of the IPaC for the project vicinity.

² Sensitivity Status Codes

| <u>Federal</u> | FT - Federally Threatened under the Federal Endangered Species Act FE - Federally Endangered under the Federal Endangered Species Act |
|----------------|---|
| | FC – A Federal Candidate for listing under the Federal Endangered Species Act |
| <u>State</u> | ST - State Threatened under the California Endangered Species Act |
| | SE - State Endangered under the California Endangered Species Act |
| <u>CRPR</u> | CNPS California Rare Plant Rank (CRPR) |
| | 1A: Plants presumed extinct in California |
| | 1B: Plants rare, threatened, or endangered in California and elsewhere |
| | 2: Plants rare, threatened, or endangered in California, but more common elsewhere |
| | 3: Plants more information is needed for |
| | 4: Plants of limited distribution – a watch list |
| | 0.1: Seriously threatened in California |
| | 0.2: Fairly endangered in California |
| | 0.3: Not very endangered in California |

³ General Habitat Descriptions from CNPS.

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|---|--|---|--|
| Invertebrates | | | |
| Crotch bumble bee Bombus crotchii | Federal: None State: CE Other: CNDDB | Occurs at relatively warm and dry sites, including the inner Coast Range of California and the margins of the Mojave Desert. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| San Diego fairy shrimp Branchinecta sandiegonensis | Federal: FE State: None Other: NCCP | Occurs in vernal pools from 5-30 centimeters deep at temperatures between 10-20°C (50-68°F). Occasionally found in ditches and road ruts that support suitable conditions. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Riverside fairy shrimp Streptocephalus wootoni | Federal: FE State: None Other: NCCP | Occurs in vernal pools at least 30 centimeters in depth. Found in Riverside and San Diego counties, as well as northern Baja California. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| monarch butterfly-California overwintering population Danaus plexippus pop. 1 | Federal: None State: None Other: CNDDB | Winter roosts occur along California coast from Mendocino County, south to Baja California, Mexico. Roosts in wind-protected tree groves (eucalyptus, Monterey pine, cypress) with nectar and water sources nearby. | Not Expected. Potentially suitable tree groves are absent from the BSA and there are no suitable water sources nearby. |
| quino checkerspot butterfly Euphydryas editha quino | Federal: FE State: None Other: NCCP | Occurs in coastal sage scrub habitats in southern California and northern Baja California. Larvae rely on host plants <i>Plantago erecta</i> or <i>Castilleja</i> <i>exserta</i> found in meadows and upland sage scrub/chaparral. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and the host plant for this species was not detected within the BSA. |
| San Gabriel chestnut Glyptostoma gabrielense | Federal: None State: None Other: CNDDB | Found in humid areas in rocky hills and mountains at low elevations. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| mimic tryonia (=California brackishwater snail) <i>Tryonia imitator</i> | Federal: None State: None Other: CNDDB | Prefers coarse brackish sediments at the mouths of creeks, streams and rivers of southern California. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Fish | _ | | |
| Santa Ana sucker Catostomus santaanae | Federal: FT State: None | Inhabits permanent streams and rivers, with depths from a few centimeters to over a meter. Water must be cool with variable flows. Substrates of gravel, rubble and boulders are preferred for foraging | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

and required for breeding.

Table BSpecial-Status Wildlife Species1

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|---|---|---|---|
| tidewater goby Eucyclogobius newberryi | Federal: FE State: None Other: SSC | Occurs in small coastal lagoons, lower reaches of streams, and uppermost portions of large bays. Most abundant in the upper ends of lagoons created by small coastal streams. In lower sections of coastal streams, occurs in fresh to brackish water (preferably less than 10 ppt). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| arroyo chub Gila orcuttii | Federal: None State: None Other: SSC | Found in headwaters, creeks, and small to medium rivers, often intermittent streams; permanent, small to moderate-sized, moderate to high gradient streams with more than 50% of the habitat as runs and pools < 10 cm deep and reaches of permanent water more than 2 km long; requires some flow. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| steelhead – southern California DPS Oncorhynchus mykiss irideus pop.10 | Federal: FE State: None | Found in Pacific Ocean tributaries from Aleutian Islands in Alaska south to Southern California. Anadromous forms are known as steelhead, freshwater forms as rainbow trout. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Santa Ana speckled dace Rhinichthys osculus ssp. 3 | Federal: None State: None Other: SSC | Inhabits a variety of habitats, including perennial streams, riffles dominated by gravel and cobble, and pools in low-gradient streams. Mainly found in areas that maintain summer water temperatures below 68 °F (20 °C). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Reptiles | | | |
| southern California legless lizard Anniella stebbinsi | Federal: None State: None Other: SSC | Found in a broader range of habitats than any of the other species in the genus. Often locally abundant, specimens are found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| California glossy snake Arizona elegans occidentalis | Federal: None State: None Other: SSC | Most common is desert habitats but also occur in chaparral, sagebrush, valley-foothill hardwood, pine- juniper, and annual grass. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| orange-throated whiptail Aspidoscelis hyperythra | Federal: None State: None Other: WL, NCCP | Inhabits washes, streams, terraces, and other sandy areas often where there are rocks and patches of brush and rocky hillsides. Frequent coastal chaparral, thorn scrub and streamside growth. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|--|--|--|--|
| coastal whiptail Aspidoscelis tigris stejnegeri | Federal: None State: None Other: SCC, NCCP | Found in deserts and semiarid areas with sparse vegetation and open areas. Also occurs in woodland and riparian areas. Substrate may be firm, sandy, or rocky soils. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| red-diamond rattlesnake Crotalus ruber | Federal: None State: None Other: SSC, NCCP | Occurs in coastal sage scrub, chamise chaparral, redshank, desert slope scrub, desert washes, grassy fields, orchards, cactus patches, and rocky areas. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| western pond turtle Emys marmorata | Federal: None State: None Other: SSC | Inhabits permanent or nearly permanent bodies of water in many habitat types, below 1,830 meters (6,000 feet). Requires basking sites such as partially submerged logs, vegetation mats, or open mud banks. Also needs suitable nesting sites. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| coast horned lizard Phrynosoma blainvillii | Federal: None State: None Other: SSC, NCCP | Inhabits coastal sage scrub and chaparral in arid and semiarid climates. Prefers friable, rocky, or shallow sandy soils. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| coast patch-nosed snake Salvadora hexalepis virgultea | Federal: None State: None Other: SSC | Inhabits brushy chaparral habitats dominated by chamise and redshank, as well as riparian areas. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| two-striped garter snake Thamnophis hammondii | Federal: None State: None Other: SSC | Highly aquatic, found in or near permanent freshwater, often along streams with rocky beds and riparian growth. Known from coastal California from the vicinity of Salinas to northwest Baja California, from sea level to about 2,135 meters (7,000 feet). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Amphibians | | | |
| arroyo toad Anaxyrus californicus | Federal: FE State: None Other: SSC, NCCP | Requires shallow, slow moving stream and riparian habitat, with extensive braided channels and sediment deposits of sand, gravel, or pebbles, occasionally reworked by flooding. Tadpoles may require 2-4 years to complete their aquatic development. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| western spadefoot Spea hammondii | Federal: None State: None Other: SSC, NCCP | Grasslands with shallow temporary pools are optimal habitats for the western spadefoot. Elevations of occurrence extend from near sea level to 1,360 meters (4,460 feet). This species occurs primarily in | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|--|---|---|---|
| | | grasslands, but occasional populations also occur in valley- foothill hardwood woodlands. | |
| Coast Range newt Taricha torosa | Federal: None State: None Other: SSC | Endemic to California. Found in wet forests, oak forests, chaparral, and rolling grasslands. In southern California, drier chaparral, oak woodland, and grasslands are used. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Birds | | | |
| Cooper's hawk Accipiter cooperii | Federal: None State: None Other: WL | Inhabits dense stands of live oak, riparian deciduous, or other forest habitats near water. Nests in deciduous riparian areas, usually near streams. Species has become a fairly common urban/suburban bird in southern California. | Low: This species is common in urbanized areas across southern California and a CNDDB record of this species from 2016 occurs approximately one mile southwest of the BSA along San Diego Creek. This species may fly over or occur within the BSA as a transient migrant or forager. Mature trees in the BSA may provide suitable nesting habitat; however, this species prefers nesting in riparian habitats and is not expected to nest in the BSA. |
| tricolored blackbird Agelaius tricolor | Federal: None State: ST Other: SSC | Inhabits annual grasslands, wet and dry vernal pools, seasonal wetlands. Frequently found in and around agricultural areas. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| southern California rufous- crowned sparrow Aimophila ruficeps | Federal: None State: None Other: WL, NCCP | Resident of southern California coastal sage scrub and sparse mixed chaparral. Frequents relatively steep, often rocky hillsides with grass and forb patches. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| grasshopper sparrow Ammodramus savannarum | Federal: None State: None Other: SSC | Prefers moderately open grasslands with scattered shrubs such as California buckwheat and California sagebrush. | Not Expected. The BSA lacks scattered native scrubs preferred by this species and the nearest record is from 2003 and is approximately 4-5 miles south of the BSA. As a result, this species is not expected to occur within the BSA. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|--|---|--|--|
| golden eagle Aquila chrysaetos | Federal: None State: None Other: BGE, FP, NCCP | Prefers rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops. Uncommon permanent resident and migrant throughout California, except center of Central Valley. Ranges from 0- 3,830 meters (0-11,500 feet). Habitat typically includes rolling foothills, mountain areas, sage- juniper flats, and desert. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| great blue heron Ardea herodias | Federal: None State: None Other: CNDDB | Prefers shallow estuaries and fresh and saline emergent wetlands. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| long-eared owl Asio otus | Federal: None State: None Other: SSC | Prefers dense foliage, such as willow thickets and evergreen trees. Nests in conifer groves adjacent to open fields and wetlands. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| burrowing owl Athene cunicularia | Federal: None State: None Other: SSC | Inhabits open, dry annual or perennial grasslands, deserts, and scrublands characterized by low- growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, California ground squirrel. | Not Expected. Although two 2010 records of this species occur within 2 miles of the BSA and conditions onsite are marginally suitable, no indications of this species presence onsite (i.e. suitable burrows, owl pellets, white-wash) were observed during the field survey. As a result, this species is not expected to occur within the BSA. |
| ferruginous hawk <i>Buteo regalis</i> | Federal: None State: None Other: WL | Inhabits arid grasslands and adjacent farmlands. Nests in isolated trees or on rock outcrops. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| coastal cactus wren Campylorhynchus brunneicapillus sandiegensis | Federal: None State: None Other: SSC, NCCP | Inhabits cactus scrub complexes that can include <i>Rhus</i> sp. Presence of cholla cactus is preferred, as well as large dense stands of cactus. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| western snowy plover <i>Charadrius nivosus</i> | Federal: FT State: None Other: SSC | Inhabits coastal beaches, coastal dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common habitat includes dredged material disposal sites, salt pond levees, dry salt ponds, and river bars. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|---|---|---|--|
| northern harrier Circus hudsonius | Federal: None State: None Other: SSC, NCCP | Found in meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands, and occasionally in wooded areas. Occurs from 0-3,000 meters (0-10,000 feet). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| western yellow-billed cuckoo Coccyzus americanus occidentalis | Federal: FT State: SE | Found in valley foothill and desert riparian habitats across California. Breeding pairs are known to reside in the Sacramento and Owens valleys and along the Kern, Santa Ana, Amargosa, and San Luis Rey rivers. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| yellow rail Coturnicops noveboracensis | Federal: None State: None Other: SSC | Inhabits sedge marshes and meadows with moist soil or shallow standing water. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| white-tailed kite Elanus leucurus | Federal: None State: None Other: FP | Inhabits herbaceous and open stages of most habitats, primarily in cismontane California. Prefers undisturbed, open grasslands, meadows, farmlands, and emergent wetlands for foraging. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| southwestern willow flycatcher Empidonax traillii extimus | Federal: FE State: SE Other: NCCP | Found in riparian woodlands in Southern California. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| California horned lark Eremophila alpestris actia | Federal: None State: None Other: WL | Prefers expansive open areas, with barren or sparsely vegetated ground, such as beaches, plowed fields and occasionally parking lots or runways. | Low. Although site conditions may be suitable for this ground-nesting species, the nearest record of this species is from 2003 and occurs approximately 4 miles south of the BSA. |
| American peregrine falcon Falco peregrinus anatum | Federal: Delisted State: Delisted Other: FP, NCCP | Frequents bodies of water in open areas with cliffs and canyons nearby for cover and nesting. Also know to nest on tall buildings or bridges within urban environments. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| bald eagle Haliaeetus leucocephalus | Federal: Delisted State: SE Other: BGE, FP | Occurs as a local winter migrant of inland waters in southern California, including at Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, San Antonio Reservoir, and along the Colorado River. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| yellow-breasted chat Icteria virens | Federal: None State: None Other: SSC | Occurs in dense tangled brushy patches, hedgerows and wood edges, in open sunny areas and along riparian woodland ecotones. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|---|--|---|--|
| California black rail Laterallus jamaicensis coturniculus | Federal: None State: ST Other: FP | Inhabits saline, brackish, and fresh emergent wetlands. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Belding's savannah sparrow Passerculus sandwichensis beldingi | Federal: None State: SE | Inhabits southern coastal wetlands. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| coastal California gnatcatcher Polioptila californica | Federal: FT State: None Other: SSC, NCCP | Obligate, permanent resident of coastal sage scrub below 2.500 feet (760 meters) in southern California. Inhabits low, coastal sage scrub in arid washes, on mesas and slopes. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| light-footed Ridgway's rail Rallus obsoletus levipes | Federal: FE State: SE Other: FP | Resident of coastal wetlands in southern California. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| yellow warbler Setophaga petechia | Federal: None State: None Other: SSC | Occupy riparian vegetation in close proximity to water along streams and in wet meadows. Associated with willows and cottonwoods. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| California least tern Sternula antillarum browni | Federal: FE State: SE Other: FP | Found along coastal beaches, bays, large rivers, and salt flats. Known to feed in shallow coastal waters and occasionally inland. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| least Bell's vireo Vireo bellii pusillus | Federal: FE State: SE Other: NCCP | Summer resident of southern California in low riparian habitat in vicinity of water or in dry river bottoms, below 620 meters (2,000 feet). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Mammals | | | |
| pallid bat Antrozous palidus | Federal: None State: None Other: SCC, WBWG- H | Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rock areas for roosting. Roosts must protect bats from high temperatures; very sensitive to disturbance of roosting sites. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| northwestern San Diego pocket mouse <i>Chaetodipus fallax</i> | Federal: None State: None Other: SSC | Found in coastal scrub, chamise- redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent scrub, pinyon-juniper, and annual grassland habitats. Prefers sandy herbaceous areas with rocks or course gravel. Occurs in Riverside, San Bernardino, and San Diego counties from 0-1,350 meters (0-4,500 feet). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|---|--|--|--|
| Mexican long-tongued bat Choeronycteris mexicana | Federal: None State: None Other: SSC, WBWG- H | In California, mostly known from urban habitats in San Diego county. In New Mexico and Arizona, found in desert and montane riparian, desert succulent shrub, desert scrub, and pinyon-juniper habitats from 0-2,400 meters (0-6,000 feet). | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Stephens' kangaroo rat Dipodomys stephensi | Federal: FE State: ST | Found from San Jacinto Valley in Riverside County to the vicinity of Vista in San Diego County. Prefers grassland habitats, but also found in open coastal scrub or sagebrush and disturbed areas. | Not Expected. Although onsite habitat is potentially suitable for this species, it is not known to occur in Orange County. |
| western mastiff bat Eumops perotis californicus | Federal: None State: None Other: SCC, WBWG- H | Known from open semiarid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grassland, and chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels. Roost locations are generally high above the ground providing a 3-meter minimum clearance below the entrance for flight. Requires large open-water drinking sites. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| western red bat Lasiurus blossevillii | Federal: None State: None Other: SCC, WBWG- H | Prefers edges or habitat mosaics that have trees for roosting and open areas for foraging. Roosting habitat includes forests and woodlands from sea level up through mixed conifer forests. Feeds over a wide variety of habitats including grasslands, shrublands, open woodlands and forests, and croplands. Not found in desert areas | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| western yellow bat <i>Lasiurus xanthinus</i> | Federal: None State: None Other: SSC, WBWG- H | Occurs below 600 meters (2,000 feet) in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees and palms. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Yuma myotis <i>Myotis yumanensis</i> | Federal: None State: None Other: WBWG-LM | Distribution is closely tied to bodies of water, which it uses as foraging sites and sources of drinking water. Found in a wide variety of habitats ranging from sea level to 3,300 meters (11,000 feet), but it is uncommon to rare above 2,560 meters (8,000 feet). Optimal habitats are open forests and woodlands with sources of water over which to feed. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |

| Common Name Scientific Name | Status ² | General Habitat Description ³ | Potential for Occurrence in the BSA ⁴ |
|--|---|--|---|
| San Diego desert woodrat Neotoma lepida intermedia | Federal: None State: None Other: SCC, NCCP | Found in coastal scrub of southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. They are particularly abundant in rock outcrops and rocky cliffs and slopes. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| pocketed free-tailed bat Nyctinomops femorosaccus | Federal: None State: None Other: SSC, WBWG- M | Occurs in pinyon-juniper woodlands, desert scrub, desert succulent scrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis habitats. Roost in rock crevices, caverns, or buildings. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| big free-tailed bat Nyctinomops macrotis | Federal: None State: None Other: SSC, WBWG- MH | Often found in urban areas. Roost in buildings, caves, hollow trees, high cliffs, and rocky outcrops. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| southern grasshopper mouse Onychomys torridus ramona | Federal: None State: None Other: SSC | Prefers alkali desert scrub and other desert scrub habitats. Also occurs in succulent shrub, wash, riparian, coastal scrub, mixed chaparral, sagebrush, low sage, and bitterbrush habitats. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| Pacific pocket mouse Perognathus longimembris pacificus | Federal: FE State: None Other: SSC, NCCP | Inhabits areas with fine-grained sandy substrates in coastal dunes, river alluvium, and coastal sage scrub habitats within 3 miles of the ocean. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| southern California saltmarsh shrew Sorex ornatus salicornicus | Federal: None State: None Other: SSC | Occurs in coastal salt marshes, preferring those dominated by pickleweed and saltgrass. | Not Expected. Potentially suitable habitat for this species is absent from the BSA. |
| American badger <i>Taxidea taxus</i> | Federal: None State: None Other: SCC | Uncommon, permanent resident found throughout most of the state, except in the northern North Coast area. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. | Not Expected. Potentially suitable habitat for this species is absent from the BSA and burrows suitable for the species were not observed during the field survey. |

¹ Special-status wildlife species known from the CNDDB and NMFS databases to occur in the El Toro, Tustin, Orange, Black Star Canyon, Corona South, Santiago Peak, Laguna Beach, San Juan Capistrano, and Canada Gobernadora quadrangles, and from a search of IPaC for the project vicinity.

quadrangles, and from a search of IPaC for the project vicinity. ² Sensitivity Status Codes <u>Federal</u> FT – Federally Threatened under Federal Endangered Species Act (FESA) <u>FE</u> – Federally Endangered under FESA <u>State</u> ST – State Threatened under California Endangered Species Act (CESA) <u>SE</u> – State Endangered under CESA <u>Other</u> BGE – Bald and Golden Eagle Protection Act <u>SSC</u> – Designated as a Species of Special Concern by CDFW

WL – Designated as a Watch List species by CDFW

- **CNDDB** Tracked by CDFW in the CNDDB or considered locally sensitive
- **WBWG-H** Designated by the Western Bat Working Group (WBWG) as High Priority species that are imperiled or are at high risk of imperilment
- WBWG-M Designated by the WBWG as Medium Priority a level of concern that should warrant closer evaluation, more research, and conservation actions of both species and possible threats
- **WBWG-L** Designated by the WBWG as Low Priority an indication that existing data supports stable populations of the species and that the potential for major changes in status in the future is considered unlikely

³General Habitat Descriptions from CDFW and NMFS.

⁴ References to historical species occurrences taken from the CNDDB (CDFW 2020a).

Appendix D Technical Memorandum Cultural Resources

Metrolink Orange County Maintenance Facility

Prepared for:

Orange County Transportation Authority

550 S. Main St. Orange, CA 92868

And

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

AECOM

300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|---|------------|
| 0 | Draft Cultural Resources Technical Memorandum | 01/08/21 |
| 1 | Draft Cultural Resources Technical Memorandum (Incorporating OCTA's comments) | 03/17/21 |
| 2 | Draft Cultural Resources Technical Memorandum (Incorporating Independent Reviewer's comments) | 08/24/21 |
| 3 | Draft Cultural Resources Technical Memorandum (Incorporating Independent Reviewer's comments and results of Native American AB 52 consultation) | 10/04/21 |
| 4 | Draft Cultural Resources Technical Memorandum (Incorporating comments from OCTA) | 11/18/2021 |
| 5 | Draft Cultural Resources Technical Memorandum (Incorporating comments from OCTA) | 12/13/2021 |
| 6 | Update of Mitigation Measures per coordination with Kizh Nation | 5/2/2022 |

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- Attachment D DPR 523 Forms (Confidential)
- Attachment E Extended Phase I

1. INTRODUCTION

The Southern California Regional Railroad Authority (SCRRA) Metrolink Commuter Rail System (Metrolink) is proposing to construct a new Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project"). The Project would include several facilities including a transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth, sand silos, a maintenance facility, a maintenance facility extension, and 11 tracks. Approximately 80 employees would report to the Project. The Project consists of buildings that would have a total building area of approximately 90,000 square feet when combined. Metrolink currently operates two maintenance facilities across its service area: Central Maintenance Facility (CMF) in Los Angeles and Eastern Maintenance Facility (EMF) in San Bernardino County. Due to projected population expansion within its service area and the agency's goal to be prepared for the 2028 Los Angeles Summer Olympic Games, Metrolink will require an increased number of commuter rail services, as well as additional train storage and maintenance facilities associated with an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the Project would provide an optimal location for a new Metrolink maintenance facility. Metrolink's member agency, the Orange County Transportation Authority (OCTA), proposes to build this facility on an OCTA-owned parcel in the City of Irvine. OCTA is the lead agency under the California Environmental Quality Act (CEQA). The City of Irvine and SCRRA are the responsible agencies under CEQA.

The purpose of this memorandum is to present the results of a cultural resources investigation and to describe the potential impacts to historic properties as defined by Section 106 of the National Historic Preservation Act (NHPA), or cultural resources as defined by CEQA, that may be associated with the Project.

2. PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

As a result of the projected population expansion within the five-county area (Orange County, Los Angeles County, San Bernardino County, Riverside County, and Ventura County) currently served by the SCRRA, Metrolink will require an increased number of commuter rail services to support the growth. Consequently, the Metrolink system (Figure 2.1-1) would require additional train storage and maintenance facilities to support an increased fleet size.

Metrolink's CMF facility is located on the east bank of the Los Angeles River near the Interstate 5 (I-5) and Interstate 10 (I-10) highways, just south of the location of the former Southern Pacific Taylor Yard. The CMF is currently near capacity, which will impact the ability to provide the necessary train servicing for planned service-expansion of various Metrolink lines throughout the system under the Southern California Optimized Rail Expansion (SCORE) program. By transferring a portion of the current fleet from CMF to the proposed OCMF (specifically the Orange County Line trains), capacity for the non-Orange County trains will be increased at CMF. The Orange County Line has the highest ridership within the Metrolink system; therefore, a maintenance facility to serve the Orange County area with sufficient storage and servicing capabilities for both locomotives and rail cars is critical to controlling operating costs. In order to optimize rail service in the region, the proposed facility development would need to be completed by 2028. The SCORE program may also require heavy overhaul capabilities at OCMF, subject to pending decisions regarding fleet technology and management.





Source: SCRRA (2019)

The expansion of Orange County and overall Metrolink commuter rail service will ultimately require additional or expanded equipment servicing capabilities for both locomotives and rail cars. Since a significant portion of the fleet will be in Orange County, a maintenance facility located along the Metrolink route through Orange County would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and San Bernardino. The proposed maintenance facility would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Much of the inspection and maintenance activity is federally mandated and must be performed at specific intervals. The OCMF will also provide refueling services thus reducing fuel costs, reducing fuel consumption, and will reduce emissions. Currently trains operating in the Orange County Region must travel either the CMF or EMF for refueling, which are sometimes non-revenue runs. The location of the Project is on a 21.3-acre OCTA-owned parcel on Ridge Valley south of Marine Way in the City of Irvine (Project Site). The Project Site is located within the boundaries of a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was guitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City of Irvine that same year. OCTA then purchased the fee ownership of the Project Site from the City of Irvine. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley.

Prior to the current construction of the storage/set-out track, the Project Site was mostly vacant. The site currently includes 1,000-foot-long storage for miscellaneous rail equipment including temporary railroad bridges, signal houses, railroad ties, and signal components. Although not part of the Project, OCTA is currently installing a single 1,000-foot-long, single-ended storage track and fencing of the perimeter of the property to provide temporary storage of two trainsets and/or track maintenance equipment when necessary. There is a segment of an abandoned road, stormwater drains, and underground water transfer vault with a network of pipelines, valves and associated vents, that are currently not in use.

2.2 PROJECT DESCRIPTION

The OCMF would be located in the City of Irvine, on a 21.3-acre parcel owned by OCTA and adjacent to Marine Way and the Metrolink Orange subdivision between mileposts 183.50 and 184.00 on Metrolink's "Orange" Subdivision (Figure 2.2-1 and Figure 2.2-2). The Project Site is located within Planning Area 51 of the updated City of Irvine General Plan, adopted in June 2015, and designated for the Great Park (formerly known as the Orange County Great Park (OCGP)) land use under the General Plan. Per the City's zoning ordinance, the proposed use is a conditionally allowable use under the existing zone; therefore, OCTA is submitting a Conditional Use Permit to the City of Irvine for approval.

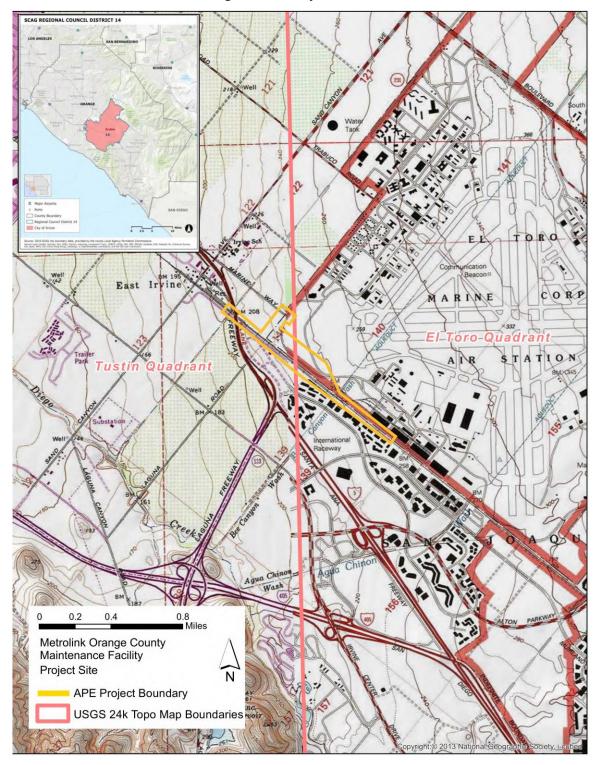
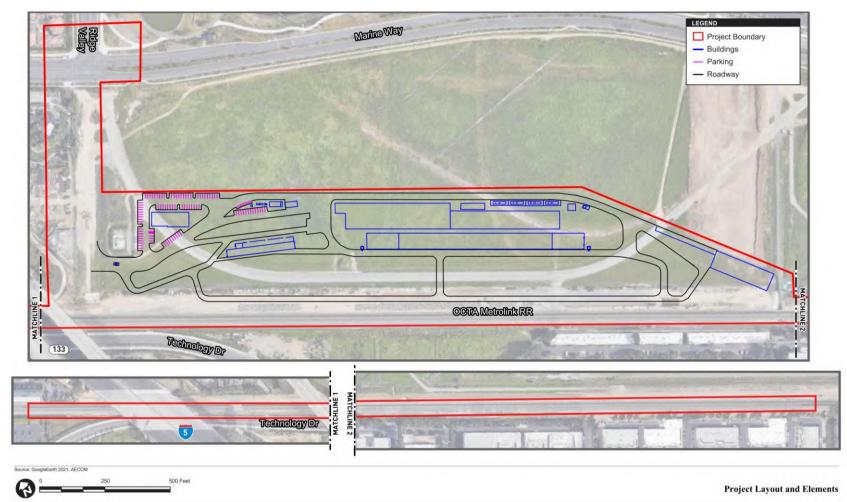


Figure 2.2-1 Project Location

Source: ESRI (2021), OCTA (2021)





Metrolink Orange County Maintenance Facility

32397 GF_OCTA_MSF/900-CAD-GIS/930 Graphics/2.2-2 Proj Layout_Elements.ai, 12/09/2021, BradyD

Source: ESRI (2021), OCTA (2021)

The Project would be developed in two phases with an anticipated completion date of 2028. Phase 1 focuses on developing facilities needed for the storage and routine cleaning, inspection and servicing of the anticipated trainsets. The total area of the Phase 1 buildout would be approximately 20,996 square feet and would be comprised of the following facilities: the transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth and sand silos (Table 0-1). A total of 11 tracks would be built. The Phase 1 layout situates the train wash, fueling/sanding, and service and inspection tracks on the two tracks with the greatest tangent length, which are the ones nearest the railroad right of way ("ROW"). This is important in fitting a second fueling/sanding facility so that there is one at each end of the service and inspection platform to support having the locomotive at either end, all within tangent track. Additionally, six storage tracks and appurtenant features (air, water, head end power and toilet dump facilities) would be constructed. The storage tracks would be built near the middle of the site east of the service and inspection tracks. Phase 1 of the buildout would anticipate approximately 52 employees total throughout the entire day, split across three eight-hour shifts.

| Building/Facility/Item | Building Area | Building Height |
|--------------------------------|----------------------|------------------------|
| Transportation Building | 7,495 sq. ft. | 20 ft |
| Train Wash Building | 11,110 sq. ft. | 21 ft |
| Maintenance Building | 40,392 sq. ft. | 48 ft |
| Maintenance Building Expansion | 27,880 sq. ft. | |
| Utility Building | 981 sq. ft. | 20 ft |
| Pump House | 750 sq. ft. | 14 ft |
| Guard Booth | 36 sq. ft. | |
| Equipment Booth | 48 sq. ft. | |
| Sand Silos (2 Total) | 576 sq. ft. | |
| Total | 89,268 sq. ft. | |

Table 0-1 Building Specifications

Source: Gannett Fleming, Metrolink (February 2022) Note: sq. ft. = square feet; ft = feet

A runaround track would be provided between the service and inspection tracks and storage tracks. Additionally, two temporary stub-ended set out tracks would be provided in the Phase 1 layout that occupies the footprint of the future shop tracks (one at the north and one at the south end of the yard). These set out tracks would be converted to shop access tracks in Phase 2 and, therefore, would no longer be available as set out tracks. A new set out track would then be provided as part of Phase 2.

A transportation building that would be utilized for administrative purposes is also included in Phase 1. This building would house managerial offices, welfare spaces for train crews and on-site personnel. This facility would include restrooms, showers, locker rooms, a break/day room, vending space and a kitchenette.

Parking would be provided for staff reporting to the site. Fire department compliant roadways would be developed to permit circulation of the site for Metrolink vehicles as well as delivery trucks (sand and fuel).

Phase 2 completes the full buildout of the Project. It would include development of the maintenance shop building and its future extension that would comprise of a total buildout area of 68,272 square feet (Table 0-1). The shop would have capabilities to perform regular three-month, six-month, and one-year preventive maintenance cycles on trainsets. Phase 2 of the buildout would consist of approximately 28 employees. With the full buildout of Phase 1 and Phase 2, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts.

Access to the OCMF would require a roadway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The Project includes the southern extension of Ridge Valley Road from Marine Way and associated traffic signal improvements to provide access to the OCMF.

The 11 new east and west lead tracks, as discussed in this section above, would be constructed within the existing railroad corridor between MP 183.0 and MP 184.00 on Metrolink's "Orange" Subdivision to connect the existing mainline railroad to the proposed OCMF rail yard. A new single span concrete bridge over the Bee Canyon Channel (Channel) would be built for the east lead track. A segment of the Channel and utilities that are found to be in conflict would be lowered by approximately 2.5 feet to facilitate the construction of the bridge.

3. ENVIRONMENTAL SETTING

3.1 REGULATORY FRAMEWORK

3.1.1 National Environmental Policy Act and National Historic Preservation Act

Federal agencies must consider the effects of proposed projects on historic properties and natural resources. Lead agencies evaluate potential impacts under the National Environmental Policy Act (Public Law 91-190; NEPA) and potential effects under the NHPA (16 USC 470) to "historic properties," which are defined as resources that are listed in or eligible for listing in the National Register of Historic Places (NRHP), in an effort to avoid potential significant impacts and adverse effects. Resources that may be eligible for listing in the NRHP include districts, sites, buildings, structures, and objects that are at least 50 years old and are significant in American history, prehistory, architecture, archaeology, engineering, and/or culture. To be eligible for listing, the resource must meet one of the NRHP Criteria for Evaluation (A–D) (36 Code of Federal Regulations [CFR] 60.4), as follows:

- A. A property is associated with events that have made a significant contribution to the broad patterns of our history; or
- B. A property is associated with the lives of a person or persons significant in our past; or
- C. A property embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or
- D. A property has yielded, or may be likely to yield, information important in prehistory or history.

In addition, historic properties must possess integrity of location, design, setting, material, workmanship, feeling, and association.

Resources younger than 50 years may be eligible if they have exceptional importance and meet Criteria Consideration G, as described in Bulletin No. 22 from the National Park Service (NPS), *How to Evaluate and Nominate Potential National Register Properties that have Achieved Significance Within the Last 50 Years* (Sherfy and Luce 1998). Other types of resources that are typically not eligible for the NRHP, including religious properties, moved properties, birthplaces or graves, cemeteries, reconstructed properties, and commemorative properties, may be eligible under other specific NRHP criteria considerations.

NEPA requires that environmental impacts to historic properties be evaluated and addressed during the environmental review process in coordination with procedures established by Section 106 of the NHPA to address effects on historic properties. A significant impact and/or an adverse effect would occur if a project would directly or indirectly diminish any of the characteristics that qualify a historic property for NRHP eligibility or listing. Under NEPA, a significant impact may be resolved with mitigation measures to avoid the impact or to reduce the impact to a level of less than significant. Under Section 106 of the NHPA, adverse effects must be resolved through a consultation process between the federal lead agency, the State Historic Preservation Office, interested parties, and the Advisory Council on Historic Preservation (ACHP). If an adverse effect cannot be avoided, mitigation may be agreed upon and documented in a signed Memorandum of Agreement to resolve the adverse effect. If mitigation is not agreed upon through the Section 106 process, consultation is terminated and the ACHP may make comments on the procedure.

3.1.2 California Environmental Quality Act

CEQA (Public Resources Code [PRC] Sections 21000–21177) is intended to prevent significant avoidable impacts to the environment by requiring feasible alternatives or mitigation measures. If cultural resources are identified within the Project Site, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the cultural resource.

A cultural resource is considered to be a "historical resource" under CEQA if the resource meets the criteria for listing in the California Register of Historical Resources (CRHR) (PRC Section 5024.1, Title 14 California Code of Regulations [CCR], Section 4852). The CRHR was designed to be used by state and local agencies, private groups and citizens to identify existing historical resources within the state and to indicate which of those resources should be protected, to the extent prudent and feasible, from substantial adverse change. The criteria for the CRHR (PRC Section 5024.1, Title 14 CCR, Section 4852) are consistent with the criteria for the NRHP, but generally focus on resources of statewide, rather than national, significance. To be eligible for listing in the CRHR, a property generally must be at least 50 years of age and possess significance at the local, state, or national level, under one or more of the following four criteria:

- 1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
- 2. It is associated with the lives of persons important to local, California, or national history;
- 3. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values; and/or
- 4. It has yielded, or has the potential to yield, information important in the prehistory or history of the local area, California, or the nation.

Potential historical resources eligible for listing in the CRHR may include buildings, sites, structures, objects and historic districts. A resource less than 50 years of age may be eligible if it can be demonstrated that sufficient time has passed to understand its historic importance. While the criteria for the CRHR is less rigorous than the NRHP with regard to the issue of integrity, there is the expectation that properties reflect their appearance during their period of significance (Title 14 CCR, Section 4852).

Archaeological resources identified as "unique archaeological resources" are similarly protected by Division 13, Chapter 2.6, of the Public Resources Code. A "unique archaeological resource" is defined as an archaeological resource that:

- 1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- 2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- 3. Is directly associated with a scientifically recognized important prehistoric or historic event or person. (PRC Division 13, Chapter 2.6, 21083.2[g])

An archaeological resource that is considered nonunique need be given no additional consideration other than its existence being recorded, unless it is determined to be a tribal cultural resource.

3.1.3 Public Resources Code Section 5097.5

PRC Section 5097.5 states that no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate

paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological, or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. "Public lands" refers to land owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

3.1.4 Public Resources Code Section 5097.9-5097.991

PRC Section 5097.9 protects the free expression of Native American religion. Section 5097.91 creates the Native American Heritage Commission (NAHC) to coordinate with state agencies. Section 5097.94 empowers the NAHC to identify and catalog Native American sacred sites, including graves, thereby creating the Sacred Lands File. The NAHC is also empowered to make recommendations to public agencies to ensure their access and protection. Section 5097.98 mandates County Coroners to notify the NAHC when human remains of Native American origin are identified and provides for the identification of a Most Likely Descendant to advise the respectful treatment of such remains. Section 5097.99 makes it illegal to obtain Native American artifacts or human remains from a burial or cairn except by following the legal process outlined in Section 5097.98, and Section 5097.991 indicates that it is the policy of the State that Native American human remains and grave artifacts be repatriated.

3.1.5 Public Resources Code Section 21074

PRC Section 21074 was added as one of the amendments to CEQA enacted in Assembly Bill (AB) 52. This section creates a new category of resources called tribal cultural resources, which are defined as either of the following:

- 1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
 - a. Included or determined to be eligible for inclusion in the CRHR.
 - b. Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

3.1.6 Public Resources Code Section 21080.3.1

PRC Section 21080.3.1 was also added to the Public Resources Code by AB 52. Section 21080.3.1 recognizes that California Native American tribes which are traditionally and culturally affiliated with a geographic area may have expertise regarding potential tribal cultural resources that may be impacted by proposed projects. Section 21080.3.1 also mandates that a lead agency consult with geographically and culturally affiliated Native American tribes prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report for a project in order to identify potential impacts to tribal

cultural resources and, if necessary, craft mitigation measures to reduce impacts to tribal cultural resources.

3.1.7 Local Regulations - City of Irvine General Plan

The City of Irvine General Plan includes Element E on Cultural Resources. It recognizes the importance of historical, archaeological and paleontological resources in the City and establishes a process for their early identification, consideration, and where appropriate, preservation. It requires assessment of potential resources on projects and utilizes planning policies, ordinances, approval conditions and mitigation measures to protect the resources.

Cultural resources are the physical remains of the City's historic and prehistoric heritage (City of Irvine, 2015). Historical resources include sites established after 1542 A.D., the date when European contact with California began, which may be significant to history, architecture, or culture. Archaeological resources include any location containing evidence of human activities which took place prior to 1750 A.D. Historical sites established prior to 1750 A.D. are also archaeological sites. Paleontological resources include any location containing a trace of plants or animals from past ages.

3.2 AREA OF POTENTIAL EFFECTS

The Area of Potential Effects (APE or "Project APE") is defined in 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."

The APE consists of the area where the proposed undertaking has the potential to cause effects on historic properties, and has been delineated to reflect the nature, scale, and location of the Project. The proposed APE includes built resources and historic and cultural landscapes and all areas that could be directly (caused by an action and occurring at the same time and place) or indirectly (caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable) affected by the proposed project, as defined in 40 CFR § 1508.8(a)-(b). The APE has been delineated to include the Project Site and a portion of railroad and right-of-way (which includes access roads, new roads and intersections, new track leads along the rail alignment, and construction staging areas), in which impacts on both archaeological and built environment resources are possible, and adjacent areas to consider the Project Site. The vertical extent of the APE encompasses the maximum depth of excavation and grading, which may extend up to 10 feet beneath the existing ground surface for the building foundations, and the maximum height of construction, which will extend no more than 30 feet above the existing ground surface for the proposed administration building. The APE, showing historic built resources, is shown in Figure 3.2-1. The APE showing all resources, including previously documented archaeological resources, is depicted in the map in Attachment A.

3.3 EXISTING CONDITIONS

3.3.1 Prehistoric Overview

Geologic maps indicate that the entire Project APE is covered with surficial deposits of Qyf (Morton and Miller 2006). These deposits consist of young Quaternary alluvial fan deposits. They consist of slightly consolidated to cemented deposits of unsorted boulders, cobbles, gravels, and sands deposited by fluvial processes. Shallow Qyf deposits date to the Holocene (approximately 11,650 calibrated radiocarbon years before present to today). These younger Quaternary deposits can be tens of feet thick and overlie older Quaternary alluvium at varying depths.

The earliest occupation of Southern California may be associated with the peoples who first colonized North America in the terminal Pleistocene and earliest Holocene (Arnold et al., 2004). A key indicator of these early cultures are fluted points, which have been reported at a number of locations in Southern California (Rondeau, 2008). Closest to the Project APE, the Farpoint Site (CA-LAN-451) in Malibu, Los Angeles County, has yielded a fluted point, and its excavator argues the site should be associated with the Clovis culture (Stickel, 2008). Clovis is the earliest universally recognized material culture in North America, and dates to approximately 11,500 radiocarbon years before present (B.P.).

However, scholarly consensus holds that the earliest unambiguous evidence of human occupation in the Los Angeles area dates to at least 9000 B.P. and is associated with a period known as the Millingstone Cultural Horizon (Wallace 1955; Warren 1968). Millingstone populations established permanent settlements that were located primarily on the coast and in the vicinity of estuaries, lagoons, lakes, streams, and marshes where a variety of resources, including seeds, fish, shellfish, small mammals, and birds, were exploited. Early Millingstone occupations are typically identified by the presence of handstones (manos) and millingstones (metates), while those Millingstone occupations dating later than 5000 B.P. contain a mortar and pestle complex as well, signifying the exploitation of acorns in the region.

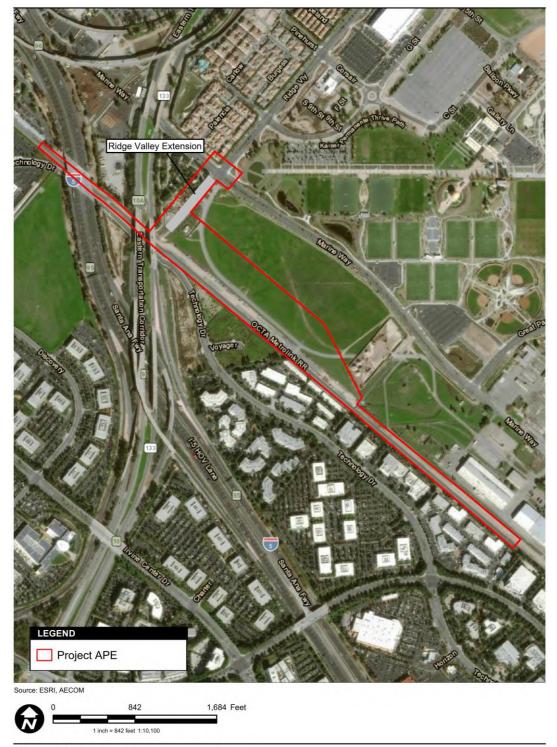


Figure 3.2-1 Area of Potential Effects Map

Metrolink Orange County Maintenance Facility

Although many aspects of Millingstone culture persisted, by 3500 B.P., a number of socioeconomic changes occurred (Erlandson 1994; Wallace 1955; Warren 1968). These changes are associated with the period known as the Intermediate Horizon (Wallace 1955). Increasing population size necessitated the intensification of existing terrestrial and marine resources (Erlandson 1994). This was accomplished in part through use of new technological innovations such as the circular shell fishhook on the coast and, in inland areas, use of the mortar and pestle to process an important new vegetal food staple (acorns); and the dart and atlatl, which resulted in a more diverse hunting capability. Evidence for shifts in settlement patterns has been noted as well at a variety of locations at this time and is seen by many researchers as reflecting increasingly territorial and sedentary populations. The Intermediate Horizon marks a period in which specialization in labor emerged, trading networks became an increasingly important means by which both utilitarian and nonutilitarian were acquired, and travel routes were extended.

The Late Prehistoric period, spanning from approximately 1500 years B.P. to the Spanish mission era, is the period associated with the florescence of contemporary Native American groups. The group occupying the southern Channel Islands and adjacent mainland areas of Los Angeles and Orange Counties came to be known as the Gabrielino, after Mission San Gabriel. They are reported to have been second only to their Chumash neighbors in terms of population size, regional influence, and degree of sedentism (Bean and Smith 1978). The boundary between these two groups is commonly believed to be in the area by Topanga Canyon, with the Chumash living along the beaches of Malibu up to the area of Paso Robles and the Gabrielino residing along the coast to southern Orange County. The Gabrielino are estimated to have numbered around 5,000 in the pre-contact period (Kroeber 1925). Maps produced by early explorers indicate the existence of at least 40 Gabrielino villages, but as many as 100 may have existed prior to contact with Europeans (Bean and Smith 1978; McCawley 1996; Reid 1939 [1852]).

Subsistence during the Late Prehistoric period consisted of hunting, fishing, and gathering. Small terrestrial game was hunted with deadfalls and rabbit drives, and by burning undergrowth, while larger game such as deer were hunted using bows and arrows. Fish were taken by hook and line, nets, traps, spears, and poison (Bean and Smith 1978; Reid 1939 [1852]). The primary plant resources were acorns gathered in the fall and processed with mortars and pestles, and various seeds that were harvested in late spring and summer and ground with manos and metates. The seeds included chia and other sages, various grasses, and Islay or holly-leafed cherry (Reid 1939 [1852]).

3.3.2 Historic Overview

Spanish explorers made brief visits to Gabrielino territory in 1542 and 1602, and on both occasions the two groups exchanged trade items (McCawley 1996). Sustained contact with Europeans did not commence until the onset of the Spanish period, which began in 1769 when Gaspar de Portola and a small Spanish contingent began their exploratory journey along the California coast from present-day San Diego to Monterey. The Portola expedition crossed today's Orange County and forded the Santa Ana River on July 28, 1769. On the banks of the river they encountered "a populous village of Indians, who received us with great friendliness" (quoted in McCawley 1996:60).

Several Native American villages are known to have existed on the Santa Ana River plain at about the time of contact. The village encountered by the Portola expedition was probably *Hotuuknga*, which was located near the former location of the Bernardo Yorba adobe, in today's Yorba Linda (McCawley 1996:60). A village named *Pasbengna* was located on the Santa Ana River in the vicinity of today's Santa Ana (McCawley 1996:60). A place called *Moyo* or *Moyoonga*, which may have been a village, was located on what became the Rancho San Joaquin near Newport Bay (McCawley 1996:72). Other villages, some of the names of which were recorded by missionaries or early anthropologists, are known to have existed throughout today's Orange County, but no village centers are known to have existed within the APE.

In the years following the Portola expedition, missions were established across California. Mission San Gabriel Arcàngel was established in 1771 in what is now Whittier Narrows in Los Angeles County. Another location considered for the mission was near the Santa Ana River (McCawley 1996:189). The natives that occupied the northern areas of present-day Orange County became known as the *Gabrieleño* (later anglicized to Gabrielino) because of the mission. Mission San Juan Capistrano was established in 1776 in present-day San Juan Capistrano, and the Native American group in the vicinity became known as the *Juaneño* (Koerper et al. 2002: 64). Missionization brought with it significant and detrimental changes in *Gabrieleño* and *Juaneño* health and cultural integrity.

Alta California became a state when Mexico won its independence from Spain in 1821, and Los Angeles selected its first city council the following year. The authority of the California missions gradually declined, culminating with their secularization in 1834. Although the Mexican government directed that each mission's lands, livestock, and equipment be divided among its converts, the majority of these holdings quickly fell into non-Indigenous hands. Mission buildings were abandoned and quickly fell into decay.

The first party of U.S. immigrants arrived in Los Angeles in 1841, although surreptitious commerce had previously been conducted between Mexican California and residents of the United States and its territories. As the possibility of a takeover of California by the United States loomed large, the Mexican government increased the number of land grants in an effort to keep the land in the hands of upper-class *Californios* such as the Avila, Domínguez, Lugo, and Sepúlveda families (Wilkman and Wilkman 2006:14–17). Governor Pío Pico and his predecessors made more than 600 rancho grants between 1833 and 1846, putting most of the state's lands into private ownership for the first time (Gumprecht 1999).

The project APE lay in the southern portion of the sphere of influence of Mission San Gabriel from its establishment in 1771. In 1842, Governor Juan Bautista Alvarado granted lands that included the project APE to José Sepúlveda as part of Rancho San Joaquin. Throughout the Spanish and Mexican periods the local Native American populations continued to use the land. They also served as the labor on the mission lands and ranchos (Phillips 2010). Writing about a rancho in the San Fernando Valley, one mission father observed in 1795, "These Indians are the cowherds, cattlemen, irrigators, bird-catchers, foremen, horsemen, etc." (Englehardt 1927:5). As time went by the Native Americans were taught additional specialists' skills such as masonry, blacksmithing, carpentry, painting, and Mexican-style ceramics (Frierman 1992; Schuetz-Miller 1994). The same was true of today's Orange County, where Native Americans labored, often with the skills and knowledge of specialists, building wealth for the missions and the rancheros.

The United States took control of California after the Mexican–American War of 1846, and seized Monterey, San Francisco, San Diego, and Los Angeles (then the state capital) with little resistance. Hostilities officially ended with the signing of the Treaty of Guadalupe Hidalgo in 1848, in which the United States agreed to pay Mexico \$15 million for the conquered territory, which included California, Nevada, and Utah, and parts of Colorado, Arizona, New Mexico, and Wyoming. The conquered territory represented nearly one-half of Mexico's pre-1846 holdings. California joined the United States in 1850 as the 31st state (Wilkman and Wilkman 2006:15).

The discovery of gold at Sutter's Mill in 1849 led to an enormous influx of people from other parts of the United States in the 1850s and 1860s; these "forty-niners" rapidly displaced the old rancho families. Southern California's prosperity in the 1850s was largely a result of the increased demand for cattle for meat and hides, which was created by the gold rush, and the local ranching community profited handsomely (Bell 1881:26).

James Irvine emigrated from Ireland to California in 1846. Between 1864 and 1876, Irvine created the Irvine Ranch (the predecessor to The Irvine Company) by purchasing three, large, Spanish-Mexican land grants: San Joaquin, Santiago de Santa Ana, and Lomas de Santiago. The Irvine Ranch was initially used for agriculture; farming fruits and vegetables, such as lima beans and oranges, and raising cattle. Irvine also developed water infrastructure by drilling wells and developing the Irvine Ranch water system.

During the 1880s, railroad development in the region put the Irvine Ranch landholdings at the focus of debate. The Southern Pacific Railroad (SPRR) wanted to build a line south to connect to San Diego before its rival the Atchison, Topeka, and Santa Fe Railroad (AT&SF). However, James Irvine despised one of the SPRR's primary investors, Collis Huntington, and refused to allow the railroad a convenient right-of-way across his property. The California Southern Railroad, a subsidiary of the AT&SF, laid a line from San Diego to Oceanside which routed northeast to Temecula, thereby avoiding the Irvine Ranch. However, this line was washed out shortly after its opening in 1882. The more ideal corridor passed through the Irvine Ranch. In 1887, the California Southern Railroad attempted to sue the ranch to obtain a right-of-way. Ultimately, the Irvine family agreed to grant the AT&SF passage, as long as the railroad would build a depot to serve the property. The railroad segment that passes through the ranch was laid in 1887 (Amtrak 2019; Cleland 1952; Liebeck 1988). The AT&SF railroad ceased operating passenger trains in 1971 with the establishment of the National Railroad Passenger Corporation (Amtrak). In 1995, the AT&SF ceased operations and the entire company's holdings were acquired by the Burlington Northern Santa Fe (BNSF). Within the APE, the Orange County Transportation Authority is the current owner of the SCRRA Orange Subdivision railroad tracks.

In 1942, a military pilot's fleet operational training facility was established on 2,340 acres of the Irvine Ranch Corporation. In the following year, the facility was commissioned as MCAS El Toro. During World War II, MCAS El Toro was a major debarkation location and served as a training base for pilots, aircrews, and ground personnel (City of Irvine 2003). During the 1950s, the Irvine Company donated land to the University of California system, and the campus became the new focus of development in the periphery. The Irvine Company hired architect and planner William Pereira to develop a master plan. The master-planned community was defined by architectural themes among neighborhoods, roadway connections to shopping centers, and open spaces. The I-5 bridge crossing Bee Canyon Channel, located south of the APE, was constructed in 1958, and later reconstructed in 1969 (NBI 2020). The Irvine Ranch Water District (IRWD) was formed in 1961. The IRWD tiered off much of the existing water infrastructure developed during the 1930s and 1940s including Irvine Lake (formerly Santiago Reservoir) which was constructed in 1931.

MCAS El Toro was decommissioned in 1999. The roadways to the northwest and south of the APE were further developed in the 1990s. The I-5 bridge crossing the AT&SF was constructed in 1992, the State Route 133 (SR-133) bridge crossing Marine Way was constructed in 1997, and the SR-133 bridge over the former AT&SF was constructed in 1998 (NBI 2020). In 2001, Measure W was passed which authorized the former air station's use as a park and multi-use development, now known as the Great Park area.

Based on review of historical topographic maps and aerial photographs, the APE itself has undergone some development in the past 100 years. The earliest topographic map from 1901 shows the railroad alignment, but no buildings are depicted. A 1938 aerial photograph shows the area as agricultural fields bound to the southwest by the former AT&SF alignment (NETR 2020). From 1942 to 1950, a rail siding was added bisecting the APE. In 1952, the water transfer vault located at the northwestern end of the APE is present. The current footprint of the perimeter road is present by 1963, and trees were planted alongside the perimeter road by 1994 (NETR 2020). Additional fencing and water transfer equipment structures were constructed at the northwestern end of the APE during the mid-2000s. The former AT&SF alignment southwest of the APE boundaries has been altered over time for modern use, with modifications accommodating technological developments and commercial demands (e.g., larger trains, second track, automated switches), and other ongoing maintenance.

3.3.3 Archival Research

On April 30, 2020, AECOM requested a California Historical Resources Information System records search from the South Central Coastal Information Center (SCCIC) housed at California State University, Fullerton. The research focused on the identification of previously recorded cultural resources within the APE and a 0.5-mile radius around the Project site. The SCCIC responded via email on August 19, 2020.

The records search revealed that 37 cultural resources investigations were previously conducted within a 0.5-mile radius of the Project site (Table 3.3.3-1). Four of these investigations overlap the APE in whole or in part. The entirety of the APE has been subject to previous archaeological study.

| Author | Report # (OR-) | Description | Date |
|--------------------------|-------------------|--|------|
| Schroth, Adella | 00305 | The History of Archaeological Research on Irvine Ranch | 1979 |
| | | Property: The Evolution of a Company Tradition | |
| Douglas, Ronald D. | 00586 | Assessment of Cultural/Scientific Resources, Village 12, SCE | 1980 |
| | | HVtl Relocation, Irvine, California | |
| Padon, Beth | 00754 | Cultural Resource Assessment, Irvine Center Project, Orange | 1984 |
| | | County, California | |
| Padon, Beth | 00787 | Archaeological and Paleontological Monitoring for the Irvine Center Project | 1985 |
| Anonymous | 00808 | Final Environmental Impact Report Regional Domestic Water | 1979 |
| | | Storage and Transmission Facilities from Diemer/SAC and | |
| | | Wellfield Systems to Existing Distribution Network | |
| Romani, John F. | 00814 | Archaeological Survey Report for the Route I-5 Santa Ana | 1982 |
| | | Transportation Corridor, Route 405 in Orange County to | |
| | | Route 65 in Los Angeles County, PM 21.30/44.38; 0.00/6.85 | |
| Padon, Beth | 00847 | Archaeological Resource Inventory, City of Irvine and Its | 1985 |
| , | | Sphere of Influence | |
| Padon, Beth and Pat | 00906 | Cultural Resources Report for the San Diego Creek Drainage | 1988 |
| Jertberg | | Basin Project Level Facilities Orange County | |
| Jertberg, Patricia R. | 00972 | Archaeological and Paleontological Monitoring at Spectrum I | 1989 |
| , | | Parcel #87-212 | |
| Padon, Beth | 01098 | Cultural/Scientific Resources Assessment for Planning Area | 1991 |
| , | | 13 | |
| Cooley, Theodore G. | 01099* | Archaeological Resources Assessment Conducted for | 1979 |
| | | Proposed Irvine Ranch Water District Pipeline Right-of-Ways | |
| Brock, James P. | 01402* | Cultural Resources Assessment for the Irvine Desalter | 1994 |
| | | Project, Irvine California | |
| Webb, Lois M. | 01844 | Request for Finding of Effect for the Proposed Eastern | 1991 |
| , | | Transportation Corridor | |
| Anonymous | 01902 | Historic Property Survey 07ORA-133 | 1985 |
| Padon, Beth | 01941 | Archaeological and Paleontological Monitoring of Preliminary | 1999 |
| , | | Grading for Jack-in-the-Box Restaurant 3278, Permit No. | |
| | | 34126 CCG, Irvine, California | |
| Anonymous | 01944 | Draft Environmental Impact Report, East Irvine Historical | 1991 |
| - , | | Site, Irvine, California | |
| Strozier, Hardy | 02225 | The Irvine Company Planning Process and California | 1978 |
| | | Archaeology—A Review and Critique | |
| Hunt, Kevin P. | 02267 | An Archaeological and Paleontological Survey of the Irvine | 2000 |
| | | Spectrum GPA Project | |
| Demcak, Carol, and Milos | 02337 | Final Report on Archaeological and Paleontological | 2000 |
| Vlechovsky | | Monitoring Program Conducted at Spectrum 6, City of Irvine, | |
| 1 | | Orange County, California | |
| Anonymous | 02534 | Annual Report to the Irvine Company from Archaeological | 1976 |
| | 0_001 | Research, Inc. | , |
| Brown, Joan C. | 02636 | A Cultural Resources Literature Study and Field | 2003 |
| | | Reconnaissance for the Natural Treatment System Master | |
| | | | |

| Author | Report # (OR-) | Description | Date |
|--------------------------------------|-------------------|---|------|
| Allen, Rebecca | 02649* | Archaeological Survey Report Marine Corps Air Station, El Toro | 1997 |
| Mason, Roger D. 03293 | | Historic Property Survey Report for the Sand Canyon Grade Separation Project in the City of Irvine, Orange County, California | |
| Bonner, Michael A. | 03347 | Supplemental Environmental Impact Statement for the Eastern Transportation Corridor TCA EIS 2-1 | |
| Marvin, Judith | 03355 | Historical Resources Evaluation Report for the Interstate 5/S and Canyon Avenue Interchange Improvement Project, City of Irvine, Orange County, California | |
| Padon, Beth | 03380 | Cultural Resource Assessment for Traveland Project, Irvine, Orange County | 2007 |
| Strudwick, Ivan H. | 03392* | Cultural Resource Survey for the Proposed Irvine Desalter Project, City of Irvine, Orange County, California | 2004 |
| Bonner, Wayne H. | 03357 | Cultural Resources Records Search and Site Visit for Royal Street Communications, California LLC Candidate LA2516B— La Quinta | 2008 |
| Drover, Christopher | 03825 | A Cultural Resources Inventory of Planning Area 9B and 9C, Irvine, California | 2000 |
| McKenna, Jeanette A. | 03917 | Historic Resource Evaluation Report: Hangar 244 of the Former El Toro Marine Corps Air Station (MCAS) and Now Located Within the Great Park, Orange County, California (Project No. B-09-SP-CA-0359) | 2010 |
| Fitzgerald, Maggie | 03933 | Great Park, Cultural Resources Monitoring Report | 2010 |
| Fulton, Terri, and Deborah McLean | 04084 | Cultural Resource Assessment of 22 Natural Treatment System Facility Sites Within the San Diego Creek Watershed – Natural Treatment System Project, Irvine Ranch Water District, Orange County, California | 2005 |
| Flynn, Chris | 04223 | Notification of Finding of No Adverse Effect with Standard Conditions for the Bridge Deck Maintenance and Sealing at 30 Locations Throughout Orange County, California | 2011 |
| Strudwick, Ivan | 04403 | Cultural Resource Monitoring Report for the Sand Canyon Avenue Undercrossing Project, City of Irvine, County of Orange, California | 2014 |
| Strudwick, Ivan | 04478 | Cultural Resource Analysis for the Technology Drive Extension Project in the City of Irvine, Orange County, California | 2013 |

In addition to the reports reviewed at the SCCIC, the 1998 *Architectural Survey of Marine Corps Air Station, El Toro* (JRP 1998) and the 2000 *California Historic Military Buildings and Structures Inventory* (USACE 2000) were reviewed. The 1998 study included an inventory and evaluation of the buildings and structures at MCAS El Toro and determined that there are no NRHP eligible buildings, structures, or districts within the former base (JRP 1998). The SCCIC records search identified 14 previously recorded cultural resources within a 0.5-mile radius of the Project Site (Table 3.3.3-2). These resources include one isolated lithic flake and one isolated shell that, although unmodified, was transported to the APE by human activity, possibly during the prehistoric period. The remaining 12 resources include nine historic buildings dating from the 1890s to the 1950s, one historic district encompassing some of those buildings, and two historic railroad alignments. The majority of the historic buildings are associated with Old Town Irvine Historic District, which is located approximately 0.40-mile northeast of the APE.

Two of the resources overlap the APE in whole or in part and are detailed below in Table 3.3.3-2.

| Primary Number (P-30-) | Permanent Trinomial (CA-ORA-) | Description/Historic Name | Period of Significance | NRHP/CRHR Eligibility |
|---------------------------|-------------------------------------|---|---------------------------|--|
| 100124 | None | Isolated metavolcanic flake | Prehistoric | Not eligible for CRHR or NRHP |
| 100372* | None | Isolated Venus clam shell | Prehistoric | Not eligible for CRHR or NRHP |
| 157788 | None | Irvine Blacksmith Shop | 1915-1916 | Listed on CRHR and NRHP |
| 161870 | None | Worker's Cottage | 1904 | Appears ineligible for NRHP; not evaluated for CRHR |
| 161871 | None | Irvine Hotel | 1913 | Appears ineligible for NRHP; not evaluated for CRHR |
| 161872 | None | Agricultural Storage Shed | 1930 | Appears ineligible for NRHP; not evaluated for CRHR |
| 161875 | None | Irvine Garage | 1923 | Appears ineligible for NRHP; not evaluated for CRHR |
| 161889 | None | Irvine Bean Growers Association Building | 1895-1947 | Listed in NRHP and CRHR |
| 161894 | None | Old Town Irvine Historic District | 1887-1947 | Listed in CRHR |
| 176663* | None | Former AT&SF | 1885-1888 | Appears ineligible for NRHP, CRHR, or local designation |
| 176838 | None | Irvine Community Church | 1952 | Appears ineligible for NRHP, CRHR, or local designation |
| 176945 | None | Irvine General Store | 1911 | Appears ineligible for NRHP |
| 177038 | None | El Toro MCAS Hanger 244 | 1943-1945 | Found ineligible for NRHP by consensus through the Section 106 process |
| 179855* | None | Former AT&SF Railroad | 1885-1888 | Appears ineligible for NRHP |

Table 3.3.3-2 Previously Recorded Resources within 0.5 Mile of the Project APE

*Intersects with Project APE.

Resource P-30-100372

This resource is an isolated Venus clam shell. The shell was observed next to a gopher hole with no other shell or artifacts in the vicinity (Garcia and Vader 2006). A shovel test pit was excavated next to the shell to a depth of 30 centimeters with negative results. Because of the distance from the coast, it was assumed that the shell was transported to this location by human activity. However, it is impossible to determine

when or how the shell was transported, or whether the shell's transportation to this location was intentional or accidental. By their nature, isolated resources are in general not eligible for inclusion in the CRHR or NRHP.

Resource P-30-176663

This resource is an approximately 14.7-mile-long segment of the SCRRA Orange Subdivision railroad tracks (originally part of the AT&SF Railway and subsequently BNSF Railway) and is within Orange and Los Angeles Counties. While originally constructed between 1885 and 1888, the railroad has been continuously used, resulting in replacement of all or most of its historic fabric. Because of its lack of integrity, this resource has been repeatedly recommended ineligible for listing in the NRHP (see Attachment A, Records Search Results Map). The eligibility of this segment has not been formally determined via State Historic Preservation Officer (SHPO) consensus.

3.3.4 Sacred Lands File Search and Native American Consultation

On July 8, 2020, AECOM contacted the NAHC and requested the Sacred Lands File be searched for documented sacred sites within the APE or its vicinity. The NAHC responded in a letter dated July 9, 2020. According to the NAHC letter, "The results were positive [meaning that there are known sacred lands or resources in the vicinity of the APE]. Please contact the Juaneno Band of Mission Indians and the Juaneno Band of Mission Indians Acjachemen Nation - Belardes on the attached list for more information." The response also included a list of 11 Native American representatives of nine State-recognized tribal governments who may have interest in and knowledge of resources that may be impacted by the Project. Two of these tribal governments are also Federally-recognized.

OCTA is conducting consultation under AB 52.

Assembly Bill 52 Consultation

OCTA contacted each of the tribal contacts by mail on June 2, 2021, to invite them to consult under AB 52. One of these letters was returned by the U.S. Postal Service as undeliverable. Follow-up emails were sent on June 30, 2021, to each tribal contact who did not respond to the mailing.

To date, one tribal representative has responded to the request for AB 52 consultation. Chairperson Andrew Salas of the Gabrieleno Band of Mission Indians-Kizh Nation requested a meeting with OCTA to discuss his tribe's concerns regarding the project. On September 9, 2021, a meeting was held between OCTA representatives and Chairperson Salas and Tribal Archaeologist John Torres representing the Kizh Nation. At the meeting, Chairperson Salas expressed that the Project APE is sensitive for buried tribal cultural resources. He pointed out that his tribe, and his family in particular, have ties to the region. He noted that railroads often followed traditional Native American trails, and also observed that military bases often encompassed ancient village sites. Moreover, he informed OCTA that his monitors are currently involved in projects elsewhere in the Irvine area where buried human remains were identified by his tribal monitors. Chairperson Salas recommended tribal monitoring during ground-disturbing activities in order to identify and protect any tribal cultural resources that may exist within the APE. Chairperson Salas provided OCTA with more historical information regarding the general project region, the project APE, as well sample language to help guide mitigation measures to be developed for this project. Consultation is ongoing (see Confidential Attachment B for files associated with consultation).

3.3.5 Field Survey

An archaeological and built environment survey was conducted on July 30, 2020, by AECOM personnel Marc Beherec, Ph.D., RPA, and Frank Humphries, M.S., RPA, who both meet the Secretary of the Interior's Professional Qualifications Standards in Archaeology (36 CFR Part 61). The two surveyors walked over the entire APE, with the exception of the active railroad right-of-way and a segment of Ridge Valley Road that is paved or covered in imported gravel (see Figure 3.2-1), in a series of transects spaced 15 meters apart. Part of the APE is obscured by a paved access road. Ground visibility in the rest of the APE ranged from approximately 10 to 50 percent. Non-native grasses obscured much of the ground surface, but the area was mowed at the time of visit.

Evidence of superficial disturbances included abundant gopher holes and evidence of an irrigation system in the form of 3/4-inch polyvinyl chloride (PVC) pipes and sprinkler heads. The ground also appeared recently disced or plowed and has been historically plowed based on historic aerial photographs.

Archaeological Resources

No archaeological resources were observed within the APE. The previously recorded isolated clam shell (P-30-100372) was not located during the survey. The resource was documented in 2006 (Garcia and Vader 2006); however, the single clam shell may have been misplotted, or it may have been removed or reburied by human or animal activity in the 14 years since it was recorded.

Built Environment Resources

The archival research and survey identified two built resources that are greater than 50 years of age within the APE. Resource information is included on California Department of Parks and Recreation (DPR) 523 forms included in Attachment C.

P-30-176663 Former AT&SF Segment

The portion of resource P-30-176663, the former AT&SF railroad within the APE, is a double track which runs northwest to southeast (Figure 3.3.5-1). The profile approaches one percent grade, rising from the north (west) end of the site as the tracks pass under the SR-133 overhead structure, to the south (east) end of the site where the mainline tracks cross over the Bee Canyon Channel on a double track bridge. This portion of the former AT&SF is a standard gauge railroad which sits on a bed of large-medium ballasts. The rails sit on wooden ties and are fastened via metal railroad spikes. This segment has been altered over time for modern use, with modifications accommodating technological developments and commercial demands (e.g., larger trains, second track, automated switches), and other ongoing maintenance. The original elements of the rail line have been repaired and replaced.



Figure 3.3.5-1 Cultural Resources within APE

Metrolink Orange County Maintenance Facility



Figure 3.3.5-2 Overview of P-30-176663, Former AT&SF Railroad from Project APE, View to West

Source: AECOM (2020)

NRHP and CRHR Evaluation

Resource P-30-176663 was originally recorded in 2002, and updated in 2007 (Ballester and Tang, 2002; McCormick, 2007; Smith and Harper, 2007). The resource was found to have been upgraded and substantially altered since its original construction and did not retain sufficient historical integrity to reflect its original historical association (Figure 3.3.5-2). Therefore, the railroad was recommended as not eligible for listing on the NRHP or CRHR due to its lack of integrity of materials, workmanship, and setting. The records do not note whether Section 106 consultation with the SHPO was performed for these undertakings. It does not appear that a formal determination of eligibility with SHPO concurrence has been completed for this resource. After review of the previous recordation and current field check and research, AECOM concurs with the previous eligibility assessments.

Water Transfer Vault

Within the APE and approximately 350 feet northeast of the SR-133 bridge over the former AT&SF railroad is a rectangular water transfer vault constructed circa 1950 and abandoned in 2006 (Figure 3.3.5-3). The resource is a concrete domestic water intake structure originally used for MCAS El Toro. The vault located on the western periphery of the former MCAS El Toro property does not have any distinct associations with the United States Marine Corps' mission operations during the 1950s and is a minor and vernacular water infrastructure element. The entrance to the subterranean structure is by way of stairs covered by a metal grate. The vault measures approximately 46 feet long and 27 feet wide; the interior is approximately 10 feet tall. The vault's footprint appears unchanged since construction; however, a low concrete interior

partition appears to have been removed in order to install new piping. Additional fencing and water transfer equipment structures were constructed adjacent to the vault during the mid-2000s.



Figure 3.3.5-3 Overview of Water Transfer Vault from surface, View to West

Source: AECOM (2020)

NRHP and CRHR Evaluation

Under NRHP Criterion A and CRHR Criterion 1, the water transfer vault has no significant association with the broad patterns of local, state, or national history. This structure was constructed during the 1950s and is associated with MCAS El Toro's expansion and development but does not convey an important association with the base. The water transfer vault's components, which include concrete construction and piping, are representative of utilitarian work. Since the water transfer vault has no association with the broad patterns of local, state, or national history, it is not eligible for the NRHP under Criterion A or CRHR under Criterion 1.

Under NRHP Criterion B and CRHR Criterion 2, this structure is not significant for any associations with the lives of persons important to history. Research did not identify any important associations between the water transfer vault and any notable persons or their work. Therefore, this property is not eligible under NRHP under Criterion B or CRHR Criterion 2.

Under NRHP Criterion C and CRHR Criterion 3, the water transfer vault is not an important example of a type, period, or method of construction. The vault's design and construction is typical of utilitarian

construction and does not appear to possess any unique characteristics; therefore, it is not eligible for the NRHP under Criterion B or CRHR under Criterion 3.

Under NRHP Criterion D and CRHR Criterion 4, the water transfer vault is not significant as a source (or likely source) of important information regarding history. It does not appear to have any likelihood of yielding important information about historic construction materials or technologies. It is not eligible for the NRHP under Criterion D or CRHR under Criterion 4.

The water transfer vault does not appear to meet the criteria for listing in the NRHP or CRHR, either as an individual resource or as a contributor to a larger resource such as the former MCAS El Toro. In addition, a 1998 inventory and evaluation of the buildings and structures at MCAS El Toro determined that there are no NRHP eligible buildings, structures, or districts within the former base (JRP 1998).

4. EXTENDED PHASE I

An Extended Phase I (XPI) cultural resources identification was completed within the APE in 2021 by HDR (HDR 2021). The XPI was conducted because the APE was determined to have a moderate sensitivity to encounter buried cultural resources. The purpose of the XPI was to determine the presence or absence of buried historic or prehistoric cultural resources and to further assess the overall archaeological sensitivity in portions of the OCMF project area where deep Project-related excavations are proposed. XPI investigations consisted of 40 subsurface shovel and hand auger test probe excavations to confirm the presence or absence or absence of buried cultural materials. All tests were negative for the presence of prehistoric cultural material. No historic properties, historic resources, unique archaeological resources, or tribal cultural resources were identified during the XPI. Based on the results of the XPI, it is not anticipated that the Project will impact buried cultural resources. A copy of the XPI is included in Attachment E.

5. METHODOLOGY

Archival research, Native American consultation, and survey activities were conducted to identify archaeological or historic built resources within the Project APE that may be considered historical resources for the purposes of CEQA or historic properties for the purposes of Section 106 of the NHPA. In addition, this study sought to evaluate the potential to encounter unknown buried archaeological resources within the APE that may meet the criteria to be considered historical resources and/or historic properties. Because of the Project APE's sensitivity, an XPI study was also conducted to probe the APE for subsurface archaeological deposits. The section above contains the environmental setting, cultural history, previous archaeological studies, results of archival research and records search, survey results, and the results of the XPI for the Project APE.

Archival research was conducted to determine the nature and substance of existing documentation or archaeological resources within the APE. The research was conducted at the South Central Coastal Information Center, located at California State University, Fullerton. In addition, published and unpublished archival material was consulted as appropriate. The NAHC was contacted to provide their input regarding known tribal resources and contacts, and every tribal contact identified by the NAHC was invited to consult upon the Project. However, no significant resources were identified within the Project APE as a result of the archival research, surface survey, or XPI. Mitigation measures are proposed for the treatment of potential buried resources that may be located within the APE.

6. IMPACTS ANALYSIS

Under Section 106 of the NHPA, an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property as defined by 36 CFR 60.4 that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration must be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include any reasonably foreseeable effects caused by the undertaking, including not only immediate effects, but also effects that may occur later in time, be farther removed in distance, or be cumulative.

As detailed in Appendix G of the CEQA Guidelines, a project would have an adverse impact to a historical resource if it would:

a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5;

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5; or

c) Disturb any human remains, including those interred outside of formal cemeteries.

The archival research and survey identified two built environment resources that are greater than 50 years of age within the Project APE. P-30-176663 is a segment of the former AT&SF that was previously recorded and evaluated as not eligible for the NRHP or CRHR; however, the records do not note whether a formal determination of eligibility was made. In addition, the survey identified a previously unrecorded historic-period resource, a water transfer vault. The water transfer vault is evaluated in Section 3.3.5 of this document and is recommended not eligible for inclusion in the CRHR or NRHP. Both resources do not appear to be historic properties as defined by 36 CFR 60.4 historical resource in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code.

The archival research identified one isolated archaeological resource within the Project APE. Resource P-30-100372 is a Venus clam shell that was documented within the boundaries of the APE in 2006 but could not be relocated during the recent survey. By its nature, this isolated shell is not eligible for inclusion in the NRHP or CRHR. No archaeological resources were identified within the Project APE that meet the criteria to be considered historic properties as defined by 36 CFR 60.4. No archaeological resources were identified within the Project APE that can be considered a historical resource in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California

Public Resources Code, or a unique archaeological resource in accordance with Section 15064.5(c) of the CEQA Guidelines, using the criteria outlined in Section 21083.2 of the California Public Resources Code.

However, based on the results of the archival research, field survey, Native American consultation, and past documented land use of the APE, the Project has a moderate to high sensitivity to encounter buried cultural resources. The single isolated Venus clam shell, while not itself significant and possibly not prehistoric, indicates an elevated sensitivity for resources within the APE. The APE is located near to water sources that both would have been attractive as natural resource procurement areas and could have contributed to burying archaeological resources beneath fluvial sediments. Native American authorities have pointed out their tribes; close ties to the project APE, the possibility that the existing railroad right-of-way was placed on an Native American trade route, and the fact that the project lay within the territory of nearby villages. Although the entire Project APE has been subject to surficial ground disturbance including farming and the construction of Marine Corps Station El Toro and despite the negative findings of the XPI, the likelihood of encountering native sedimentary deposits that may preserve significant archaeological remains increases with depth.

7. RECOMMENDATIONS

Based on the results of the archival research, field survey, and Native American consultation, the Project has a moderate to high sensitivity to encounter significant intact buried cultural resources. While the XP1 that was conducted was negative for the presence of subsurface cultural deposits, there is still the potential to encounter resources during construction as the Project will impact native soils. The possibility exists for the Project to encounter unknown archaeological resources in the course of ground-disturbing construction in native soils. The following mitigation measures are recommended to reduce any impacts to unknown archaeological resources encountered during excavations to a less than significant level.

MM-CUL-1 Prior to construction, OCTA shall retain a qualified archaeologist who meets the Secretary of the Interior's Guidelines for Archaeology (36 CFR Part 61). The qualified archaeologist shall prepare a Cultural and Tribal Cultural Resources Awareness Training as part of the Project Worker Environmental Awareness Program (WEAP). The training will instruct workers as to the laws protecting cultural and tribal cultural resources and also give examples of the kinds of resources that can be reasonably expected to be found in the Area of Potential Effect (APE). An environmental compliance contact responsible for enforcing mitigation measures and who is to be notified in the event of a find will be identified in the training. Training will be delivered to all staff involved in ground-disturbing activities prior to their working on the project.

MM-CUL-2 Prior to construction, a project-specific cultural resources monitoring, and discovery plan (CRMDP) will be developed by a qualified archaeologist who meets the Secretary of the Interior's Guidelines for Archaeology (36 CFR Part 61). The monitoring plan should identify what construction activities that occur in native soils would require archaeological and tribal monitoring, describe monitoring procedures, and outline the protocol to be followed in the event of a find. Criteria will be defined, and triggers identified as to when further consultation is required for the treatment of finds. Plans of treatment of typical finds will be detailed, as will a plan of treatment for any human remains that are inadvertently encountered. If a potentially significant discovery is made and cannot feasibly be avoided, then additional work, potentially including data recovery excavations, may be required. Key staff will be identified, and the process of notification and consultation will be specified within the CRMDP. A curation plan will also be outlined within the CRMDP. All work should be conducted under the direction of a qualified archaeological Principal Investigator who meets the Secretary of the Interior's standards for archaeology. Consulting tribes under AB52 for the Project shall have the opportunity to review and comment on the draft CRMDP.

- **MM-TCR-1** Retain a Native American Monitor Prior to Commencement of Ground-Disturbing Activities.
 - A. The project applicant/lead agency shall retain a Native American Monitor from or approved by the Gabrieleño Band of Mission Indians – Kizh Nation. The monitor shall be retained prior to the commencement of any "ground-disturbing activity" for the subject project at all project locations (i.e., both on-site and any off-site locations that are included in the project description/definition and/or required in connection with the project, such as public improvement work). "Grounddisturbing activity" shall include, but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching.
 - B. A copy of the executed monitoring agreement shall be submitted to the lead agency prior to the earlier of the commencement of any ground-disturbing activity, or the issuance of any permit necessary to commence a ground-disturbing activity.
 - C. The monitor will complete daily monitoring logs that will provide descriptions of the relevant ground-disturbing activities, the type of construction activities performed, locations of ground-disturbing activities, soil types, cultural-related materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe. Monitor logs will identify and describe any discovered TCRs, including but not limited to, Native American cultural and historical artifacts, remains, places of significance, etc., (collectively, tribal cultural resources, or "TCR"), as well as any discovered Native American (ancestral) human remains and burial goods. Copies of monitor logs will be provided to the project applicant/lead agency upon written request to the Tribe.
 - D. On-site tribal monitoring shall conclude upon the latter of the following (1) written confirmation to the Kizh from a designated point of contact for the project applicant/lead agency that all ground-disturbing activities and phases that may involve ground-disturbing activities on the project site or in connection with the project are complete; or (2) a determination and written notification by the Kizh to the project applicant/lead agency that no future, planned construction activity and/or development/construction phase at the project site possesses the potential to impact Kizh TCRs.
 - E. Upon discovery of any TCRs, all construction activities in the immediate vicinity of the discovery shall cease (i.e., not less than the surrounding 50 feet) and shall not resume until the discovered TCR has been fully assessed by the Kizh monitor and/or Kizh archaeologist. The Kizh will recover and retain all discovered TCRs in the form and/or manner the Tribe deems appropriate, in the Tribe's sole discretion, and for any purpose the Tribe deems appropriate, including for educational, cultural and/or historic purposes.

MM-TCR-2 Unanticipated Discovery of Human Remains and Associated Funerary Objects.

- A. Native American human remains are defined in PRC 5097.98 (d)(1) as an inhumation or cremation, and in any state of decomposition or skeletal completeness. Funerary objects, called associated grave goods in Public Resources Code Section 5097.98, are also to be treated according to this statute.
- B. If Native American human remains and/or grave goods discovered or recognized on the project site, then all construction activities shall immediately cease. Health and Safety Code Section 7050.5 dictates that any discoveries of human skeletal material shall be immediately reported to the County Coroner and all ground-disturbing activities shall immediately halt and shall remain halted until the coroner has determined the nature of the remains. If the coroner recognizes the human remains to be those of a Native American or has reason to believe they are Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission, and Public Resources Code Section 5097.98 shall be followed.
- C. Human remains and grave/burial goods shall be treated alike per California Public Resources Code section 5097.98(d)(1) and (2).
- D. Construction activities may resume in other parts of the project site at a minimum of 200 feet away from discovered human remains and/or burial goods, if the Kizh determines in its sole discretion that resuming construction activities at that distance is acceptable and provides the project manager express consent of that determination (along with any other mitigation measures the Kizh monitor and/or archaeologist deems necessary). (CEQA Guidelines Section 15064.5(f).)
- E. Preservation in place (i.e., avoidance) is the preferred manner of treatment for discovered human remains and/or burial goods. Any historic archaeological material that is not Native American in origin (non-TCR) shall be curated at a public, non-profit institution with a research interest in the materials, such as the Natural History Museum of Los Angeles County or the Fowler Museum, if such an institution agrees to accept the material. If no institution accepts the archaeological material, it shall be offered to a local school or historical society in the area for educational purposes.
- F. Any discovery of human remains/burial goods shall be kept confidential to prevent further disturbance.

- **MM-TCR-3** Procedures for Burials and Funerary Remains.
 - A. As the Most Likely Descendant ("MLD"), the Koo-nas-gna Burial Policy shall be implemented. To the Tribe, the term "human remains" encompasses more than human bones. In ancient as well as historic times, Tribal Traditions included, but were not limited to, the preparation of the soil for burial, the burial of funerary objects with the deceased, and the ceremonial burning of human remains.
 - B. If the discovery of human remains includes four or more burials, the discovery location shall be treated as a cemetery and a separate treatment plan shall be created.
 - C. The prepared soil and cremation soils are to be treated in the same manner as bone fragments that remain intact. Associated funerary objects are objects that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later; other items made exclusively for burial purposes or to contain human remains can also be considered as associated funerary objects. Cremations will either be removed in bulk or by means as necessary to ensure complete recovery of all sacred materials.
 - D. In the case where discovered human remains cannot be fully documented and recovered on the same day, the remains will be covered with muslin cloth and a steel plate that can be moved by heavy equipment placed over the excavation opening to protect the remains. If this type of steel plate is not available, a 24-hour guard should be posted outside of working hours. The Tribe will make every effort to recommend diverting the project and keeping the remains in situ and protected. If the project cannot be diverted, it may be determined that burials will be removed.
 - E. In the event preservation in place is not possible despite good faith efforts by the project applicant/developer and/or landowner, before ground-disturbing activities may resume on the project site, the landowner shall arrange a designated site location within the footprint of the project for the respectful reburial of the human remains and/or ceremonial objects.

- F. Each occurrence of human remains and associated funerary objects will be stored using opaque cloth bags. All human remains, funerary objects, sacred objects and objects of cultural patrimony will be removed to a secure container on site if possible. These items should be retained and reburied within six months of recovery. The site of reburial/repatriation shall be on the project site but at a location agreed upon between the Tribe and the landowner at a site to be protected in perpetuity. There shall be no publicity regarding any cultural materials recovered.
- G. The Tribe will work closely with the project's qualified archaeologist to ensure that the excavation is treated carefully, ethically and respectfully. If data recovery is approved by the Tribe, documentation shall be prepared and shall include (at a minimum) detailed descriptive notes and sketches. All data recovery data recovery-related forms of documentation shall be approved in advance by the Tribe. If any data recovery is performed, once complete, a final report shall be submitted to the Tribe and the NAHC. The Tribe does NOT authorize any scientific study or the utilization of any invasive and/or destructive diagnostics on human remains.

8. IMPACTS AFTER MITIGATION MEASURES

There are no known historic properties, cultural resources, or tribal cultural resources that would be impacted by the Project. In the event that any unknown resources that may meet the criteria to be considered historic properties, cultural resources, or tribal cultural resources are found during construction, implementation of Mitigation Measures MM-CUL-1 and MM-CUL-2 and MM-TCR-1, MM-TCR-2, and MM-TCR-3 would reduce any potential impacts to less than significant.

9. **REFERENCES**

- Amtrak, 2019, "Irvine, CA (IRV)." Electronic document, https://www.greatamericanstations.com/stations/irvine-ca-irv/, accessed August 18, 2020.
- Arnold, Jeanne E., Michael Walsh, and Sandra E. Hollimon, 2004, The Archaeology of California. *Journal of Archaeological Research* 12(1):1–73.
- Ballester, D. and B. Tang, 2002, DPR 523 Record: P-30-176663. Prepared by CRM Tech, Inc., Riverside, California. On file at the South Central Coastal Information Center, California State University, Fullerton, California.
- Bean, Lowell John, and Charles R. Smith, 1978, Gabrielino. In *Handbook of North American Indians*, Vol. 9, pp. 538–562. Robert F. Heizer, editor. Smithsonian Institution, Washington, D.C.
- Bell, Horace, 1881, Reminiscences of a Ranger or Early Times in Southern California. Yarnel, Caystile, and Mathes, Los Angeles.
- City of Irvine, 2015, General Plan Cultural Resource Element. Electronic document, http://alfresco.cityofirvine.org/alfresco/guestDownload/direct?path=/Company%20Home/Shared/C D/Planning%20and%20Development/General%20Plan/06.%20Cultural%20Resources%20Element%20 -%20Aug%202015.pdf
- City of Irvine, 2003, Final Program Environmental Impact Report Volume I for the Orange County Great Park (Annexation, General Plan Amendment, Zoning and Related Actions). Electronic document, http://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=31598, accessed August 18, 2020.
- Cleland, Robert, 1952, The Irvine Ranch of Orange County, 1810-1950. Huntington Library, San Marino, California.
- JRP Historical Consulting Services (JRP), 1998, Architectural Survey of Marine Corps Air Station, El Toro.
 Prepared for the Department of the Navy, Naval Facilities Engineering Command, Southwest Division,
 San Diego. Prepared by JRP Historical Consulting Services, Inc.
- Englehardt, Zephyrin, 1927, Mission San Fernando Rey, the Mission of the Valley. Franciscan Herald Press, Chicago, Illinois.

Erlandson, Jon M., 1994, Early Hunter-Gatherers of the California Coast. Plenum Press, New York.

Frierman, Jay D., 1992, The Pastoral Period in Los Angeles: Life on the Ranchos and in the Pueblo,
1800-1850. In Historical Archaeology of Nineteenth-Century California, edited by Jay D. Frierman and
Roberta S. Greenwood, pp. 1-52. William Andrews Clark Memorial Library, University of California,
Los Angeles.

- Garcia, K., and M. Vader, 2007, DPR 523 Record: P-30-100372. Prepared by PCR Services Corporation, Irvine, California. On file at the South Central Coastal Information Center, California State University, Fullerton, California.
- Gumprecht, Blake, 1999, The Los Angeles River: Its Life, Death and Possible Rebirth. John Hopkins University Press, Baltimore, Maryland.
- HDR, 2021, Technical Memorandum: OCTA OCMF Extended Phase I Cultural Resource Survey. Prepared for Orange County Transportation Authority, November 29, 2021.
- Koerper, Henry C., Roger D. Mason, and Mark L. Peterson, 2002, Complexity, Demography, and Change in Late Holocene Orange County. In Catalysts to Complexity: Late Holocene Societies of the California Coast, edited by Jon M. Erlandson and Terry L. Jones, pp. 63-81. University of California, Los Angeles, Institute of Archaeology, Perspectives in California Archaeology, Vol. 6. Los Angeles.
- Kroeber, Alfred L., 1925, Handbook of Indians of California. *Bureau of American Ethnology Bulletin 78*, Smithsonian Institution, Washington D.C.
- Liebeck, Judy, 1988, Irvine. In A Hundred Years of Yesterdays: a centennial history of the people of Orange County and their communities, Cramer, E., K. Dixon, D. Marsh, P. Brigandi, and C. Blamer (eds), pages 119-121. Orange County Centennial Inc., Santa Ana.
- McCawley, William, 1996, The First Angelinos: The Gabrielino Indians of Los Angeles. Malki Museum Press. Banning.
- McCormick, S., 2007, DPR 523 Record Update: P-30-176663. Prepared by Cogstone Resource Management. On file at the South Central Coastal Information Center, California State University, Fullerton, California.
- Morton, Douglas M. and Fred K. Miller. 2006. *Geologic Map of the San Bernardino and Santa Ana, California*. United States Geological Survey.
- National Bridge Inventory Data (NBI), 2020, "Orange County." Electronic database, https://bridgereports.com/ca/orange/, accessed August 18, 2020.
- Nationwide Environmental Title Research (NETR), 2020 Historic Aerials. Years accessed: 1938, 1946, 1952, 1963, 1967, 1972, 1980, 1994, 2002, 2010, and 2016. Electronic database, https://www.historicaerials.com/ accessed August 18, 2020.
- Phillips, George Harwood, 2010, Vineyards and Vaqueros: Indian Labor and the Economic Expansion of Southern California, 1771-1877. Arthur H. Clark Co., Norman, Oklahoma.
- Reid, Hugo, 1939 [1852], Letters on the Los Angeles County Indians. In *A Scotch Paisano in Old Los Angeles*, by Susanna Bryant Dakin, pp. 215–286. Berkeley, CA: University of California Press.

- Rondeau, Michael F., 2008, Fluted Points of the Far West. *Proceedings of the Society for California* Archaeology 21:265–-274.
- Schuetz-Miller, Mardith K., 1994, Building and Builders in Hispanic California, 1769-1850. Southwestern Mission Research Center, Tucson, Arizona.
- Sherfy, Marcella and W. Ray Luce. 1998. National Register Bulletin No. 22: How to Evaluate and Nominate Potential National Register Properties that have Achieved Significance Within the Last 50 Years. U.S.
 Department of the Interior, National Park Service, National Register of Historic Places.
- Southern California Regional Rail Authority (SCRRA), Metrolink System Map, October 2019, Available at: https://metrolinktrains.com/about/agency/
- Smith, F. G. and C. D. Harper, 2007, DPR 523 Record Update: P-30-176663. Prepared by Parsons Corporation. On file at the South Central Coastal Information Center, California State University, Fullerton, California.
- Stickel, E. Gary, 2008, The Farpoint Site (CA-LAN-451): A Unique Clovis Culture Site of the First Americans on the Malibu Coast. Online at http://farpointsite.blogspot.com/2008/02/farpoint-site-ca-lan-451unique-clovis.html. Accessed December 27, 2013.
- United States Army Corps of Engineers (USACE), 2000, California Historic Military Buildings and Structures Inventory: Volume 1: Inventories of Historic Buildings and Structures on California Military Installations. Prepared for the United States Army Corps of Engineers. Prepared by the Foster Wheeler Environmental Corporation and JRP Historical Consulting Services.
- Wallace, William J., 1955, A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11(3):214–230.
- Warren, Claude N., 1968, Cultural Traditions and Ecological Adaptation on the Southern California Coast. In Archaic Prehistory in the Western United States, edited by Cynthia Irwin-Williams. Eastern New Mexico University Contributions in Anthropology 1(3):1–14.

Wilkman, Nancy, and Jon Wilkman, 2006, Picturing Los Angeles. Gibbs Smith Publishers, Salt Lake City.

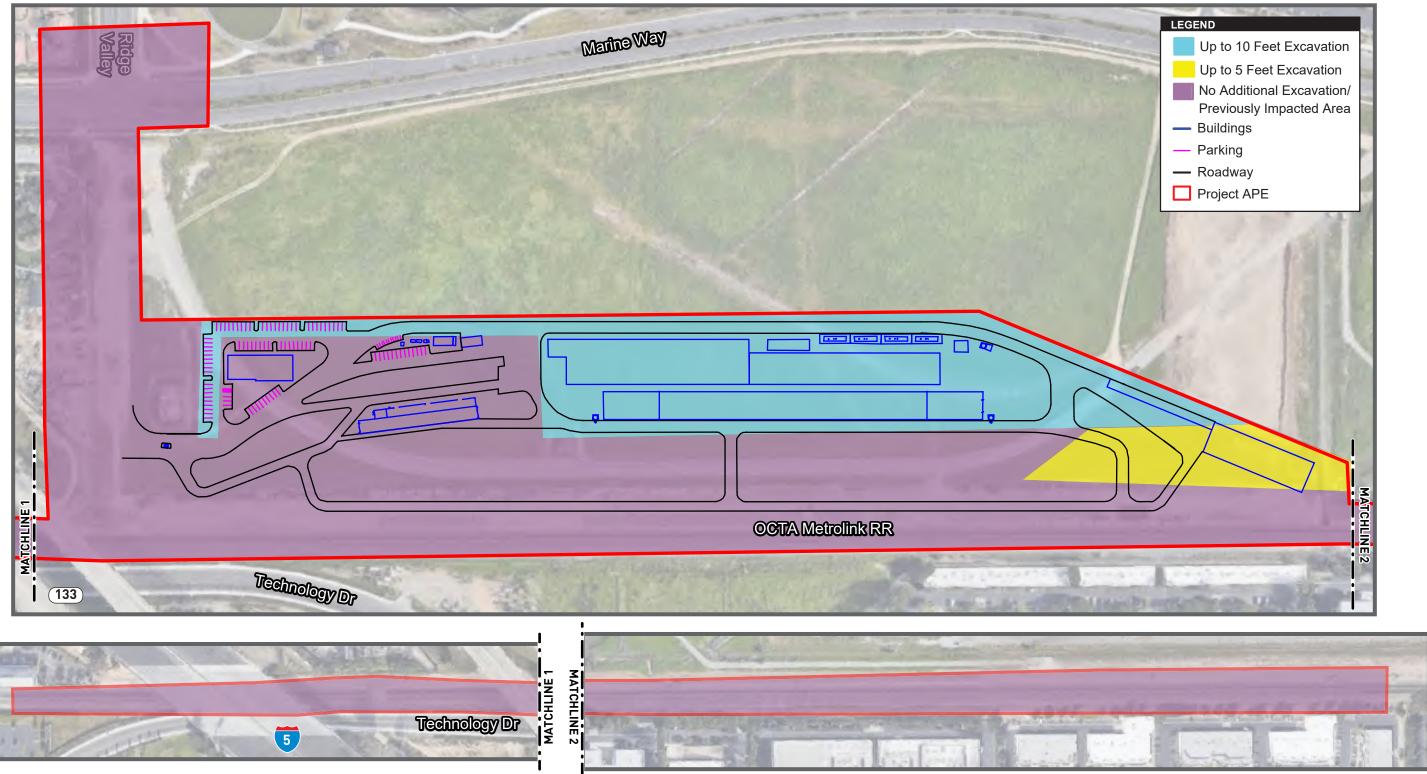
Attachment A

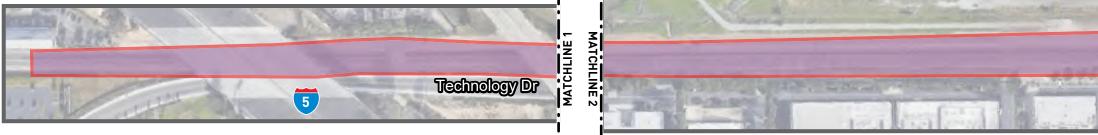
Area of Potential Effects Map



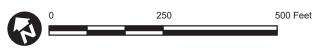
Metrolink Orange County Maintenance Facility

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Source: GoogleEarth 2021, AECOM



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FIGURE A2: PROPOSED EXCAVATION DEPTHS WITHIN APE

Attachment B

Records Search Results Confidential

Attachment C

AB 52 Consultation Confidential Attachment D

DPR 523 Forms Confidential

Attachment E

Extended Phase I

Technical Memorandum

| Subject: | OCTA OCMF Extended Phase I Cultural Resource Survey |
|----------|---|
| Date: | November 29, 2021 |
| From: | Daniel Leard, Archaeologist, HDR |
| То: | Lora Cross, Project Manager, Orange County Transportation Authority |

1. Introduction

HDR completed Extended Phase I (XPI) cultural resources identification work in support of Orange County Transit Authority's (OCTA) Orange County Maintenance Facility (OCMF) Project (Project). In compliance with the requirements of the California Environmental Quality Act and Section 106 of the National Historic Preservation Act, AECOM cultural resources specialists completed a Phase I cultural resources investigation of the designated Area of Potential Effects (APE) as defined in 36 CFR 800.16(d), that included archival research at the California Historical Resources Information System records search from the South Central Coastal Information Center, a search of the Sacred Lands File, Native American Consultation, and completion of archaeological and built environment field surveys. The results of the cultural resources investigations were presented in a technical memorandum prepared for OCTA by AECOM in 2021. Archaeological field survey was limited to pedestrian surface inspection of the APE. Based on the results of the survey, no historic properties, historical resources, or unique archaeological resources were identified within the APE. However, the Project area was determined to have a moderate sensitivity to encounter buried cultural resources.

The purpose of the XPI was to determine the presence or absence of buried historic or prehistoric cultural resources and to further assess the overall archaeological sensitivity in portions of the OCMF project area where deep Project-related excavations are proposed. Cultural resource presence-and-absence testing was conducted by HDR from October 25 to November 4, 2021. This technical memorandum documents the results of the XPI to append to the archaeological survey report previously prepared by AECOM.

2. Study Area

The proposed OCMF is planned to be located on a 21.3-acre parcel owned by OCTA in the City of Irvine. The site is adjacent to the Metrolink Orange subdivision between mileposts 183.50 and 184.00 and the future Ridge Valley Road extension, and approximately 400 feet south of Marine Way (**Figure 1**). The APE includes the Project Site (which includes access roads and construction staging areas) and adjacent areas. The vertical extent of the APE encompasses the maximum depth of excavation and grading, which may extend up to 10 feet beneath the existing ground surface. Scoping for the XPI effort was based an aerial exhibit showing anticipated areas of

Project cut (deeper than 2 feet) produced by OCTA consultant Gannett Fleming and transmitted to the Project Delivery Team on October 14, 2021. The XPI area includes approximately 8.4 acres where ground excavation was expected, primarily along the northeast side of the 21.3-acre Project APE (**Figure 1** and **Figure 2**).

3. Methods

Professional services were performed by individuals who meet the Secretary of the Interior's Professional Qualification Standards for Archaeology (48 Federal Register 44716). Field efforts were led by Daniel Leonard, PhD, and Daniel Leard, both of whom are Registered Professional Archaeologists. Katherine Lemberg provided geographical information system and global positioning system support.

XPI investigations consisted of excavation of subsurface shovel test probes (STPs) to confirm the presence or absence of buried cultural materials. STPs were placed at 30-meter (100-foot) intervals across the 8.4-acre XPI area and numbered sequentially (**Figure 1**). Initially, 41 STPs were planned within the 30 m grid. Each STP measured approximately 50 centimeters (cm) in diameter and was excavated with hand tools (e.g., picks, shovels, trowels, augers) to a maximum depth of 2 meters (6.5 feet) below surface level or upon reaching culturally sterile sediments. Shovels were primarily used to excavate to a maximum workable depth of approximately 80 cm. Hand augers, using either a 4-inch diameter (sand auger) or 6-inch diameter (clay auger) bucket depending on the soil texture, were used for deeper testing. All soils recovered were dry-sifted through 1/8-inch wire mesh screens. All cultural material discovered during testing was recorded and reburied. Data from the testing—including location, depth of excavation, soil type and consistency, stratigraphy, and descriptions of any cultural materials recovered—was recorded on standardized forms. Photographs were taken of each STP prior to backfilling with the excavated soils. The location of each STP was recorded using a hand-held global positioning system unit with sub-meter accuracy capabilities.

4. Results

As a result of the survey, HDR archaeologists completed 40 STPs within the 8.4-acre XPI area. STP 4 was planned between STP 3 and STP 5 but not excavated because of the existing roadway at this location. Full descriptions of each test are presented in Error! Reference source not found.. Soil types varied from silty or sandy loams to dense clays or silty clay loam with varying trace gravels. Layers of fine loamy silt or sand and loose gravelly sands were found at depths below approximately 150 cm. As expected, moderate to significant soil disturbance was observed across the testing area, likely resulting from the development of Marine Corps Air Station El Toro between 1942 and 1999 or previous historic plowing. Depth of visible disturbance varied from 20 cm to as much as 80 cm below surface level depending on location. Areas with the most significant disturbance were found at the southeastern and northwestern ends of the XPI area at STPs 1-5, 10 11, 18, 19, and 33-41. These tests exhibited top layers of highly compacted artificial fill consisting of mixed sandy sediments with concrete slurry and imported gravel with chunks of asphalt and concrete/mortar, or, in some cases loose sand and gravel road base (**Figure 3** and

Figure 4). In the remaining tests, disturbance was less obvious; however, possible grading or historic plowing and compaction of the soil was still evident to depths varying between 15 cm and 40 cm below surface level. Natural disturbance from rodent burrowing was also visible across the site. Soil disturbance at STPs 16 (**Figure 5**), 17 and 20-30 appeared relatively minimal.

All tests were negative for the presence of prehistoric cultural material. A small amount of likely modern debris was identified in eighteen of the tests (STPs 2, 5, 7, 8, 12, 13, 14, 19, 23, 24, 25, 32, 36, 37, 38, 39, 40, and 41). This included small bottle glass fragments, window glass fragments, several plastic fragments, green PVC pipe pieces, several wire nails, an aluminum can tab, one piece of wire, and one possible piece of asbestos, all found at shallow depths and within disturbed soils. All material was analyzed in the field and reburied upon completion of the test. None of the material recovered could be identified as older than 50 years in age.

5. Recommendations

No historic properties, historic resources, or unique archaeological resources were identified during the XPI. Based on the results of the XPI, it is not anticipated that the Project will impact buried cultural resources. Implementation of mitigation measures MM-CUL-1 through MM-CUL-3 recommended in the *Technical Memorandum Cultural Resources* for the Metrolink Orange County Maintenance Facility completed by AECOM in 2021 would reduce any impacts to unknown archaeological resources encountered during excavations to a less than significant level.

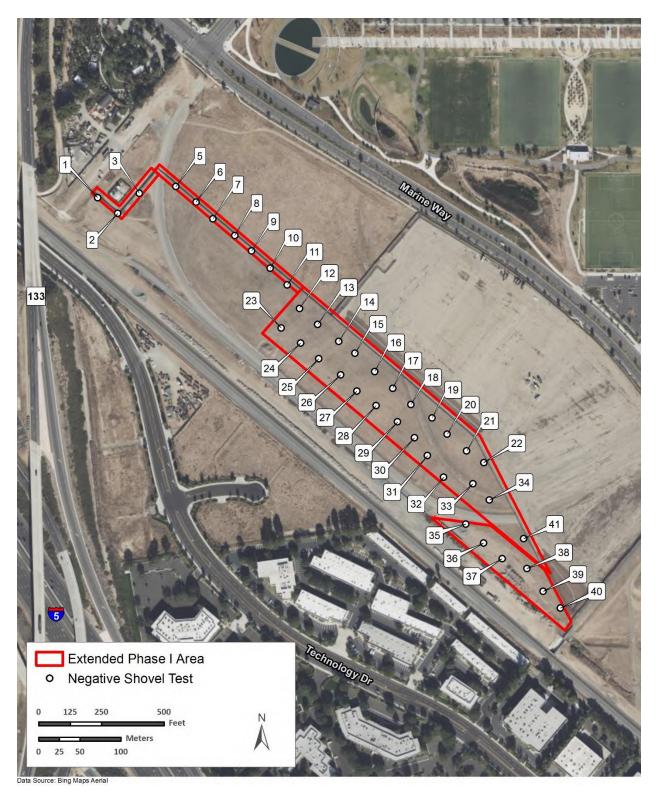


Figure 1. Extended Phase I Study Area and Subsurface Test Locations



Figure 2. Overview of XPI area from location of STP 34, viewing northwest



Figure 3. Soil profile at STP 36 showing layer of compacted fill beneath loose overburden

FS



Figure 4. Soil profile at STP 3 showing deep layer of road base



Figure 5. Soil profile at STP 16

Table 1. Excavation notes for STPs 1 through 41

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|---|--|--|--|--|
| | 0-22 | 10YR5/3 brown | Sandy loam, high compaction, with 40-50% poorly sorted gravels | None | Possible artificial fill or reworked and compacted topsoil | None noted |
| | 22-55 | 10YR4/2 dark grayish brown | Clayey silt loam, very compact | None | None noted | None noted |
| 1 | 55-120 | 10YR4/3 brown | Silty loam, moderate compaction | None | None noted | Gradual soil transition; sand auger after 80 cm |
| | 120-160 | 10YR3.5/2 very dark grayish brown | Silty clay loam | None | None noted | None noted |
| | 160-200 | 10YR4/3 brown | Clayey silt loam, less compact | None | None noted | None noted |
| | 0-9 | 10YR4/3 brown | Sandy loam, moderate compaction with 15% gravel | None | None noted | None noted |
| 2 | 9-45 | 10YR5/3 brown | Sandy loam, rock hard fill with slurry mix, 20-25% gravel | Bits of asphalt; colorless glass fragments; 1 wire nail | None noted | None noted |
| | 45-80 | 10YR3/2 very dark grayish brown | Sandy Clay, high compaction | None | None noted | None noted |
| 3 | 0-60 | | Coarse sand and gravel road base | None | Artificial fill | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|--------------|---------------------------------------|---|--|---|--|
| | 60-75 | 10YR3/2 very dark grayish brown | Loamy clay | None | None noted | None noted |
| | 75-80 | 10YR4/3 brown | Gravelly coarse sand with clay | None | None noted | Too much large gravel to auger through |
| 4 | Not excavate | ed because of th | ne existing roadway at this loca | ation | I | |
| | 0-7 | 10YR4/2 dark grayish brown | Loamy loose sediments | None | Recently spread dirt | None noted |
| | 7-45 | 10YR5/3 brown | Sandy clay loam, rock hard, dry, with 30-50% gravel content | Several small pieces of asphalt | Appears to be artificial fill with slurry/gravel mix | None noted |
| 5 | 45-80 | 10YR3/3 dark brown | Sandy loam, compact, with varying amounts of gravel | Small bits of asphalt and several pieces of green PVC plastic from 45-60cm | Likely disturbed to 60 cm depth | No clear soil transition |
| | 80-180 | 10YR3/3 dark brown | Silty clay loam getting sandier after 150 cm; medium compaction | None | None noted | Sand auger after 80 cm |
| | | 10YR4/4 dark yellowish brown | Silty loam to very fine sandy loam | None | None noted | None noted |
| 6 | 0-30 | 10YR4/3 brown | Sandy loam, high compaction | None | None noted | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|---------------------------------------|---|--------------------------|--|----------------------------------|
| | 30-60 | 10YR3/3 dark brown | Silty clay loam, medium compaction | None | None noted | None noted |
| | 60-80 | 10YR4/3 brown | Loam, medium compaction | None | None noted | Subtle soil transition |
| | 0-20 | | Mix of wood chip debris and loose sediments | None | Not natural | None noted |
| 7 | 20-35 | 10YR3/2 very dark grayish brown | Very compact sandy clay loam with small gravels | 1 possible asbestos tile | Likely artificial fill or plowed and recompacted | None noted |
| | 35-100 | 10YR3/2 very dark grayish brown | Clay loam or loamy clay, speckled with light sand or carbonates | None | None noted | None noted |
| | 100-160 | 10YR5/3 brown | Clayey loam to silty clay loam, getting gradually lighter in color and less compact | None | None noted | None noted |
| | 160-200 | 10YR6/3 pale brown | Sandy silt, loosely compacted | None | None noted | None noted |
| 8 | 0-25 | 10YR4/3 brown | Clayey loam with imported shale gravel, compact | Plastic | Likely previously plowed or graded and recompacted | None noted |
| | 25-80 | 10YR4/3 brown | Loam, medium compaction | None | | Appears to be natural horizon |
| | 80-130 | 10YR3/3 dark brown | Loamy clay with carbonate stringers | None | None noted | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|---------------------------------------|---|-------------------|---|----------------------------------|
| | 0-30 | 10YR4/3 brown | Clayey loam with imported shale gravel, compact | None | Likely previously plowed or graded and recompacted | None noted |
| | 30-90 | 10YR3/3 dark brown | Clayey loam, medium compaction | None | | Appears to be natural horizon |
| 9 | 90-130 | 10YR3/2 very dark grayish brown | Loamy clay with speckles of light sand or carbonates | None | None noted | None noted |
| | 130-150 | 10YR3/3- 4/3 dark brown | Mottled loamy clay with carbonate stringers | None | None noted | None noted |
| | 150-190 | 10YR5/3 brown | Clayey silt loam | None | None noted | None noted |
| | 190-200 | 10YR6/3 pale brown | Silt, very soft | None | None noted | Possible E horizon |
| | 0-37 | 10YR7/3 very pale brown | 60-70% imported gravel with compact sand and silt | None | Looks like slurry fill | None noted |
| 10 | 37-75 | 10YR4/3 brown | Clayey silt loam, very compact | None | None noted | <10% gravel |
| | 75-120 | 10YR4/3 brown | Silty loam, moderate compaction | None | None noted | Sand auger after 80 cm |
| | 0-30 | | Crushed shale base (no soil) | None | Artificial fill | None noted |
| 11 | 30-80 | 10YR4/3 brown | Clayey sandy loam, compact | None | None noted | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|---------------------------------------|--|--|---|---------------------------------------|
| | 80-100 | 10YR5/3 brown | Fine sandy silt, loosely compacted | None | None noted | Sand auger after 80 cm |
| | 100-150 | 10YR4/3 brown | Clayey loam, compact | None | None noted | Too difficult to auger past 150 cm |
| | 0-5 | 10YR4/2 dark grayish brown | Loose loamy sediments | 1 piece of window glass; lumber pieces | Loose dirt spread over surface | None noted |
| 12 | 5-25 | 10YR5/3 brown | Silty clay loam, compact, with 25% large gravels | None | Likely artificial fill or plowed and recompacted | None noted |
| | 25-150 | 10YR4/3 - 3/2 dark brown | Clayey silt loam, medium compaction | None | None noted | Sand auger after 80 cm |
| | 150-200 | 10YR4/4 - 5/4 yellowish brown | Fine sandy silt, loosely compacted; changing to 5/4 after 180 cm | None | None noted | Gradual soil transition |
| 13 | 0-10 | 10YR5/3 brown | Loose mixed sediments | 10-15 pieces of tinted flat glass; 1 piece of colorless glass; 2 pieces of white plastic | Loose dirt spread over surface | None noted |
| | 10-25 | 10YR4/3 brown | Compacted mixed sand and silt with some clay | Several pieces of plastic | Reworked and compacted soil | None noted |
| | 25-70 | 10YR3/4 dark yellowish brown | Silty loam, medium compaction | None | None noted | Appears to be natural horizon |
| | 70-120 | 10YR3/2 very dark grayish brown | Loamy clay or clay loam, compact | None | None noted | Sand auger after 80 cm |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|-------------------------------|---|---------------------------|-----------------------------|----------------------------------|
| | | 10YR5/4 yellowish brown | Sandy silt loam, loosely compacted | None | None noted | Gradual soil transitions |
| | | 7.5YR5/4 brown | Loose, dry silty sand | None | None noted | None noted |
| | 0-20 | 10YR5/3-4/3 brown | Mixed sediments, very compact but lacks structure | Plastic PVC pipe fragment | Reworked and compacted soil | None noted |
| | 20-75 | 10YR4/3 brown | Sandy clay loam, medium compaction | None | None noted | Appears to be natural horizon |
| 14 | 75-170 | 10YR5/3 brown | Silty sand loam, medium compaction. A greenish mudstone surface is present at around 110 cm with pockets of clay beneath. | None | None noted | None noted |
| | 170-200 | 10YR5/4 yellowish brown | Silty sand, loosely compacted | None | None noted | None noted |
| | 0-25 | 10YR5/3 brown | Mixed sediments, very compact but lacks structure | None | Reworked and compacted soil | None noted |
| 15 | 25-70 | 10YR4/3 brown | Silty loam, compact | None | None noted | Appears to be natural horizon |
| | 70-90 | 10YR4.5/3 brown | Sandy silt loam, medium compaction | None | None noted | Sand auger after 80 cm |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|------------------------------------|--|-------------------|--|----------------------------------|
| | 90-200 | 10YR5/4 yellowish brown | Fine silty sand, loosely compacted, transitioning to lighter color and sandier with depth | None | None noted | None noted |
| | 0-25 | 10YR5/3 brown | Silty loam, very compact | None | Likely plowed or graded and recompacted | None noted |
| | 25-80 | 10YR4/3 brown | Sandy silt loam, medium compaction | None | None noted | Appears to be natural horizon |
| 16 | 80-180 | 10YR4/4 dark yellowish brown | Clayey sand, loosely compacted | None | None noted | Sand auger after 80 cm |
| | 180-200 | 10YR5/4 yellowish brown | Gravelly fine sand | None | None noted | None noted |
| 17 | 0-65 | 10YR4/3 brown | Silty sand loam, dry and compact from 0-20 cm; slightly less compact 20-65 cm | None | Appears minimal but likely historically plowed (0-20 cm) | None noted |
| | 65-100 | 10YR4/4 dark yellowish brown | Loamy sand, low compaction | None | None noted | Sand auger after 80 cm |
| | 100-130 | 7.5YR5/3 brown | Clayey silt, compact, with carbonate stringers after 120 cm | None | None noted | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|------------------------------------|--|----------------------------|--|-------------------------------|
| | 0-15 | | Loose sand and large gravel overburden | None | Road berm buildup | None noted |
| 18 | 15-40 | | 75% gravel cemented with yellow sand/slurry mix | None | Road base | None noted |
| | 40-60 | | 75% gravel with compact sand and clay | None | Road base | Impenetrable with hand tools |
| | 0-10 | 10YR5/3 brown | Gravelly loose loam | None | Rodent burrowing | None noted |
| | 10-40 | 10YR5/3 brown | Silty loam, very compact | 1 colorless glass fragment | Likely plowed or graded and recompacted | None noted |
| 19 | 40-75 | 10YR4/3 brown | Silty loam, compact | None | None noted | Appears to be natural horizon |
| | 75-160 | 10YR4/4 dark yellowish brown | Clayey silt, getting lighter in color with depth | None | None noted | None noted |
| | 160-200 | 10YR5/4 yellowish brown | Fine sand, loosely compacted | None | None noted | None noted |
| 20 | 0-50 | 10YR5/3 brown | Silty loam, very compact, dry | None | Likely plowed/recompacted | None noted |
| 20 | 50-75 | 10YR4/3 brown | Silty loam, compact | None | None noted | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|-------------------------------------|--|-------------------|------------------|-----------------------------------|
| | 75-130 | | Sandy loam, medium compaction | None | None noted | None noted |
| | 130-200 | 10YR5/4 yellowish brown | Fine sand, loosely compacted | None | None noted | None noted |
| | 0-40 | 7.5YR3/2 dark brown | Silty loam, damp and soft | None | Rodent burrowing | Appears relatively undisturbed |
| | 40-100 | 7.5YR3/3 dark brown | Silty loam, damp and soft | None | None noted | Sand auger after 90 cm |
| 21 | 100-120 | | Clayey sand loam, moist and loosely compacted | None | None noted | None noted |
| | 120-160 | 7.5YR5/4 brown | Loamy sand, low compaction | None | None noted | None noted |
| | 160-200 | 10YR5/4 yellowish brown | Fine sandy silt, loosely compacted | None | None noted | None noted |
| | 0-90 | 10YR4/3 brown | Silty loam, compact | None | None noted | Sand auger after 80 cm |
| 22 | 90-180 | 10YR5/4 yellowish brown | Sandy silt | None | None noted | None noted |
| | 180-200 | 10YR6/4 light yellowish brown | Loamy silt, loose compaction | None | None noted | 15% angular shale gravel |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|-------------------------------|---|--|--------------------------------|------------------------|
| | 0-15 | 10YR4/3 brown | Gravelly sand and silt, very compact, lacks soil structure | | Graded and recompacted dirt | None noted |
| | 15-40 | 7.5YR3/2 dark brown | Clayey loam, compact | None | None noted | None noted |
| 23 | 40-70 | 10YR5/3 brown | Loamy silt, medium compaction | None | None noted | None noted |
| | 70-120 | dark grayish | Clay loam to loamy clay with carbonate stringers below 90 cm, compact | None | None noted | Hand auger after 80 cm |
| | 120-200 | 7.5YR5/4 brown | Loamy silt, compact | None | None noted | None noted |
| | 0-20 | 10YR4/3 brown | Gravelly sand and silt, very compact, lacks soil structure | | Graded and recompacted dirt | None noted |
| 24 | 20-150 | | Silty clay loam to clayey silt, compact | 1 piece of plastic that may have fallen from above | None noted | Hand auger after 80 cm |
| | 150-120 | 10YR5/4 yellowish brown | Fine sandy silt, loosely compacted | None | None noted | None noted |
| 25 | 0-28 | 10YR5/3 brown | Sandy loam to sandy clay loam, dry with moderate compaction | Piece of plastic | None noted | <10% gravel |
| | 28-50 | 10YR4/3 brown | Silty clay loam, moderate compaction | None | None noted | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|------------------------------------|---|-------------------|--|------------------------|
| | 50-70 | 10YR3/2 - 5/3 | Compact silty loam mottled with 20% soft silt | None | None noted | None noted |
| | 70-80 | 10YR4/2 dark grayish brown | Silty clay loam, moderate compaction | None | None noted | None noted |
| | 80-180 | 10YR4/3 brown | Fine sandy loam, low compaction | None | None noted | Sand auger after 80 cm |
| | 180-200 | 10YR4/4 dark yellowish brown | Fine sandy loam with increasing gravel content, loose | None | None noted | None noted |
| | 0-30 | 10YR4/3 brown | Silty loam, dry and compact | None | Likely plowed or graded and recompacted | None noted |
| | 30-80 | 7.5YR4/2 brown | Clayey loam, compact | None | None noted | None noted |
| 26 | 80-150 | 10YR5/4 yellowish brown | Clayey sand, loosely compacted | None | None noted | None noted |
| | 150-200 | 10YR6/3 pale brown | Gravelly sand, loosely compacted | None | None noted | None noted |
| 27 | 0-80 | 10YR4/3 brown | Clayey silt loam, compact | None | Bioturbation from 0-30 cm | None noted |
| 27 | 80-140 | 7.5YR6/3 pale brown | Loamy silt, compact | None | None noted | Hand auger after 80 cm |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|---------------------------------------|---|------------------------------|---|---------------------------------|
| | 0-5 | 10YR4/2 dark grayish brown | Loose loamy sediments | None | None noted | None noted |
| | 5-30 | 10YR4/3 brown | Silty clay loam, medium compaction | None | None noted | None noted |
| | 30-70 | 10YR4/2 dark grayish brown | J | None | None noted | None noted |
| 28 | 70-150 | 10YR5/4 yellowish brown | Silty loam, medium compaction | None | None noted | Sand auger after 80 cm |
| | 150-180 | 10YR4/3 brown | Silty loam, transitioning to 10YR5/3 -6/3 with depth | None | None noted | None noted |
| | 180-200 | 10YR5/4 yellowish brown | Fine sand, loosely compacted | None | None noted | None noted |
| | 0-30 | 10YR4/3 brown | Gravelly silty loam, very compact | None | Likely graded and recompacted soil | None noted |
| 29 | 30-80 | 10YR3/2 very dark grayish brown | Silty clay loam, compact | None | None noted | Unable to auger through clay |
| 30 | 0-100 | 10YR4/3 brown | loam; very compact but | and 1 large cobble between 0 | Likely plowed and possible reworked and compacted dirt from 0-40 cm | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|-------------------------------------|--|--|------------------------------------|------------------------------|
| | 100-150 | 10YR5/4 yellowish brown | Silty clay loam, low compaction, with calcium carbonates | None | None noted | Sand auger after 80 cm |
| | 150-200 | 10YR5/4 yellowish brown | Loam transitioning to gravelly loamy sand after 170 cm | None | None noted | 30% gravel at 190 cm |
| 31 | 0-40 | 10YR5/3 brown | Gravelly silty loam, very compact | None | Heavy bioturbation. | None noted |
| | 40-110 | 10YR4/3 brown | Clayey silt loam, compact | None | None noted | None noted |
| | 110-180 | 10YR5/3 - 5/4 yellowish brown | Loamy silt, dry and compact | None | None noted | None noted |
| | 180-200 | 10YR6/3 pale brown | Silt, loosely compacted | None | None noted | None noted |
| 32 | 0-40 | 10YR5/3 brown | Sandy loam, dry, very compact with 40% mixed gravel | Small concrete chunks and some plastic | Likely graded and recompacted soil | None noted |
| | 40-120 | 10YR4/3 - 5/3 brown | sandy silty loam, transitioning to loamy silt, medium compaction | None | None noted | Sand auger after 80 cm |
| | 120-160 | 10YR6/3 pale brown | Fine silty sand with approx. 25% gravel | None | None noted | Terminated at gravelly layer |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|-------|------------|---------------------------------------|--|-------------------|--|------------------------|
| 511 # | 0-10 | 10YR4/3 brown | Loose sand and silt | None | Artificial fill | None noted |
| | 10-30 | | Gravel and sand road base | None | Artificial fill | None noted |
| 33 | 30-60 | 10YR4/3 to 3/2 brown | Sandy loam or clayey sand loam, very compact | None | Mottled and lacks structure. Likely reworked or plowed soil and recompacted | Not uniform |
| | 60-120 | 10YR4/3 brown | Silty clay loam, moderate compaction | None | Looks like natural A horizon | Sand auger after 80 cm |
| | 120-200 | 10YR5/3 - 6/3 pale brown | Silty loam, low compaction, getting lighter with depth | None | None noted | None noted |
| 34 | 0-15 | 10YR4/3 brown | Gravelly sand, loose compaction, 25% poorly sorted gravels | None | Looks like road base | None noted |
| | 15-27 | 10YR5/3 brown | Gravelly sand continuation, but high compaction | None | Road base | None noted |
| | 27-37 | 10YR5/4 yellowish brown | Sand and gravel, rock hard, with 60-70% poorly sorted gravel | None | Road base | None noted |
| | 37-100 | 10YR3/2 very dark grayish brown | clay loam, high to moderate compaction | None | Tiny bits of asphalt down to 80 cm | Sand auger after 80 cm |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|------------------------------------|--|---|--|---|
| | 100-185 | | Silty clay loam, low compaction | None | None noted | None noted |
| | 185-200 | 10YR4/4 dark yellowish brown | Fine powdery sandy loam | None | None noted | None noted |
| 35 | 0-25 | 10YR5/3 brown | Highly compacted sandy loam | Several small pieces of asphalt and concrete | Reworked and compacted soil | None noted |
| | 25-70 | 10YR4/3 brown | sandy clay loam to sandy loam, very compact | Several small asphalt bits down to approx. 40 cm | | Mottled soil color between 10YR4/2 and 3/2. Very compact but breaks up easy. |
| | 70-170 | 10YR3/3 dark brown | Sandy loam, moderate compaction; transitions to 10YR4/4 after 120 cm | None | None noted | Sand auger after 80 cm |
| | 170-200 | 10YR5/4 yellowish brown | Loamy sand, low compaction | None | None noted | None noted |
| 36 | 0-25 | | Sandy loam, very compact, with 40% large gravels/ballast | | Appears to be artificial fill with slurry/gravel mix | None noted |
| | 25-55 | 10YR5/3 brown | Loamy sand, dry and compact | None | None noted | None noted |
| | 55-100 | | Clayey sand loam to silty loam, medium compaction | None | None noted | Clay auger after 60 cm |

| STP# | | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|---------|-------------------------------------|--|--|--|------------------------|
| | 100-150 | 10YR4/3 brown | Silty loam, medium compaction | None | None noted | None noted |
| | 150-200 | 10YR6/4 light yellowish brown | Fine sandy silt | None | None noted | Sand auger |
| 37 | 0-65 | grayish brown | Fine sandy loam, medium compaction, 60% large gravel from 0-10 cm decreasing to 20% gravel below 10cm | 1 wire nail; 1 colorless glass fragment; 1 piece of asphalt | Gravel consists of ballast from nearby stockpile to the south. Likely all artificial fill | None noted |
| | 65-80 | 10YR4/3 brown | Loamy sand, medium compaction, with 10% small gravels | Aluminum pull tab and a few small, rusted metal fragments | None noted | None noted |
| 38 | 0-40 | 10YR5/3 brown | Loamy sand, very compact, with poorly sorted gravel | Small pieces of asphalt and 1 Styrofoam chunk | Probable overburden with possible slurry mix | None noted |
| | 40-80 | 10YR4/3 brown | Loamy coarse sand, moderate compaction, with 40-50% mixed gravel | 2 rusted iron pieces and 1 piece of cement/mortar | Continuation of above disturbed layer, less dry | None noted |
| | 80-200 | 10YR4/3 brown | Fine sand, loosely compacted | None | None noted | Hand auger after 80 cm |
| 39 | 0-50 | 10YR5/3 brown | Sandy with clay, very compact, with 40-50% gravel | Several small glass and asphalt fragments | Appears to be artificial fill with slurry/imported gravel mix | None noted |
| | 50-75 | 10YR4/3 brown | Sandy loam, very compact, minimal gravel | None | None noted | None noted |

| STP# | Depth (cm) | Munsell Soil Color | Soil Description | Cultural Material | Disturbance | Comments |
|------|------------|-------------------------------------|--|--|---|--|
| | 75-90 | 10YR4/3 brown | Gravelly loamy sand with 20% poorly sorted gravel | None | None noted | Sand auger after 75 cm. Unable to excavate past 90 cm |
| | 0-50 | 10YR5/3 brown | Sandy with clay, compact, with 50-60% gravel | Several green glass fragments and chunks of asphalt and concrete | Appears to be artificial fill with slurry/gravel mix | None noted |
| 40 | 50-80 | 10YR4/3 brown | Sandy loam, very compact, 5% gravel | None | None noted | None noted |
| | 80-110 | 10YR4/3 brown | Loamy sand with 20% gravel | None | None noted | Sand auger after 80 cm. Terminated at large rock obstruction |
| | 0-5 | 10YR4/3 brown | Loose sand and silt | None | Loose overburden | None noted |
| | 5-30 | 10YR6/3 pale brown | Sandy silt loam with 40-50% gravel | 1 piece of colorless glass; several chunks of asphalt | Compacted artificial fill | None noted |
| 41 | 30-70 | 10YR5/3 brown | Silty loam, dry, very compact | None | Possibly compacted | None noted |
| | 70-180 | 10YR5/3 - 4/3 brown | Silty loam to fine sandy silt, gradually less compact | None | None noted | Sand auger after 70 cm |
| | 180-200 | 10YR6/4 light yellowish brown | Fine loamy sand, dry and loose | None | None noted | None noted |

Appendix E Technical Memorandum Hazards and Hazardous Materials

Metrolink Orange County Maintenance Facility

Prepared for: Orange County Transportation Authority

> 550 S. Main St. Orange, CA 92868 and

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

Prepared by:

ΑΞϹΟΜ

300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|---|----------|
| 0 | Draft Hazards & Hazardous Materials Technical Memorandum | 01/06/21 |
| 1 | Draft Hazards & Hazardous Materials Technical Memorandum (Incorporating OCTA's comments) | 02/25/21 |
| | | |

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1. INTRODUCTION

The Southern California Regional Railroad Authority (SCRRA) Metrolink Commuter Rail System (Metrolink) is proposing to construct a new Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project"). The Project would include several facilities including a transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth, sand silos, a maintenance facility, a maintenance facility extension, and 11 tracks. Approximately 80 employees would report to the Project. The Project consists of buildings that would have a total building area of approximately 90,000 square feet when combined. Metrolink currently operates two maintenance facilities across its service area: Central Maintenance Facility (CMF) in Los Angeles and Eastern Maintenance Facility (EMF) in San Bernardino County. Due to projected population expansion within its service area and the agency's goal to be prepared for the 2028 Los Angeles Summer Olympic Games, Metrolink will require an increased number of commuter rail services, as well as additional train storage and maintenance facilities associated with an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the Project would provide an optimal location for a new Metrolink maintenance facility. Metrolink's member agency, the Orange County Transportation Authority (OCTA), proposes to build this facility on an OCTA-owned parcel in the City of Irvine. OCTA is the lead agency under the California Environmental Quality Act (CEQA). The City of Irvine and SCRRA are the responsible agencies under CEQA.

The purpose of this memorandum is to present the results of a Hazardous Materials investigation and to describe the potential impacts to the proposed OCMF project.

2. PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

As a result of the projected population expansion within the five-county area (Orange County, Los Angeles County, San Bernardino County, Riverside County, and Ventura County) currently served by the SCRRA, Metrolink will require an increased number of commuter rail services to support the growth. Consequently, the Metrolink system (Figure 2.1-1) would require additional train storage and maintenance facilities to support an increased fleet size.



Figure 2.1-1 Metrolink System Map

Source: SCRRA (2019)

Metrolink's CMF facility is located on the east bank of the Los Angeles River near the Interstate 5 (I-5) and Interstate 10 (I-10) highways, just south of the location of the former Southern Pacific Taylor Yard. The CMF is currently near capacity, which will impact the ability to provide the necessary train servicing for planned service-expansion of various Metrolink lines throughout the system under the Southern California Optimized Rail Expansion (SCORE) program. By transferring a portion of the current fleet from CMF to the proposed OCMF (specifically the Orange County Line trains), capacity for the non-Orange County trains will be increased at CMF. The Orange County Line has the highest ridership within the Metrolink system; therefore, a maintenance facility to serve the Orange County area with sufficient storage and servicing capabilities for both locomotives and rail cars is critical to controlling operating costs. In order to optimize rail service in the region, the proposed facility development would need to be completed by 2028. The SCORE program may also require heavy overhaul capabilities at OCMF, subject to pending decisions regarding fleet technology and management.

The expansion of Orange County and overall Metrolink commuter rail service will ultimately require additional or expanded equipment servicing capabilities for both locomotives and rail cars. Since a significant portion of the fleet will be in Orange County, a maintenance facility located along the Metrolink route through Orange County would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and San Bernardino. The proposed maintenance facility would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Much of the inspection and maintenance activity is federally mandated and must be performed at specific intervals. The OCMF will also provide refueling services thus reducing fuel costs, reducing fuel consumption, and will reduce emissions. Currently trains operating in the Orange County Region must travel either the CMF or EMF for refueling, which are sometimes non-revenue runs. The location of the Project is on a 21.3-acre OCTA-owned parcel on Ridge Valley south of Marine Way in the City of Irvine (Project Site). The Project Site is located within the boundaries of a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was quitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City of Irvine that same year. OCTA then purchased the fee ownership of the Project Site from the City of Irvine. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley.

Prior to the current construction of the storage/set-out track, the Project Site was mostly vacant. The site currently includes 1,000-foot-long storage for miscellaneous rail equipment including temporary railroad bridges, signal houses, railroad ties, and signal components. Although not part of the Project, OCTA is currently installing a single 1,000-foot-long, single-ended storage track and fencing of the perimeter of the property to provide temporary storage of two trainsets and/or track maintenance equipment when necessary. There is a segment of an abandoned road, stormwater drains, and underground water transfer vault with a network of pipelines, valves and associated vents, that are currently not in use.

2.2 PROJECT DESCRIPTION

The OCMF would be located in the City of Irvine, on a 21.3-acre parcel owned by OCTA and adjacent to Marine Way and the Metrolink Orange subdivision between mileposts 183.50 and 184.00 on Metrolink's "Orange" Subdivision (Figure 2.2-1). The Project Site is located within Planning Area 51 of the updated City of Irvine General Plan, adopted in June 2015, and designated for the Great Park (formerly known as the Orange County Great Park (OCGP)) land use under the General Plan. Per the City's zoning ordinance, the proposed use is a conditionally allowable use under the existing zone; therefore, OCTA is submitting a Conditional Use Permit to the City of Irvine for approval.

The Project would be developed in two phases with an anticipated completion date of 2028. Phase 1 focuses on developing facilities needed for the storage and routine cleaning, inspection and servicing of the anticipated trainsets. The total area of the Phase 1 buildout would be approximately 20,996 square feet and would be comprised of the following facilities: the transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth and sand silos (Table 2.2-1). A total of 11 tracks would be built. The Phase 1 layout situates the train wash, fueling/sanding, and service and inspection tracks on the two tracks with the greatest tangent length, which are the ones nearest the railroad right of way ("ROW"). This is important in fitting a second fueling/sanding facility so that there is one at each end of the service and inspection platform to support having the locomotive at either end, all within tangent track. Additionally, six storage tracks and appurtenant features (air, water, head end power and toilet dump facilities) would be constructed. The storage tracks would be built near the middle of the site east of the service and inspection tracks. Phase 1 of the buildout would anticipate approximately 52 employees total throughout the entire day, split across three eight-hour shifts.

| Building/Facility/Item | Building Area | Building Height |
|--------------------------------|----------------------|------------------------|
| Transportation Building | 7,495 sq. ft. | 20 ft |
| Train Wash Building | 11,110 sq. ft. | 21 ft |
| Maintenance Building | 40,392 sq. ft. | 48 ft |
| Maintenance Building Expansion | 27,880 sq. ft. | |
| Utility Building | 981 sq. ft. | 20 ft |
| Pump House | 750 sq. ft. | 14 ft |
| Guard Booth | 36 sq. ft. | |
| Equipment Booth | 48 sq. ft. | |
| Sand Silos (2 Total) | 576 sq. ft. | |
| Total | 89,268 sq. ft. | |

Table 2.2-1 Building Specifications

Source: Gannett Fleming, Metrolink (February 2022)

Note: sq. ft. = square feet; ft = feet

A runaround track would be provided between the service and inspection tracks and storage tracks. Additionally, two temporary stub-ended set out tracks would be provided in the Phase 1 layout that occupies the footprint of the future shop tracks (one at the north and one at the south end of the yard). These set out tracks would be converted to shop access tracks in Phase 2 and, therefore, would no longer be available as set out tracks. A new set out track would then be provided as part of Phase 2.

A transportation building that would be utilized for administrative purposes is also included in Phase 1. This building would house managerial offices, welfare spaces for train crews and on-site personnel. This facility would include restrooms, showers, locker rooms, a break/day room, vending space and a kitchenette. Approximately 120 automobile parking spaces would be provided for staff reporting to the site. Fire department compliant roadways would be developed to permit circulation of the site for Metrolink vehicles as well as delivery trucks (sand and fuel).

Phase 2 completes the full buildout of the Project. It would include development of the maintenance shop building and its future extension that would comprise of a total buildout area of 68,272 square feet (Table 2.2-1). The shop would have capabilities to perform regular three-month, six-month, and one-year preventive maintenance cycles on trainsets. Phase 2 of the buildout would consist of approximately 28 employees. With the full buildout of Phase 1 and Phase 2, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts.

Access to the OCMF would require a roadway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The Project includes the southern extension of Ridge Valley Road from Marine Way and associated traffic signal improvements to provide access to the OCMF.

The 11 new east and west lead tracks, as discussed in this section above, would be constructed within the existing railroad corridor between MP 183.0 and MP 184.00 on Metrolink's "Orange" Subdivision to connect the existing mainline railroad to the proposed OCMF rail yard. A new single span concrete bridge over the Bee Canyon Channel (Channel) would be built for the east lead track. A segment of the Channel and utilities that are found to be in conflict would be lowered by approximately 2.5 feet to facilitate the construction of the bridge.

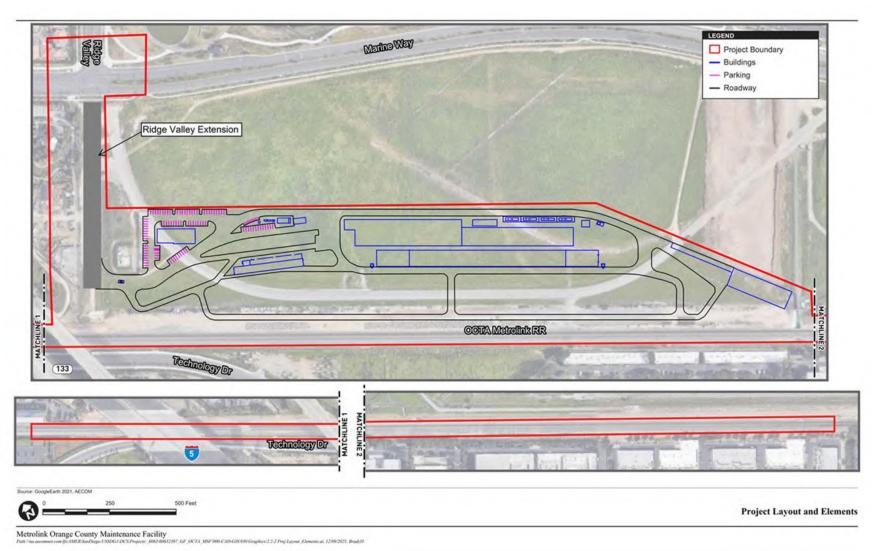


Figure 2.2-1 Project Layout and Elements

Source: ESRI (2021), OCTA (2021)

3. ENVIRONMENTAL SETTING

3.1 EXISTING CONDITIONS

The Project Site is located within a portion of the former MCAS El Toro, which was decommissioned in 1999, which is a Superfund site [(U.S. Environmental Protection Agency (EPA), 2020]. Hazardous materials, including chemicals and jet fuels, were stored and used on various portions of the former MCAS, including the OCMF site. These chemicals resulted in contamination of the soils, for which the DON was required to perform environmental remediation. From records provided by the DON, it appears only two groundwater monitoring wells were installed within the Project Site after the closure of MCAS El Toro. One of the wells is located in the middle of the proposed storage yard (between storage tracks) and would require relocation. The other well is located near the south entrance of the site and appears out of conflict with any major proposed improvements. The site will be developed to provide for periodical access to the wells by the DON. Previous analysis related to hazardous materials have been prepared to address contamination on the Project Site. A Phase I Site Assessment completed in 2014 did not find any recognized environmental condition (REC) sites (Kleinfelder 2014). There is an updated Phase I Environmental Site Assessment that is currently being finalized, which has been used to supplement this information.

As mentioned in the Wildfire portion of Chapter 5 of the Baseline Analysis, the Project Site is not located within or in proximity to an area designated as "High Fire Severity Rating & Open Space with Fire Potential" according to the City of Irvine General Plan's Safety Element.

Moreover, the Project Site is not located within two miles of a public airport or public use airport. The closest airport to the Project Site is John Wayne Airport, which is located in Santa Ana adjacent to the City of Irvine boundary. This airport is approximately seven miles to the west of the Project Site and, thus, the Project Site is located outside of the John Wayne Airport Clear Zones according to the City of Irvine General Plan's Safety Element. No private airstrip exists in the vicinity of the Project, either.

In addition, there are no existing schools or educational institutions within one-quarter mile of the Project Site (refer to Table 3.15-1 Public Service Facility Summary, in Chapter 3.15 Public Services).

3.2 REGULATORY FRAMEWORK

3.2.1 Federal

Hazardous Materials Resources

The USEPA is the lead federal agency responsible for enforcing federal regulations regarding hazardous materials. The primary legislation governing hazardous materials includes the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act (SARA), and the Toxic Substances Control Act (TSCA).

Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA, also known as Superfund, created a tax on the chemical and petroleum industries to provide for response and cleanup of hazardous substances that may endanger public health or the environment. CERCLA established requirements for abandoned hazardous waste sites and provided for liability of persons responsible for releases of hazardous waste at these sites.

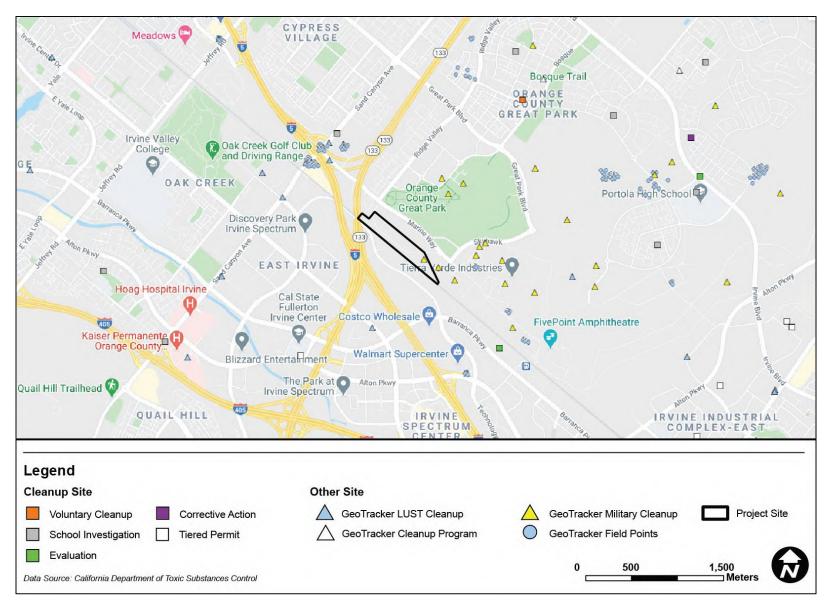


Figure 3.2-1 Known Hazardous Material Sites

Superfund Amendments and Reauthorization Act

SARA amended CERCLA to increase state involvement and required Superfund actions to consider state environmental laws and regulations. SARA also established a regulatory program for underground storage tanks (USTs) and the Emergency Planning and Community Right-to-Know Act (EPCRA).

3.2.2 State

In case of any chemical release of hazardous materials, the project will comply with the Hazardous Materials Release Notification, including the following:

- Health and Safety Codes Sections 25270.7, 25270.8, and 25507
- Vehicle Code Section 23112.5
- Public Utilities Code Section 7673 (PUC General Orders #22-B, 161)
- Government Code Sections 51018, 8670.25.5 (a)
- Water Codes Sections 13271, 13272
- Labor Code Section 6409.1(b)10

If hazardous materials or extremely hazardous materials are to be handled at the project site more than a specified amount ("reporting quantity"), the project will need to develop and submit a Hazardous Materials Business Plan (HMBP) as mandated both by the federal government (Code of Federal Regulations) and the State of California (Health and Safety Code) to the Orange County Health Care Agency (OCHCA).

3.2.3 Local

The project will need to comply with the Irvine Municipal Code, especially Division 9 (Emergency Services) and Division 17 (Hazardous Materials) of Title 4 (Public Safety), as well as the Irvine Zoning Ordinance, Chapter 2-13 (Hazardous Waste Facility Procedure).

The project will also need to comply with the Hazardous Materials Disclosure Program and the Accidental Release Prevention Program. The Unified Program is implemented at the local government level by the OCHCA. The Hazardous Materials Division of OCHCA is designated by the State Secretary for Environmental Protection as the CUPA for Orange County. Inspections and business plans are managed by the Orange County Fire Authority (OCFA) on behalf of OCHCA.

Assembly Bill (AB) 1130 authorized CUPAs to administer and implement programs related to the Aboveground Petroleum Storage Act (APSA) for any business with a total aboveground storage capacity of 1,320-gallons of petroleum products in tanks or containers larger than 55 gallons. APSA defines "Petroleum" as crude oil, or any fraction thereof, which is liquid at 60 degrees Fahrenheit temperature and 14.7 pounds per square inch absolute pressure. Tank facilities that are regulated under APSA are also regulated by the U.S. EPA Region 9 Oil Program Clean Water Act Compliance Office. Since the Project will consider building underground storage tanks or aboveground storage tanks (ASTs) for petroleum products/fuels, the plan will need to comply with the California Code of Regulations for underground and aboveground tanks, respectively, as oversight by OCHCA. APSA would require the following of the Project if storage of petroleum tanks meets or exceeds the 1,320-gallon aboveground petroleum products/fuels storage threshold:

- Complete and submit to OCHCA an initial Aboveground Petroleum Storage Tank Facility Statement Form.
- Prepare and implement an Spill Prevention Control and Countermeasures (SPCC) Plan in accordance with U.S. Code of Federal Regulations, Title 40, Part 112 (40 CFR 112).
- Conduct periodic inspections of ASTs to ensure compliance with the 40 CFR 112.
- Allow OCHCA to conduct periodic inspections.
- Immediately notify the California Emergency Management Agency (EMA) and OCHCA upon discovery of a spill or release of 42 gallons or more of petroleum.

Facilities regulated under APSA or the Federal SPCC Rule must prepare and implement a Spill Prevention Control and Countermeasures Plan (SPCC Plan) or Spill Prevention and Counter Measure Plan. Regulated facilities fall into three categories:

- Aboveground storage capacity more than 10,000 gallons who must prepare a full plan that has been certified by a Professional Engineer and be approved by the facility or corporation management.
- Aboveground storage capacity more than 1,320-gallons and less than 10,000-gallons, and with no history of release, can prepare and self-certify an abbreviated plan. These businesses are known as "Qualified Facilities". There are in turn two types of Qualified Facilities, Tier I and Tier II Qualified Facilities:
 - Tier I Qualified Facility: has between 1,320 and 10,000 gallons with no single container greater than 5,000-gallons and have no single discharge to navigable waters or adjacent shorelines exceeding 1,000 gallons and no two discharges, each exceeding 42 gallons within any twelve-month period in the past three years.
 - Tier II Qualified Facility: has between 1,320 and 10,000 gallons with a single container greater than 5,000 gallons and have no single discharge to navigable waters or adjacent shorelines exceeding 1,000 gallons and no two discharges, each exceeding 42 gallons within any twelve-month period in the past three years.

The Project will need to notify the appropriate State and local agencies (e.g., OCHCA, DTSC, or the Regional Water Quality Board) since soil and groundwater contamination is present due to the MCAS site. Notification to these State and local regulatory oversight agencies will simultaneously satisfy coverage under the applicable Federal agencies under Superfund (refer back to Section 3.2.1 above). If requested as follow-up by the State and/or local regulatory oversight agency(ies), then an environmental site assessment or a risk assessment (e.g., human health risk assessment) shall be prepared to ensure that future site activities and/or uses pose no risks to human health and/or the environment. In accordance with the State Water Board's requirements for construction sites greater than one acre, a stormwater pollution prevention plan (SWPPP) must be prepared and implemented during construction for coverage under the National Pollution Discharge Elimination System (NPDES) Construction General Permit. Similarly, construction sites subject to the Construction General Permit are required to implement SWPPP in the City of Irvine. While Santa Ana Regional Water Quality Board issues the Construction General Permit, Water Quality Ordinance (No. 10-06) gives the City of Irvine adequate legal authority as may be necessary to carry out the requirements of the NPDES Permit and accomplish the requirements of the Clean Water Act.

4. METHODOLOGY

A Draft Phase I Environmental Site Assessment (ESA) was prepared for the Project Site by Diaz, Yourman & Associates, on behalf of OCTA, dated November 12, 2020. The assessment was performed in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Standard E1527-13. During the assessment, the Project Site was observed currently vacant, with the exception of a segment of an abandoned road, stormwater drains, an underground bunker with a network of pipelines, valves and associated vents, and including miscellaneous rail equipment observed stored on site. The following hazardous materials were identified in the assessment to be potentially encountered at the Project Site from historical and/or current uses:

- Hydrocarbons, volatile organic compounds (VOCs) including chlorinated solvents such as trichloroethylene (TCE), and metals to soil, soil vapor and/or groundwater from historical former MCAS El Toro operations, adjacent oil and gas pipelines, and soil and other debris stockpiles observed on site;
- 2) Pesticides/herbicides to soil from historical agricultural crop land use;
- 3) Polychlorinated biphenyls (PCBs)-containing equipment remaining on site, if any including potential impacts to soils due to leaks;
- 4) Asbestos-containing material (ACM) and lead-based paint from existing structures;
- 5) Treated wood waste (TWW) from materials remaining on site (e.g., railroad ties); LBP/chromium from yellow thermoplastic striping from road materials remaining on site; and, aerially deposited lead in soil due to adjacent and onsite roadways.

5. IMPACTS ANALYSIS

Based on the above-described proposed project information, the following hazards and hazardous materials impacts analysis is provided for the Project Site:

1) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Determination: Less Than Significant Impact

Construction and operation of the Project Site would require the routine handling and storage of petroleum products and hazardous materials. Wastes including used oils and hazardous wastes generated from the Project Site would be properly managed, transported and disposed resulting in less than significant hazard to the public or environment. The Project shall comply to regulatory standards specified under the California Code of Regulations (CCR), Title 22, Division 4.5 during the transport, use, or disposal of hazardous materials to make this a less than significant impact. Criteria for identifying characteristics of hazardous waste are also designated in CCR Title 22 Division 4.5.

2) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Determination: Less Than Significant Impact

Construction Impacts

Due to the routine handling and use of petroleum products and hazardous materials to be used during the construction of the proposed project, the potential for environmental impacts from hazardous material incidents is less than significant. The most likely incidents involving these materials are associated with minor drips, leaks or spills. Impacts from such incidents would be avoided by thoroughly cleaning up minor drips, leaks or spills as soon as they occur. A site-specific SWPPP would be developed and implemented to ensure quick response to minor drips, leaks or spills.

Operational Impacts

The Project Site would conduct routine handling and use of petroleum products and hazardous materials that could leak or spill if equipment such as tanks are damaged from a seismic event, fire or other unforeseen incident. To minimize potential impacts, the design of the proposed project would provide containment and/or diversionary structures or equipment to prevent illicit discharge of an oil or hazardous materials spill. Furthermore, the facility would develop and implement a HMBP and SPCC Plan before reportable quantities of hazardous materials/wastes or

tanks/oil-filled equipment are handled or stored on site. The HMBP includes an Emergency Response Plan element.

If the Project has aboveground petroleum products/fuel tanks larger than 55-gallons with the storage capacity of 1,320-gallons or more, the SPCC Plan would be required to comply with the regulatory framework set forth by the Aboveground Storage Tank Act. Tank facilities that are regulated under APSA are also regulated by the U.S. EPA Region 9 Oil Program Clean Water Act Compliance Office. The Project would be required to prepare and implement an SPCC Plan in accordance with U.S. Code of Federal Regulations, Title 40, Part 112 (40 CFR 112). In addition, SCRRA would be required to immediately notify the California Emergency Management Agency (EMA) and OCHCA upon discovery of a spill or release of 42 gallons or more of petroleum.

These programs and plans would be developed to be consistent with other Metrolink maintenance facilities.

3) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Determination: No Impact

There are no existing schools or educational institutions within one-quarter mile of the Project Site.

4) Would the project be on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Determination: Less Than Significant Impact

The Project Site is located within a portion of the MCAS El Toro Superfund site, situated within a portion of Operating Unit (OU) 2A - IRP Site 24 - water transfer facility. According to the Phase I ESA, one groundwater monitoring well (18BGMW101A) and one groundwater extraction well (24EX11) in connection with IRP Site 24 are located within the Project Site boundaries. According to additional information provided in site documents available in the online California Department of Toxic Substances Control's (DTSC's) Envirostor database and on the EPA's Superfund Site El Toro MCAS web page, buried water transfer conveyance lines associated with these wells are also located within the Project Site boundaries. An Institutional Control (IC) is in effect in connection with IRP Site 24, which includes the following land use restrictions and/or requirements:

- Activities prohibited which disturb the remediation and monitoring systems without approval;
- Annual inspection and/or report;
- No drilling for drinking water, oil or gas without approval;
- Notify damages to remedy and monitoring systems no later than 10 days upon discovery;
- Notify no later than 30 days after change of property owner; and
- Only extraction of groundwater for site remediation and/or construction dewatering permitted.

Prior to construction of the project and also following construction of the project, proper notifications to the required parties will be made in accordance with the IRP Site 24 IC in order to maintain compliance with the site management requirements/IC in connection with the ongoing military clean-up site operations.

5) For a project located within an airport land use plan or, where such as plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

Determination: No Impact

The Project Site is not located within two miles of a public airport or public use airport. The closest airport to the Project Site is John Wayne Airport, which is located in Santa Ana adjacent to the City of Irvine boundary. This airport is approximately seven miles to the west of the Project Site and, thus, the Project Site is located outside of the John Wayne Airport Clear Zones according to the City of Irvine General Plan's Safety Element. No private airstrip exists in the vicinity of the Project, either.

6) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Determination: No Impact

Construction Impacts

In places where the components of the Proposed Project span a road or require a lane closure, construction activities would be coordinated with the local jurisdiction so as not to cause closure of any emergency access route. Flaggers may briefly hold traffic back while conductor is pulled across a roadway, but emergency vehicles would be provided access even in the event of temporary road closures. Therefore, emergency access would not be directly impacted by construction of the proposed project because all streets would remain open to emergency vehicles at all times during construction activities.

Operational Impacts

The Project Site design will be constructed in a configuration that complies with required emergency response plan or emergency evacuation plan elements in accordance with project design and permitting requirements.

7) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Determination: **No Impact**

The Project Site is not located within or in proximity to an area designated as "High Fire Severity Rating & Open Space with Fire Potential" according to the City of Irvine General Plan's Safety Element. Additionally, the Project Site would be grubbed of vegetation and graded prior to the staging of equipment, further minimizing the potential for wildland fires.

6. MITIGATION MEASURES

Mitigation measures were described in Section 5 above where a less than significant impact to the Project Site was identified. The mitigation measures for the Project Site are summarized as follows:

- MM-HAZ-1 The Project applicant shall notify the appropriate agencies (e.g., OCHCA, DTSC, USEPA, or the Regional Water Quality Board) regarding soil, soil gas and/or groundwater contamination in connection with the ongoing military clean-up site associated with the former El Toro MACS Superfund site.
- **MM-HAZ-2** Where the Project Site construction and operational activities coincide with the current groundwater monitoring systems (e.g., wells, water transfer conveyance lines) the requirements of the IC in connection with IRP Site 24 for the ongoing military clean-up site associated with the former El Toro MACS Superfund site shall be adhered to in order to protect human health and the environment from potential hazardous materials exposures.
- MM-HAZ-3 Prior to construction activities at the Project, if required by the State or local regulatory oversight agencies, then further assessment including soil, soil vapor and/or groundwater investigations shall be conducted to reveal the presence, if any, of potential hazardous materials at the Project Site that were identified as a result of the Phase I ESA, and would assist in determining further mitigations required to address human health and/or the environment impacts due to potential hazardous materials exposures.
- **MM-HAZ-4** The Project shall need to adhere to all required permit applications and permit conditions, and local, state and federal requirements (e.g., regulatory framework, site-specific environmental permits and plans).

7. IMPACTS AFTER MITIGATION MEASURES

Impacts after implementing mitigation measures MM-HAZ-1 through MM-HAZ-4 would result in less than significant impact related to hazards and hazardous materials during construction and operations.

8. **REFERENCES**

- U.S. Environmental Protection Agency (EPA), online webpage, 2020, Accessed December 2020 https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0902770
- California Department of Toxic Substances Control's (DTSC's) online Envirostor database, <u>https://www.envirostor.dtsc.ca.gov/public/</u>
- Diaz, Yourman & Associates, Draft Phase I Environmental Site Assessment, Metrolink Orange County Maintenance Facility, Version 1, 11/2020.
- Kleinfelder, Phase I Environmental Site Assessment, OCTA Excess Land APN: 580-081-53, 21.3 Acres in "Great Park" Area Irvine, California, 2014.
- Southern California Regional Rail Authority (SCRRA), OCTA, Project Study Report for Orange County Maintenance Report, 2019
- SCRRA, Metrolink System Map, October 2019, Available at: https://metrolinktrains.com/about/agency/

Appendix F Technical Memorandum Noise and Vibration

Metrolink Orange County Maintenance Facility

Prepared for:

Orange County Transportation Authority 550 S. Main St. Orange, CA 92868

and

Gannett Fleming

20 Pacifica, Suite 430 Irvine, CA 92618

Prepared by:



401 West A Street Suite 1200 San Diego, CA 92101

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|---|----------|
| 0 | Draft Noise & Vibration Technical Memorandum | 01/14/21 |
| 1 | Draft Noise & Vibration Technical Memorandum (Incorporating OCTA's comments) | 02/25/21 |
| | | |

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Glossary

| Term | Abbreviation | Description |
|---------------------------|--------------------|---|
| A-Weighted | dBA | A-weighted sound levels represent the overall noise at a receiver that is |
| Decibels | | adjusted in frequency to approximate typical human hearing sensitivity. This |
| | | is expressed as A-weighted decibels (dBA), the basic noise unit for transit |
| | | noise analyses. |
| Community | CNEL | CNEL is a single number result that is calculated for a complete 24-hour |
| Noise Equivalent | | period and usually made up of results taken at shorter intervals such as 5 |
| Level | | minutes or 1 hour and then averaged over the whole 24 hours. This |
| | | measurement is similar to L_{dn} except with a 5 dBA penalty added for hours |
| | | between 7 PM and 10 PM. The logic behind this applied penalty is that since |
| | | most residents in a given area are somewhat sensitive to noise during evening hours, a weighting factor is applied. |
| | | |
| Day-Night Sound | Ldn | L _{dn} describes a receiver's cumulative noise exposure from all events over 24 |
| Level | | hours. Events between 10 PM and 7 AM are increased by 10 dB to account |
| | | for humans' greater nighttime sensitivity to noise. L _{dn} is used to assess transit |
| | | noise for residential land uses. |
| Equivalent Sound Level | L _{eq(t)} | The equivalent sound level L _{eq(t)} describes a receiver's cumulative noise |
| Sound Level | | exposure from all events normalized to a specified period of time "t". L _{eq(t)} represents a hypothetical, constant sound level and contains the same |
| | | overall sound energy as the actual varying sound energy during the time |
| | | period "t". For transit noise impact assessments, the equivalent sound level |
| | | metric is A-weighted and all events are normalized over a one-hour time |
| | | period, Leq(1hr). For transit noise assessments, this metric is appropriate for |
| | | non-residential land uses and is computed for the loudest hour of project |
| | | related activity during hours of noise sensitivity. |
| Maximum Sound | L _{max} | The maximum level describes the maximum noise level reached during a |
| Level | | single noise event. For transit noise impact assessments, it is appropriate to |
| | | consider the A-weighted maximum level (L _{max}) to understand the full context |
| | | of the scenario. It is not appropriate to use this metric for transit noise |
| | | impact assessments. This metric is commonly used in vehicle noise |
| | | specifications and commonly measured for individual vehicles. |
| Peak Particle | PPV | The peak signal value of an oscillating vibration velocity waveform. Usually |
| Velocity | | expressed in inches/second in the United States. Often used to assess |
| | | potential building damage due to ground-borne vibration. |
| Sound Exposure | SEL | SEL is the cumulative noise exposure from a single noise event, normalized to |
| Level | | one second. SEL contains the same overall sound energy as the actual varying |
| | | sound energy during the event. It is the primary metric for the measurement |
| | | of transit vehicle noise emissions and is an intermediate metric in the |
| | | measurement and calculation of both L _{eq(t)} and L _{dn} . |
| Vibration | VdB | The vibration velocity level in decibel scale. Often used to assess annoyance |
| Decibels | | due to ground borne-vibration. |

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1. INTRODUCTION

The Southern California Regional Railroad Authority (SCRRA) Metrolink Commuter Rail System (Metrolink) is proposing to construct a new Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project"). The Project would include several facilities including a transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth, sand silos, a maintenance facility, a maintenance facility extension, and 11 tracks. Approximately 80 employees would report to the Project. The Project consists of buildings that would have a total building area of approximately 90,000 square feet when combined. Metrolink currently operates two maintenance facilities across its service area: Central Maintenance Facility (CMF) in Los Angeles and Eastern Maintenance Facility (EMF) in San Bernardino County. Due to projected population expansion within its service area and the agency's goal to be prepared for the 2028 Los Angeles Summer Olympic Games, Metrolink will require an increased number of commuter rail services, as well as additional train storage and maintenance facilities associated with an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the Project would provide an optimal location for a new Metrolink maintenance facility. Metrolink's member agency, the Orange County Transportation Authority (OCTA), proposes to build this facility on an OCTA-owned parcel in the City of Irvine. OCTA is the lead agency under the California Environmental Quality Act (CEQA). The City of Irvine and SCRRA are the responsible agencies under CEQA.

This technical memo provides the summary results of the noise and vibration analysis associated with the construction and operation of the proposed OCMF. This document provides concise sections regarding the project description, environmental setting, noise and vibration prediction methodology, impact analysis and recommended mitigation measures associated with the Project.

2. PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

As a result of the projected population expansion within the five-county area (Orange County, Los Angeles County, San Bernardino County, Riverside County, and Ventura County) currently served by the SCRRA, Metrolink will require an increased number of commuter rail services to support the growth. Consequently, the Metrolink system (Figure 2.1-1) would require additional train storage and maintenance facilities to support an increased fleet size.



Figure 2.1-1 Metrolink System Map

Source: SCRRA (2019)

Metrolink's CMF facility is located on the east bank of the Los Angeles River near the Interstate 5 (I-5) and Interstate 10 (I-10) highways, just south of the location of the former Southern Pacific Taylor Yard. The CMF is currently near capacity, which will impact the ability to provide the necessary train servicing for planned service-expansion of various Metrolink lines throughout the system under the Southern California Optimized Rail Expansion (SCORE) program. By transferring a portion of the current fleet from CMF to the proposed OCMF (specifically the Orange County Line trains), capacity for the non-Orange County trains will be increased at CMF. The Orange County Line has the highest ridership within the Metrolink system; therefore, a maintenance facility to serve the Orange County area with sufficient storage and servicing capabilities for both locomotives and rail cars is critical to controlling operating costs. In order to optimize rail service in the region, the proposed facility development would need to be completed by 2028. The SCORE program may also require heavy overhaul capabilities at OCMF, subject to pending decisions regarding fleet technology and management.

The expansion of Orange County and overall Metrolink commuter rail service will ultimately require additional or expanded equipment servicing capabilities for both locomotives and rail cars. Since a significant portion of the fleet will be in Orange County, a maintenance facility located along the Metrolink route through Orange County would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and San Bernardino. The proposed maintenance facility would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Much of the inspection and maintenance activity is federally mandated and must be performed at specific intervals. The OCMF will also provide refueling services thus reducing fuel costs, reducing fuel consumption, and will reduce emissions. Currently trains operating in the Orange County Region must travel either the CMF or EMF for refueling, which are sometimes non-revenue runs. The location of the Project is on a 21.3-acre OCTA-owned parcel on Ridge Valley south of Marine Way in the City of Irvine (Project Site). The Project Site is located within the boundaries of a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was quitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City of Irvine that same year. OCTA then purchased the fee ownership of the Project Site from the City of Irvine. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley.

Prior to the current construction of the storage/set-out track, the Project Site was mostly vacant. The site currently includes 1,000-foot-long storage for miscellaneous rail equipment including temporary railroad bridges, signal houses, railroad ties, and signal components. Although not part of the Project, OCTA is currently installing a single 1,000-foot-long, single-ended storage track and fencing of the perimeter of the property to provide temporary storage of two trainsets and/or track maintenance equipment when necessary. There is a segment of an abandoned road, stormwater drains, and underground water transfer vault with a network of pipelines, valves and associated vents, that are currently not in use.

2.2 PROJECT DESCRIPTION

The OCMF would be located in the City of Irvine, on a 21.3-acre parcel owned by OCTA and adjacent to Marine Way and the Metrolink Orange subdivision between mileposts 183.50 and 184.00 on Metrolink's "Orange" Subdivision (Figure 2.2-1). The Project Site is located within Planning Area 51 of the updated City of Irvine General Plan, adopted in June 2015, and designated for the Great Park (formerly known as the Orange County Great Park (OCGP)) land use under the General Plan. Per the City's zoning ordinance, the proposed use is a conditionally allowable use under the existing zone; therefore, OCTA is submitting a Conditional Use Permit to the City of Irvine for approval,

The Project would be developed in two phases with an anticipated completion date of 2028. Phase 1 focuses on developing facilities needed for the storage and routine cleaning, inspection and servicing of the anticipated trainsets. The total area of the Phase 1 buildout would be approximately 20,996 square feet and would be comprised of the following facilities: the transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth and sand silos (Table 2.2-1). A total of 11 tracks would be built. The Phase 1 layout situates the train wash, fueling/sanding, and service and inspection tracks on the two tracks with the greatest tangent length, which are the ones nearest the railroad right of way ("ROW"). This is important in fitting a second fueling/sanding facility so that there is one at each end of the service and inspection platform to support having the locomotive at either end, all within tangent track. Additionally, six storage tracks and appurtenant features (air, water, head end power and toilet dump facilities) would be constructed. The storage tracks would be built near the middle of the site east of the service and inspection tracks. Phase 1 of the buildout would anticipate approximately 52 employees total throughout the entire day, split across three eight-hour shifts.

| Building/Facility/Item | Building Area | Building Height |
|--------------------------------|----------------|------------------------|
| Transportation Building | 7,495 sq. ft. | 20 ft |
| Train Wash Building | 11,110 sq. ft. | 21 ft |
| Maintenance Building | 40,392 sq. ft. | 48 ft |
| Maintenance Building Expansion | 27,880 sq. ft. | |
| Utility Building | 981 sq. ft. | 20 ft |
| Pump House | 750 sq. ft. | 14 ft |
| Guard Booth | 36 sq. ft. | |
| Equipment Booth | 48 sq. ft. | |
| Sand Silos (2 Total) | 576 sq. ft. | |
| Total | 89,268 sq. ft. | |

Table 2.2-1 Building Specifications

Source: Gannett Fleming, Metrolink (February 2022)

Note: sq. ft. = square feet; ft = feet

A runaround track would be provided between the service and inspection tracks and storage tracks. Additionally, two temporary stub-ended set out tracks would be provided in the Phase 1 layout that occupies the footprint of the future shop tracks (one at the north and one at the south end of the yard). These set out tracks would be converted to shop access tracks in Phase 2 and, therefore, would no longer be available as set out tracks. A new set out track would then be provided as part of Phase 2.

A transportation building that would be utilized for administrative purposes is also included in Phase 1. This building would house managerial offices, welfare spaces for train crews and on-site personnel. This facility would include restrooms, showers, locker rooms, a break/day room, vending space and a kitchenette. Approximately 120 automobile parking spaces would be provided for staff reporting to the site. Fire department compliant roadways would be developed to permit circulation of the site for Metrolink vehicles as well as delivery trucks (sand and fuel).

Phase 2 completes the full buildout of the Project. It would include development of the maintenance shop building and its future extension that would comprise of a total buildout area of 68,272 square feet (Table 2.2-1). The shop would have capabilities to perform regular three-month, six-month, and one-year preventive maintenance cycles on trainsets. Phase 2 of the buildout would consist of approximately 28 employees. With the full buildout of Phase 1 and Phase 2, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts.

Access to the OCMF would require a roadway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The Project includes the southern extension of Ridge Valley Road from Marine Way and associated traffic signal improvements to provide access to the OCMF.

The 11 new east and west lead tracks, as discussed in this section above, would be constructed within the existing railroad corridor between MP 183.0 and MP 184.00 on Metrolink's "Orange" Subdivision to connect the existing mainline railroad to the proposed OCMF rail yard. A new single span concrete bridge over the Bee Canyon Channel (Channel) would be built for the east lead track. A segment of the Channel and utilities that are found to be in conflict would be lowered by approximately 2.5 feet to facilitate the construction of the bridge.

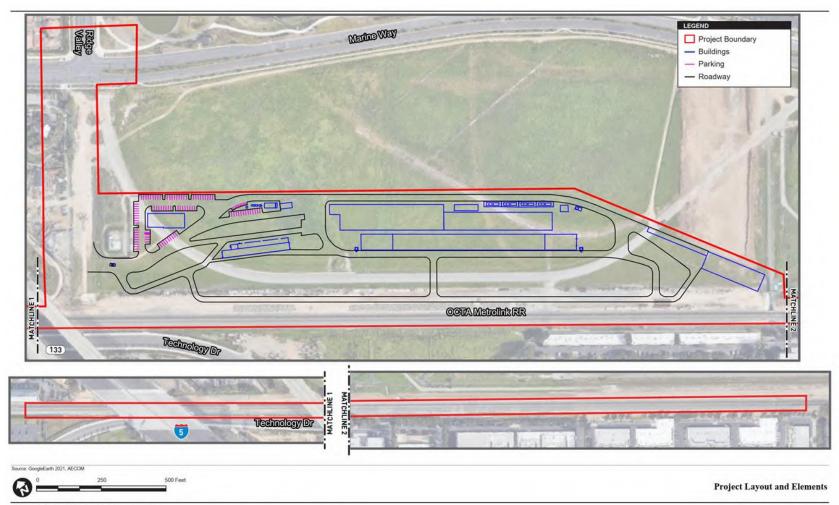


Figure 2.2-1 Project Layout and Elements

Metrolink Orange County Maintenance Facility Path Instancement one 19: MARE SanDegs-USIDGI DCS Property 6885 05851397_GF_OCTA_MSF 968-CAD-GS5936 Graphics 2.3.2 Prof. Leyont_Elements at 12:09:2021, Brah,D

Source: ESRI (2021), OCTA (2021)

3. ENVIRONMENTAL SETTING

3.1 Existing Conditions

Noise measurements were conducted at the Project Site and selected nearby noise sensitive locations on July 30-31, 2020. The measurements were conducted with American National Standards Institute (ANSI) Type 1 sound level meters within their manufacturer's recommended 1-year calibration period. Measurements were conducted and documented in keeping with standard environmental noise measurement procedures. Weather conditions during the measurement period were generally typical for this location during this time of year, with observed temperatures between 70° and 80° F (degrees Fahrenheit) and wind speeds generally less than 5 miles per hour (mph).

Noise measurements were conducted at five locations in the vicinity of the Project Site, including one Long-Term (LT) measurement location for an entire 24-hour duration, and four short-term (ST) locations with durations of approximately 20 to 30 minutes each. The noise measurement locations are shown in Figure 3.1-1.

The noise measurement locations were selected to represent the following acoustical environments:

- LT-1. This location was conducted at the Project's northern fence line and was intended to represent the typical hour to hour variation of noise levels in the general Project Area over the course of an entire day. Contributing sound sources here included traffic from highways I-5 and State Route 133 (SR-133) and local roads, and occasional rail activity on the nearby Metrolink/Amtrak mainline tracks as well as occasional, short-term contributions for other miscellaneous local sound sources (aircraft overflights, individual vehicle pass-bys, trash collection, etc.).
- ST-1. This measurement location represented the residential development to the north of the Marine Way and Ridge Valley intersection. The contributing sound sources here included traffic on SR-133 and local roadways, with lesser contributions from traffic on I-5, rail activity, and other local noise sources.
- ST-2. This location represents a passive use area within the park (quiet area near the reflecting pond) and with direct exposure to the Project Area. Contributing sound sources here were similar to LT-1.
- ST-3. This location represents an active sports area within the park (soccer field) with direct exposure to the Project Area. Noise sources here were similar to those observed at LT-1 and ST-2.
- ST-4. This measurement location represents an informal exterior use area in a commercial area south of the mainline tracks (a bench within a grassy median in the parking area, presumably used as a short-term break area for employees).



Figure 3.1-1 Noise Measurement Locations

Figure 3.1-2 provides the LT noise measurement data displaying the equivalent average (L_{eq}), maximum (L_{max}) and minimum (L_{min}) value for each 10-minute measurement interval over the entire 24-hour measurement period (between 10:00 AM on 7/30/2020 and 10:00 AM on 7/31/2020). The L_{eq} values range mostly between 45 A weighted decibels (dBA) (during the early morning hours) and 60 dBA (during peak morning and afternoon periods). Individual spikes in the L_{eq} and L_{max} data are mostly caused by train pass-by events (the LT location was situated about 450 feet from the mainline tracks).

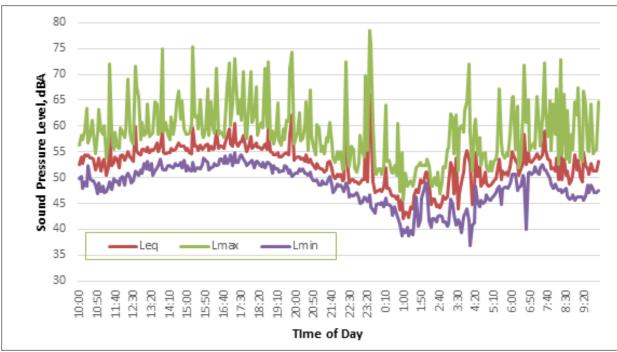




Table 3-1 provides a summary of the collected ST measurement data. Measurements were conducted twice at each ST location and the long-term metrics (L_{eq} -day, L_{dn} , and community noise equivalent level [CNEL]) at each ST location were calculated by using a relative comparison to the 24-hour data collected at the central LT measurement location.

| Ν | /leasurement Ti | me and Dura | ation | | Measured | or Calculated ² Sound Level, dBA | | |
|-------------------|-----------------|-------------|-------|----------|---------------------|---|-----|------|
| ID | Date | Start | End | Duration | L _{eq} -ST | L _{eq} -Day | Ldn | CNEL |
| ст 11 | 7/30/20 | 10:58 | 11:30 | 0:32 | 61 | 62 | 67 | 68 |
| ST-1 ¹ | 7/31/20 | 10:00 | 10:24 | 0:24 | 62 | 63 | | |
| ST-2 | 7/30/20 | 12:46 | 13:12 | 0:26 | 55 | 55 | 59 | 59 |
| 51-2 | 7/31/20 | 9:45 | 10:04 | 0:19 | 53 | 55 | | |
| ST-3 | 7/30/20 | 13:25 | 13:52 | 0:27 | 63 | 60 | 64 | 65 |
| 51-3 | 7/31/20 | 9:05 | 9:24 | 0:19 | 58 | 60 | | |
| ST-4 | 7/30/20 | 14:10 | 14:40 | 0:30 | 52 | 52 | 50 | ГС |
| 51-4 | 7/31/20 | 8:30 | 8:50 | 0:20 | 50 | 52 | 56 | 56 |

Table 3-1 Short-term Noise Measurement Summary

Source: AECOM, 2020.

Notes:

¹ Reported ambient noise levels for Measurement location ST-1 were reduced by 5 dBA to estimate the influence of an existing 8- to-10-foot-high noise wall between the actual exterior sidewalk noise measurement location near Marine Way and the residential backyards for the adjacent homes. This reduction was limited to 5 dBA due to traffic noise contributions from nearby elevated ramps and lanes on SR-133.

 2 L_{eq}-day, LDN and CNEL values were calculated by comparing measured ST noise measurement values to calculated L_{eq}-day, L_{dn} and CNEL from LT measurement location.

3.2 Regulatory Framework

Federal

Federal Transit Administration: As a transit Project, the primary source used for the prediction and assessment impacts associated with noise and vibration for the Project would come from the Federal Transit Administration (FTA) Noise and Vibration Impact Assessment Manual (2018), which provides prediction methodology and impact assessment guidance for both construction and operational phases of the Project as outlined below.

Construction Noise and Vibration

FTA-recommended construction noise impact criteria are presented in Table 3-2 below, as a function of land use.

Ldn-equip.(30 day), dBA Leq-equip.(8hr), dBA Land Use **30-day Average** Night Day Residential 80 70 75 80* Commercial 85 85 85* Industrial 90 90

Table 3-2 Construction Noise Impact Criteria

Note: *Use a 24-hour $L_{eq(24hr)}$ instead of $L_{dn-equip(30day)}$ Source FTA 2018, Table 7-3

For construction vibration, FTA guidance provides impact criteria for two different impact types, potential building damage and potential human annoyance, both categorized by building type or land use, which are presented in Table 3-3 and Table 3-4, respectively.

| Building/ Structural Category | PPV, in/sec | Approximate L _v * |
|---|-------------|---------------------------------|
| I. Reinforced-concrete, steel or timber (no plaster) | 0.5 | 102 |
| II. Engineered concrete and masonry (no plaster) | 0.3 | 98 |
| III. Non-engineered timber and masonry buildings | 0.2 | 94 |
| IV. Buildings extremely susceptible to vibration damage | 0.12 | 90 |

Table 3-3 Construction Vibration Damage Criteria

*RMS velocity in decibels, VdB re 1 micro-in/sec Source FTA 2018, Table 7-5

Table 3-4 Indoor Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact Criteria for General Vibration Assessment

| Land Use Category | | GBV Impact Levels (VdB re 1 micro-inch /sec) | | | GBN Impact Levels (dBA re 20 micro Pascals) | | |
|--|---------------------------------|---|-----------------------------------|---------------------------------|--|-----------------------------------|--|
| Land Ose Category | Frequent Events ⁺ | Occasional Events ^α | Infrequent Events ^β | Frequent Events ⁺ | Occasional Events ^α | Infrequent Events ^β | |
| Category 1: Buildings where vibration would interfere with interior operations. | 65 VdB * | 65 VdB * | 65 VdB * | N/A ** | N/A ** | N/A ** | |
| Category 2: Residences and buildings where people normally sleep. | 72 VdB | 75 VdB | 80 VdB | 35 dBA | 38 dBA | 43 dBA | |
| Category 3: Institutional land uses with primarily daytime use. | 75 VdB | 78 VdB | 83 VdB | 40 dBA | 43 dBA | 48 dBA | |

*This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. For equipment that is more sensitive, a Detailed Vibration Analysis must be performed.

** Vibration-sensitive equipment is generally not sensitive to ground-borne noise; however, the manufacturer's specifications should be reviewed for acoustic and vibration sensitivity.

[†]Frequent events- More than 70 events per day (most rapid transit)

αOccasional events- 30-70 events per day (most commuter trunk lines)

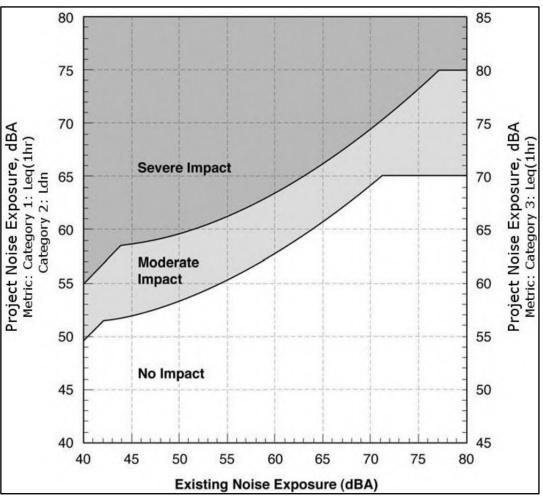
 $^{\beta}$ Infrequent events- Fewer than 30 events per day (most commuter rail branch lines)

Source: FTA 2018, Table 6-3.

Operational Noise and Vibration

FTA operational noise impacts are determined as a function of the predicted project noise, existing noise exposure, and land use category, as shown in Figure 3.2-1. Generally, the higher the existing noise exposure, the higher the noise level threshold for moderate and severe impacts. For example, at a Category 2 (residential) receptor location with an existing noise exposure level of 55 dBA L_{dn}, a moderate noise

impact would be triggered with a project-only noise exposure of 56 dBA L_{dn} and a severe impact at a project-only noise level of 61 dBA L_{dn}. However, for the same receiver location with an existing exposure of 60 dBA L_{dn}, a moderate impact would occur at a project-only noise level of 58 dBA L_{dn}, and a severe impact at 63 dBA, L_{dn}. Operational ground-borne vibration impact criteria are the same as for construction activity, as shown in Tables 3-3 and 3-4.





Local

<u>City of Irvine General Plan, Noise Element</u>- The noise standards specified in the City's General Plan, 2015, Section F, Noise Element (shown in Table 3-5) are used as a guideline to evaluate the acceptability of the noise levels generated by the traffic flow. These standards are for the assessment of long-term vehicular traffic noise impacts. The City has exterior noise criteria for outdoor living areas associated with residential uses and requires that interior areas of new residential homes not exceed 45 dBA CNEL and that exterior active use areas not exceed 65 dBA CNEL. Other short-term noise impacts (e.g., construction activities or on-site stationary sources) are regulated by the noise ordinance.

Source: FTA 2018, Figure 4-2

| La | and Use Categories | Energy Averag | e (CNEL) |
|---------------|---|-----------------------|-----------------------|
| Categories | Uses | Interior ¹ | Exterior ² |
| Residential | Single-Family, Multiple-Family | 45³, 55⁴ | 65 ⁷ |
| | Mobile Home | - | 65⁵ |
| Commercial/ | Hotel, Motel, Transient Lodging | 45 | 65 ⁵ |
| Industrial | Commercial, Retail, Bank, Restaurant | 55 | _ |
| | Office Building, Professional Office, Research & Development | 50 | _ |
| | Amphitheater, Concert Hall, Auditorium, Meeting Hall | 45 | _ |
| | Gymnasium (Multipurpose) | 50 | _ |
| | Health Clubs | 55 | _ |
| | Manufacturing, Warehousing, Wholesale, Utilities | 65 | _ |
| | Movie Theater | 45 | _ |
| Institutional | Hospital, School Classroom | 45 | 65 |
| | Church, Library | 45 | _ |
| Open Space | Parks | _ | 65 |

Table 3-5 City of Irvine Interior and Exterior Noise Standards

Notes:

¹ Interior environment excludes bathroom, toilets, closets, and corridors.

² Outdoor environment limited to private yard of single-family or multifamily residences private patio which is accessed by a means of exit from inside the unit; mobile home park; hospital patio; park picnic area; school playground; and hotel and motel recreation area.

³ Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided pursuant to Appendix Chapter 12, Section 1208 of UBC.

- ⁴ Noise level requirement with open windows, if they are used to meet natural ventilation requirement.
- ⁵ Exterior noise level shall be such that interior noise level will not exceed 45 dBA CNEL.

⁶ Except those areas affected by aircraft noise.

⁷ Multifamily developments with balconies that do not meet the 65 dBA CNEL are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

CNEL = Community Noise Equivalent Level, UBC = Uniform Building Code

Source: City of Irvine General Plan Supplement No. 3, Noise Element, Table F-1 (2005).

<u>Municipal Code</u>. Section 6-8-204 of the City's Municipal Code (City of Irvine, 2015b) establishes the maximum permissible noise level that may intrude into a neighbor's property. The Noise Ordinance (adopted in 1975 and revised in 2015) establishes noise level standards for various land use categories affected by stationary noise sources. Land use categories in the City are defined in four noise zones, as listed below. Table 3-6 provides the City's maximum noise standard based on the noise zone, the assessment location (exterior/interior), and the time period. As shown in Table 3-6, the City's noise standards do not apply to multifamily residence private balconies (City of Irvine 2015b).

- 1. Noise Zone 1: All hospitals, libraries, churches, schools, and residential properties.
- 2. Noise Zone 2: All professional office and public institutional properties.
- 3. Noise Zone 3: All commercial properties excluding professional office properties.
- 4. Noise Zone 4: All industrial properties.

| Noise Zone | Exterior/ Interior | Time Period | L₅₀ (30 mins) | L₂₅ (15 mins) | L ₈ (5 mins) | L2 (1 min) | L _{max} (Anytime) |
|---------------|-----------------------|---------------------|---------------------|---------------------|----------------------------|-----------------|-------------------------------|
| 1 | Exterior | 7:00 AM to 10:00 PM | 55 | 60 | 65 ¹ | 70 | 75 |
| | | 10:00 PM to 7:00 AM | 50 | 55 | 60 | 65 ¹ | 70 |
| | Interior | 7:00 AM to 10:00 PM | — | _ | 55 | 60 | 65 |
| | | 10:00 PM to 7:00 AM | — | _ | 45 | 50 | 55 |
| 2 | Exterior | Anytime | 55 | 60 | 65 | 70 | 75 |
| | Interior | Anytime | — | _ | 55 | 60 | 65 |
| 3 | Exterior | Anytime | 60 | 65 | 70 | 75 | 80 |
| | Interior | Anytime | — | _ | 55 | 60 | 65 |
| 4 | Exterior | Anytime | 70 | 75 | 80 | 85 | 90 |
| | Interior | Anytime | — | _ | 55 | 60 | 65 |

Table 3-6 City of Irvine Maximum Noise Level Standards

Note:

It shall be unlawful for any person at any location within the City to create any noise or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level when measured on any property within designated noise zones either within or without the City to exceed the applicable noise standard. Each of the noise standards specified above shall be reduced by 5 dBA for impact, or predominant tone noise or for noises consisting of speech or music. In the event the noise source and the affected property are within different noise zones, the noise standards of the affected property shall apply.

¹ This standard does not apply to multifamily residence private balconies. Multifamily developments with balconies that do not meet the 65 dBA CNEL are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

Source: City Municipal Code (City 2015a).

The City's Municipal Code Noise Ordinance has not established any upper limits for construction noise because construction noise is temporary and will stop after project construction is complete. Section 6-8-205a of the City's Municipal Code Noise Ordinance regulates the timing of construction activities and includes special provisions for sensitive land uses. *Construction activities shall occur only between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and between 9:00 a.m. and 6:00 p.m. on Saturday. No construction shall be permitted outside of these hours or on Sundays and federal holidays, except for Columbus Day, unless a temporary waiver is granted by the Chief Building Official or his or her authorized representative. Trucks, vehicles, and equipment that are making or are involved with material deliveries, loading, or transferring materials, equipment service, maintenance of any devices or appurtenances for or within any construction project in the City shall not be operated or driven on City streets outside of these hours or on Sundays and federal holidays unless a temporary waiver is granted by the community. No construction activity will be permitted outside of these hours a temporary waiver is granted or driven on City streets outside of these hours or on Sundays and federal holidays unless a temporary waiver is granted by the City. Any waiver granted shall take into consideration the potential impact on the community. No construction activity will be permitted outside of these hours except in emergencies, including maintenance work on the City rights-of-way that might be required.*

<u>Zoning Ordinance</u>. Sections 5-8-4.A.5a and 5-8-4.A.5b of the City's Zoning Ordinance (City of Irvine, 2015b) establish requirements to minimize construction noise and vibration impacts. Although these requirements are intended for residential and mixed-use spaces in the Irvine Business Complex, the requirements listed below are applicable for the Project. Section 5-8-4.A.5a of the City's Zoning Ordinance requires that before the issuance of grading permits, the Project applicants shall incorporate the following measures as a note on the grading plan cover sheet to ensure that the greatest distance between noise sources and sensitive receptors during construction activities has been achieved:

- Construction equipment, fixed or mobile, shall be equipped with properly operating and maintained noise mufflers consistent with manufacturer's standards.
- Construction staging areas shall be located away from off-site sensitive uses during the later phases of project development.
- The project contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the Project Site, whenever feasible.
- For construction of sound walls that have been incorporated into the project design, prior to construction of the building foundation, installation of temporary sound blankets (fences typically composed of poly-vinyl-chloride-coated outer shells with absorbent inner insulation) shall be placed along the boundary of the Project Site during construction activities.

Section 5-8-4.A.5b of the City's Zoning Ordinance requires that before the issuance of a grading permit, applicants for individual projects that involve vibration-intensive construction activities (e.g., pile drivers, jackhammers, and vibratory rollers) near sensitive receptors shall submit a noise and vibration analysis. If construction-related vibration is determined to exceed the FTA vibration annoyance criterion of 78 vibration decibels (VdB) for residential uses during the daytime (FTA, 2018), additional requirements, such as the use of less vibration-intensive equipment or construction techniques, shall be implemented during construction (e.g., drilled piles to eliminate use of a vibration-intensive pile driver). In the same FTA guidelines, 84 VdB is the vibration annoyance criterion for offices and non-sensitive areas.

4. METHODOLOGY

The methodologies for predicting noise and vibration levels from Project construction and operation are taken primarily from the general assessment methodology of the FTA Noise and Vibration Impact Assessment Manual with additional information from FHWA Roadway Construction Noise Model (RCNM) and Traffic Noise Model (TNM), as discussed in the following section. **4.1 Construction Noise and Vibration Vibration**

Construction noise and vibration prediction procedures are covered in Section 7 of the FTA Manual and supplemented by reference information from the FHWA RCNM.

Construction Noise Prediction Procedure

Construction noise impacts were assessed by predicting construction noise levels using methods consistent with the FTA Noise and Vibration Manual and comparing these values to identified impact thresholds. This methodology starts with the reference noise level for each piece of construction equipment to be used

under conservative worst-case conditions for each identified construction phase. This value is adjusted for the distance from the source to the noise-sensitive receptor, the fractional portion of time that the equipment is operating at full power (acoustical usage factor), and any acoustical shielding that may be present (such as buildings or terrain), and then summing together the contributed noise from all sources.

Construction equipment rosters and usage are provided by the Project contractors to represent typical worst-case noise conditions. The acoustical contribution for each piece of equipment at each activity area is calculated using the following equation:

$$L_{eq} = L_{max(ref)} - 20 \log \left(\frac{D}{D_{ref}}\right) + 10 \log \left(\frac{AUF\%}{100}\right) + 10 \log(N) - S$$

Where:

| L _{eq} = | the equivalent sound level energy-averaged over the period of time over which the equipment is operating, in dBA |
|-------------------------|--|
| L _{max(ref)} = | the maximum operating equipment sound level operating at full power as measured at the reference distance |
| D = | the distance between the operating equipment and the noise-sensitive receptor location (distances conservatively assumed to be from the receiver location to the acoustic center of the construction site) |
| D _{ref} = | the reference distance for the L _{max(ref)} , typically 50 feet |
| AUF = | the Acoustic Use Factor (typical fractional value of time that equipment is operating at full power) |
| N = | number of similar pieces of equipment operating in the same area |
| S = | the estimated noise reduction shielding value between that source and noise-sensitive receptor, in dBA |

The acoustic contribution for all equipment assumed to be operating during the defined construction phase is summed together on an energy basis to determine the combined construction noise level for each studied noise-sensitive receptor. The equipment to be used for the various construction phases of the Project, selected from the RCNM equipment list, the reference maximum noise level (L_{max}) and acoustic use factor (AUF) are shown in Table 4-1 below.

| Equivalent Type | L _{max} Ref dBA (50 feet) | AUF% |
|--------------------------|---------------------------------------|------|
| Auger Drill | 84 | 20 |
| Backhoe | 78 | 40 |
| Boring Jack Power Unit | 83 | 50 |
| Chain Saw | 84 | 20 |
| Compactor (ground) | 83 | 20 |
| Compressor (air) | 78 | 40 |
| Concrete Mixer Truck | 79 | 40 |
| Concrete Pump Truck | 81 | 20 |
| Concrete Saw | 90 | 20 |
| Crane | 81 | 16 |
| Dozer | 82 | 40 |
| Drill Rig Truck | 79 | 20 |
| Drum Mixer | 80 | 50 |
| Dump Truck | 76 | 40 |
| Excavator | 81 | 40 |
| Flat Bed Truck | 74 | 40 |
| Front End Loader | 79 | 40 |
| Generator (>25KVA) | 81 | 50 |
| Generator (<25KVA) | 73 | 50 |
| Gradall | 83 | 40 |
| Grader | 85 | 40 |
| Horizontal Boring Jack | 82 | 25 |
| Hoe Ram | 90 | 20 |
| Impact Pile Driver | 101 | 20 |
| Jackhammer | 89 | 20 |
| Man Lift | 75 | 20 |
| Pavement Scarafier | 90 | 20 |
| Paver | 77 | 50 |
| Pickup Truck | 75 | 40 |
| Pneumatic Tools | 85 | 50 |
| Pumps | 81 | 50 |
| Roller | 80 | 20 |
| Scraper | 84 | 40 |
| Shears (on backhoe) | 96 | 40 |
| Tractor | 84 | 40 |
| Vacuum Excavator | 85 | 40 |
| Vacuum Street Sweeper | 82 | 10 |
| Ventilating Fan | 79 | 100 |
| Vibrating Hopper | 87 | 50 |
| Vibratory Concrete Mixer | 80 | 20 |
| Warning Horn | 83 | 5 |
| Welder/Torch | 74 | 40 |

Table 4-1 Acoustical Properties of Construction Equipment

Source: RCNM User Guide 2006, Table 1 (actual measured L_{max}), FTA 2018, Table 7-1.

Construction Vibration Prediction Procedure

Construction-related vibration is assessed using two different metrics. Peak Particle Velocity (PPV) in inches per second (in/sec) is used to assess potential structural damage from vibration, and Vibration Velocity Level (L_v) in VdB is used to assess human annoyance from vibration. These are calculated using the following equations.

Structural Damage Equation (PPV):

$$PPV = PPV_{ref} * \left(\frac{25}{D}\right)^{1.5}$$

Where:

PPV =Peak Particle Velocity at the nearest structurePPVref =the reference PPV value for a piece of equipment at reference distance of 25 feetD =the distance from the construction equipment to the structure

Human Annoyance Equation (L_v)

$$L_v = L_{v(ref)} - 30 \log \left(\frac{D}{25}\right)$$

Where:

L_v = the Vibration Velocity Level at the nearest structure

 $L_{v(ref)}$ = the reference L_v value for a piece of equipment at a reference distance of 25 feet

D = the distance from the construction equipment to the receiver

Not all construction equipment produces significant ground-borne vibration. Of the equipment listed to be used on this Project shown in Table 4-1, the equipment with the highest reference vibration level would be "Impact Pile Driver" which has a upper range reference PPV ref value of 1.518 in/sec at 25 feet and Lv(ref) equal to 112 VdB at 25 feet. Other construction equipment types expected to be used on the Project that generate ground borne vibration are listed in Table 4-2 (from FTA 2018, Table 7-4).

Potential vibration impacts for both damage and human annoyance are typically assessed using the closest distance to the potentially impacted structure.

| Equipment Type | | PPV at 25 ft, in/sec | L _v , VdB at 25 ft. |
|-----------------------------|-------------|----------------------|-----------------------------------|
| Dilo Drivor (impost) | Upper range | 1.518 | 112 |
| Pile Driver (impact) | Typical | 0.644 | 104 |
| Dilo Drivor (conic) | Upper range | 0.734 | 105 |
| Pile Driver (sonic) | Typical | 0.17 | 93 |
| Vibratory Roller | | 0.21 | 94 |
| Hoe-Ram | | 0.089 | 87 |
| Large Bulldozer | | 0.089 | 87 |
| Caisson/Auger Drilling | | 0.089 | 87 |
| Loaded Trucks | | 0.076 | 86 |
| Jackhammer | | 0.035 | 79 |
| Small Bulldozer | | 0.003 | 58 |
| Source: FTA 2018, Table 7-4 | | ÷ | • |

Table 4-2 Reference Vibration Properties of Selected Construction Equipment

4.2 Operational Noise and Vibration

Operational Noise Prediction Procedure

Operational noise prediction for this Project follows the general noise prediction techniques identified in Section 4.4 of the FTA Transit Noise and Vibration Impact Assessment Manual, 2018, as detailed below.

The FTA manual includes procedures for the computation of noise levels for various types of stationary rail noise sources, including "Rail Yards and Shops". For this computation, it is assumed that the resulting noise level is inclusive of the typical variety of activities and noise sources normally associated with "Rail Yards and Shops" including rail vehicle movements coming in and out of revenue service, vehicle storage and inspection tracks, routine rail vehicle maintenance and refueling areas, vehicle wash stations, shop and storage building, and internal movement of worker and delivery vehicles. Existing mainline rail activity is considered part of the existing environment and therefore is excluded from the noise impact analysis. The equations used to calculate the Leg and Ldn values at the various receptor locations are presented below.

 $L_{eq(1hr)}$ at 50 feet = SEL_{ref} + 10*Log(N_T/20) - 35.6

Where:

L_{eq(1hr)} = the Equivalent Sound Level over 1-hour (peak)
 SEL_{ref} = Reference Sound Exposure Level (118 dBA for Rail Yard and Shops)
 N_T = Train Movements During Peak Hour

The Day-Night Noise level (L_{dn}) is calculated from Daytime and Nighttime L_{eq} levels at 50 feet given number of train movements and then converted to L_{dn} with the following equation:

 $L_{dn} = 10*\log(15*10^{(L_d/10)} + 9*10^{((L_n+10)/10)}) - 13.8$

Where:

Ldn = Day-Night Noise Level Ld = Daytime L_{eq} Ln = Nighttime L_{eq}

Finally, the distance correction for Stationary Sources is estimated using the following equation:

 $L_{rec} = L_{50ft} - 25*log(D_{rec}/50) - S$

Where:

Lrec = the resulting sound level at the receiver location, dBA

L50ft = the calculated source level at 50 feet (L_{eq} or L_{dn}), dBA

Drec = the distance from the source to the receiver, in feet

S = the shielding between the source and receiver locations, in dBA

In addition to the sound levels predicted from Yards and Shops as described above, operational traffic noise, including sound from staff trips and some heavy truck deliveries, was calculated for receivers along the haul route using the FHWA Traffic Noise Model Version 2.5, and those values added to the Yards and Shops noise source for impact assessment.

Operational Vibration Prediction Procedure

While operational ground vibration may be generated by some types of operational rail or industrial activity, no significant ground vibrations sources are anticipated from the operation of the maintenance facility.

5. IMPACT ANALYSIS

5.1 Construction Noise and Vibration

Construction activity for the Project was defined in terms of two construction phases. Phase 1 would consist of the primary build-out of the facility and would last up to 30 months in duration. Phase 2 is a secondary build-out of up to 24 months in duration. Both phases identify 13 sub-phases, including Survey, Clear and Grub, Site Utility/Electric, Demo, Earthwork, Foundations, Roadway/Paving, Buildings, Trackwork (ballasted and direct fixation), Major Equipment, and Commissioning, each with a defined set of equipment to be used (with combined total of over 50 individual types of equipment listed). It was assumed that all construction activity would be restricted to daytime hours between 7 AM and 7 PM as required by the City noise ordinance.

Resulting noise levels for each of the four identified noise-sensitive receptors were calculated in accordance with the procedures outlined in Section 4 and are reported in Table 5-1, below.

| Receiver ID/ Land Use | Impact Metric | Impact Threshold (L _{dn} /L _{eq}) | Distance to Project Center (ft) | Acoustical Shielding (dBA) | Predicted Range (L _{dn} /L _{eq}) | Impact |
|--------------------------|------------------|--|---------------------------------------|----------------------------------|---|--------|
| ST-1/Residential | L _{dn} | 75 | 1275 | 5 ¹ | 50-68 | None |
| ST-2/Park | L_{eq} | 80 | 1100 | 0 | 57-74 | None |
| ST-3/Park | L _{eq} | 80 | 1220 | 0 | 56-73 | None |
| ST-4/Commercial | L _{eq} | 80 | 650 | 5 ² | 56-73 | None |

Table 5-1 Construction Noise Levels and Impacts Summary (Worst Case for All Phases)

Notes:

¹ ST-1 receives estimated minimum 5 dBA shielding from construction activity due to existing 8-to-10-foot-high noise wall.

² ST-4 receives estimated minimum 5 dBA shielding due to intervening row of buildings.

The range of predicted construction values presented in Table 5-1 represent the predicted noise levels over the 30-month Phase 1 schedule (i.e. for ST-1, 50 dBA during the least noisy month up to 68 dBA during the noisiest month).

Construction vibration typically only generates potential impacts at existing structures within a maximum of a few hundred feet, and only then with the use of equipment with particularly high vibration levels such as vibratory roller and impact pile drivers. Of these, impact pile drivers were identified for potential use on just two construction sub-phases, Foundations and Bridges. The exact locations of the potential pile driving activity is currently unknown, but if pile driving is conducted within approximately 250 feet of an occupied commercial building, a short-term significant impact could occur with a predicted vibration level of 75 VdB or greater (corresponding to vibration annoyance for "frequent" events). Only the commercial buildings on the south/west side of the existing mainline tracks could potentially be within this distance.

Ground-borne vibration for construction activity would not be expected to approach potential damage thresholds at any nearby structures. The closest distance at which a pile driver might be to an existing building would be approximately 120 feet at existing commercial building south of mainline tracks, with an estimated vibration level from impact pile driving of 0.144 in/sec PPV, well below the damage threshold of 0.5 in/sec PPV for modern commercial buildings.

5.2 Operational Noise and Vibration

The following operations assumptions were used in calculating potential noise levels and impacts for the noise-sensitive land-uses near the Project.

- Train movements in and out of Maintenance Facility: Peak Hour, 10 daytime (9-10 PM) and 10 nighttime (6-7 AM)
- Vehicle Trips: Average hourly traffic volumes of 10 autos/hour + 1 heavy truck/hour daytime (7 AM to 10 PM), 3 autos/hour + 0 Heavy Trucks/hour nighttime (10 PM to 7 AM)

Table 5-2 below provides a summary of the operational noise level prediction and impact assessment. The Total Project noise level includes contributions from both on-site operational noise sources associated with Rail Shops and Yard as well as automobile and truck traffic in and out of the sight.

| Receiver info | | | | | Impact Th (dB | | Prediction (dBA) | |
|---------------|-------------|---------------|---------------------|----------|------------------|-----------|---------------------|--------|
| | | Distance to | | Existing | Total | Moderate | Severe | |
| | | Project | Analysis | Noise | Project-Only | Impact | Impact | |
| ID | Land Use | Center (feet) | Metric | Level | Sound Level | Threshold | Threshold | Impact |
| ST-1 | Residential | 1275 | L _{dn} | 67 | 52* | 63 | 67 | None |
| ST-2 | Park | 1100 | L _{eq-1hr} | 55 | 41 | 61 | 66 | None |
| ST-3 | Park | 1220 | L _{eq-1hr} | 60 | 39 | 63 | 68 | None |
| ST-4 | Industrial | 650 | L _{eq-1hr} | 52 | 51 | 60 | 65 | None |

Table 5-2 Operational Noise Levels and Impacts Summary

*Predicted project-only noise level at ST-1 includes contributions from both facility site and project-related traffic on adjacent local roads.

6. MITIGATION MEASURES

All operational noise and vibration levels as well as construction noise associated with the Project would not result in any impacts. The only construction impacts that could be considered significant would be construction vibration annoyance resulting from pile-driving equipment if these are used within 250 feet of an existing structure during Project construction. Only the commercial buildings on the south/west side of the existing mainline tracks could potentially be within this distance. The following mitigation measures should be implemented to reduce or eliminate vibration impacts associated with the use of impact pile drivers during construction:

- **MM-NOI-1** If feasible, relocate Project elements requiring pile driving to locations greater than 250 feet from occupied buildings.
- **MM-NOI-2** If MM-NOI-1 is not feasible, use a less intrusive form of pile insertion, such as pre-augured piling.
- **MM-NOI-3** Arrange to conduct pile driving activities during a period when the affected building(s) are not in use (such as Saturdays).

7. IMPACTS AFTER MITIGATION MEASURES

The only potential Project impacts are associated with vibration annoyance impacts associated with Pile Driving activity. Upon implementation of MM-NOI-1 through MM-NOI-3, all impacts can be reduced to less than significant.

8. **REFERENCES**

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2018. <u>https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf</u>.

City of Irvine, 2015a, Noise Element of the Irvine General Plan, 2015

https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=20695#:~:text=maximum%20int erior%20noise%20levels%20of,7%20a.m.%20for%20typical%20occupancy.

_, 2015b, Municipal Code Irvine, Chapter 2, NOISE,

https://library.municode.com/ca/irvine/codes/code of ordinances?nodeId=TIT6PUWO DIV8PO CH2NO

SCRRA, Metrolink System Map, October 2019, Available at: https://metrolinktrains.com/about/agency/

Appendix G Technical Memorandum Paleontological Resources

Metrolink Orange County Maintenance Facility

Prepared for: Orange County Transportation Authority

> 550 S. Main St. Orange, CA 92868

> > And

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

Prepared by:

AECOM 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|--|----------|
| 0 | Draft Paleontological Resources Technical Memorandum | 01/08/21 |
| 1 | Draft Paleontological Resources Technical Memorandum (Incorporating OCTA's comments) | 4/27/21 |
| | | |

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1. INTRODUCTION

The Southern California Regional Railroad Authority (SCRRA) Metrolink Commuter Rail System (Metrolink) is proposing to construct a new Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project"). The Project would include several facilities including a transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth, sand silos, a maintenance facility, a maintenance facility extension, and 11 tracks. Approximately 80 employees would report to the Project. The Project consists of buildings that would have a total building area of approximately 90,000 square feet when combined. Metrolink currently operates two maintenance facilities across its service area: Central Maintenance Facility (CMF) in Los Angeles and Eastern Maintenance Facility (EMF) in San Bernardino County. Due to projected population expansion within its service area and the agency's goal to be prepared for the 2028 Los Angeles Summer Olympic Games, Metrolink will require an increased number of commuter rail services, as well as additional train storage and maintenance facilities associated with an increased fleet size. As a significant proportion of the expanded services will operate in Orange County, the Project would provide an optimal location for a new Metrolink maintenance facility. Metrolink's member agency, the Orange County Transportation Authority (OCTA), proposes to build this facility on an OCTA-owned parcel in the City of Irvine. OCTA is the lead agency under the California Environmental Quality Act (CEQA). The City of Irvine and SCRRA are the responsible agencies under CEQA.

The purpose of this memorandum is to present the results of a paleontological resources investigation and to describe the potential impacts to paleontological resources as defined by CEQA that may be associated with the Project.

2. PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

As a result of the projected population expansion within the five-county area (Orange County, Los Angeles County, San Bernardino County, Riverside County, and Ventura County) currently served by the SCRRA, Metrolink will require an increased number of commuter rail services to support the growth. Consequently, the Metrolink system (Figure 2.1-1) would require additional train storage and maintenance facilities to support an increased fleet size.



Figure 2.1-1 Metrolink System Map

Source: SCRRA (2019)

Metrolink's CMF facility is located on the east bank of the Los Angeles River near the Interstate 5 (I-5) and Interstate 10 (I-10) highways, just south of the location of the former Southern Pacific Taylor Yard. The CMF is currently near capacity, which will impact the ability to provide the necessary train servicing for planned service-expansion of various Metrolink lines throughout the system under the Southern California Optimized Rail Expansion (SCORE) program. By transferring a portion of the current fleet from CMF to the proposed OCMF (specifically the Orange County Line trains), capacity for the non-Orange County trains will be increased at CMF. The Orange County Line has the highest ridership within the Metrolink system; therefore, a maintenance facility to serve the Orange County area with sufficient storage and servicing capabilities for both locomotives and rail cars is critical to controlling operating costs. In order to optimize rail service in the region, the proposed facility development would need to be completed by 2028. The SCORE program may also require heavy overhaul capabilities at OCMF, subject to pending decisions regarding fleet technology and management.

The expansion of Orange County and overall Metrolink commuter rail service will ultimately require additional or expanded equipment servicing capabilities for both locomotives and rail cars. Since a significant portion of the fleet will be in Orange County, a maintenance facility located along the Metrolink route through Orange County would be the optimal location as it would reduce operating costs by limiting non-revenue moves to the existing SCRRA storage and maintenance facilities in the cities of Los Angeles and San Bernardino. The proposed maintenance facility would provide equipment to inspect, clean, and maintain cars and locomotives on a regular and efficient basis. Much of the inspection and maintenance activity is federally mandated and must be performed at specific intervals. The OCMF will also provide refueling services thus reducing fuel costs, reducing fuel consumption, and will reduce emissions. Currently trains operating in the Orange County Region must travel either the CMF or EMF for refueling, which are sometimes non-revenue runs. The location of the Project is on a 21.3-acre OCTA-owned parcel on Ridge Valley south of Marine Way in the City of Irvine, (Project Site). The Project Site is located within the boundaries of a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was quitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City of Irvine that same year. OCTA then purchased the fee ownership of the Project Site from the City of Irvine. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley.

Prior to the current construction of the storage/set-out track, the Project Site was mostly vacant. The site currently includes 1,000-foot-long storage for miscellaneous rail equipment including temporary railroad bridges, signal houses, railroad ties, and signal components. Although not part of the Project, OCTA is currently installing a single 1,000-foot-long, single-ended storage track and fencing of the perimeter of the property to provide temporary storage of two trainsets and/or track maintenance equipment when necessary. There is a segment of an abandoned road, stormwater drains, and underground water transfer vault with a network of pipelines, valves and associated vents, that are currently not in use.

2.2 PROJECT DESCRIPTION

The OCMF would be located in the City of Irvine, on a 21.3-acre parcel owned by OCTA and adjacent to Marine Way and the Metrolink Orange subdivision between mileposts 183.50 and 184.00 on Metrolink's "Orange" Subdivision (Figure 2.2-1). The Project Site is located within Planning Area 51 of the updated City of Irvine General Plan, adopted in June 2015, and designated for the Great Park (formerly known as the Orange County Great Park (OCGP)) land use under the General Plan. Per the City's zoning ordinance, the proposed use is a conditionally allowable use under the existing zone; therefore, OCTA is submitting a Conditional Use Permit to the City of Irvine for approval,

The Project would be developed in two phases with an anticipated completion date of 2028. Phase 1 focuses on developing facilities needed for the storage and routine cleaning, inspection and servicing of the anticipated trainsets. The total area of the Phase 1 buildout would be approximately 20,996 square feet and would be comprised of the following facilities: the transportation building, employee parking area, train-wash building, pump house, utility building, guard booth, equipment booth and sand silos (Table 2.2-1). A total of 11 tracks would be built. The Phase 1 layout situates the train wash, fueling/sanding, and service and inspection tracks on the two tracks with the greatest tangent length, which are the ones nearest the railroad right of way ("ROW"). This is important in fitting a second fueling/sanding facility so that there is one at each end of the service and inspection platform to support having the locomotive at either end, all within tangent track. Additionally, six storage tracks and appurtenant features (air, water, head end power and toilet dump facilities) would be constructed. The storage tracks would be built near the middle of the site east of the service and inspection tracks. Phase 1 of the buildout would anticipate approximately 52 employees total throughout the entire day, split across three eight-hour shifts.

| Building/Facility/Item | Building Area | Building Height |
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| Transportation Building | 7,495 sq. ft. | 20 ft |
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| Utility Building | 981 sq. ft. | 20 ft |
| Pump House | 750 sq. ft. | 14 ft |
| Guard Booth | 36 sq. ft. | |
| Equipment Booth | 48 sq. ft. | |
| Sand Silos (2 Total) | 576 sq. ft. | |
| Total | 89,268 sq. ft. | |

| Table 2 | 2.2-1 | Building | Specifications |
|---------|-------|----------|----------------|
|---------|-------|----------|----------------|

Source: Gannett Fleming, Metrolink (February 2022)

Note: sq. ft. = square feet; ft = feet

A runaround track would be provided between the service and inspection tracks and storage tracks. Additionally, two temporary stub-ended set out tracks would be provided in the Phase 1 layout that occupies the footprint of the future shop tracks (one at the north and one at the south end of the yard). These set out tracks would be converted to shop access tracks in Phase 2 and, therefore, would no longer be available as set out tracks. A new set out track would then be provided as part of Phase 2.

A transportation building that would be utilized for administrative purposes is also included in Phase 1. This building would house managerial offices, welfare spaces for train crews and on-site personnel. This facility would include restrooms, showers, locker rooms, a break/day room, vending space and a kitchenette.

Parking would be provided for staff reporting to the site. Fire department compliant roadways would be developed to permit circulation of the site for Metrolink vehicles as well as delivery trucks (sand and fuel).

Phase 2 completes the full buildout of the Project. It would include development of the maintenance shop building and its future extension that would comprise of a total buildout area of 68,272 square feet (**Error! R eference source not found.**). The shop would have capabilities to perform regular three-month, six-month and one-year preventive maintenance cycles on trainsets. Phase 2 of the buildout would consist of approximately 28 employees. With the full buildout of Phase 1 and Phase 2, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts.

Access to the OCMF would require a roadway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The Project includes the southern extension of Ridge Valley Road from Marine Way and associated traffic signal improvements to provide access to the OCMF.

The 11 new east and west lead tracks, as discussed in this section above, would be constructed within the existing railroad corridor between MP 183.0 and MP 184.00 on Metrolink's "Orange" Subdivision to connect the existing mainline railroad to the proposed OCMF rail yard. A new single span concrete bridge over the Bee Canyon Channel (Channel) would be built for the east lead track. A segment of the Channel and utilities that are found to be in conflict would be lowered by approximately 2.5 feet to facilitate the construction of the bridge.

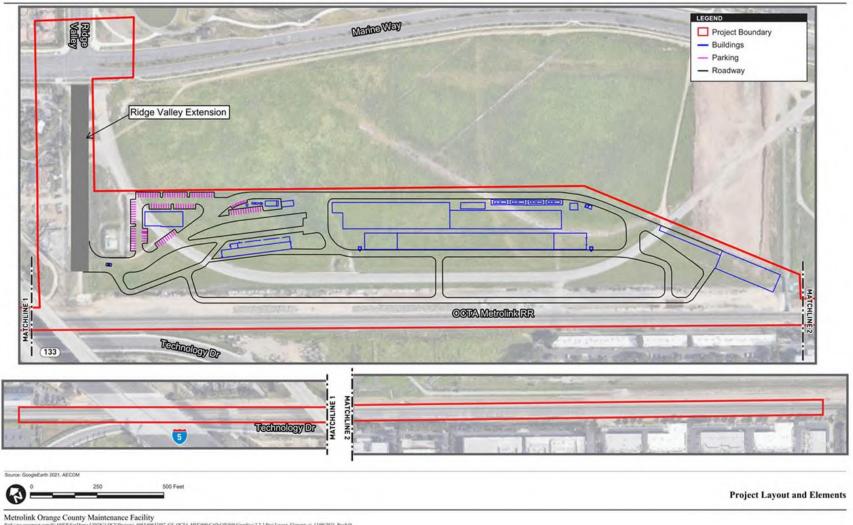


Figure 2.2-1 Project Layout and Elements

197_GF_OCTA_MSF 900-CAD-GIS 930 Graphics 2.2-2 Proj Layout_Elements.ai, 12/09/2021, BradyD SSEGLECSPH

Source: ESRI (2021), OCTA (2021)

3. **REGULATORY FRAMEWORK**

3.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA (Public Resources Code [PRC] Sections 21000–21177) is intended to prevent significant avoidable impacts to the environment by requiring feasible alternatives or mitigation measures. If cultural resources are identified within the Project Site, the sponsoring agency must take those resources into consideration when evaluating the Project's effects. The level of consideration may vary with the importance of the cultural resource.

Paleontological resources are not explicitly mentioned in the text of California Register of Historical Resources (CRHR) (PRC Section 5024.1, Title 14 California Code of Regulations [CCR], Section 4852). However, they are specifically identified for protection in Section V(c) of Appendix G, the "Environmental Checklist Form," which asks whether the Project would "Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?"

A paleontological resource is typically considered "unique" if it provides significant information about past environments or ancient life.

3.2 PUBCIC RESOURCES CODE SECTION 5097.5

PRC Section 5097.5 states that no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological, or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. "Public lands" refers to land owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

4. METHODOLOGY

A paleontological resources assessment was obtained for this Project from the Natural History Museum of Los Angeles County (LACM). Pertinent geological information was reviewed for the Project extent, including a review of paleontological literature; no paleontological field survey was performed. Paleontological sensitivity of the Project Site was addressed, and potential paleontological mitigation measures offered, as appropriate.

5. ENVIRONMENTAL SETTING

5.1 GEOLOGIC OVERVIEW

Geologic maps indicate that the entire Project Site is covered with surficial deposits of Qyf, (Morton and Miller, 2006). These deposits consist of young Quaternary alluvial fan deposits. They consist of slightly consolidated to cemented deposits of unsorted boulders, cobbles, gravels, and sands deposited by fluvial

processes. Shallow Qyf deposits date to the Holocene (approximately 11,650 calibrated radiocarbon years before present to today). The guidelines of the Society of Vertebrate Paleontology state that fossils as young as 5,000 years can be significant paleontological resources. But older Qyf deposits may date to the late Pleistocene (approximately 129,000 to 11,650 calibrated radiocarbon years before present). Thus, the sensitivity of Qyf deposits for significant paleontological remains increases with depth. Moreover, in this vicinity Qof deposits, which consist of older Quaternary alluvium dating to the late to middle Pleistocene, typically underlies the Qyf younger Quaternary alluvium at varying depths. Older Quaternary alluvium, which also dates to the Pleistocene, has yielded significant fossils in the Irvine area.

5.2 ARCHIVAL RESEARCH

Archival research included a records search conducted by the Los Angeles County Museum of Natural History (NHM) and a review of reports in AECOM's library. AECOM requested a paleontological records search be conducted by the NHM on July 8, 2020. Dr. Samuel MacLeod responded on behalf of the museum in a letter dated July 22, 2020. The records search found that no paleontological localities are documented within the Project Site. However, fossil localities are documented nearby in older Quaternary deposits (Table 5.2-1).

The closest NHM vertebrate fossil locality from older Quaternary deposits is LACM 7867, approximately 0.6mile northeast of the Project Site near the intersection of C Street and 5th Street, that produced fossil specimens of pocket gopher, *Thomomys*, at a depth of 25 feet below the surface.

The next closest vertebrate fossil from older Quaternary deposits is in Borrego Canyon, located approximately one mile east of the Project Site. Two fossil localities are found there. The lower one, 7.5 feet below the surface, produced remains of ground sloth, reptiles, amphibians, and freshwater fish (Stewart, 2006). Directly over that horizon is another that produces fossils of Pleistocene plants including manzanita and has been radiocarbon dated at about 28,000 calibrated radiocarbon years before present.

The next closest vertebrate locality is LACM 7713, located approximate 1.5 miles southwest of the Project Site on the western side of the Laguna Freeway (State Route 133 [SR-133]) at the southern end of the interchange with the San Diego Freeway (I-405), that produced a fossil specimen of ground sloth, *Mylodontidae*, from unstated but shallow depth.

| Locality | Location | Age/ Formation | Findings |
|------------------------|--|-----------------------|--|
| LACM 7867 | Immediately northeast of the Project Site near the intersection of C Street and 5th Street, 25 feet below surface. | Quaternary deposit | <i>Thomomys</i> (pocket gopher) |
| LACM 7713 | Southwest of the Project Site on the western side of the Laguna Freeway (SR-133) at the southern end of the interchange with the San Diego Freeway (I-405), from unstated but shallow depth. | Quaternary deposit | <i>Mylodontidae</i> (ground sloth) |
| Borrego Canyon Wash | Immediately east of the Project Site in Borrego Canyon Wash at a depth of 5 feet. | Quaternary deposit | Arctostaphylos manzanita) |
| Borrego Canyon Wash | Immediately east of the Project Site in Borrego Canyon Wash at a depth of 7.5 feet. | Quaternary deposit | Freshwater fish, amphibians, reptiles, ground sloth |

Table 5.2-1. Previously Recorded Paleontological Resources Closest to the Project

Source: NHM (2020)

6. IMPACTS ANALYSIS

The sensitivity of the Project to encounter significant fossil remains appears high. Geologic maps indicate that the surficial deposits at the Project Site consist of younger Quaternary alluvium. These Holocene deposits are too young to typically contain significant fossils. The depth of excavations required for the Project could encounter Pleistocene horizons as shallow as 5 feet from the existing surface elevation. Moreover, soils at very shallow depths can reasonably be assumed to have been disturbed in the recent past by grading, by utilities excavations, and by activities related to the railroad and Marine Corps Station El Toro. However, the conditions at the Project Site are unknown.

Nevertheless, it is possible that the Project would encounter older Qyf deposits or Qof deposits during excavations. Unknown fossil resources may exist within these deposits, which have yielded significant fossils in the near vicinity of the Project. The sensitivity for the Project to encounter significant fossils increases with depth.

7. MITIGATION MEASURES

It is not anticipated that the Project would impact known paleontological resources. However, the possibility exists for the Project to encounter unknown paleontological resources in the course of excavation, if excavations exceed a depth of 5 feet. The following mitigation measures are recommended to reduce any impacts to unknown paleontological resources encountered during excavations to a less than significant level.

- MM-PAL-01 Worker Environmental Awareness Program. Prior to construction, OCTA shall retain a qualified paleontologist who meets the requirements to be included in Orange County's list of qualified paleontologists. The qualified paleontologist shall prepare a Worker Environmental Awareness Program (WEAP). The WEAP will describe the types of resources that may be encountered during construction, the laws protecting those resources, and the procedures to follow when finds are encountered. The WEAP will be presented either in person or in video form to all construction employees involved in ground-disturbing activities before they begin work at the Project Site. If Project excavations are expected to exceed a depth of 5 feet below the surface, the qualified paleontologist shall prepare a Paleontological Resources Monitoring and Mitigation Plan that includes sampling and wet screening of sediment samples.
- **MM-PAL-02 Response to Unanticipated Paleontological Finds.** If buried paleontological resources are uncovered during construction, all work shall be halted in the vicinity of the discovery until a qualified paleontologist can visit the site of discovery and assess the significance of the resource and, if necessary, recommend treatment.

8. IMPACTS AFTER MITIGATION

There are no known paleontological resources that would be impacted by the Project. Implementation of Mitigation Measure MM-PAL-01 would contribute to the successful identification of unanticipated fossil deposits that are encountered during construction. In the event that any unknown paleontological resources are found during construction, implementation of Mitigation Measure MM-PAL-02 would reduce any potential impacts to less than significant.

9. PREPARER'S QUALIFICATIONS

Dr. Marc Beherec has worked in the field of cultural resources management for approximately 20 years. He obtained his B.A. in Anthropology with a Geology minor from the University of Texas, Austin, and his M.A. and Ph.D. in Anthropology from the University of California, San Diego. He coordinated paleontological monitoring for various local agencies and assisted in the preparation of paleontological impact studies for the purposes of CEQA, as well as paleontological monitoring plans and memoranda documenting the results of paleontological monitoring.

Dr. Joe Stewart is a vertebrate paleontologist with over 40 years of experience in paleontology and 30 years of experience in the geology and paleontology of California, particularly in Merced, Fresno, Kern, Santa Barbara, Los Angeles, Orange, San Bernardino, Riverside, Imperial, and San Diego counties. Dr. Stewart has been involved in the permitting or construction of more than ten power plants and has directed the paleontological monitoring and mitigation program for Path 15, a major transmission line Project. He is also a certified paleontologist for the Counties of Orange and Riverside. His publications include 40 peer-reviewed articles in books and journals. His research specialties are fossil fishes and Pleistocene vertebrate faunas.

10. REFERENCES

- Morton, D.M., and F.K. Miller, 2006, *Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangles, California.* Reston, VT: United States Geological Survey.
- Stewart, J.D. 2006. Paleontological Resources Update and Review, Heritage Fields / The Great Park, City of Irvine, Orange County, California. Document prepared by PCR Services Corporation for Heritage Fields El Toro, LLC, Orange County Great Park Corporation Community Development Department, and City of Irvine.

SCRRA, Metrolink System Map, October 2019, Available at: https://metrolinktrains.com/about/agency/

Appendix H Technical Memorandum Traffic

Metrolink Orange County Maintenance Facility

Prepared for: Orange County Transportation Authority

> 550 S. Main St. Orange, CA 92868 And

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

AECOM

One California Plaza 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|--|-----------|
| 0 | Draft Traffic Technical Memorandum | 01/26/21 |
| 1 | Draft Traffic Technical Memorandum (Incorporating OCTA's comments) | 03/17/21 |
| 2 | Draft Traffic Technical Memorandum (Incorporating OCTA's comments) | 10/4/2021 |
| 3 | 3 Draft Traffic Technical Memorandum (Incorporating City of Irvine's comments on the Conditional Use Permit) | |
| 4 | Draft Traffic Technical Memorandum (Incorporating City of Irvine's comments on the Conditional Use Permit) | 2/16/2022 |

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Attachments

- Attachment A Limited Traffic Study Scope of Work
- Attachment B Project Plans
- Attachment C ICU Level of Service Calculations
- Attachment D HCM Level of Service Calculations

1. INTRODUCTION

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This traffic study has been prepared to identify the short-term traffic deficiencies (level of service [LOS]) and CEQA transportation impacts (vehicle miles travelled [VMT]) resulting from the Project. The study meets the requirements of a Limited Scope Traffic Study as defined by the City of Irvine (City) and has been prepared in accordance with applicable sections of the City of Irvine Traffic Study Guidelines (November 2021) and the City of Irvine Transportation Design Procedures (February 2007).

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| Guard Booth | 36 sq. ft. | |
| Equipment Booth | 48 sq. ft. | |
| Sand Silos (2 Total) | 576 sq. ft. | |
| Total | 89,268 sq. ft. | |

| Table | 2.2-1 | Building | Specifications |
|-------|-------|----------|----------------|
|-------|-------|----------|----------------|

Source: Gannett Fleming, Metrolink (2022)

Note: sq. ft. = square feet; ft = feet

A runaround track would be provided between the service and inspection tracks and storage tracks. Additionally, two temporary stub-ended set out tracks would be provided in the Phase 1 layout that occupies the footprint of the future shop tracks (one at the north and one at the south end of the yard). These set out tracks would be converted to shop access tracks in Phase 2 and, therefore, would no longer be available as set out tracks. A new set out track would then be provided as part of Phase 2.

A transportation building that would be utilized for administrative purposes is also included in Phase 1. This building would house managerial offices, welfare spaces for train crews and on-site personnel. This facility would include restrooms, showers, locker rooms, a break/day room, vending space and a kitchenette. Approximately 120 automobile parking spaces would be provided for staff reporting to the site. Fire department compliant roadways would be developed to permit circulation of the site for Metrolink vehicles as well as delivery trucks (sand and fuel).

Phase 2 completes the full buildout of the Project. It would include development of the maintenance shop building and its future extension that would comprise of a total buildout area of 68,272 square feet (Table 2.2-1). The shop would have capabilities to perform regular three-month, six-month, and one-year preventive maintenance cycles on trainsets. Phase 2 of the buildout would consist of approximately 28 employees. With the full buildout of Phase 1 and Phase 2, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts. The 11 new east and west lead tracks, as discussed in this section above, would be constructed within the existing railroad corridor between MP 183.0 and MP 184.00 on Metrolink's "Orange" Subdivision to connect the existing mainline railroad to the proposed OCMF rail yard. A new single span concrete bridge over the Bee Canyon Channel (Channel) would be built for the east lead track. A segment of the Channel and utilities that are found to be in conflict would be lowered by approximately 2.5 feet to facilitate the construction of the bridge.

Regional vehicle access to and from the Project Site is provided primarily by I-5 at Sand Canyon Avenue, with supplemental access by State Route (SR) 133, which provides connections to SR-241 and I-405. Local vehicle access is provided by Marine Way and Ridge Valley. Direct access in and out of the Project Site would be provided by a driveway opening onto a dead-end (cul-de-sac) extension of Ridge Valley southwest from Marine Way. A detailed site plan showing the Ridge Valley extension and proposed driveway is included in Attachment B.

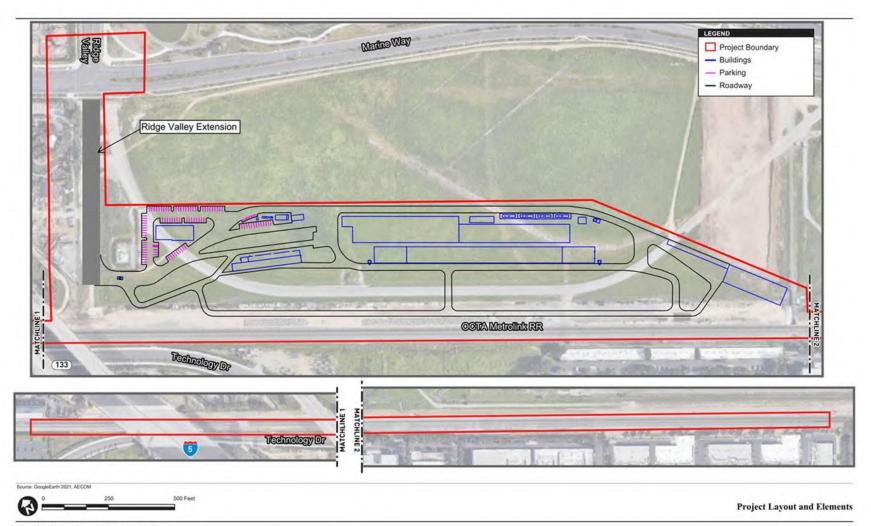


Figure 2.2-1 Project Layout and Elements

Metrolink Orange County Maintenance Facility Path: maacommet.com/fit/MIR/SatDage-USDG7 DCSProjects. 9651 9652397 GF OCTA MSF900-C4D-G55910 Graphes/2.2-2 Proj Layout Elements.al, 1209/2021, BradyD

Source: ESRI (2021), OCTA (2021)

3. ANALYSIS METHODOLOGY AND APPROACH

For reference, the scope of work for this traffic analysis, as submitted to the City of Irvine, is included as Attachment A to this technical memorandum.

3.1 STUDY AREA

The roadway network in the vicinity of the Project Site is illustrated in Figure 3.2-1.

The study area includes the following four signalized study intersections (illustrated in Figure 3.2-1) and three study roadway segments:

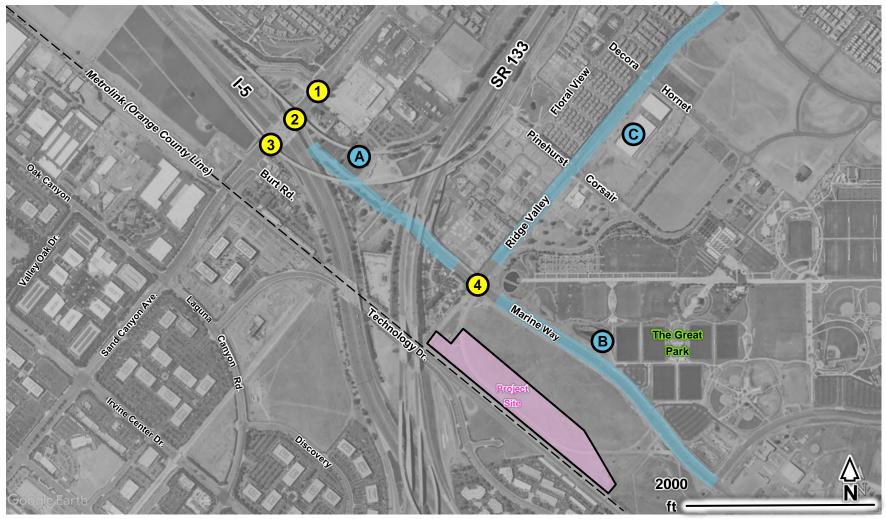
- Study intersections:
 - 1. Sand Canyon Avenue / I-5 Northbound Ramps
 - 2. Sand Canyon Avenue / Marine Way
 - 3. Sand Canyon Avenue / I-5 Southbound Ramps
 - 4. Ridge Valley / Marine Way
- Study roadway segments:
 - A. Marine Way between Sand Canyon Avenue and Ridge Valley
 - B. Marine Way east of Ridge Valley
 - C. Ridge Valley between Great Park Boulevard and Marine Way

3.2 PERFORMANCE CRITERIA

Intersections and Roadway Segments

Peak-hour operations at the study intersections were analyzed according to the intersection capacity utilization (ICU) methodology, which compares the volume-to-capacity (v/c) ratios of conflicting turn movements at an intersection to identify the critical movements for each intersection approach. The v/c ratios for the identified critical movements are then summed together to determine the overall v/c ratio (or ICU) of the intersection, which can then be expressed in terms of LOS, where LOS A represents free-flow conditions and LOS F represents operations exceeding the capacity of the intersection. The analysis includes parameters set by the City for ICU calculations, including lane capacity, right-turn treatment, and clearance intervals.

Figure 3.2-1 Study Intersections



Source: Google Earth (2018)

The relationship between ICU and LOS is summarized in Table 3.2-1.

| Level of service | v/c range | Delay range | | | |
|------------------|----------------------------|---------------------------------|--|--|--|
| | (ICU and roadway segments) | (HCM, signalized intersections) | | | |
| A | $0.00 \leq x \leq 0.60$ | <i>x</i> ≤ 10.0 | | | |
| В | $0.61 \le x \le 0.70$ | $10.0 < x \leq 20.0$ | | | |
| С | $0.71 \leq x \leq 0.80$ | $20.0 < x \leq 35.0$ | | | |
| D | $0.81 \leq x \leq 0.90$ | $35.0 < x \leq 55.0$ | | | |
| E | $0.91 \le x \le 1.00$ | $55.0 < x \le 80.0$ | | | |
| F | 1.00 < x | 80.0 < <i>x</i> | | | |

| Table 3.2-1 | Level of Service Definitions |
|-------------|------------------------------|
|-------------|------------------------------|

Source: City of Irvine Traffic Study Guidelines (June 2020); Transportation Research Board, Highway Capacity Manual (2017)

For signalized intersections under the jurisdiction of the California Department of Transportation (Caltrans), LOS was also calculated according to the Highway Capacity Manual (HCM) methodology [Transportation Research Board (TRB), 2017].⁽¹⁾ The HCM methodology determines LOS based on average delay (in seconds per vehicle) at the intersection, as summarized in Table 3.2-1.

For roadway segments, v/c ratios were calculated using theoretical daily capacities (as defined in the *City of Irvine Traffic Study Guidelines*) by roadway type (as defined in the Circulation Element of the City's General Plan), as summarized in Table 3.2-2.

According to the *City of Irvine Traffic Study Guidelines* and consistent with the City's General Plan, acceptable conditions are generally defined as LOS D or better, calculated according to the City's ICU methodology. The City applies several special exceptions for specific locations and / or development sites, but none of these exceptions apply to the study intersections and roadway segments analyzed in this study.

The City applies the following performance criteria to identify whether a project results in, or substantially contributes to, an LOS deficiency:

- A location is at an acceptable LOS in the baseline condition and the project causes the location to become deficient; or
- A location is deficient (i.e., at unacceptable LOS) in the baseline condition and the project causes the location to further deteriorate by two percent or more.⁽²⁾

⁽¹⁾ HCM-based results are presented for informational purposes only, and are not used in the determination of significant impacts.

⁽²⁾ For v/c ratios, the two-percent threshold is applied as an increase of 0.02 or greater in the v/c ratio (based on the City's ICU methodology for intersections and daily capacity methodology for roadway segments).

| Facility type | Lanes | Capacity ⁺ |
|-------------------|-------|-----------------------|
| | 10 | 210,000 |
| Freeview | 8 | 176,000 |
| Freeway | 6 | 135,000 |
| | 4 | 90,000 |
| | 2 | 22,000 |
| Freeway ramps | 1 | 16,000 |
| Expressway | 6 | 135,000 |
| | 8 | 72,000 |
| Major highway — | 6 | 54,000 |
| Primary highway | 4 | 32,000 |
| Secondary highway | 4 | 28,000 |
| Commuter | 2 | 13,000 |
| Commuter (rural) | 2 | 18,000 |

Source: City of Irvine Traffic Study Guidelines (June 2020)

Notes: Capacity may be interpolated for roadways that do not specifically fall into one of the facility type–lane combinations indicated above.

+ vehicles per day of the roadway

For roadway segments determined to be deficient based on daily capacity, the City requires an additional peak-hour link analysis (PHLA) to make a final LOS deficiency determination. The peak-hour link analysis determines v/c ratios for each direction of the roadway segment, for both the weekday a.m. and p.m. peak hours.⁽³⁾ The roadway capacity is determined by multiplying the number of lanes (at an appropriate mid-block location) by a lane capacity of 1,600 vehicles per hour (vph). Where the distance between controlled intersections is one mile or more, the assumed lane capacity is increased to 2,000 vph.

Where a project is determined to result in or substantially contribute to a LOS deficiency, the given project is required to improve operations to baseline conditions or better.

Transportation Design Procedures

The proposed vehicle access—including the Project's driveway and the proposed cul-de-sac extension of Ridge Valley—were analyzed based on the design criteria described in the *City of Irvine Transportation Design Procedures* (June 2020). The Transportation Design Procedures (TDPs) establish uniform policies and procedures for reviewing traffic design plans within the City and are used in this study to evaluate roadway design as it relates to the Project. Discussion and analysis of applicable design criteria are provided in later sections of this study.

⁽³⁾ The a.m. and p.m. peak hours are typically defined as the peak 60-minute periods (i.e., four consecutive 15-minute periods) with the highest total intersection volume within each of the a.m. and p.m. peak periods (7:00–9:00 a.m. and 4:00–6:00 p.m., respectively).

3.3 ANALYSIS SCENARIOS

Given the size and nature of the Project, this study is designed to meet the City's requirements for a Limited Scope Traffic Study, and includes analysis of the following scenarios:

• Existing Baseline

This scenario represents existing conditions in 2020, assuming the continuation of traffic levels and growth trends prior to the shelter-in-place restrictions and other effects associated with the COVID-19 pandemic.

• Existing Baseline plus Project

This scenario represents the Existing Baseline scenario plus the effects of the Project, including Project-generated traffic.

• Short-Term Interim Year Baseline

This scenario represents a five-year horizon (2025) beyond the Existing Baseline scenario, and accounts for development projects approved by the City and expected to be completed by that time.

• Short-Term Interim Year Baseline plus Project

This scenario represents the Short-Term Interim Year Baseline scenario plus the effects of the Project, including Project-generated traffic.

3.4 COMMITTED IMPROVEMENTS

Currently, Marine Way intersects Sand Canyon Avenue in between the two ramp intersections at I-5's interchange with Sand Canyon Avenue. While the portions of Marine Way approaching Sand Canyon Avenue and Ridge Valley are built to a minimum cross-section of four lanes, the mid-block portion crossing over the Marshburn Channel flood control facility only features two lanes.

The City is actively working on a future realignment of Marine Way at its northern end intersecting Sand Canyon Avenue. The new alignment would begin approximately where Marine Way passes underneath SR 133, swinging to the northeast along the south edge of the Caltrans District 12 Transportation Management Center and the OCTA's Sand Canyon Bus Base and tying into Sand Canyon Avenue as the southern leg of the existing intersection at the I-5 Northbound Ramps. The realigned segment would feature a minimum cross-section of four lanes for its entire length.

To account for the Marine Way realignment, the Short-Term Interim Year scenarios each include two alternatives: Alternative 1 assuming Marine Way as it is currently, and Alternative 2 assuming the planned realignment.

City of Irvine staff also identified a future lane striping modification at the Sand Canyon Avenue / Marine Way intersection proposed as part of a separate development on the nearby Traveland site. These modifications would convert one of the southbound left-turn lanes into a through lane, leaving only a single southbound left-turn lane.

A review of committed improvements identified in the City's latest Circulation Phasing Analysis Report (March 2020) did not find any other relevant improvements affecting the study intersections and roadway segments analyzed in this study.

4. **PROJECT TRAFFIC**

4.1 TRIP GENERATION

Due to the specialized nature of the Project, trip generation for the Project was estimated based on the number of employees, plus allowances to account for fleet vehicles, deliveries (e.g., fuel, sand, maintenance equipment, etc.), visitors, and other ancillary traffic.

Based on existing operations at other commuter rail maintenance facilities, approximately 80 employees are expected to access the Project Site daily, split across three eight-hour shifts. As much of the actual fleet maintenance activities would take place overnight, when locomotives and passenger cars are not in revenue service, the majority of employees are expected to work the overnight shifts, with 60 percent working the 4:00 p.m.–12:00 a.m. shift and 30 percent working the 12:00–8:00 a.m. shift. The remaining 10 percent of employees are assumed to work the daytime shift (8:00 a.m.–4:00 p.m.). The trip generation conservatively assumes an automobile mode share of 100 percent, with an average vehicle occupancy of 1.00. Thus, no reductions were taken to account for other modes—including public transit or active transportation (walking or biking)—or carpooling.

The Project would also serve as a base for approximately 10 fleet vehicles, each of which were conservatively assumed to be used for off-site duties once daily, proportionally distributed across the three work shifts based on the number of workers assigned to each shift. For both peak hours, the analysis conservatively includes fleet vehicles assigned to both the leading shift and following shift. For the a.m. peak hour, for example, the Project's trip generation includes both inbound fleet vehicles arriving back at the site (for the work shift ending at 8:00 a.m.) and departing the site (for the work shift beginning at 8:00 a.m.). The fleet vehicles are assumed to be off-site for most of the corresponding shift to conduct repair, regular maintenance, and other duties within Metrolink right-of-way and at Metrolink facilities; thus, any fleet vehicles assigned to a given peak hour are assigned to that peak hour only once.

To account for deliveries, visitors, and other ancillary traffic, an additional allowance of 20 vehicles per day, spread uniformly across the typical eight-hour workday, was assumed.

The estimated trip generation for the Project is summarized in Table 4.1-1. As the site is currently vacant, there are no existing trips or uses to be considered for this study.

| | | | | | Ve | ehicle-tri | ps | | | |
|-----------------|--------------|-------|-----|--------------|----|--------------|-------|----|-----|-------|
| Trip category | | Daily | | AM peak hour | | PM peak hour | | | | |
| | | In | Out | Total | In | Out | Total | In | Out | Total |
| Worker commutes | 80 employees | 80 | 80 | 160 | 8 | 24 | 32 | 0 | 8 | 8 |
| Fleet vehicles | 10 vehicles | 10 | 10 | 20 | 3 | 1 | 4 | 1 | 6 | 7 |
| Other | | 20 | 20 | 40 | 3 | 3 | 6 | 3 | 3 | 6 |
| Total | | 110 | 110 | 220 | 14 | 28 | 42 | 4 | 17 | 21 |

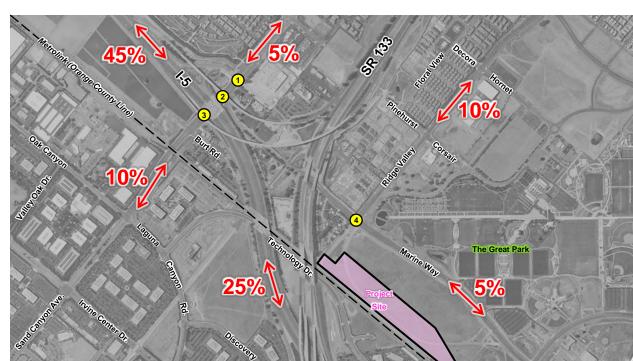
| Table 4.1-1 | Project Trip Generation |
|-------------|-------------------------|
|-------------|-------------------------|

Notes: "Other" includes deliveries, visitors, and other ancillary traffic. No "other" trips assumed during a.m. and p.m. peak hours.

Source: AECOM (2022)

4.2 TRIP DISTRIBUTION AND ASSIGNMENT

The assumed trip distribution and assignment is illustrated in Figure 4.2-1, and is based on existing travel and land use patterns. I-5 is the primary access for the regional roadway network, as it is a major north– south freeway and provides additional connections to and from I-405 (via SR-133). Smaller percentages of Project trips are distributed on major local streets, including Sand Canyon Avenue to / from the southwest and northeast, Ridge Valley to / from the northeast, and Marine Way to / from the southeast.





Source: Google Earth (2018)

2000 ft

Ν

The Project Site is located within Irvine, which is on the periphery of Greater Los Angeles, with areas beyond (such as southern Orange County) generally less dense and constrained by geography. As such, the trip distribution is weighted more heavily to the north, favoring the contiguous, built-up areas in northern Orange County and adjacent Los Angeles County.

5. EXISTING CONDITIONS

5.1 EXISTING ROADWAY NETWORK

Key roadways in the vicinity of the Project include Sand Canyon Avenue, Marine Way, and Ridge Valley.

Sand Canyon Avenue

According to the Circulation Element of the City's General Plan, Sand Canyon Avenue is classified as a six-lane Major Highway and functions as a Thruway. Sand Canyon Avenue is oriented in the north–south direction⁽⁴⁾ and provides direct access to / from I-5, with a posted speed limit of 50 miles per hour (mph). In the vicinity of the Project Site, Class II bikeways (on-street bicycle lanes) and sidewalks are generally provided on both sides of the street but may be discontinuous in some locations. On-street parking is not permitted.

Marine Way

The Circulation Element of the City's General Plan classifies Marine Way as a Primary Highway, functioning as a Parkway. Marine Way is oriented in the east–west direction, with a posted speed limit of 45 mph. Marine Way is originally a two-lane roadway that served as an access road and perimeter road for MCAS El Toro, but it is planned to be realigned and widened to a four-lane facility. Work on the segment in the immediate vicinity of the Project Site (between Ridge Valley and Skyhawk) has been completed, but portions of Marine Way north of Ridge Valley and south of Skyhawk have not yet been improved and will retain their previous alignment and cross-section (two lanes) as a temporary scenario only. Future roadway improvements- as mentioned above in this section and not a part of the scope of this Project- plans to realign and widen this portion of Marine Way from a two-lane facility to a four-lane facility..

In the vicinity of the Project Site, Class II bikeways are provided in both directions north of Skyhawk, but sidewalks may be discontinuous, particularly north of SR-133 (where the roadway was never fully improved) and on the north side east of Ridge Valley (where construction is currently underway for the Great Park). On-street parking is not permitted.

Ridge Valley

According to the Circulation Element of the City's General Plan, Ridge Valley is classified as a Secondary Highway and functions as a Collector. Ridge Valley is a four-lane facility oriented in the north–south direction, with a posted speed limit of 45 mph. In the vicinity of the Project Site, Class II bikeways are

⁽⁴⁾ For roadways in the vicinity of the Project Site, the City's standard convention defines I-5 and Marine Way in the east–west direction and Sand Canyon Avenue and Ridge Valley in the north–south direction.

provided in both directions, but sidewalks along the east side of the street may be discontinuous as redevelopment on the former MCAS El Toro site is still underway. On-street parking is not permitted.

5.2 LEVEL OF SERVICE ANALYSIS

Due to shelter-in-place restrictions and other effects associated with the COVID-19 pandemic, traffic levels are currently depressed, and traffic counts collected during this period would not give an accurate representation of "normal" conditions prior to the pandemic. As described in Section 3.3, an Existing Baseline scenario was therefore developed assuming the continuation of traffic levels and growth trends prior to COVID-19.

Pre-COVID count data (from May 2018 and February 2019) were provided by the City for use in the study and extrapolated to 2020 levels assuming a uniform growth rate of two percent per year. These extrapolated traffic volumes were then compared to a separate set of 2020 traffic projections obtained by interpolating between traffic volumes for 2018 and 2023 used for the City's latest Circulation Phasing Analysis Report.⁽⁵⁾ For the study intersections common to this study and the Circulation Phasing Analysis Report, the latter dataset generally showed higher total intersection volumes during the a.m. and p.m. peak hours, and was therefore conservatively carried forward for use in this study.

Count data provided by the City only included a daily count for one of the three roadway segments (Marine Way between Sand Canyon Avenue and Ridge Valley). With current traffic levels substantially depressed due to COVID-19, initial estimates of daily traffic volume for the remaining two roadway segments were developed by multiplying the peak hour traffic volume (calculated as entering / exiting volumes from the adjacent study intersections) by 10, a common rule of thumb frequently used when data are not readily available. The calculation was done separately using the a.m. and p.m. peak hour volumes, with the higher of the two selected for further analysis. Separately, existing daily traffic volumes were also referenced from the Circulation Phasing Analysis Report and compared against the rule-of-thumb estimates. The approach resulting in the higher traffic volume was then conservatively carried for ward for use in the v/c analysis.

The results of the intersection and roadway segment LOS analyses are summarized in Table 5.2-1 and Table 5.2-2, respectively. Detailed ICU and HCM LOS calculation worksheets for the study intersections, including traffic volume projections for each scenario, are provided in Attachment C and Attachment D, respectively.

As shown in Table 5.2-1 and Table 5.2-2, all study intersections and roadway segments would operate at acceptable LOS (LOS D or better), even with the addition of the Project. Therefore, the Project would not result in or substantially contribute to any LOS deficiencies under the Existing Baseline scenario.

⁽⁵⁾ Traffic projections from the Circulation Phasing Analysis Report were developed using Model No. 18 of the City's travel demand forecasting and analysis model, the Irvine Transportation Analysis Model (ITAM). The ITAM is the OCTA-sanctioned subarea traffic model for the City of Irvine.

| | | | | Existing Baseline | | | | Exist | ing Baseli | ICU change | | | |
|---|--|------|-------------|-------------------|-----|-----------------|-----|-----------------|------------|-----------------|-----|-----------|---------|
| | Intersection | ITAM | Methodology | AM peak hour | | PM peak hour | | AM peak hour | | PM peak hour | | AM | PM peak |
| | | node | | ICU or Delay | LOS | ICU or delay | LOS | ICU or delay | LOS | ICU or delay | LOS | peak hour | |
| 1 | Sand Canyon Ave. / I-5 NB Ramps 303 | 202 | ICU | 0.58 | А | 0.68 | В | 0.59 | А | 0.68 | В | 0.01 | 0.00 |
| | | 303 | HCM | 28.1 | С | 39.8 | D | 26.8 | С | 39.8 | D | — | — |
| 2 | Sand Canyon Ave. / Marine Way | 304 | ICU | 0.62 | В | 0.58 | А | 0.62 | В | 0.58 | А | 0.00 | 0.00 |
| | Sand Canyon Ave. / | | ICU | 0.60 | А | 0.58 | А | 0.61 | В | 0.58 | А | 0.01 | 0.00 |
| 3 | I-5 SB Ramps | 305 | НСМ | 18.6 | В | 24.4 | С | 18.8 | В | 24.5 | С | _ | _ |
| 4 | Ridge Valley / Marine Way | _ | ICU | 0.39 | A | 0.24 | A | 0.38 | А | 0.25 | А | (0.01) | 0.00 |

Table 5.2-1 Intersection Level of Service Summary: Existing

Source: AECOM (2022)

| | Roadway segment | Capacity | E | xisting Baselin | e | Existing | v/c | | |
|---|---|----------|--------|-----------------|-----|----------|-----------|-----|--------|
| | Roadway segment | Capacity | ADT | v/c ratio | LOS | ADT | v/c ratio | LOS | change |
| A | Marine Way between Sand Canyon Avenue and Ridge Valley | 13,000 | 11,400 | 0.88 | D | 11,600 | 0.89 | D | 0.01 |
| В | Marine Way east of Ridge Valley | 32,000 | 7,200 | 0.22 | А | 7,200 | 0.22 | А | 0.00 |
| С | Ridge Valley between Great Park Boulevard and Marine Way | 28,000 | 14,800 | 0.53 | A | 14,800 | 0.53 | А | 0.00 |

Table 5.2-2 Roadway Segment Level of Service Summary: Existing

Source: AECOM (2022)

6. FUTURE CONDITIONS

6.1 LEVEL OF SERVICE ANALYSIS

Similar to the derivation of Existing Baseline traffic volumes, traffic projections for the Short-Term Interim Year scenarios were developed using two different methods: one assuming a uniform growth rate of two percent per year applied to the Existing Baseline volumes, and another applying it to the 2023 volumes from the City's Circulation Phasing Analysis Report. For intersections and roadway segments common between this study and the Circulation Phasing Analysis Report, the method resulting in the higher traffic volume was conservatively carried forward for use in this study.

Alternative 1

The results of the intersection and roadway segment LOS analyses for Alternative 1 (existing Marine Way alignment) are summarized in Table 6.1-1 and Table 6.1-2, respectively. As shown in Table 6.1-1 and Table 6.1-2, all study intersections and roadway segments would operate at acceptable LOS (LOS D or better) based on the City's LOS thresholds, even with the addition of the Project, with the exception of the segment of Marine Way between Sand Canyon Avenue and Ridge Valley, which would be deficient in terms of daily LOS. A peak-hour link analysis, however, shows that both directions of this segment would operate at LOS A under both the a.m. and p.m. peak hours, even with the addition of the Project (refer to Table 6.1-3). Therefore, the Project would not result in or substantially contribute to any LOS deficiencies under the Short-Term Interim Year scenario with Alternative 1.

Alternative 2-Realigned Marine Way

For Alternative 2, all traffic turning into or out of Marine Way under Alternative 1 was manually redistributed to the new intersection at the I-5 Northbound Ramps. The existing Marine Way ("Old Marine Way") alignment is assumed to remain to provide local access for adjacent properties, such as the Caltrans Marine Way Maintenance Station at 6641 Marine Way. To account for traffic that would continue to use Old Marine Way, volumes turning into or out of Old Marine Way at Sand Canyon Avenue were referenced from the recent traffic study for the Hoag Hospital Irvine (LSA, 2020). The referenced volumes represent 2040 traffic projections, but were conservatively taken as is, without adjustments to omit potential growth occurring after the Short-Term Interim Year horizon (2025) for this study.

| | | | | Short-Term Interim Year Baseline Alternative 1 | | | | | Term Inter ternative 1 | ICU change | | | |
|---|------------------------------------|--------------|-------------|---|-----|-----------------|-----|-----------------|---------------------------|-----------------|-----|-----------|------|
| | Intersection | ITAM node | Methodology | AM peak hour | | PM peak hour | | AM peak hour | | PM peak hour | | AM | PM |
| | | noue | | ICU or Delay | LOS | ICU or delay | LOS | ICU or delay | LOS | ICU or delay | LOS | peak hour | |
| 1 | Sand Canyon Ave. / I-5 NB Ramps | 303 | ICU | 0.72 | С | 0.86 | D | 0.72 | С | 0.86 | D | 0.00 | 0.00 |
| T | | 303 | HCM | 37.8 | D | 69.4 | E | 38.5 | D | 73.4 | Е | — | — |
| 2 | Sand Canyon Ave. / Marine Way | 304 | ICU | 0.59 | А | 0.77 | С | 0.59 | А | 0.78 | С | 0.00 | 0.01 |
| - | Sand Canyon Ave. / | 205 | ICU | 0.66 | В | 0.72 | С | 0.66 | В | 0.72 | С | 0.00 | 0.00 |
| 3 | I-5 SB Ramps | 305 | НСМ | 19.6 | В | 27.9 | С | 19.9 | В | 28.0 | С | _ | — |
| 4 | Ridge Valley / Marine Way | _ | ICU | 0.44 | А | 0.27 | А | 0.45 | А | 0.28 | А | 0.01 | 0.01 |

Table 6.1-1 Intersection Level of Service Summary: Short-Term Interim Year Alternative 1

Source: AECOM (2022)

| Roadway segment | | | Capacity | Short-Ter | m Interim Yea Alternative 1 | | Short-Ter Alter | v/c | | |
|-----------------|---|-----------|----------|-----------|--------------------------------|--------|--------------------|-----------|-----|--------|
| | | | | Volume | v/c ratio | LOS | Volume | v/c ratio | LOS | change |
| А | Marine Way between Sa Avenue and Ridge Valley | 13,000 | 17,400 | 1.34 | F | 17,600 | 1.35 | F | _ | |
| | AM peak hour | Eastbound | 1,600 | 364 | 0.23 | А | 376 | 0.24 | А | 0.01 |
| | | Westbound | 1,600 | 728 | 0.46 | А | 752 | 0.47 | А | 0.01 |
| | PM peak hour | Eastbound | 1,600 | 875 | 0.55 | А | 878 | 0.55 | А | 0.00 |
| | | Westbound | 1,600 | 689 | 0.43 | А | 704 | 0.44 | А | 0.01 |
| В | Marine Way east of Ridge Valley | | 32,000 | 10,800 | 0.34 | А | 10,800 | 0.34 | А | 0.00 |
| с | Ridge Valley between Great Park Boulevard and Marine Way | | 28,000 | 16,300 | 0.58 | A | 16,300 | 0.58 | A | 0.00 |

 Table 6.1-2
 Roadway Segment Level of Service Summary: Short-Term Interim Year Alternative 1

Source: AECOM (2022)

The results of the intersection and roadway segment LOS analyses for Alternative 2 (realigned Marine Way) are summarized in Table 7.1-1 and Table 7.1-2, respectively. As shown in Table 7.1-1 and Table 7.1-2, all study intersections and roadway segments would operate at acceptable LOS (LOS D or better) based on the City's LOS thresholds, even with the addition of the Project. Therefore, the Project would not result in or substantially contribute to any LOS deficiencies under the Short-Term Interim Year scenario with Alternative 2.

7. SPECIAL ISSUES

7.1 SITE ACCESS ANALYSIS

Access for the Project Site would be provided by extending Ridge Valley south of Marine Way by approximately 675 feet as a cul-de-sac (dead-end street), converting the existing T-intersection at Ridge Valley / Marine Way into a four-way intersection. A turnaround would be provided at the end of the Ridge Valley extension, with a driveway providing access into and out of the Project Site. This would serve as the sole vehicle access for the Project Site, and the estimated traffic using the Project driveway and the new Ridge Valley extension would generally be as shown in the Project's trip generation in Table 4.1-1. Project trip assignments at the Ridge Valley / Marine Way intersection are illustrated in Figure 7.1-1, based on the trip distribution shown in Figure 4.2-1.

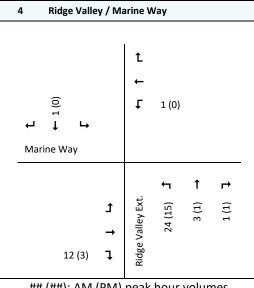


Figure 7.1-1 Project Trip Assignment at Ridge Valley / Marine Way

^{## (##):} AM (PM) peak hour volumes Source: AECOM (2022)

| | | | | Short-Term Interim Year Baseline Alternative 2 | | | | Short-Term Interim Year Baseline Alternative 2 plus Project | | | | ICU change | |
|---|---|--------------|-------------|---|-----|-----------------|-----|--|-----|-----------------|-----|--------------|--------------|
| | Intersection | ITAM node | Methodology | AM peak hour | | PM peak hour | | AM peak hour | | PM peak hour | | AM | PM |
| | | | | ICU or Delay | LOS | ICU or delay | LOS | ICU or delay | LOS | ICU or delay | LOS | peak hour | peak hour |
| 1 | Sand Canyon Ave. / I-5 NB / Marine Way | 303 | ICU | 0.74 | С | 0.73 | С | 0.73 | С | 0.73 | С | (0.01) | 0.00 |
| 1 | | | HCM | 78.7 | E | > 80 | F | 75.9 | E | > 80 | F | — | — |
| 2 | Sand Canyon Ave. / Old Marine Way | 304 | ICU | 0.53 | А | 0.58 | А | 0.53 | А | 0.58 | А | 0.00 | 0.00 |
| | Sand Canyon Ave. / | 205 | ICU | 0.66 | В | 0.72 | С | 0.66 | В | 0.72 | С | 0.00 | 0.00 |
| 3 | I-5 SB Ramps | 305 | НСМ | 30.4 | С | 31.6 | C | 34.1 | С | 31.6 | С | _ | _ |
| 4 | Ridge Valley / Marine Way | _ | ICU | 0.44 | А | 0.27 | А | 0.45 | А | 0.28 | А | 0.01 | 0.01 |

 Table 7.1-1
 Intersection Level of Service Summary: Short-Term Interim Year Alternative 2

Source: AECOM (2022)

| | Roadway segment | Capacity | Short-Ter | m Interim Yea Alternative 2 | | Short-Ter Alterr | v/c change | | |
|---|---|----------|-----------|--------------------------------|-----|---------------------|---------------|-----|--------|
| | | | Volume | v/c ratio | LOS | Volume | v/c ratio | LOS | Change |
| А | Marine Way between Sand Canyon Avenue and Ridge Valley | 32,000 | 17,400 | 0.54 | A | 17,600 | 0.55 | A | 0.01 |
| В | Marine Way east of Ridge Valley | 32,000 | 10,800 | 0.34 | A | 10,800 | 0.34 | А | 0.00 |
| С | Ridge Valley between Great Park Boulevard and Marine Way | 28,000 | 16,300 | 0.58 | A | 16,300 | 0.58 | A | 0.00 |

 Table 7.1-2
 Roadway Segment Level of Service Summary: Short-Term Interim Year Alternative 2

Source: AECOM (2022)

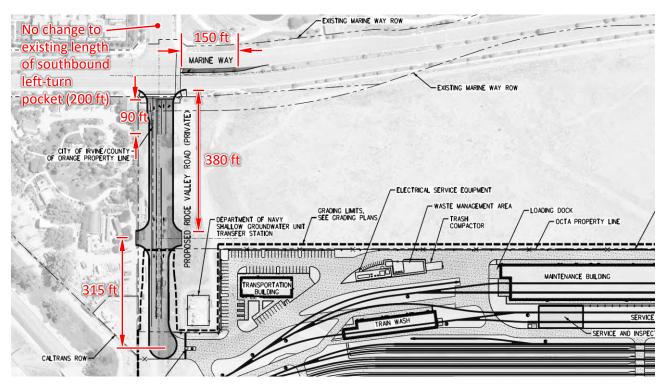
It should be noted that there may also be some marginal traffic associated with other properties along the Ridge Valley extension, such as the gardening / landscaping supply businesses located on the southwest quadrant of the Ridge Valley / Marine Way intersection. While the Project does not preclude driveways for other properties along the extension, such improvements are not expressly part of the Project and would be evaluated separately should the relevant property owners desire access. The design of the proposed Ridge Valley extension would, however, allow for future local access for other properties on either side of the extension via a future "A Street", intersecting the extension approximately midway between Marine Way and the cul-de-sac. As such, driveway / intersection spacing for this future A Street is evaluated where appropriate in later subsections of this memorandum.

The new northbound approach at the Ridge Valley / Marine Way intersection would be striped with three lanes: a left-turn lane, a through lane, and a right-turn lane. To accommodate the new northbound approach at the intersection, the existing outer left-turn lane on the southbound (Ridge Valley) approach would be restriped as a through lane. With this change, the existing southbound and new northbound approaches would operate with protected left-turn phasing in a lead–lag sequence. Actuation through detector loops or other means would minimize impacts to background traffic along Marine Way and Ridge Valley, allowing the northbound approach to be served only when there is demand.

In addition, the Project would provide a new westbound left-turn pocket at the intersection (replacing a portion of the landscaped median along Marine Way), operating with protected phasing in a lead–lag sequence with the eastbound left-turn movement. Signal phasing for the southbound right-turn movement would also be modified to provide an overlap phase with the eastbound left-turn movement.

The LOS results summarized in Table 5.2-1, Table 6.1-1, and Table 7.1-1 already incorporate all of these lane configurations and signal phasing assumptions and show that the modified intersection would operate at LOS A during the a.m. and p.m. peak hours.

An analysis of relevant criteria from the *City of Irvine Transportation Design Procedures (TDP)* (June 2020) is provided in the following subsections. Proposed turn pocket lengths and driveway spacing are illustrated in Figure 7.1-2. Detailed plans are provided in Attachment B to this memorandum.





TDP-1: Turn Lane Pocket Lengths

At the Ridge Valley / Marine Way intersection, the Project would add two new left-turn movements (northbound left and westbound left) and modify the southbound left-turn movement by converting the shared left-through lane into a through lane (leaving only one left-turn lane). A Leish nomograph analysis of turn pocket lengths was conducted for these three left-turn movements, together with the southbound left-turn movement at Sand Canyon Avenue / Marine Way, which will be reduced to a single lane in the future as part of striping modifications proposed by a proposed development on the nearby Traveland site. The results of the Leish nomograph analysis are shown in Figure 7.1-3 and Figure 7.1-4.

As shown in Figure 7.1-3, left-turn pocket lengths at Ridge Valley / Marine Way would exceed the recommended (desirable) distance for all three left-turn movements under the Short-Term Interim Year Baseline plus Project scenarios.⁽⁶⁾ The peak-hour left-turn volume is on the order of 25–35 vehicles or less in all cases, and is generally below the meaningful range of the nomograph analysis.

As shown in Figure 7.1-4, the existing length of the southbound left-turn pocket at Sand Canyon Avenue / Marine Way would fall below the recommended (desirable) distance in both the AM peak hour and PM peak hour under the Short-Term Interim Year Baseline Alternative 1 plus Project scenario. The Project is estimated to add approximately four vehicles to this movement in the AM peak hour and one vehicle to this

⁽⁶⁾ Alternative 1 and Alternative 2 are the same for purposes of this Leish nomograph analysis, as traffic volumes and lane configurations at the Ridge Valley / Marine Way intersection are the same for both alternatives.

movement in the PM peak hour, which is on the order of 1–3 percent of the total peak-hour volume on this movement. This is an interim condition until Marine Way is realigned to reflect Alternative 2, which aligns with the northbound I-5 off-ramp. Two southbound left turn lanes will be provided at that time.

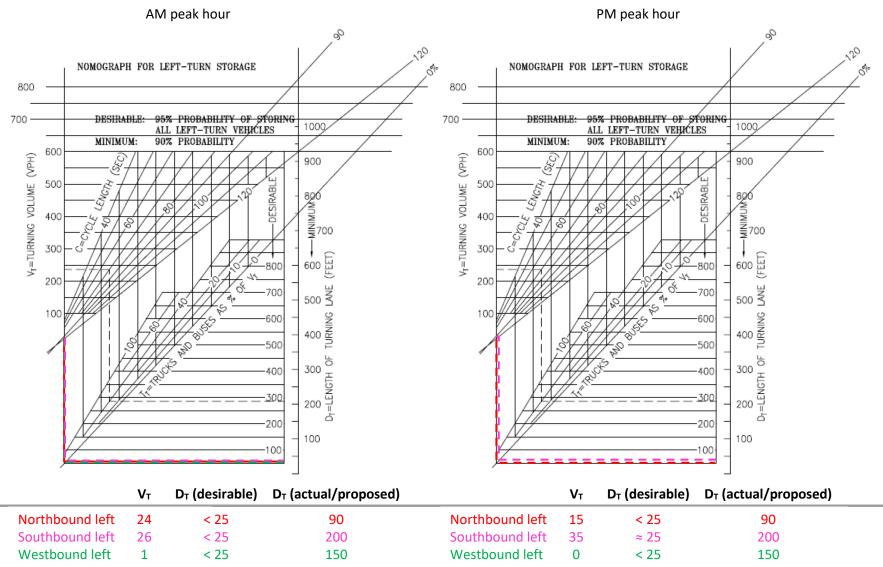


Figure 7.1-3 Leish Nomograph – Ridge Valley / Marine Way

Note: Assume cycle length C = 120 sec and conservatively assume heavy vehicle percentage T_T = 10%

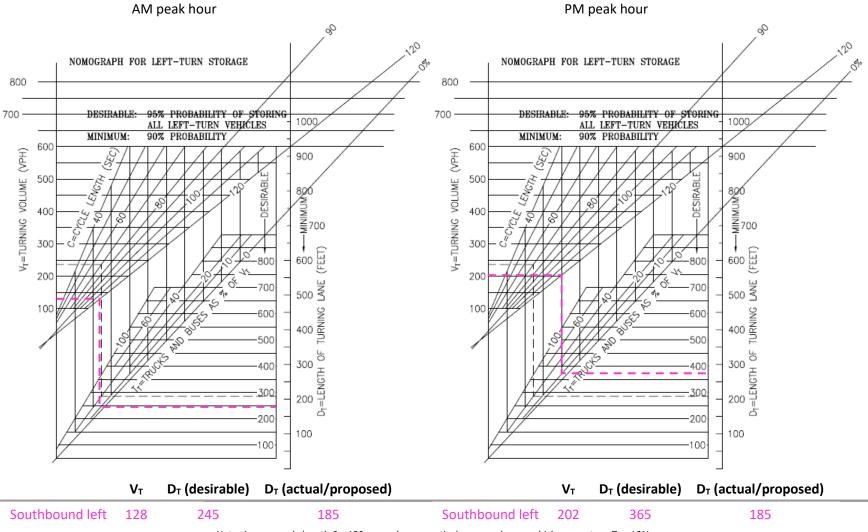


Figure 7.1-4 Leish Nomograph – Sand Canyon Avenue / Marine Way (Alternative 1)

Note: Assume cycle length C = 120 sec and conservatively assume heavy vehicle percentage T_T = 10%

TDP-10: Distance Between Driveways and Intersections

The recommended minimum spacing between a driveway and an intersection (or between two driveways) is 90 feet for a roadway classified as a Private Way, although this classification applies only to residential streets. Based on the width of the proposed roadway, the City of Irvine has recommended application of the Commuter roadway classification for the analysis of driveway spacing. For Commuter roadways, the minimum spacing is 150 feet.

As indicated in Figure 7.1-2, the nearest driveway / intersection (the future "A Street") is 380 feet from the Ridge Valley / Marine Way intersection (measured from Marine Way nearest curb face to A Street nearest curb face). The Project's proposed driveway would be located 315 feet from A Street (measured from centerline to centerline). In both cases, the spacing would exceed the minimum spacing prescribed in TDP-10.

Furthermore, the proposed Ridge Valley extension would be a cul-de-sac primarily intended to provide local access for the Project and adjacent properties, with no through traffic and minimal traffic volumes. The Project driveway would be located at the end of this private road (the proposed turnaround is actually located within the Project's property lines), such that any queues at the proposed controlled gate access would not obstruct access to other properties, much less background traffic at the upstream intersection with Marine Way.

Therefore, the Project would satisfy TDP-10.

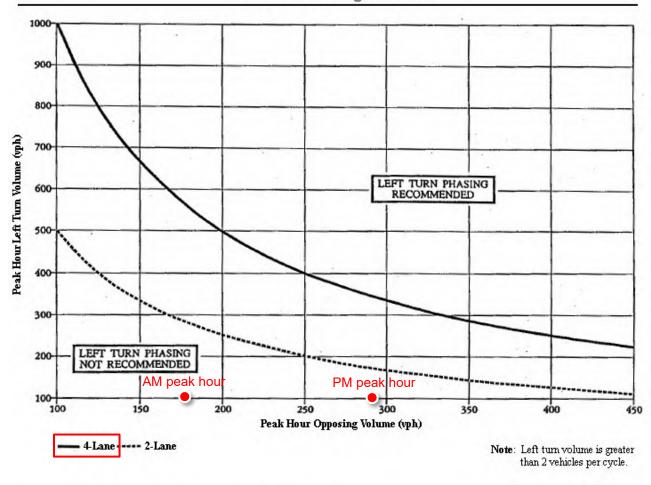
TDP-11: Corner Clearance

As the proposed Ridge Valley extension is a cul-de-sac primarily intended for local access for the Project (and, potentially in the future, adjacent properties), there would be no through traffic, and the only adjacent intersection for consideration is the Ridge Valley/ Marine Way intersection. As mentioned above, the Project would meet TDP-10 criteria for minimum distance between driveways and intersections and would, therefore, also generally satisfy TDP-11.

TDP-13: Left-Turn Signal Phasing

As illustrated in Figure 7.1-1, the Project is expected to add 1 vehicle during the AM peak hour and 0 vehicles during the PM peak hour to the westbound left-turn movement at Ridge Valley / Marine Way. Under the Short-Term Interim Year Baseline plus Project scenarios, there would be no other traffic expected on this turn movement outside of Project-generated traffic. As such, the peak-hour volume on this movement would be negligible. However, a left-turn signal phasing analysis was conducted to determine the need for protected signal phasing for this turn movement and is illustrated in Figure 7.1-5.





Left Turn Phasing Guidelines

Source: Traffic Engineering Handbook, 4th Edition, ITE, Chapter 9, pg. 295.

Figure 13.1

As indicated in Figure 7.1-5, the expected traffic volume on this movement under the Short-Term Interim Year Baseline plus Project scenarios is well below the meaningful range of the analysis, which is approximately 100 vehicles per hour for the left-turn volume (2 vehicles per cycle or more). Despite these conclusions, protected left-turn phasing can still be considered appropriate at this location due to several factors:

- Permitted left-turn movements with high-volumes of opposing traffic can present a risk for pedestrians in the crosswalk, as motorists are frequently focused on finding gaps in opposing traffic flow and may not pay adequate attention to pedestrian activity in the far-side crosswalk.
- The opposing eastbound approach features double left-turn lanes, which may complicate permitted left-turn movements from the westbound approach.
- Fuel trucks and other large vehicles that may need to visit the site on a regular basis may access the site from this westbound left-turn movement. Providing protected phasing for this movement would ensure adequate time and protection for these vehicles, which may require additional time and larger turning clearances. As indicated in the detailed plans in Attachment B, the Project proposes to use lead–lag sequencing to avoid potential conflicts between the eastbound and westbound left-turn movements.
- Future development of adjacent properties along the Ridge Valley extension as part of other projects may eventually warrant protected phasing for this movement, even if the Project alone may not warrant it.
- A protected left-turn phase at this location offers safer opportunities for potential U-turn movements. Currently, the large intersection spacing and lack of side streets along Marine Way between Ridge Valley and Skyhawk can complicate traffic circulation.

For these reasons, protected signal phasing is considered appropriate at this location and the Project would satisfy TDP-13.

TDP-15: Vehicle Stacking and Gate Stacking Analysis

As indicated in the site plan shown in Attachment B, ingress / egress at the Project driveway would be restricted by a controlled gate access. For analysis of gate stacking at office and retail developments, TDP-15 prescribes use of the Crommelin methodology. Figure 7.1-6 and Figure 7.1-7 show the results of this analysis for the Project based on the estimated trip generation summarized in Table 4.1-1.

As shown in Figure 7.1-6, the estimated traffic intensity of the Project would fall well below the meaningful range of the Crommelin methodology. However, the gate arm would be located to provide at least 25 feet of ingress stacking (measured from the curb line of the turnaround), which would be sufficient to accommodate one standard passenger car. In addition, there would be no conflicting traffic when entering or exiting the Project site, as the Project driveway would be located at the end of a dead-end, private road

primarily intended to provide local access for the Project, as mentioned above. Therefore, no queuing due to conflicting traffic is expected within or external to the site.

As shown in Figure 7.1-7, the amount of parking provided and the estimated directional peak-hour volumes would not warrant more than a single lane in each direction.

Overall, the Project would satisfy TDP-15.

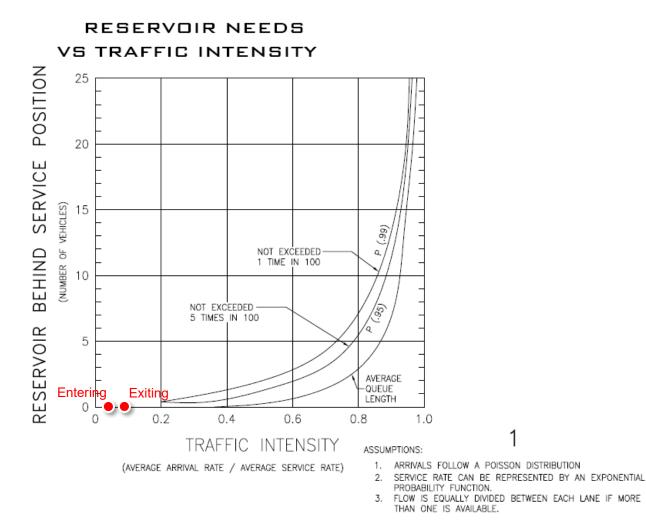


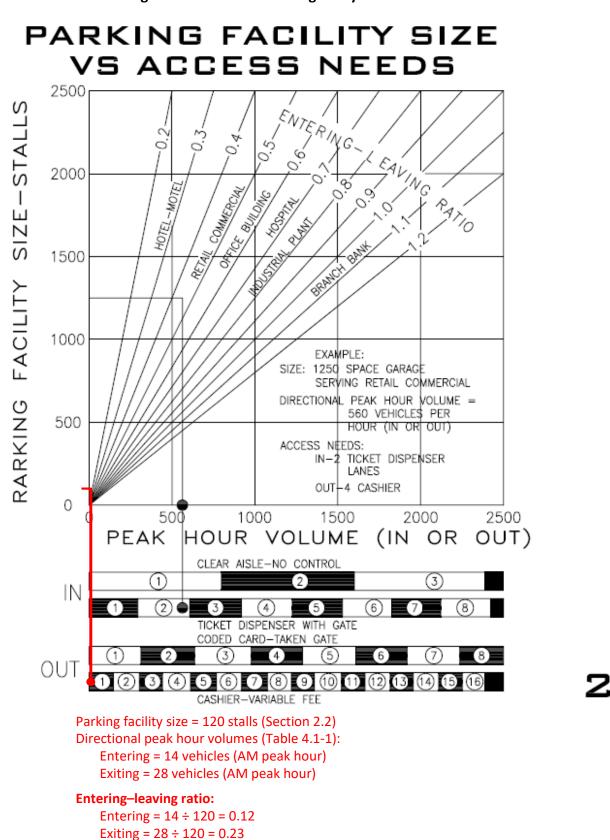
Figure 7.1-6 Gate Stacking Analysis – Reservoir Needs

Entering

Average arrival rate = 14 vehicles per hour (Table 4.1-1) Average service rate = 340 vehicles per hour (coded-card operated gate) Traffic intensity = 14 ÷ 340 ≈ 0.04

Exiting

Average arrival rate = 28 vehicles per hour (Table 4.1-1) Average service rate = 320 vehicles per hour (coded-card operated gate) Traffic intensity = 28 ÷ 340 ≈ 0.09





7.2 CIRCULATION PHASING

The City's latest Circulation Phasing Analysis Report (March 2020) did not identify any affected locations within the area in the vicinity of the Project Site. Based on the results of the LOS analysis described earlier, the Project would not result in or substantially contribute to LOS deficiencies at any study intersections or roadway segments.

7.3 CONGESTION MANAGEMENT PROGRAM CONSISTENCY

As shown in Table 4.1-1, the Project would generate approximately 220 daily trips, which would be well below the general threshold of 2,400 daily trips for all development projects and the specific threshold of 1,600 daily trips for development projects with direct access to, or in close proximity to, the Congestion Management Program (CMP) Highway System. Therefore, a CMP Traffic Study to determine the Project's consistency with the CMP is not required, in accordance with Exhibit 6 ("CMP Traffic Impact Analysis Exempt Projects") of the *City of Irvine Traffic Study Guidelines* (City of Irvine, 2007).

7.4 PEDESTRIAN CIRCULATION

Objective B-3 of the Circulation Element of the City's General Plan is to "establish a pedestrian circulation system to support and encourage walking as a mode of transportation". The Circulation Element includes the following three policies to support Objective B-3:

- Link residences with schools, shopping centers, and other public facilities, both within a planning area and to adjacent planning areas, through an internal system of trails.
- Require development to provide safe, convenient, and direct pedestrian access to surrounding land uses and transit stops. Issues such as anticipated interaction between pedestrians and vehicles, proposed infrastructure improvements, and design standards shall be considered.
- Design and locate land uses to encourage access to them by nonautomotive means.

The Project is a specialized use without access for the general public and would not be a major activity generator or attractor. Pedestrian circulation from the general public is not anticipated for the Project and therefore sidewalks would not be provided on the Ridge Valley extension. The Project would provide two sidewalk curb ramps on the Ridge Valley and Marine Way intersection. These modifications would generally support Objective B-3 and the three associated policies by providing safe, convenient, and direct pedestrian access. Proposed modifications would also be designed in accordance with applicable standards (such as City of Irvine street design standards and Americans with Disabilities Act [ADA] design standards) and would facilitate safe pedestrian circulation at this location.

7.5 BICYCLE CIRCULATION

Objective B-4 of the Circulation Element of the City's General Plan is to "plan, provide and maintain a comprehensive bicycle trail network that together with the regional trail system, encourages increased use of bicycle trails for commuters and recreational purposes". The Circulation Element includes several

supporting policies to expand and enhance bicycle circulation, as well as a separate objective (Objective B-5) and associated policies regarding riding and hiking trails.

While the Project is a specialized use with limited access for the general public and would not be a major activity generator or attractor, bicycle access would be provided by existing Class II bikeways along Marine Way, Ridge Valley, and Sand Canyon Avenue, as well as Class I bikeways along Sand Canyon Avenue (Sand Canyon Side Path) and within the Great Park and the surrounding neighborhoods. The Project would not physically alter existing bikeways, and the proposed modifications at the Ridge Valley / Marine Way intersection as part of the Ridge Valley extension would be designed in accordance with applicable standards to facilitate safe bicycle circulation at this location.

7.6 TRANSIT FACILITIES

There are no transit services in the immediate vicinity of the Project Site. The closest major route is OCTA's Route 90 (Tustin–Dana Point) traveling along Irvine Center Drive, with the closest stops located at Sand Canyon Avenue, approximately 1.3 miles away from the Ridge Valley / Marine Way intersection.

Supplemental peak-period-only bus service is provided by two OCTA iShuttle routes (402C and 403D) out of Metrolink's Irvine station. These two routes are designed to connect Metrolink passengers with workplaces in the areas surrounding the station, and only operate in the commute direction (departing the station during the a.m. peak period and arriving at the station during the p.m. peak period). The closest stops for these routes are as follows:

- For Route 402C: Sand Canyon Avenue at the Capital Group complex (north side, between Oak Canyon and Irvine Center Drive), approximately 1.1 miles away from the Ridge Valley / Marine Way intersection
- For Route 403D: Sand Canyon Avenue at Waterworks Way, approximately 1.4 miles away from the Ridge Valley / Marine Way intersection

The Project is a specialized use with limited access for the general public and would not be a major activity generator or attractor.

7.7 VEHICLES MILES TRAVELED ANALYSIS

As indicated in Table 4.1-1, the Project's weekday daily trip generation would not exceed 250 trips. As such, a VMT impact analysis is not required for the Project, in accordance with the project screening criteria established in Exhibit 8 ("VMT Impact Analysis Guidelines (SB 743)") of the *City of Irvine Traffic Study Guidelines* (City of Irvine, 2007).

8. REQUIRED IMPROVEMENTS AND RECOMMENDATIONS

Based on the results of the intersection and roadway segment LOS analysis in Section 5.2 and Section 6.1, the Project would not result in or make a substantial contribution to any LOS deficiencies. Therefore, no LOS deficiency improvements are required.

9. CONCLUSION

As discussed in further detail in Section 7.1, the Project would create a new northbound approach at the Ridge Valley / Marine Way. The new Ridge Valley northbound approach would be striped with three lanes (a left, through, and right turn) and Marine Way would be provided with a new westbound left-turn pocket. The southbound approach would be restriped to provide a left, through and right turn lane. Signal phasing would be modified to north/south and east/west lead-lag operation with southbound right turn overlap at the Ridge Valley / Marine Way intersection for the revised roadway configuration.

The Project does not result in or make a substantial contribution to any LOS deficiencies under either the Existing Baseline scenario or the two Short-Term Interim Year Baseline scenario alternatives (with and without the Marine Way realignment). All study intersections and roadway segments would operate at acceptable LOS under all scenarios based on the City's LOS thresholds, with the exception of the segment of Marine Way between Sand Canyon Avenue and Ridge Valley, which would be deficient in terms of daily LOS under Short-Term Interim Year Alternative 1, with and without the Project. However, a peak-hour link analysis indicates that this segment would operate at acceptable conditions based on peak-hour LOS, even with the addition of the Project. Therefore, no improvements are required.

All applicable City of Irvine's TDPs were evaluated and adequately addressed, including TDP-1 (Turn Lane Pocket Lengths), TDP-10 (Distance Between Driveways and Intersections), TDP-11 (Corner Clearance), TDP-13 (Left-Turn Signal Phasing), and TDP-15 (Vehicle Stacking and Gate Stacking Analysis).

Based on the Project's trip generation, a CMP Traffic Study and VMT impact analysis are not required.

10. **REFERENCES**

City of Irvine, (2007).Transportation Design Procedures. Available at: https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=10062

_____, (2020). 2020 Citywide Phasing Analysis Report. Available at: <u>https://irvinewatchdog.org/wp-</u> <u>content/uploads/2020/06/Attachment 1 -</u> 2020 Citywide Circulation Phasing Analysis Report.pdf

_____, (2021). Traffic Study Guide. Available at: https://legacy.cityofirvine.org/civica/filebank/blobdload.asp?BlobID=32554

- Gannett Fleming, Metrolink, (2022). Southern California Regional Rail Authority Maintenance Facility Project. Engineering Plans.
- LSA, (October 2020).Traffic Study Hoag Hospital Irvine. Available at: https://www.cityofirvine.org/cmis/views/9d41e22f-0d2b-433c-85a5-547a4fb3627b%253B1.0
- Southern California Regional Rail Authority (SCRRA), (2019). Metrolink System Map, Available at: https://metrolinktrains.com/about/agency/

Transportation Research Board (TRB), (2017). Highway Capacity Manual.

Appendix H Attachments Technical Memorandum Traffic

Metrolink Orange County Maintenance Facility

Prepared for:

Orange County Transportation Authority

550 S. Main St. Orange, CA 92868

And

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

AECOM 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

Attachment A

Limited Traffic Study Scope of $W \mbox{ork}$



AECOM 300 S Grand Avenue Los Angeles, CA 90071 www.aecom.com

Memorandum

| Date: | November 24, 2020 |
|----------|---|
| To: | Victor Mendez – City of Irvine |
| From: | Jaime Guzman, AECOM Noel Casil, AECOM |
| Subject: | OCTA Metrolink Maintenance Facility Draft Limited Traffic Study Scope of Work Memorandum |

AECOM is responsible for the preparation of a Traffic Study for the OCTA Metrolink Orange County Maintenance Facility Project (OCMF). Discussion and coordination of the traffic study parameters between OCTA representatives and the City of Irvine resulted in the mutual agreement that a Limited Scope Traffic Study is necessary consistent with the scope format and content as described in the City's Traffic Study Guidelines (April 2020). This scope of work memorandum is intended to document the planned approach for the Limited scope Traffic Study.

Limited Traffic Study Scope of Work

AECOM will conduction the Limited Scope Traffic Study according to the City of Irvine Traffic Study Guidelines (April 2020).

General Assumptions:

- Study Area will be limited to adjacent intersection/s
- Analysis Scenarios
 - Existing Conditions
 - Opening Year Without Project this should be called Short-term Interim Year Baseline
 - Opening Year With Project this should be called Short-term Interim Year Baseline Plus



Limited Traffic Study Outline and Scope of Work Assumptions

I. Executive Summary

The Limited Scope Traffic Study will include an Executive Summary that provides a summary of all calculations and findings of the report.

II. Introduction

A. Study Area

The following five (5) study intersections will be evaluated in this Limited Scope Traffic Study:

- Sand Canyon Ave/I-5 NB Ramps
- Sand Canyon Ave/Marine Way
- Sand Canyon Ave/I-5 SB Ramps
- Ridge Valley/Marine Way
- Ridge Valley/Project

The following three (3) roadway segments will be evaluated in this Limited Scope Traffic Study:

- Marine Way between Sand Canyon and Ridge Valley
- Marine Way east of Ridge Valley
- Ridge Valley between Great Park Blvd and Marine Way

III. Existing Conditions

The study will include an assessment of existing conditions, including existing intersection counts (from data provided by the City of Irvine in pre-COVID-19 conditions) and existing transit information. As there are no existing uses on-site, there is no current contribution of traffic by the existing site.

In communications with the City of Irvine, the City of Irvine states, "The existing conditions data should be based on the most recent counts collected prior to COVID-19 conditions and a 2% growth rate per year should be added to those counts to represent 2020 conditions.

IV. Existing Conditions with Proposed Development (Not required for this Project)

Based on coordination between OCTA and the City of Irvine, there is no need for an Existing Plus Project scenario to be included in the traffic study.

V. Future Traffic Without Proposed Development (Short-term Interim Year only)

The study will include an analysis of the future condition with the proposed Project. Per City of Irvine requirements, "the Short-term Interim Year analysis to identify LOS impacts can be based on ITAM with and without project. Alternatively, the Short-term Interim Year analysis can be based on 2020 volumes with 2% growth per year to represent future conditions five years out. If this alternative is used, manual distribution of project trips is required, and city staff will need to confirm that distribution."



A. Projected Traffic

For this study, the City of Irvine recommends the following: "There should be two Short-term Interim Year scenarios studied: Alt 1 that is based on the assumption that Marine Way is an existing two-lane roadway that connects to Sand Canyon at its existing location; and Alt 2 that is based on the near-term future assumption that Marine Way is a four-lane roadway that is realigned to connect to Sand Canyon at the Sand Canyon/I-5 NB on-off-ramps. For each of these two alternatives, all study intersections and links must be evaluated."

B. Committed Improvements

The study will include a description of the committed improvements under the interim conditions. Interim improvements are not proposed by OCTA but the team will coordinate with the City of Irvine to identify and committed improvements that need to be considered.

VI. Proposed Project Impacts

As part of the evaluation for project impacts, the following elements will be done as part of the Limited Traffic Study:

A. Model Trip Generation - Manual Trip Generation will be conducted

B. Adjustments to Trip Generation adjustments are not anticipated, but any adjustment requests would be coordinated with the City of Irvine

C. Trip Distribution and Trip Assignment - Manual Trip Distribution will be conducted

D. Phased Projects - although the OCMF project will include a phased approach to construction, the project will analyze the full long-term compliment of trips/traffic anticipated with full build out of the site as planned.

VII. Future Traffic With Proposed Development

This task will be conducted in conjunction with Item V above.

VIII. Cumulative Analysis

OCTA and its contractors need to discuss with City of Irvine if this is applicable based on the need for CUP approval of site use

IX. Analysis/Performance Criteria

This task will be completed consistent with City's Traffic Study Guidelines (April 2020) for intersection and roadway link LOS.

X. Special Issues (As Needed)

A. Site Access Analysis (City requirements shown below)

City of Irvine states, "An access analysis section must be included in the traffic study (i.e., within the Special Issues section) and all applicable Transportation Design Procedures (TDPs) must be evaluated, including but not limited to TDP-1 (turn lane pocket lengths), TDP-14 (driveway throat



length), and TDP-3, TDP-4, and TDP-10 (if a second project driveway is proposed to access Marine Way.)"

B. Transit Connectivity and Pedestrian Circulation this is anticipated to not be applicable since the OCMF will not be accessible for pedestrians and no transit service will be provided for the public at this facility.

C. Congestion Management Program (CMP) Consistency/Requirements - the OCMF project is exempt from the mandatory CMP Traffic Impact Analysis per Exhibit 6: CMP Traffic Impact Analysis Projects

D. Circulation Phasing Locations - not applicable for the OCMF project

E. CEQA VMT Analysis Summary - the OCMF project is anticipated to have only 80 employees at peak operation, therefore it does not meet 250 daily trip thresholds, therefore CEQA VMT analysis is not needed as confirmed by City

City of Irvine however states, "The Limited Scope Traffic Study must include this discussion regarding VMT impact analysis. The traffic study cannot be silent regarding VMT analysis." Therefore, the study will include a section that describes VMT analysis provisions and the rationale for why VMT is not applicable to the project.

F. Others, as appropriate

XI. Required Improvements/Recommendations

Based on City review of the draft Limited Scope Traffic Study, the team will address comments and identify and required improvements if applicable.

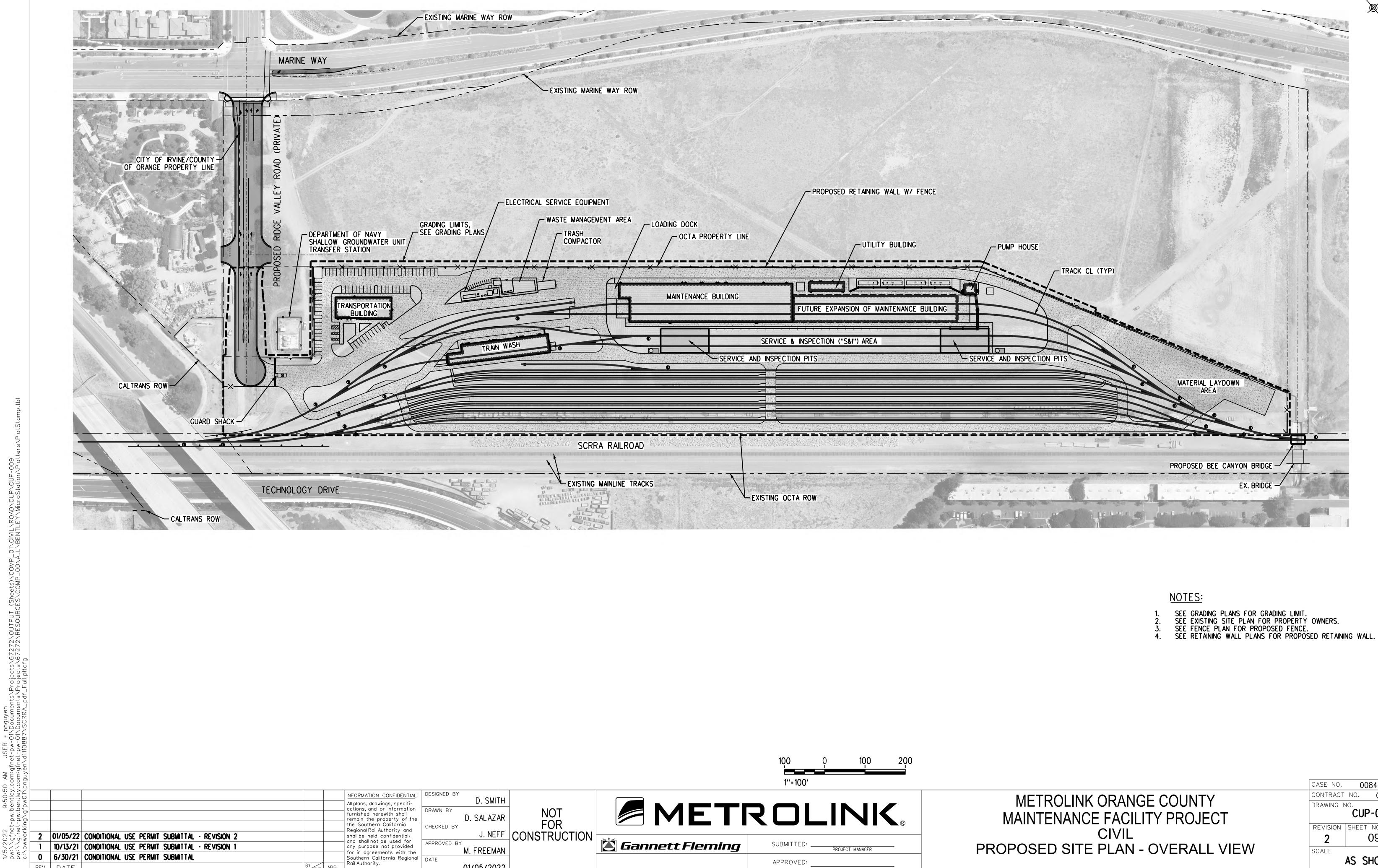
Please confirm that you approve of the approach outlined above and/or contact us with additional comments or thoughts on items that should be included in our analysis. We anticipate moving ahead with analysis upon confirmation of this approach. Should you have any questions or comments please contact me at your earliest convenience.

Sincerely,

Jaime R Guzman AECOM – Deputy Project Manager (323) 605-1691 jaime.guzman1@aecom.com

cc: Lora Cross, OCTA Huey Yann Ooi, OCTA Mrika Simoni, Gannett Fleming Jason Neff, Gannett Fleming Rob Hertz, AECOM Attachment B

Project Site Plan



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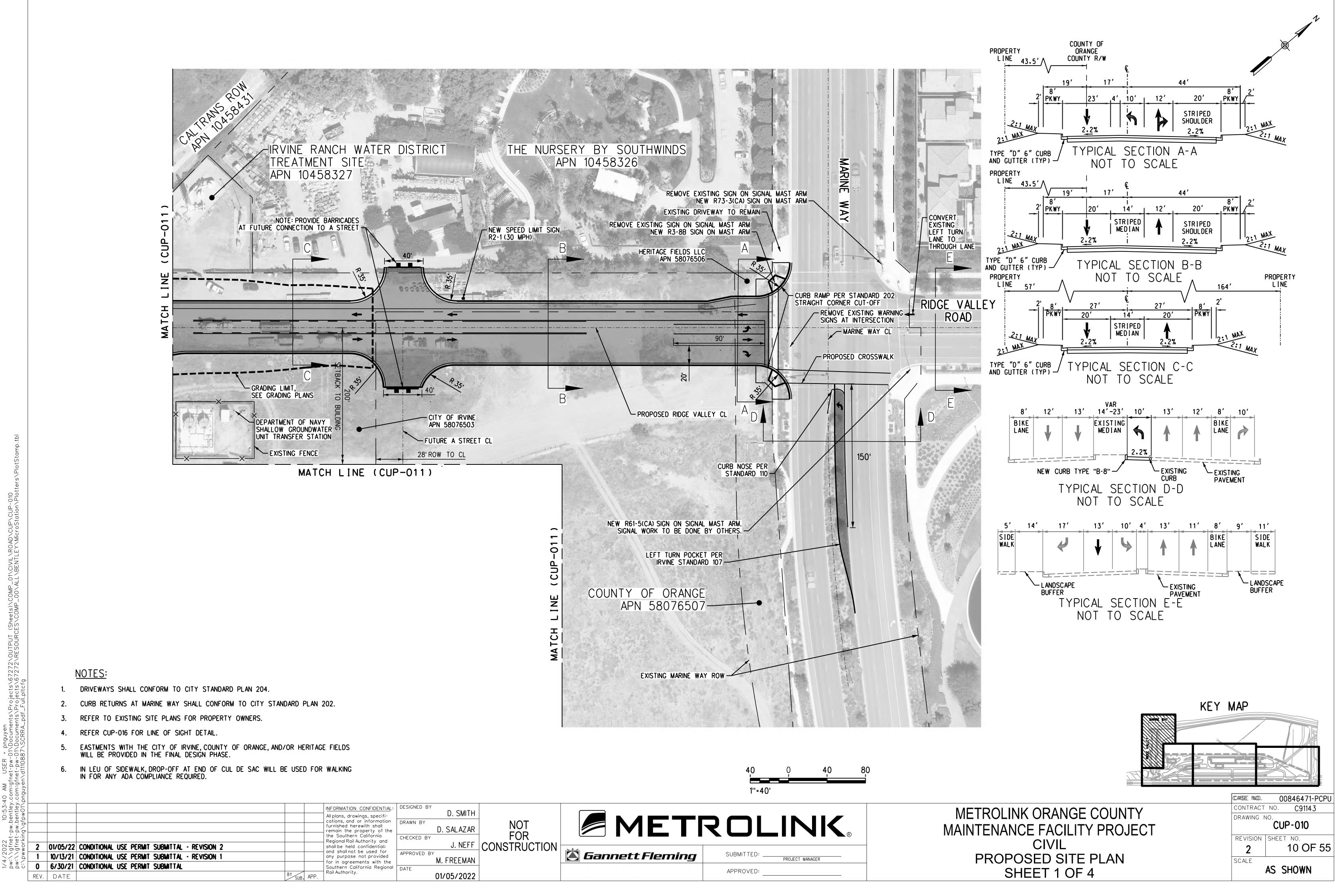
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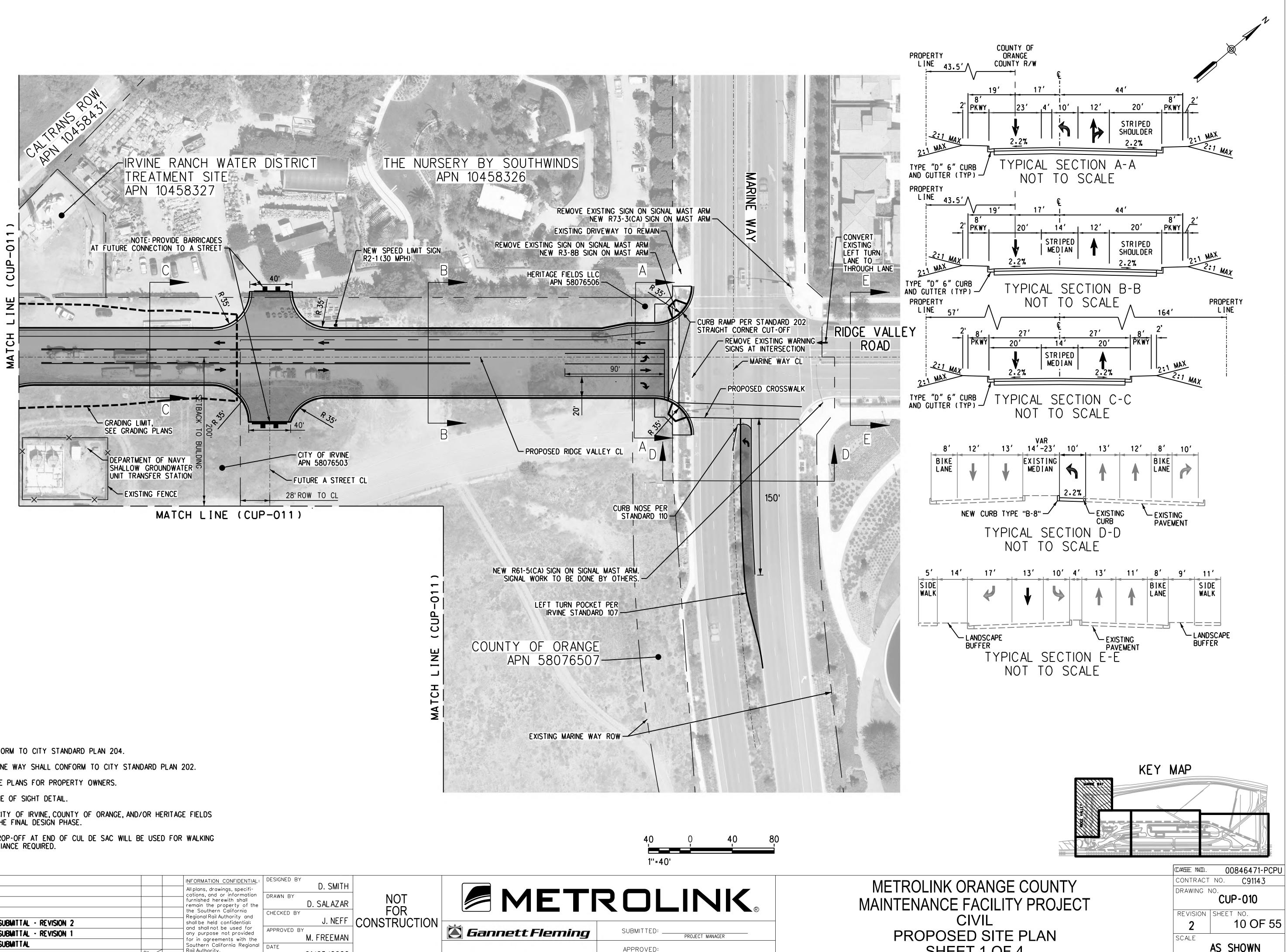
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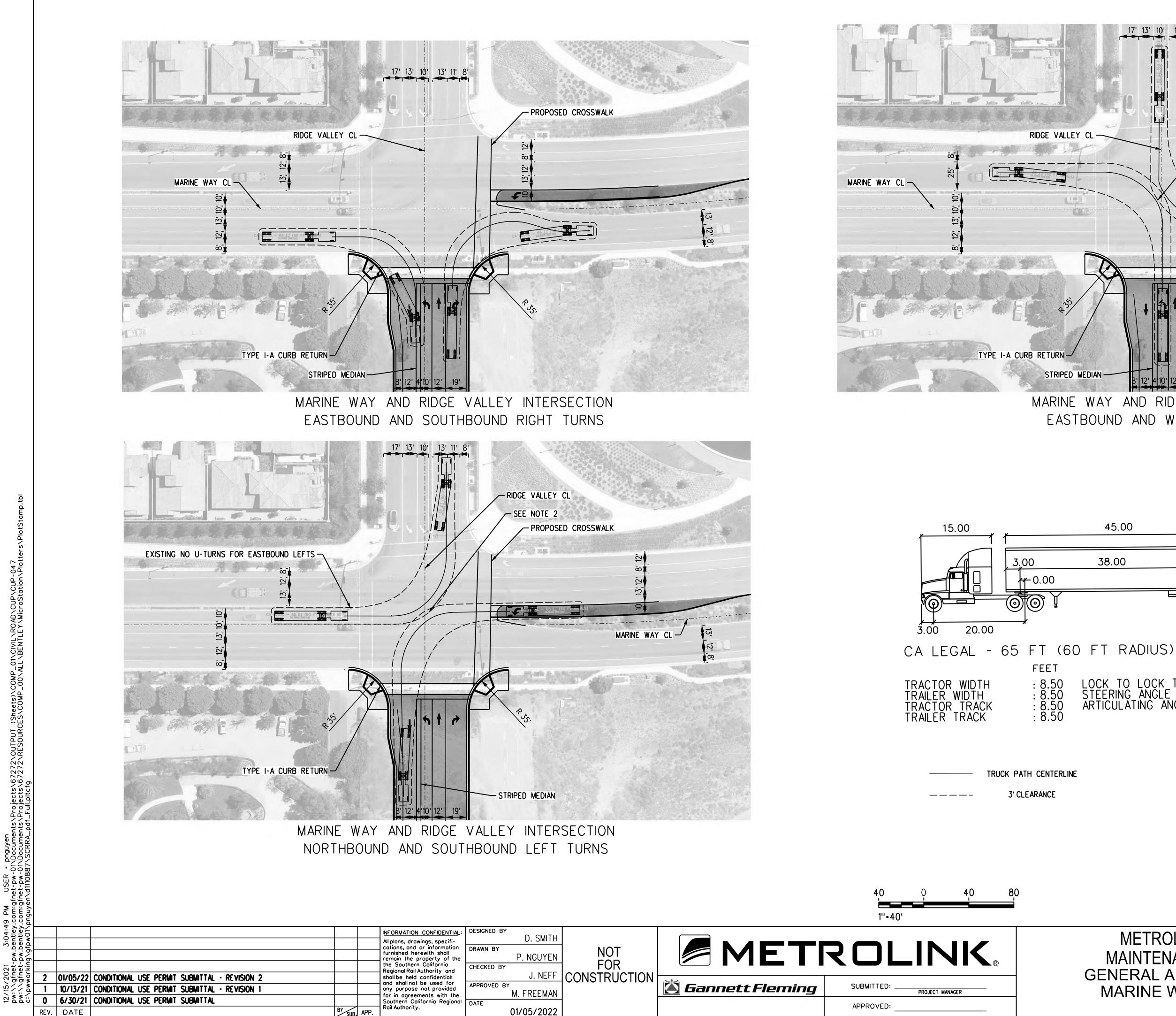
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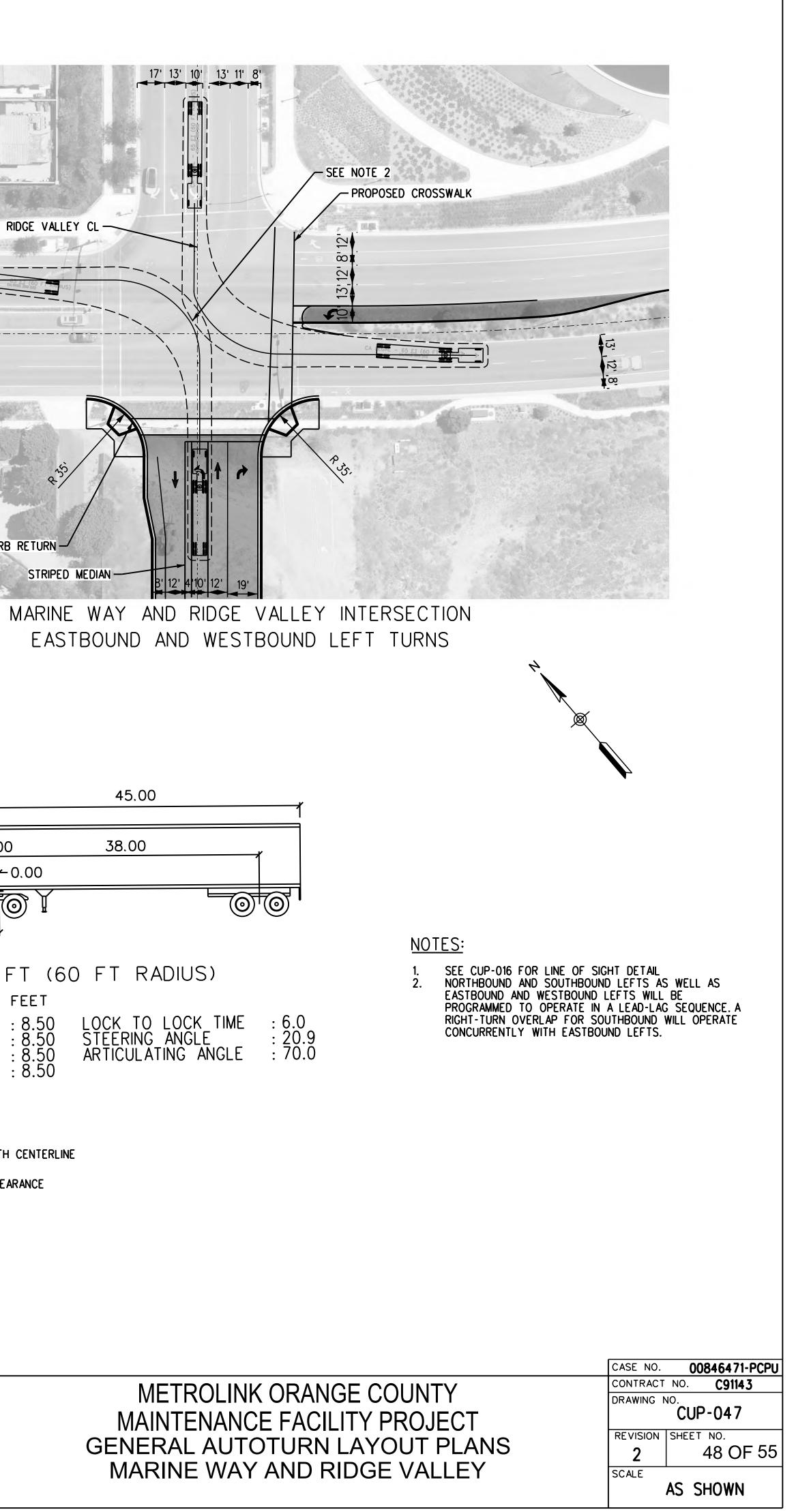
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| J. NEFF | CONSTRUCTION | | | |
| . FREEMAN | | 🖲 Gannett Fleming | SUBMITTED:PROJECT MANAGER | |
| /05/2022 | | | APPROVED: | |
| | | | | |



01/05/2022

FEET

: 8.50 : 8.50 : 8.50 : 8.50



Attachment C

ICU Level of Service Calculations

Existing Baseline (2020)

| 1 (3 | 1 (303) Sand Canyon Ave. / I-5 NB Ramps | | | | | | | |
|------------------|---|-------------|--------|------|---|--------|------|---|
| | | | | | | DM | | |
| | | 0 1 | AM pea | | | PM pea | | |
| | Lanes | Capacity | Volume | v/c | | Volume | v/c | |
| NBL | 2 | 3,400 | 243 | 0.07 | с | 566 | 0.17 | с |
| NBT | 3 | 5,100 | 467 | 0.09 | | 1,657 | 0.32 | |
| NBR | d | 1,700 | 13 | 0.01 | | 18 | 0.01 | |
| | _ | ., | | | | | | |
| SBL | 1 | 1,700 | 16 | 0.01 | | 5 | 0.00 | |
| SBT | 3 | 5,100 | 1,878 | 0.37 | с | 836 | 0.16 | с |
| SBR | 1 | 1,700 | 570 | 0.34 | | 222 | 0.13 | |
| | | | | | | | | |
| EBL | 1.5 | | 322 | | | 938 | | |
| EBT | 0.5 | 3,400 | 0 | 0.09 | с | 0 | 0.28 | с |
| EBR | 2 | 3,400 | 526 | 0.15 | | 217 | 0.06 | |
| | | | | | | | | |
| WBL | 1 | 1,700 | 6 | 0.00 | С | 37 | 0.02 | С |
| WBT | 1 | 1,700 | 0 | 0.00 | | 0 | 0.00 | |
| WBR | 0 | 0 | 3 | | | 0 | | |
| | | | | | | | | |
| Right t | urn adjust | tment | NBR | | | NBR | | |
| | | | SBR | | | SBR | | |
| | | | EBR | | | EBR | | |
| | | | WBR | | | WBR | | |
| | Clearance interval | | | 0.05 | С | | 0.05 | С |
| Split phasing | | | N/S | | | N/S | | |
| | | | E/W | + | | E/W | + | |
| Total | anacity | utilization | | 0.58 | | | 0.68 | |
| | Total capacity utilization | | | | | | | |
| Level of service | | | | Α | | | В | |

| 2 (3 | 04) Sand | I Canyon Ave | . / Marine W | ay | | |
|----------|------------|--------------|--------------|--------|--------|---------|
| | | | AM pea | k hour | PM pea | ak bour |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | Lanes | Capacity | Volume | V/C | volume | V/C |
| NBL | 0 | 0 | 0 | | 0 | |
| NBT | 3 | 5,100 | 548 | 0.11 | 2,084 | 0.41 c |
| NBR | 1 | 1,700 | 197 | 0.12 | 463 | 0.27 |
| SBL | 2 | 3,400 | 99 | 0.03 | 141 | 0.04 c |
| SBT | 3 | 5,100 | 2,236 | 0.44 c | 937 | 0.18 |
| SBR | 0 | 0 | 0 | | 0 | |
| EBL | 0 | 0 | 0 | | 0 | |
| EBT | Õ | Ő | Ő | | 0 0 | |
| EBR | 0 | 0 | 0 | | 0 | |
| WBL | 2 | 3,400 | 448 | 0.13 c | 281 | 0.08 c |
| WBT | 0 | 0 | 0 | | 0 | |
| WBR | 1 | 1,700 | 146 | 0.09 | 130 | 0.08 |
| Right tu | urn adjus | tment | NBR | | NBR | |
| 0 | , | | SBR | | SBR | |
| | | | EBR | | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | /al | | 0.05 c | | 0.05 c |
| Split ph | nasing | | N/S | | N/S | |
| | | | E/W | | E/W | |
| | | | | | | |
| | • • | utilization | | 0.62 | | 0.58 |
| Level of | of servic | e | | В | | Α |

| 3 (3 | 05) Sand | Canyon Ave | . / I-5 SB Ra | mps | | |
|--------------------|------------|-------------|---------------|--------|--------|--------|
| | | | | | | |
| | | | AM pea | | PM pea | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | 0 | 0 | 0 | | 0 | |
| NBT | 4 | 6,800 | 473 | 0.07 | 1,922 | 0.28 c |
| NBR | 1 | 1,700 | 121 | 0.07 | 380 | 0.22 |
| SBL | 2 | 3,400 | 732 | 0.22 | 450 | 0.13 c |
| SBT | 4 | 6,800 | 1,967 | 0.29 c | 726 | 0.11 |
| SBR | 0 | 0,000 | 0 | 0.20 0 | 0 | 0.11 |
| ODIX | Ŭ | U U | Ŭ | | Ŭ | |
| EBL | 2.5 | | 254 | 0.07 c | 617 | 0.12 c |
| EBT | 0 | 6,800 | 4 | | 1 | |
| EBR | 1.5 | | 893 | 0.26 | 250 | 0.15 |
| WBL | 0 | 0 | 0 | | 0 | |
| WBT | 0 | 0 0 | ů 0 | | ů 0 | |
| WBR | 0 | 0 | 0 0 | | 0 | |
| WDIX | Ŭ | 0 | U | | U | |
| Right t | urn adjust | tment | NBR | | NBR | |
| • | | | SBR | | SBR | |
| | | | EBR | 0.19 c | EBR | |
| | | | WBR | | WBR | |
| Clearance interval | | | | 0.05 c | | 0.05 c |
| Split pl | hasing | | N/S | | N/S | |
| | | | E/W | | E/W | |
| - | | | | | | |
| | • • | utilization | | 0.60 | | 0.58 |
| Level of service | | | | Α | | Α |

| 4 R | idge Vall | ey / Marine W | ay | | | |
|---------|---------------|---------------|--------------------|--------|--------|--------|
| | | | A A A a a a | | DM | - I- I |
| | 1 | 0 | AM pea | | PM pea | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| NBL | | 0 | | | | |
| NBT | | 0 | | | | |
| NBR | | 0 | | | | |
| | | | | | | |
| SBL | 2 | 3,400 | 23 | 0.01 c | 32 | 0.01 c |
| SBT | 0 | 0 | 0 | | 0 | |
| SBR | 1 | 1,700 | 526 | 0.31 | 171 | 0.10 |
| | | | | | | |
| EBL | 2 | 3,400 | 114 | 0.03 c | 390 | 0.11 c |
| EBT | 2 | 3,400 | 149 | 0.04 | 262 | 0.08 |
| EBR | 0 | 0 | 0 | | 0 | |
| | | | | | | |
| WBL | 0 | 0 | 0 | | 0 | |
| WBT | 2 | 3,400 | 80 | 0.02 c | 220 | 0.06 c |
| WBR | 1 | 1,700 | 16 | 0.01 | 37 | 0.02 |
| Right t | urn adjust | iment | NBR | | NBR | |
| rugitu | annaajao | | SBR | 0.28 c | SBR | 0.01 c |
| | | | EBR | | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | val | | 0.05 c | | 0.05 c |
| | Split phasing | | N/S | | N/S | |
| | - | | E/W | | E/W | |
| | | | | | | |
| | | utilization | | 0.39 | | 0.24 |
| Level | of service | e | | Α | | Α |

Existing Baseline (2020) plus Project

| 1 (303) Sand Canyon Ave. / I-5 NB Ramps | | | | | | | | |
|---|------------------|-------------|--------|---------|-----|--------|--------|---|
| | | | AM pea | ak hour | | PM pea | k hour | _ |
| | Lanes | Capacity | Volume | v/c | | Volume | v/c | _ |
| NBL | 2 | 3,400 | 255 | 0.08 | с | 573 | 0.17 | с |
| NBT | 3 | 5,100 | 469 | 0.09 | | 1,658 | 0.33 | |
| NBR | d | 1,700 | 13 | 0.01 | | 18 | 0.01 | |
| SBL | 1 | 1,700 | 16 | 0.01 | | 5 | 0.00 | |
| SBT | 3 | 5,100 | 1,878 | 0.37 | с | 836 | 0.16 | с |
| SBR | 1 | 1,700 | 570 | 0.34 | | 222 | 0.13 | |
| EBL | 1.5 | | 322 | | | 938 | | |
| EBT | 0.5 | 3,400 | 0 | 0.09 | с | 0 | 0.28 | с |
| EBR | 2 | 3,400 | 530 | 0.16 | | 218 | 0.06 | |
| WBL | 1 | 1,700 | 6 | 0.00 | с | 37 | 0.02 | с |
| WBT | 1 | 1,700 | 0 | 0.00 | | 0 | 0.00 | |
| WBR | 0 | 0 | 3 | | | 0 | | |
| Right t | urn adjust | tment | NBR | | | NBR | | |
| | | | SBR | | | SBR | | |
| | | | EBR | | | EBR | | |
| | | | WBR | | | WBR | | |
| - | ince interv | val | | 0.05 | С | | 0.05 | С |
| Split phasing | | N/S | | | N/S | | | |
| | | | E/W | + | | E/W | + | _ |
| Total | capacity | utilization | | 0.59 | | | 0.68 | |
| | Level of service | | | Α | | | в | |

| 2 (3 | 04) Sand | Canyon Ave | . / Marine W | ay | | |
|------------------|------------|---------------------------------------|--------------|---------|--------|---------|
| - | | | | | | |
| | | | AM pea | ak hour | PM pea | ak hour |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| NBL | 0 | 0 | 0 | | 0 | |
| NBT | 3 | 5,100 | 548 | 0.11 | 2,084 | 0.41 c |
| NBR | 1 | · · · · · · · · · · · · · · · · · · · | 203 | 0.11 | 463 | 0.41 C |
| NDK | 1 | 1,700 | 203 | 0.12 | 403 | 0.27 |
| SBL | 2 | 3,400 | 103 | 0.03 | 142 | 0.04 c |
| SBT | 3 | 5,100 | 2,236 | 0.44 c | 937 | 0.18 |
| SBR | 0 | 0 | 0 | | 0 | |
| EBL | 0 | 0 | 0 | | 0 | |
| EBT | Ő | Õ | Ő | | Õ | |
| EBR | Ő | 0 | 0 | | 0 | |
| 2211 | Č. | · · | Ť | | · · | |
| WBL | 2 | 3,400 | 457 | 0.13 c | 287 | 0.08 c |
| WBT | 0 | 0 | 0 | | 0 | |
| WBR | 1 | 1,700 | 159 | 0.09 | 137 | 0.08 |
| Riaht t | urn adjust | ment | NBR | | NBR | |
| 5 | , | | SBR | | SBR | |
| | | | EBR | | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | al | | 0.05 c | | 0.05 c |
| Split pl | hasing | | N/S | | N/S | |
| | | | E/W | | E/W | |
| | •. | | | | | |
| | • • | utilization | | 0.62 | | 0.58 |
| Level of service | | | | В | | A |

| 3 (305) Sand Canyon Ave. / I-5 SB Ramps | | | | | | |
|---|------------|---|--------|--------|--------|---------|
| | | | | | | |
| | | | AM pea | | | ak hour |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | 0 | 0 | 0 | | 0 | |
| NBT | 4 | 6,800 | 474 | 0.07 | 1,922 | 0.28 c |
| NBR | 1 | 1,700 | 121 | 0.07 | 380 | 0.22 |
| SBL | 2 | 3,400 | 739 | 0.22 | 455 | 0.13 c |
| SBT | 4 | 6,800 | 1,970 | 0.29 c | 727 | 0.11 |
| SBR | 0 | 0 | 0 | | 0 | |
| | - | - | - | | - | |
| EBL | 2.5 | | 259 | 0.08 c | 617 | 0.12 c |
| EBT | 0 | 6,800 | 4 | | 1 | |
| EBR | 1.5 | | 893 | 0.26 | 250 | 0.15 |
| WBL | 0 | 0 | 0 | | 0 | |
| WBT | 0 | 0 | 0 | | 0 | |
| WBR | 0 | 0 | 0 | | 0 0 | |
| | Č. | , in the second s | · · · | | Ĭ | |
| Right t | urn adjus | tment | NBR | | NBR | |
| Ţ | | | SBR | | SBR | |
| | | | EBR | 0.19 c | EBR | |
| | | | WBR | | WBR | |
| Clearance interval | | | 0.05 c | | 0.05 c | |
| Split pl | nasing | | N/S | | N/S | |
| | | | E/W | | E/W | |
| | | | | | | |
| | | utilization | | 0.61 | | 0.58 |
| Level | of service | 9 | | В | | Α |

| 4 R | idge Vall | ey / Marine W | ay | | | |
|----------|------------|---------------|--------|---------|-------------|---------|
| | | | AM pea | ik hour | PM pe | ak hour |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | 1 | 1,700 | 21 | 0.01 | 13 | 0.01 |
| NBT | 1 | 1,700 | 2 | 0.01 | c 1 | 0.01 c |
| NBR | 1 | 1,700 | 1 | 0.00 | 0 | 0.00 |
| | | | | | | |
| SBL | 1 | 1,700 | 23 | | c <u>32</u> | 0.02 c |
| SBT | 1 | 1,700 | 1 | 0.00 | 0 | 0.00 |
| SBR | 1 | 1,700 | 526 | 0.31 | 171 | 0.10 |
| | | | | | | |
| EBL | 2 | 3,400 | 114 | 0.03 | | 0.11 c |
| EBT | 2 | 3,400 | 149 | 0.05 | 262 | 0.08 |
| EBR | 0 | 0 | 10 | | 1 | |
| WBL | 1 | 1,700 | 0 | 0.00 | 0 | 0.00 |
| WBT | 2 | 3,400 | 80 | 0.02 | - | 0.06 c |
| WBR | 1 | 1,700 | 16 | 0.01 | 37 | 0.02 |
| | | ., | | | | |
| Right t | urn adjust | tment | NBR | | NBR | |
| | | | SBR | 0.26 | c SBR | |
| | | | EBR | | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | al | | 0.05 | C | 0.05 c |
| Split pl | nasing | | N/S | | N/S | |
| | | | E/W | | E/W | |
| | | | | | | |
| | | utilization | | 0.38 | | 0.25 |
| Level | of service | 9 | | Α | | Α |

Short-Term Interim Year Baseline (2025) Alternative 1

| 1 (3 | 1 (303) Sand Canyon Ave. / I-5 NB Ramps | | | | | | | | |
|---------|---|-------------|--------|--------|--------|--------|--|--|--|
| | | | | | | | | | |
| | | | AM pea | | PM pea | | | | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c | | | |
| NBL | 2 | 3,400 | 291 | 0.09 0 | 710 | 0.21 c | | | |
| NBT | 3 | 5,100 | 602 | 0.12 | 1,829 | 0.36 | | | |
| NBR | d | 1,700 | 33 | 0.02 | 31 | 0.02 | | | |
| SBL | 1 | 1,700 | 40 | 0.02 | 10 | 0.01 | | | |
| SBT | 3 | 5,100 | 2,175 | 0.43 0 | 1,074 | 0.21 c | | | |
| SBR | 1 | 1,700 | 749 | 0.44 | 310 | 0.18 | | | |
| EBL | 1.5 | | 461 | | 1,126 | | | | |
| EBT | 0.5 | 3,400 | 0 | 0.14 d | | 0.33 c | | | |
| EBR | 2 | 3,400 | 622 | 0.18 | 268 | 0.08 | | | |
| WBL | 1 | 1,700 | 12 | 0.01 d | 94 | 0.06 c | | | |
| WBT | 1 | 1,700 | 0 | 0.00 | 0 | 0.00 | | | |
| WBR | 0 | 0 | 8 | | 0 | | | | |
| Right t | turn adjust | ment | NBR | | NBR | | | | |
| • | - | | SBR | | SBR | | | | |
| | | | EBR | | EBR | | | | |
| | | | WBR | | WBR | | | | |
| Cleara | ance interv | al | | 0.05 0 | | 0.05 c | | | |
| Split p | hasing | | N/S | | N/S | | | | |
| | | | E/W | + | E/W | + | | | |
| Total | capacity | utilization | | 0.72 | | 0.86 | | | |
| Level | Level of service | | | С | | D | | | |

| 2 (3 | 804) Sanc | I Canyon Ave | . / Marine W | ay | | |
|--|------------|--------------|--------------|---------|--------|-----------|
| | | | AMpos | le haur | DMmar | h h a u m |
| | | | AM pea | | PM pea | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | 0 | 0 | 0 | | 0 | |
| NBT | 3 | 5,100 | 701 | 0.14 | 2,342 | 0.46 c |
| NBR | 1 | 1,700 | 240 | 0.14 | 674 | 0.40 |
| | | | | | | |
| SBL | 1 | 1,700 | 124 | 0.07 | 201 | 0.12 c |
| SBT | 4 | 6,800 | 2,607 | 0.38 c | 1,222 | 0.18 |
| SBR | 0 | 0 | 0 | | 0 | |
| | | | | | | |
| EBL | 0 | 0 | 0 | | 0 | |
| EBT | 0 | 0 | 0 | | 0 | |
| EBR | 0 | 0 | 0 | | 0 | |
| | | | | | | |
| WBL | 2 | 3,400 | 535 | 0.16 c | 487 | 0.14 c |
| WBT | 0 | 0 | 0 | | 0 | |
| WBR | 1 | 1,700 | 194 | 0.11 | 202 | 0.12 |
| | | , | | | | |
| Riaht t | urn adjus | tment | NBR | | NBR | |
| 5 | , | | SBR | | SBR | |
| | | | EBR | | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | /al | TIDI(| 0.05 c | | 0.05 c |
| Split pl | | | N/S | 5.00 0 | N/S | 5.00 0 |
| | | | E/W | | E/W | |
| | | | | | | |
| Total o | anacity | utilization | | 0.59 | | 0.77 |
| Total capacity utilization Level of service | | | | A | | C |
| Level of service | | | | A | | U |

| 3 (305) Sand Canyon Ave. / I-5 SB Ramps | | | | | | | | | |
|---|----------------------------|----------|--------|--------|--------|--------|--|--|--|
| | | | | | | | | | |
| | | | AM pea | | PM pea | | | | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c | | | |
| | | _ | | | | | | | |
| NBL | 0 | 0 | 0 | | 0 | | | | |
| NBT | 4 | 6,800 | 611 | 0.09 | 2,315 | 0.34 c | | | |
| NBR | 1 | 1,700 | 131 | 0.08 | 401 | 0.24 | | | |
| SBL | 2 | 3,400 | 844 | 0.25 | 649 | 0.19 c | | | |
| SBT | 4 | 6,800 | 2,314 | 0.34 c | 1,012 | 0.15 | | | |
| SBR | 0 | 0 | 0 | | 0 | | | | |
| EBL | 2.5 | | 305 | 0.09 c | 702 | 0.14 c | | | |
| EBT | 0 | 6,800 | 4 | | 1 | | | | |
| EBR | 1.5 | -, | 911 | 0.27 | 236 | 0.14 | | | |
| WBL | 0 | 0 | 0 | | 0 | | | | |
| WBT | 0 | 0 | 0 | | 0 | | | | |
| WBR | 0 | 0 | 0 | | 0 | | | | |
| Right t | urn adjust | ment | NBR | | NBR | | | | |
| rugitet | ann aajao | inone | SBR | | SBR | | | | |
| | | | EBR | 0.18 c | EBR | | | | |
| | | | WBR | 0.10 0 | WBR | | | | |
| Cleara | nce interv | al | | 0.05 c | | 0.05 c | | | |
| Split pl | Split phasing | | | | N/S | | | | |
| | - | | E/W | | E/W | | | | |
| | | | | | | | | | |
| | Total capacity utilization | | | 0.66 | | 0.72 | | | |
| Level | Level of service | | | В | | C | | | |

| 4 R | idge Vall | ey / Marine W | ay | | | |
|------------------|----------------------------|---------------|--------|--------|--------|----------|
| | | | | | | <u> </u> |
| | | | AM pea | | PM pea | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | | 0 | | | | |
| NBT | | 0 | | | | |
| NBR | | 0 | | | | |
| SBL | 2 | 3,400 | 26 | 0.01 c | 35 | 0.01 c |
| SBL | 0 | 0 | 20 | 0.01 C | 0 | 0.01 C |
| SBR | 1 | 1,700 | 581 | 0.34 | 189 | 0.11 |
| SBR | 1 | 1,700 | 501 | 0.54 | 109 | 0.11 |
| EBL | 2 | 3,400 | 126 | 0.04 c | 430 | 0.13 c |
| EBT | 2 | 3,400 | 164 | 0.05 | 289 | 0.09 |
| EBR | 0 | 0 | 0 | | 0 | |
| | | | | | | |
| WBL | 0 | 0 | 0 | | 0 | |
| WBT | 2 | 3,400 | 88 | 0.03 c | 243 | 0.07 c |
| WBR | 1 | 1,700 | 18 | 0.01 | 41 | 0.02 |
| Diabte | uma adiuai | tua a un t | NBR | | NBR | |
| Right t | urn adjus | uneni | SBR | 0.31 c | SBR | 0.01 c |
| | | | EBR | 0.51 C | EBR | 0.01 C |
| | | | WBR | | WBR | |
| Cleara | nce interv | val | VVDR | 0.05 c | VVDR | 0.05 c |
| Split pl | | | N/S | 0.00 0 | N/S | 0.00 0 |
| Spirtpi | | | | | E/W | |
| | | | E/W | | _/** | |
| Total of | Total capacity utilization | | | 0.44 | | 0.27 |
| Level of service | | | Α | | Α | |

Short-Term Interim Year Baseline (2025) Alternative 1 plus Project

| 1 (3 | 1 (303) Sand Canyon Ave. / I-5 NB Ramps | | | | | | | | |
|----------|---|-------------|--------|---------|---|--------|---------|---|--|
| | | | AM pea | ak hour | | PM pea | ak hour | | |
| | Lanes | Capacity | Volume | v/c | | Volume | v/c | | |
| | | | | | | | | | |
| NBL | 2 | 3,400 | 304 | 0.09 | С | 717 | 0.2. | С | |
| NBT | 3 | 5,100 | 604 | 0.12 | | 1,830 | 0.36 | | |
| NBR | d | 1,700 | 33 | 0.02 | | 31 | 0.02 | | |
| SBL | 1 | 1,700 | 40 | 0.02 | | 10 | 0.01 | | |
| SBT | 3 | 5,100 | 2,176 | 0.43 | с | 1,074 | 0.21 | С | |
| SBR | 1 | 1,700 | 749 | 0.44 | | 310 | 0.18 | | |
| EBL | 1.5 | | 461 | | | 1,126 | | | |
| EBT | 0.5 | 3,400 | 0 | 0.14 | с | 0 | 0.33 | с | |
| EBR | 2 | 3,400 | 626 | 0.18 | | 270 | 0.08 | | |
| WBL | 1 | 1,700 | 12 | 0.01 | с | 94 | 0.06 | с | |
| WBT | 1 | 1,700 | 0 | 0.00 | | 0 | 0.00 | | |
| WBR | 0 | 0 | 8 | | | 0 | | | |
| Riaht t | urn adjust | tment | NBR | | | NBR | | | |
| 5 | , | | SBR | | | SBR | | | |
| | | | EBR | | | EBR | | | |
| | | | WBR | | | WBR | | | |
| Cleara | nce interv | val | | 0.05 | С | | 0.05 | С | |
| Split p | Split phasing | | N/S | | | N/S | | | |
| | | | E/W | + | | E/W | + | | |
| Total of | capacity | utilization | | 0.72 | _ | | 0.86 | | |
| | Level of service | | | С | | | D | | |

| 2 (3 | 2 (304) Sand Canyon Ave. / Marine Way | | | | | | | | |
|--|---------------------------------------|-------------|-----------|----------------|-----------|---------|--|--|--|
| | | | AM pea | ik hour | PM pea | ak hour | | | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c | | | |
| NBL | 0 | 0 | 0 | | 0 | | | | |
| NBT | 3 | 5,100 | 701 | 0.14 | 2,342 | 0.46 c | | | |
| NBR | 1 | 1,700 | 248 | 0.15 | 676 | 0.40 | | | |
| SBL | 1 | 1,700 | 128 | 0.08 | 202 | 0.12 c | | | |
| SBL | 4 | 6,800 | 2,607 | 0.00 0.38 c | 1,222 | 0.12 0 | | | |
| SBR | 0 | 0 | 0 | 0.00 0 | 0 | 0.10 | | | |
| FBI | 0 | 0 | 0 | | 0 | | | | |
| EBT | 0 | 0 | 0 | | 0 | | | | |
| EBR | 0 | 0 | 0 | | 0 | | | | |
| WBL | 2 | 3,400 | 545 | 0.16 c | 494 | 0.15 c | | | |
| WBT | 0 | 0 | 0 | 0.10 0 | 0 | 0.10 0 | | | |
| WBR | 1 | 1,700 | 207 | 0.12 | 210 | 0.12 | | | |
| Right t | urn adjust | iment | NBR | | NBR | | | | |
| | ann aujuo | | SBR | | SBR | | | | |
| | | | EBR | | EBR | | | | |
| | | | WBR | | WBR | | | | |
| Cleara | nce interv | val | | 0.05 c | | 0.05 c | | | |
| Split pl | Split phasing | | N/S | | N/S | | | | |
| | | | E/W | | E/W | | | | |
| Total | anacity | utilization | | 0.59 | | 0.78 | | | |
| Total capacity utilization Level of service | | | 0.59 A | | 0.78 C | | | | |
| Level of service | | | | ~ | | U | | | |

| 3 (3 | 05) Sand | Canyon Ave | . / I-5 SB Ra | mps | | 3 (305) Sand Canyon Ave. / I-5 SB Ramps | | | | | | | | | |
|------------------|----------------------------|------------|---------------|--------|--------|---|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | |
| | | | AM pea | | PM pea | | | | | | | | | | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| NBL | 0 | 0 | 0 | | 0 | | | | | | | | | | |
| NBT | 4 | 6,800 | 612 | 0.09 | 2,315 | 0.34 c | | | | | | | | | |
| NBR | 1 | 1,700 | 131 | 0.08 | 401 | 0.24 | | | | | | | | | |
| SBL | 2 | 3,400 | 851 | 0.25 | 655 | 0.19 c | | | | | | | | | |
| SBT | 4 | 6,800 | 2,316 | 0.34 c | 1,013 | 0.15 | | | | | | | | | |
| SBR | 0 | 0 | 0 | | 0 | | | | | | | | | | |
| EBL | 2.5 | | 311 | 0.09 c | 704 | 0.14 c | | | | | | | | | |
| EBT | 0 | 6,800 | 4 | 0.00 0 | 1 | 0.11 0 | | | | | | | | | |
| EBR | 1.5 | 0,000 | 911 | 0.27 | 236 | 0.14 | | | | | | | | | |
| WBL | 0 | 0 | 0 | | 0 | | | | | | | | | | |
| WBT | 0 | 0 | 0 | | 0 | | | | | | | | | | |
| WBR | 0 | 0 | 0 | | 0 | | | | | | | | | | |
| Right t | urn adjust | ment | NBR | | NBR | | | | | | | | | | |
| | ann aajao | | SBR | | SBR | | | | | | | | | | |
| | | | EBR | 0.18 c | EBR | | | | | | | | | | |
| | | | WBR | | WBR | | | | | | | | | | |
| Cleara | nce interv | val | | 0.05 c | | 0.05 c | | | | | | | | | |
| | Split phasing | | | | N/S | | | | | | | | | | |
| | | | E/W | | E/W | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | Total capacity utilization | | | 0.66 | | 0.72 | | | | | | | | | |
| Level of service | | | | В | | С | | | | | | | | | |

| 4 R | idge Vall | ey / Marine W | 'ay | | | |
|----------------------------|---------------|---------------|--------|--------|--------|--------|
| | | | | | | |
| | | | AM pea | | PM pea | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | 1 | 1,700 | 24 | 0.01 | 15 | 0.01 |
| NBT | 1 | 1,700 | 3 | 0.02 c | 1 | 0.01 c |
| NBR | 1 | 1,700 | 1 | 0.00 | 1 | 0.00 |
| SBL | 1 | 1,700 | 26 | 0.02 c | 35 | 0.02 c |
| SBT | 1 | 1,700 | 1 | 0.02 0 | 0 | 0.00 |
| SBR | 1 | 1,700 | 581 | 0.34 | 189 | 0.00 |
| ODIX | · · · | 1,700 | 001 | 0.04 | 100 | 0.11 |
| EBL | 2 | 3,400 | 126 | 0.04 c | 430 | 0.13 c |
| EBT | 2 | 3,400 | 164 | 0.05 | 289 | 0.09 |
| EBR | 0 | 0 | 12 | | 3 | |
| WBL | 1 | 1,700 | 1 | 0.00 | 0 | 0.00 |
| WBT | 2 | 3,400 | 88 | 0.03 c | 243 | 0.07 c |
| WBR | 1 | 1,700 | 18 | 0.01 | 41 | 0.02 |
| Right t | urn adjust | iment | NBR | | NBR | |
| raginea | ann aajao | linent | SBR | 0.29 c | SBR | |
| | | | EBR | 0.20 0 | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | val | | 0.05 c | | 0.05 c |
| | Split phasing | | | | N/S | |
| | - | | E/W | | E/W | |
| | | | | | | |
| Total capacity utilization | | | | 0.45 | | 0.28 |
| Level | of service | 9 | | Α | | Α |

Short-Term Interim Year Baseline (2025) Alternative 2

| 1 (3 | 303) Sand | Canyon Ave | . / I-5 NB Ra | mps / | Mar | ine Way | |
|---------|----------------------------|------------|---------------|---------|-----|---------|---------|
| | | | | | | | |
| | | | AM pea | ık hour | | PM pea | ik hour |
| | Lanes | Capacity | Volume | v/c | | Volume | v/c |
| NBL | 2 | 2 400 | 228 | 0.07 | | 653 | 0.19 c |
| NBL | 2 4 | 3,400 | 472 | 0.07 | С | | 0.19 0 |
| | | 6,800 | | | | 1,684 | |
| NBR | 1 | 1,700 | 274 | 0.16 | | 705 | 0.41 |
| SBL | 2 | 3.400 | 136 | 0.04 | | 171 | 0.05 |
| SBT | 4 | 6,800 | 2,079 | 0.31 | с | 913 | 0.13 c |
| SBR | 1 | 1,700 | 749 | 0.44 | - | 310 | 0.18 |
| 02.1 | | ., | | •••• | | 0.0 | 0.10 |
| EBL | 2 | 3,400 | 461 | 0.14 | | 1,126 | 0.33 c |
| EBT | 1.5 | 5,100 | 28 | 0.02 | с | 40 | 0.02 |
| EBR | 1.5 | | 595 | 0.18 | | 228 | 0.07 |
| | | 0.400 | | | | 504 | 0.47 |
| WBL | 2 | 3,400 | 547 | 0.16 | С | 581 | 0.17 |
| WBT | 2 | 3,400 | 63 | 0.02 | | 56 | 0.02 c |
| WBR | 1 | 1,700 | 139 | 0.08 | | 145 | 0.09 |
| Right t | urn adjust | iment | NBR | | | NBR | |
| ragine | amaajao | | SBR | 0.02 | с | SBR | |
| | | | EBR | 0.11 | c | EBR | |
| | | | WBR | 0 | Ū | WBR | 0.01 c |
| Cleara | nce interv | val | | 0.05 | С | | 0.05 c |
| Split p | hasing | | N/S | | | N/S | |
| | - | | E/W | | | E/W | |
| - | | | | | | | |
| | Total capacity utilization | | | 0.74 | | | 0.73 |
| Level | Level of service | | | С | | | С |

| 2 (3 | 804) Sand | I Canyon Ave | . / Old Marin | e Way | | |
|----------------------------|-------------------------------------|--------------|---------------|---------|--------|---------|
| | | | | | | |
| | | | AM pea | ık hour | PM pea | ak hour |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | 0 | 0 | 0 | | 0 | |
| NBT | 4 | 6,800 | 828 | 0.12 | 2,911 | 0.43 c |
| NBR | d | 1,700 | 114 | 0.07 | 105 | 0.06 |
| SBL | 0 | 0 | 94 | 0.06 | 113 | 0.07 c |
| SBT | 4 | 6,800 | 3,048 | 0.46 c | 1,596 | 0.25 |
| SBR | 0 | 0 | 0 | | 0 | |
| | | | | | | |
| EBL | 0 | 0 | 0 | | 0 | |
| EBT | 0 | 0 | 0 | | 0 | |
| EBR | 0 | 0 | 0 | | 0 | |
| WBL | 2 | 3,400 | 53 | 0.02 c | 89 | 0.03 c |
| WBT | 0 | 0 | 0 | | 0 | |
| WBR | 1 | 1,700 | 44 | 0.03 | 84 | 0.05 |
| Distant | | | NDD | | NBR | |
| Right i | urn adjust | lment | NBR SBR | | SBR | |
| | | | EBR | | EBR | |
| | | | | | | |
| Cloara | noo inton | val | WBR | 0.05 c | WBR | 0.05 c |
| - | Clearance interval Split phasing | | | 0.05 C | N/S | 0.05 0 |
| Spir p | nasing | | N/S E/W | | E/W | |
| | | | | | | |
| Total capacity utilization | | | 0.53 | | 0.58 | |
| Level of service | | | Α | | A | |

| 3 (3 | 3 (305) Sand Canyon Ave. / I-5 SB Ramps | | | | | | | | | |
|---------|---|----------|--------|----------------|--------|--------|--|--|--|--|
| | | | | | | | | | | |
| | | | AM pea | | PM pea | | | | | |
| | Lanes | Capacity | Volume | v/c | Volume | v/c | | | | |
| | | | | | | | | | | |
| NBL | 0 | 0 | 0 | | 0 | | | | | |
| NBT | 4 | 6,800 | 611 | 0.09 | 2,315 | 0.34 c | | | | |
| NBR | 1 | 1,700 | 131 | 0.08 | 401 | 0.24 | | | | |
| SBL | 2 | 3,400 | 844 | 0.25 | 649 | 0.19 c | | | | |
| SBT | 4 | 6,800 | 2,314 | 0.23 0.34 c | 1,012 | 0.15 | | | | |
| SBR | 0 | 0,000 | 2,514 | 0.04 0 | 0 | 0.10 | | | | |
| SDIX | 0 | 0 | 0 | | 0 | | | | | |
| EBL | 2.5 | | 305 | 0.09 c | 702 | 0.14 c | | | | |
| EBT | 0 | 6,800 | 4 | | 1 | | | | | |
| EBR | 1.5 | | 911 | 0.27 | 236 | 0.14 | | | | |
| WBL | 0 | 0 | 0 | | 0 | | | | | |
| WBT | 0 | 0 | 0 | | 0 | | | | | |
| WBR | 0 | 0 | 0 | | 0 | | | | | |
| VUDIX | 0 | 0 | 0 | | 0 | | | | | |
| Right t | urn adjus | tment | NBR | | NBR | | | | | |
| | | | SBR | | SBR | | | | | |
| | | | EBR | 0.18 c | EBR | | | | | |
| | | | WBR | | WBR | | | | | |
| Cleara | nce interv | /al | N/S | 0.05 c | | 0.05 c | | | | |
| Split p | Split phasing | | | | N/S | | | | | |
| | | | E/W | | E/W | | | | | |
| Takal | | | | | | 0.70 | | | | |
| | Total capacity utilization | | | 0.66 | | 0.72 | | | | |
| Level | of service | 9 | | В | | C | | | | |

| 4 R | idge Vall | ey / Marine W | ay | | | |
|----------------------------|---------------|---------------|--------|---------|--------|---------|
| | | | AM pea | ik hour | PM pea | ak hour |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | | 0 | | | | |
| NBT | | 0 | | | | |
| NBR | | 0 | | | | |
| SBL | 2 | 3,400 | 26 | 0.01 c | 35 | 0.01 c |
| SBT | 0 | 0 | 0 | | 0 | |
| SBR | 1 | 1,700 | 581 | 0.34 | 189 | 0.11 |
| EBL | 2 | 3,400 | 126 | 0.04 c | 430 | 0.13 c |
| EBT | 2 | 3,400 | 120 | 0.04 C | 289 | 0.09 |
| EBR | 0 | 0,400 | 04 | 0.05 | 203 | 0.05 |
| | U | 0 | 0 | | U | |
| WBL | 0 | 0 | 0 | | 0 | |
| WBT | 2 | 3,400 | 88 | 0.03 c | 243 | 0.07 c |
| WBR | 1 | 1,700 | 18 | 0.01 | 41 | 0.02 |
| Riaht t | urn adjus | tment | NBR | | NBR | |
| 5 | , | | SBR | 0.31 c | SBR | 0.01 c |
| | | | EBR | | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | /al | N/S | 0.05 c | | 0.05 c |
| Split pl | Split phasing | | | | N/S | |
| | | | E/W | | E/W | |
| Tatal | | | | 0.44 | | 0.07 |
| Total capacity utilization | | | | 0.44 | | 0.27 |
| Level of service | | | | Α | | Α |

Short-Term Interim Year Baseline (2025) Alternative 2 plus Project

| 1 (: | 303) Sand | I Canyon Ave | . / I-5 NB Ra | mps / | Ma | rine Way | | |
|---------|-------------|--------------|---------------|---------|----|----------|---------|---|
| | | | AM pea | ak hour | | PM pea | ak hour | |
| | Lanes | Capacity | Volume | v/c | | Volume | v/c | |
| NBL | 2 | 3,400 | 228 | 0.07 | с | 653 | 0.19 | с |
| NBT | 4 | 6,800 | 472 | 0.07 | | 1,684 | 0.25 | |
| NBR | 1 | 1,700 | 281 | 0.17 | | 707 | 0.42 | |
| SBL | 2 | 3,400 | 136 | 0.04 | | 171 | 0.05 | |
| SBT | 4 | 6,800 | 2,079 | 0.31 | С | 913 | 0.13 | с |
| SBR | 1 | 1,700 | 749 | 0.44 | | 310 | 0.18 | |
| EBL | 2 | 3,400 | 461 | 0.14 | | 1,126 | 0.33 | с |
| EBT | 1.5 | 5,100 | 32 | 0.02 | С | 41 | 0.02 | |
| EBR | 1.5 | | 595 | 0.18 | | 228 | 0.07 | |
| WBL | 2 | 3,400 | 557 | 0.16 | с | 587 | 0.17 | |
| WBT | 2 | 3,400 | 76 | 0.02 | | 64 | 0.02 | С |
| WBR | 1 | 1,700 | 140 | 0.08 | | 146 | 0.09 | |
| Right t | turn adjus | tment | NBR | | | NBR | | |
| | | | SBR | 0.01 | С | SBR | | |
| | | | EBR | 0.11 | С | EBR | | |
| | | | WBR | | | WBR | | С |
| Cleara | ance interv | /al | | 0.05 | С | | 0.05 | С |
| Split p | hasing | | N/S | | | N/S | | |
| | | | E/W | | | E/W | | |
| Total | capacity | utilization | | 0.73 | | | 0.73 | |
| Level | of service | e | | С | | | С | |

| 2 (3 | 804) Sand | I Canyon Ave | . / Old Marin | e Way | | |
|---------|------------|--------------|---------------|-----------|--------|-----------|
| | | | AM pea | ik hour | PM pea | ak hour |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| NBL | 0 | 0 | 0 | | 0 | |
| NBT | 4 | 6.800 | 835 | 0.12 | 2,913 | 0.43 c |
| NBR | d | 1,700 | 114 | 0.07 | 105 | 0.06 |
| | | , | | | | |
| SBL | 0 | 0 | 94 | 0.06 | 113 | 0.07 c |
| SBT | 4 | 6,800 | 3,058 | 0.46 c | 1,603 | 0.25 |
| SBR | 0 | 0 | 0 | | 0 | |
| EBL | 0 | 0 | 0 | | 0 | |
| EBL | 0 0 | 0 0 | 0 0 | | 0 0 | |
| EBR | 0 | 0 | 0 | | 0 | |
| LDIX | Ŭ | Ŭ | Ŭ | | Ŭ | |
| WBL | 2 | 3,400 | 53 | 0.02 c | 89 | 0.03 c |
| WBT | 0 | 0 | 0 | | 0 | |
| WBR | 1 | 1,700 | 44 | 0.03 | 84 | 0.05 |
| Right t | urn adjus | tment | NBR | | NBR | |
| rugitu | ann aajao | | SBR | | SBR | |
| | | | EBR | | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | /al | | 0.05 c | | 0.05 c |
| Split p | hasing | | N/S | | N/S | |
| | | | E/W | | E/W | |
| Total | canacity | utilization | | 0.53 | | 0.58 |
| | • • | | | | | |
| | of service | | | 0.53 A | | 0.58 A |

| 3 (3 | 805) Sand | l Canyon Ave | . / I-5 SB Ra | mps | | |
|---------|------------|--------------|---------------|---------|--------|---------|
| | | | | | | |
| | | | AM pea | ık hour | PM pea | ak hour |
| | Lanes | Capacity | Volume | v/c | Volume | v/c |
| | | | | | | |
| NBL | 0 | 0 | 0 | | 0 | |
| NBT | 4 | 6,800 | 612 | 0.09 | 2,315 | 0.34 c |
| NBR | 1 | 1,700 | 131 | 0.08 | 401 | 0.24 |
| SBL | 2 | 3,400 | 851 | 0.25 | 655 | 0.19 c |
| SBT | 4 | 6,800 | 2,316 | 0.34 c | 1,013 | 0.15 |
| SBR | 0 | 0 | _,0.0 | 0.01 0 | 0 | 0.10 |
| OBIC | Ŭ | Ŭ | Ŭ | | Ŭ | |
| EBL | 2.5 | | 311 | 0.09 c | 704 | 0.14 c |
| EBT | 0 | 6,800 | 4 | | 1 | |
| EBR | 1.5 | | 911 | 0.27 | 236 | 0.14 |
| WBL | 0 | 0 | 0 | | 0 | |
| WBT | 0 | 0 | 0 | | 0 0 | |
| WBR | õ | 0 | 0 | | 0 0 | |
| 11 BIX | Ŭ | Ŭ | Ŭ | | Ŭ | |
| Right t | urn adjus | tment | NBR | | NBR | |
| | | | SBR | | SBR | |
| | | | EBR | 0.18 c | EBR | |
| | | | WBR | | WBR | |
| Cleara | nce interv | val | | 0.05 c | | 0.05 c |
| Split p | hasing | | N/S | | N/S | |
| | | | E/W | | E/W | |
| | | | | | | |
| | | utilization | | 0.66 | | 0.72 |
| Level | of service | 9 | | В | | C |

| 4 R | idge Vall | ey / Marine W | 'ay | | | | | |
|----------|------------|---------------|--------|------|---|--------|--------|---|
| | | | | | | | | _ |
| | | | AM pea | | | PM pea | | |
| | Lanes | Capacity | Volume | v/c | | Volume | v/c | |
| | | | | | | | | |
| NBL | 1 | 1,700 | 24 | 0.01 | | 15 | 0.01 | |
| NBT | 1 | 1,700 | 3 | 0.02 | С | 1 | 0.01 0 | С |
| NBR | 1 | 1,700 | 1 | 0.00 | | 1 | 0.00 | |
| | | 4 700 | | | | | | |
| SBL | 1 | 1,700 | 26 | | С | 35 | 0.02 0 | C |
| SBT | 1 | 1,700 | 1 | 0.00 | | 0 | 0.00 | |
| SBR | 1 | 1,700 | 581 | 0.34 | | 189 | 0.11 | |
| EBL | 2 | 3,400 | 126 | 0.04 | с | 430 | 0.13 | _ |
| EBL | 2 | 3,400 | 120 | 0.04 | C | 289 | 0.13 0 | |
| EBR | 2 | 3,400 0 | 104 | 0.05 | | 209 | 0.09 | |
| EDK | 0 | 0 | 12 | | | 3 | | |
| WBL | 1 | 1,700 | 1 | 0.00 | | 0 | 0.00 | |
| WBT | 2 | 3,400 | 88 | 0.03 | с | 243 | 0.07 | С |
| WBR | 1 | 1,700 | 18 | 0.01 | | 41 | 0.02 | |
| | | | | | | | | |
| Right t | urn adjus | tment | NBR | | | NBR | | |
| | | | SBR | 0.29 | С | SBR | | |
| | | | EBR | | | EBR | | |
| | | | WBR | | | WBR | | |
| | nce interv | /al | | 0.05 | С | | 0.05 0 | С |
| Split pl | nasing | | N/S | | | N/S | | |
| | | | E/W | | | E/W | | |
| Tatal | | | | 0.45 | | | 0.00 | |
| | | utilization | | 0.45 | | | 0.28 | |
| Level | of servic | e | | Α | | | Α | |

Attachment D

HCM Level of Service Calculations

| HCM 6th Signalized Intersection Summary |
|---|
| 1: I-5 Northbound Ramps & Sand Canyon Ave |

| | ۶ | → | 7 | 1 | + | ۰. | 4 | Ť | 1 | \$ | ţ | 1 |
|------------------------------|------|----------|-----------|------|------|------|------|------|------|------|-------------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | ٦. | र्स | 11 | ٦ | 4Î | | ሻሻ | *** | 7 | ٦. | † †† | 7 |
| Traffic Volume (veh/h) | 322 | 0 | 526 | 6 | 0 | 3 | 243 | 467 | 13 | 16 | 1878 | 570 |
| Future Volume (veh/h) | 322 | 0 | 526 | 6 | 0 | 3 | 243 | 467 | 13 | 16 | 1878 | 57 |
| nitial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Nork Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 194 |
| Adj Flow Rate, veh/h | 350 | 0 | 572 | 7 | 0 | 3 | 264 | 508 | 14 | 17 | 2041 | 62 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.9 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 478 | 0 | 1049 | 22 | 0 | 19 | 680 | 3053 | 948 | 99 | 2333 | 75 |
| Arrive On Green | 0.13 | 0.00 | 0.13 | 0.01 | 0.00 | 0.01 | 0.06 | 0.20 | 0.20 | 0.06 | 0.46 | 0.4 |
| Sat Flow, veh/h | 3563 | 0 | 3170 | 1781 | 0 | 1585 | 3456 | 5106 | 1585 | 1781 | 5106 | 164 |
| Grp Volume(v), veh/h | 350 | 0 | 572 | 7 | 0 | 3 | 264 | 508 | 14 | 17 | 2041 | 62 |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | 1781 | 0 | 1585 | 1728 | 1702 | 1585 | 1781 | 1702 | 164 |
| 2 Serve(q_s), s | 8.5 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 | 6.6 | 7.4 | 0.6 | 0.8 | 32.6 | 29. |
| Cycle Q Clear(q_c), s | 8.5 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 | 6.6 | 7.4 | 0.6 | 0.8 | 32.6 | 29. |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| ane Grp Cap(c), veh/h | 478 | 0 | 1049 | 22 | 0 | 19 | 680 | 3053 | 948 | 99 | 2333 | 75 |
| V/C Ratio(X) | 0.73 | 0.00 | 0.55 | 0.32 | 0.00 | 0.15 | 0.39 | 0.17 | 0.01 | 0.17 | 0.87 | 0.8 |
| Avail Cap(c_a), veh/h | 574 | 0 | 1134 | 99 | 0 | 88 | 680 | 3053 | 948 | 99 | 2383 | 76 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.0 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.98 | 0.98 | 0.98 | 1.00 | 1.00 | 1.0 |
| Uniform Delay (d), s/veh | 37.4 | 0.0 | 24.6 | 44.1 | 0.0 | 44.0 | 36.9 | 17.5 | 14.8 | 40.5 | 22.1 | 21.3 |
| ncr Delay (d2), s/veh | 3.9 | 0.0 | 0.5 | 8.1 | 0.0 | 3.6 | 0.4 | 0.1 | 0.0 | 0.8 | 5.0 | 9.1 |
| nitial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/In | 3.9 | 0.0 | 5.0 | 0.2 | 0.0 | 0.1 | 2.7 | 2.6 | 0.2 | 0.4 | 11.9 | 11.0 |
| Jnsig. Movement Delay, s/veh | 1 | | | | | | | | | | | |
| InGrp Delay(d), s/veh | 41.3 | 0.0 | 25.0 | 52.2 | 0.0 | 47.6 | 37.2 | 17.6 | 14.8 | 41.3 | 27.1 | 31. |
| nGrp LOS | D | А | С | D | А | D | D | В | В | D | С | (|
| Approach Vol, veh/h | | 922 | | | 10 | | | 786 | | | 2678 | |
| Approach Delay, s/veh | | 31.2 | | | 50.8 | | | 24.2 | | | 28.1 | |
| Approach LOS | | C | | | D | | | C | | | C | |
| | | _ | | | - | | | _ | | | | _ |
| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.5 | 58.3 | | 5.6 | 22.2 | 45.6 | | 16.6 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 47.5 | | 5.0 | 10.5 | 42.0 | | 14.5 | | | | |
| Max Q Clear Time (g_c+l1), s | 2.8 | 9.4 | | 2.4 | 8.6 | 34.6 | | 10.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 3.2 | | 0.0 | 0.2 | 6.6 | | 1.6 | | | | |
| ntersection Summary | | | | | | | | | | | | |
| ICM 6th Ctrl Delay | | | 28.1 | | | | | | | | | |
| ICM 6th LOS | | | 20.1 C | | | | | | | | | |

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| | ۶ | | > | 1 | - | • | • | Ť | 1 | 1 | ţ | 1 |
|------------------------------|------|------|------|------|------|------|------|----------|------|------|------|-----|
| lovement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBI |
| ane Configurations | 1 | र्भ | 11 | 1 | ĥ | | ኘኘ | ^ | 1 | 5 | 111 | 1 |
| raffic Volume (veh/h) | 938 | 0 | 217 | 37 | 0 | 0 | 566 | 1657 | 18 | 5 | 836 | 22 |
| uture Volume (veh/h) | 938 | 0 | 217 | 37 | 0 | 0 | 566 | 1657 | 18 | 5 | 836 | 22 |
| itial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| ed-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| arking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| /ork Zone On Approach | | No | | | No | | | No | | | No | |
| dj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 194 |
| dj Flow Rate, veh/h | 1020 | 0 | 236 | 40 | 0 | 0 | 615 | 1801 | 20 | 5 | 909 | 24 |
| eak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.9 |
| ercent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| ap, veh/h | 1103 | 0 | 1736 | 63 | 66 | 0 | 823 | 2042 | 634 | 99 | 1110 | 35 |
| rrive On Green | 0.31 | 0.00 | 0.31 | 0.04 | 0.00 | 0.00 | 0.08 | 0.13 | 0.13 | 0.06 | 0.22 | 0.2 |
| at Flow, veh/h | 3563 | 0 | 3170 | 1781 | 1870 | 0 | 3456 | 5106 | 1585 | 1781 | 5106 | 164 |
| rp Volume(v), veh/h | 1020 | 0 | 236 | 40 | 0 | 0 | 615 | 1801 | 20 | 5 | 909 | 24 |
| rp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | 1781 | 1870 | 0 | 1728 | 1702 | 1585 | 1781 | 1702 | 164 |
| Serve(g_s), s | 24.9 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 15.7 | 31.2 | 1.0 | 0.2 | 15.3 | 12. |
| ycle Q Clear(g_c), s | 24.9 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 15.7 | 31.2 | 1.0 | 0.2 | 15.3 | 12. |
| rop In Lane | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| ane Grp Cap(c), veh/h | 1103 | 0 | 1736 | 63 | 66 | 0 | 823 | 2042 | 634 | 99 | 1110 | 35 |
| /C Ratio(X) | 0.93 | 0.00 | 0.14 | 0.64 | 0.00 | 0.00 | 0.75 | 0.88 | 0.03 | 0.05 | 0.82 | 0.6 |
| vail Cap(c_a), veh/h | 1128 | 0 | 1758 | 99 | 104 | 0 | 823 | 2042 | 634 | 99 | 1214 | 393 |
| CM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.0 |
| pstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.63 | 0.63 | 0.63 | 1.00 | 1.00 | 1.0 |
| niform Delay (d), s/veh | 30.1 | 0.0 | 10.0 | 42.9 | 0.0 | 0.0 | 38.8 | 37.0 | 23.9 | 40.3 | 33.5 | 32. |
| ıcr Delay (d2), s/veh | 12.5 | 0.0 | 0.0 | 10.4 | 0.0 | 0.0 | 2.4 | 3.9 | 0.1 | 0.2 | 6.8 | 9. |
| iitial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| ile BackOfQ(50%),veh/In | 12.4 | 0.0 | 1.1 | 1.1 | 0.0 | 0.0 | 7.4 | 14.6 | 0.3 | 0.1 | 6.4 | 5.4 |
| nsig. Movement Delay, s/vel | | | | | | | | | | | | |
| nGrp Delay(d), s/veh | 42.6 | 0.0 | 10.0 | 53.2 | 0.0 | 0.0 | 41.2 | 40.9 | 23.9 | 40.5 | 40.3 | 42. |
| nGrp LOS | D | A | A | D | A | A | D | D | С | D | D | |
| pproach Vol, veh/h | | 1256 | | | 40 | | | 2436 | | | 1155 | |
| pproach Delay, s/veh | | 36.4 | | | 53.2 | | | 40.8 | | | 40.7 | |
| pproach LOS | | D | | | D | | | D | | | D | |
| imer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| hs Duration (G+Y+Rc), s | 9.5 | 40.5 | | 7.7 | 25.9 | 24.1 | | 32.4 | | | | |
| hange Period (Y+Rc), s | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | | 4.5 | | | | |
| lax Green Setting (Gmax), s | 5.0 | 33.5 | | 5.0 | 17.1 | 21.4 | | 28.5 | | | | |
| lax Q Clear Time (q_c+l1), s | 2.2 | 33.2 | | 4.0 | 17.7 | 17.3 | | 26.9 | | | | |
| reen Ext Time (p_c), s | 0.0 | 0.3 | | 0.0 | 0.0 | 2.3 | | 0.9 | | | | |
| tersection Summary | | | | | | | | | | | | |
| CM 6th Ctrl Delay | | | 39.8 | | | | | | | | | |
| CM 6th LOS | | | D | | | | | | | | | |

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HCM 6th Signalized Intersection Summary

Baseline Conditions AM Peak Hour

| | ٠ | | \mathbf{r} | < | +- | | 1 | Ť | - | 1 | Ţ | |
|-------------------------------|------|------|--------------|-----|------|------|------|------|------|------|------|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | S |
| Lane Configurations | ኘካ | 4 | 1 | mbe | mb i | mon | HDL | tttt | 1 | ኘካ | tttt | |
| Traffic Volume (veh/h) | 254 | 4 | 893 | 0 | 0 | 0 | 0 | 473 | 121 | 732 | 1967 | |
| Future Volume (veh/h) | 254 | 4 | 893 | Ő | Ő | ŏ | ŏ | 473 | 121 | 732 | 1967 | |
| Initial Q (Qb), veh | 0 | 0 | 0,0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A_pbT) | 1.00 | 0 | 1.00 | | | | 1.00 | 0 | 1.00 | 1.00 | 0 | 1 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1 |
| Work Zone On Approach | 1.00 | No | 1.00 | | | | 1.00 | No | 1.00 | 1.00 | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | |
| Adj Flow Rate, veh/h | 222 | 0 | 1031 | | | | 0 | 514 | 132 | 796 | 2138 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0 |
| Percent Heavy Veh, % | 2 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | U |
| Cap, veh/h | 1276 | 0 | 1136 | | | | 0 | 1592 | 392 | 844 | 3485 | |
| Cap, venim Arrive On Green | 0.36 | 0.00 | 0.36 | | | | 0.00 | 0.25 | 0.25 | 0.49 | 1.00 | 0 |
| Sat Flow, veh/h | 3563 | 0.00 | 3170 | | | | 0.00 | 6696 | 1585 | 3456 | 6696 | U |
| | | | | | | | | | | | | |
| Grp Volume(v), veh/h | 222 | 0 | 1031 | | | | 0 | 514 | 132 | 796 | 2138 | |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | |
| Q Serve(q_s), s | 3.8 | 0.0 | 27.8 | | | | 0.0 | 5.9 | 6.2 | 19.7 | 0.0 | |
| Cycle Q Clear(g_c), s | 3.8 | 0.0 | 27.8 | | | | 0.0 | 5.9 | 6.2 | 19.7 | 0.0 | |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0 |
| Lane Grp Cap(c), veh/h | 1276 | 0 | 1136 | | | | 0 | 1592 | 392 | 844 | 3485 | |
| V/C Ratio(X) | 0.17 | 0.00 | 0.91 | | | | 0.00 | 0.32 | 0.34 | 0.94 | 0.61 | 0 |
| Avail Cap(c_a), veh/h | 1366 | 0 | 1215 | | | | 0 | 1592 | 392 | 864 | 3485 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.59 | 0.59 | 0 |
| Uniform Delay (d), s/veh | 19.8 | 0.0 | 27.5 | | | | 0.0 | 27.7 | 27.8 | 22.4 | 0.0 | |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 9.6 | | | | 0.0 | 0.5 | 2.3 | 12.3 | 0.5 | |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| %ile BackOfQ(50%),veh/In | 1.5 | 0.0 | 11.4 | | | | 0.0 | 2.1 | 2.4 | 6.2 | 0.1 | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 19.8 | 0.0 | 37.1 | | | | 0.0 | 28.2 | 30.1 | 34.8 | 0.5 | |
| LnGrp LOS | В | А | D | | | | А | С | С | С | Α | |
| Approach Vol, veh/h | | 1253 | | | | | | 646 | | | 2934 | |
| Approach Delay, s/veh | | 34.0 | | | | | | 28.6 | | | 9.8 | |
| Approach LOS | | С | | | | | | С | | | А | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 26.5 | 26.8 | | | | 53.3 | | 36.7 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 22.5 | 19.5 | | | | 46.5 | | 34.5 | | | | |
| Max Q Clear Time (g_c+l1), s | 21.7 | 8.2 | | | | 2.0 | | 29.8 | | | | |
| Green Ext Time (p_c), s | 0.3 | 2.6 | | | | 23.4 | | 2.4 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 18.6 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM

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| | 100 | | | on Av | 02000 | 1740 | 53.00 | 1.280 | 1.00 | | 2412 | |
|------------------------------|------|------|--------------|-------|----------|------|-------|-----------|-----------|------|-----------|-----|
| | ٨ | -> | \mathbf{F} | 1 | Sector S | ~ | 1 | t | 1 | * | ŧ | * |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SB |
| Lane Configurations | ኘኘ | \$ | 1 | | | | | 1111 | 1 | ሻኘ | 1111 | |
| Traffic Volume (veh/h) | 617 | 1 | 250 | 0 | 0 | 0 | 0 | 1922 | 380 | 450 | 726 | |
| Future Volume (veh/h) | 617 | 1 | 250 | 0 | 0 | 0 | 0 | 1922 | 380 | 450 | 726 | |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | |
| Adj Flow Rate, veh/h | 756 | 0 | 182 | | | | 0 | 2089 | 413 | 489 | 789 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.9 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 994 | 0 | 295 | | | | 0 | 2669 | 657 | 861 | 4593 | 1 |
| Arrive On Green | 0.19 | 0.00 | 0.19 | | | | 0.00 | 0.41 | 0.41 | 0.25 | 0.71 | 0.0 |
| Sat Flow, veh/h | 5344 | 0 | 1585 | | | | 0 | 6696 | 1585 | 3456 | 6696 | |
| Grp Volume(v), veh/h | 756 | 0 | 182 | | | | 0 | 2089 | 413 | 489 | 789 | |
| Grp Sat Flow(s).veh/h/ln | 1781 | Ő | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | |
| Q Serve(a s), s | 12.1 | 0.0 | 9.5 | | | | 0.0 | 25.3 | 18.6 | 11.1 | 3.6 | 0. |
| Cycle Q Clear(q_c), s | 12.1 | 0.0 | 9.5 | | | | 0.0 | 25.3 | 18.6 | 11.1 | 3.6 | 0.0 |
| Prop In Lane | 1.00 | 0.0 | 1.00 | | | | 0.00 | 20.0 | 1.00 | 1.00 | 0.0 | 0.0 |
| Lane Grp Cap(c), veh/h | 994 | 0 | 295 | | | | 0 | 2669 | 657 | 861 | 4593 | |
| V/C Ratio(X) | 0.76 | 0.00 | 0.62 | | | | 0.00 | 0.78 | 0.63 | 0.57 | 0.17 | 0.0 |
| Avail Cap(c_a), veh/h | 1395 | 0 | 414 | | | | 0 | 2824 | 696 | 861 | 4593 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.0 |
| Uniform Delay (d), s/veh | 34.7 | 0.0 | 33.7 | | | | 0.0 | 22.8 | 20.8 | 29.6 | 4.2 | 0. |
| Incr Delay (d2), s/veh | 1.6 | 0.0 | 2.1 | | | | 0.0 | 2.4 | 4.5 | 0.8 | 0.1 | 0.0 |
| Initial Q Delav(d3) s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| %ile BackOfQ(50%),veh/In | 5.2 | 0.0 | 3.7 | | | | 0.0 | 8.7 | 6.7 | 4.3 | 0.7 | 0.0 |
| Unsig. Movement Delay, s/ver | | 0.0 | 0.1 | | | | 0.0 | 0.7 | 0.7 | 1.0 | 0.7 | 0. |
| LnGrp Delay(d), s/veh | 36.3 | 0.0 | 35.8 | | | | 0.0 | 25.2 | 25.3 | 30.4 | 4.3 | 0. |
| LnGrp LOS | D | A | D | | | | A | 23.2 C | 23.5 C | C | 4.5 A | 0. |
| Approach Vol. veh/h | 0 | 938 | | | | | | 2502 | 0 | 0 | 1278 | |
| Approach Delay, s/veh | | 36.2 | | | | | | 25.2 | | | 14.3 | |
| Approach LOS | | J0.2 | | | | | | 23.2 C | | | 14.3 B | |
| | | - | | | | | | - | | | D | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 26.9 | 41.8 | | | | 68.8 | | 21.2 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 13.5 | 39.5 | | | | 57.5 | | 23.5 | | | | |
| Max Q Clear Time (g_c+l1), s | 13.1 | 27.3 | | | | 5.6 | | 14.1 | | | | |
| Green Ext Time (p_c), s | 0.1 | 10.0 | | | | 5.4 | | 2.7 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 24.4 | | | | | | | | | |
| HCM 6th LOS | | | С | | | | | | | | | |

OCTA Metrolink Maintenance Facility AECOM

| HCM 6th Signalized Intersection Summary |
|--|
| 1: LE Northbound Pamps & Sand Canvon Avo |

| HCM 6th Signalized I 1: I-5 Northbound Ra | | | | | e | | | | В | laselin | e + Pro AM Pea | |
|--|-----------|-----------|------------|-----------|----------|------------|------|-----------|-----------|-----------|-------------------|-----------|
| | ۶ | → | 7 | 1 | + | × | 1 | Ť | 1 | 1 | ţ | 1 |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 1 | र्स | 77 | ٦ | f, | | ሻሻ | *** | 1 | 5 | ^ | 1 |
| Traffic Volume (veh/h) | 322 | 0 | 530 | 6 | 0 | 3 | 256 | 469 | 13 | 16 | 1879 | 570 |
| Future Volume (veh/h) | 322 | 0 | 530 | 6 | 0 | 3 | 256 | 469 | 13 | 16 | 1879 | 570 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A pbT) | 1.00 | - | 1.00 | 1.00 | - | 1.00 | 1.00 | - | 1.00 | 1.00 | - | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1945 |
| Adi Flow Rate, veh/h | 350 | 0 | 576 | 7 | 0 | 3 | 278 | 510 | 14 | 17 | 2042 | 620 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 466 | 0 | 1024 | 22 | 0 | 19 | 664 | 3070 | 953 | 99 | 2373 | 766 |
| Arrive On Green | 0.13 | 0.00 | 0.13 | 0.01 | 0.00 | 0.01 | 0.13 | 0.40 | 0.40 | 0.06 | 0.46 | 0.46 |
| Sat Flow, veh/h | 3563 | 0.00 | 3170 | 1781 | 0.00 | 1585 | 3456 | 5106 | 1585 | 1781 | 5106 | 1648 |
| Grp Volume(v), veh/h | 350 | 0 | 576 | 7 | 0 | 3 | 278 | 510 | 14 | 17 | 2042 | 620 |
| Grp Sat Flow(s).veh/h/ln | 1781 | 0 | 1585 | 1781 | 0 | 1585 | 1728 | 1702 | 1585 | 1781 | 1702 | 1648 |
| Q Serve(q s), s | 8.5 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 | 6.7 | 5.8 | 0.5 | 0.8 | 32.1 | 29.0 |
| Cycle Q Clear(g c), s | 8.5 | 0.0 | 0.0 | 0.4 | 0.0 | 0.2 | 6.7 | 5.8 | 0.5 | 0.8 | 32.1 | 29.0 |
| Prop In Lane | 1.00 | 0.0 | 1.00 | 1.00 | 0.0 | 1.00 | 1.00 | 0.0 | 1.00 | 1.00 | JZ.1 | 1.00 |
| Lane Grp Cap(c), veh/h | 466 | 0 | 1024 | 22 | 0 | 19 | 664 | 3070 | 953 | 99 | 2373 | 766 |
| V/C Ratio(X) | 0.75 | 0.00 | 0.56 | 0.32 | 0.00 | 0.15 | 0.42 | 0.17 | 0.01 | 0.17 | 0.86 | 0.81 |
| Avail Cap(c a), veh/h | 534 | 0.00 | 1085 | 99 | 0.00 | 88 | 664 | 3070 | 953 | 99 | 2440 | 788 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.98 | 0.98 | 0.98 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.7 | 0.00 | 25.2 | 44.1 | 0.00 | 44.0 | 34.6 | 12.4 | 10.9 | 40.5 | 21.5 | 20.7 |
| Incr Delay (d2), s/veh | 5.1 | 0.0 | 0.6 | 8.1 | 0.0 | 3.6 | 0.4 | 0.1 | 0.0 | 40.5 | 4.4 | 9.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.0 | 0.0 | 5.1 | 0.0 | 0.0 | 0.0 | 2.7 | 1.8 | 0.0 | 0.0 | 11.6 | 11.2 |
| Unsig. Movement Delay, s/veh | | 0.0 | J.1 | 0.2 | 0.0 | 0.1 | 2.1 | 1.0 | 0.1 | 0.4 | 11.0 | 11.2 |
| LnGrp Delay(d),s/veh | 42.8 | 0.0 | 25.8 | 52.2 | 0.0 | 47.6 | 35.0 | 12.5 | 10.9 | 41.3 | 25.9 | 29.7 |
| LnGrp LOS | 42.0 D | A | 20.0 C | 02.2 D | 0.0 A | -77.0 D | C | 12.5 B | 10.5 B | 41.5 D | 20.5 C | 20.1 C |
| Approach Vol, veh/h | | 926 | | | 10 | | | 802 | | | 2679 | |
| Approach Delay, s/veh | | 32.0 | | | 50.8 | | | 20.3 | | | 26.8 | |
| Approach LOS | | 02.2 C | | | JU.U | | | 20.5 C | | | 20.0 C | |
| | | | | | | | | | | | U | |
| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.5 | 58.6 | | 5.6 | 21.8 | 46.3 | | 16.3 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 48.5 | | 5.0 | 10.5 | 43.0 | | 13.5 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.8 | 7.8 | | 2.4 | 8.7 | 34.1 | | 10.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 3.2 | | 0.0 | 0.2 | 7.7 | | 1.3 | | | | |
| Intersection Summary | | _ | | | | _ | | | _ | | | |
| HCM 6th Ctrl Delay | | | 26.8 | | | | | | | | | _ |
| HCM 6th LOS | | | 20.0 C | | | | | | | | | |
| | | | | | | | | | | | | |
| Notes User approved volume balanci | | a the lea | oo for hur | ing may | mont | | | | | | | |

User approved volume balancing among the lanes for turning movement.

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| | ۶ | - | Y | 4 | + | ۰. | • | t | 1 | \$ | ţ | 4 |
|------------------------------|------|------|-----------|------|------|------|------|----------|------|------|------|-----|
| Novement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SB |
| ane Configurations | 5 | र्भ | 11 | ň | Î≯ | | ሻሻ | ^ | 1 | ۲ | 111 | 1 |
| raffic Volume (veh/h) | 938 | Ö | 218 | 37 | Ō | 0 | 574 | 1658 | 18 | 5 | 837 | 22 |
| uture Volume (veh/h) | 938 | 0 | 218 | 37 | 0 | 0 | 574 | 1658 | 18 | 5 | 837 | 22 |
| nitial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| ed-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Vork Zone On Approach | | No | | | No | | | No | | | No | |
| dj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 194 |
| dj Flow Rate, veh/h | 1020 | 0 | 237 | 40 | 0 | 0 | 624 | 1802 | 20 | 5 | 910 | 24 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.9 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 1103 | 0 | 1738 | 63 | 66 | 0 | 825 | 2042 | 634 | 99 | 1106 | 35 |
| Arrive On Green | 0.31 | 0.00 | 0.31 | 0.04 | 0.00 | 0.00 | 0.08 | 0.13 | 0.13 | 0.06 | 0.22 | 0.2 |
| Sat Flow, veh/h | 3563 | 0 | 3170 | 1781 | 1870 | 0 | 3456 | 5106 | 1585 | 1781 | 5106 | 164 |
| Grp Volume(v), veh/h | 1020 | 0 | 237 | 40 | 0 | 0 | 624 | 1802 | 20 | 5 | 910 | 24 |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | 1781 | 1870 | 0 | 1728 | 1702 | 1585 | 1781 | 1702 | 164 |
| Serve(g_s), s | 24.9 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 15.9 | 31.2 | 1.0 | 0.2 | 15.3 | 12. |
| cycle Q Clear(g_c), s | 24.9 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 15.9 | 31.2 | 1.0 | 0.2 | 15.3 | 12 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| ane Grp Cap(c), veh/h | 1103 | 0 | 1738 | 63 | 66 | 0 | 825 | 2042 | 634 | 99 | 1106 | 35 |
| //C Ratio(X) | 0.93 | 0.00 | 0.14 | 0.64 | 0.00 | 0.00 | 0.76 | 0.88 | 0.03 | 0.05 | 0.82 | 0.6 |
| wail Cap(c_a), veh/h | 1128 | 0 | 1761 | 99 | 104 | 0 | 825 | 2042 | 634 | 99 | 1203 | 38 |
| ICM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.0 |
| lpstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.63 | 0.63 | 0.63 | 1.00 | 1.00 | 1.0 |
| Jniform Delay (d), s/veh | 30.1 | 0.0 | 9.9 | 42.9 | 0.0 | 0.0 | 38.9 | 37.0 | 23.9 | 40.3 | 33.6 | 32. |
| ncr Delay (d2), s/veh | 12.5 | 0.0 | 0.0 | 10.4 | 0.0 | 0.0 | 2.6 | 3.9 | 0.1 | 0.2 | 7.0 | 9. |
| nitial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| 6ile BackOfQ(50%),veh/In | 12.4 | 0.0 | 1.1 | 1.1 | 0.0 | 0.0 | 7.5 | 14.6 | 0.3 | 0.1 | 6.5 | 5. |
| Insig. Movement Delay, s/veh | | | | | | | | | | | | |
| nGrp Delay(d),s/veh | 42.6 | 0.0 | 10.0 | 53.2 | 0.0 | 0.0 | 41.5 | 40.9 | 23.9 | 40.5 | 40.6 | 42. |
| nGrp LOS | D | A | A | D | A | A | D | D | С | D | D | |
| pproach Vol, veh/h | | 1257 | | | 40 | | | 2446 | | | 1156 | |
| pproach Delay, s/veh | | 36.4 | | | 53.2 | | | 40.9 | | | 40.9 | |
| Approach LOS | | D | | | D | | | D | | | D | |
| imer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| hs Duration (G+Y+Rc), s | 9.5 | 40.5 | | 7.7 | 26.0 | 24.0 | | 32.4 | | | | |
| change Period (Y+Rc), s | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | | 4.5 | | | | |
| lax Green Setting (Gmax), s | 5.0 | 33.5 | | 5.0 | 17.3 | 21.2 | | 28.5 | | | | |
| lax Q Clear Time (g c+l1), s | 2.2 | 33.2 | | 4.0 | 17.9 | 17.3 | | 26.9 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.3 | | 0.0 | 0.0 | 2.2 | | 0.9 | | | | |
| ntersection Summary | | | | | | | | | | | | |
| ICM 6th Ctrl Delay | | | 39.8 | | | | | | | | | - |
| ICM 6th LOS | | | 03.0 D | | | | | | | | | |
| lotes | | | 2 | | | | | | | | | |

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| HCM 6th Signalized Intersection Summary |
|---|
| 3: I-5 Southbound Ramps & Sand Canyon Ave |

Baseline + Project AM Peak Hour

| | • | - | \mathbf{r} | * | + | * | 1 | Ť | 1 | 1 | ŧ | - |
|------------------------------|-------------|-----------|--------------|-----|-----|------|------|-----------|-------------|------|------|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | S |
| Lane Configurations | ሻሻ | 4 | 1 | | | | | 1111 | 1 | ካካ | 1111 | |
| Traffic Volume (veh/h) | 260 | 4 | 893 | 0 | 0 | 0 | 0 | 474 | 121 | 740 | 1970 | |
| Future Volume (veh/h) | 260 | 4 | 893 | 0 | 0 | 0 | 0 | 474 | 121 | 740 | 1970 | |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | |
| Adj Flow Rate, veh/h | 228 | 0 | 1033 | | | | 0 | 515 | 132 | 804 | 2141 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 1278 | 0 | 1137 | | | | 0 | 1576 | 388 | 851 | 3482 | |
| Arrive On Green | 0.36 | 0.00 | 0.36 | | | | 0.00 | 0.24 | 0.24 | 0.49 | 1.00 | 0 |
| Sat Flow, veh/h | 3563 | 0.00 | 3170 | | | | 0.00 | 6696 | 1585 | 3456 | 6696 | 0 |
| Grp Volume(v), veh/h | 228 | 0 | 1033 | | | | 0 | 515 | 1305 | 804 | 2141 | |
| | | 0 | | | | | 0 | 1609 | | | 1609 | |
| Grp Sat Flow(s),veh/h/ln | 1781 3.9 | | 1585 27.9 | | | | 0.0 | 1609 | 1585 6.2 | 1728 | 1609 | |
| Q Serve(g_s), s | | 0.0 | | | | | | | | 19.9 | | |
| Cycle Q Clear(g_c), s | 3.9 | 0.0 | 27.9 | | | | 0.0 | 5.9 | 6.2 | 19.9 | 0.0 | |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0 |
| Lane Grp Cap(c), veh/h | 1278 | 0 | 1137 | | | | 0 | 1576 | 388 | 851 | 3482 | |
| V/C Ratio(X) | 0.18 | 0.00 | 0.91 | | | | 0.00 | 0.33 | 0.34 | 0.95 | 0.61 | 0 |
| Avail Cap(c_a), veh/h | 1366 | 0 | 1215 | | | | 0 | 1576 | 388 | 868 | 3482 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.63 | 0.63 | 0 |
| Uniform Delay (d), s/veh | 19.8 | 0.0 | 27.4 | | | | 0.0 | 27.9 | 28.0 | 22.3 | 0.0 | |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 9.7 | | | | 0.0 | 0.6 | 2.4 | 13.2 | 0.5 | |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 11.4 | | | | 0.0 | 2.1 | 2.4 | 6.3 | 0.1 | |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 19.8 | 0.0 | 37.1 | | | | 0.0 | 28.4 | 30.3 | 35.5 | 0.5 | |
| LnGrp LOS | B | A | D | | | | A | C | C | D | A | |
| Approach Vol. veh/h | | 1261 | | | | | | 647 | | | 2945 | |
| Approach Delay, s/veh | | 34.0 | | | | | | 28.8 | | | 10.1 | |
| Approach LOS | | 04.0 C | | | | | | 20.0 C | | | B | |
| | | | | | | | | | | | 0 | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 26.7 | 26.5 | | | | 53.2 | | 36.8 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 22.6 | 19.4 | | | | 46.5 | | 34.5 | | | | |
| Max Q Clear Time (g_c+l1), s | 21.9 | 8.2 | | | | 2.0 | | 29.9 | | | | |
| Green Ext Time (p_c), s | 0.3 | 2.6 | | | | 23.4 | | 2.4 | | | | |
| Intersection Summary | _ | | | | | _ | _ | | _ | _ | | |
| HCM 6th Ctrl Delay | | | 18.8 | | | | | | | | | |
| HCM 6th LOS | | | В | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM

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| 3: I-5 Southbound Rate | amps | | i Caliy | | 6 | | | | | | PM Pea | JK TIUL |
|------------------------------|------|------|--------------|-----|-----|------|------|------|------|------|--------|---------|
| | ۶ | -+ | \mathbf{r} | 4 | + | * | 1 | t | 1 | 1 | ţ | ~ |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | ሻሻ | 4 | 1 | | | | | 1111 | 1 | ሻሻ | 1111 | |
| Traffic Volume (veh/h) | 618 | 1 | 250 | 0 | 0 | 0 | 0 | 1922 | 380 | 456 | 727 | 1 |
| Future Volume (veh/h) | 618 | 1 | 250 | 0 | 0 | 0 | 0 | 1922 | 380 | 456 | 727 | (|
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | (|
| Ped-Bike Adj(A pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | (|
| Adj Flow Rate, veh/h | 757 | 0 | 182 | | | | 0 | 2089 | 413 | 496 | 790 | C |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | C |
| Cap, veh/h | 995 | 0 | 295 | | | | 0 | 2669 | 657 | 860 | 4592 | (|
| Arrive On Green | 0.19 | 0.00 | 0.19 | | | | 0.00 | 0.41 | 0.41 | 0.25 | 0.71 | 0.00 |
| Sat Flow, veh/h | 5344 | 0 | 1585 | | | | 0 | 6696 | 1585 | 3456 | 6696 | (|
| Grp Volume(v), veh/h | 757 | 0 | 182 | | | | 0 | 2089 | 413 | 496 | 790 | C |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | 0 |
| Q Serve(q s), s | 12.1 | 0.0 | 9.5 | | | | 0.0 | 25.3 | 18.6 | 11.3 | 3.6 | 0.0 |
| Cycle Q Clear(g c), s | 12.1 | 0.0 | 9.5 | | | | 0.0 | 25.3 | 18.6 | 11.3 | 3.6 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 995 | 0 | 295 | | | | 0 | 2669 | 657 | 860 | 4592 | C |
| V/C Ratio(X) | 0.76 | 0.00 | 0.62 | | | | 0.00 | 0.78 | 0.63 | 0.58 | 0.17 | 0.00 |
| Avail Cap(c a), veh/h | 1395 | 0 | 414 | | | | 0 | 2824 | 696 | 860 | 4592 | C |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.00 |
| Uniform Delay (d), s/veh | 34.7 | 0.0 | 33.7 | | | | 0.0 | 22.8 | 20.8 | 29.6 | 4.2 | 0.0 |
| Incr Delay (d2), s/veh | 1.6 | 0.0 | 2.1 | | | | 0.0 | 2.4 | 4.5 | 0.9 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.2 | 0.0 | 3.7 | | | | 0.0 | 8.7 | 6.7 | 4.4 | 0.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 36.3 | 0.0 | 35.8 | | | | 0.0 | 25.2 | 25.3 | 30.5 | 4.3 | 0.0 |
| LnGrp LOS | D | A | D | | | | A | С | С | С | A | F |
| Approach Vol. veh/h | | 939 | | | | | | 2502 | | | 1286 | |
| Approach Delay, s/veh | | 36.2 | | | | | | 25.2 | | | 14.4 | |
| Approach LOS | | D | | | | | | С | | | В | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 26.9 | 41.8 | | | | 68.7 | | 21.3 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 13.5 | 39.5 | | | | 57.5 | | 23.5 | | | | |
| Max Q Clear Time (q c+l1), s | 13.3 | 27.3 | | | | 5.6 | | 14.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 10.0 | | | | 5.4 | | 2.7 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 24.5 | | | | | | | | | |
| HCM 6th LOS | | | C | | | | | | | | | |
| | | | | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

| HCM 6th Signalized Intersection Summary | Alte |
|---|------|
| 1: I-5 Northbound Ramps & Sand Canyon Ave | e |

Iternative 1 - Short Term Interim Conditions AM Peak Hour

| | ۶ | - | 7 | 1 | - | • | 1 | Î | 1 | 1 | ţ | 1 |
|------------------------------|---------|-----------|------------|----------|-------|------|------|----------|------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | 1 | ÷. | 11 | 1 | ĥ | | ካካ | ^ | 1 | 1 | *** | 1 |
| Traffic Volume (veh/h) | 461 | 0 | 622 | 12 | 0 | 8 | 291 | 602 | 33 | 40 | 2175 | 749 |
| Future Volume (veh/h) | 461 | 0 | 622 | 12 | 0 | 8 | 291 | 602 | 33 | 40 | 2175 | 749 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1945 |
| Adj Flow Rate, veh/h | 501 | 0 | 676 | 13 | 0 | 9 | 316 | 654 | 36 | 43 | 2364 | 814 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 572 | 0 | 940 | 42 | 0 | 37 | 470 | 2862 | 888 | 99 | 2451 | 791 |
| Arrive On Green | 0.16 | 0.00 | 0.16 | 0.02 | 0.00 | 0.02 | 0.09 | 0.38 | 0.38 | 0.06 | 0.48 | 0.48 |
| Sat Flow, veh/h | 3563 | 0 | 3170 | 1781 | 0 | 1585 | 3456 | 5106 | 1585 | 1781 | 5106 | 1648 |
| Grp Volume(v), veh/h | 501 | 0 | 676 | 13 | 0 | 9 | 316 | 654 | 36 | 43 | 2364 | 814 |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | 1781 | 0 | 1585 | 1728 | 1702 | 1585 | 1781 | 1702 | 1648 |
| Q Serve(q_s), s | 12.4 | 0.0 | 4.9 | 0.6 | 0.0 | 0.5 | 8.0 | 7.9 | 1.3 | 2.1 | 40.3 | 43.2 |
| Cycle Q Clear(g_c), s | 12.4 | 0.0 | 4.9 | 0.6 | 0.0 | 0.5 | 8.0 | 7.9 | 1.3 | 2.1 | 40.3 | 43.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 572 | 0 | 940 | 42 | 0 | 37 | 470 | 2862 | 888 | 99 | 2451 | 791 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.72 | 0.31 | 0.00 | 0.24 | 0.67 | 0.23 | 0.04 | 0.43 | 0.96 | 1.03 |
| Avail Cap(c_a), veh/h | 574 | 0 | 942 | 99 | 0 | 88 | 470 | 2862 | 888 | 127 | 2451 | 791 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.96 | 0.96 | 0.96 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.9 | 0.0 | 28.3 | 43.2 | 0.0 | 43.2 | 39.0 | 14.8 | 12.8 | 41.1 | 22.7 | 23.4 |
| Incr Delay (d2), s/veh | 14.2 | 0.0 | 2.7 | 4.1 | 0.0 | 3.3 | 3.6 | 0.2 | 0.1 | 3.0 | 11.6 | 39.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/In | 6.5 | 0.0 | 6.8 | 0.3 | 0.0 | 0.2 | 3.5 | 2.7 | 0.4 | 0.9 | 15.8 | 22.4 |
| Unsig. Movement Delay, s/vel | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 51.1 | 0.0 | 31.0 | 47.4 | 0.0 | 46.4 | 42.5 | 15.0 | 12.8 | 44.1 | 34.2 | 63.0 |
| LnGrp LOS | D | A | С | D | A | D | D | В | В | D | С | F |
| Approach Vol, veh/h | | 1177 | | | 22 | | | 1006 | | | 3221 | |
| Approach Delay, s/veh | | 39.6 | | | 47.0 | | | 23.6 | | | 41.6 | |
| Approach LOS | | D | | | D | | | С | | | D | |
| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.5 | 54.9 | | 6.6 | 16.7 | 47.7 | | 18.9 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 6.4 | 46.1 | | 5.0 | 9.3 | 43.2 | | 14.5 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.1 | 9.9 | | 2.6 | 10.0 | 45.2 | | 14.4 | | | | |
| Green Ext Time (p_c), s | 0.0 | 4.3 | | 0.0 | 0.0 | 0.0 | | 0.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 37.8 | | | | | | | | | |
| HCM 6th LOS | | | D | | | | | | | | | |
| Notes | | | | | | | | | | | | |
| User approved volume balanci | ing amo | a tho lan | os for tur | nina mou | omont | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM Synchro 10 Report Page 1

| | ٠ | -+ | 7 | 1 | + | • | • | Ť | 1 | \$ | ŧ | - |
|--|--------------|-----------|-------------|--------------|----------|----------|--------------|--------------|-------------|-------------|--------------|-----|
| Novement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SB |
| ane Configurations | ň | र्स | 11 | ň | f) | | ሻሻ | ^ | 1 | ۲ | 111 | i |
| Fraffic Volume (veh/h) | 1126 | Ó | 268 | 94 | 0 | 0 | 710 | 1829 | 31 | 10 | 1074 | 31 |
| Future Volume (veh/h) | 1126 | 0 | 268 | 94 | 0 | 0 | 710 | 1829 | 31 | 10 | 1074 | 31 |
| nitial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Nork Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 194 |
| Adj Flow Rate, veh/h | 1224 | 0 | 291 | 102 | 0 | 0 | 772 | 1988 | 34 | 11 | 1167 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.9 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 1093 | 0 | 1624 | 99 | 104 | 0 | 710 | 1952 | 606 | 99 | 1186 | 38 |
| Arrive On Green | 0.31 | 0.00 | 0.31 | 0.06 | 0.00 | 0.00 | 0.07 | 0.13 | 0.13 | 0.06 | 0.23 | 0.2 |
| Sat Flow, veh/h | 3563 | 0 | 3170 | 1781 | 1870 | 0 | 3456 | 5106 | 1585 | 1781 | 5106 | 164 |
| Grp Volume(v), veh/h | 1224 | 0 | 291 | 102 | 0 | 0 | 772 | 1988 | 34 | 11 | 1167 | 33 |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | 1781 | 1870 | 0 | 1728 | 1702 | 1585 | 1781 | 1702 | 164 |
| 2 Serve(g_s), s | 27.6 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 18.5 | 34.4 | 1.7 | 0.5 | 20.5 | 17. |
| Cycle Q Clear(g_c), s | 27.6 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 18.5 | 34.4 | 1.7 | 0.5 | 20.5 | 17. |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| ane Grp Cap(c), veh/h | 1093 | 0 | 1624 | 99 | 104 | 0 | 710 | 1952 | 606 | 99 | 1186 | 38 |
| //C Ratio(X) | 1.12 | 0.00 | 0.18 | 1.03 | 0.00 | 0.00 | 1.09 | 1.02 | 0.06 | 0.11 | 0.98 | 0.8 |
| Avail Cap(c_a), veh/h | 1093 | 0 | 1624 | 99 | 104 | 0 | 710 | 1952 | 606 | 99 | 1186 | 38 |
| ICM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.0 |
| Jpstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.46 | 0.46 | 0.46 | 1.00 | 1.00 | 1.0 |
| Jniform Delay (d), s/veh | 31.2 66.6 | 0.0 | 11.8 0.1 | 42.5 99.0 | 0.0 | 0.0 | 41.9 50.4 | 39.3 18.8 | 25.0 0.1 | 40.4 0.5 | 34.4 22.6 | 33 |
| ncr Delay (d2), s/veh | | | | | | | | | | | | |
| nitial Q Delay(d3),s/veh %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.0 4.9 | 0.0 | 0.0 | 0.0 13.3 | 0.0 18.7 | 0.0 | 0.0 | 0.0 10.1 | 0. |
| Jnsig. Movement Delay, s/vel | | 0.0 | 1.0 | 4.9 | 0.0 | 0.0 | 15.5 | 10.7 | 0.0 | 0.2 | 10.1 | 9. |
| .nGrp Delay(d), s/veh | 97.8 | 0.0 | 11.8 | 141.5 | 0.0 | 0.0 | 92.3 | 58.1 | 25.1 | 40.9 | 57.0 | 57. |
| InGrp LOS | 97.0 F | 0.0 A | B | 141.5 F | 0.0 A | 0.0 A | 92.3 F | 50.1 F | 20.1 C | 40.9 D | 57.0 E | 37. |
| | г | 1515 | D | г | 102 | A | г | 2794 | U | U | 1515 | |
| Approach Vol, veh/h Approach Delay, s/veh | | 81.3 | | | 141.5 | | | 67.1 | | | 56.9 | |
| Approach LOS | | 01.5 F | | | F | | | 07.1 E | | | 50.7 F | |
| •• | | | | | | | | | | | L | |
| Fimer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.5 | 38.9 | | 9.5 | 23.0 | 25.4 | | 32.1 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 5.0 | 34.4 | | 5.0 | 18.5 | 20.9 | | 27.6 | | | | |
| /lax Q Clear Time (g_c+l1), s | 2.5 | 36.4 | | 7.0 | 20.5 | 22.5 | | 29.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | | | | |
| ntersection Summary | | | | | | | | | | | | |
| ICM 6th Ctrl Delay | | | 69.4 | | | | | | | | | |
| ICM 6th LOS | | | E | | | | | | | | | |
| lotes | | | | | | | | | | | | |

OCTA Metrolink Maintenance Facility AECOM HCM 6th Signalized Intersection Summary Alter 3: I-5 Southbound Ramps & Sand Canyon Ave

Alternative 1 - Short Term Interim Conditions

| | 1 | - | \mathbf{r} | 1 | + | * | 1 | Ť | 1 | 1 | ŧ | - |
|------------------------------|--------------|------|--------------|-----|-----|------|------|--------------|------|------|--------------|-----|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SI |
| Lane Configurations | ሻሻ | 4 | 1 | | | | | 1111 | 1 | ሻሻ | 1111 | |
| Traffic Volume (veh/h) | 305 | 4 | 911 | 0 | 0 | 0 | 0 | 611 | 131 | 844 | 2314 | |
| Future Volume (veh/h) | 305 | 4 | 911 | 0 | 0 | 0 | 0 | 611 | 131 | 844 | 2314 | |
| nitial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | |
| Adj Flow Rate, veh/h | 267 | 0 | 1062 | | | | 0 | 664 | 142 | 917 | 2515 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0. |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0.72 | 2 | 2 | 2 | 2 | 0. |
| Cap, veh/h | 1270 | 0 | 1130 | | | | 0 | 1424 | 351 | 941 | 3498 | |
| Arrive On Green | 0.36 | 0.00 | 0.36 | | | | 0.00 | 0.22 | 0.22 | 0.54 | 1.00 | 0.0 |
| Sat Flow, veh/h | 3563 | 0.00 | 3170 | | | | 0.00 | 6696 | 1585 | 3456 | 6696 | 0. |
| Grp Volume(v), veh/h | 267 | 0 | 1062 | | | | 0 | 664 | 142 | 917 | 2515 | |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | |
| D Serve(a s), s | 4.7 | 0.0 | 29.2 | | | | 0.0 | 8.1 | 6.9 | 23.2 | 0.0 | 0 |
| | 4.7 | 0.0 | 29.2 | | | | 0.0 | 8.1 | 6.9 | 23.2 | 0.0 | 0 |
| Cycle Q Clear(g_c), s | 4.7 | 0.0 | 1.00 | | | | 0.00 | ð. I | 1.00 | 1.00 | 0.0 | |
| Prop In Lane | | 0 | | | | | 0.00 | 1404 | 351 | 941 | 2400 | 0.0 |
| Lane Grp Cap(c), veh/h | 1270 0.21 | 0.00 | 1130 0.94 | | | | 0.00 | 1424 0.47 | 0.40 | 0.97 | 3498 0.72 | 0. |
| V/C Ratio(X) | | | | | | | | | | | | 0.0 |
| Avail Cap(c_a), veh/h | 1290 | 0 | 1148 | | | | 0 | 1424 | 351 | 941 | 3498 | 1. |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.0 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.46 | 0.46 | 0.0 |
| Uniform Delay (d), s/veh | 20.2 | 0.0 | 28.0 | | | | 0.0 | 30.4 | 30.0 | 20.2 | 0.0 | 0 |
| ncr Delay (d2), s/veh | 0.1 | 0.0 | 14.4 | | | | 0.0 | 1.1 | 3.4 | 14.4 | 0.6 | 0 |
| nitial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| %ile BackOfQ(50%),veh/In | 1.9 | 0.0 | 12.6 | | | | 0.0 | 3.0 | 2.7 | 6.8 | 0.1 | 0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 20.2 | 0.0 | 42.4 | | | | 0.0 | 31.5 | 33.4 | 34.6 | 0.6 | 0 |
| LnGrp LOS | С | A | D | | | | A | С | С | С | A | |
| Approach Vol, veh/h | | 1329 | | | | | | 806 | | | 3432 | |
| Approach Delay, s/veh | | 38.0 | | | | | | 31.9 | | | 9.7 | |
| Approach LOS | | D | | | | | | С | | | А | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 29.0 | 24.4 | | | | 53.4 | | 36.6 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 24.5 | 19.4 | | | | 48.4 | | 32.6 | | | | |
| Max Q Clear Time (q_c+l1), s | 25.2 | 10.1 | | | | 2.0 | | 31.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 3.0 | | | | 30.8 | | 0.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 19.6 | | | | | | | | | |
| HCM 6th LOS | | | B | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM Synchro 10 Report Page 3

| | ۶ | -+ | \mathbf{i} | 1 | + | * | 1 | 1 | 1 | 1 | ţ | 1 |
|---|-------------|------|--------------|-----|-----|------|------|------|------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBI |
| Lane Configurations | ኘኘ | 4 | 1 | | | | | 1111 | 1 | ኘኘ | 1111 | |
| Traffic Volume (veh/h) | 702 | 1 | 236 | 0 | 0 | 0 | 0 | 2315 | 401 | 649 | 1012 | |
| Future Volume (veh/h) | 702 | 1 | 236 | 0 | 0 | 0 | 0 | 2315 | 401 | 649 | 1012 | |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 1 |
| Ped-Bike Adj(A_pbT) | 1.00 | - | 1.00 | | | | 1.00 | - | 1.00 | 1.00 | - | 1.0 |
| Parking Bus, Adi | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | |
| Adj Flow Rate, veh/h | 843 | 0 | 172 | | | | 0 | 2516 | 436 | 705 | 1100 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 960 | 0 | 285 | | | | 0 | 2805 | 691 | 810 | 4635 | (|
| Arrive On Green | 0.18 | 0.00 | 0.18 | | | | 0.00 | 0.44 | 0.44 | 0.23 | 0.72 | 0.0 |
| Sat Flow, veh/h | 5344 | 0.00 | 1585 | | | | 0.00 | 6696 | 1585 | 3456 | 6696 | (|
| Grp Volume(v), veh/h | 843 | 0 | 172 | | | | 0 | 2516 | 436 | 705 | 1100 | |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | Ì |
| Q Serve(q_s), s | 13.8 | 0.0 | 9.0 | | | | 0.0 | 32.6 | 19.3 | 17.7 | 5.2 | 0.0 |
| Cycle Q Clear(q_c), s | 13.8 | 0.0 | 9.0 | | | | 0.0 | 32.6 | 19.3 | 17.7 | 5.2 | 0. |
| Prop In Lane | 1.00 | 0.0 | 1.00 | | | | 0.00 | 32.0 | 1.00 | 1.00 | J.Z | 0.0 |
| Lane Grp Cap(c), veh/h | 960 | 0 | 285 | | | | 0.00 | 2805 | 691 | 810 | 4635 | 0.01 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.60 | | | | 0.00 | 0.90 | 0.63 | 0.87 | 0.24 | 0.0 |
| Avail Cap(c_a), veh/h | 980 | 0.00 | 291 | | | | 0.00 | 2824 | 696 | 810 | 4635 | 0.01 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.84 | 0.84 | 0.00 |
| | 36.0 | 0.0 | 34.0 | | | | 0.00 | 23.5 | 19.8 | 33.1 | 4.2 | 0.0 |
| Uniform Delay (d), s/veh Incr Delay (d2), s/veh | 30.0 9.1 | 0.0 | 34.0 | | | | 0.0 | 23.5 | 4.3 | 33.1 | 4.2 | 0. |
| | 9.1 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 4.5 | 0.0 | 0.0 | 0. |
| Initial Q Delay(d3),s/veh %ile BackOfQ(50%),veh/ln | 6.6 | 0.0 | 3.6 | | | | 0.0 | 11.4 | 6.9 | 7.7 | 1.0 | 0. |
| | | 0.0 | 3.0 | | | | 0.0 | 11.4 | 0.9 | 1.1 | 1.0 | 0. |
| Unsig. Movement Delay, s/veh | | | 07.4 | | | | | 00 (| | 44.0 | | |
| LnGrp Delay(d), s/veh | 45.0 | 0.0 | 37.4 | | | | 0.0 | 28.6 | 24.1 | 41.8 | 4.3 | 0. |
| LnGrp LOS | D | A | D | | | | A | С | С | D | A | |
| Approach Vol, veh/h | | 1015 | | | | | | 2952 | | | 1805 | |
| Approach Delay, s/veh | | 43.7 | | | | | | 27.9 | | | 19.0 | |
| Approach LOS | | D | | | | | | С | | | В | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 25.6 | 43.7 | | | | 69.3 | | 20.7 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 20.5 | 39.5 | | | | 64.5 | | 16.5 | | | | |
| Max Q Clear Time (q_c+11), s | 19.7 | 34.6 | | | | 7.2 | | 15.8 | | | | |
| Green Ext Time (p_c), s | 0.3 | 4.6 | | | | 8.4 | | 0.3 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 27.9 | | | | | | | | | |
| HCM 6th LOS | | | C | | | | | | | | | |
| Notes | | | | | | | | | | | | |

OCTA Metrolink Maintenance Facility AECOM

| HCM 6th Signalized Intersection Summary | Alternative 1 - Short Term Interim Year | + Project |
|--|---|--------------|
| 1: I-5 Northbound Ramps & Sand Canvon Av | e | AM Peak Hour |

| | ٠ | + | 1 | 4 | Ļ | • | < | Ť | 1 | * | ţ | 1 |
|-------------------------------|------|-------------|------|-------|-----------|-------|------|-----------|-----------|------|-----------|-----------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ۲ | र्भ | 11 | ٦ | f, | | ሻኘ | *** | 1 | ٦. | ^ | 7 |
| Traffic Volume (veh/h) | 461 | 0 | 626 | 12 | 0 | 8 | 304 | 604 | 33 | 40 | 2176 | 749 |
| Future Volume (veh/h) | 461 | 0 | 626 | 12 | 0 | 8 | 304 | 604 | 33 | 40 | 2176 | 749 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1945 |
| Adj Flow Rate, veh/h | 501 | 0 | 680 | 13 | 0 | 9 | 330 | 657 | 36 | 43 | 2365 | 814 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 570 | 0 | 947 | 42 | 0 | 37 | 480 | 2865 | 889 | 99 | 2440 | 788 |
| Arrive On Green | 0.16 | 0.00 | 0.16 | 0.02 | 0.00 | 0.02 | 0.09 | 0.38 | 0.38 | 0.06 | 0.48 | 0.48 |
| Sat Flow, veh/h | 3563 | 0 | 3170 | 1781 | 0 | 1585 | 3456 | 5106 | 1585 | 1781 | 5106 | 1648 |
| Grp Volume(v), veh/h | 501 | 0 | 680 | 13 | 0 | 9 | 330 | 657 | 36 | 43 | 2365 | 814 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | 1781 | 0 | 1585 | 1728 | 1702 | 1585 | 1781 | 1702 | 1648 |
| Q Serve(q s), s | 12.4 | 0.0 | 4.7 | 0.6 | 0.0 | 0.5 | 8.3 | 7.9 | 1.3 | 2.1 | 40.6 | 43.0 |
| Cycle Q Clear(g c), s | 12.4 | 0.0 | 4.7 | 0.6 | 0.0 | 0.5 | 8.3 | 7.9 | 1.3 | 2.1 | 40.6 | 43.0 |
| Prop In Lane | 1.00 | 0.0 | 1.00 | 1.00 | 0.0 | 1.00 | 1.00 | 1.0 | 1.00 | 1.00 | 10.0 | 1.00 |
| Lane Grp Cap(c), veh/h | 570 | 0 | 947 | 42 | 0 | 37 | 480 | 2865 | 889 | 99 | 2440 | 788 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.72 | 0.31 | 0.00 | 0.24 | 0.69 | 0.23 | 0.04 | 0.43 | 0.97 | 1.03 |
| Avail Cap(c a), veh/h | 570 | 0 | 947 | 99 | 0 | 88 | 480 | 2865 | 889 | 127 | 2440 | 788 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.96 | 0.96 | 0.96 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.0 | 0.0 | 28.2 | 43.2 | 0.0 | 43.2 | 38.9 | 14.8 | 12.7 | 41.1 | 22.9 | 23.5 |
| Incr Delay (d2), s/veh | 14.7 | 0.0 | 2.6 | 4.1 | 0.0 | 3.3 | 3.9 | 0.2 | 0.1 | 3.0 | 12.3 | 41.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.5 | 0.0 | 6.8 | 0.3 | 0.0 | 0.2 | 3.6 | 2.7 | 0.4 | 0.9 | 16.1 | 22.6 |
| Unsig. Movement Delay, s/veh | | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 2.1 | 0.4 | 0.0 | 10.1 | 22.0 |
| LnGrp Delay(d),s/veh | 51.7 | 0.0 | 30.8 | 47.4 | 0.0 | 46.4 | 42.9 | 15.0 | 12.8 | 44.1 | 35.2 | 64.5 |
| LnGrp LOS | D | A | C | D | A | -+0.+ | | 10.0 B | 12.0 B | D | D | 64.5 F |
| Approach Vol, veh/h | 0 | 1181 | 0 | | 22 | | | 1023 | | | 3222 | |
| Approach Delay, s/veh | | 39.7 | | | 47.0 | | | 23.9 | | | 42.7 | |
| Approach LOS | | 39.7 D | | | 47.0 D | | | 23.9 C | | | 42.7 D | |
| Approach LOS | | U | | | U | | | U | | | U | |
| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.5 | 55.0 | | 6.6 | 17.0 | 47.5 | | 18.9 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 6.4 | 46.2 | | 5.0 | 9.6 | 43.0 | | 14.4 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.1 | 9.9 | | 2.6 | 10.3 | 45.0 | | 14.4 | | | | |
| Green Ext Time (p_c), s | 0.0 | 4.3 | | 0.0 | 0.0 | 0.0 | | 0.0 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 38.5 | | | | | | | | | |
| HCM 6th LOS | | | D | | | | | | | | | |
| Notes | | | | | | | | | | | | |
| licer approved volume balanci | | - He - Le - | | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM Synchro 10 Report Page 1

| | ۶ | Ŷ | * | 4 | Ļ | ▲ | < | Ť | * | ∢ | ţ | 1 |
|------------------------------|-----------|-----------|-----------|------------|------------|----------|------------|-----------|-----------|-----------|-----------|------|
| Vovement | FBI | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| ane Configurations | 5 | र्भ | 11 | ň | ₽ | | ኘኘ | ^ | 1 | 5 | 111 | 7 |
| Fraffic Volume (veh/h) | 1126 | 0 | 270 | 94 | 0 | 0 | 717 | 1830 | 31 | 10 | 1074 | 31 |
| uture Volume (veh/h) | 1126 | 0 | 270 | 94 | 0 | 0 | 717 | 1830 | 31 | 10 | 1074 | 31 |
| nitial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Ped-Bike Adj(A pbT) | 1.00 | - | 1.00 | 1.00 | - | 1.00 | 1.00 | - | 1.00 | 1.00 | - | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Nork Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 194 |
| dj Flow Rate, veh/h | 1224 | 0 | 293 | 102 | 0 | 0 | 779 | 1989 | 34 | 11 | 1167 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.9 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 1089 | 0 | 1585 | 109 | 114 | 0 | 672 | 1929 | 599 | 99 | 1220 | 39 |
| Arrive On Green | 0.31 | 0.00 | 0.31 | 0.06 | 0.00 | 0.00 | 0.06 | 0.12 | 0.12 | 0.06 | 0.24 | 0.2 |
| Sat Flow, veh/h | 3563 | 0 | 3170 | 1781 | 1870 | 0 | 3456 | 5106 | 1585 | 1781 | 5106 | 164 |
| Grp Volume(v), veh/h | 1224 | 0 | 293 | 102 | 0 | 0 | 779 | 1989 | 34 | 11 | 1167 | 33 |
| Grp Sat Flow(s), veh/h/ln | 1781 | Ő | 1585 | 1781 | 1870 | Ő | 1728 | 1702 | 1585 | 1781 | 1702 | 164 |
| Serve(q s), s | 27.5 | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 | 17.5 | 34.0 | 1.7 | 0.5 | 20.3 | 17. |
| Cycle Q Clear(g c), s | 27.5 | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 | 17.5 | 34.0 | 1.7 | 0.5 | 20.3 | 17. |
| Prop In Lane | 1.00 | 0.0 | 1.00 | 1.00 | 0.0 | 0.00 | 1.00 | 04.0 | 1.00 | 1.00 | 20.0 | 1.0 |
| ane Grp Cap(c), veh/h | 1089 | 0 | 1585 | 109 | 114 | 0.00 | 672 | 1929 | 599 | 99 | 1220 | 39 |
| //C Ratio(X) | 1.12 | 0.00 | 0.18 | 0.94 | 0.00 | 0.00 | 1.16 | 1.03 | 0.06 | 0.11 | 0.96 | 0.8 |
| vail Cap(c a), veh/h | 1089 | 0.00 | 1585 | 109 | 114 | 0.00 | 672 | 1929 | 599 | 99 | 1220 | 39 |
| CM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 0.33 | 1.00 | 1.00 | 1.0 |
| Jpstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.50 | 0.50 | 0.50 | 1.00 | 1.00 | 1.0 |
| Jniform Delay (d), s/veh | 31.3 | 0.00 | 12.4 | 42.1 | 0.00 | 0.0 | 42.1 | 39.4 | 25.3 | 40.4 | 33.8 | 32.0 |
| ncr Delay (d2), s/veh | 68.2 | 0.0 | 0.1 | 66.4 | 0.0 | 0.0 | 80.4 | 23.3 | 0.1 | 0.5 | 17.3 | 20.0 |
| nitial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20. |
| 6ile BackOfQ(50%),veh/ln | 21.8 | 0.0 | 1.6 | 4.3 | 0.0 | 0.0 | 15.4 | 19.2 | 0.6 | 0.2 | 9.5 | 8. |
| Jnsig. Movement Delay, s/veh | | 0.0 | 1.0 | 4.0 | 0.0 | 0.0 | 10.4 | 10.2 | 0.0 | 0.2 | 5.0 | 0. |
| nGro Delav(d).s/veh | 99.5 | 0.0 | 12.5 | 108.4 | 0.0 | 0.0 | 122.5 | 62.7 | 25.3 | 40.9 | 51.1 | 53.4 |
| InGrp LOS | 99.0 F | 0.0 A | 12.5 B | 100.4 F | 0.0 A | 0.0 A | 122.5 F | 02.7 F | 20.0 C | 40.9 D | 51.1 D | 55. |
| | | 1517 | 0 | | 102 | ~ | | 2802 | 0 | 0 | 1515 | |
| Approach Vol, veh/h | | 82.7 | | | 102 | | | 78.9 | | | 51.5 | |
| Approach Delay, s/veh | | 62.7 F | | | 106.4 F | | | 76.9 F | | | 51.5 D | |
| Approach LOS | | F | | | F | | | E | | | U | |
| imer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 9.5 | 38.5 | | 10.0 | 22.0 | 26.0 | | 32.0 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | | 4.5 | | | | |
| lax Green Setting (Gmax), s | 5.0 | 34.0 | | 5.5 | 17.5 | 21.5 | | 27.5 | | | | |
| Aax Q Clear Time (g_c+I1), s | 2.5 | 36.0 | | 7.1 | 19.5 | 22.3 | | 29.5 | | | | |
| Green Ext Time (p c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | | | | |
| u = <i>1</i> - | | | | | | | | | | _ | | |
| ntersection Summary | | | | | | | | | | | | |
| ICM 6th Ctrl Delay | | | 73.4 | | | | | | | | | |
| HCM 6th LOS | | | E | | | | | | | | | |
| lotes | | | | | | | | | | | | |

OCTA Metrolink Maintenance Facility AECOM HCM 6th Signalized Intersection Summary Alternative 1 - Short Term Interim Year + Project 3: I-5 Southbound Ramps & Sand Canyon Ave AM Peak Hour

| | 1 | -+ | \mathbf{r} | - | + | * | 1 | Ť | 1 | 1 | Ŧ | - |
|------------------------------|------|------|--------------|-----|-----|------|------|------|------|------|------|-----|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SE |
| Lane Configurations | ኘኘ | 4 | ۲ | | | | | tttt | 1 | ሻኘ | 1111 | |
| Traffic Volume (veh/h) | 311 | 4 | 911 | 0 | 0 | 0 | 0 | 612 | 131 | 851 | 2316 | |
| Future Volume (veh/h) | 311 | 4 | 911 | 0 | 0 | 0 | 0 | 612 | 131 | 851 | 2316 | |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1. |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1. |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | |
| Adi Flow Rate, veh/h | 272 | 0 | 1063 | | | | 0 | 665 | 142 | 925 | 2517 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0. |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 1272 | 0 | 1132 | | | | 0 | 1420 | 350 | 941 | 3493 | |
| Arrive On Green | 0.36 | 0.00 | 0.36 | | | | 0.00 | 0.22 | 0.22 | 0.54 | 1.00 | 0.0 |
| Sat Flow, veh/h | 3563 | 0.00 | 3170 | | | | 0.00 | 6696 | 1585 | 3456 | 6696 | 0. |
| Grp Volume(v), veh/h | 272 | 0 | 1063 | | | | 0 | 665 | 142 | 925 | 2517 | |
| | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | |
| Grp Sat Flow(s),veh/h/ln | 4.8 | 0.0 | 29.2 | | | | 0.0 | | 1585 | | | C |
| Q Serve(g_s), s | | | | | | | | 8.1 | | 23.6 | 0.0 | |
| Cycle Q Clear(g_c), s | 4.8 | 0.0 | 29.2 | | | | 0.0 | 8.1 | 6.9 | 23.6 | 0.0 | 0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0. |
| Lane Grp Cap(c), veh/h | 1272 | 0 | 1132 | | | | 0 | 1420 | 350 | 941 | 3493 | |
| V/C Ratio(X) | 0.21 | 0.00 | 0.94 | | | | 0.00 | 0.47 | 0.41 | 0.98 | 0.72 | 0. |
| Avail Cap(c_a), veh/h | 1294 | 0 | 1152 | | | | 0 | 1420 | 350 | 941 | 3493 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.0 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.46 | 0.46 | 0.0 |
| Uniform Delay (d), s/veh | 20.1 | 0.0 | 28.0 | | | | 0.0 | 30.5 | 30.0 | 20.3 | 0.0 | C |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 14.2 | | | | 0.0 | 1.1 | 3.5 | 16.1 | 0.6 | 0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | C |
| %ile BackOfQ(50%),veh/ln | 1.9 | 0.0 | 12.6 | | | | 0.0 | 3.0 | 2.7 | 7.0 | 0.1 | 0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 20.2 | 0.0 | 42.2 | | | | 0.0 | 31.6 | 33.5 | 36.4 | 0.6 | 0 |
| LnGrp LOS | С | A | D | | | | A | С | С | D | A | |
| Approach Vol. veh/h | | 1335 | | | | | | 807 | | | 3442 | |
| Approach Delay, s/veh | | 37.7 | | | | | | 31.9 | | | 10.2 | |
| Approach LOS | | D | | | | | | C | | | B | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 29.0 | 24.4 | | | | 53.4 | | 36.6 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 24.5 | 19.3 | | | | 48.3 | | 32.7 | | | | |
| Max Q Clear Time (g c+l1), s | | 10.1 | | | | 2.0 | | 31.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 3.0 | | | | 30.8 | | 0.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 19.9 | | | | | | | | | _ |
| HCM 6th LOS | | | B | | | | | | | | | |
| | | | 5 | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM Synchro 10 Report Page 3

| | ۶ | | \mathbf{i} | 1 | | • | 1 | t | 1 | \ | ţ | 1 |
|------------------------------|-------------|------|--------------|-----|-----|------|------|------|------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | ኘካ | 4 | 1 | | | | | tttt | 1 | ካካ | tttt | |
| Traffic Volume (veh/h) | 704 | 1 | 236 | 0 | 0 | 0 | 0 | 2315 | 401 | 655 | 1013 | |
| Future Volume (veh/h) | 704 | 1 | 236 | 0 | 0 | 0 | 0 | 2315 | 401 | 655 | 1013 | (|
| Initial Q (Qb), veh | 0 | 0 | 0 | | - | | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A pbT) | 1.00 | , v | 1.00 | | | | 1.00 | , v | 1.00 | 1.00 | , v | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | 1.00 | No | 1.00 | | | | 1.00 | No | 1.00 | 1.00 | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | (|
| Adj Flow Rate, veh/h | 845 | 0 | 172 | | | | 0 | 2516 | 436 | 712 | 1101 | (|
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh. % | 2 | 2 | 2 | | | | 0.52 | 2 | 2 | 2 | 2 | 0.51 |
| Cap, veh/h | 961 | 0 | 285 | | | | 0 | 2805 | 691 | 810 | 4634 | i |
| Arrive On Green | 0.18 | 0.00 | 0.18 | | | | 0.00 | 0.44 | 0.44 | 0.23 | 0.72 | 0.0 |
| Sat Flow, veh/h | 5344 | 0.00 | 1585 | | | | 0.00 | 6696 | 1585 | 3456 | 6696 | 0.01 |
| Grp Volume(v), veh/h | 845 | 0 | 172 | | | | 0 | 2516 | 436 | 712 | 1101 | |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | Ì |
| Q Serve(q s), s | 13.9 | 0.0 | 9.0 | | | | 0.0 | 32.6 | 19.3 | 17.9 | 5.2 | 0.0 |
| | 13.9 | 0.0 | 9.0 | | | | 0.0 | 32.6 | 19.3 | 17.9 | 5.2 | 0.0 |
| Cycle Q Clear(g_c), s | | 0.0 | 9.0 | | | | 0.00 | 32.0 | 19.3 | 1.00 | 5.2 | 0.0 |
| Prop In Lane | 1.00 961 | 0 | 285 | | | | 0.00 | 2805 | 691 | 810 | 4634 | 0.00 |
| Lane Grp Cap(c), veh/h | | 0.00 | 265 | | | | 0.00 | 2605 | 0.63 | 0.88 | | 0.0 |
| V/C Ratio(X) | 0.88 | 0.00 | 291 | | | | 0.00 | 2824 | 696 | 810 | 0.24 | |
| Avail Cap(c_a), veh/h | 980 | | | | | | | | | | 4634 | (|
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 34.0 | | | | 0.00 | 1.00 | 1.00 | 0.83 | 0.83 | 0.00 |
| Uniform Delay (d), s/veh | 36.0 | 0.0 | | | | | 0.0 | 23.5 | 19.8 | 33.2 | 4.3 | 0.0 |
| Incr Delay (d2), s/veh | 9.2 | 0.0 | 3.4 | | | | 0.0 | 5.0 | 4.3 | 9.3 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/In | 6.6 | 0.0 | 3.6 | | | | 0.0 | 11.4 | 6.9 | 7.8 | 1.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 45.1 | 0.0 | 37.4 | | | | 0.0 | 28.6 | 24.1 | 42.6 | 4.4 | 0.0 |
| LnGrp LOS | D | A | D | | | | A | С | С | D | A | 4 |
| Approach Vol, veh/h | | 1017 | | | | | | 2952 | | | 1813 | |
| Approach Delay, s/veh | | 43.8 | | | | | | 27.9 | | | 19.4 | |
| Approach LOS | | D | | | | | | С | | | В | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 25.6 | 43.7 | | | | 69.3 | | 20.7 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 20.5 | 39.5 | | | | 64.5 | | 16.5 | | | | |
| Max Q Clear Time (q c+l1), s | 19.9 | 34.6 | | | | 7.2 | | 15.9 | | | | |
| Green Ext Time (p c), s | 0.2 | 4.6 | | | | 8.4 | | 0.3 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 28.0 | | | _ | | | | | | _ |
| HCM 6th LOS | | | C | | | | | | | | | |
| Notes | _ | _ | | | | | | | | | | |

OCTA Metrolink Maintenance Facility AECOM

| 1: I-5 Northbound Ra | | | 2020 | | | | | | | | | , |
|--|-----------|------------|------------|-----------|------------|------|-----------|-----------|----------|-----------|--------------|------|
| | • | - | 7 | 1 | • | | 1 | T | 1 | > | ŧ | * |
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | ኘኘ | A | 1 | ኘካ | † † | 1 | ኘካ | *** | 1 | 1 | 111 | 7 |
| Traffic Volume (veh/h) | 461 | 28 | 595 | 547 | 63 | 139 | 228 | 472 | 274 | 136 | 2079 | 74 |
| Future Volume (veh/h) | 461 | 28 | 595 | 547 | 63 | 139 | 228 | 472 | 274 | 136 | 2079 | 74 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 194 |
| Adi Flow Rate, veh/h | 501 | 30 | 647 | 595 | 68 | 151 | 248 | 513 | 298 | 148 | 2260 | 81- |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.9 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 566 | 242 | 409 | 628 | 540 | 241 | 281 | 2244 | 697 | 178 | 2338 | 75 |
| Arrive On Green | 0.16 | 0.13 | 0.13 | 0.18 | 0.15 | 0.15 | 0.08 | 0.44 | 0.44 | 0.10 | 0.46 | 0.4 |
| Sat Flow, veh/h | 3563 | 1870 | 3170 | 3456 | 3554 | 1585 | 3456 | 5106 | 1585 | 1781 | 5106 | 164 |
| Grp Volume(v), veh/h | 501 | 30 | 647 | 595 | 68 | 151 | 248 | 513 | 298 | 148 | 2260 | 81 |
| Grp Sat Flow(s), veh/h/ln | 1781 | 1870 | 1585 | 1728 | 1777 | 1585 | 1728 | 1702 | 1585 | 1781 | 1702 | 164 |
| 2 Serve(a_s), s | 16.5 | 1.7 | 15.5 | 20.4 | 2.0 | 10.7 | 8.5 | 7.5 | 8.4 | 9.8 | 51.7 | 31. |
| Cycle Q Clear(q_c), s | 16.5 | 1.7 | 15.5 | 20.4 | 2.0 | 10.7 | 8.5 | 7.5 | 8.4 | 9.8 | 51.7 | 31. |
| Prop In Lane | 1.00 | 1.7 | 1.00 | 1.00 | 2.0 | 1.00 | 1.00 | 7.0 | 1.00 | 1.00 | 01.7 | 1.0 |
| Lane Grp Cap(c), veh/h | 566 | 242 | 409 | 628 | 540 | 241 | 281 | 2244 | 697 | 178 | 2338 | 75 |
| V/C Ratio(X) | 0.89 | 0.12 | 1.58 | 0.95 | 0.13 | 0.63 | 0.88 | 0.23 | 0.43 | 0.83 | 0.97 | 1.0 |
| Avail Cap(c_a), veh/h | 626 | 242 | 409 | 628 | 540 | 241 | 281 | 2244 | 697 | 270 | 2340 | 75 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Uniform Delay (d), s/veh | 49.4 | 46.2 | 52.3 | 48.5 | 44.0 | 47.7 | 54.6 | 21.0 | 6.8 | 53.0 | 31.6 | 10. |
| Incr Delay (d2), s/veh | 13.4 | 0.2 | 272.5 | 23.8 | 0.1 | 5.1 | 26.5 | 0.2 | 1.9 | 12.6 | 12.2 | 55. |
| Initial Q Delav(d3).s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| %ile BackOfQ(50%),veh/ln | 8.4 | 0.8 | 21.7 | 10.9 | 0.9 | 4.6 | 4.6 | 2.8 | 3.1 | 4.8 | 21.7 | 22.3 |
| Unsig. Movement Delay, s/veh | | 0.0 | 21.7 | 10.7 | 0.7 | 4.0 | 4.0 | 2.0 | 5.1 | 4.0 | 21.7 | 22.0 |
| LnGrp Delay(d), s/veh | 62.7 | 46.5 | 324.8 | 72.3 | 44.1 | 52.8 | 81.0 | 21.2 | 8.7 | 65.7 | 43.9 | 66. |
| LIGIP Delay(d), siven | 02.7 E | 40.5 D | 524.0 F | 72.3 E | 44.1 D | J2.0 | 61.0 F | 21.2 C | 0.7 A | 03.7 E | 43.7 D | 00. |
| Approach Vol. veh/h | E | 1178 | г | E | 814 | D | г | 1059 | A | E | 3222 | |
| Approach Vol, ven/n Approach Delay, s/veh | | 206.2 | | | 66.3 | | | 31.7 | | | 3222 50.6 | |
| | | 206.2 F | | | 00.3 F | | | 31.7 C | | | 0.0C D | |
| Approach LOS | | F | | | E | | | U | | | D | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 16.5 | 57.2 | 26.3 | 20.0 | 14.2 | 59.5 | 23.6 | 22.7 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | | | |
| Max Green Setting (Gmax), s | 18.2 | 46.5 | 21.8 | 15.5 | 9.7 | 55.0 | 21.1 | 16.2 | | | | |
| Max Q Clear Time (q_c+l1), s | 11.8 | 10.4 | 22.4 | 17.5 | 10.5 | 53.7 | 18.5 | 12.7 | | | | |
| Green Ext Time (p_c), s | 0.2 | 4.3 | 0.0 | 0.0 | 0.0 | 1.3 | 0.5 | 0.3 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 78.7 | | | | | | | | | |
| HCM 6th LOS | | | E | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM Synchro 10 Report Page 1

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|------------------------------|------|-----------|------|------|------------|-------|------|-----------|-------|-------|------|-----|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | ሻኘ | tî≻ | 1 | ኘኘ | ^ | 1 | ኘኘ | *** | 1 | 1 | 111 | 1 |
| Traffic Volume (veh/h) | 1126 | 40 | 228 | 581 | 56 | 145 | 653 | 1684 | 705 | 171 | 913 | 31 |
| Future Volume (veh/h) | 1126 | 40 | 228 | 581 | 56 | 145 | 653 | 1684 | 705 | 171 | 913 | 31 |
| nitial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Nork Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 194 |
| Adj Flow Rate, veh/h | 1224 | 43 | 248 | 632 | 61 | 158 | 710 | 1830 | 766 | 186 | 992 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.9 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 1182 | 137 | 232 | 1054 | 165 | 73 | 745 | 1806 | 561 | 186 | 1239 | 40 |
| Arrive On Green | 0.33 | 0.07 | 0.07 | 0.31 | 0.05 | 0.05 | 0.22 | 0.35 | 0.35 | 0.10 | 0.24 | 0.2 |
| Sat Flow, veh/h | 3563 | 1870 | 3170 | 3456 | 3554 | 1585 | 3456 | 5106 | 1585 | 1781 | 5106 | 164 |
| Grp Volume(v), veh/h | 1224 | 43 | 248 | 632 | 61 | 158 | 710 | 1830 | 766 | 186 | 992 | 33 |
| Grp Sat Flow(s).veh/h/ln | 1781 | 1870 | 1585 | 1728 | 1777 | 1585 | 1728 | 1702 | 1585 | 1781 | 1702 | 164 |
| 2 Serve(q_s), s | 36.5 | 2.4 | 5.5 | 17.1 | 1.8 | 4.1 | 22.3 | 38.9 | 38.9 | 11.5 | 20.1 | 21. |
| Cycle Q Clear(q_c), s | 36.5 | 2.4 | 5.5 | 17.1 | 1.8 | 4.1 | 22.3 | 38.9 | 38.9 | 11.5 | 20.1 | 21. |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Lane Grp Cap(c), veh/h | 1182 | 137 | 232 | 1054 | 165 | 73 | 745 | 1806 | 561 | 186 | 1239 | 40 |
| V/C Ratio(X) | 1.04 | 0.31 | 1.07 | 0.60 | 0.37 | 2.15 | 0.95 | 1.01 | 1.37 | 1.00 | 0.80 | 0.8 |
| Avail Cap(c_a), veh/h | 1182 | 221 | 375 | 1054 | 165 | 73 | 745 | 1806 | 561 | 186 | 1239 | 40 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Jpstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 |
| Uniform Delay (d), s/veh | 36.8 | 48.4 | 23.5 | 32.5 | 50.9 | 34.0 | 42.6 | 35.5 | 35.5 | 49.2 | 39.1 | 39. |
| ncr Delay (d2), s/veh | 35.8 | 1.3 | 60.3 | 0.9 | 1.4 | 559.8 | 22.3 | 24.6 | 176.2 | 65.6 | 5.5 | 19. |
| nitial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0. |
| %ile BackOfQ(50%),veh/ln | 21.6 | 1.2 | 5.1 | 7.3 | 0.9 | 13.4 | 11.2 | 18.8 | 42.2 | 8.2 | 8.5 | 10. |
| Unsig. Movement Delay, s/veł | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 72.5 | 49.7 | 83.8 | 33.5 | 52.3 | 593.8 | 64.9 | 60.1 | 211.7 | 114.8 | 44.6 | 58. |
| LnGrp LOS | F | D | F | C | D | F | E | F | F | F | D | 00. |
| Approach Vol. veh/h | · · | 1515 | · · | | 851 | · · | | 3306 | · · | · · | 1515 | |
| Approach Delay, s/veh | | 73.7 | | | 138.8 | | | 96.3 | | | 56.4 | |
| Approach LOS | | 73.7 F | | | 130.0 F | | | 70.5 F | | | 50.4 | |
| | | - | | | | | | | | | - | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 16.0 | 43.4 | 38.1 | 12.5 | 28.2 | 31.2 | 41.0 | 9.6 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | | | |
| Max Green Setting (Gmax), s | 11.5 | 38.9 | 28.6 | 13.0 | 23.7 | 26.7 | 36.5 | 5.1 | | | | |
| Max Q Clear Time (g_c+I1), s | 13.5 | 40.9 | 19.1 | 7.5 | 24.3 | 23.4 | 38.5 | 6.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.8 | 0.6 | 0.0 | 2.1 | 0.0 | 0.0 | | | | |
| ntersection Summary | | | | | | | | | | | | |
| ICM 6th Ctrl Delay | | | 88.1 | | | | | | | | | |
| ICM 6th LOS | | | F | | | | | | | | | |
| Votes | | | | | | | | | | | | |

OCTA Metrolink Maintenance Facility AECOM HCM 6th Signalized Intersection Summary A 3: I-5 Southbound Ramps & Sand Canyon Ave

Alternative 2 - Short Term Interim Conditions Ave AM Peak Hour

| | 1 | -+ | \mathbf{r} | 1 | +- | * | 1 | Ť | 1 | 1 | Ŧ | - |
|------------------------------|------|------|--------------|-----|-----|------|------|------|------|------|------|----|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SE |
| Lane Configurations | ሻሻ | 4 | 1 | | | | | 1111 | 1 | ካካ | 1111 | |
| Traffic Volume (veh/h) | 305 | 4 | 911 | 0 | 0 | 0 | 0 | 611 | 131 | 844 | 2314 | |
| Future Volume (veh/h) | 305 | 4 | 911 | 0 | 0 | 0 | 0 | 611 | 131 | 844 | 2314 | |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1. |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1. |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | |
| Adj Flow Rate, veh/h | 267 | 0 | 1062 | | | | 0 | 664 | 142 | 917 | 2515 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0. |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 1270 | 0 | 1130 | | | | 0 | 1424 | 351 | 941 | 3498 | |
| Arrive On Green | 0.36 | 0.00 | 0.36 | | | | 0.00 | 0.22 | 0.22 | 0.27 | 0.54 | 0. |
| Sat Flow, veh/h | 3563 | 0 | 3170 | | | | 0 | 6696 | 1585 | 3456 | 6696 | |
| Grp Volume(v), veh/h | 267 | 0 | 1062 | | | | 0 | 664 | 142 | 917 | 2515 | |
| Grp Sat Flow(s), veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | |
| Q Serve(q_s), s | 4.7 | 0.0 | 29.2 | | | | 0.0 | 8.1 | 6.9 | 23.7 | 26.4 | (|
| Cycle Q Clear(q_c), s | 4.7 | 0.0 | 29.2 | | | | 0.0 | 8.1 | 6.9 | 23.7 | 26.4 | (|
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0. |
| Lane Grp Cap(c), veh/h | 1270 | 0 | 1130 | | | | 0 | 1424 | 351 | 941 | 3498 | |
| V/C Ratio(X) | 0.21 | 0.00 | 0.94 | | | | 0.00 | 0.47 | 0.40 | 0.97 | 0.72 | 0. |
| Avail Cap(c_a), veh/h | 1290 | 0 | 1148 | | | | 0 | 1424 | 351 | 941 | 3498 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1. |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0. |
| Uniform Delay (d), s/veh | 20.2 | 0.0 | 28.0 | | | | 0.0 | 30.4 | 30.0 | 32.4 | 15.4 | (|
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 14.4 | | | | 0.0 | 1.1 | 3.4 | 23.3 | 1.3 | (|
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | (|
| %ile BackOfQ(50%),veh/In | 1.9 | 0.0 | 12.6 | | | | 0.0 | 3.0 | 2.7 | 11.9 | 8.0 | (|
| Unsig. Movement Delay, s/vel | h | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 20.2 | 0.0 | 42.4 | | | | 0.0 | 31.5 | 33.4 | 55.7 | 16.7 | (|
| LnGrp LOS | С | А | D | | | | А | С | С | E | В | |
| Approach Vol, veh/h | | 1329 | | | | | | 806 | | | 3432 | |
| Approach Delay, s/veh | | 38.0 | | | | | | 31.9 | | | 27.1 | |
| Approach LOS | | D | | | | | | С | | | С | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 29.0 | 24.4 | | | | 53.4 | | 36.6 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 24.5 | 19.4 | | | | 48.4 | | 32.6 | | | | |
| Max Q Clear Time (g_c+l1), s | 25.7 | 10.1 | | | | 28.4 | | 31.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 3.0 | | | | 16.3 | | 0.9 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 30.4 | | | | | | | | | |
| HCM 6th LOS | | | С | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

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|------------------------------|------|------|--------------|-----|-----|------|------|-------------|------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SB |
| Lane Configurations | ኘካ | 4 | 1 | | | | | 1111 | 1 | ሻሻ | 1111 | |
| Traffic Volume (veh/h) | 702 | 1 | 236 | 0 | 0 | 0 | 0 | 2315 | 401 | 649 | 1012 | |
| Future Volume (veh/h) | 702 | 1 | 236 | 0 | 0 | 0 | 0 | 2315 | 401 | 649 | 1012 | |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | (|
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.0 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | (|
| Adj Flow Rate, veh/h | 843 | 0 | 172 | | | | 0 | 2516 | 436 | 705 | 1100 | (|
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | (|
| Cap, veh/h | 988 | 0 | 293 | | | | 0 | 2811 | 692 | 883 | 4718 | (|
| Arrive On Green | 0.18 | 0.00 | 0.18 | | | | 0.00 | 0.44 | 0.44 | 0.26 | 0.73 | 0.00 |
| Sat Flow, veh/h | 5344 | 0 | 1585 | | | | 0 | 6696 | 1585 | 3456 | 6696 | (|
| Grp Volume(v), veh/h | 843 | 0 | 172 | | | | 0 | 2516 | 436 | 705 | 1100 | (|
| Grp Sat Flow(s), veh/h/In | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | (|
| Q Serve(g_s), s | 16.8 | 0.0 | 10.9 | | | | 0.0 | 39.8 | 23.5 | 21.0 | 6.1 | 0.0 |
| Cycle Q Clear(g_c), s | 16.8 | 0.0 | 10.9 | | | | 0.0 | 39.8 | 23.5 | 21.0 | 6.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 988 | 0 | 293 | | | | 0 | 2811 | 692 | 883 | 4718 | (|
| V/C Ratio(X) | 0.85 | 0.00 | 0.59 | | | | 0.00 | 0.90 | 0.63 | 0.80 | 0.23 | 0.00 |
| Avail Cap(c_a), veh/h | 1093 | 0 | 324 | | | | 0 | 2837 | 699 | 883 | 4718 | (|
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.0 |
| Uniform Delay (d), s/veh | 43.4 | 0.0 | 41.0 | | | | 0.0 | 28.6 | 24.1 | 38.3 | 4.7 | 0.0 |
| Incr Delay (d2), s/veh | 6.2 | 0.0 | 2.3 | | | | 0.0 | 4.9 | 4.3 | 5.2 | 0.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/In | 7.8 | 0.0 | 4.4 | | | | 0.0 | 14.6 | 8.8 | 8.9 | 1.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | 10.0 | | | | | 00 <i>(</i> | 00.4 | 10.5 | | |
| LnGrp Delay(d), s/veh | 49.6 | 0.0 | 43.3 | | | | 0.0 | 33.6 | 28.4 | 43.5 | 4.8 | 0.0 |
| LnGrp LOS | D | A | D | | | | A | С | С | D | A | / |
| Approach Vol, veh/h | | 1015 | | | | | | 2952 | | | 1805 | |
| Approach Delay, s/veh | | 48.5 | | | | | | 32.8 | | | 20.0 | |
| Approach LOS | | D | | | | | | С | | | В | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 32.6 | 52.6 | | | | 85.2 | | 24.8 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 25.5 | 48.5 | | | | 78.5 | | 22.5 | | | | |
| Max Q Clear Time (q_c+l1), s | 23.0 | 41.8 | | | | 8.1 | | 18.8 | | | | |
| Green Ext Time (p_c), s | 0.7 | 6.3 | | | | 8.4 | | 1.6 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 31.6 | | | | | | | | | |
| HCM 6th LOS | | | С | | | | | | | | | |

HCM 6th Signalized Intersection Summary 1: I-5 Northbound Ramps & Sand Canyon Ave

| | ۶ | ţ | 1 | 4 | ţ | * | < | 1 | 1 | ¢ | ţ | 1 |
|------------------------------|------|-------|-------|------|-----------|------|-------|------|------|------|-----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ጎኘ | A | 1 | ሻሻ | ^ | 1 | ሻሻ | *** | 1 | ۳. | *** | 1 |
| Traffic Volume (veh/h) | 461 | 32 | 595 | 557 | 76 | 140 | 228 | 472 | 281 | 136 | 2079 | 749 |
| Future Volume (veh/h) | 461 | 32 | 595 | 557 | 76 | 140 | 228 | 472 | 281 | 136 | 2079 | 749 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1945 |
| Adj Flow Rate, veh/h | 501 | 35 | 647 | 605 | 83 | 152 | 248 | 513 | 305 | 148 | 2260 | 814 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 575 | 260 | 441 | 659 | 599 | 267 | 233 | 2146 | 666 | 178 | 2310 | 746 |
| Arrive On Green | 0.16 | 0.14 | 0.14 | 0.19 | 0.17 | 0.17 | 0.07 | 0.42 | 0.42 | 0.10 | 0.45 | 0.45 |
| Sat Flow, veh/h | 3563 | 1870 | 3170 | 3456 | 3554 | 1585 | 3456 | 5106 | 1585 | 1781 | 5106 | 1648 |
| Grp Volume(v), veh/h | 501 | 35 | 647 | 605 | 83 | 152 | 248 | 513 | 305 | 148 | 2260 | 814 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 1585 | 1728 | 1777 | 1585 | 1728 | 1702 | 1585 | 1781 | 1702 | 1648 |
| Q Serve(g s), s | 16.5 | 2.0 | 16.7 | 20.6 | 2.4 | 10.6 | 8.1 | 7.8 | 9.0 | 9.8 | 52.2 | 30.9 |
| Cycle Q Clear(g c), s | 16.5 | 2.0 | 16.7 | 20.6 | 2.4 | 10.6 | 8.1 | 7.8 | 9.0 | 9.8 | 52.2 | 30.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 575 | 260 | 441 | 659 | 599 | 267 | 233 | 2146 | 666 | 178 | 2310 | 746 |
| V/C Ratio(X) | 0.87 | 0.13 | 1.47 | 0.92 | 0.14 | 0.57 | 1.06 | 0.24 | 0.46 | 0.83 | 0.98 | 1.09 |
| Avail Cap(c a), veh/h | 689 | 260 | 441 | 680 | 599 | 267 | 233 | 2146 | 666 | 270 | 2311 | 746 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.1 | 45.3 | 51.7 | 47.6 | 42.5 | 45.9 | 55.9 | 22.4 | 7.3 | 53.0 | 32.3 | 10.6 |
| Incr Delay (d2), s/veh | 10.3 | 0.2 | 222.1 | 17.2 | 0.1 | 2.8 | 76.5 | 0.3 | 2.3 | 12.6 | 14.3 | 60.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/In | 8.2 | 0.9 | 20.3 | 10.5 | 1.1 | 4.4 | 5.9 | 3.0 | 3.4 | 4.8 | 22.3 | 23.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 59.4 | 45.5 | 273.7 | 64.8 | 42.6 | 48.7 | 132.4 | 22.7 | 9.6 | 65.7 | 46.5 | 71.3 |
| LnGrp LOS | E | D | F | F | D | D | .02.1 | C | A | E | D | F |
| Approach Vol. veh/h | | 1183 | · · | | 840 | | · · | 1066 | | | 3222 | |
| Approach Delay, s/veh | | 176.2 | | | 59.7 | | | 44.5 | | | 53.7 | |
| Approach LOS | | F | | | 55.7 E | | | 44.J | | | 55.7 D | |
| H | | | | | | | | | | | U | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 16.5 | 54.9 | 27.4 | 21.2 | 12.6 | 58.8 | 23.9 | 24.7 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | | | |
| Max Green Setting (Gmax), s | 18.2 | 43.5 | 23.6 | 16.7 | 7.4 | 54.3 | 23.2 | 17.1 | | | | |
| Max Q Clear Time (g_c+I1), s | 11.8 | 11.0 | 22.6 | 18.7 | 10.1 | 54.2 | 18.5 | 12.6 | | | | |
| Green Ext Time (p_c), s | 0.2 | 4.3 | 0.3 | 0.0 | 0.0 | 0.1 | 0.9 | 0.4 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 75.9 | | | | | | | | | |
| HCM 6th LOS | | | E | | | | | | | | | |
| Notes | | | | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM

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HCM 6th Signalized Intersection Summary

| | 1 | - | \mathbf{i} | 1 | + | * | 1 | Ť | 1 | 1 | Ŧ | 1 |
|------------------------------|------|------|--------------|-----|-----|------|------|------|------|------|------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBF |
| Lane Configurations | ሻሻ | \$ | 1 | | | | | 1111 | 1 | ስካ | 1111 | |
| Traffic Volume (veh/h) | 311 | 4 | 911 | 0 | 0 | 0 | 0 | 612 | 131 | 851 | 2316 | (|
| Future Volume (veh/h) | 311 | 4 | 911 | 0 | 0 | 0 | 0 | 612 | 131 | 851 | 2316 | (|
| nitial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | (|
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Nork Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | C |
| Adj Flow Rate, veh/h | 272 | 0 | 1063 | | | | 0 | 665 | 142 | 925 | 2517 | C |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | C |
| Cap, veh/h | 1322 | 0 | 1176 | | | | 0 | 1474 | 363 | 993 | 3564 | 0 |
| Arrive On Green | 0.37 | 0.00 | 0.37 | | | | 0.00 | 0.23 | 0.23 | 0.29 | 0.55 | 0.00 |
| Sat Flow, veh/h | 3563 | 0 | 3170 | | | | 0 | 6696 | 1585 | 3456 | 6696 | C |
| Grp Volume(v), veh/h | 272 | 0 | 1063 | | | | 0 | 665 | 142 | 925 | 2517 | C |
| Grp Sat Flow(s),veh/h/In | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | 0 |
| Q Serve(g_s), s | 6.2 | 0.0 | 38.1 | | | | 0.0 | 10.7 | 9.1 | 31.3 | 34.4 | 0.0 |
| Cycle Q Clear(g c), s | 6.2 | 0.0 | 38.1 | | | | 0.0 | 10.7 | 9.1 | 31.3 | 34.4 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 1322 | 0 | 1176 | | | | 0 | 1474 | 363 | 993 | 3564 | 0 |
| V/C Ratio(X) | 0.21 | 0.00 | 0.90 | | | | 0.00 | 0.45 | 0.39 | 0.93 | 0.71 | 0.00 |
| Avail Cap(c_a), veh/h | 1499 | 0 | 1334 | | | | 0 | 1474 | 363 | 1051 | 3564 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 25.7 | 0.0 | 35.7 | | | | 0.0 | 39.8 | 39.2 | 41.6 | 19.6 | 0.0 |
| ncr Delay (d2), s/veh | 0.1 | 0.0 | 8.2 | | | | 0.0 | 1.0 | 3.1 | 13.8 | 1.2 | 0.0 |
| nitial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 0.0 | 15.6 | | | | 0.0 | 4.1 | 3.7 | 14.4 | 11.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 25.8 | 0.0 | 43.9 | | | | 0.0 | 40.8 | 42.3 | 55.4 | 20.8 | 0.0 |
| LnGrp LOS | С | A | D | | | | A | D | D | E | С | A |
| Approach Vol, veh/h | | 1335 | | | | | | 807 | | | 3442 | |
| Approach Delay, s/veh | | 40.2 | | | | | | 41.0 | | | 30.1 | |
| Approach LOS | | D | | | | | | D | | | С | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 39.0 | 32.0 | | | | 71.0 | | 49.0 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 36.5 | 19.5 | | | | 60.5 | | 50.5 | | | | |
| Max Q Clear Time (g c+l1), s | 33.3 | 12.7 | | | | 36.4 | | 40.1 | | | | |
| Green Ext Time (p_c), s | 1.2 | 2.5 | | | | 19.0 | | 4.4 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 34.1 | | | | | | | | | |
| HCM 6th LOS | | | C | | | | | | | | | |

User approved volume balancing among the lanes for turning movement.

OCTA Metrolink Maintenance Facility AECOM

Synchro 10 Report Page 2

HCM 6th Signalized Intersection SummaAtemative 2 - Short Term Interim Conditions + Project 3: I-5 Southbound Ramps & Sand Canyon Ave PM Peak Hour

| | ٨ | -+ | \mathbf{i} | 1 | - | * | 1 | Ť | 1 | 1 | ŧ | * |
|------------------------------|------|------|--------------|-----|-----|------|------|------|------|------|------|----|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | S |
| Lane Configurations | ሻሻ | \$ | 1 | | | | | 1111 | 1 | ሻሻ | 1111 | |
| Traffic Volume (veh/h) | 704 | 1 | 236 | 0 | 0 | 0 | 0 | 2315 | 401 | 655 | 1013 | |
| Future Volume (veh/h) | 704 | 1 | 236 | 0 | 0 | 0 | 0 | 2315 | 401 | 655 | 1013 | |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | |
| Ped-Bike Adj(A pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | |
| Adj Flow Rate, veh/h | 845 | 0 | 172 | | | | 0 | 2516 | 436 | 712 | 1101 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | |
| Cap, veh/h | 990 | 0 | 294 | | | | 0 | 2811 | 692 | 882 | 4716 | |
| Arrive On Green | 0.19 | 0.00 | 0.19 | | | | 0.00 | 0.44 | 0.44 | 0.26 | 0.73 | 0 |
| Sat Flow, veh/h | 5344 | 0 | 1585 | | | | 0 | 6696 | 1585 | 3456 | 6696 | |
| Grp Volume(v), veh/h | 845 | 0 | 172 | | | | 0 | 2516 | 436 | 712 | 1101 | |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1585 | 1728 | 1609 | |
| Q Serve(g s), s | 16.8 | 0.0 | 10.9 | | | | 0.0 | 39.8 | 23.5 | 21.3 | 6.1 | 1 |
| Cycle Q Clear(g c), s | 16.8 | 0.0 | 10.9 | | | | 0.0 | 39.8 | 23.5 | 21.3 | 6.1 | 1 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0 |
| Lane Grp Cap(c), veh/h | 990 | 0 | 294 | | | | 0 | 2811 | 692 | 882 | 4716 | |
| V/C Ratio(X) | 0.85 | 0.00 | 0.59 | | | | 0.00 | 0.90 | 0.63 | 0.81 | 0.23 | 0 |
| Avail Cap(c a), veh/h | 1093 | 0 | 324 | | | | 0 | 2837 | 699 | 882 | 4716 | |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1. |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0 |
| Uniform Delay (d), s/veh | 43.4 | 0.0 | 41.0 | | | | 0.0 | 28.6 | 24.1 | 38.4 | 4.7 | 1 |
| Incr Delay (d2), s/veh | 6.2 | 0.0 | 2.3 | | | | 0.0 | 4.9 | 4.3 | 5.6 | 0.1 | |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1 |
| %ile BackOfQ(50%),veh/In | 7.9 | 0.0 | 4.4 | | | | 0.0 | 14.6 | 8.8 | 9.1 | 1.4 | 1 |
| Unsig. Movement Delay, s/veh | 1 | | | | | | | | | | | |
| LnGrp Delay(d),s/veh | 49.6 | 0.0 | 43.2 | | | | 0.0 | 33.6 | 28.4 | 44.0 | 4.8 | |
| LnGrp LOS | D | A | D | | | | A | C | C | D | A | |
| Approach Vol. veh/h | | 1017 | | | | | | 2952 | | | 1813 | |
| Approach Delay, s/veh | | 48.5 | | | | | | 32.8 | | | 20.2 | |
| Approach LOS | | D | | | | | | C | | | C | |
| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 32.6 | 52.6 | | | | 85.1 | | 24.9 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | | | | 4.5 | | 4.5 | | | | |
| Max Green Setting (Gmax), s | 25.5 | 48.5 | | | | 78.5 | | 22.5 | | | | |
| Max Q Clear Time (g c+l1), s | | 41.8 | | | | 8.1 | | 18.8 | | | | |
| Green Ext Time (p_c), s | 0.7 | 6.3 | | | | 8.4 | | 1.5 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 31.6 | | | | | | | | | |
| HCM 6th LOS | | | С | | | | | | | | | |
| Notes | | | | | | | | | | | | |

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| OCTA Metrolink Maintenance Facility | |
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| AECOM | |

| HCM 6th Signalized 1: I-5 Northbound F | | | | 2 - Sh | nort Tei | rm Inter | im Co | nditio | | roject ak Hour |
|---|---|-----|---|--------|----------|----------|-------|--------|---|-------------------|
| | * | 100 | 4 | ٨ | | | | ١ | 1 | 7 |

| | / | → | 7 | 1 | | \sim | | | 1 | * | ŧ | * |
|------------------------------|----------|--------------|------------|----------|----------|--------|------|------|-------|-------|----------|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | ኘኘ | ↑1 }- | 1 | ሻኘ | <u>^</u> | 1 | ሻኘ | *** | 1 | ľ | ^ | 1 |
| Traffic Volume (veh/h) | 1126 | 41 | 228 | 587 | 64 | 146 | 653 | 1684 | 707 | 171 | 913 | 310 |
| Future Volume (veh/h) | 1126 | 41 | 228 | 587 | 64 | 146 | 653 | 1684 | 707 | 171 | 913 | 310 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Ped-Bike Adj(A pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1945 |
| Adj Flow Rate, veh/h | 1224 | 45 | 248 | 638 | 70 | 159 | 710 | 1830 | 768 | 186 | 992 | 337 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1182 | 137 | 232 | 1054 | 165 | 73 | 745 | 1806 | 561 | 186 | 1239 | 400 |
| Arrive On Green | 0.33 | 0.07 | 0.07 | 0.30 | 0.05 | 0.05 | 0.22 | 0.35 | 0.35 | 0.10 | 0.24 | 0.24 |
| Sat Flow, veh/h | 3563 | 1870 | 3170 | 3456 | 3554 | 1585 | 3456 | 5106 | 1585 | 1781 | 5106 | 1648 |
| Grp Volume(v), veh/h | 1224 | 45 | 248 | 638 | 70 | 159 | 710 | 1830 | 768 | 186 | 992 | 337 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 1585 | 1728 | 1777 | 1585 | 1728 | 1702 | 1585 | 1781 | 1702 | 1648 |
| Q Serve(q s), s | 36.5 | 2.5 | 5.5 | 17.3 | 2.1 | 4.1 | 22.3 | 38.9 | 38.9 | 11.5 | 20.1 | 21.4 |
| Cycle Q Clear(g c), s | 36.5 | 2.5 | 5.5 | 17.3 | 2.1 | 4.1 | 22.3 | 38.9 | 38.9 | 11.5 | 20.1 | 21.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 1182 | 137 | 232 | 1054 | 165 | 73 | 745 | 1806 | 561 | 186 | 1239 | 400 |
| V/C Ratio(X) | 1.04 | 0.33 | 1.07 | 0.61 | 0.42 | 2.16 | 0.95 | 1.01 | 1.37 | 1.00 | 0.80 | 0.84 |
| Avail Cap(c a), veh/h | 1182 | 221 | 375 | 1054 | 165 | 73 | 745 | 1806 | 561 | 186 | 1239 | 400 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.8 | 48.4 | 23.5 | 32.6 | 51.0 | 34.0 | 42.6 | 35.5 | 35.5 | 49.2 | 39.1 | 39.6 |
| Incr Delay (d2), s/veh | 35.8 | 1.4 | 59.6 | 1.0 | 1.7 | 565.8 | 22.3 | 24.6 | 177.7 | 65.6 | 5.5 | 19.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/In | 21.6 | 1.2 | 5.1 | 7.4 | 1.0 | 13.6 | 11.2 | 18.8 | 42.5 | 8.2 | 8.5 | 10.8 |
| Unsig. Movement Delay, s/veh | 1 | | | | | | | | | | | |
| LnGrp Delav(d).s/veh | 72.5 | 49.8 | 83.1 | 33.6 | 52.8 | 599.7 | 64.9 | 60.1 | 213.2 | 114.8 | 44.6 | 58.6 |
| LnGrp LOS | F | D | F | C | D | F | E | F | F | F | D | E |
| Approach Vol. veh/h | | 1517 | | | 867 | | | 3308 | | | 1515 | |
| Approach Delay, s/veh | | 73.6 | | | 139.0 | | | 96.7 | | | 56.4 | |
| Approach LOS | | E | | | F | | | F | | | E | |
| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 16.0 | 43.4 | 38.0 | 12.6 | 28.2 | 31.2 | 41.0 | 9.6 | | | | |
| Change Period (Y+Rc), s | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | | | |
| Max Green Setting (Gmax), s | 11.5 | 38.9 | 28.6 | 13.0 | 23.7 | 26.7 | 36.5 | 5.1 | | | | |
| Max Q Clear Time (g c+l1), s | 13.5 | 40.9 | 19.3 | 7.5 | 24.3 | 23.4 | 38.5 | 6.1 | | | | |
| Green Ext Time (p c), s | 0.0 | 0.0 | 1.8 | 0.6 | 0.0 | 2.1 | 0.0 | 0.0 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 6th Ctrl Delay | | | 88.4 | | | | | | | | | |
| HCM 6th LOS | | | F | | | | | | | | | |
| Notes | _ | | | | | | | | | | | |
| User approved volume balanci | ing amor | g the lan | es for tur | ning mov | ement. | | | | | | | |

Appendix I Public Outreach

Metrolink Orange County Maintenance Facility

Prepared for:

Orange County Transportation Authority

550 S. Main St. Orange, CA 92868 and

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

Prepared by:

AECOM 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|----------------------------------|----------|
| 0 | Draft Appendix I Public Outreach | 4/1/2022 |
| | | |
| | | |

Table of Contents

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|----|---------------------------|-----|
| 2. | PUBLIC OUTREACH MATERIALS | .1 |

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1. PUBLIC OUTREACH SUMMARY

OCTA provided the nearby residents of the Travata community with several opportunities to meet to discuss the Project. Below is a summary of those meetings.

- OCMF Virtual Public Meeting , Oct. 5, 2021 5:30 p.m.
 - o Travata was notified via flyer
 - Recording of meeting is available here: <u>https://youtu.be/luPm9uYc2ns</u>. Also posted on <u>www.octa.net/ocmf</u>
- Thursday, Nov. 4, 10:30 a.m.
 - Member of OCTA Outreach went to Travata to provide residents with ways to access project information if they missed the virtual meeting.
 - o Residents were notified via email through Travata property manager.
- Wednesday, Jan. 12, 5 p.m.
 - OCTA Outreach and Project Manager met with Travata to go over project, answer questions and clarify environmental process.
 - o Residents were notified via email through Travata property manager.
- Wednesday, March 14, 5 p.m.
 - OCTA Outreach, Project Manager, Environmental Consultant, and City of Irvine staff met with Travata to go over project, answer questions on the Draft IS/MND that was circulated on Monday, February 28, 2022. A hardcopy of the Draft IS/MND was delivered to the community on February
 - o Residents were notified via email through Travata property manager.

2. PUBLIC OUTREACH MATERIALS

The following are outreach materials for this Project, including the Notice of Intent to Adopt a Mitigated Negative Declaration (NOI) and newspaper (printed and website) publications.



February 28, 2022

To: Public Agencies, Organizations, and Interested Parties

From: Orange County Transportation Authority

Subject: Notice of Public Review and Intent to Adopt a Mitigated Negative Declaration

Pursuant to the *State of California Public Resources Code* and the *Guidelines for Implementation of the California Environmental Quality Act*, as most recently amended, this notice is issued to advise that the Orange County Transportation Authority (OCTA) has prepared a Draft Initial Study/Mitigated Negative Declaration (IS/MND) to evaluate the environmental effects of the Metrolink Orange County Maintenance Facility Project (Project). The Project will provide locomotive and railcar servicing and storage facilities for Metrolink's Orange County Line trains in order to improve Metrolink's operational efficiency and overall system performance.

This Initial Study was completed in accordance with OCTA's Guidelines for Implementing the California Environmental Quality Act (CEQA). The document relies on site-specific analysis prepared to address in detail the environmental impacts associated with the Project. On the basis of the Initial Study, OCTA staff has concluded that the Project will not have a significant effect on the environment with the implementation of best management practices and mitigation measures. Consequently, a Mitigated Negative Declaration is proposed.

The Project site is not listed on any lists enumerated under Section 65962.5 of the California Government Code.

Project Location: The proposed location for the Project lies in the City of Irvine (City). The main Project Footprint is located on a 21.3-acre OCTA-owned parcel in the City, adjacent to Marine Way and OCTA Metrolink Railroad, between mileposts (MP) 183.50 and 184.00. This location is within a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was quitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City that same year. OCTA then purchased the fee ownership of the Project Site from the City. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley. Construction for the Project will also occur within the existing Metrolink railroad corridor between MP 183.30 and MP 184.50.

Project Description: The Project includes the construction of a new rail yard, a new rail bridge over the Bee Canyon Channel adjacent to an existing single-span rail bridge, lead tracks and yard tracks, storage, operations and maintenance buildings, train wash, ancillary structures, landscape improvements, street and traffic signal improvements, and safety and security features. Funding is currently not available to construct the entire facility at one time. Instead, a phase construction approach is proposed to build the initial portion of the facility including the most immediately needed elements. The addition of the remaining components will be advanced as the need arises and when funding becomes available.

Public Review Period: A 30-day public review period will begin on February 28, 2022. Comments can be submitted via email (ocmf@octa.net) or mailed to Lora Cross, Project Manager, Orange County Transportation Authority, 550 S. Main Street Orange, CA 92868. Comments must be submitted by no later than 5:00 p.m. on March 29, 2022. The Draft IS/MND and reference documents are also available for review with a link to comment on the Project webpage (www.octa.net/ocmf) and for review physically at the OCTA headquarters at 550 S. Main Street in the City of Orange.

For additional information regarding this Project, please contact:

Lora Cross Project Manager Orange County Transportation Authority E-mail: ocmf@octa.net

HOLLYWOOD

Protesters seek end to COVID-19 mandates as they wane

By Linh Tat ltat@scng.com

On the eve of an anticipated announcement by Gov. Gavin Newsom's administration about when its indoor school masking mandate might be lifted, more than 100 people gathered in Hollywood on Sunday to demand the end of coronavirus mandates – with an emphasis on doing away with school masking requirements in order to restore a sense of normalcy for students.

During the "March to Free L.A.," an event orga-nized by The L.A. Uprising and California Students United and attended by parents from Los Angeles Unified and other Southern California districts, participants called on local, state and federal officials to stop treating the presence of the coronavirus as a state of emergency.

Two years into the pandemic, with transmission and hospitalization rates coming down again after the winter surge and with vaccines available in the United States to those who want them, there is a growing sentiment that the virus is here to stay, and that society must learn to live with it.

"Why are we having a state of emergency when we're hosting the Super Bowl and the Oscars? ... We want L.A. to go back to normal," said Danna realizing what we've done bara Ferrer to be fired or eased up on its guidance coronavirus safety proto- cluding the current test-Rosenthal, a member of to kids, it's going to be a to step down. The L.A. Uprising and Cal- major tragedy going forifornia Students United, and a parent in L.A. Uni- need to start putting chil- from La Brea Avenue to the new guidelines, L.A. for keeping students and fied.

She and other parents have voiced concerns that strictions in schools are mental health crises that many children have experienced throughout the pandemic



More than 100 protesters including parents and their kids march along Hollywood on Boulevard Sunday. The "March to Free L.A." rally to demand the county end all coronavirus mandates, including ones related to masking in schools, and for a return to normalcy. Today, state officials are expected to lift an indoor mask mandate within schools.

РНОТО ВУ GENE BLEVINS

ward," Rosenthal said. "We Hollywood Boulevard dren first instead of asking Vine Street came on the the children to protect us.²

prolonged coronavirus re- in the march say they've state officials are expected lost faith in public health to make today regarding harming students, cit- officials and believe that when California might lift ing learning loss and coronavirus restrictions its indoor school masking aren't grounded in science policy. but, rather, politics.

ing for L.A. County Pub- U.S. Centers for Disease trict officials have repeat- in schools. "If the adults don't start lic Health Director Bar- Control and Prevention edly touted the district's

Sunday's march down eve of a highly antici-Those who participated pated announcement that still considered a high-risk core reason why no cam-

The march also took masks indoors. They have been call- place two days after the

dates. However, under counties in the U.S., is area for coronavirus transmissions. In such counties, the CDC continues to recommend that people, in- teachers union also recluding students, wear

L.A. Unified School Dis-

to allow more counties to cols – whose standards lift indoor masking man- are considered among the highest in the nation – cited those protocols as a pus has had to shut down since schools reopened.

The head of the local cently suggested that it's indoor masking mandates

"These protocols, in- and schools."

ing regiment and indoor masking, have protected tens of thousands of educators and more than County, like 37% of other staff safe. They have often half a million students, along with their families,² United Teachers Los Angeles President Cecily Myart-Cruz had said Wednesday. "It is premature to discuss removing these health and safety measures while too early to discuss lifting there are still many unvaccinated youths in our early education programs



Metrolink Orange County Maintenance Facility Project Notice of Public Review and Intent to Adopt a Mitigated Negative Declaration



Pursuant to the State of California Public Resources Code and the Guidelines for Implementation of the California Environmental Quality Act, as most recently amended, this notice is issued to advise that the Orange County Transportation Authority (OCTA) has prepared a Draft Initial Study/Mitigated Negative Declaration (IS/MND) to evaluate the environmental effects of the Metrolink Orange County Maintenance Facility Project (Project). The Project will provide locomotive and railcar servicing and storage facilities for Metrolink's Orange County Line trains in order to improve Metrolink's operational efficiency and overall system performance.

This Initial Study was completed in accordance with OCTA's Guidelines for Implementing the California Environmental Quality Act (CEQA). The document relies on site-specific analysis prepared to address in detail the environmental impacts associated with the Project. On the basis of the Initial Study, OCTA staff has concluded that the Project will not have a significant effect on the environment with the implementation of best management practices and mitigation measures. Consequently, a Mitigated Negative Declaration is proposed.

The Project site is not listed on any lists enumerated under Section 65962.5 of the California Government Code.

Project Location: The proposed location for the Project lies in the City of Irvine (City). The main Project Footprint is located on a 21.3-acre OCTA-owned parcel in the City, adjacent to Marine Way and OCTA Metrolink Railroad, between mileposts (MP) 183.50 and 184.00. This location is within a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was quitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City that same year. OCTA then purchased the fee ownership of the Project Site from the City. Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley. Construction for the Project will also occur within the existing Metrolink railroad corridor between MP 183.30 and MP 184.50.

Project Description: The Project includes the construction of a new rail yard, a new rail bridge over the Bee Canyon Channel adjacent to an existing single-span rail bridge, lead tracks and yard tracks, storage, operations and maintenance buildings, train wash, ancillary structures, landscape improvements, street and traffic signal improvements, and safety and security features. Funding is currently not available to construct the entire facility at one time. Instead, a phase construction approach is proposed to build the initial portion of the facility including the most immediately needed elements. The addition of the remaining components will be advanced as the need arises and when funding becomes available.

Public Review Period: A 30-day public review period will begin on February 28, 2022. Comments can be submitted via email (ocmf@octa.net) or mailed to Lora Cross, Project Manager, Orange County Transportation Authority, 550 S. Main Street Orange, CA 92868. Comments must be submitted by no later than 5:00 p.m. on March 29, 2022. The Draft IS/MND and reference documents are also available for review with a link to comment on the Project webpage (www.octa.net/ocmf) and for review physically at the OCTA headquarters at 550 S. Main Street in the City of Orange.

For additional information regarding this Project, please contact:

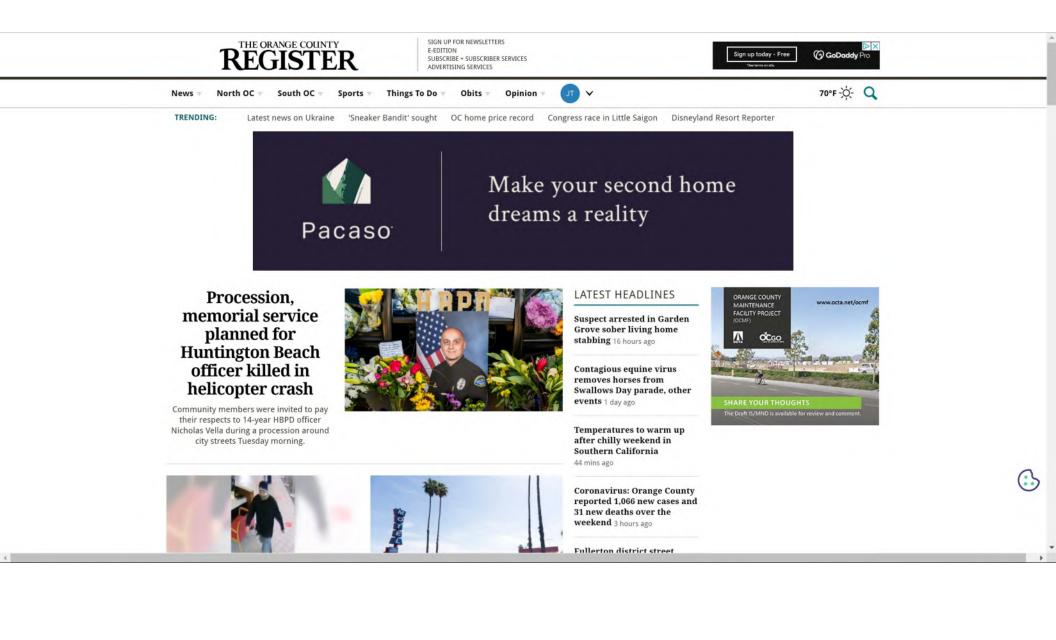
Lora Cross

Project Manager Orange County Transportation Authority E-mail: ocmf@octa.net

APPOINTMENTS AVAILABLE NOW!







Appendix J Response to Comments

Metrolink Orange County Maintenance Facility

Prepared for:

Orange County Transportation Authority

550 S. Main St. Orange, CA 92868 and

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

Prepared by:

AECOM 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|-----------------------------------|----------|
| 0 | Draft IS-MND Response to Comments | 4/1/2022 |
| 1 | Final IS-MND Response to Comments | 5/9/2022 |
| | | |

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1. INTRODUCTION

The Draft Initial Study/Mitigated Negative Declaration (Draft IS/MND) for the Metrolink Orange County Maintenance Facility Project (Project) was circulated for public review on February 28, 2022 through March 29, 2022. A total of 85 comment letters were received. Written responses are presented for all comments received during the public review period. Each comment letter comment has been assigned a comment number that reflects the order in which the comments was entered into our comment log.

2. RESPONSES TO COMMENTS

The following matrix provides all comments letter text received during the public review period and the responses associated with all individual comments contained in the comment letter.

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| Comme nt No. | Date Received | Commen tor | Contact Info | Comment Received | Response to Comment |
|-----------------|----------------------|--------------------------------|--|---|--|
| | Received | Name(s) | | Dear Sir: | Opposition of the Project has been noted and will be considered by OCTA. |
| | | | | We would like to take this opportunity to inform you of our objection to the proposed construction of the Metrolink maintenance facility by the Orange County Transportation Authority (OCTA) at the former El Toro Marine Base. | Section 3.3 of the IS/MND states impacts related to air quality would be less than significant with mitigation measures incorporated, and the criteria air pollutant emissions associated with the pr |
| | | | | Our opposition to the facility is predicated upon the creation of potentials for health hazards, noise issues, increased traffic activity possibly resulting in congestion, devaluation of surrounding real estate property, and air pollution. | Section 3.13 of the IS/MND states impacts related to noise would be less than significant with miligation measures, and the generation of a substantial temporary or permanent increase in amb standards of other agencies would be less than significant. Additionally, total Project sound levels would not meet or exceed the FTA thresholds for both on-site operational noise sources assort |
| | | | | Prior to the purchase of our residence in April 2019 at the Travata Community across from the Great Park, we had explored many other residential locations. We found Travata to offer many amenities which facilitated our decision to purchase. It should be noted that at no time during our purchasing process was there a disclosure regarding the proposed OCTA maintenance facility. The disclosure of such information would have deterred us from making the purchase. | |
| | | | | We did not become aware of the proposed facility until November 2021. | Section 3.14 of the IS/INID states impacts related to population and housing would not occur because the proposed Project is located on vacant land where no housing currently exists, and the |
| 1 | 03/02/22 | Chris & Joyce Loo | loo1995@aol. com | As a suggestion, we would like to see the city planners collaborate with OCTA to find another location which would be suitable and conducive for a rail maintenance facility. | impacts, including those specific to real estate property values is not required per CEQA Guidelines. |
| | | JOYCE LOO | Irvine, CA | Sincerely, | Regarding disclosure of the Project, per Planning Commission resolution 16-3551 which was adopted November 17, 2016, disclosure statements for the Travata community were to include no |
| | | | | Chris/Joyce Loo | Regarding possible relocation of the Project to another site, in June of 2010 OCTA entered into an agreement for reserving the 21 acre site for purchase from the City of Irvine for the purpose is no other open land along the Orange County rail line that would make it feasible ot move the location of the station. |
| | | | | Proposed OCTA facility location. The Travata Community is directly in the background. | Refer to Comment Response 1 regarding concern over disclosure of project. |
| | | | | March 2, 2022 | Refer to Comment Response 1 regarding impacts related to noise and air quality. |
| | | | | Lora Cross, Project Manager Orange County Transportation Authority 550 S. Main Street Orange, CA 92868. | Section 3.1 of the IS/MND states sensitive receptors (the Great Park and residences) would be too far from the Project Site to experience spillover lighting due to security lighting. Additionally, sensitive areas to the maximum each feasible. Therefore, impact sould be less than system is section also states views from the residences located northwest of the Project Site outly be blocked by fencing that would surround the Project Site during construction and a six-fact concrete wall with landscaping during operations. The Project would not substantially alter the visu are surrounded by an existing tail concrete wall and large trees within their property. Additionally, no aesthetically significant view or landmark would be altered or blocked. Therefore, impacts we |
| | | | mail.com | Our recently constructed Travata community (55 years and over) has been given a major blow by finding out about the plans to build an OCTA train maintenance facility directly across the street from our community. This project was never disclosed to us in the required disclosure documents, prior to purchasing our properties, and we would have never build not more in the Travata development if we had known what was being planned. A 24 hour a day train maintenance facility directly across the street from our community. This project was maintenance facility directly across the street from our community is totally unacceptable. Noise, light, air / ground pollution and its visual presence have the potential to drastically alter the quality of our lives and values of our properties. Our community is made up of senior citizens and this is the wrong project for the proposed location. | S OCTA is not familiar with the All American Asphalt Plan and therefore cannot comment on it. The OCMF is not a manufacturing site. Refer to Comment Response 1 regarding relocation of the Project. |
| 2 | 03/02/22 | Howard Lichtman | (310) 710- 8001 | This is a very serious matter and we do not want to end up with another "North Irvine - All American Asphalt Plant" nightmare in our backyard. | |
| | | | 105 Palencia, Irvine CA | Please find another location away from our community. A portion of the south / adjacent RV Storage Depot or further south Great Park land to the south of the RV Storage Depot (both properties adjacent to the railroad tracks) are just a few of alternate locations that should be considered. | |
| | | | | PLEASE FIND ANOTHER LOCATION!!!! | |
| | | | | Sincerely, | |
| | | | | Howard Lichtman Homeowner | |
| | | | | 105 Palencia, Irvine, CA. 92618 | |
| | | | | to: Lora Cross, Project Manager, Orange County Transportation Authority | Refer to Comment Response 1 for impacts related to noise and air quality. Refer to Comment Response 2 for impacts related to lighting and visual quality. |
| | | | | Dear Ms. Cross: | Regarding a request for a meeting, on March 14th, 2022 OCTA held a meeting with the Travata Community in which City Planners were present to answer questions. A separate meeting was I |
| | | | | Our recently constructed Travata community (55 years and over) has been given a major blow by finding out about the plans to build an OCTA train maintenance facility directly across the street from our community. This project was never | er Refer to Comment Response 2 regarding All-American Asphalt. |
| | | | | disclosed to us in the required disclosure documents, prior to purchasing our properties, and we would have never bought our homes in the Travata development if we had known what was being planned. A 24 hour a day train maintenance facility within 500 feet of our community is totally unacceptable. Noise, light, air / ground pollution and its visual presence have the potential to drastically after the quality of our lives and values of our properties. Our | Opposition of the Project has been noted and will be considered by OCTA. |
| | | | | community is made up of senior citizens and this is the wrong project for the proposed location. We need to have a meeting with city council and city planner representatives as soon as possible to discuss this matter and to voice our concerns. A meeting at our Travata Community Center with city representatives is requested as | |
| 3 | 03/03/22 | David Wang and | | we need to have a meeting with city council and city planner representatives as soon as possible to discuss this matter and to voice our concerns. A meeting at our fravata community center with city representatives is requested as soon as possible. | |
| 5 | 00/00/22 | Jeanne Lu | 148 Burgess, Irvine CA | This is a very serious matter and we do not want to end up with another "North Irvine - All American Asphalt Plant" nightmare in our backyard. | |
| | | | | Best regards | |
| | | | | David Wang and Jeanne Lu Residents at | |
| | | | | 148 Burgess Irvine, CA92618 | |
| | | | | | |
| | | | | Dear Orange County Transit Authority members, | Refer to Comment Response 1 regarding impacts related to noise, air quality, and traffic. Refer to Comment Response 2 regarding impacts to visual quality. |
| | | | | We are senior citizens living in the Travata neighborhood which is adjacent to the proposed Irvine Metrolink Rail Yard site. We relocated to Irvine and to our specific location next to the Great Park for the healthy Irvine environment and for the ability to enjoy healthy walks in the Great Park with clean air, and peaceful surroundings. We are quite disturbed to have recently learned about OCTA plans to build a noisy, pollution generating, view blocking, rail yard right next door. | the use of some heavy equipment and chemical processes for the purpose of maintaining rail vehicles on site does not qualify the OCMF as heavy industrial use. There are no heavy industrial |
| | | | | We believe the proposed use would violate zoning ordinances and clearly result in excessive noise at night and degradation of air quality, not to mention already high traffic on Marine Way. These would certainly have substantial adverse | consistent with existing land use and zoning requirements. |
| | | Thomas | tcooper1213 @icloud.com | effects on nearby residents. | Refer to Comment Response 1 regarding relocation of the Project. Opposition of the Project has been noted and will be considered by OCTA. |
| 4 | 03/06/22 | and Nancy Cooper | 144 Palencia, | We are totally against the proposed Metrolink Rail Yard, and we object to the Mitigated Negative Declaration. | |
| | | | Irvine CA | Sincerely, Thomas L Cooper and Nancy A Cooper | |
| | | | | 144 Palencia Irvine, CA 92618 | |
| | | | | | |
| | | | | To Whom It May Concern, | As detailed in Table 3.3-15, Summary of Excess Cancer Risks, of the MND, and shown in Figure 10.2-2 (Contour Map of 30-Year Residential Cancer Risk) of Appendix B of the MND, the maa million. The maximum excess cancer risk for an individual in a non-age restricted community is 9.25 in a million, also less than the SCAOMD threshold of 10 in a million. Therefore, the Project v |
| | | | alanga6604@ | My name is Patricia Langevin, 134 Burgess, Irvine 92618. I am writing this letter to oppose the proposed Metrolink Rail Maintenance Facility to be built at Marine Way and Ridge Valey. I have been an Irvine resident for 44 years and purchased my new home in Travata near the Great Park in November of 2018. I have read the Mitigated Negative Declaration Document and the Contour Map of the 30 year Cancer Risk report on the Proposed Metrolink Facility and I be an intervention of the second se | Refer to Comment Response 1 regarding impacts to noise, air quality, and traffic. Refer to Comment Response 2 regarding impacts to lighting. |
| 5 | 03/08/22 | Patricia | cox.net | have several objections to this project. I am very concerned about the added noise, light, traffic, and air pollution that the building and operation of this facility would bring to my community. I would have never purchased my new home had I know this was to be developed just 500 feet from my neighborhood. I would appreciate your support in choosing another site for this project. Thank you. | |
| | | Langevin | 134 Burgess, Irvine CA | | |
| | | | | Patricia Langevin | |
| | | | | Ms Cross, | Refer to Comment Response 1 regarding impacts related to noise and air quality. |
| | | | | I received subject letter and reviewed reference documents associated with the proposed rail yard project. I was stunned and appalled to learn that OCTA would propose such a heavy, noisy, pollution-generating industrial site literally | Refer to Comment Response 2 regarding impacts related to visual quality. Refer to Comment Response 1 regarding concern over disclosure of project. |
| | | | | across the street from an over-55 residential community (Travata) and the Great Park recreation complex serving thousands of families in pursuit of healthy outdoor activities. The documents discussing environmental and aesthetic impacts glossed over the reality that such a large complex operating 24/7 and receiving/dispatching rail cars day and night would have a devastating impact to the quality of life for so many proximal Irvine residents. I was particularly strucl by mention that a "six foot fence surrounding the rail vard" would shalf any negative twees of activity conducted within the confines of the site, notificitis and ing the fact that constant noise during nightime and early mention that a "six foot fence surrounding the rail vard" would shalf any negative twees of activity conducted within the confines of the site, notificitis and ing the fact that constant noise during nightime and early mention that a "six foot fence surrounding the rail vard" would shalf any negative twees of activity conducted within the confines of the site, notificities of the site in constant noise during nightime and early mention that a "site for some site of the site in constant noise during nightime and early mention that a site of the site in constant noise during nightime and early mention that and the site that a site of the site in constant noise during nightime and early mention that and the site that and the site that a site of the site in constant noise during nightime and early mention that and the site of the site in constant noise during nightime and early mention that and the site of the site in constant noise during nightime and early mention the site of the site in constant noise during nightime early and the site of the site | k l |
| | | | | operations will regard that boundary as irrelevant. | |
| | | James F. | @rcn.com | | |
| 6 | 03/08/22 | | 258 Carlow, | Respectfully, | |
| 6 | 03/08/22 | Geiger | II VIIIe CA | | |
| 6 | 03/08/22 | Geiger | | James F, Gelger, Colonel, USAF (ret) | |
| 6 | 03/08/22 | Geiger | | James F. Geiger, Colonel, USAF (ret) 258 Carlow Irvine, CA 92618 | |
| 6 | 03/08/22 | Geiger | | 258 Carlow Irvine, CA 92618 Irvine, CA 92618 If ma resident here at the Travata Community in Irvine. I recently learned that the OCTA is contemplating a maintenance facility directly across from our neighborhood. At the time of my purchase, I was never informed in the form of any | Refer to Comment Response 1 regarding concern over disclosure of project. |
| 6 | 03/08/22 | Geiger | | 258 Carlow Irvine, CA 92618 | Refer to Comment Response 1 regarding impacts related to noise and air quality. Refer to Comment Response 2 for impacts related to lighting and aesthetics. |
| 6 | | | qnumber5@a | 258 Carlow Irvine, CA 92618 I'm a resident here at the Travata Community in livine. I recently learned that the OCTA is contemplating a maintenance facility directly across from our neighborhood. At the time of my purchase, I was never informed in the form of any disclosures of the possibility of this happening. I would have seriously reconsidered my purchase had I known. I am very concerned about noise disturbance, lighting disturbance, pollution, aesthetics and the negative effect this facility with | Refer to Comment Response 1 regarding impacts related to noise and air quality. |
| 6 | 03/08/22 03/09/22 | Geiger Edward Benveniste | qnumber5@a tt.net 239 Carlow, | 258 Carlow Invine, CA 92618 I'm a resident here at the Travata Community in livine. I recently learned that the OCTA is contemplating a maintenance facility directly across from our neighborhood. At the time of my purchase, I was never informed in the form of any disclosures of the possibility of this happening. I would have seriously reconsidered my purchase had I known. I am very concerned about noise disturbance, lighting disturbance, pollution, aesthetics and the negative effect this facility will have on the value of my property. What alarms me most, is that the facility will be functioning during unacceptable hours in such close proximity to the residents here at Travata. I am very much against this project being built so close to my home and feel an alternative location should be considered. Sincerely, | Refer to Comment Response 1 regarding impacts related to noise and air quality. Refer to Comment Response 2 for impacts related to lighting and aesthetics. |
| 6 | | Edward | qnumber5@a tt.net 239 Carlow, Irvine CA | 258 Carlow Invine, CA 92618 I'm a resident here at the Travata Community in Irvine. I recently learned that the OCTA is contemplating a maintenance facility directly across from our neighborhood. At the time of my purchase, I was never informed in the form of any disclosures of the possibility of this happening. I would have seriously reconsidered my purchase had I known. I am very concerned about noise disturbance, lighting disturbance, pollution, aesthetics and the negative effect this facility will have on the value of my property. What alarms me most, is that the facility will be functioning during unacceptable hours in such close proximity to the residents here at Travata. | Refer to Comment Response 1 regarding impacts related to noise and air quality. Refer to Comment Response 2 for impacts related to lighting and aesthetics. |

e proposed Project would not expose sensitive receptors to substantial criteria pollutant concentrations.

ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable associated with the Rail Shops and Yard, as well as automobile and truck traffic in and out of the site.

olds and meets the requirements of the Congestion Management Program (CMP) Highway System.

d the land use is designated as the Great Park. The displacement of households or businesses would not occur. The analysis of potential economic

e notification of OCTA facilities in the area including the future Metrolink Maintenance Facility.

ose of a rail maintenance facility. It is not feasible to move the site further south on the rail road due to the location of Irvine Metrolink station and there

III), the nightime lighting futures would be installed to direct the majority of the light to within and directly adjacent to the OCMF, and away from would be blocked by existing mature trees on their properties, as well as the concrete wall that surrounds the residential complex. The view would also visual character for residential viewers primarily due to the distance of the Project buildings from the residential viewers, and because the residences s would be less than significant.

vas held on March 15th between City Planners and Travata residences.

is, schools, or utilities. The Project can be categorized as one of the conditional uses under 6.1 Institutional zoning—government facility. Additionally, strial manufacturing or production features involved in activities at the OCMF during construction and operations. As such, the Project would be

e maximum excess cancer risk for an individual resident in the age restricted community would be 1.68 in a million, less than the threshold of 10 in a ject would not expose the surrounding residents to significant air quality impacts.

| Comme nt No. | Date Received | Commen tor Name(s) | Contact Info | Comment Received | Response to Comment |
|-----------------|------------------|---------------------------------|---|--|--|
| 8 | 03/09/22 | Kelvin Ko | kokelvin@gm ail.com 111 Carlow, Irvine CA | To: Lora Cross Project Manager OCTA Orange, CA Dear Lora, Please consider finding an alternate site to build the captioned project. I am currently residing at Travata, Irvine, an over 55 senior community. Your planned project will adversely impact the quality of life of our community. The noise, light and pollution would be unbearable. The people of our community are at the last stage of our lives. Please don't let that happen to us. Thanks Sincerely, Kedwin Ko Kedwin K | Refer to Comment Response 1 regarding relocation or alternative site of the Project. Refer to Comment Response 1 for impacts related to noise and air quality, and Comment Response 2 for impacts related to lighting. |
| 9 | 03/10/22 | Debra Geiger | geiger.debra @rcn.com | Ints Cross. My fusuband and I, both USAF Veterans, purchased a home in the Travata Community in October 2021. We carefully reviewed and researched the disclosure documents and there was NOTHING provided about the plans to build an OCTA train maintenance facility directly across the street from our intended home. Had there been such a disclosure, we NEVER would have purchased this home. And because we financed using a VA loan, these plans also place the VA Administration at risk should this facility be built and housing prices subsequently decline. Noise and air pollution are a significant concern to me as I suffer from Timitus from my time in the military and have a significant breathing issue related to Diesel fuel (so much so that we had to self a boat we loved because it ran on diese fuel). The diesel furnes caused by trains is likely one of the primary reasons for locating train stations in commercial and industrial areas and not near residences. The proposed train yard site is far doser to residential areas than any Metrolink station in Commercial and provide train yard achiesites produce high here's of diesel particulates. Trains are a major contributor of toxic air contaminants along with construction explines provides particulate matter continues to account for about two-thrids of the cancer risk from air toxins'. This is the WRONG PROJECT for senior citizens like me living nearby the proposed location. Our move to livine was to bring us closer to our 2 grandhilditer (a 2-year of all a newbord) who live within 10 meets of our home. The 2-year old already spends significant time at our home—and in Great Park which is across the street. It is wrong to expose our grandchildren, and the hundreds of other children who participate in events at Great Park, to these toxins. The MND recognizes the train yard as an institutional land use—the same categorization as for churches and schools. However, the use of thesis y duip equipment such as cranes and forklifts' along with the use of industrial chemical | fortifis); fuel tank emissions; natural gas consumption; and on-road vehicle travel for worker, delivery, and haul tips to and from the site. As shown in Table 3.3-10, Localized Operational Maxim operational emissions would not exceed the SCAMD localized thresholds of significance. Trus, the impacts to the nearty sensitive receptors and surrounding land uses would be tests than sig ell increase in commuter rail service or additional boomotive train travel in the region. On the contrary, due to the optimal location of the Project Site, the Project is also anticipated to result in reduct that total regional emissions associated with train idling would decrease at the existing maintenance facilities due to more efficient operations and logistics with the shift of a portion of operations to of significance. |
| 10 | 03/11/22 | Joseph and Sandy Toma | joetoma@me. com 135 Palencia, Irvine CA | To Whom it may concern, Our recently constructed Travata community (55 years and over) has been given a major blow by finding out about the plans to build an OCTA train maintenance facility directly across the street from our community. This project was never disclosed to us in the required disclosure documents, prior to purchasing our properties. Based on this recently discovered information, we would have never bought our home in the Travata development if we had known what was being planned. A 24 hour a day train maintenance facility within 500 feet of our community is totally unacceptable. Noise, light, air / ground pollution and its visual presence have the potential to drastically after the quality of our lives and values of our properties. Our community is made up of senior citizens and this is the wrong project for the proposed location. Regards, Sandy and Joe Toma 135 Palencia Irvine, Ca 92618 | Refer to Comment Response 1 regarding concern over disclosure of project. Refer to Comment Response 1 for impacts related to highting and visual quality. Refer to Comment Response 2 for impacts related to lighting and visual quality. |
| 11-1 | 03/14/22 | Robert and Pamela Swanson | bpswanson@ hotmail.com 209 Carlow, Irvine CA | To: OCTA Re: Opposition to Metrolink Rail Maintenance Facility (OCTA) In 2018, we purchased our home In the senior community of Travata, across from the Irvine Great Park. At that time, we gave careful consideration to the surrounding areas: the 133 and 5 Freeways, the railroad tracks and the Great Park. We believed that those were acceptable as is and would not infringe on our right to a quiet enjoyment of our propertix. We are opposed to the OCTA's plans to build a 24/7 Metrolink maintenance facility across the street from our community. This project was never disclosed to us in the required disclosure documents prior to purchasing our properties, and would have never bought our home in the Travata development if the value ab ping planned. A 24 hour a day train maintenance facility within 500 feet of our community is totally unacceptable. Noise, light air / ground pollution and its visual presence have the potential to drastically ater the quality of our lives and values of our properties, and would have never bought our home in the Travata development if the values of our properties. A 24 hour a day train maintenance facility within 500 feet of our community is totally unacceptable. Noise, light air / ground pollution and its visual presence have the potential to drastically ater the quality of our lives and values of our properties. A 24 hour a day train maintenance facility within 500 feet of our community is totally unacceptable. Noise, light air / ground pollution and its visual presence have the potential to drastically atternite use of industrial chemests should class the yard as heavy industry, a non-periopsed site. A 24 hour a day train maintenance facility within 500 feet of our community and train do into the noise splace. Noise: (a) No actual measurements of noise levels at existing Metrolink train ayards were provided, only estimates mere used. (b) Measurements of sound levels at the time when there are no trains stopping or leaving the site the yard would substanial privation. (c) Oliy of invin | f 1 0. |
| 11-2 | 03/14/22 | Robert and Pamela Swanson | bpswanson@ hotmail.com 209 Carlow, Irvine CA | 5. AIR QUALITY: The MND notes that rail yard activities produce high levels of diesel particulates. Trains are a major contributor of toxic air contaminants along with construction equipment and ships. The report states that 'desel particulate matter: The diesel function of the cancer risk from air toxins. The operational impacts from the rail yard will be primarily from diesel particulate matter. The diesel funces caused by trains is likely one of the particulate matter. The diesel funces caused by trains is likely one of the primary reasons for locating train stations in commercial and industrial areas and not near residences. The proposed train yard site is far closer to residential areas than any Metrolink station. 6. TRAFFIC: Access to the rail yard is along the same single tane road (Marine Way) that is presently well beyond is capacity to handle all users. Travata residents. Great Park users, food bank, distribution center, recycling plant, nursey and soor water park users all are forced onthe. This road reader dy clearly showe the Great Park sports fields were closed due to the pandemic. 7. MANDATORY FINDINGS OF SIGNIFICANCE: The project has environmental impacts that will cause subtertatial adverse effects on humans both directly and indirectly as a result of the negative impact on air quality, noise, light, asstetics and traffic defects as discussed herein. These impacts cannot the mitglated to make the rail yard project feasible at fits' current location. Its' original Status and the rest of Cypress Village residents and secus was feasible. The new location at 500 – 650 feet from Travata is not feasible and the negative impacts are unable to be mitigated successfully. This proposed facility is not an acceptable use of land so near to a residential neighborhood especially when there are alternative sites closer to the Metrolink station on Ada and Barranca where there are only park and commercial neighborhood especially when there are alternative sites closer to the Metrolink st | Refer to Comment Response 1 traffic. In addition, Section 3.20 of the Draft IS/INID states the Project does not include any characteristics such as permanent road closure or long-term blocking shall comply with fire prevention regulations codified by local, regional, and state authorities. Therefore, no construction or operational impacts related to substantially impairing an adopted emerg Section 3.21 of the IS/INID states the Project does not include any characteristics such as permanent road closure or long-term blocking Section 3.21 of the IS/INID states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. Refer to Comment Response 1 regarding relocation of the Project. |
| 12 | 03/14/22 | Stuart Kaufman | skaufman@lu ckymail.com | 1. Trash compactors & waste management located close to Travata. Why not locate farther away? 2. Will wallfence in front of project be landscape to help with the view? 3. New wall should be sound wall Landscaped in front. 4. How are you mitigating traffic? 5. Has a property value study been done showing r.e. value decline. 6. Buildings need to be sound proofed. | The trash compactor and waste management facilities are located at the western end of the maintenance building in an area that is outside of the operating area of the yard, is in close proximity t removal of trash and waste from the site. Refer to Comment Response 2 regarding impacts related to aesthetics and visual quality. Refer to Comment Response 1 regarding impacts related to traffic. The analysis of potential economic impacts, including those specific to real estate property, is not required per CEQA Guidelines. Refer to Section 3.13 as well as Appendix F Noise Technical Memorandum regarding anticipated noise levels. |

3.3 of the MND, operational activities would include emissions from locomotive operations; heavy-duty equipment used on-site (such as cranes and Maximum Daily Emissions, which summarizes the Project's total operational, no-site emissions including locomotive operations, the Project's on-site an significant. For the purposes of the regional emissions analysis, based on information provided by OCTA, the Project would not result in an reduced locomotive travel in the region. It is as anticipated to anticipated disons to the Project site. Thus, as a shown in Table 3.3, the Project en cluster is not increased in egional emissions in the section. It is also anticipated disons to the Project site. Thus, as a shown in Table 3.3, the Project sect regional emissions would also not exceed the regional mitersions. ocking of road access that would physically impair or otherwise conflict with the City's Emergency Preparedness Program. Furthermore, the Project emergency response plan or emergency evacuation plan would occur. imity to the loading docks and maintenance building itself, and is refuse vehicle accessible from the main entrance of the OCMF for pick up and

| Comme nt No. | Date Received | Commen tor | Contact Info | Comment Received | Response to Comment |
|-----------------|------------------|------------------------------|--|--|--|
| | | Name(s) | | 1. Zoning: | Refer to Comment Response 4 regarding impacts related to land use and zoning. |
| 13 | 03/14/22 | Ann Harris | 126 Burgess, Irvine CA | A. The current zoning is institutional: there is no doubt that the proposed use of a maintenance faility that uses heavy equipment and hazard waste materials belong in an industrial use zone. B. In order to rectify the conflict in zoning and use: will the agency seek a ZONE CHANGE or petition for a CONDITIONAL USE PERMIT? 2. TRAFFIC: A. Exactly how many vehicle trips per day will this site create when fully operational? B. Your Environmental Study does not distinguish the difference of heavy truck traffic and passenger vehicles. This is a major concern with so many heavy truck already using Marine Way. C. Will the ingress/regress be located off Marine Way and will this be the only employee and public ingress/regress access? 3. ENVIRONMENTAL ISSUES: 4. (SOUND) What is the maximum sound decimal when fully operational? B. Will there be a sound/site barrier build on Marine Way? What type of barrie will it be? C. Will the water source for the washing bays? Will they be using culturary water or a secondary water source? E. How many guillors of vehace will be goread use water? 4. LOSS OF PUBLIC REVENUES: A. SINCE BOTH THE FROPERTY AND FACILITY IS OWNED AND OPERATED BY THE COUNTY: A TAX EXEMPT ENITY: WILL THERE BE ANY OFF SETS TO MAKE UP FOR LOST REVENUES TO THE PUBLIC? B. F. How and guides the addition the public record as comments for this project. THANK YOU ANN HARRIS A. SOUND WHARRISA. | Refer to Comment Response 1 regarding impacts related to traffic. Approximately 220 vehicles trips would be made per day when fully operational. Table 3.17-3 (Project Trip Generation) of the IS/MND identifies approximately 220 vehicles trips would be made per day when fully operational. Table 3.17-3 (Project Trip Generation) of the IS/MND identifies approximately 220 vehicles trips would be made per day when fully operational. Table 3.17-3 (Project Trip Generation) of the IS/MND identifies approximately 220 vehicles trips would be made per day when fully operational. Table 3.17-3 (Project Trip Generation) of the IS/MND identifies approximately 220 vehicles trips would be made per day when fully operational. Table 3.17-3 (Project Trip Generation) of the IS/MND identifies approximately 220 vehicles trips would be fast an access to the OCMF would require a readway extension along Ridge Valley from the intersection of Ridge Valley and Marine Way. The only site access comes from the new access to the S1.00 operational Noise Levels and Impacts Summary) and in Section 3.13 of the Draft IS/MND, the total Project noise level would be 52 decimals, and includes contributions from both on-site operations is the Trate 3.13.8 (Operational mades contributions from both on-site operations) and in Section 3.19 of the Draft IS/MND, was building. As stated in Section 3.19 of the IS/MND, water imgation would be required for landscape within the Project Site and for train washing activities. In addition, the proposed OCMF would require onsite imgation that would be to significant. Section 2.19 of the IS/MND states, the Project would install a 115 foot by 5 feet deep underground cistem that would hold approximately 552.254 gallons for retention and capture/reuse. Additionally, Section 3.1 four-inch connection line to an existing 12-inch water main line on Marine Way, which would adequately support the project needs. Therefore, impacts would be less than significant. Section 3.19 of the Draft IS/MND states the Project would require t |
| 14 | 03/14/22 | Patty Olvea | m2@gmail.co | IRVINE, CA 92818 It is difficult for me to understand how your report says that there will be just limited environmental impact on the surrounding area. It is difficult for me to understand how your report says that there will be just limited environmental impact on the surrounding area. It is difficult for me to understand how your report says that there will be just limited environmental impact on the surrounding area. It is intervale neighborhood at the at the corner of Ridge Valley and Marine Way. This is a senior community and this project will impact our neighborhood and my life in a few ways. My main concern is sound and raffic. There are concerts, abtietic fields the Great Valley Park, and the water park currently under construction. There is already major traffic jams both on Marine Way and Ridge Valley after athletics are over, especially at the baseball stadiun and soccer fields and Great Park and concerts. 2nd Major Concern - Noise especially when 1 am sleeping. Please do not do this project so close to homes | Refer to Comment Response 1 regarding impacts to noise and traffic. |
| 15 | 03/14/22 | Adly Fam | afam1946@ya hoo.com 129 Palencia, Irvine CA | Can liquids (washing, spilled fuel etc) leach in in the ground and get to the basin inside travata in the Palencia area? -Would the existence of this facility reduce the price of our homes. -Polution from fuels, cleaning liquids and process, sanding, welding, increased traffic How is this polution be measured and controlled. Did the Irvine Co. now the intended use of this land as a maintenance facility? When was your intended use communicated to the Irvine Co. or the City of Irvine? 9 | Refer to Comment Response 14 regarding impacts to wastewater. Economic analysis is not required per CEQA Guidelines. Refer to Comment Response 9 regarding impacts related diesel particulate matter. Section 3.9 of the IS/MND states construction and operation of the Project Site would require the routine handling and storage of petroleum products and hazardous materials. Wastes, including used oils and hazardous wa standards specified under the CCR Title 22 Division 4.5. Additionally, operations of the Project Include the routine handling and use of petroleum products and hazardous materials. Wastes, including used oils and hazardous wa standards specified under the CCR Title 22 Division 4.5. Additionally, operations of the Project Include the routine handling and use of petroleum products and hazardous materials that could leak or spill if equipment such a Storage Building that would store hazardous materials and batteries. To minimize potential impacts, the design of the Project provides containment and/or diversionary structures or equipment to prevent illicit discharge of an or environment through reasonaby foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be less than significant. Refer to Comment Response 1 regarding macts, the related to traffic. |
| 16-1 | 03/15/22 | Kelvin Loh | 104 Palencia, | To: OCTA (OCMF@OCTA.net), Mayor Farrah Khan (farrahkhan@citydirvine.org), Vice Mayor Anthony Kuo (anthonykuo@citydirvine.org), Councilmember Larry Agran (farryagran@citydirvine.org), Councilmember Tarmny Kim (farmykin@citydirvine.org), Councilmember Mike Carol (mikecarol@citydirvine.org)). WY COMMENTS TO THE MTIGATED NEGATIVE DECLARATION (MND') ISSUED TO OCTA FOR THE METROLINK RAIL YARD 1.2 CNING: a. The train yard is classed as an 'institutional' land use, the same categorization as for a school or church. By its' own admission, the use of 'heavy duty equipment such as cranes and forklifts' along with the use of industrial chemicals and processes school: class the yard as heavy industry, a non-permitted use at the proposed site. 2. NOSE: a. No actual measurements of noise levels at existing Metrolink train yards were provided, only estimates were used. b. Measurements of sound levels at the site were taken at a time when there are no trains stopping or leaving the site. Trains were only passing by and yet caused substantial spikes in noise near Travata. Once operational, the train noise form mary more insince control the solving and processes to solving and processes of the solving and processes to solve and the vices of the oscie provided to be solving and possible use of the whitesite on there the yard would substantial increase the frequency and duration of the noise pikes. The noise impact of the solving and possible use of the whitesite are consideration. c. City of Vinne Minicipal Code Nuise Ordnance does not have an upper limit for consideration on ite as the solven and possible use of the whitesite are considerated to more than solven train areas (how tall'). Travata's view of the hilts to the southwere than ingle there will be no impact on the views of the highest exterior noise levels allowed for residential areas in the City of Irvine. 3. AESTHETCS: a. The MND tates that there will be no impact on the southwere tweet set outrary to the report (pg 33, 3, 13, 4). We have to assume that the of c | |
| 16-2 | 03/15/22 | Kelvin Loh | loh.kelvin@g mail.com 104 Palencia, Irvine CA | C. NND notes that the EPA is attempting to reduce locomotive diesel emissions by as much as 90% but has no idea as to where Metrolink's fleet lies at present. d. The methodology used throughout the NND report may not be applicable to the proposed site's size and thus the results provided may need further clarification from an air dispersion analysis. e. The diesed throughout the NND report may not be applicable to the proposed site's size and thus the results provided may need further clarification from an air dispersion analysis. e. The diesed throughout the NND report may not be applicable to the proposed site's size and thus the results provided may need further clarification from an air dispersion analysis. e. TRAFFIC: a. Access to the rail yard is along the same single lane road (Marine Way) that is presently well beyond its capacity to handle all users. Travata residents. Great Park users, food bank, distribution center, recycling plant, nursery and soon water park users all are forced on air single lane. This road ready deary showed its inadequary to ruse as an evacuation road when the Cytrees Village community (that includes Travata) was used a volution to moder a voluntary evacuation during the October 2020 widfire. Traffic was jammed and very slow moving and at a time when the Great Park sports fields were closed due to the pandemic. This inadequate roadway could see the same result as we all witnessed during the Paradise fire tragedy. MANDATORY FINDINGS OF SIGNIFICANCE: TA. Project Hars environmental impacts that will cause substantial adverse effects on humans both directly and indirectly as a result of the negative impact on air quality, noise, light, aesthetic and traffic effects as discussed herein. This is inadequary to the asset more substantial is not feasible and the negative impacts are unable to be mitigated successfully. Submitted ty Kein Lon Submitted ty Kein L | Refer to Comment Response 9 regarding impacts related to diesel fuel and particulate matter. Refer to Comment Response 12 regarding impacts related to the air dispersion analysis. Refer to Comment Response 11 trading impacts related to the air dispersion analysis. Section 3.21 of the IS/MND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| 17 | 03/15/22 | Tim and Nancy Heitkamp | NHeitkamp@ msn.com Irvine,CA | Dear Mayor and City employees My husband and I recently purchased a home in the Travata community across from the Great Park. We enjoy living across from the Great Park and utilize the walking paths daily. We recently learned that OCTA plans to build a 24/7 Metrolink maintenance facility with water treatment, IAKA Sewage Treatment) across the street which is of great concorn. We came from the area near the 60 freeway in Ontaino which has a water (sewage) treatment facility is out a darming. This is not an in Chino on Chino Hills Parkway. The dor that emits from both these facilities is extremely viul. To learn that a water (sewage) treatment facility is out a darming, is out as a one concern you. Who wants their ic City on Chino Hills Parkway. I beg the City Planners to work with the Community Development Dept. and OCTA to relocate this facility to a more acceptable location. There is property near the RV storage yard, the food bank and abandoned buildings. My understanding is this area of choice was made to keep it away from the concert yenue and water park. Sincerely, Tim and Nancy Heltkamp | The Project does not include wastewater treatment, including a sewage treatment plant. Refer to Comment Response 14 regarding impacts to wastewater. Refer to Comment Response 1 regarding impacts to noise and Comment Response 2 for impacts related to lighting. |

| Response to Comment | |
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| able 3.17-3 (Project Trip Generation) of the IS/MND identifies approximately 40 "Other" vehicle trips accessing the Project Site daily (20 in and 20 out), of the total 220 vehicles. "Other" | |
| Ridge Valley and Marine Way. The only site access comes from the new Ridge Valley Extension. At the entrance a security booth, gate arms, and fencing are provided to limit unauthorized uld be 52 decimals, and includes contributions from both on-site operational noise sources associated with the Rail Shops and Yard, as well as automobile and truck traffic in and out of the | |
| dition, the proposed OCMF would require onsite irrigation that would be tied to an existing recycled water main line located on Ridge Valley. Therefore, impacts would be less than 52.254 gallons for retention and capture/reuse. Additionally, Section 3.19 states domestic water requirements are estimated under 250 gallons per minute (gpm) and would require a two to swould be less than significant. Utilities located on Marine Way. During Project operations, solid waste would be collected by underground pipes that would connect to existing utilities on Marine Way that would transfer | |
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| and hazardous materials. Wastes, including used oils and hazardous wastes generated from the Project Site, would be properly managed, transported and disposed per regulatory ducts and hazardous materials that could leak or spill if equipment such as tanks is damaged from a seismic event, fire, or other unforeseen incident. The Project would construct a Material d/or diversionary structures or equipment to prevent illicit discharge of an oil or hazardous materials spill. Therefore, operational impacts that would create a significant hazard to the public d be less than significant. | |
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| 18-1 | 03/15/22 | Dan and Charlotte Nelson | dannnsk@yah oo.com | Dear Mayor and council members: Our recently constructed Travita community (55 years and over) has been given a major blow by finding out about the plans to build an OCTA train maintenance facility directly across the street from our community. This project was never disclosed to us in the required disclosure documents, prior to purchasing our properties, and we would have never bought our homes in the Travita development if we had known what was being planned. A 24 hour a day train maintenance facility diritectly across the street from our community. This project was never disclosed to us in the required disclosure documents, prior to purchasing our properties, and we would have never bought our homes in the Travita development if we had known what was being planned. A 24 hour a day train maintenance facility within 500 feet of our community is totally unacceptable. Noise, light, air / ground pollution and its visual presence have the potential to drastically alter the quality of our lives and values of our properties. Our community is trained use of industrial chemicals and processes should class the year as heavy industry, a non-permitted use at the proposed site. 1. ZONING: The train yard is classed as an "institutional" induse, the same categorization as for a school or church. By lis' own admission, the use of heavy duty equipment such as cranes and forklifts' along with the anticipated high levels of dised train yards. 2. AIR OUALITY: Noise and air quality impacts are likely the most concerning. Page 40 from the MND is attached as 1 (beday discusses the health risks from train yards. 3. The MDN robes that rain yard activities produce high plancialses. Trains are a major combutour of loxic air contrainmaints along yubic construction equivals in the regular were level at the data discusses thores are well incontruction equivals the analysis. The report states that 'disesel particulate matter continues to accurit for about wo-thirds of the cancer risk from air toxns'. 3. The MDN robes that as and acqua | |
| 18-2 | 03/15/22 | Dan and Charlotte Nelson | dannnsk@yah oo.com | 5. LIGHTING: a. Nightime lighting would certainly impact residents' views over the site contrary to the report. We have to assume that the train yard and the 4 cranes of unknown height will be well itt 2477. b. MND incorrectly states that fidelighting at the Great Park obscures our views anyway which is not ture as the rail yard is to the right of the Great Park and field lighting is guite a distance from our homes. 6. TRAFFIC: Access to the rail yard is along the same single lane road (Marine Way) that is presently well beyood its capacity to handle all users. Travata residents, Great Park users, food bank, distribution center, recycling plant, nursery and soon water park users all are forced on a single lane road. This road aready clearly showed its inadequacy for use as an evacuation road when the Cyrcess Village community (that includes Travata) was under a voluntary evacuation during the October 2020 wildfire. Traffic was jammed and very slow moving and at a time when the Great Park sports fields were closed due to the pandemic. This inadequate roadway could see the same result as we all witnessed during the October 2020 wildfire. Traffic was jammed and very slow moving and at a time when the Great Park sports fields were closed due to the pandemic. This inadequate roadway could see the same result as we all witnessed during the advised fire tragedy. 7. MANDATORY FINDINGS OF SIGNIFICANCE: The project has environmental impacts that will cause substantial adverse effects on humans both directly and indirectly as a result of the negative impact on air quality, noise, light, aesthetic and traffic as discussed herein. Please do not permit this project. Dan and Charlotte Nelson | Refer to Comment Response 2 regarding impacts related to lighting. Refer to Comment Response 1 regarding impacts to traffic and Comment Response 11-2 regarding impacts related to fire evacuation. Section 3.21 of the IS/MIND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| 19-1 | 03/16/22 | Serah Maloof | sarahjmaloof @gmail.com 127 Burgess, Irvine CA | OCTA Project Planners: My name is Sarah Maloof, and I am a homeowner in Travata, the 55+ Senior Community across the street from the proposed site for the new OCTA Metrolink Maintenance Facility in Irvine. I have reviewed the document called The Draft Initial Study/Mitigated Negative Declaration (IS/MND) posted on the OCTA site for the Orange County Maintenance Facility Project (OCMF). I am strongly opposed to the OCMF being located on the site detailed in the IS/MND, and I would would like to provide the following comments: 1. ZONING: The rail yard is classed as an "institutional" land use, the same categorization as for a school or church. The use of heavy equipment such as cranes and forkiffs along with the anticipated high levels of diesel emissions, and use of industrial chemicals and processes should class the yard as heavy industry, anon-permitted use at the proposed site. 2. AIR QUALITY: The ISMND cleary discusses the negative health risks from air pollutants and odors on ensitive receptors living within close proximity to facilities emitting diseel particulates. I am retired and spend much of my time in my home and around the Travata achives protochase should class the yard as heavy industry, anon-permitted use at the proposed site. 3. The ISMND notes that rail yard advites protochase the registry expection than thy relaxing the discusses of the cancer risk from air toxins'. 4. The ISMND notes that rail yard advites protochase the registry expection that the ISMND notes that and a story acd advites protochase particulate matter continues to account for about two-thirds of the cancer risk from air toxins'. 5. The operational impacts from the rail yard Wile primarily from disce particulate matter. The ISMND notes that and so construction equipment and ships. The report states that 'diesel particulate' matter' as for the raily and 'disce addition's diad Caryon. 5. Signad Caryon. 6. ISMND notes that the EPA is attempting to reduce locomotive diesel particulate matter. The ISMND notes that the | r |
| 19-2 | 03/16/22 | Sarah Maloof | Irvine CA | | Refer to Comment Response 1 regarding impacts related to traffic and Comment Response 11-2 regarding impacts related to fire evacuation. Section 32 of the IS/NND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. Refer to Comment Response 1 regarding concern over disclosure of project. |
| 20-1 | 03/16/22 | Melissa and Marilyn Sokolow | 1spdwrtr@gm ail.com 148 Palencia, Irvine CA | Dear OCTA, My elderly mother and I are residents of the Travata community in Irvine, California. After my father passed away in 2018, we felt that we needed to move from our house in Fountain Valley that we had lived in with him for more than 30 years. We found Travata in Irvine, which we viewed as a peaceful casis where we were not reminded daily of our loss. My mother and I pooled our life savings to be able to purchase our little casis, a brand-new house which cost over \$1,000,000. We've been happy here since and have found a little pace in our lives. We first became aware of the proposed OCTA Project in the recent past when it was mentioned that literature was distributed to Travata residents concerning this rail yard facility. Before we bought our house, no Lennar sales staff ever mentioned anything about a Metrolink facility being proposed for the future. If this had been disclosed, we wouldn't have purchased our home; it would have been an immediate deal-breaker, at ANY price. We have been in complete appoare to this facility being proposed or health-related concerns/pollution concerns connected to this facility and its construction, including air pollution, ground pollution, drasic lighting changes, and all the health risks and dranging consequences sterming from these factors, as well as the anticipation of our property value decreasing. Alter reading through the Mitgateation, we eleve more strongly that this would destroy our beautiful neighborhood and our quality of life. We are, franky, appelled after reading this document and, honestly, in disbelief that something like this would even be contemplated so close to a residential community with a beautiful word harons ark right arcs to strose the IRVINE, CA, one of the top-rated clies in America. Several findings from the MND were either inaccurate or extremely concerning: 1) How can the OCTA facility be classified as an institutional land use, the same as a school or church? Clearly, this would be an industrial facility utilizing heavy-duty | Refer to Comment Response 16 related to hazardous materials. CECAC Acidelines do not require the analysis of potential economic impacts, including the effects of property values. Refer to Comment Response 9 regarding impacts related to diesel fuel and particulate matter. |

| SCAQMD modeling guidance. Advanced coordination or nd a modeling protocol before performing a risk account | r approval of modeling protocols with SCAQMD is not required for projects for which the ent which deviates from SCAQMD's methodology (emphasis added). Although the Project's ID methodology and approval of the modeling protocol from SCAQMD is not required. |
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| ssment modeling was performed consistent with SCAQM | ID methodology and approval of the modeling protocol from SCAQMD is not required. |
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| 20-2 | 03/16/22 | Melissa and Marilyn Sokolow | 1spdwrtr@gn ail.com 148 Palencia Irvine CA | 3) As far as potential noise pollution, measurements of sound levels around the site were only taken at a time when trains were simply passing through our area, and yet they caused substantial spikes in noise near Travata. Obviously, once the facility is built and operational, the train noise coming from many trains, sometimes simultaneously, would increase the severity, frequency, and duration of the noise. This is not even taking into consideration the sounds of facility equipment in use, which would only add to the noise pollution. On top of all of this, the planned 4 1/2 years of construction would yield noise levels predicted to be at or in excess of the highest exterior noise levels allowed for residential areas in livine. 4) Marine Way, the single-lane road that Travata borders on and the OCTA site would have its employees access from, is already overly crowded with traffic from local residents, Great Park visitors, recycling plant visitors, and soon water park visitors. The resently an inadequate passage for a high volume of vehicles, creating more traffic would turn the situation into a complete rightmane. 5) Contrary to what the MND states, nightlime lighting would certainly impact residents' views over the site. Common sense tells us that the train yard and multiple cranes would be well lif 24/7. In addition, it is incorrect for the MND to that the field lighting at the Great Park obscures our nightlime views anyway. The rail facility would have are a multi-level structure right in its center along with multiple permanent cranes. Obviously, the view would be howed in the MD are very misleading, as they on'the hill formation that are generally visible at any time. b) It is stated that there would be no impact on the WD are very misleading, as they on'the hill formation that are generally visible at multiple permanent cranes. Obviously, the view would be impacted, in a very negative way. The principation this section on air quality, noise level, traffic, lighting, an | |
| 21 | 03/17/22 | Candice Ho | ampil com | Dear Sir and Madam To whom it may concern OCTA (corrifigiocat net), Donald Wagner, 3rd District Supervisor, OCTA Board of Directors, City Of Irvine, Mayor Farrah Khan, Vice Mayor Anthony Kuo, Councilmember Tammy Kim, Councilmember Mike Carroll, Councilmember Larry Agran, City Manager, Oliver C. Chi, Bill Rodrigues, Principle Planner, Victor Mendes, Asst. Planner I hope the Mayor, Councilmembers, City Manager, City Planners, OC Project Manager and Staffs take our voices into consideration and make the City of Irvine beautiful. The City of Irvine is known to be a beautiful city and safe city to live In Manager for their hard velid done work these past years. The City of Irvine has Innovation Intus: - aerospace, gaming industry, Iransportation, Marieta Janen Mogula, et and thoughful development. We applaad to the City of Irvine has anotavian Intus: - aerospace, gaming industry, Iransportation, Marieta Janen Zong, Janes Mare Hander, Janey, Councilmember Jane, Janes Ja | Refer to Comment Response 2 regarding impacts related to aesthetics and visual quality. |
| 22 | 03/17/22 | Michelle Zamora | michellezamo ra4@gmail.co m | I'm writing this email on behalf of my parents, Jerry and Isabel Zamora, to express my concern with the proposed OCTA Maintenance Facility Project to be located off Ridge Valley. This facility would be located near the Travata 55+ community where they reside. Based on the information available, if appears an Environmental impact Review was not completed to determine the potential impact this facility would have on the surrounding communities, which consists of residences and the Great Park. You must be aware of the population density in the area due to them many communities that have been built and the populatity of the Great Park. The popule who purchased homes in the Travata 55+ community be deemed the most vulnerable health wise due to their ages, which includes my parents, ather are built from the failing to the first and the populatity of the Great Park. The popule who for CTA weetsite in the construction is the possible air populating from the facility being used for fusion and clearing the cars. This possible publics would nearly that is hard the home and have whose sud of the families enjoying their time with their loved ones who reside at Travata too. It would be a share if this facility could have on the simulation was a provinonmental impact Review. And it would also cause great distasses if the families enjoying their time with their loved ones who reside at Travata too. It would be a share if this facility county Maintenance Facility (OCMF) to be constructed of of Ridge Valley in Invine. California will include train storage tracks. Icocombre and car service platforms, and a service building with overhead cances. Service platforms will include facilities for inspection fuelting and sanding, and interior and exterior car cleaning. Additional facility components will include facility staff, parts storage and o management, water treatment, parking access roads, and security. The security events common share the responsibility of the treade can environment the resident sureounding dars storage, overhea | |
| 23 | 03/17/22 | and Roger | henrily28@g mail.com 425-239-2900 | To all above-named parties. We moved to trivine from Washington state almost three years ago because we've heard a lot of good things about Irvine, how it's safe, and how the city planners had long term vision while developing this city. We love the Great Parks and all the green around us. When we heard at Lot TA is planning to build a rail maintenance facility next to the Great Park sports fields where our future generations are using constantly, it's such a disappointment that our City officials are even considering the proposal. We're sure you've heard a lot of opposing visices and seen a lot of opposing emails. There are a lot of valid reasons such as toxic waste, noises, traffic congestion on Marine Way which is a one lane road etc During the 2020 fire evacuation, the traffic was so had on Ridge Valley turning to Marine Way. Being senior, we were so happy to be able to reside in the Travata 55+ community, next to the Great Park with a view of the open space around us. It's such a warm and caring community. We don't want the building of the rail yard to destroy it. | Refer to Comment Response 1 regarding impacts related to noise and traffic. Refer to Scotion 3.13 as well as Appendix F Noise Technical Memorandum regarding anticipated noise levels. Opposition of the Project has been noted and will be considered by OCTA. |
| 24 | 03/17/22 | Izzy Zamora | 169 Palencia | My husband and I are 78 yrs old, and have a great concern on OCTA Metrolink Maintenance Yard. This Train Yard is too close to our Senior Community, Great Park and other Family Communities. The City of Irvine and their elected dificials are suppose to protect the citizens in Irvine. We are asking that you really look at how this Project will affect the air quality, health and quality of life for Seniors and Families near this Train Yard. Please look at well I have listed below and how these sisses will have an impact on our lives. I'm sure you are well aware of these issues. 2. Hruman waske will be engited from trains. 3. Storing and use of fuel chemicals and solvents which will be used for trains. 4. Grinding of certain train parks which will be used for trains. 5. Yard will be operating 24/7, which means more noise from trains and druck scorning in and out of yard. 6. Yard lights on 24/7. 7. More trucks and traffic which will create more potheses on the streets. 8. There are no safe levels of bad air emissions and dors. 9. This area has several windy periods, which will bow more toxic (turnes and doors into our communities, first you out for kill you care levels of bad air emissions and dors. 9. This area has several windy periods, which will bow more toxic (turnes and doors into our communities, first you out for kill you are listening to our concerns. 9. This area has several windy periods, which will be used of the air. 1. Jard and the weekly hope you are listening to our concerns. 1. Jard and the weekly hope you are listening to our concerns. 1. Jard and the weekly hope you are listening to our concerns. 1. Jard and the weekly hope you are listening to our concerns. 3. Jard and the weekly hope you are listening to our concerns. 3. Jard and the weekly hope you are listening to our concerns. 3. Jard and the weekly hope you are listeni | Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to air quality and wastewater. Refer to Comment Response 1 regarding impacts related to lighting. Refer to Comment Response 2 regarding impacts related to lighting. |

| Response to Comment |
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| neet the additional police service needs at the Project Site. Furthermore, the Irvine Police Department headquarters, as well as the nearby Irvine Valley College Police Department and Cal State I that the capacity of police service is sufficient for the Project Site through coordination of three police departments. |
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| | | Name(s) | | Hello, I am writing to strongly ask that the OCTA rail yard not be relocated so that it is not near Travata Community residents and Great Park users. The negative impacts to our health and well-being cannot be sufficiently mitigated. The following points emphasize the hazards of having the rail yard so close to our community: ZONING: | Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to air quality, noise and traffic, and Comment Response 11-2 regarding impacts related to fire evacuation. Refer to Comment Response 2 regarding impacts related to lighting. |
| | | | | The train yard site within invine's Great Park is not compatible with the existing institutional zoning designation. A train yard that involves the use of heavy machinery, heardrous chemicals and emits high levels of particulates into the surrounding residential and recreational areas violates the planning area's purpose. Per the MND, The Project type is closest to an industrial type' and therefore does not belong in an institutional zone. Why was this land ever sold to OCTA for a rail yard when it is clearly not compatible with the nearby residents and Great Park visitors. AIR QUALITY: The operational impacts from the rail yard will be primarily from diesel particulate matter. The MND notes that as of 2005, the Air Resources Board (Federal Agency) recommended a 1,000 foot buffer between residences and rail yards. | |
| | | | bonnienangliu | (Travata's closest homes are within 500 feet of the train yard's nearest property line.) The next highest impact was determined to be between one-half to one mile from the site, which is where the original site for the rail yard was located laong Sand Canyon. At the proposed site, the MND estimates an increased cancer risk for the community of Travata. At a minimum, this finding alone should indicate that a more rigorous study of the negative impacts on nearby residents and park users be undertaken. NOISE: Measuments of sound levels at the site were taken at a time when trains were only passing by Travata and yet they caused substantial spikes in noise near Travata. Once operational, the train noise from many more trains compounded by the longer noise impact of the showing trains and possible use of the whist be entert the yard was locatantially increase the frequency and duration of the noise spikes. The noise impact alone may explain why Meriofink stations are | |
| 25-1 | 03/18/22 | Bonnie Liu | @gmail.com | by including how many here has residential areas. This is besulted to the minimum of output here pairs model added | |
| | | | | Paradise, California fire tragedy. HAZARDOUS NATERIALS: The MND repeatedly uses the word "normal" when discussing the storage of petroleum products and hazardous chemicals. There is nothing more concerning than having these types of substances within such a short distance of residences and Great Park visitors. On any given day, there might be thousands of people within 1.000 feet of the site. This is very concerning given that we hear constantly about leaks, fires, etc. occurring at industrial sites such as the rail yard. This is a dangerous facility to be located anywhere near to such a busy area and one that already suffers from congested roadways. | |
| | | | | Lick in INS: Mightime lighting would certainly impact residents' views over the site contrary to the report. As 80% of the train yard's operations will be during the overnight hours, all of the cranes and surrounding area will need to be well it and quite visible from a large segment of Travata's residences along Marine Wayand Ridge Valley. Any resident trying to sleep in the upstatis rooms will definitely look out onto the train yard and will be impacted by the lighting. The MND incorrectly states thield lighting at the Great Park obscures our views anyway which is not true. The sports fields at the Great Park are only it until 10pm. | |
| | | | | CONCLUSION: The rail yard project has environmental impacts that will cause substantial adverse effects on humans both directly and indirectly as a result of the negative impacts on air quality, noise, hazardous materials and traffic as discussed herein. These negative impacts cannot be miligated to make the rail yard project feasible at its "current location. At a minimum, we urge the City of livine to require that OCTA prepare a more rigorous Environmental impact Study. We believe that this study will prove that this raily and osen of bedray in the raise of a study and the rail yard beneficient. These negative instents and part will be readed away from residents and parts (visitors. | Section 3.21 of the IS/MND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| 25-2 | 03/18/22 | Bonnie Liu | bonniepangliu @gmail.com | Thank you for listening to our concerns. Sincerely, | |
| | | | | Bonnie Liu | Comment includes introductory remarks and states the MND is deficient, and requests an Environmental Impact Report (EIR) be prepared. This has been noted and will be considered by OCTA. |
| | | | | Dear OCTA, Please find attached comments on the Draft Initial Study/Mitigated Negative Declaration (MND) for the proposed Metrolink Orange County Maintenance Facility Project. | |
| | | | | The comments demonstrate that the MND is deficient and not the appropriate document for a project with the potential for significant environmental effects such as this one. As the Lead Agency for this project, the Orange County Transportation Authority should withdraw the MND and prepare an Environmental Impact Report (EIR) for the subject project. | |
| 26-1 | 03/18/22 | Bob Onufer | onuferbob@g | In addition to being a resident of the Travata Community, a community that will be significantly and irreparably harmed should this project go forward, I am an environmental engineer with more than forty years of experience with a primary focus on air quality. I am currently an independent consultant involved in the permitting, emissions reporting, and document preparation for clients in the western United States with an emphasis on the South Coast Air Quality Management District (SCAQMD) jurisdiction. I have been certified as an expert witness and have testified to the interpretation and application of SCAQMD regulations in Orange County Superior Court. I have also testified more than two dozen times before air district hearing boards throughout California, most recently before the SCAQMD Hearing Board in February 2022. | |
| | 00/10/22 | Dob Children | mail.com | Prior to becoming an independent consultant, I was responsible for the air quality compliance of all facilities owned and operated by Kinder Morgan throughout the western United States including western Texas, Arizona, Nevada, California, Oregon, and Washington. I have prepared or been responsible for numerous CEQA projects including those requiring MNDs as well as EIRs. I have performed all the calculations listed in the air quality portion of the MND at one time or another including dispersion modeling with AERMOD, HARP modeling for risk, LST analyses, tank modeling, and utilizing CalEEMod for construction and ancillary emission estimates. | |
| | | | | The attached comments are based on my years of experience preparing and reviewing CEQA documents along with my experience working with the SCAQMD for more than 20 years. In my expert opinion the MND is flawed and should be replaced with an EIR. Should you wish to discuss the comments, I can be reached at (949) 606-3088 or by email. | |
| | | | | Best regards, Bob Onufer | |
| | | | | SUMMARY: The Project Proponent (Progonent) has prepared a draft initial Study/Mitigated Negative Declaration (NND) for the Metrolink Orange County Maintenance Facility Project. The MND is not the appropriate form the CEQA document should take for a variety of reasons outlined in the MND. The Proponent has prepared the MND using assumptions that the project isses than significant. However, as presented in these comments, here are equally solentifically valid assumptions that will readly demonstrated the project massing frame and the project impacts are less than significant. However, as presented in these comments, here are equally solentifically valid assumptions that will readly demonstrate the project thas significant evorimential effects. In some cases, data presented in the MDD shows impacts just below significant (e.g., the MEIR significance threshold is 10 and the MEIR presented is 9.25), hother cases, the Proponent has disrised emissions in a sentence, taking, what we believe, an unacceptable approach to these emissions. The MND also makes unsupported statements, uses assumptions that readly demonstrate the project incorrectly calculates emissions for a number of sources. | This comment summarizes the specific comments outlined in the letter; please refer to responses to comments 26-3 through 26-7. As described in Section 3.3, Air Quality, impacts wou significant. Therefore, from an air quality and greenhouse gas emissions standpoint, the Project would not create significant environmental effects and an EIR is not required. This comment also quotes Section 15002(k) of the CEQA Guidelines; no response is required. |
| 26-2 | 03/18/22 | Bob Onufer | onuferbob@g mail.com | CEAN CLUBELINES: CEAN middlines remains that a three step preserves he used to determine the appropriate desument time or centralized in the following specifies: | |
| | | | | Exemption. (See: Sections 15061 and 15062.) (2) If the project is not exempt, the Lead Agency takes the second step and conducts an Initial Study (Section 15063) to determine whether the project may have a significant effect on the environment. If the Initial Study shows that there is no substantial evidence that the project may have a significant effect, the Lead Agency prepares a Negative Declaration. (See: Sections 15070 et seq.) (3) If the Initial Study shows that the project may have a significant effect, the Lead Agency takes the third step and prepares an EIR. (See: Sections 15080 et seq.) | |
| | | | | While Section 15064(f)(2) of the guidelines allows a Proponent to mitigate the effects to the point where they are no longer significant, Section 15064(g) states that when there is substantial evidence there may be a significant impact on the environment coupled with a disagreement over the significance of the effect, the Proponent will treat the effect as significant and prepare an EIR. This process has been upheld in the courts (see No. Oil Inc. v. City of Los Angeles (1974) 13 Cal.360, These quidelines are quiced as follows: | Comment describes Section 15064 of CEQA Guidelines and does not identify environmental concerns regarding the Project. The comment has been noted by OCTA. No response is needed. |
| | | | | 15064 DETERMINING THE SIGNIFICANCE OF THE ENVIRONMENTAL EFFECTS CAUSED BY A PROJECT (f) The decision as to whether a project may have one or more significant effects shall be based on substantial evidence in the record of the lead agency. | |
| | | | | (1) If the lead agency determines there is substantial evidence in the record that the project may have a significant effect on the environment, the lead agency shall prepare an EIR (Friends of B Street v. City of Hayward (1980) 106 (CalApp.3d 98B, Said another way, if a lead agency is presented with a fair argument that a project may have a significant effect on the environment, the lead agency shall prepare an EIR (Friends of B Street v. City of Hayward (1980) 106 (CalApp.3d 98B, Said another way, if a lead agency is presented with other substantial evidence that the project will not have a significant effect (No Oil, inc. v. City of Los Angeles (1974) 13 Cal 3d 68). | |
| 26-3 | 03/18/22 | Bob Onufer | onuferbob@g | agreed to by, the applicant would avoid the effects or miligate the effects to a point where clearly no significant effect on the environment would occur and there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment, the lead agency stall prepare a negative declaration (Friends of B Street v. City of Hayward (1980) 106 (Cal.App. 31 988). | |
| | | | | (4) The existence of public controversy over the environmental effects of a project will not require preparation of an EIR if there is no substantial evidence before the agency that the project may have a significant effect on the environment. (5) Argument, speculation, unsubstantiated ophinon or marriely, or evidence that is clearly inaccurate or enroneous, or evidence that is not credible, shall not constitute substantial evidence. Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert ophinon support by facts. | |
| | | | | (6) Evidence of economic and social impacts that do not contribute to or are not caused by physical changes in the environment is not substantial evidence that the project may have a significant effect on the environment. (7) The provision of sections 15162, 15163, and 15164 apply when the project briang hand/action and analyzed is a change to, or further approval for a project for which an ETR or negative declaration was previously certified or adopted (e.g. a tentative subdivision, conditional use permit). Under case law, the fair argument standard does not apply to determinations of significance pursuant to sections 15162, 15163, and 15164. | |
| | | | | agency shall be guided by the following principle: | Refer to comment response 26-2 regarding the environmental document prepared for this Project. Comment on the deficiency of the MND and a request to prepare an EIR has been forwarded to C |
| | | | | If there is disagreement among expert opinion supported by facts over the significance of an effect on the environment, the Lead Agency shall treat the effect as significant and shall prepare an EIR. Failure to make a good faith effort: The Proponent idd not demonstrate that the MND was, and is, the appropriate form of the document. The MND appears to have been prepared to justify the project as less than significant rather than present objective data to analyze protochild effects on the environment. | Commenter states project alternatives were not evaluated, however, the evaluation of project alternatives is not required under CEQA for an ISMND. As detailed in Response to Comment 26-5, consultation with SCAQMD is not required for projects for which the SCAQMD is not the lead agency. In addition as detailed in SCAQMD's Risk Assess performing a risk assessment which deviates from SCAQMD is mot nequired for projects and device the Projects and addition and relative assessment modeling, were conducted for the purpose |
| | | | | Project Alternatives: The MND does not evaluate project alternatives but rather alternatives configurations within a single project site. Differences in the alternatives are trivial and do not address the appropriateness of this site versus other sites. Any economic benefits to the Proponent, City, or other stakeholders should not be considered as part of a more robust alternative site study. An EIR will allow for a thorough study of alternatives along with a no project option. | performed consistent with SCAQMD methodology and approval or consultation with SCAQMD is not required. The Project would obtain all applicable SCAQMD permits and comply with all applicable |
| 26-4 | 03/18/22 | Bob Onufer | onuferbob@g mail.com | Failure to include South Coast Air Quality Management District (SCAQMD) as a Responsible Agency: The MND spends 148 of its 651 pages addressing air quality and the associated environmental effects. This represents 22.7 percent of the document, yet SCAQMD is not identified as a Responsibile Agency. This is, at a minimum, a termendous oversight. SCAQMD is the premiere air quality agency in the basin and has responsibility for the attainment of air quality standards as well as extensive experience in permiting, toxic emissions, dispersion modeling, and health in this assessment. Consultation with SCAQMD prior the preparation of the MND brould have led valuable insight into the application of the methodologies used and the selection of appropriate parameters and assumptions. The proponent will need to obtain a number of permits from the SCAQMD and, at a minimum, comply with the following rules: - Nue 2019 Permit to Construct. | |
| | | | | - Rule 219 Equipment NM Requiring a Written Permit Pursuant to Regulation II (regarding elimination of exemption for equipment subject to New Source Performance Standards (NSPS) or National Emissions Standards for Hazardous Air Pollutats (NSESHAPs)) - Rule 463 Organic Liquid Storage - Rule 1133 Architectural Coatings - Rule 1034 Requirements (to New Source Review) | |
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acts would be less than significant with mitigation. As described in Section 3.8, Greenhouse Gas Emissions, impacts would be less than

rded to OCTA for consideration.

sk Assessment Procedures for Rules 1401, 1401.1, & 212, SCAQMD modeling staff recommends consultation and a modeling protocol before purposes of CEOA environmental documentation and not for the SCAQMD Rules 1401, 1401.1, or 212, the risk assessment modeling was II applicable SCAQMD Rules.

| Comme nt No. | Date Received | Commen tor Name(s) | Contact Info | Comment Received | Response to Comment |
|-----------------|------------------|--------------------------|-------------------------------|--|--|
| 26-5 | 03/18/22 | Bob Onufer | იიაferhab@a | In the technically required to comply with the Leak Detection and Repair (LDAR) and component tagging requirements under Rule 1173, the CEQA document regardless of form must quarify all potential emissions and include these emissions and the emissions and the emissions and the emissions are part of the work-case day when assessing whether a project has significant effects on the environment. The MND fails to estimate the number and type of components associated with the project. These fugitive emissions are to be quarified in accordance with SCAQMD Rule 403 requires these obtained for storage tanks with a volume of greater than 19.815 galons storing organic liquids. The four proposed 30,000 gallon tanks fail into this category. Submittal ad applications for these tanks requires complance with SCAQMD Rule 1030,013, Rule 1303(01) requires the new source to encly be Best Available Control Tor SCAQMD much darey the applications. SCAQMD has established the installation of floating roofs as BACT for non-major polluting sources storing organic liquids with a true vapor pressure of less than 11 pia (copy of BACT document attached). The MND fails to address the BACT requirements. Is addition to the rule requirementes: liced dare and receptor grid. It is possible, even if likely, that SCAQMD would have a different topino. The AERMOD motel uses a claim as to the appropriateness of 1s selected parameters. Including the selection of meteorologic data at ne consultation with SCAQMD occurred, it is possible even it likely, that SCAQMD would have a different topino. The AERMOD modules are different to HMND is the disregard of operational emissions from on-sile operations, including locomotives. While the MND acknowledges the presence of these emissions are not evide at the the sense and and the data is the data at the data of the AERMOD inplementation guide and started. The MND fails to address that these emissions don to exist for the purpose data and the operation difference fueld. Work data athe MND corner polytating tha tr | plant, lubricating oil and grease re-refiner, marine terminal, oil and gas production field, natural gas processing plant, physicing the transfer station, the Project would not be subject to component tide diesel fuel storage were estimated and accounted for in the operational emissions. As described in more detail in Appendix B to the MDD, fugitive VOC emissions associated with the project would not be subject to component tide transfer stations that are typically operational uses of concern with regard to fugitive emissions. In addition, the fueling operations associated with the Project would not store California. Low Sulful 2282; thus, resulting in low volatility compared to other fuels. Furthermore, as described in more california, but he operational uses of concern with regard to fugitive emissions. In addition, the fueling operations associated with the Project are approxima transfer stations Calculations (fuel 2003), available cellines at http://www amg dow/dow/docs/default-sources/planning/amuual-emission-reporting/quie/leines-for-fugitive-emission-facilations pdf, a typical terminal/depct were reviewed. Based on an average of the default emission factors for the various types of acures at a terminal/depct, each source at a typical terminal or depot would rule (low volatility of diesel fuel, any fugitive emissions from the few additional components associated with the transfer station. The CI requirements are not applicable is a this stage of the storage tanks and comply with permit conditions, including BACT, as applicable, per SCAQMD Rule 463 and Rule 1303. The CI requirements are not applicable at this stage of the project's CEOA environmental documentation. As described in Appendix B, polutant concentrations were estimated using the American Meteorological Society/U.S. EPA Regulatory Model (AERMOD) dispersion model, consistent with SCAMD SCAQMD is not the lead agency. In addition as detailed in SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1, 8.212 (available online at thttp://www.aamg.d |
| 26-6 | 03/18/22 | Bob Onufer | onuferbob@g mail.com | Failure to use worst-case fleet data: Throughout the MND, the Proponent utilizes the fleet "mix" to develop emissions and perform calculations that inform significance and health risk thresholds. This change alone will make the MEIR (currently at 9.25) exceed the significance threshold of 10. It will also result in the LST for PM2.5 exceeding the limit of 2.5 ug/m3. It is reasonable to assume that older locomotives will be relegated to maintenance facility work. There is also no guarantee that Tire? Locomotives will be relegated to maintenance facility work. There is also no guarantee that Tire? Locomotives will be completely out-of-service even after 2028 especially with the expected growth of ridership noted in the MND. All calculations should assume Tire 2 engines unless the Proponent agrees to a legally enforceable condition utlawing the use of Tire 2 engines. This table indicates that locomotives idle for approximately tendy minutes per day and otherwise operate for approximately tendy to responding or the calculated emissions in blacking. To show inconsistencies in the MND perform, the usage corresponding to the reported emissions was calculated using the emission factors in gransigalion of fuel as cited in the NMD are to 20.2 - 10.180, CH4 - 0.8, and N2O - 0.29. The corresponding to the reported emissions was calculations for the componding emission factors in gransigalion of fuel as cited in the NMD are coreal 0.28, converting to consistent turing to consistent turing days. The difference wereal for approximately to approximately to approximately tr30 galions of the - 0.8, and N2O - 0.29. Converting and the analyze outsing approximately to approximately tr30 galions of the AND are coreal approximately tr30 galions of the AND are coreal approximately tr30 galions of the approximately tr30 galions of the AND are coreal approximate approximate approximately t | appropriate assumption to analyze the Projects impacts based on the reasonably forseeable and available data, as OCTA has already made progress towards retring Ter 2 engines. For examp projected that approximately 40 locomotives would be Tier 4. SCRRA has committed to an all-Tier 4 locomotive feel mix by 2028. The use of reasonably forseeable data is supported by CEQA of As described in Section 3.3.3, the Project would not result in an increase in commuter rail service or additional locomotive ten in travel in the increase in commuter rail service or additional locomotive ten in travel in the neglon. Therefore, the locomotive operational end throughput of the uproposed fue tragena tarket required of the locomotivers that would be serviced at the Project still. Commenting provides an incomposed storage tanks reflects the fuer lequired in the adaptive correctly evaluated the impacts to the surrounding sensitive receptors. As presented in Tai the surrounding receptors: therefore, the on-sell bornomiter end is the state still the analysis correctly evaluated the impacts to the surrounding sensitive receptors. As presented in Tai thresholds of significance or cancer risk thresholds and this impact would be less than significant. TankESP, follows the methodology in the latest United States Environmental Protection Agency guidance in AP-42. Compilation of Air Emissions Factors, Chapter 7: Liquid Storage Tanks (June explanation that advanced coordination with SCAQMD is not required. The model does not utilize diese as aurrogate for renewable diesel. The commenter incorrect in assuming that renewas storage tank emissions have been estimated correctly. As described in Section 3.3.3.2, emissions from Project operations, including storage tank emissions, would be less than significant. |
| 26-7 | 03/18/22 | Bob Onufer | onuferbob@g mail.com | Undercounting of fuel truck miles: Consistent with tank usage based on equipment capacity, fuel deliveries must be based on the worst-case day. To accommodate 120,000 gallons of diesel fuel, fifteen truck trips would be required. The MND tatase that two trips are required. In addition, the MND uses a default mileage of 6.9 for the distance traveled by fuel trucks. This default underpredict emissions since no fuel terminals are located within 6.9 miles of the proposed project site. It is the Kinder Morgan Terminal located in Crange approximately 15 miles from the proposed project site. It is the Kinder Morgan Terminal Located in Crange approximately 17 miles from the proposed project site. It is the MND. Using EMFAC emission factors (copy attached) results in the following emissions: Polluting 15 miles from the proposed project site. It is MND. Using EMFAC emission factors (copy attached) results in the following emissions: Polluting 10 miles gover 1 miles (for round trips). This is about 13 times gover 10 miles (box ROG SOX PM10 PM2.5 CO2 CH4 Emission Factor (Boxing) 0.00090512 0.000039592 4.21 0.0004176 Lbs/day 2.06 4.64 0.40 0.02 0.24 0.18 1896.7 0.19 Use of regulatory compliance as miligation measure: AQ-1 specified in the MND as miligation for architectural coating emissions cites compliance with SCAQMD Rule 1113 as a miligation measure. Compliance with regulation cannot be considered a miligation measure. AQ-1 specified in the MND as miligation for architectural coating emissions cites compliance with SCAQMD Rule 1113 as a miligation measure. Compliance with regulation cannot be considered a miligation measure. Biol Sign Figure 4 and Bio Rule 2.0003475 (Box ROG Sign Amage) Bio Rule 2.0003475 | As described in Section 3.3, Air Quality, impacts would be less than significant with mitigation. As described in Section 3.8, Greenhouse Gas Emissions, impacts would be less than significant. |
| 27 | 03/18/22 | Jennifer Fernatt | jennifernfema tt@gmail.com | To Whom It May Concern, I am writing to express my deep concern and vehement opposition to the proposed OCTA. Maintenance Facility in Irvine. I was shocked to receive a distraught call from my grandparents who reside in the nearby Travata 55+ community. They purchased a new construction home from Lenard in December d' 2020. I read the available reports online and have many concerns about the negative impact to them personally as well as to the local community. My most immediate concern is for their health. Many seniors are a vulnerable population and as they continue to age, experience increased health issues. There is no way to guarantee chemicals, waste, debris and harmful substances from the proposed enerty facility, despite comments that efforts will be made to mitigate the impact, will not be released into the environment that will undoubtably aggravate or exacerbate existing health conditions and potentially create new health problems or diseases. Would you not have the same concern for yourself or elderly loved ones? Additionally, I am concerned about the negative impact this will have on their property value. Many retired seniors are on reduced incomes and their homes are often their most significant asset. My grandparents personally placed a significant casts down payment when purchasing this property and if this information was previously disclosed to them, they would not have purchased the property. Being in the real setate businese, Inter no down that, if approved, this facility will reduce the value and desirability of surrounding homes due to noise, light pollution, visible cranes, increased traffic, reduced air quality/contaminated air and living by a construction site for many years. I implore you to reject this proposal and will end with this; Would you want to live by this maintenance facility or have one constructed by your home? Thank you for your time. Jennifer Fernatt | Refer to Comment Response 1 for impacts related to land use and zoning. Refer to Comment Response 1 for impacts related to land use and zoning. Refer to Comment Response 1 for impacts related to hazardous materials. Refer to Comment Response 10 impacts related to land use and zangual quality. The analysis of impacts to property values is not required by CEOA Guidelines. Opposition of the Project has been noted and will be considered by OCTA. |

e terminals, oil and gas production facilities, natural gas processing plants and pipeline transfer stations. As the Project is not a refinery, chemical nt identification requirements under Rule 1173. As described in Section 3.3.2.2 of the MND, fugitive VOC emissions associated with train fueling and fuel storage tanks were estimated using TankESP. TankESP accounts for fugitive VOC emissions associated with train fueling and fuel storage tanks were estimated using TankESP. TankESP accounts for fugitive VOC emissions associated with train fueling and nontis would be minimal as the components would be limited to train theiring operations, which is negligible compared to facilities such as a refinery or Sufur Disesi, which has an aromatic hydrocarbon content, the compounds that affect volatility, of less than 10 percent by volume per CCR Section winately 1.5 pounds per day, substantially below the SCAMID VOC threshold of Spounds per day. SCAMID has provided Guidelines for p.df, with default emission factors for facilities subject to Rule 1173. Although this Project is not subject to Rule 1173, the default emission factors for uol result in approximately 0.31 pounds of VOC per day. Therefore, due to the few number of tanks and components associated with the Project and e significance findings of the MND.

e CEQA document is not a permit application to the SCAQMD for any project components; thus, BACT and any other SCAQMD permitting

CAQMD modeling guidance. Advanced coordination or approval of modeling protocols with SCAQMD is not required for projects for which the ource/permitting/rule-1401-risk-assessment/riskassessproc-v6-1.pdf), SCAQMD modeling staff recommends consultation and a modeling protocol or the purposes of CEOA environmental documentation and not for the SCAQMD Rules 1401, 1401, 1, or 212, the risk assessment modeling was tation guide and the project's localized emissions and health risk impacts were found to be less than significant.

tank emissions; natural gas consumption; and on-road vehicle travel for worker, delivery, and haul trips to and from the site. The commenter summarizes the Project's total operational on-site emissions including locomotive operations and compares the emissions to the SCAQMD localized cance. Thus, the impacts to the nearby sensitive receptors and surrounding land uses would be less than significant. For the purposes of the herefore, on a regional emissions basis, the locomotive operations due to the project would not be an increase beyond existing conditions. A nonrevenue moves to the existing SGRRA storage and maintenance facilities in the project Storage and could not be an increase beyond existing conditions. A nonrevenue moves to the existing SGRRA storage and maintenance facilities to the project Storage and could not be an increase beyond existing conditions. A nonrevenue moves to the existing SGRRA storage and maintenance facilities to the project Storage and could not be an increase beyond existing conditions. A solution the region. On the contrary, due to the optimal location of the Project Site, the Project is anticipated to result in reduced locomotive ease at the existing maintenance facilities due to more efficient operations and logistics. Therefore, as described in Section 33.32, operational localized emissions and evaluated the impact of siting these emissions, including locomotive emissions, near the surrounding recreational, worker,

rcent Tier 4 engines. The commenter incorrectly states that the project's impacts should have analyzed a Tier 2 fleet mix; this would not be an ample, as detailed in a May 2020 press release by OCTA, Metrolink Locomotives Move toward a Cleaner Future, by summer 2020, Metrolink's 2A case law, including Smart Rail v. Exposition Metro Line Construction Authority (2013) 57 Cal.4th 439.

issions cited by the commenter are emissions associated with on-site locomotive idling operations only and are not representative of the fuel issions due to on-site activity to fuel use provides only an estimate of fuel consumption associated with such on-site locomotive activity; whereas, the correct comparison of the on-site fuel use (as estimated using a conversion of the locomotive operational emissions presented in the NND) to the regional travel). Localized emissions analyses and health risk (e.g., cancer risk) evaluations are focused on the emissions occurring in the vicinity of n Table 3.3-13 for the LST analysis and Table 3.3-15 for excess cancer risks, the Projects operational emissions volution to exceed the localized to the localized the localized the localized the localized the localized localized the localized the localized to the localized localized localized to the localized localized localized localized localized to the localized to the

June 2020). Therefore, it is an appropriate tool for use in estimating storage tank emissions. Please refer to Response to Comment 26-5 for an ewable diesel would be utilized for the Project. Locomotives would be diesel fueled; thus, the storage tanks would store diesel and the diesel-fuel

ely accepted land use tool for estimating emissions: (the model was developed for the California Air Pollution Officers Association (CAPCOA) in o account for local requirements and conditions). The commenter suggests that there are no fuel terminals located within 6.9 miles of the Project 9. Operational Maximum Daily Increase in Regional Emissions, even if the ting distance for the fuel-delivery truck trips were to be doubled, the on a worst-case day to accommodate 12,000 galans of diese (the based on the storage tank capacity. It is not reasonable to assume that all fuel using the most reasonably available information, consistent with precedent CEQA case law including Smart Rail v. Exposition Metro Line

interior and exterior paints. As noted in MM-AQ-1, the VOC content of the architectural coatings shall comply with the VOC content limits in CAQMD Rule 1113, some coating categories have VOC limits ranging from 50 grams per liter to 730 grams per liter for clear shellac coatings.

nt. As detailed in the responses above, the emissions estimates used to substantiate the air quality and greenhouse gas emissions analyses utilize nations in either Section 3.3, Air Quality, or Section 3.8, Greenhouse Gas Emissions, of the MND. Therefore, from an air quality and greenhouse

| Comme nt No. | Date | Commen tor | Contact Info | Comment Received | Response to Comment |
|-----------------|----------|-------------------|--|--|---|
| | received | Name(s) | | This email is to provide our feedback regarding the proposed OCTA Rail Yard within the Great Park. This facility is completely inconsistent with the Great Park as a focal point for community activities, sport facilities, and an area of quiet tranquility for Irvine's adjacent communities. This is particularly true for our Travata 55 Plus Community | Refer to Comment Response 1 regarding concern over disclosure of project. Refer to Comment Response 4 for impacts related to land use and zoning. Refer to Comment Response 1 for impacts related to air quality, noise, and traffic, and Comment Response 11-2 regarding impacts related to fire evacuation. |
| | | | | Which is located within about 500 feet and will suffer from the disruption of its construction, and the ongoing nuisances of greater traffic, noise, light, and environmental pollution, plus other negative consequences for Travata, neighboring communities, and Great Park users. The project should have been rejected before the major investment in planning and design work because it just doesn't fit in this area. In addition, we had an opportunity to meet with OCTA management to explain their project and found | |
| | | | | them unable to answer questions regarding the design, hazards, risks, and other issues. In my opinion as a retired project manager/ project executive for major petroleum projects worldwide for nearly 40 years, the group we met with had neither the technical background, nor skills and knowledge to be handling a project such as this. The entire Travata Community is unlified in opposition to this project being located in the Great Park and particularly within 500 feet of our community. | |
| | | | smithfrankb@ | Following are some more detailed and specific points developed amongst our community: ZONING: The train word dis within Indiné's Great Park is not compatible with the eviction institutional control designation. A train word that involves the use of home machinery, homerative chemicals and emits high levels of particulates into the | |
| 28-1 | 03/18/22 | Frank B. Smith | 864-640-5869 | Contraining resolution and not been and an advance of particular particular particular particular products of a non-inductional users. OCTA for a raily and when it is clearly not compatible with the nearby residents and Greed Park recreational users. 9 ARE OUALITY: The operational impacts from the rail yard will be primarily from diesel particulate matter. The MND notes that as of 2005, the Air Resources Board (Federal Agency) recommended a 1,000 foot buffer between residences and rail yards. (Travata's closest homes are within 500 feet of the train yard's nearest property line.) The next highest impact was determined to be between one-half to one mile from the site, which is where the original is for the rail yard was located along Sand Carryon. At the proposed site, the MND estimates an increased cancer risk for the community of Travata. At a minimum, this finding alone should indicate that amore fororous study of the negative impacts on nearby residents and the negative impacts on nearby residents. | |
| | | | | and park users be undertaken. NOISE: Measurements of sound levels at the site were taken at a time when trains were only passing by Travata and yet they caused substantial spikes in noise near Travata. Once operational, the train noise from many more trains compounded by the longer noise impact of the slowing trains and possible use of the whistle to enter the yard would substantially increase the frequency and duration of the noise spikes. The noise impact at the train substantially increase the frequency and duration of the noise spikes. The noise impact at | |
| | | | | Incl located anywhere near residential areas. This is not even taking the sounds from the equipment used in the train yard into consideration. TRAFFIC: Access to the rail yard is along the same single lane road (Marine Way) that is presently well beyond its capacity to handle all users. Travata residents, Great Park users, food bank, distribution center, recycling plant, nursery and soon water park users all er forced onto a single lane road. This road already clearly showed its inadequacy for use as an evacuation road when the Cypress Village community (that includes Travata) was under a voluntary evacuation during the October 2020 wildfile. Traffic was jammed and very slow moving and at a time when the Great Park sports fields were closed due to the pandemic. This inadequate roadway could see the same result as we all witnessed during the Paradise, California fire tragedy. | |
| | | | | HAZARDOUS MATERIALS: The MND repeatedly uses the word 'normal' when discussing the storage of petroleum products and hazardous chemicals. There is nothing more concerning than having these types of substances within such a short distance of residences and Great Park visitors. On any given day, there might be thousands of people within 1,000 feet of the site. This is very concerning given that we hear constantly about leaks, fires, etc. occurring at industrial sites such as the rail yard. This is a dangerous facility to be located anywhere near to such a busy area and one that already suffers from congested readways. LIGHTING: | Refer to Comment Response 16 regarding impacts related to hazardous materials. Refer to Comment Response 2 regarding impacts related to lighting and visual quality. Section 3.21 of the IS/INND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| | | | | Nightime lighting would certainly impact residents' views over the site contrary to the report. As 80% of the train yard's operations will be during the ournight hours, all of the cranes and surrounding area will need to be well its and quite visible from a large segment of Travata's residences along Marine Way and Ridge Valley. Any resident trying to sleep in the upstains rooms will definitely look out on the train yard and will be impacted by the lighting. The NND incorrectly states that field lighting at the Great Park obscures our views anyway which is not true. The sports fields at the Great Park are only it until 10pm. CONCLUSION: The rail yard project has environmental impacts that will cause subtantial adverse effects on humans both directly and rainfectly as a result of the negative impacts on air quality, noise, hazardous materials and traffic as @ discussed herein. These negative impacts cannot be mitigated to make the rail yard project freastive and the structure. The relocated away from the thirts rail yard does not been and the creat Park hose of the train adverse effects on humans both directly and indirectly of livine to require that OCTA prepare a more rigorous Environmental Impacts the structure to resolute and yrom residents and park visitors. | |
| 28-2 | 03/18/22 | Frank B. Smith | 864-640-5869 141 Palencia, Irvine CA | We would appreciate confirmation from each recipient of this communication and an indication of your position on this matter. | |
| | | | | Frank and Alieen Smith Travata Community 141 Palencia Irvine, CA292618 | |
| | | | | Phone 864-640-5869 | |
| | | | | Dear Mayor and Staff: | The Project does not include wastewater treatment, including a sewage treatment plant. Refer to Comment Response 14 regarding impacts to wastewater. Refer to Comment Response 4 regarding impacts related to hazardous materials, and Comment Response 9 regarding impacts related to dissel fuel and particulate matter. |
| | | | therealkochs | I own a home in the Tristania condo community across from the Great Park. I love living across from the Great Park, and I walk there daily. I just learned that OCTA plans to build a 24/7 Metrolink maintenance facility with water treatment, I (AKA Sewage) treatment, Tearing in your park now, the typical treatment plant is NOT usually plasmant. To learn that a water (sewage) treatment, Tearing its going up as your may know, the typical treatment plant is NOT usually plasmant. To learn that a water (sewage) treatment facility is going up as well as an OCTA that maintenance facility with water treatment, facility is disturbing. This is not a good location being so close to residential property and a park that is used daily by so many children. This park is a TREASURE for Irvine and Orange County. To add a sewage treatment facility and dised dumping ground here greatly diminishes livine and Orange County's reputation. The environmental disaster possibilities are endess!!! Who wants any child playing sports while smelling toxic odors, breathing lead, dised furmes and other acrossons? | 1 |
| 29 | 03/18/22 | Karen Koch | | I ask that the City Planners work with the Community Development Dept. and OCTA to relocate this facility to a more desolate location. I understand this area was chosen to keep it away from the concert venue and water park. This was good; however, we in Cypress Village live here too and breathe the air DAILY. Near our community is NOT a wise choice either. | |
| | | | | Thank You for Your Consideration, Karen Koch ⊜ | |
| | | | | Good evening, I am writing to urge you to not relocate the OCTA rail yard to be near Travata Community residents and Great Park users. The negative impacts to our health and well-being cannot be sufficiently mitigated. The following points emphasize the hazards of having the rail yard so close to our community. | Tefer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 9 regarding impacts related to disel fuel and particulate matter. Refer to Comment Response 1 regarding impacts related to air quality, noise, and traffic, and Comment Response 11-2 regarding impacts related to hazardous materials. Refer to Comment Response 1 fegarding impacts related to hazardous materials. Refer to Comment Response 1 regarding impacts related to hazardous materials. |
| | | | | ZONING: The train yard site within Irvine's Great Park is not compatible with the existing institutional zoning designation. A train yard that involves the use of heavy machinery, hazardous chemicals and emits high levels of particulates into the surrounding residential and recreational areas violates the planning area's purpose. Per the MND, The Project type is closest to an industrial type' and therefore does not belong in an institutional zone. Why was this land ever sold to OCTA for a rail yard when it is clearly not compatible with the early presidents and Great Park visitors. | |
| | | | | ARE QUALITY: The operational impacts from the rail yard will be primarily from diesel particulate matter. The MND notes that as of 2005, the Air Resources Board (Federal Agency) recommended a 1,000 foot buffer between residences and rail yards. (ITravata 5 closest homes are within 500 feet of the train yard's nearest property line.) The next highest impact was determined to be between one-half to one mile from the site, which is where the original site for the rail yard was located along Sand Canyon. At the proposed site, the MND estimates an increased cancer risk for the community of Travata. At a minimum, this finding alone should indicate that a more rigorous study of the negative impacts on nearby residents and park users be undertaken. | |
| 30 | 03/18/22 | Stephanie Liu | stephaniestliu @gmail.com | All pairs does be underakent. NOISE: Weasurements of sound levels at the site were taken at a time when trains were only passing by Travata and yet they caused substantial spikes in noise near Travata. Once operational, the train noise from many more trains compounded by the longer noise impact of the slowing trains and possible use of the whistle to enter the yard would substantially increase the frequency and duration of the noise spikes. The noise impact alone may explain why Metrolink stations are 1 not located anywhere near residential areas. This is not even taking the sounds from the equipment used in the train yard into consideration. | |
| | | | C 8 | TRAFFIC: TRAFFIC: Access to the rail yard is along the same single lare road (Marine Way) that is presently well beyond its capacity to handle all users. Travata residents, Great Park users, food bank, distribution center, recycling plant, nursery and scon water park users all are forced onto a single lane road. This road already learly showed its inadequate for users an evacuation road when the Cypress Village community (that includes Travata) was under a voluntary evacuation during the October 2020 widdline. Traffic was jammed and very slow moving and at a time when the Great Park sports fields were closed due to the pandemic. This inadequate roadway could see the same result as we all witnessed during the Paradise. California fire traced. | |
| | | | | HAZARDOUS MATERIALS: The MND repeatedly uses the word 'normal' when discussing the storage of petroleum products and hazardous chemicals. There is nothing more concerning than having these types of substances within such a short distance of residences and Great Park visitors. On any given day, there might be thousands of people within 1,000 feet of the site. This is very concerning given that we hear constantly about leaks, fires, etc. occurring at industrial sites such as the rail yard. This is a dangerous facility to be located anywhere near to such a busy area and one that already suffers from congested readways. | |
| | | | | LIGHTING: Nightime inglighting would certainly impact residents' views over the site contrary to the report. As 80% of the train yard's operations will be during the overnight hours, all of the cranes and surrounding area will need to be well lit and quite visible from a large segment of Travata's residences along Marine Way and Ridge Valley. | |
| | | | | I am writing to convey that I am vehemently opposed to this project's close proximity to our (husband and my) residence at Travata's senior community, neighboring homes, and Great Park. We already have to put up with the noise and traffic of Interstate 5, Highway 133, trains passing by and engaging their whistles, participants using Great Park and FivePoint Amphiltheatre, and soon to be open Wild Rivers. We are | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 1 regarding impacts related to noise, air quality, and traffic. Refer to Comment Response 9 regarding impacts related to disele the and particulate matter, and Comment Response 5 regarding impacts related to cancer risk. |
| | | | | resigned to this because we knew about this situation when we purchased our home a year ago. But now a rail maintenance facility so close? We do not wish to telerate the rest of our lives with more noise, traffic, and additional health risks associated with diesel gas storage, sewage disposal, pollutants in the air from grinding train wheels and direst fue combustion which is known to contain cancer causing particles. | Refer to Comment Response 16 regarding impacts related to hazardous materials. The Project does not include wastewater treatment, including a sewage treatment plant. Refer to Comment Response 14 regarding impacts to wastewater. |
| 31 | 03/19/22 | Debbie Noonan | noonansfive @gmail.com | Please put the health of Irvine residents first and require this project to be placed further away from homes and Great Park where there are seniors and growing children! | |
| | | | | Thank you, Debible Noonan Noonansfive@gmail.com | |
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| Response to Comment |
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| nt No. | Received | Name(s) | Info | To Whom It May Concern, | Refer to Comment Response 1 regarding concern over disclosure of project. |
| 32 | 03/19/22 | Alex and Kristen Negvesky | negveskyfamil y@icloud.com | In on norms may concern, My husband and I moved to invine from the East Coast because of the quality of life here. For us, part of that Quality of Life has been the dean air and abundance of parks, especially The Great Park. We now enjoy the Farmer's Market and other events at Great Park with our young family. We hope that our children will eventually be playing soccer or tennis or multiple other sports at Great Park as well. We have recently been made aware of a disturbing development–development of an OCTA MetricLink Rail Yard immediately across from the park! This information has not been widely shared throughout the livine community and it needs to be This is a matter for all hose that visituse the park. We have many concerns with this development to include increased traffic, storage of hazardous materials/chemicals, noise; but MOST CONCERNING is the impact on air quality. Form what we have read, OCTA has made numerous assumptions regarding their ability to mitigate the particulate matter, it is easy to seeffect that when at Ceread Park the winds blow from the cocean directly over the proposed location of the rail yand, and into Great Park! These particulates will be inhaled by any of the children and adults who are playing on the fields as well as residents of the nearby residential senior community. There are experts galore in the fine universities within Orange County and nearby locates. Why is there not an independent analysis by any of these experts offered by the OCTA? This heavy industrial operation does not appear appropriate for an area zoned as "institutional use." As Irvine residents, we expect the city of Irvine to place the wellness of the families here as a top priority. Sincerely, Mr. Alex and Dr. Kristen Negvesky | Refer to Comment Response 1 regarding impacts related to air quality, noise, and traffic. Refer to Comment Response 1 regarding impacts related to diselfuel and particulate matter, and Comment Response 5 regarding impacts related to cancer risk. Refer to Comment Response 4 regarding impacts related to land use and zoning. Independent analysis from local universities and locals is not required by CEOA. |
| | | | | Dear City and County Officials, PLEASE: voto is disprove the Orange County Transit Authority's request to build a railway maintenance station directly across the street from Great Park and the Travata 55+ community! | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 1 regarding impacts related to air quality and noise. |
| 33 | 03/20/22 | James Geiger | james.geiger @rcn.com | This hortfic proposal would introduce an industrial complex operating 24 hours per day, seven days per week producing diesel contaminants into the air we breathe, non-stop overnight noise from moving trains and planned maintenance activities, and handling of hazardous materials where one mishap would spel disaster for the health of our senior community. As a military veteran with 26 years of active serving, I have experienced first-hand the negative effects of continuous 24/7 diesel-fueled tent city and heavy machines y operations in two different forward-deployed conflict zones, in current reacerbated by nightlime noise, glaring security lighting, and the every resent danger of a mishap involving hazardous materials. That is exactly what our senior travata community will face of this project goes through, a community where an enary esidents are already dealing with a host of debilitating medical issues. For the housands of families and community serving this industrial complex literally across the street from our retirement homes and the treasured community server of G creat Park would be terriby, terriby wrong. For a city that profes teed no being one of the best places to live in this complex. Iterative accounts the other to account the order on the order on the order to account the order to account the order to account the order to account the order on the order to account the order on the order to account the order on th | Refer to Comment Response 16 regarding impacts related to hazardous materials. Refer to Comment Response 9 regarding impacts related to disaft fuel and particulate matter, and Comment Response 5 regarding impacts related to cancer risk. Refer to Comment Response 4 regarding impacts related to land use and zoning. |
| 34-1 | 03/20/22 | Annie Leong | 131 Palencia, | March 20, 2022 Dear Mayor and Council Members: I very strongly oppose locating the rail yard in such close proximity to my home in Travata for the following reasons: -TRAFFIC: Access to the rail yard is along the same single lane road. This vary that is presently well beyond its capacity to handle all users. Travata residents, Great Park users, a food bank, distribution center, recycling plant, nursery and soon water park users all are forced onto a single lane road. This variad heavy clearly showed its inadequacy for use as an evacuation road when the Cypress Village community (that includes Travata) was under a voluntary evacuation during the October 2020 widfire. Traffic was jammed and very slow moving and at a time when the Great Park sports fields were closed due to the pandemic. This inadequate roadway could see the same result as we all whnessed during the Foradies. California fire tagody. +NOSE: Measurements of sound levels at the site were taken at a time when trains were only passing by Travata and yet they caused substantial spikes in noise near Travata. Once operational, the train noise from many more trains compounded by Me longer noise impact of the solwing trains and possitig to estimate yet quit owuld substantial increase the frequency and duration of the noise pakes. The noise impact alone may explain why Metrolink stations are not located anywhere near residential areas. This is a dregency statily these might be thousands of people within 1,000 feet of the site. This is very concerning given that we hear constantly about leaks, free, etc. occurring at industrial sites exists at the rail yard. This is a dregency statily they readies using the sorage of people within 1,000 feet of the site. This is very concerning given that were the original site for the rail yard was located anyon. At the proposed site, the MND estimates an increased cancer risk for the community of Travata's closes that and and charding chemese the reginal site of the rail yard was located anyon. At the proposed site, the MND | |
| 34-2 | 03/20/22 | Annie Leong | leong.aml@g mail.com 131 Palencia, Irvine CA | CONCLUSION: The rail yard project has environmental impacts that will cause substantial adverse effects on humans both directly and indirectly as a result of the negative impacts on air quality, noise, hazardous materials and traffic as discussed herein. These negative impacts cannot be mitigated to make the rail yard project feasible at its' current location. At a minimum, we urge the City of Irvine to require that OCTA prepare a more rigorous Environmental Impact Study. We believe that this study will prove that this rail yard does not belong in the Great Park neighborhood and needs to be relocated away from residents and park visitors. | Section 3.21 of the IS/MND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| 35 | 03/20/22 | | davidro48@g mail.com 131 Burgess, | Dear Irvine Mayor and Council Members: My wife and I purchased our home In the Travata community(55 years and older senior citizens) across from the Great Park in September 2018. At that time, we gave careful consideration to our neighbors: the 133 and 5 Freeways, the railicad tracks, Cypress Village, the Great Park, and other surrounding communities. We believed that those were acceptable neighbors and would not infinge on our right to peaceful coexistence. We recently learned that OCTA plans to build a 247 Metodink rail year diminerance facility in Oceanside, you will understand my community satim at this news. That facility is noisy and well-it and most importantly, there are no residents anywhere near 1, for good neason. And the operation that OCTA is proposing will be even larger combining operations from 1. And RVerside as well. We have learned through our research that the Community Development Dept, and the City Planners did not even know that OCTA was considering the site for such an operation until late 2016 when OCTA responded during the public comment period for Travata. At that time this subation should have been discussed and an alternative site chosen. In response to OCTA's environmental report why was this land ever sold to OCTA for a rail yard when its Clearly not compatible with showing times, whistel, and the noise spikes would cause substantial spikes near senior Travata residents 24H70 (noise), Marine Way is already well beyond to capacity to handfe all users and showed inadequacy to use as an evacuation road during the OCtober 2020 Matine Way is already well beyond to capacity ob that due states and crease and surrounding area will need to be well it and quite visible from a large segment of Travata action the intervata and comments, align and the stravades the estimation in pact resident's and the adverse dive impact so normice port as 80%. At the terra wards operation will be during the overlight hours, all of the cranes and surrounding areaw will need to be well it and quite v | As described in Section 3.3.3 of the IS/MND, the Project would not result in an increase in commuter rail service or additional locomotive train travel in the region. Refer to Comment Response 1 regarding impacts related to fan dues and zoning. Refer to Comment Response 1 regarding impacts related to an output, noise, and traffic, and Comment Response 11-2 regarding impacts related to fine evacuation. Refer to Comment Response 1 regarding impacts related to an output, noise, and traffic, and Comment Response 11-2 regarding impacts related to fine evacuation. Refer to Comment Response 1 regarding impacts related to an output, noise, and traffic, and Comment Response 11-2 regarding impacts related to fine evacuation. Refer to Comment Response 1 regarding impacts related to an output, noise, and traffic, and Comment Response 11-2 regarding impacts related to hazardous materials. Refer to Comment Response 1 regarding impacts related to the and and visual quality. Refer to Comment Responses 1 regarding relocation or alternative site of the Project. Comment on the deficiency of the MND and a request to prepare an EIR has been forwarded to OCTA for consideration. |
| 36-1 | 03/20/22 | Karen Blakeley | y@gmail.com 109 Palencia, | My husband and I purchased a home in the Travata community in late 2021, our community learned that OCTA planned to develop a Metrolink Rail Maintenance Facility on 21 acres just across Marine Way from our community. No mention of such a facility was made during the sale process nor in the disclosures made by Lennar whene w purchased our home. We subsequently learned that OCTA hought the 21+ acre site in 2015, one year before CarManie, now lennar, submitted a CUP Application to built Travata. CTA's raily and project never even came up until CCTA whole alter to the Community Development 10 gameter during the public comment period for the Mitigated Negative Earor of the negative consequences of that mistake. At this time, we find ourselves in the public comment period for the Mitigated Negative Declaration submitted by QCTA in a lame effort to show that the rail yard will not negatively impact. Travata residents and surrounding Cypress Village residents and Great Park visitors. For the reasons laid out below, this is a further insult to our community and OCTA should be required to prepare a more rigrorus EIR instead of the inaccurate and self-serving MND. COMMENTS TO THE MITIGATED NEGATIVE DECLARATION Zoning: The train yard site within livine's Great Park visitors. For the reasons laid out below, this is a further insult to our community and OCTA should be required to prepare a more rigrorus EIR instead of the inaccurate and self-serving MND. COMMENTS TO THE MITIGATED NEGATIVE DECLARATION Zoning: The train yard site within livine's Great Park visitors and presside with the easity residents and serve and users. This facility belongs in an institutional zone. Why was this land ever sold to OCTA for anal Jard y not compatible with the easity residents and Great Park recreational needs users. This facility belongs in an institutional zone. Why was this land ever sold to OCTA for anal Jard y not considerative the mean train serve only passing by Travata and yet the ycassed substantial spikes in noise near Tr | Refer to Comment Response 1 regarding impacts related to noise and air quality, and Comment Response 9 regarding impacts related to diesel fuel and particulate matter. Refer to Comment Response 20 regarding the methodology used in accordance with SCAQMD. |

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| I fuel and particulate matter. Refer to Comment Response 5 for impacts related to exposure of cancer risk toxins. |
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| ni No. | Receiveu | Name(s |) """ | Traffic: Access to the rail yard is along the same single lane road (Marine Way) that is presently well beyond its capacity to handle all users. Travata residents, Great Park users, food bank, distribution center, recycling plant, nursery and | |
| 36-2 | 03/20/22 | Karen Blakeley | y@gmail.com | scon water park users all are forced onto a single lane road. This road already clearly showed its inadequacy for use as an evacuation road when the Cypress Village community (that includes Travata) was under a voluntary evacuation during the October 2020 willfer. Traffic was jammed and very slow moving and at a time when the Great Park sports fields were closed due to the pandemic. This inadequate roadway could see the same result as we all witnessed during the Paradise, California fire tragedy. Hazardous Materials: As proposed, the rail yard will have four 30.000 gailon tanks for refueling locomotives. These are to be located very near to the site's property line and thus within 500 or so feet of the Great Park. These tanks not only pose ar is fix from potential fire but the furnes related to their use is a great concern for realidents and fract Park users given the North. East within fow. In addition, the need to refit the tanks will generate a great date of lanker trips to and from the facility. The HND repeatedly uses the word 'normal' when discussing the storage of people within 1,000 feet of the site. This is very concerning given that we hear constantly about leaks, fires, etc. occurring at industrial sites such as the rail yard. Aschthetics: The NND states that there will be no impact on the views of hills to the southwest. Yet the train yraid will have a diverse fieldences and Great Park users alore the add of the site of the yard and 4 permanent cranes. Travata's view of the hills to the southwest to close provide show the hill formations which are quite attractive and very visible. In closing, the negative impact described above cannot be mitigated to make the rail yard project feasible at its current location. At a minimum, we urge the City of Irvine to nequire that CCTA prepare a more rigorous Environmental Impact Study. We believe that this study will prove that this rail yard does not belong in the Great Park neighborhood and needs to be relocated away from residents and park visitors at an i | Refer to Comment Response 2 regarding impacts related to aesthetics and visual quality. |
| 37 | 03/20/22 | Jack and Maureen Khaw | 1@gmail.com 111 Burgess, Irvine CA | To Whom It May Concern: We (Jack and Maureen) would like OCTA and City of Irvine officials to hear us loud and clear that we do NOT want the OCTA rail yard in Irvine. The negative impacts to our health and well-being cannot be sufficiently mitigated. Here are the concerns: Zoning, Ar Quality, Noise, Aesthetics, Lighting, Traffic, Hazardous materials, Great Park users. The project has environmental impacts that will cause substantial adverse effects on humans both directly and indirectly as a result of the negative impacts on air quality, noise, hazardous materials and traffic as discussed herein. These negative impacts cannot be mitigated to make the rail yard project feasible at its current location. At a minimum, we urge the City of Irvine to require that OCTA prepare a more rigorous Environmental Impact Study. We believe that this suby will prove that this railyard does not belong in Irvine or the Great Park neighborhood and needs to be relocated away from residents and park visitors. Thank you very much, Jack and Maureen 111 Burgess | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 1 regarding impacts related to larid aesthetics. Refer to Comment Response 4 regarding impacts related to larid and aesthetics. Refer to Comment Response 16 regarding impacts related to hazardous materials. Refer to Comment Response 16 regarding impacts related to hazardous materials. |
| 38 | 03/20/22 | Richard Leong | 131 Palencia, | March 20, 2022 Dear Mayor and Council Members: I live in travata and very strongly oppose locating the rail yard in such close proximity to my home for the following reasons: TRAFFIC: Access to the rail yard is along the same single lane road. (Mairie Way) that is presently well beyond its capacity to use as an evacuation road when the Cypress Village community (that includes Travata) was under a voluntary evacuation during the October 2020 widfler. Traffic was jammed and very slow moving and at a time when the Grate Pas sports fields were closed due to the pandemic. This inadequate road was under a voluntary evacuation during the October 2020 widfler. Traffic was jammed and very slow moving and at a time when the Grate Pas sports fields were closed due to the pandemic. This inadequate road was under a voluntary evacuation during the October 2020 widfler. Traffic was jammed and very slow moving and at a time when the Grate Pas sports fields were closed due to the pandemic. This inadequate road was under a voluntary whoresed during the longer noise impact of the slowing trains and possible use of the whisties be enter the yard would substantially increase the frequency and duration of the noise spikes. The noise impact of the slowing trains and possible use of the whisties of any divente may due would substantially increase the frequency, and duration of the noise spikes. The noise impact of the slowing trains and possible use of the whisties of approxements of approxements. Their is and previous first to be cloaed anywhere near residences and Great Park visitors. On any given day, there right the thousands of pactie within 1,000 feed of the aisa' provides. This is a danger concerning given that where constantly about leaks, fires, etc. occurring at naturatia slows and the site way is an and possible to the toria yard and a strong. Their and approxemented at 1,000 foot buffer between ne-hit is under and cloaed anywere near this is the anger provides. The hit is a subrary provides and feed any acces and thing bof | |
| 39 | 03/20/22 | Judy Fen | g @hotmail.co m | To Whom This May Concern, This is emails to express our concerns and opposition to theproposed 24/7 OCTA train/rail yard project in the close proximity to us residents in the Travata Community. Below is a list of our concerns: ZONING: The train yard sile within Invine's Great Park is not compatible with the existing institutional zoning designation. A train yard that involves the use of heavy machinery, hazardous chemicals and emits high levels of particulates into the surrounding residential and recreational areas violates the planning area's purpose. Per the NND. The Project type is coleses to an industrial type' and therefore does not belong in an institutional zone. Why was this land ever sold to OCT A for a rail yard when is is clearly not compatible with the nearly residents and Great Park receational uses. TRAFFIC: TRAFF | Oppaliton of the Project has been noted and will be considered by OCTA. Refer to Comment Response 4 regarding impacts related to hazerdown materials. Refer to Comment Response 2 regarding impacts related to logithing and aesthetics. Refer to Comment Response 2 regarding impacts related to noise and raffic. Comment on the deficiency of the MND and a request to prepare an EIR has been forwarded to OCTA for consideration. |
| 40 | 03/20/22 | Letitia Leung | letitiapharmd @yahoo.com | OCTA rail yard and have it relocate elsewhere. | Refer to Comment Response 1 regarding concern over disclosure of project. Refer to Comment Response 1 regarding impacts related to hoise and air quality, and Comment Response 9 regarding impacts related to diesel fuel and particulate matter. Refer to Comment Response 1 regarding impacts related to inzardous materials. CEOA does not require the analysis of economic impacts, including the analysis of property values. Refer to Comment Response 1 regarding relocation of the Project. |

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| | | Name(3) | | Atlantic, now Lennar, of an application to build Travata. OCTA's rail yard project never was mentioned during the review process for Travata until OCTA wrote a letter to the City Planner during the public comment period reminding the City | Comment on the deficiency of the MND and a request to prepare an EIR has been forwarded to OCTA for consideration. |
| | | | | part or only of mine and the climit and the mean restances and not mere and the negative consequences or line end. We are now in the public comment period for the Mitigated Negative Declaration submitted by OCTA in an attempt to show that the rail yard will not negatively impact Travata residents, surrounding Cypress Village residents and Great Park visitors. For the reasons laid or below, this is a uther in sult to community and OCTA should be required to prepare a more rigorous EIR instead of the inaccurate and self-serving MND. | Neter to Comment Response 3 regarding impacts related to deservice and particulate nation, and Comment Response 20 regarding the interfocuety data in accordance with Concerno. |
| | | | | Zoning: The train yard site within livine's Great Park is not compatible with the existing institutional zoning designation. A train yard that involves the use of heavy machinery, hazardous chemicals and emits high levels of particulates into the surrounding residential and recreational areas violates the planning area's purpose. Per the MND, 'The Project type is closest to an industrial type' and therefore does not belong in an institutional zone. Why was this land ever sold to OCTA for a rail yard when it is clearly not corresplate with the rearry residents and read read users. This facility belongs in an industrial indepictorodon do a residential and recreational nece. | |
| | | | seplaekeley11 | Noise impacts: Measurements of sound levels at the site were taken at a time when trains were only passing by Travata and yet they caused substantial spikes in noise near Travata. Once operational, the train noise from many more trains compounded by the longer noise impact of the slowing trains and possible use of the whistle to enter the yard would substantially increase the frequency and duration of the noise spikes. The noise impact alone may explain why Metrolink stations are not located anywhere near residential areas. This is not even taking the sounds from the equipment used in the train yard into consideration. Since the majority of the rail yard's operations would be during the overhight hours. Travata residential and to slowe through all this noise. | |
| 41-1 (| 03/21/22 | Blakeley | 109 Palencia, Irvine CA | overlight hours, invate residents would be expected to seep intrody; at its invise. Air Quality: The MDD notes that rail yards are one of the highest emitters of diesel particulates and are a major contributor of toxic air contaminants. Trains are also a major contributor of toxic air contaminants along with construction equipment. The report states that it discel particulate matter continues to account for about two-thirds of the cancer risk from air toxins' which is a major concern for those living nearby. The MND should have analyzed the dispersion of contaminants at its Los Angeles train yard. Instead it discounts the presence of contaminants uses and acce and particulates and incorrectly applies SCAMDD methodology to the rail yard's risk to nearby residents in Travala and visitors to the Great Park. The MND seem schoology the rail yard's risk to nearby resident Park site. SCAMDD advises instead that an air dispersion analysis be prepared. It appears that, rather than presenting objective does. An EIR would provide a nuch more figuros in thave been travile and is an absolutes furgivent for the regivent site share is a nearby of Travala and this rail yard project Doess. An EIR would provide a nuch more figuros on this of the regivent of this situation. | |
| | | | | Traffic: Access to the rail yard is along the same single lane road (Marine Way) that is presently well beyond its capacity to handle all users. Travata residents, Great Park users, food bank, distribution center, recycling plant, nursery and soon water park users and are forced onto a single lane road. This road already clearly showed its inadequacy for use as an evacuation road when the Cypress Village community (that includes Travata) was under a voluntary evacuation during the Cother 2020 wildline. Traffic was jammed and very slow moving and at a time when the Great Park sports fields were closed due to the pandemic. This inadequate roadway could see the same result as we all witnessed during the Paradise, California fire tragedy. | |
| | | | | Hazardous Materials: the rail yard will have four 30.000 gation tanks for refueing locomotives. These are to be located very near to the site's property line and thus within 500 or so feet of the Great Park. These tanks not only pose a risk from potential fire but the fumes related to their use is a great concern for residents and Great Park users given the North East wind flow. In addition, the need to refill the tanks will generate a great deal of tanker trips to and from the | Refer to Comment Response 16 regarding impacts related to hazardous materials. Refer to Comment Response 2 regarding impacts related to aesthetics. |
| | | | seblaekeley11 | [facility: The MND repeatedly uses the word 'normal' when discussing the storage of petroleum products and hazdrods schemicals. There is nothing more concerning than having these types of substances within such a short distance of the residences and for each advect schemicals. There is nothing more concerning than having these types of substances within such a short distance of the set. This is every concerning given that we have constantly about leads, free, etc. counting at industrial tables such as the | Refer to Comment Response 4 regarding impacts related to land use and zoning. |
| 1-2 0 | 03/21/22 | | @gmail.com 109 Palencia, Irvine CA | Aesthetics: The MND states that there will be no impact on the views of hills to the southwest. Yet the train yard will have a 5 story structure in the middle of the yard and 4 permanent cranes. Travata's view of the hills to the southwest (Quali Hill and Shady/Bommer Canyon) will certainly be negatively impacted. The report is deliberately misleading as neither of the photos provided show the hill formations which are quite attractive and very visible. | |
| | | | | The negative impacts described above cannot be mitigated to make the rail yard project feasible at its current location. It needs to be relocated to a site that is appropriately zoned for industrial use. | |
| | | | | To whom it may concern, This letter is to address our concern regarding the proposed Transportation Maintenance Facility between Ridge Valley and Marine Way in the City of Irvine. | Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to ain quality, noise, and traffic. Refer to Comment Response 2 regarding impacts related to faithing and aesthetics. |
| | | | | As residents of the Travata Community, we are expressing our deepest concern regarding this proposed project being so close to Great Park and residential community. We would like the Planning Department and City Manager to address the basis of approval on the following controls. | Section 3.21 of the IS/MND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| | | | | 1. Zoning: Why is the Train Yard, which uses heavy duty equipment, such as cranes and forkfilts be dived in the proceed site. | |
| | | | | 2. Air Quality: Why is toxic air contaminants from train and construction be allowed so close to Great Park and residences. | |
| | | | | 3. Noises: No actual measurement of noise level were provided. No consideration of noise impact on close-by residents. | |
| 42 0 | 03/21/22 | Kenneth and Annie Lam | lamspl2@yah oo.com | 4. Aesthetics: Report deliberately misleading there is no impact on the views of hills to the Southwest. No clear photo of views along Marine Way. | |
| | | Lum | | Lighting: No concern for nightime lighting, 24/7 days a week, especially lighting on the 4 tail cranes affecting the residents. Traffic: Disregard already congested traffic along single lane Marine Way. The proposed project will definitely create more traffic jam, and thereby more unavoidable accidents along Great Park neighborhood. | |
| | | | | Trainic. Distrigate a aready congested ratine area in a single rate mainine way. The proposed project will definitely cleare note a rate part of the result of the negative impact on air quality, noise, light, aesthetic and Mandatory Finding of Significance: The project has environmental impacts that will cause substantial adverse effects on humans both directly and indirectly as a result of the negative impact on air quality, noise, light, aesthetic and | |
| | | | | traffic as discussed herein. These negative impacts cannot be mitigated to make the Rail Yard Project feasible at it's current location. | |
| | | | | Sincerely, | |
| | | | | Kenneth and Annie Lam | |
| | | | | I am proud of living in our beautiful city of Irvine and the unique Great Park nearby but I heard our city is going to consider to approve Railroad Yard which will cause all the problems like pollution, noise, traffic, lights and so on. | Refer to Comment Response 1 regarding impacts related to air quality, noise, and traffic. Refer to Comment Response 2 regarding impacts related to lighting. |
| | | | insoochin@g | I don't quite understand why we need this facility and how it is going to be beneficial to our community. It does not make sense. This is only going to deteriorate the quality of life in our wonderful community. I want to live in a peachulf and quite place like it is now of the rest of my life. I hope you understand the concerns of our community. | |
| 43 (| 03/21/22 | Insoo Chin | mail.com 124 Palencia, | Best regards | |
| | | | Irvine CA | Insoo Chin | |
| | | | | 124 Palencia, Irvine, CA 92618 | |
| | | | | | Refer to Comment Response 1 regarding impacts related to air quality, noise, and traffic. Refer to Comment Response 2 regarding impacts related to lighting. |
| 44 0 | 03/21/22 | Harry I Yessain | hyessain@gm ail.com | leaking. For this being a "proposed" project, there sure is much prep work already being done. This was never disclosed to the residents that bought in this community. It needs to be placed elsewhere. Best regards | Refer to Comment Response 9 regarding impacts related to diesel fuel and particulate matter, and Comment Response 16 regarding impacts related to hazardous materials. Refer to Comment Response 1 regarding concern over disclosure of project. |
| | | roodan | an.com | Harry Yessian | |
| | | | | This letter is to address our concern regarding the proposed Transportation Maintenance Facility between Ridge Valley and Marine Way in the City of Irvine. | Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to air quality, noise, and traffic. |
| | | | | As residents of the Travata Community, we are expressing our deepest concern regarding this proposed project being so close to Great Park and residential community. We would like the Planning Department and City Manager to address the basis of approval on the following points. | Refer to Comment Response 2 regarding impacts related to lighting and aesthetics. Section 3.21 of the IS/MND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| | | | | 1. Zoning: Why is the Train Yard, which uses heavy duty equipment, such as cranes and forklifts be allowed in the proposed site. | |
| | | | | 2. Air Quality: Why is toxic air contaminants from train and construction be allowed so close to Great Park and residences. | |
| | | | | Noises: No actual measurement of noise level were provided. No consideration of noise impact on close-by residents. Aesthetics: Report deliberately misleading there is no impact on the views of hills to the Southwest. No clear photo of views along Marine Way. | |
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| 45 (| 03/21/22 | Kenneth Lam | lamspl@yaho o.com | Lighting: No concern for nightime lighting, 24/7 days a week, especially lighting on the 4 tail cranes affecting the residents. | |
| 45 0 | 03/21/22 | | | | |
| 45 0 | 03/21/22 | | o.com | 5. Lighting: No concern for nightlime lighting, 24/7 days a week, especially lighting on the 4 tall cranes affecting the residents. | |
| 45 (| 03/21/22 | | o.com | Lighting: No concern for nighttime lighting, 24/7 days a week, especially lighting on the 4 tail cranes affecting the residents. Traffic: Disregard already congested traffic along single lane Marine Way. The proposed project will definitely create more traffic jam, and thereby more unavoidable accidents along Great Park neighborhood. Mandatory Finding of Significance: The project has environmental impacts that will cause substantial adverse effects on humans both directly and indirectly as a result of the negative impact on air quality, noise, light, aesthetic and traffic accused herein. These negative impacts cannot be mitigated to make the Rail Yard Project feasible at it's current location. | |
| 45 (| 03/21/22 | | o.com | 5 Lighting: No concern for nighttime lighting, 24/7 days a week, especially lighting on the 4 tail cranes affecting the residents. 6. Traffic: Disregard already congested traffic along single lane Marine Way. The proposed project will definitely create more traffic jam, and thereby more unavoidable accidents along Great Park neighborhood. 7. Mandatory Finding of Significance: The project has environmental impacts that will cause substantial adverse effects on humans both directly and indirectly as a result of the negative impact on air quality, noise, light, aesthetic and traffic as discussed herein. | |

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| | Received | tor Name(s) | Info | Comment Received | Response to Comment |
| 46 | 03/21/22 | Anthony and Tali Halfpenny | | | Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to lighting. |
| 47 | 03/22/22 | Beth and Bain Patrick | bpatrick8@ao I.com 197 Carlow, Irvine CA | Dear Inview Mayor and Council members: We purchased out home In the Travata community across from the Great Park in May 2021. At that time, we gave careful consideration to our neighbors: the 133 and 5 Freeways, the railroad tracks and the Park. We believed that those We recorely beams to build a 247 Metrolink maintenance facility across the street which is appalling. If any of you have traveled the 5 freeway at night over their facility in Oceanside, you will understand my community alarm at this news. That facility is noisy and well-lit and most importantly, there are no residents anywhere near it, for good reason. The operation that OCTA is proposing will be even larger combining operations from LA and Riverside as well. We have bearned through our research that the Community Development Dept and the City Planners did not even know that OCTA was considering the sile for such an operation until late 2016 when OCTA responded during the public comment period for Travata. At this me, this siluation should have been discussed and an alternative sile chosen. Needless to say, this proposed facility is not an acceptable use of land so near to a residential neighborhood especially when there are alternative siles closer to the Metrolink station on Ada and Barranca where there are only park and comment period for Travata. At the community Development Dept. and OCTA to relocate this facility to a more acceptable location. Please vole "NO" to this proposal. Thank you for your assistance. Brian and Beth Patrick 197 Carlow Irvine CA 52618 | Refer to Comment Response 1 regarding concern over disclosure of project. Refer to Comment Response 1 regarding inpact related to land use and zoning. Refer to Comment Response 1 regarding relocation of the Project. |
| 48-1 | 03/21/22 | Alfred Cheung | alfredcwc@ya hoo.com | To: OCTA (conf@cota.net), Donald Wagner, 3rd District Supervisor, OCTA Board of Directors, City Of Irvine, Mayor Farrah Khan, Vice Mayor Anthony Kuo, Councilmember Tammy Kim, Councilmember Mike Carroll, Councilmember Larry Agam, Bill Rodigues, Principle Planner, Victor Mendes, Asst. Planner To all above-named parties: My Wife and I moved from the San Francisco Bay area to our new home in Irvine about 1 year ago. We settled in the Travata 55+ adult community for our retirement life due to its tranquil surroundings and close to many health facilities. However our peaceful retirement fair awas abruppit interrupted after we learned only a month or 2 ago on the proposal for OCTA to build up the Metrolink Rail Depot at a location only about 500 feet where our Travata community is located This news is very disturbing as it appears that there is lack of oversight in the proposal without proper scruthry and sufficient time given to the public on the negative impacts to our daily life. My objectons on the proposal on this Metrolink Rail Maintenance Yard are based on many common ads opecific personal factors. Since many residents in Travata have voiced numerous common concerns to you aready and therefore I will focus primarity on my personal concerns in 1 just found out that I have cancer and thus having proper rest is very important for my proper recovery, in particular a good night sleep without woken up by the loud sound from the rail yard. The operation hours of the rail yard over the earlier ingit, no doubt will not allow me to have a good night sleep with the sound pollution from the rail yard. The operation hours of the rail yard over the entrier ingit, no doubt will not allow me to have a good night sleep with the sound pollution from the rail yard. The experiment to a gooding the sleep without being disturbed from the loud sound from the concerts, often times after 10.30pm. This is already a considerable disters to my daily life and now with the proposal will and whore therein yingit, into 7 days a wee | Refer to Comment Response 9 regarding impacts related to diesel fuel and particulate matter, and Comment Response 16 regarding impacts related to hazardous materials. |
| 48-2 | 03/21/22 | Alfred Cheung | h | In summary, it appears to me that OCTA is rushing to have this proposal approved but without proper disclosures, independent environment impact studies and public review period, so that the voices of the citizens affected by this proposal can be heard. I am making my plea to the livine City Council to disapprove and not consider this OCTA proposal as this does NOT serve the public interests for livine, in particular to the residents of Travata. I want to live even when inflicted with my 'killing' cancer and possibly additional health risks to me with the erection of this rail yard and I want to keep livine beautiful. I do NOT want to see this OCTA proposal considered at all at the curren proposed site. Thank you for listening to my plight. | The comment has been noted and will be considered by OCTA. |
| 49 | 03/22/22 | Raymond and Dianne Wong | rswong@veriz on.net 626-590-6608 167 Burgess, Irvine CA | This email is to provide our feedback regarding the proposed OCTA Orange County Maintenance Facility within the Great Park. This property is not zoned for this type of facility. Planning Area 51 is zoned for 6.1 institutional and a conditional use permit SHOULD NOT BE granted or even considered. Area 51 is designated as Lifelong Learning District. Area 51 is for a mix of residential, commercial, and educational uses that promotes and supports a synergistic levelean/work/hype environment. If the conditional use permit is approved, the project should be scaled back to minimize impact on the Great Park and surrounding community. There should also be a Noise Abatement Phan imposed to limit operations between the bedfine hours of 11 pm to 7am much like the General Aviation Noise Ordinance (GANO) at the John Wayne Alport. Even the 5-points amphitheater limits noise after 10pm. This will ensure the health and well-being of residents and visitors to the Great Park. Key Points for Comem This facility is completely inconsistent with the Great Park as a focal point for community activities, sport facilities, and an area of quiet tranquility for Irvine's adjacent communities. This is particularly true for our Travata 55 Plus Community which is located within about 500 feet and will suffer from the disruption of its construction, and the ongoing nuisances of greater traffic, noise, light, and environmental pollution, plus other negative consequences for Travata, neighboring communants, and Great Park. Uses. In the EPA document Thiomation on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (March 1974), the long-term health and welfare on an individual are related to cumulative and exposure Community of the submite vessions who excessive noise 2477. The noise at the COKF will start after Sgn whom trains are taken off-service entering the facility, sanding and market community. Facility age as some more dealable and specific points developed anongsto ur communit | |

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| 50 | 03/23/22 | Joseph Toma | joetoma@me. com 135 Palencia, Irvine CA | To Whom it may concern. Please find attached our concerns about the OCTA Maintenance Facility Project. Regards, Joe Toma Grange County Transportation Authority Afth: Lora Cross, Project Manager comf@ccta.net Re: Comment and Objection to Orange County Transportation Authority's Draft Initial Study/Mitigated Negative Declaration for the Metrolink Orange County Maintenance Facility Project To Whom It May Concern. We are opposed to the proposed Metrolink Conange County Maintenance Facility Project. OCTA is proposing to put this 24-hour heavy industrial maintenance facility use in an institutional zone a few feet away from our residential Community. It e declass of this ill-advised project are numerous, OCTA's Draft Initial Study/Mitigated Negative Declaration ignores the significant impacts to the existing residential community. It ignores specific impacts to the project adequalety analyzed the environmental issues and the impact to the residential homes just across the street. Further analysis and a full Environmental Impact Report should be prepared to consider: The raider impacts from the 24-hour operation of the proposed heavy industrial Metrolink maintenance Facility. The inarcies caused by the use of anazarous materiais at the proposed heavy industrial Metrolink maintenance Facility. The impacts from the 24-hour operation of the proposed heavy industrial Metrolink maintenance Facility. The impacts form the 24-hour operation of the proposed heavy industrial Metrolink maintenance Facility. The air quality impacts from the 24-hour operation of the proposed heavy industrial Metrolink maintenance Facility. The air quality impacts form the 24-hour operation of the proposed heavy industrial Metrolink maintenance Facility. The air quality impacts from the 24-hour operation of the proposed heavy industrial Metrolink maintenance Facility. The air quality impacts from the 24-hour operation of the proposed heavy industrial Metrolink maintenance Facility. The aind use impacts form the 24-hour operation of the proposed he | Opposition of the Project has been noted and will be considered by OCTA. Comment on the deficiency of the MND and a request to prepare an EIR has been forwarded to OCTA for consideration. Refer to Comment Respons 1 regarding impacts related to biard use and zoning, and Comment Response 16 regarding impacts related to biard use and zoning, and Comment Response 16 regarding impacts related to bighting and aesthetics. Refer to Comment Response 2 regarding impacts related to lighting and aesthetics. |
| 51 | 03/23/22 | Howard Hewitt | howardh1971 | Howard Hewitt 249 Carlow Irvine Ca. 32618 I am writing this letter to oppose the proposed Metrolink Rail Maintenance Facility to be built at Marine Way and Ridge Valley. I purchased my home in the Travata Community in 2019. I purchased this home because I wanted to retire in a paecoful, quide community. I have read the Mitigated Negative Declaration Document and the Contour Map of the 30 year Cancer Risk report on the Proposed Metrolink Facility and have several objections to this project. I am very concerned about the added noise, light, traffic, and air pollution that the building and operation of this facility would bring to my community. I would have never purchased my new home had I know this was to be developed just 500 feet from my neighborhodel et would appreciate your support in choosing another site for this project. Thank you. Sincerely, Howard Hewitt | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 9 regarding impacts related to idesel fuel and particulate matter, and Comment Response 5 regarding impacts related to the exposure of toxins and cancer risk. Refer to Comment Response 1 regarding impacts related to noise, ratific, and air quality. Refer to Comment Response 1 regarding relocation of the Project. |
| 52 | 03/23/22 | Harry Yessain | | Attr: Darrell E. Johnson; Jennifer Bergener; Lora Cross, My wife and I purchased our home in the Travata community across from the Great Park in 2019. At that time, we gave careful consideration to our neighbors: the 133 and 5 Freeways, the railroad tracks and the Park. We believed that those were acceptable neighbors and would not infinge on our right to a peaceful coexistence. We recently learned that COTA plans to build a 247/ Merdinity maintenance facility across the street which is appalling. If any of you have travelled the 5 freeway at night over their facility in Oceanside, you will understand my community's alarm at this news. That facility is noisy and well-it and most importantly, there are no residents anywhere near it, for good reason. And the operation that CCTA is proposing will be even larger combining operations from LA and Riversida es well. We have learned through our research that the Community Development Dept. and the City Planners did not even know that OCTA was considering the site for such an operation until late 2016 when OCTA responded during the public community the isothed a "proposed" project, there sure is much prevent and the Cite and the Cite at Park is just a wong location for time residents. It will affect the Great Park surrounding communities in air quality, noise, lights, traffic jam on Marine Way and potential diesel tank explosion or leaking. Er for its being a "proposed" project, there sure is much prev work already being done. This was never disclosed to the residents that bought in this community. It needs to be placed elsewhere It must be stopped and not approved by the city. Needless to say, this proposed facility is not an acceptable use of land so near to a residential neighborhood especially when there are alternative sites closer to the Metrolink station on Ada and Barranca where there are only park and commercial neighbors. I encourage the City Planners to work with the Community Development Dept. and OCTA to relocate this facility to a more acceptabl | Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding concern over disclosure of project. Refer to Comment Response 1 regarding relocation of the Project. |
| 53 | 03/23/22 | Swaroop Mallegari | swaroopmalle gari@gmail.co m | Hi, Please VOTE NO the OCTA Train Maintenance Facility in Irvine. We do not want this in our community and do not need it. The repercussions are too high. Swaroop Benjamin Mallegari | Opposition of the Project has been noted and will be considered by OCTA. |
| 54-1 | 03/23/22 | Raymond and Kenny Wong | ail com | This email is to provide our feedback regarding the proposed OCTA Orange County Maintenance Facility within the Great Park. This email is to provide our feedback regarding the proposed OCTA Orange County Maintenance Facility within the Great Park. This property is not zoned for this type of facility. Planning Area 51 is zoned for 6.1 institutional and a conditional use permit SHOULD NOT BE granted or even considered. Area 51 is designated as Lifelong Learning District. Area 51 allows for a mix of residential, commercial, and educational uses that promotes and supports a synergistic liveleant/work/type environment. If the conditional use permit is approved, the project should be scaled back to minimize impact on the Great Park and surrounding community. There should as be at Noise Abatement Plan imogered to limit ceparations between the bedtime hours of 11pm to 7am - much like the General Aviation Noise Ordinance (GANO) at the John Wayne Arport. Even the 5-points amphilteater limits noise after 10pm. This will ensure the health and well-being of residents and visitors to the Great Park. Key Points for Concem This facility is completely inconsistent with the Great Park as a focal point for community, activities, sport facilities, and an area of quiet tranquility for Irvine's adjacent communities, and cleres Park users. The project should have been rejected before the major investment in planning and design work because it just deesn't fit in this area. In addition, we had an opportunity to meet with OCTA management to explain their project and found them unable to answer questions regarding the design, hazards, risk, and other issues. In the EPA document 'Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (March 1974), the long-term health and welfare on an individual are related to cumulative noise exposure necesive environemental post of the information on Levels of Environmental ty be posted to the Great Park and particularly within 500 | y |
| 54-2 | 03/23/22 | Raymond and Kenny Wong | rdewong@gm ail.com 626-590-6608 | rail yard. This is a dangerous facility to be located anywhere near to such a busy area and one that already suffers from congested roadways. | Refer to Comment Response 2 regarding impacts related to lighting. Section 3.21 of the IS/MND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |

| Comme nt No. | Date Received | Commen tor Name(s) | Contact Info | Comment Received | Response to Comment |
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| | | Name(s) | | Dear OCTA, We are writing to you on a matter of great concern. It has come to our attention that the OCTA has plans to develop a rail yard within close proximity to the Travata housing development. It is our understanding that this rail yard is proposed to be developed within 500-1000 feet of most Travata residents. We have also learned that the Air Resources Board does not advise locating rail yards within 1000 feet of residential areas due to significant health concerns. | Refer to Comment Response 9 regarding impacts related to diesel fuel and particulate matter, and Comment Response 5 regarding impacts related to the exposure of toxins and cancer risk. Refer to Comment Response 1 regarding impacts related to noise, air quality, and traffic, and related to the exposure of toxins and cancer risk. Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to land use and asthetics. |
| | | | | Further, we fail to understand why such a development is under consideration to be built along side newly built residential horees as opposed to a more sensible industrial or commercial location. The development of a project posing significant health concerns within close proximity to a residential housing community is clearly unacceptable. First and foremost, there is the issue of air quality. A rail yard will emit toxic diesel particulates into the neighboring and. Furthere were concerned about excessive noise levels, disruptive levels | |
| 55 | 03/23/22 | Bijan and Zina | bijan6@me.c om 107 Carlow, | Please keep in mind, Travata is a 55 and over community. You are proposing a development of a dangerous project next door to a community of our more vulnerable city residents. We fail to accept the OCTA's Mitigated Negative Declaration for all of the reasons stated above. To date we have not heard of any adequate mitigants to the health and safely issues you are proposing to bring to our community. Frankly, we cannot see how these obvious dangers can be mitigated without relocating this project to an appropriate location. | e |
| | | Towfigh | Irvine CA | We sincerely hope that you will take these matters into serious consideration and put peoples health and safety above an industrial project that can and should be moved to a location where damage and harm will not come to the residents of our city. Thank you. | |
| | | | | Respectfully. Bija and Zina Towfigh 107 Carlow Irvine, CA 92618 bijan6@me.com | |
| 56 | 03/24/22 | Karen | karensblakele | Please find a petition signed by over 70% of the residents of the 55+ community of Travata that would be impacted negatively by the proposed rail facility across from their homes. None believe that the negative effects can be mitigated and respectfully ask that the City of Irvine and OCTA find a more suitable site for the facility. | Refer to Comment Response 1 regarding relocation or alternative site of the Project. |
| | | Blakeley | y@gmail.com | The Residents of Travata | Refer to Comment Response 16 regarding impacts related to hazardous materials. |
| 57 | 03/24/22 | Rana Azimi | rana.azimi@g mail.com | I write this on behalf of the children who can not self advocate for their right to play sports and enjoy the Great Park. Noving forward on the OCTA railcar Maintenance center (which included all the benzene storage) is not the right move for Irvine. I have lines where the storage tanks have leaded or spiled, causing disastrous outcomes to the health of the reputation of the rich. This would increase cancer risks in the area, Do we really want livine to have the reputation of high cancer clusters? Irvine is already dealing with All American Asphalt, it does not need another major polluter to add to its list of toxic emitters in the so-called "safest city". The diesel tanks are at risk of leaks and explosions as kids and grandidis, or any non of us are at the Great Park. These demy the OCTA permit application and do not allow any loopholes or future permits to prevail. Please make Irvine safe to live, work, and play inSHUT DOWN AAA and do not add the railcar maintenance centerPLASE!!! This will be your legacy. | Refer to Comment Response 9 regarding impacts related to diesel fuel and particulate matter, and Comment Response 5 regarding impacts related to the exposure of toxins and cancer risk. |
| | | | | Sincerely. Rana Azimi Invine Resident (I do not even live near Great Park and am concerned enough to take time to send this out, you should be concerned too if you visit the area even once!) | |
| | | | | To the OCTA, In regards to the OCTA Metrolink Rail Yard, which is proposed to be located very close to the Travata Community where my wife and I reside, please consider a different location. There is no advantage to the City of Irvine and especially | Refer to Comment Response 1 regarding relocation or alternative site of the Project. Refer to Comment Response 1 regarding impacts related to noise and air quality. Refer to Comment Response 4 regarding impacts related to land use and zoning, and Comment Response 16 regarding impacts related to hazardous materials. |
| | | | | the livine citizens that live near the proposed location or to the thousands of families that visit The Great Park regularly from all over Orange County and beyond. There are many reasons to move the proposed location. Noise and emissions pollution and an overall degradation of the quality of life for us who live in the Travata Community. The Great Park communities and visitors to The Great Park. | |
| | | | | The usage of proposed site and facilities is clearly industrial with inherent dangers associated with industrial plants, which may include but not limited to serious accidents, fuel and chemical spills and explosions. | |
| | | | jimandhilma | The proposed location is a great and grave hazard to the citizens of Travata, Cypress Vilage and all of The Great Park communities, as well as The Great Park itself. The City of Irvine has a stellar history of planning and development that has yielded superior community advantages of education, health care, business, nature and lifestyle. Please continue to employ the same kind of wisdom that has | |
| 58 | 03/24/22 | James and Hilma | 265 Carlow, | made the City of Irvine great, and move the location of the OCTA Metrolink Yard. | |
| | | | Irvine CA | Sincerely, James Martin | |
| | | | | and Hilma Martin | |
| | | | | 265 Carlow Irvine, CA 92618 | |
| | | | | Hello, my name is Crystal, | Opposition of the Project has been noted and will be considered by OCTA. |
| 59 | 03/25/22 | Crystal | cantognel@at | I live in the Travata Community in Irvine at the comer of Marine way and Ridge Valley where they want to build a Maintence Rail Train Yard. I moved to this community because I wanted to live in a Quiet, Environmentally Safe Healthy Community and Home. I am very much oppose to the construction of this Train Maintenance yard being built so close to my home and community. I have serious health issues and I am so worried this Train yard will impact the air quality that will make me even sicker. Not to mention the noise and extra traffic on Marine Way that is already become a traffic clutter jam at given times of the day. I'm asking that they find another spot for this Train yard site far way from the Travata Retirement Community. | Refer to Comment Response 1 regarding impacts related to noise, air quality, and traffic. Refer to Comment Response 1 regarding relocation or alternative site of the Project. |
| 55 | 00/20/22 | Antognelli | t.net | Transk ocu drank Community. Transk you, Crystal Antognelii | |
| | | | | Dear Irvine Mayor and Council Members: | Refer to Comment Response 1 regarding concern over disclosure of project. Refer to Comment Response 1 regarding impacts related to noise and traffic. |
| | | | sehyuckoh@h | My wife and I purchased our home in the Travata Community across from the Orange County Great Park in September 2019 to enjoy our retirement life in sunny California. At the time of purchase, there were no disclosure documents informing about the plan to build a rail yard maintenance facility in such proximity to our house. We recently learned, with a BIG surprise, about the OCTA's plan to build a 24/7 Metrolink rail yard maintenance facility across Marine Way and Ridge Valley. Such a facility located so close to our senior residential community clearly poses substantial adverse effects on human health, environments, noise, and traffic in the surrounding communities, and the impacts will be most direct and severe on the Travata community. | Refer to Comment Response Tregarding impacts related to in tasks and zoning. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding relocation or alternative site of the Project. |
| 60 | 03/25/22 | Se Oh | otmail.com 256 Carlow, Irvine CA | Thus, we feel that this proposed rail yard maintenance facility is not an acceptable use of land so close to a residential (like Travata) and recreational (like Great Park) neighborhood, and strongly urge the City Planners to work with the OCTA and Community Development Department to find an alternative site that is more consistent with the land use assumptions in Irvine's General Plan. | |
| | | | | Thank you for your assistance. Se H. Oh 256 Carlow, Irvine CA 92618 | |
| | | | | Will the construction of this railroad facility impact nearby Technology Drive? Will the facility have full security? Will the outskirts be parolled? I don't want the area to become a hotspot for graffit on the railroad tracks or train cars. You also have homeless to worry about that could get access to the tracks. | No construction impacts would occur along Technology Drive. Section 2.3.2 of the IS/MND states the only site access comes from the new Ridge Valley Extension. At the entrance a security booth, gate arms, and fencing are provided to limit unauthorized |
| 61 | 03/25/22 | Ben Thatcher | btrules8@gm ail.com | How gated off will the facility be? This relates to my question above and new concerns where it could become a downside to the community. I know the maintenance facility that's closer to Carlsbad for trains is no where near any housing, offices, and just sits close to the freeway. A facility needs to be closed off to the public unless otherwise. | around and within the OCMF, including buildings, which would operate continuously. A solid 6-foot concrete wall along Marine Way would be installed as part of the Project. |
| | | | | Dear Invine Mayor and Council Members: My wife and I purchased our house in the Travata Community across from the Orange County Great Park in October 2019 as our retirement home in California. At the time of purchase, there were no disclosure documents informing us | Refer to Comment Response 1 regarding concern over disclosure of project. Refer to Comment Response 1 regarding impacts related to noise and traffic. Refer to Comment Response 4 regarding impacts related to and use and zoning. |
| | | | | about the plan to build a rail yard maintenance facility in such proximity to our house. We recently learned, with a BIG suprise, about the OCTA's plan to build a 24/7 Metrolink rail yard maintenance facility across Marine Way and Ridge Valley, which must be a heary industrial facility. Such a facility located so close to our senior residential community clearly posses substantial adverse effects on human health, environments, noise, and traffic in the surrounding community but also on the Orange County Great Park. | Refer to Comment Response 1 regarding relocation or alternative site of the Project. |
| | | | songjioh@gm | If you don't mind, we would like to corvey our points using very simple terms. Assuming the maintenance facility is built here and in operation as you planned in the near future. 1) Would you recommend your parents or grandparents to choose this senior committy as their desirable retirement place? 2) Would you have your children or grandchildren to grandchildren to grand as well. The above two questions is negative, levens light how a good lead to a stop this project as it is, for this community, Great Park as usual? If you ransver to the above two questions is negative, levens light how a good lead to stop this project as it is, for this community. Great Park, and Irvine City as well. We don't want to see the reputation of Irvine City being slowly deteriorated and 'Great Park' becoming 'Terrible Park' in the foreseeable future. | |
| 62 | 03/26/22 | Ji Oh and Jeon Sook Song | ail.com 143 Palencia, Irvine CA | Thus, we feel that this proposed rail yard maintenance facility is not an acceptable use of land so close to a residential (like Travata) and recreational (like Great Park) neighborhood, and strongly urge the City Planners to work with the OCTA and Community Development Department to find an alternative site that is more consistent with the land use assumptions in trvine's General Plan. | |
| | | | | We are looking forward to seeing the mutually agreeable solutions soon. Thank you in advance for your assistance. | |
| | | | | Best Regards, J Oh Song and Jeong Sook Song | |
| | | | | Jar On Song and Seding Sook Song 143 Palencia Irvine, CA 92618 | |
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| vized access to the site. Additionally, Section 3.1.3.4 states the Project would include installation of new standard exterior and interior s | ecurity lighting |
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| 63 | 03/27/22 | Name(s) | Info guppy35@yah oo.com | Dear OCTA, I am writing to oppose the OCTA Proposed Rail Yard in Irvine. This industrial yard with heavy equipment is much too close to housing and athletic fields in the Irvine Great Park. The increased dised particles in the air will be detrimental to vulnerable older adults in the community of Travata, which is directly adjacent to the proposed train yard. The Great Park attracts many sporting tournaments and activities. The reduction in the area's air quality will discourage recreational and sporting used of the park. The Great Park attracts many sporting tournaments and activities. The reduction in the area's air quality would compound the problem. The noise and light pollution from this project are also of great concern. Please relocate this project to a more industrial area or completely enclose the project to mitigate its effects on its immediate radius. Sincerely, Amy Doyle MBA, CMA Travata Resident | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 9 regarding impacts related to diesel fuel and particulate matter. Refer to Comment Response 2 regarding impacts related to lighting. Refer to Comment Response 2 regarding match related to lighting. Refer to Comment Response 1 regarding relocation or atternative site of the Project. |
| 64-1 | 03/27/22 | Rutham and Yaso Bavan | il.com | March 27, 2022 COMMENTS REGARDING OCTA'S PROPOSED RAIL MAINTENANCE FACILITY (OCRMF) AND ITS MITIGATED NEGATIVE DECLARATION The proposed sile of the OCTA rail yard is wholly and fully incompatible and inappropriate to be located in such close proximity to livine's Great Park and the over 55+ Senior Community Travata for the reasons set out below. But especially because the negative impacts to the health and well-being of Irvine Great Park users and the Travata Senior Community residents cannot be adequately mitigated for the following reasons: ZONING The train yard is classed as an 'Institutional' land use, the same categorization as for a school or church. The proposed uses of 'heavy duty equipment such as cranes and forkiffs' along with the anticipated high levels of diesel emissions and the use of industrial chemicals and nound the clock operation 24/7 for 365 days a year it qualifies as heavy industry usage. With the MND admission that 'The Project type is closest to an industrial type' its clearer that the Cty of Irvine should have no heatafanor or mignings in disallowingsuch a use adjacent livine's Great Park and a Senior Community and deny the issuance of the use permit COTA's is seeking purely based on that fact. AIR QUALITY The MND holes that rail yards are because of the use of equipment's and vehicles such as trains, locomotives, trucks, cranes, etc are high emilters of diesel and other toxic particulates and are a major contributor of air contaminants. The report states that 'dised particulate anatic continues to account for about two-thrides of the cancer risk from air toxins' which is a major concern for those living nearby. The MND attempts to discount the presence of contaminants such as lead, coore and other particulates and incorrectly applies SCAQIM methodolys to the nearby residents in Travata and visitors to the Great Park whore the air qualifier and seniors. NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOISE NOI | |
| 64-2 | 03/27/22 | Rutnam and Yaso Bavan | rsbavan@gma il.com 949-378-9598 | LIGHTING Contrary to what the MND states, lighting at night would impact Travata residents' views across the site. With train yard maintenance operations continuing during the night, and the need for cranes and other equipment to be safely used, the surrounding area will be well it. This will be visible to Travata residents' views across the site. With train yard maintenance operations continuing during the night, and the need for cranes and other equipment to be safely used, the surrounding area will be well it. This will be visible to Travata residents and is bound to cause disruptions to skeep patterns of many seniors and adversely impact their health and well being. TRAFFIC Access to the rail yard is along Marine Way, a single lane road that is presently way beyond capacity to handle existing traffic safely. Travata residents, Great Park users, food bank, distribution center, recycling plant, nursery and soon water park users all are forced onto this one single lane road. Exocutation during emergencies for free tc., are bound to be disastrous and catastrophic. HAZARDOUS MATERIALS As proposed, the rail yard will have four 30,000 galton tanks for refueling locomotives. These are to be located near the site's property line and within 500 feet of the Great Park. These tanks not only pose a risk from potential fire but the toxic funser related to their use is a great concem for Travata resident and Great Park users, many of them young children. The activities proposed - restroom maintenance, fueling, train washing dc., there is a great likelihood that other toxic funser related to their use is a great torcem for Travata resident and Great Park users, many of them young children. The activities proposed - restroom maintenance, fueling, train washing dc., there is a great likelihood that other toxic funser related to their use is a great other for the safe y other the advites proposed at entrances and parking lots being secured property the potential introduction of criminal elements using the trains to gain entry | Refer to Comment Response 2 regarding impacts related to lighting. Refer to Comment Response 1 regarding impacts related to noise and traffic, and Comment Response 11-2 regarding impacts related to fire evacuation. Refer to Comment Response 10 regarding impacts related to safety. Refer to Comment Response 22 regarding impacts related to safety. Section 3.21 of the IS/MND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| 65 | 03/27/22 | Nikolai Korsun | ail.com 661-312-8981 112 Burgess, | | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 9 regarding impacts related to diset fuel and particulate matter. Refer to Comment Response 1 regarding impacts related to noise and air quality. |
| 66-1 | 03/27/22 | John Roese | et 138 Burgess, | (a) primal youndes stores due to provide of Court in a part in the an Carl You have the court of | Refer to Comment Response 1 regarding impacts related to load use and zoning. Refer to Comment Response 1 regarding impacts related to noise, irrupative and cancer risk. Refer to Comment Response 1-2 regarding impacts related to the evolution. Refer to Comment Response 1-2 regarding impacts related to hazardous materials. Refer to Comment Response 16 regarding impacts related to hazardous materials. |
| 66-2 | 03/27/22 | John Roese | roesej@cox.n et 138 Burgess, Irvine CA | (5) full disclosure of the cumulative effects of these and other negative quality of life issues attributable to the OCMF will, in all likelihood, suppress and even reduce local residential (e.g. Travata 55+ community) property values. Since our homes are generally our largest financial assets, this could have severe financial impacts for Travata 55+ community residents. An additional issue is that the OCMF proposal is inconsistent with the existing "institutional" zoning designation for the proposed sile. According to the MND, the proposed OCMF train yard is "closest to an industrial type". This characterization of 'industrial' relates to the OCMF's inherent dependence on heavy machinery (e.g., large cranes), use of hazardous chemicals and particulate emissions. Therefore, the OCMF should be prohibited from using the proposed sile since this is an "institutional" zoned area. If left that attempts to 'mediate' some or all of the above mentioned negative impacts would, in all likelihood, prove to be marginally effective and difficult to monitor, enforce and maintain on a permament basis. Mediation would also be very expensive with the associated cost ultimately being borne by the paying customers the CCTA serves or by qovernment agencies. As demonstrated by the Certral Minietenance Facility (CMF) rail yard clozetal in Cyprese Park in Los Angeles, mediation to the point of being a "good neighbor" to the nearby community is both operationally restrictive to rail yard maintenance operations and expensive. By way of comparison, San Diego's North County Transit District placed its maintenance facility rail yard at Stuart Mesa (wisible along Hws f. just north of the city of Oceanside) with estable drivine residential and family recreational areas and environmentally friendly industrial complexes. I strongly urge that we instruct the Orange County Transit Authority to study alternative OCMF site locations and not undermine our city's hard won status as a nationally recognized example of a new OCMF, these justificati | Refer to Comment Response 4 regarding impacts related to land use and zoning. |

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| 67 | | Effie Woo | sosunnee@g mail.com 103 Carlow, Irvine CA | We are opposed to the railyard because of the high volume of diesel exhaust that will blow over our homes and also because of the nighttime noise from the heavy machinery and train whistles. The MND is bought and paid for by OCTA and is not a reliable trusted source of analysis of the negative impacts from the construction and operation of the railyard. This is NOT the right use for land that is so near to residences and the visitors to the Great Park. | Refer to Comment Response 9 regarding impacts related to desel fuel and particulate matter. Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding relocation or alternative site of the Project. |
| 68 | 03/28/22 | Richard and Phyllis Keegan | rich.keegan@ cox.net 172 Palencia, Irvine CA | Travata are trying to sleep. The Air and Visual pollution would be a great distraction to the users of Great Park and the adjacent water park, as would the significant increase in street traffic. A complete Fouriement Interact study would have identified all of these issues built was not carried out. How is that the case? | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 1 regarding impacts related to land use and zoning. Refer to Comment Response 1 ergarding impacts related to note, and use and raffic. Refer to Comment Response 4 regarding impacts related to lighting and visual quality. |
| 69 | 03/28/22 | Sonal, Dilip and Ashwin Patel | patelsdp@hot mail.com 157 Palencia, Irvine CA | attended the online informational meeting run by OCTA back in October last year. After more information about this project came out this year, I believe that OCTA deliberately mislead and online of that negative consequences of this features of this features of the feat | Refer to Comment Response 4 regarding impacts related to land use and zoning. Refer to Comment Response 1 regarding impacts related to noise, air quality, and traffic. Refer to Comment Response 4 regarding impacts related to lighting and visual quality. Refer to Comment Response 9 regarding impacts related to diesel fuel and particulate matter. |
| 70-1 | 03/28/22 | Joanne Yu Chan | abacus205@y ahoo.com 626-710-209 200 Carlow, Irvine CA | Project Description 9 5. Page 7, fourth paragraph, line 4: The project description states that a total of 11 tracks and 6 storage tracks will be constructed for the Project. The planned facilities at OCMF represents a significant expansion over the current | Figure 2.3-1 (Project Layout and Elements) shows the proposed track alignment, and Section 2.3.7 describes Project components that would be completed during Phase 1 and Phase 2. Section 2.3.5 of the ISMND states the Project would not increase operational services or expand ridership through the increase in vehicle numbers or capacity. OCMF capacity is not part of the analysis of this project and that information would be determined by Metrolink at a later date. Removed reference to Layouts 2 and 3 since Layout 3 is the preferred alternative. |
| 70-2 | 03/28/22 | Joanne Yu Chan | ahoo.com 626-710-2099 | Page 18, third paragraph (Section 2.4.1): Please indicate a completion date for Phase 1 construction. Provide truck and vehicle trips required during construction such as routing, number of deliveries and daily number of employees required access to site for both construction phases. Page 19, first paragraph (Section 2.4.1): Please indicate a completion date for Phase 1 construction. Provide truck and vehicle trips provide a description of activities considered to be heavy repair that will continued to be performed at CMF. Also provide a description of activities considered to be heavy repair that will continued to be performed at CMF. There is no discussion regarding anticipand vehicle trips be source of the data used to assess the project socomotive operations (including in-transit and idling). As stated in the HRA, the methodology used for the emissions modeling identified 11 track segments for Phase 2 for a total of 16 segments. Does the "segments" reference intend to suggest a train segment? If yes, the project description has indicated that project build y out can accommodate up to a total of 12 trains and 16 trains of storace, expansite be comparison without and the Project. Regarding the Memorandum. Page 52, first paragraph, line 1: The nearest sensitive receptor, a senior housing community, is located approximately 800-900 feet from the project's closest emissions source which within 1.000 feet of the rail yard and would suffer the graveles darterial stret adjacent to the community. Since the majority suncerable to wither the senior community will be subject to all kinds of dates and sleep. Marke Way, a heavit travelied arterial stret adjacent to the community. Since the majority (80%) of the project activities would occur during evening hours (6pm to 9am), the residents of the senior community will be subject to all kinds of disturbances, dors and noxious emissions during a time requiring asassment of the project. Teasex plain with the description. T | |

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| 70-3 | 03/28/22 | Joanne Y Chan | ahoo.co | Central Comments 15. Pending City review and approval of the Project's CUP application. I have provided several provisions to be included as conditions of approval to ensure community concerns are addressed and best practices are followed during the different stages of construction and operation of the Project. They include: A provide quarterly or biannual project updates and outreach to the community during project construction and operation. These outreach efforts including Great Park users will help provide accountability while minimizing potential conflicts that any is required and include the project stage and within centain hours of the day to minimize excessive traffic on Marine Way during evening hours from 6 pm to 9 an. Require noise and is quality motioning during Project's construction and post-construction and opst-construction and opst-construction and opst-construction and post-construction a | |
| 71 | 03/28/22 | Jeannie Chiu | gmail.co | maintenance facilities to be developed so close to the Tavata Community. Please look for alternative locations further away from any residential community. The following are some of my concerns. VOING: The train yard site within livine's Great Park is not compatible with the existing institutional zoning designation. A train yard that involves the use of heavy machinery, hazardous chemicals and emits high levels of particulates into the surrounding residential and recreational areas volates the planning area's purpose. Per the NND. The Project type is closest to an industrial type' and therefore does not belong in an institutional zone. Why was this land ever sold to OCTA for a rail yard when it is clearly not compatible with the nearby residents and Great Park recreational users. A RA QUALITY: The operational impacts from the rail yard will be primarily from diesel particulate matter. The MND holes that as of 2005, the Air Resources Board (Federal Agency) recommended a 1,000 foot buffer between residences and rail yards. (Travata's closest homes are within 500 feet of the train yard's nearest propedy line.) The nearth versidents and park users be undertaken. NOISE: Measurements of sound levels at the site were taken at a time when trains were only passing by Travata and yet three, caused substantial spikes in noise near Travata. Once operational, the train noise from many more trains compounded use by be to negative impacts on nearly residents and focated anywhere near residential areas. This is not even taking the sounds from the equipment used in the train yard into consideration. The Arabita community of the aix and the equipment used in the Great Park were, food bank, distribution center, recycling plant, nursery and soon to clocede anywhere near residential areas. This is not even taking the sounds from the equipment used in the train yard dist constitution and the decloser states areas and residues that and verses of people with in 0000 feet of the site. This is not even taking the sounds from the equip | Opposition of the Polyce has been readed and will be considered by OCTA. Refer to Comment Response 1 regarding impacts related to use, air quality, and traffic, and Comment Response 11-2 regarding impacts related to fire evacuation. Refer to Comment Response 2 regarding impacts related to significant and the second |
| 72-1 | 03/28/22 | Christine Lee | ´ m 142 Burg Irvine C | I am strongly opposing that plan because of the following reasons. I am strongly opposing that plan because of the following reasons. The train yard site within Invince's Great Park is not compatible with the existing institutional zoning designation. A train yard that involves the use of heavy machinery, hazardous chemicals and emits high levels of particulates in the surrounding area's purpose. Per the MND. The Project type is closest to an industrial type' and therefore does not belong in an institutional zone. Why was this land ever sold to OCTA for a rail yard will be primarily from disest particulate matter. The MND notes that as of 2005, the Air Resources Board (Faderal Agency) recommended a 1,000 foot buffer between residences and rail yards. Intro operational impacts from the rail yard will be primarily from disest particulate matter. The MND notes that as of 2005, the Air Resources Board (Faderal Agency) recommended a 1,000 foot buffer between residences and rail yards sand gards Sand Canyon. At the proposed site, the MND estimates an increased cancer risk for the community of Travata. At a minimum, this finding alone should indicate that a more rigorous study of the negative impacts on nearby residents and park users be undertaken. Interview Measurements of sound levels at the sale were taken at a time when trains were only passing by Travata and yet they caused substantially increase the frequency and duration of the noise spikes. The noise impact of the slowing trains and possible use of the whistle to erise the yard would substantially increase the frequency and duration of the noise spikes. The noise impact atome may explain why Metolink stations are to located anywhere near residential areas. This is not even taking the scouts from the equipment used in the traini yard that consideraton. | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 1 regarding impacts related to note, air quality, and traffic, and Comment Response 11-2 regarding impacts related to fire evacuation. Refer to Comment Response 2 regarding impacts related to builting and visual quality. Refer to Comment Response 2 regarding impacts related to builting and visual quality. |
| 72-2 | 03/28/22 | Christine Lee | 018@gma | | Section 3.21 of the IS/MND states the Project with miligation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| 73 | 03/28/22 | Keumju O | keumjuoh | Dear livine Mayor and Council Members: My husband and J purchased our home in the Travata Community across from the Orange County Great Park in September 2019 to enjoy our retirement life in sunny California. At the time of purchase, there were no disclosure documents informing about the plan to build a rail yard maintenance facility in such proximity to our house. We recently learned, with a BIG surprise, about the OTAS plan to build a 24/7 Metriolik rail yard maintenance facility across Marine Way and Ridge Valley. Such a facility located so close to our senior residential community clearly poses substantial adverse effects on human health, environments, noise, and traffic in the surrounding communities, and the immediate will be ends direct and severe on the Travata community. More than the line to the Travata community. My OCTA and Community Development Department to find an alternative site that is more consistent with the land use assumptions in livine's General Plan. | Refer to Comment Response 1 regarding concern over disclosure of project. Refer to Comment Response 1 regarding relocation or alternative site of the Project. Refer to Comment Response 1 regarding relocation or alternative site of the Project. |

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| 74-1 | 03/28/22 | Name(s) | keunwoong@ gmail.com 142 Burgess, Irvine CA | To whom it may concern, I am a tertied physician and have been living in livines since 2014. I have beens have physician and have been living in livines since 2014. I have beens have physician and have been living in livines since 2014. I have beens have physician that have been living in livines since 2014. I have beens have physician that have been livines in the planet train yard area and many of us are suffering from heart and lung diseases which will obviously get worse from the OCTA plan. I am strongly opposing that plan because of the following reasons. The train yard law thin in livines Gareel Park is not compatible with the existing institutional zoning designation. A train yard that involves the use of heavy machinery, hazardous chemicals and emits high levels of particulates into the surrounding residential and recreational areas violates the planning area's purpose. Per the MND. The Project Ops is locase to an industrial lype' and therefore does not beiong in an institutional zone. Why was this land ever sold to OCTA for a rail yard when it is dealwrin to compatible with the existing institutional zone in the MND notes that as of 2005, the Air Resources Board (Federal Agency) recommended a 1,000 foot buffer between residences and rail yards. (Travata's observation the rail yard will be primaraly from desel particulate matter. The MND notes that as of 2005, the Air Resources Board (Federal Agency) recommended a 1,000 foot buffer between residences and rail yards. (Travata's observation the proposed site, the MND estimates an increased cancer risk for the community of Travata. At an initium, this finding alone should indicate that a more rigorous study of the negative impacts on nearby residents and park users be undertaken. Measurements of sound kweets at the site west only be sounder from the yard whort as classified and and and they caused studential aspecifies in a classifies and envious the event and in the yard indicatabatilial spike in noise rear Travata. Measurements of sound kwe | Refer to Comment Response 9 regarding impacts related to deself fuel and particulate matter. Refer to Comment Response 16 regarding impacts related to hazardous materials. |
| 74-2 | 03/28/22 | Kevin Lee | | Nightime lighting would certainly impact residents' views over the ethe contrary to the report. As 80% of the train yord's operations will be during the overnight hours, all of the cranes and surrounding area will need to be well it and quite visible from a large segment of Travets' residence along Marine Way and Rkige Valley. Any resident trying to aleap in the update from will be furting the overnight hours, all of the cranes and surrounding area will need to be well it and quite visible from a large segment of Travets' residence along Marine Way and Rkige Valley. Any resident trying to aleap in the update from will be furting the overnight hours, all of the cranes and surrounding area will need to be well it and quite visible from a large segment of Travets' residence along Marine Way and Rkige Valley. Any resident trying to aleap in the update from the train your of the train your of the train your of the train well to be tread to be tr | Section 3.21 of the IS/MIND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| 75 | 03/28/22 | Archana Darekar | darekar.archa na@gmail.co m 109 Augustine, Irvine CA | Dear City leaders: OCTA railcar maintenance center at Great Park is just the wrong location for Irvine residents. It will affect the Great Park surrounding communities in air quality, noise, lights, traffic jam on Marine Way and potential diesel tank explosion or leaking. Please deny OCTA permit application with dense population around it and children sports amenities. Best regards Archana Darekar 109 Augustine Irvine CA 92618 | Opposition of the Project has been noted and will be considered by OCTA. Refer to Comment Response 9 regarding impacts related to inclue, air quality, and traffic. Refer to Comment Response 9 regarding impacts related to dised the and particulate matter. Refer to Comment Response 2 regarding impacts related to lighting and visual quality. |
| 76 | 03/28/22 | Revital Gallen | revital.gallen @gmail.com 118 Full Sun, | communities already deal with increased traffic due to the activities taking place across the street, however, a maintenance center will put an unduly burden on us and will impact our wellbeing. | Opposition of the Project has been noted and will be considered by QCTA. Refer to Comment Response 1 regarding macker teated to noise air quality, and traffic. Refer to Comment Response 9 regarding impacts related to idesel fuel and particulate matter. Refer to Comment Response 2 regarding impacts related to lighting and visual quality. |
| 77 | 03/28/22 | Frank and Aileen Smith | | Thank you, | Opposition of the Project has been noted and will be considered by OCTA Refer to Comment Response 1 regarding relocation or alternative site of the Project. Section 2.7 of the IS/MND describes public outreach activities completed for this Project. |
| 78 | 03/29/22 | Ed Olivares | eolivares7603 @gmail.com 127 Burgess, Irvine CA | OCTA Maintenance Facility Project Planners: Hello, my name is Edgar Olivares, live at 127 Burgess, Irvine CA, 92618. I am a full-lime resident of the community located at the corner of Ridge Valley and Marine Way. I am writing this task that the Conditional Use Permit Application for the development of the OCTA Rairoad Maintenance Facility be withdrawn on the basis that the Initial Study/Mitigated Negative Declaration prepared by OCTA does no adequately address many issues that are critical to the environmental space, and the health and wefare of the residents in my community. Location of the facility as currently proposed does not allow for mitigation of these issues. A more appropriate siting is near the existing ralway station near the end of Marine Way at Barranca. Three examples of issues follow. 1 - The Project Steb boundary, integral in the project is the development of a Ridge Valley Road extension designated as a private road (presumably) exclusive to OCTA use. The entrance at Marine Way is approximately 150' from homes in my community. Supplies of materiais and wastes from the operation will be regularly transported and and potentially staged in too-close proximity to existing family homes. 2. The ISAND is not independently detailed to determine the level of negative impact to the existing environmental space, and the health and weffare of members of my community - in part as pertains to air quality, noise, lighting, and visual esthetics. 3. Yeas prior to the purchase of my home in 2018, the OCTA formally communicated the intended development and use of the current site to the City of Irvine. This information was omitted from required hazard disclosures during my purchase process. 1 appreciate the opportunity to provide input and look forward to your modified efforts moving forward. Sincerely, Ed Olivares | |
| 79 | 03/29/22 | Siliang Zhang | | Good morning, I saw the news last week that the metro link train maintenance facility will be proposed near the Great Park. I live in cypress village, very close to the great park. I am opposed to this plan. You really should pick somewhere else with less people living there. Your plan will affect a lot of people who live near Great Park. I will take 6 years to be finished, and for all those years the residents will have to live with noise, air pollution and traffic. So why not stop it now. In addition, if you build be facility, the Great Park neighborhood will have a much worse environment and the residents will be very any and disapointed. I think the Metrolink train maintenance facility does not fit the environment of Great Park at all. I hove the great park is gitting better and better. Please don't construct a metro link train maintenance facility near great park. I hove the great park is gitting better and better. Please don't construct a metro link train maintenance facility near great park. I hove the great park is gitting better and better. Please don't construct a metro link train maintenance facility near great park. I hove the great park is guiting better and better. Please don't construct a metro link train maintenance facility near great park. I will be very graditul if you could take my opinion seriously Best regards, Siliang Zhang | f Refer to Comment Response 4 regarding impacts related to land use and zoning. |

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| 80 | 03/29/22 | Bonnie and David Gabai | bgabai@me.c om | To Whom This May Concern: - 1 an writing to you to please vole against placing the OCTA train maintenance facility that is planned at the corner of great park across from my community Travata at Marine Way and Ridge Valley. My husband and I bought this home to enjoy our final years. Mary months after moving here, we learned that OCTA was going to be placing a facility to maintenance trains during the hours of 10 PM to 6 AM - all through the middle of the night. Lenna never informed us of this development as we made the purchase of our home. This facility is planned to be near the current train tracks that bring therendous noise to where we live already. Bringing a maintenance facility to this area would only disturb any quiet that still exists near us. Between the freeway, the 5 point amphitheater, bud sporting games at the park, as well as the nearby trains - it's loud enough. Most importantly, I'm asking that you consider the health of our community as you make this decision and place this facility in another location. The effects of this will be great and includes diseases, crime, and more. Please imagine you, family member, parent, child, sister, brother or any other relative finding out that there was going to be a maintenance facility that imposes direct darger to their community disturb any quiet that still exists nearby. We have send to hear earden morely to make Ivine Great Bark to use place this a set out the trive community as you make to be cause they believe that they ice not able to hear, smell, or see in their older years. We are here, fighting this battle, using our major trains and the Harsh to ice chinacis can not make it to reso. Here within seconds: I have seen firsthand the dangerous effects of fres and toxic chemicais can do. I just moved free accommunity where my home was damade from the Vorsely free. Gasoline from Rockettylep penetrated the ground solity organs at the farsh to ice chinacis can do. I just moved from a community where my home was damade from the Vorsely free. Gas | Refer to Comment Response 1 regarding impacts related to air quality, noise, and traffic. Section 3.16.1 of the IS/MND states three police stations are located near the Project Site. They are the Irvine Valley College Police Department, the Cal State Fullerton Police Department, so characterized to their respective campuses; however, additional staff could be dispatched for emergencies. In addition, the Irvine Police Departments are short in staff. With a low crime rate, the capacity of police service is sufficient for the Project Site through coordination of the three police departments. a Refer to Comment Response 16 regarding impacts related to hazardous materials. |
| 81 | 03/29/22 | Carolyn Peter | carolyn.peter @gmail.com 116 Burgess, Irvine CA | To the Miligated Negative Declaration regarding OCTA and its proposed Matrolink Rail Yard: I an a resident of the Travata Community across from the proposed Rail Yard Maintenance Facility. This project highly concerns many residents. 1) Noise Logically noise will be an unending factor (the rail yard is built. It is not only an issue during construction but will continue as trains are brought in for maintenance, repair (standing of wheels), washing of rail cars, refueing, trucks in the rain yard is being classed as "initiational" fad use, such as a school or church. This is indeed "heavy industry" land use. This includes heavy equipment. (privitile, cranes plus industrial chemicals. 3) Assthicts: "MID clains there and there, workers coming and going. Only estimates can be made as to the noise levels. It cannot actually be measured. Maintenance will be done all hours of the night and during the day. Noise carries farther than people railize. 3) Assthicts: "MID clains there and there and there; workers to community and the Great Park. But with a 5 story building being planned and 4 permanent cranes (what is their height?) being installed there is not worker will not be negatively impacted. An eyesone to say the least, livine is known for its commitment to maintaining a safe and beautiful city. 4) Ar Quality. Noise and a quality are two vey important integravite actions. This is an engive contributors of toxic air contaminants including construction equipment. Diesel particulate matter accounts for two thirds of the cancer risk from air testions. 4) MiD asars there produe high levels of particulates. Trains are major testions and residentiad areas and clain there. 4) Ar Quality. Noise and a quality are two vey important indive station. Is as close to a residentia have no idea where Metrolink's fleet is regarding this attempt. 4) MiD asars Erk is trying to reduce diese fluel amissiona by an much a 50% but we as residentis have no idea where Metrolink's attempt. 4) Faculat | e Refer to Comment Response 16 regarding impacts related to hazardous materials. |
| 82-1 | 03/29/22 | John Chapman | @gmail.com | To Whom It May Concern: My name is John Chapman a homeower in the Invine neighborhood of Travata and I am opopsed to the OCTA Metrolink Rail Yard. I am shocked, as a long time resident of Invine that the City would even consider allowing this kind of an addition to our beaufful City. I do understand they have to take this application & go though the steps of reviewing this application. The dity needs to unanimously volte NO on this application, as soon as, the process allows them to do so. They are certainly well aware that the entire community of Travata is unled in fierce opposition to locating the rail yard in such close proximity to our homes. It is really important that OCTA and City of Invine officials hear locudy and clearly that the proposed sile for the OCTA rail yard must be relocated so that it is not near residents and Great Park users. The negative impacts to our health and well-being cannot be sufficiently miligated. RESPONSE TO OCTA'S ENVIRONMENTAL REPORT ZONING: The train yard sile within Invine's Great Park is not compatible with the existing institutional zoning designation. A train yard that involves the use of heavy machinery, hazardous chemicals and emits high levels of particulates into the surrounding residential and createrization areas vialables the planning area's purpose. Per the MND, The Project type is closes to an industrial type' and therefore does not belong in an institutional zone. Why was this land ever sold to CCTA for a rail yard when is clearly not compatible with the easing institutional atoning dustrian train area there are foreored belong in an institutional zone. Why was this land ever sold to along Sand Canyon. At the proposed site, the MND estimates an increased cancer risk for the community of Travata. At a minimum, this finding alone should indicate that a more rigorous study of the negative impacts on nearby residents and park users to sound levels at the site were taken at a time when trains were only passing by Travata and yet they caused substantia | s |
| 82-2 | 03/29/22 | John Chapman | chapman8544 @gmail.com 949-422-6704 237 Carlow, Irvine, CA | Torcossed nerem. These negative impacts cannot be mitigated to make the rail yard project teastile at its current location, we believe that this rail yard does not being in the Great Park negroomood and needs to be relocated away from residents and park visitors. | Refer to Comment Response 2 regarding impacts related to lighting and visual quality. Section 3.21 of the IS/MND states the Project with mitigation measures would not result in substantial adverse effects on human beings, either directly or indirectly. |
| 83 | 03/29/22 | Christine Chiang | erhpei@yaho o.com | To whom it may concern, The railcar maintenance center at Great park is just a wrong location for Irvine residents. It will affect the Great Park surrounding communities in air quality, noise, lights traffic jam. We have children and family that love to enjoy the outdoors and this facility can adversely affect our health and well being. We do have concerns for this project and hope our voice can be heard. Thank you. Christine Chiang | Refer to Comment Response 1 regarding impacts related to noise, air quality, and traffic. Refer to Comment Response 2 regarding impacts related to lighting. |

| and the Irvine Police Department – Spectrum Substation. The Spectrum Substation will be the principal service provider to the Project Site. The two Department headquarters located 4.4 miles northwest of the Project Site could also serve as a backup in situations where the other three closer |
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| Comme nt No. | Date Received | Commen tor Name(s) | Contact Info | Comment Received | Response to Comment |
|-----------------|------------------|------------------------------------|--|---|--|
| 84 | 03/29/22 | Patty Olvera | averybusymo m2@gmail.co m 169 Carlow, Irvine, CA | Hello, I lived in Santa Ana for 35 years before moving to livine in 2019. I just love this city. I am a Registered Nurse and retired recently. I am blessed to live in the beautiful neighborhood of Travata. The OCTA rail maintenance facility looks like it will be very efficient, as well as aesthetically pleasing. What you cannot see in the drawings is the amount of noise that it will create. In a recent report that I read, it said that the decibels will be at acceptable levels. I do not believe that this will be the case, especially because the facility will operate mainly throughout the night. This is just my opinion and a suggestion, but I think that most of the opposition will go away if you move this foculty in the bootherm section of this empty lot as opposed to the Northern section. This would place the rail facility on an industrial area and much further away from homes. While no ne wants this facility in their backyard," it doesn't have to be in anyone's backyard, by our move to the Southern section of this same empty lot. While OCTAs Northern section. I know it is not that simple, but it will make a huge difference to the quality of our lives. Sincerely, Patty Olvera, 169 Catow Irvine, CA 925 18 | Refer to Comment Response 1 regarding impacts related to noise. Refer to Comment Response 4 regarding impacts related to land use and zoning. |
| 85 | 03/29/22 | Richard and Bonnie Kettering | dbkettering@ cox.net 166 Palencia, Irvine CA | March 29, 2022 Dear Mayor and council members: Our recently constructed Travata community (55 years and over) has been given a major blow by finding out about the plans to build an OCTA train maintenance facility directly across the street from our community. This project was never disclosed to us in the required disclosure documents, prior to purchasing our properties, and we would have never bought our homes in the Travata development if we had known what was being planned. A 24 hour a day train maintenance facility within 500 feet of our community is totally unacceptable. Noise, light, air/ ground pollution and its visual presence have the potential to drastically alter the quality of our lives and values of our properties. Our community is made up of senior citizens and this is the wrong project for the proposed location. It is our understanding that the OCTA is asking for an additional 8273.974 for additional engineering services related to the Metrolink Rail Facility. This will increase that maximum available on the contract to the firm that prepared the Mitiggated Negative Declaration to \$4.04 million. Our community has submitted numerous comments during the public comment pleiod objecting to the NMD and the project as whole. Additional spending for further work by a firm, Gament Elemino Incr. that alterary monitored an unaccentable report is a water of count funds. At a minimum. Our comment pleiod objecting to the NMD and the project as whole. Additional spending for further work by a firm, Gament | |

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Appendix K Mitigation Monitoring and Reporting Program

Metrolink Orange County Maintenance Facility

Prepared for: Orange County Transportation Authority

> 550 S. Main St. Orange, CA 92868 and

Gannett Fleming 20 Pacifica, Suite 430 Irvine, CA 92618

Prepared by:

AECOM 300 S. Grand Ave. Los Angeles, CA 90071

June 2022

| REVISION | DESCRIPTION | DATE |
|----------|--|----------|
| 0 | Draft Mitigation Monitoring and Reporting Program | 4/1/2022 |
| 1 | Update of Mitigation Measures per coordination with Kizh Nation | 5/2/2022 |
| | | |

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1. PURPOSE OF THIS MITIGATION MONITORING AND REPORTING PROGRAM

This Mitigation Monitoring and Reporting Program (MMRP) has been prepared pursuant to the California Environmental Quality Act (CEQA) and the State CEQA Guidelines to provide for monitoring of the mitigation measures required by adoption of the Initial Study/Mitigated Negative Declaration (IS/MND) of the Southern California Regional Railroad Authority (SCRRA) Metrolink Commuter Rail System (Metrolink) Orange County Maintenance Facility (hereafter referred to as "OCMF" or "the Project"). Section 21081.6 of the Public Resources Code and Section 15091(d) of the CEQA Guidelines require public agencies to "adopt a reporting or monitoring program for changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment." As the lead agency under CEQA, the Orange County Transportation Authority (OCTA) must define specific reporting and/or monitoring requirements to be enforced during project implementation prior to the Project's final approval.

The MMRP stipulates how all required mitigation measures are to be implemented and completed during the appropriate project phase. It also facilitates documentation necessary to verify that mitigation measures were in fact properly implemented.

2. MITIGATIONS MONITORING AND REPORTING PROGRAM PROCEDURES

2.1 PURPOSE OF THE MMRP

This MMRP gives OCTA the primary responsibility for taking all actions necessary to implement the mitigation measures according to the specifications provided for each measure and for demonstrating that the action has been successfully completed. The OCTA's designated environmental monitor will track and document compliance with mitigation measures, note any problems that may result, and take appropriate action to remedy problems. OCTA, at its discretion, may delegate responsibility for measure implementation and monitoring, or portions thereof, to other responsible individuals and agencies, such as a licensed contractor.

Specific responsibilities for the OCTA include:

- Coordination of all mitigation monitoring activities
- Management of the preparation, approval, and filing of monitoring or permit compliance reports
- Maintenance of records concerning the status of all approved mitigation measures
- Quality control assurance of field monitoring personnel
- Coordination with other agencies regarding compliance with mitigation or permit requirements
- Reviewing and recommending acceptance and certification of implementation documentation
- Acting as a contact for interested parties or surrounding property owners who wish to register concerns regarding environmental issues; verifying any such circumstances; and developing any necessary corrective actions.

2.2 RESOLUTION OF NONCOMPLIANCE COMPLAINTS

Any person or agency may file a complaint regarding noncompliance with the mitigation measures addressed in the MMRP. The complaint shall be directed to OCTA at the mailing address listed below in written form providing detailed information on the purported violation.

Orange County Transit Authority 600 S Main St Orange, CA 92868

OCTA will investigate any complaints filed to determine the validity of the complaint. If noncompliance with a mitigation measure is verified, OCTA will take the necessary action(s) to remedy the violation. The complainant will receive written confirmation indicating the results of the investigation, including any corrective actions.

2.3 MITIGATION MONITORING AND REPORTING PROGRAM MATRIX

The MMRP is organized in a matrix format.

- The first column identifies the mitigation measure.
- The second column, entitled "Time Frame for Implementation," refers to when monitoring will occur. The timing for implementing mitigation measures and the definition of the approval process has been provided to assist OCTA staff to plan for monitoring activities.
- The third column, entitled "Responsible Party," refers to the agency or other party responsible for ensuring that the mitigation measure is implemented.
- The fourth column, entitled "Monitoring Party," refers to the party that will conduct the monitoring to ensure compliance with the mitigation measure.
- The fifth column, entitled "Monitoring Period", indicates when monitoring will occur during implementation of the Project.

The mitigation measures are presented by environmental issue area.

| | MITIGATION MEASURE | IMPLEMENTATION | RESPONSIBLE | MONITORING | MONITORING MILESTONE/ |
|--|---|--------------------------------------|--|------------|---|
| | | TIMEFRAME | PARTY | PARTY | PERIOD |
| AIR QUALITY MM-AQ-1: Utilize low VOC paint for architectural coating activities during Phase 2 construction. | To reduce volatile organic compound (VOC) emissions during construction, the Project contractor shall utilize water-based or low VOC interior and exterior paints. The VOC content of the architectural coatings shall comply with the VOC content limits in South Coast Air Quality Management District (SCAQMD) Rule 1113 or not exceed 100 grams per liter, whichever is lower. To ensure that low VOC paint will be used during Project construction, this requirement will be included in applicable bid documents, purchase orders, and contracts. Successful contractor(s) must demonstrate the ability to supply the compliant architectural coatings for use prior to any coating activities. A copy of each proposed architectural coating Material Safety Data Sheet and VOC content shall be available upon request. Alternatively, the contractor may utilize tilt-up concrete buildings that do not require the use of architectural coatings. | Pre-Construction and Construction | Construction Contractors | OCTA | Incorporation of this mitigation measure in the final design specifications provided to the contractor Equipment log provided at intervals during construction |
| BIOLOGICAL RESOURCES | | | | | |
| MM-BIO-1: Designate Project Biological Monitor(s). MM-BIO-2: Compliance with USACE SAMP Mitigation Procedures. | Ground-disturbing activities during construction shall occur outside of the nesting bird season (generally February 15 through September 1). If avoiding the nesting season is not practicable, the following additional measures shall be employed: A pre-construction nesting survey shall be conducted by a qualified biologist within 3 days prior to the start of construction activities to determine whether active nests are present within or directly adjacent to the construction zone. All nests found shall be recorded. If construction activities must occur within 300 feet of an active nest of any passerine bird or within 500 feet of an active nest of any raptor, with the exception of an emergency, a qualified biologist shall monitor the nest on a weekly basis, and the activity shall be postponed until the biologist determines that the nest is no longer active. If the recommended nest avoidance zone is not feasible, the qualified biologist shall determine whether an exception is possible and obtain concurrence from the resource agencies before construction work can resume within the avoidance buffer zone. All work shall cease within the avoidance buffer zone until either agency concurrence is obtained or the biologist determines that the adults and young are no longer reliant on the nest site. Pursuant to Special Area Management Plan (SAMP) requirements, if a permanent loss of regulated waters or streambed occurs because of the Project, compensatory mitigation (purchase of credit at an in-lieu fee or mitigation bank approved by the resource agencies, or applicant proposed enhancement or establishment of waters or streambed) shall be provided at a minimum ratio of 1:1. Temporary impacts shall be restored to pre-Project conditions to the extent practicable. | Final Design and Construction | Final Design and Construction Contractors Final Design and Construction Contractors | OCTA | Final Plan Check and Ongoing during Construction Final Plan Check and Ongoing during Construction |
| CULTURAL RESOURCES | | | | | |
| MM-CUL-1: Cultural Resources Awareness Training. | Prior to construction, OCTA shall retain a qualified archaeologist who meets the Secretary of the Interior's Guidelines for Archaeology (36 CFR Part 61). The qualified archaeologist shall prepare a Cultural and Tribal Cultural Resources Awareness Training as part of the Project Worker Environmental Awareness Program (WEAP). The training will instruct workers as to the laws protecting cultural and tribal cultural resources and also give examples of the kinds of resources that can be reasonably expected to be found in the Area of Potential Effect (APE). An environmental compliance contact responsible for enforcing mitigation measures and who is to be notified in the event of a find will be identified in the training. Training will be delivered to all staff involved in ground-disturbing activities prior to their working on the project. | Final Design and Construction | Final Design and Construction Contractors | OCTA | Final Plan Check and Ongoing during Construction |

| | MITIGATION MEASURE | IMPLEMENTATION TIMEFRAME | RESPONSIBLE PARTY | MONITORING PARTY | MONITORING MILESTONE/ PERIOD |
|--|---|-------------------------------|---|--|---|
| MM-CUL-2: Preparation of a Cultural Resources Monitoring and Discovery Plan. | Prior to construction, a project-specific cultural resources monitoring and discovery plan (CRMDP) will be developed by a qualified archaeologist who meets the Secretary of the Interior's Guidelines for Archaeology (36 CFR Part 61). The monitoring plan should identify what construction activities that occur in native soils would require archaeological and tribal monitoring, describe monitoring procedures, and outline the protocol to be followed in the event of a find. Criteria will be defined and triggers identified as to when further consultation is required for the treatment of finds. Plans of treatment of typical finds will be detailed, as will a plan of treatment for any human remains that are inadvertently encountered. If a potentially significant discovery is made and cannot feasibly be avoided, then additional work, potentially including data recovery excavations, may be required. Key staff will be identified, and the process of notification and consultation will be specified within the CRMDP. A curation plan will also be outlined within the CRMDP. All work should be conducted under the direction of a qualified archaeological Principal Investigator who meets the Secretary of the Interior's standards for archaeology. Consulting tribes under AB52 for the Project shall have the opportunity to review and comment on the draft CRMDP. | Final Design and Construction | Final Design and Construction Contractors | OCTA | Final Plan Check and Ongoing during Construction |
| PALEONTOLOGICAL RESOURCES | | | | | |
| MM-GEO-1: Worker Environmental Awareness Program. | Prior to construction, OCTA shall retain a qualified paleontologist who meets the requirements to be included in Orange County's list of qualified paleontologists. The qualified paleontologist shall prepare a WEAP. The WEAP will describe the types of resources that may be encountered during construction, the laws protecting those resources, and the procedures to follow when finds are encountered. The WEAP will be presented either in person or in video form to all construction employees involved in ground-disturbing activities before they begin work at the Project Site. | Final Design and Construction | Final Design and Construction Contractors | ΟCTA | Final Plan Check and Ongoing during Construction |
| MM-GEO-2: Response to Unanticipated Paleontological Finds. | If buried paleontological resources are uncovered during construction, all work shall be halted in the vicinity of the discovery until a qualified paleontologist can visit the site of discovery and assess the significance of the resource and, if necessary, recommend treatment. | Construction | Construction Contractors | ΟCTA | Ongoing during Construction |
| HAZARDS AND HAZARDOUS MAT | TERIALS | | | | |
| MM-HAZ-1: Notifications to Federal, State and Local Agencies. | The Project applicant shall notify the appropriate agencies (e.g., Orange County Health Care Agency [OCHCA], Department of Toxic Substances Control [DTSC], United States Environmental Protection Agency [EPA], or the Regional Water Quality Board) regarding soil, soil gas and/or groundwater contamination in connection with the ongoing military clean-up site associated with the former El Toro Marine Corps Air Station (MCAS) Superfund site. | Final Design and Construction | ΟCTA | OCHCA, DTSC, EPA, Santa Ana Regional Quality Board | Final Plan Check |
| MM-HAZ-2: Groundwater Monitoring Requirements. | Where the Project Site construction and operational activities coincide with the current groundwater monitoring systems (e.g., wells, water transfer conveyance lines), the requirements of the Institutional Control (IC) in connection with IRP Site 24 for the ongoing military clean-up site associated with the former El Toro MCAS Superfund site shall be adhered to in order to protect human health and the environment from potential hazardous materials exposures. | Final Design and Construction | Construction Contractors | OCTA | Final Plan Check and Ongoing during Construction |
| MM-HAZ-3: Soil Assessment for Hazardous Materials. | Prior to construction activities at the Project Site, if required by the state or local regulatory oversight agencies, then further assessment including soil, soil vapor and/or groundwater investigations shall be conducted to reveal the presence, if any, of potential hazardous materials at the Project Site that were identified as a result of the Phase I ESA, and would assist in determining further mitigations required to address human health and/or the environmental impacts due to potential hazardous materials exposures. | Final Design and Construction | OCTA and Construction Contractors | EPA | Final Plan Check and Ongoing during Construction |

| MITIGATION MEASURE | | IMPLEMENTATION TIMEFRAME | RESPONSIBLE PARTY | MONITORING PARTY | MONITORING MILESTONE/ PERIOD |
|---|--|-------------------------------|---|---------------------|---|
| NOISE | | | | | |
| MM-NOI-1: <i>Relocate Pile Driving Activities</i> . | If feasible, relocate Project elements requiring pile driving to locations greater than 250 feet from occupied buildings. | Final Design and Construction | Final Design and Construction Contractors | ΟCTA | Final Plan Check and Ongoing during Construction |
| MM-NOI-2: Alternative Pile Insertion. | If MM-NOI-1 is not feasible, use a less intrusive form of pile insertion, such as pre-augured piling. | Final Design and Construction | Final Design and Construction Contractors | ΟCTA | Final Plan Check and Ongoing during Construction |
| MM-NOI-3: Schedule Pile Driving Activities. | Arrange to conduct pile driving activities during a period when the affected building(s) are not in use (such as Saturdays). | Final Design and Construction | Final Design and Construction Contractors | ΟCTA | Final Plan Check and Ongoing during Construction |

| | MITIGATION MEASURE | IMPLEMENTATION TIMEFRAME | RESPONSIBLE PARTY | MON | |
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| TRIBAL CULTURAL RESOURCES | | | | | |
| MM-TCR-1: Native American Monitoring. | Retain a Native American Monitor Prior to Commencement of Ground-Disturbing Activities. A. The project applicant/lead agency shall retain a Native American Monitor from or approved by the Gabrieleño Band of Mission Indians – Kizh Nation. The monitor shall be retained prior to the commencement of any "ground-disturbing activity" for the subject project at all project locations (i.e., both on-site and any off-site locations that are included in the project description/definition and/or required in connection with the project, such as public improvement work). "Ground-disturbing activity" shall include, but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching. B. A copy of the executed monitoring agreement shall be submitted to the lead agency prior to the earlier of the commencement of any ground-disturbing activity, or the issuance of any permit necessary to commence a ground-disturbing activity, or the issuance of any permit necessary to commence a ground-disturbing logs that will provide descriptions of the relevant ground-disturbing activities, solt types, cultural-related materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe. Monitor logs will identify and describe any discovered Native American (ancestral) human remains and burial goods. Copies of monitor logs will be provided to the project applicant/lead agency upon written notification by the Kizh from a designated point of contact for the project applicant/lead agency that all ground-disturbing activities and phases that may involve ground-disturbing activity and/or development/construction phase at the project site possesses the potential to impact Kizh TCRs. E. Upon discovery of any TCRs, all construction activities in the immediate vicinity of the discovered and reas appropriate, including 50 feet) and shall not resume until the discovered and retain all discover | Final Design and Construction | Final Design and Construction Contractors | OCT | |

Final Initial Study/Mitigated Negative Declaration Appendix K Mitigation Monitoring and Reporting Program

| IONITORING PARTY | MONITORING MILESTONE/ PERIOD |
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| PARTY CTA and Kizh Nation | PERIOD Final Plan Check and Ongoing during Construction |
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| MITIGATION MEASURE | | IMPLEMENTATION TIMEFRAME | RESPONSIBLE PARTY | MON |
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| MM-TCR-2: Unanticipated Discovery of Human Remains and Associated Funerary Objects | Unanticipated Discovery of Human Remains and Associated Funerary Objects. A. Native American human remains are defined in PRC 5097.98 (d)(1) as an inhumation or cremation, and in any state of decomposition or skeletal completeness. Funerary objects, called associated grave goods in Public Resources Code Section 5097.98, are also to be treated according to this statute. B. If Native American human remains and/or grave goods discovered or recognized on the project site, then all construction activities shall immediately cease. Health and Safety Code Section 7050.5 dictates that any discoveries of human skeletal material shall be immediately reported to the County Coroner and all ground-disturbing activities shall immediately halt and shall remain halted until the coroner has determined the nature of the remains. If the coroner recognizes the human remains to be those of a Native American or has reason to believe they are Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission, and Public Resources Code Section 5097.98 shall be followed. C. Human remains and grave/burial goods shall be treated alike per California Public Resources Code section 5097.98 (d)(1) and (2). D. Construction activities may resume in other parts of the project site at a minimum of 200 feet away from discovered human remains and/or burial goods, if the Kizh determines in its sole discretion that resuming construction activities at that distance is acceptable and provides the project manager express consent of that determination (along with any other mitigation measures the Kizh monitor and/or archaeologist deems necessary). (CEQA Guidelines Section 15064.5(f.)) E. Preservation in place (i.e., avoidance) is the preferred manner of treatment for discovered human remains and/or burial goods. Any historic archaeological material that is not Native American in origin (non-TCR) shall be curated at a public, non-profit institution with a re | Final Design and Construction | Final Design and Construction Contractors | OCTA |

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| | RESPONSIBLE PARTY | IMPLEMENTATION TIMEFRAME | MITIGATION MEASURE |
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| RTYPARTYesign andOCTA and KizhructionNation | | | Procedures for Burials and Funerary Remains. A. As the Most Likely Descendant ("MLD"), the Koo-nas-gna Burial Policy shall be implemented. To the Tribe, the term "human remains" encompasses more than human bones. In ancient as well as historic times, Tribal Traditions included, but were not limited to, the preparation of the soil for burial, the burial of funerary objects with the deceased, and the ceremonial burning of human remains. B. If the discovery of human remains includes four or more burials, the discovery location shall be treated as a cemetery and a separate treatment plan shall be created. C. The prepared soil and cremation soils are to be treated in the same manner as bone fragments that remain intact. Associated funerary objects are objects that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later; other items made exclusively for burial purposes or to contain human remains can also be considered as associated funerary objects. Cremations will either be removed in bulk or by means as necessary to ensure complete recovery of all sacred materials. D. In the case where discovered human remains cannot be fully documented and recovered on the same day, the remains will be covered with musiln cloth and a steel plate that can be moved by heavy equipment placed over the excavation opening to protect the remains. If this type of steel plate is not available, a 24-hour guard should be posted outside of working hours. The Tribe will make every effort to recommend diverting the project and keeping the remains in situ and protected. If the project cannot be diverted, it may be determined that burials will be removed. E. In the event preservation in place is not possible despite good faith efforts by the project applicant/developer and/or landowner, before ground-disturbing activities may resume on the project tise, the landowner shall arrange a des |

RESOLUTION NO. 2022-025

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE ORANGE COUNTY TRANSPORTATION AUTHORITY ADOPTING A MITIGATED NEGATIVE DECLARATION FOR THE METROLINK ORANGE COUNTY MAINTENANCE FACILITY

WHEREAS, the Orange County Transportation Authority (OCTA), acting as the Lead Agency as defined in the California Environmental Quality Act (CEQA), Public Resources Code §§21000 et seq., prepared an Initial Study for a new Metrolink maintenance facility located on a 21.3-acre parcel of land owned by OCTA in the City of Irvine (Project); and

WHEREAS, the purpose of the Initial Study was to determine whether the Project may have potential significant effects on the environment; and

WHEREAS, based upon the findings in the Initial Study, OCTA prepared a Mitigated Negative Declaration for the Project and published a Notice of Intent to adopt same in accordance with CEQA and the CEQA guidelines (14 California Code of Regulations §§15000 et seq.)

NOW, THEREFORE, BE IT RESOLVED that the OCTA Board of Directors finds as follows:

- The Board of Directors has considered the Initial Study, the Mitigated Negative Declaration, the comments received during the public review process, the staff report and all other documents, oral testimony and other evidence presented at the meeting on this Resolution and finds that there is not substantial evidence in light of the whole record that the Project will have any significant impacts on the environment.
- 2. The Mitigated Negative Declaration reflects OCTA's independent judgment and analysis.
- 3. The record of proceedings on which the Board of Director's decision is based is on file with the Clerk of the Board at OCTA, 550 South Main Street, Orange, California.

NOW, THEREFORE, BE IT FURTHER RESOLVED that the Board of Directors adopt the Mitigated Negative Declaration.

MARK A. MURPHY, CHAIRMAN ORANGE COUNTY TRANSPORATION AUTHORITY

APPROVED AS TO FORM:

JAMES M. DONICH GENERAL COUNSEL

ATTEST:

I, Andrea West, Clerk of the Board of Directors of the Orange County Transportation Authority, do hereby certify that the foregoing Resolution No. 2022-025, by the following votes:

AYES:

NOES:

ABSENT:

Andrea West CLERK OF THE BOARD

Approval to Adopt the Mitigated Negative Declaration Finding for the Orange County Maintenance Facility Project













The Orange County Transportation Authority (OCTA) and the City of Irvine (City) have a long partnership in the planning and acquisition of the Orange County Maintenance Facility (OCMF) property.

2010 OCTA provides the City with property for the Sand Canyon Grade Separation

In return, the City reserves the OCMF property for OCTA with an option to acquire the property

2015 OCTA chooses to acquire OCMF property

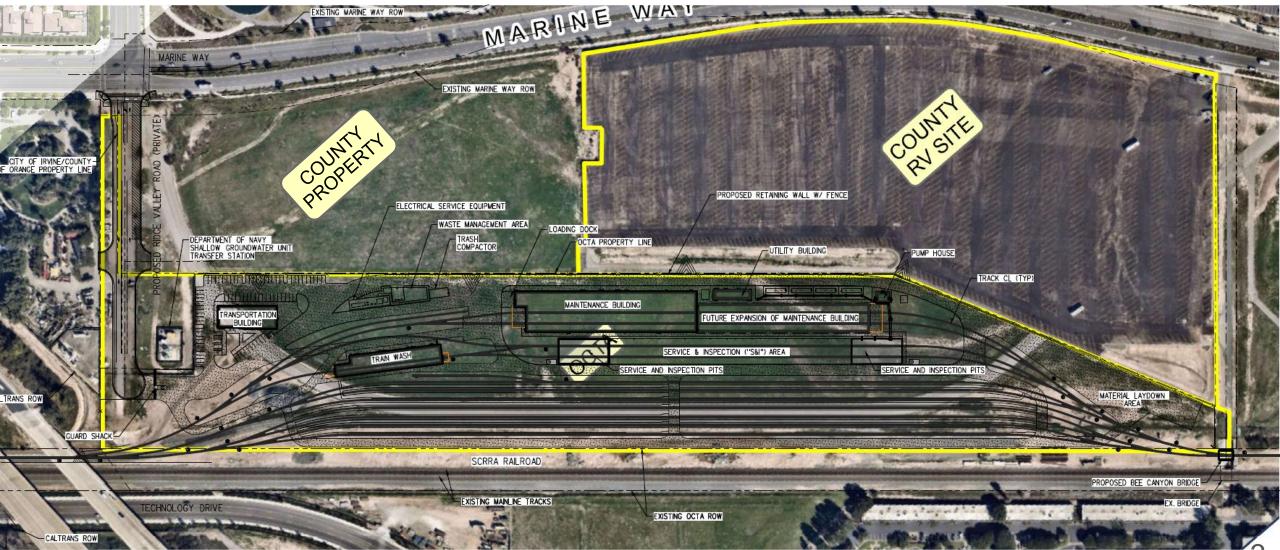
The agreement between OCTA and the City states that the property will be used as a commuter rail maintenance facility



Sand Canyon Grade Separation

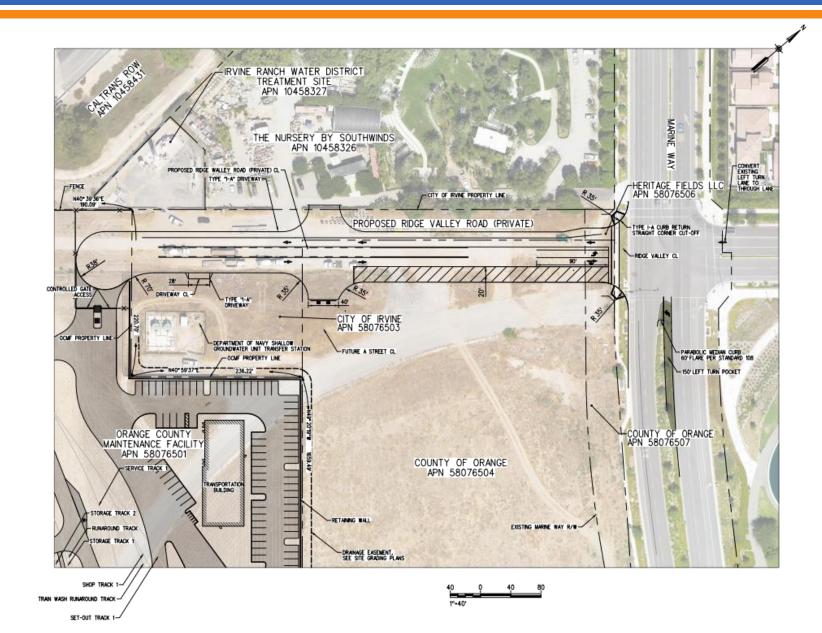
Project Overview





Ridge Valley Extension





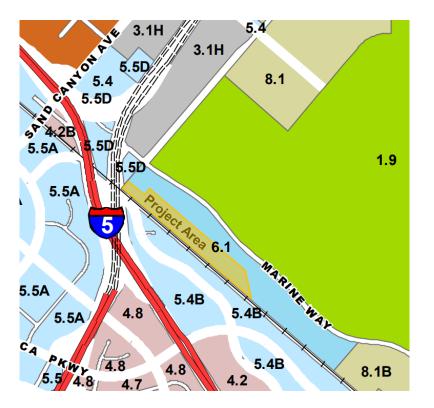
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City Zoning



OCMF:

- Located in City Planning Area 51
- Conditionally allowable under use zoning code **6.1 Institutional**
- Requires a Conditional Use Permit, which is currently under review by the City



| 📻 6.1 Institutional | 5.2 Industrial |
|---|---|
| Intended for public and quasi-public facilities, including government facilities, which the OCMF will be. | Typically used for private land use where raw materials can be manufactured into goods. The OCMF will not be manufacturing anything and will be a public use. |

Project Need



Efficiency

- Eliminates need to move empty trains to facilities in other counties at the end of the day
- Allows better use of Metrolink's existing fleet

Bi

Public Transit

 Serves long-term public transportation needs by accommodating a future expansion of Metrolink's fleet



Maintenance

- Provides needed additional service capacity
- Serves long-term maintenance of public rail facilities



Environment

- Reduces greenhouse gas emissions by getting vehicles off the road
- Reduces emissions by eliminating need to move empty trains to other facilities

Public Transit

- Accommodates future expansion of the Metrolink system
- Allows for more frequent service
- Improves on-time train performance

*** Heavy repairs trains will travel to other facilities ***

Automated Train Wash

Site Activities

Interior cleaning

- Inspections of brakes and other parts
- B Fueling
 - Light repairs
- Train storage
- Train washing
 - Sand replenishment
- Restroom cleaning





Service & Inspection Station



Dump Station

Fueling





Outreach

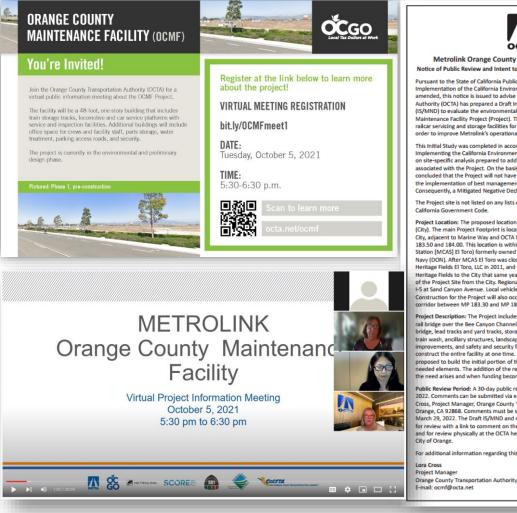


Meetings:

- Oct. 5 Virtual Meeting
- Nov. 4 OCTA Representative at Travata Community
- Jan. 12 Travata Community Meeting
- March 14 Travata Community Meeting

Notices/Collateral:

- Travata Community Email System
- Physical Notices
- Notice of Intent
- Social Media
- Newspaper Ads
- Project Collateral and Website





Metrolink Orange County Maintenance Facility Project Notice of Public Review and Intent to Adopt a Mitigated Negative Declaration

Pursuant to the State of California Public Resources Code and the Guidelines for Implementation of the California Environmental Quality Act, as most recently amended, this notice is issued to advise that the Orange County Transportation Authority (OCTA) has prepared a Draft Initial Study/Mitigated Negative Declaration (IS/MND) to evaluate the environmental effects of the Metrolink Orange County Maintenance Facility Project (Project). The Project will provide locomotive and railcar servicing and storage facilities for Metrolink's Orange County Line trains in order to improve Metrolink's operational efficiency and overall system performance

This Initial Study was completed in accordance with OCTA's Guidelines for Implementing the California Environmental Quality Act (CEQA). The document relies on site-specific analysis prepared to address in detail the environmental impacts associated with the Project. On the basis of the Initial Study, OCTA staff has concluded that the Project will not have a significant effect on the environment with the implementation of best management practices and mitigation measures Consequently, a Mitigated Negative Declaration is proposed.

The Project site is not listed on any lists enumerated under Section 65962.5 of the

Project Location: The proposed location for the Project lies in the City of Irvine (City). The main Project Footprint is located on a 21.3-acre OCTA-owned parcel in the City, adjacent to Marine Way and OCTA Metrolink Railroad, between mileposts (MP) 183.50 and 184.00. This location is within a closed military base (Marine Corps Air Station [MCAS] El Toro) formerly owned by the United States Department of the Navy (DON). After MCAS El Toro was closed, the site was guitclaimed by the Navy to Heritage Fields El Toro, LLC in 2011, and then by way of grant deed conveyed by Heritage Fields to the City that same year. OCTA then purchased the fee ownership of the Project Site from the City, Regional vehicle access to the Project Site is from I-5 at Sand Canyon Avenue. Local vehicle access is via Marine Way to Ridge Valley. Construction for the Project will also occur within the existing Metrolink railroad rridor between MP 183.30 and MP 184.50.

Project Description: The Project includes the construction of a new rail yard, a new rail bridge over the Bee Canyon Channel adjacent to an existing single-span rail bridge, lead tracks and yard tracks, storage, operations and maintenance buildings, train wash, ancillary structures, landscape improvements, street and traffic signal improvements, and safety and security features. Funding is currently not available t construct the entire facility at one time. Instead, a phase construction approach is proposed to build the initial portion of the facility including the most immediately needed elements. The addition of the remaining components will be advanced as the need arises and when funding becomes available

Public Review Period: A 30-day public review period will begin on February 28, 2022. Comments can be submitted via email (ocmf@octa.net) or mailed to Lora Cross, Project Manager, Orange County Transportation Authority, 550 S. Main Street Orange, CA 92868, Comments must be submitted by no later than 5:00 p.m. on March 29, 2022, The Draft IS/MND and reference documents are also available for review with a link to comment on the Project webpage (www.octa.net/ocmf) and for review physically at the OCTA headquarters at 550 S. Main Street in the

For additional information regarding this Project, please contact:

Common Concerns





Visual

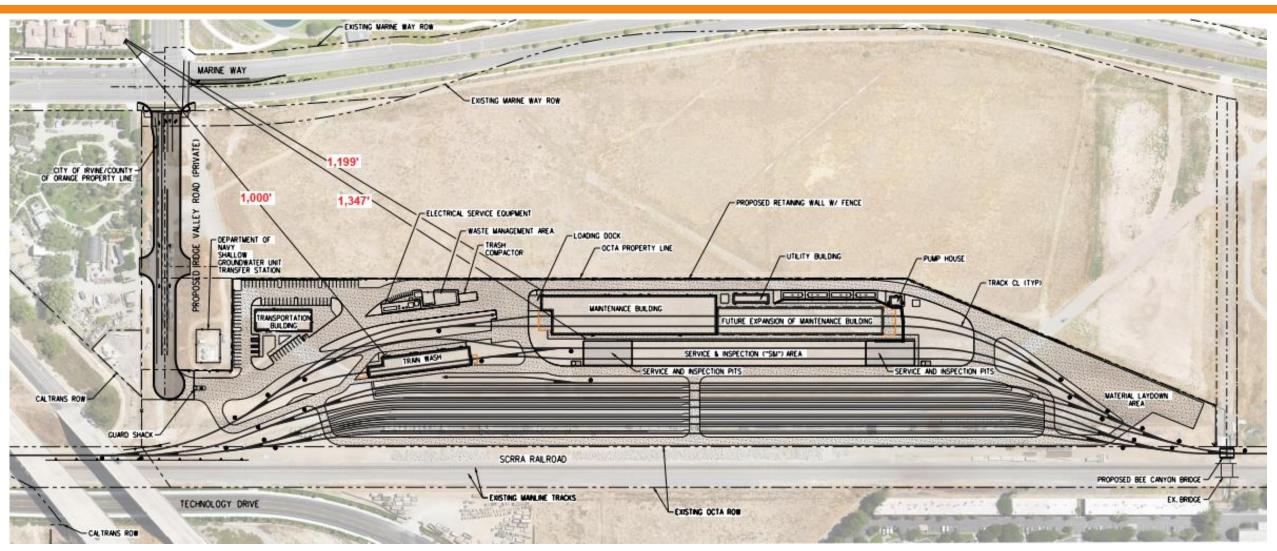




Study shows no significant impacts to aesthetics or glare from the maintenance facility.

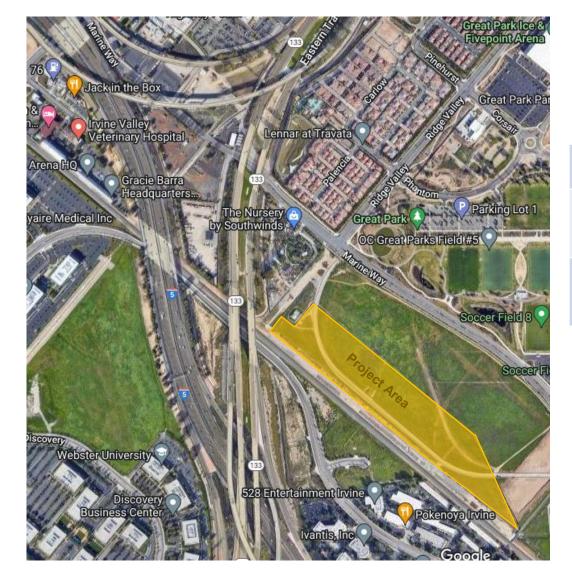
Site Plan





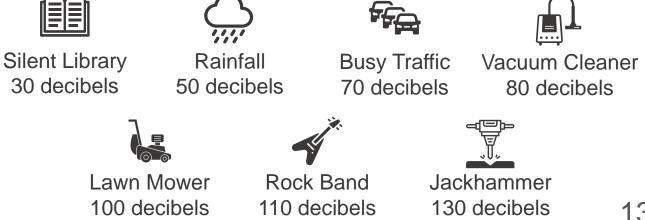
Noise





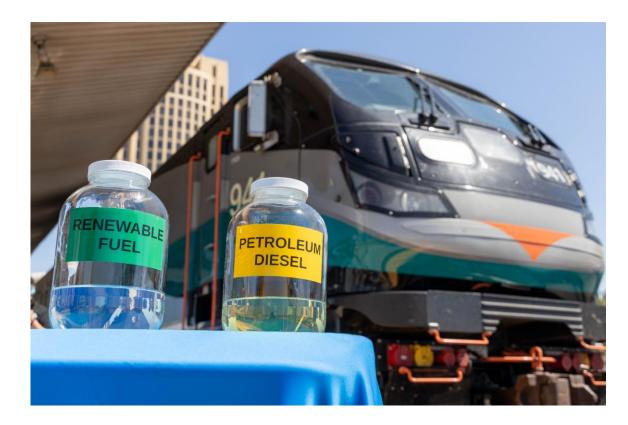
Study shows no significant impacts to noise from construction or operations of the facility.

| Current ambient noise at Travata Community | 63-68 decibels |
|--|-------------------------|
| Noise at Travata Community during construction | 68 decibels or below |
| Noise at Travata Community during operations of facility | 68 decibels or below |





Location of facility will reduce emissions by eliminating need to move empty trains to other counties at the end of the day and decreasing train idling due to more efficient logistics.



- Metrolink is the first passenger rail agency in the nation to be completely powered by renewable fuel
- Nearly 75 percent of Metrolink's locomotives use Tier 4 clean technology, which reduce emissions by up to 85 percent compared to older models

Air Quality



Study shows no significant impacts to air quality



SCAQMD threshold for maximum cancer risk in an age restricted community



Maximum modeled cancer risk of Project 1 in 1 million SCAQMD threshold for the maximum excess cancer risk for an individual in an age restricted community is 10 in 1 million. This project is well below the established threshold with 1 in 1 million.

 VOC emissions during construction can be mitigated by using water based or low VOC interior and exterior paints





Study shows no significant impacts to traffic

- 80 employees would access the facility daily
 - 10 fleet vehicles will work out of the facility



20 other vehicles including deliveries and visitors

220 total daily trips in and out of the facility each day

Schedule and Funding



Total project cost is \$150 - \$165 million:

 \$54 million state grant is funding environmental, design, and a portion of construction







More information about the project: **octa.net/OCMF**

More information about Metrolink: MetrolinkTrains.com



OC Bus and OC ACCESS Services Update





- Ridership
 - Average weekday boardings and productivity as measured by boardings per revenue vehicle hour (B/RVH)
- On-Time Performance
 - Measuring service quality as impacted by the coronavirus (COVID-19) pandemic
- Customer Comments
 - Trends, feedback, and issues reported

OC BUS RIDERSHIP AND PRODUCTIVITY



(AVERAGE WEEKDAY)







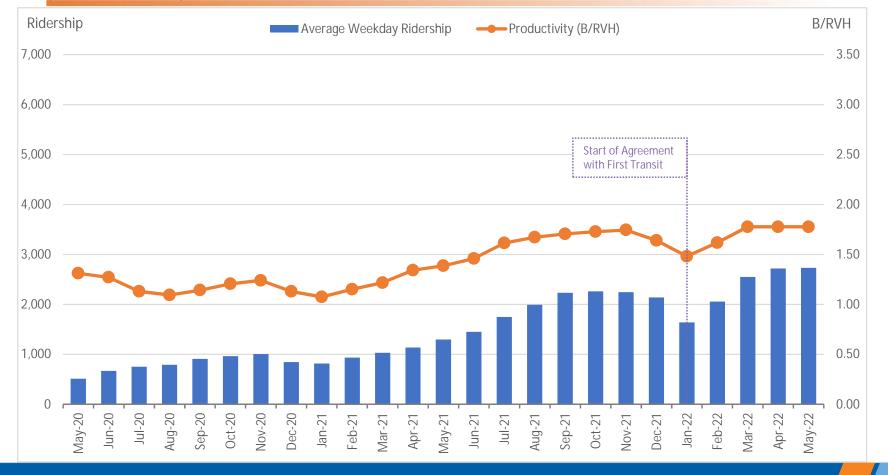
(AVERAGE WEEKDAY)



OC ACCESS RIDERSHIP AND PRODUCTIVITY



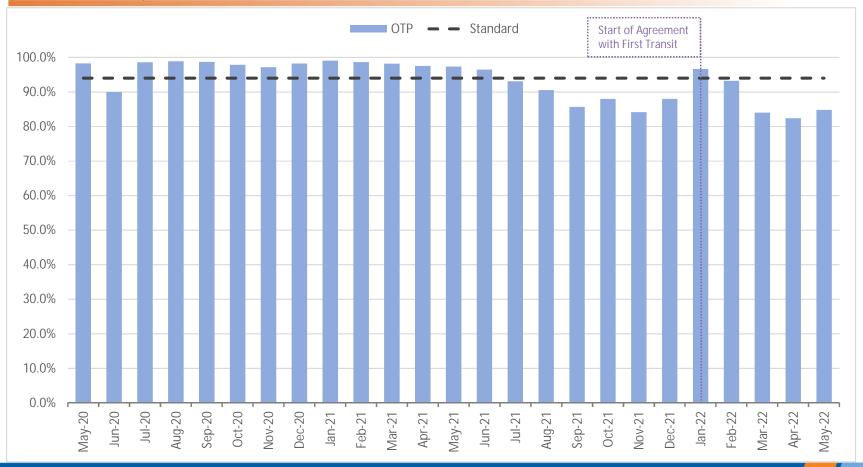
(AVERAGE WEEKDAY)



OC ACCESS ON-TIME PERFORMANCE



(AVERAGE WEEKDAY)



CUSTOMER COMMUNICATION AND FEEDBACK

Marketing and Customer Communications

Customer Communications

On May 23, OCTA launched a comprehensive multilingual public involvement program for the Making Better Connections Study's proposed service plan. Also, digital eSignage displays started to replace bus stop signage at 23 bus stops along Main Street in Orange and Santa Ana, providing real-time arrival estimates.



Customer Comments

Bus Pass-bys

Complaints on pass-bys increased slightly to an average of five complaints per week in May compared to three complaints per week in April.

No Shows

Due to COVID-19 staffing impacts, some routes were not assigned. In May, customer complaints on "no show" routes decreased to an average of 8.5 complaints per week, compared to an average of 18.75 complaints per week in April.

Data reported as of June 1, 2022



Continue to Track Service Performance

- Ridership trends
- On-time performance
- Upcoming Service Changes
 - June 12, 2022
 - October 9, 2022



1. Question: What is Metrolink's subsidy per boarding?

| FISCAL YEAR (FY) | | OC LINE | | IEOC LINE | | 91/PVL LINE | |
|------------------|----|---------|----|-----------|----|-------------|--|
| FY18 Actual | \$ | 2.92 | \$ | 12.81 | \$ | 17.12 | |
| FY19 Actual | \$ | 3.28 | \$ | 14.01 | \$ | 19.38 | |
| FY20 Actual | \$ | 6.25 | \$ | 20.37 | \$ | 31.94 | |
| FY21 Actual | \$ | 88.20 | \$ | 93.71 | \$ | 118.58 | |
| FY22 Budget | \$ | 13.43 | \$ | 34.42 | \$ | 43.91 | |
| FY23 Budget | \$ | 26.55 | \$ | 27.84 | \$ | 40.06 | |

Answer: Metrolink has provided the following subsidy per boarding by line.

* OC: Orange County, IEOC - Inland Empire/Orange County, 91/PVL: 91/Perris Valley

2. Question: Will additional details and statistics regarding Metrolink's annual budget be made available?

Answer: Yes, the entire Metrolink budget will be provided to the Board of Directors (Board) upon its formal transmittal which is anticipated to be May 27th. It will also be included in the budget public hearing agenda item scheduled for the June 8, 2022, Finance and Administration (F&A) Committee, and the June 13, 2022, Board meeting.

3. Question: Are the 91 Express Lanes operating at a surplus?

Answer: Yes, the 91 Express Lanes are anticipated to generate \$22.8 million in net excess revenue after its operating, capital, and debt service expenditures have been met. Section 130240(e)(2)(B) of the Public Utilities Code states that excess toll revenues can be used to make operational or capacity improvements designed to reduce congestion or improve the flow of traffic on State Route 91, between State Route 57 to the west and the Orange and Riverside County Line to the east. Eligible projects for these funds are included within the State Route 91 Implementation Plan, which is updated annually and brought to the Board for approval. The 2022 update for the plan is anticipated to go the Board in June.

4. Question: Why is the administrative employee headcount increasing?

Answer: Administrative headcount is increasing to support new requirements (cyber security), advancements of projects (OC Streetcar operations), and additional needs (finance, planning, procurement, and human resources). In some cases, the Orange County Transportation Authority (OCTA) has been holding off on adding needed administrative positions for the past two years while dealing with the impacts and uncertainty of the pandemic.



5. Question: How do the budgeted increases in administrative employee's salaries compare to the budgeted increases in union employee's salaries?

Answer: The fiscal year (FY) 2022-23 proposed budget includes a merit pool of five percent and a non-base building special award (bonus) pool of four percent for administrative employees.

Unlike the union groups, administrative employees are unrepresented, at-will employees with no collective bargaining agreement, no automatic step increases, and no automatic cost-of-living adjustments. Annual compensation adjustments for the administrative employees are awarded based on a pay-for-performance plan more common to the private sector. The Board has total discretion on whether to fund the administrative pay-for-performance plan on an annual basis when the Personnel and Salary Resolution is presented to the Board for consideration as part of the annual budget. If the pay-for-performance plan is funded by the Board, the Chief Executive Officer (CEO) ensures that compensation adjustments are awarded to each individual based on their individual performance against their documented annual performance goals. Additionally, the CEO ensures that the aggregate amount of merit adjustments and one-time special awards do not exceed the pool amounts approved by the Board.

A number of factors are utilized to determine the amounts of the proposed merit and special award pools for administrative employees including funding availability and market studies that are updated each year.

In contrast to the administrative compensation budget, which is brought to the Board annually, the union collective bargaining agreements are agreements generally spanning three years. Coach operators received five percent in May 2022 and will receive an additional five percent in 2023. The Transportation Communications International Union (TCU), which represents our Facilities Technicians and Parts Clerks, received eight percent this year and will receive an additional four percent next year. The maintenance contract expires in September 2022. Negotiating parameters for that contract are planned to go to the Board on May 23, 2023, for approval; however, the maintenance employees did receive a wage adjustment of four and a quarter percent in September 2021.

6. Question: Are there any projects in need of funding to which OCTA can allocate the forecasted higher than anticipated sales tax receipts?

Answer: No. OCTA has a fully funded capital sinking fund to ensure there is sufficient funding to keep all current assets in a state of good repair. All planned facilities and equipment projects are fully funded and in alignment with the Transit Asset Management Plan required by the Federal Transit Administration (FTA).



Orange County Transportation Authority Fiscal Year 2022-23 Budget Workshop Questions & Answers

7. Question: How is bus ridership recovering following the pandemic by line?

Answer: Details of current weekday ridership compared to pre-pandemic weekday ridership, by line, are included on page 5 of this document.

8. Question: What would the financial impact be of OCTA converting the entire bus fleet to zero-emission buses?

Answer: The incremental cost increase of converting the entire fixed-route and paratransit bus fleets to zero-emission vehicles, including necessary fueling infrastructure, is approximately \$383.5 million.

The biggest cost driver for the increased cost is the incremental cost to purchase a zero-emission bus compared to a compressed natural gas (CNG) powered bus. For example, the majority of OCTA's fixed-route fleet is comprised of 40-foot CNG buses, which cost \$645,000 per unit. A 40-foot hydrogen bus costs \$1.3 million, which over doubles the per unit price per bus. The significant price difference is also found in the pricing for 60-foot zero-emission buses and paratransit buses. As a result, the anticipated increased cost to convert both the fixed-route and paratransit fleets to zero-emission vehicles is \$360 million. OCTA's bus bases would also require new fueling infrastructure to fuel the zero-emission buses, and the anticipated infrastructure cost is \$23.5 million.

9. Question: What is the farebox recovery in the FY 2022-23 budget?

Answer: The farebox recovery is anticipated to be 11.29 percent in FY 2022-23. Therefore, OCTA subsidizes approximately 88.71 percent of the cost to operate bus service.

10.Question: Will administrative compensation be discussed in open session or closed session?

Answer: Administrative compensation will be discussed in open session. Administrative employees are not represented and are at-will employees, as such the decisions for compensation rest completely with the Board. Administrative employees pay is not subject to a collective bargaining agreement but is governed by a Personnel and Salary Resolution which is approved annually with the budget at the public hearing.

11.Question: Please provide a summary of merits and special awards given to OCTA employees over the last few FYs.

Answer: Managers set performance goals for each employee at the end of each FY for the following FY (or when an employee is new to OCTA). These goals are developed to support the Board and CEO initiatives to ensure that employees are focusing and being measured on what is



Orange County Transportation Authority Fiscal Year 2022-23 Budget Workshop Questions & Answers

important to the organization as defined by the CEO and Board. Towards the end of the FY, the employee completes a self-appraisal and provides supporting examples of work performance against their responsibilities and performance goals. The manager will carefully evaluate the employee's work performance against the responsibilities and performance goals with a narrative summary and will rate the employee's performance on a five-point scale. The performance review is reviewed and routed to, and approved by, higher level managers. All performance reviews are reviewed by Human Resources. After all approvals, the manager meets with the employee to discuss the employee's performance for that review period and goals for the next FY. The manager recommends a merit increase, if any, based upon the performance review rating and those recommendations are provided to Executive Directors and, ultimately, the CEO, Deputy CEO, and the Executive Director of People and Community Engagement. Additional details are available on pages 6 - 9 of this document.

12. Question: Why does OCTA's FY 2022-23 budgeted farebox recovery ratio not meet the 20 percent requirement from the State?

Answer: The state-mandated farebox recovery requirement of 20 percent was suspended beginning FY 2020-21 through FY 2022-23. In addition, the law changed in July 2021 to allow other revenues, including property tax, advertising revenue, and FTA revenues to be used towards the calculation of farebox recovery. Paratransit expenditures can also be excluded from operating costs, including the additional revenue sources and excluding paratransit operating costs brings OCTA's farebox recovery above 20 percent.

The assumption of 11.29 percent for the FY 2022-23 budgeted farebox recovery ratio in question 9 was calculated using only fare revenue in the calculation and does not include any additional eligible revenue sources in the calculation.

13. Question: Does OCTA anticipate any impact to farebox recovery with the new Youth Ride Free fare?

Answer: The Youth Ride Free fare is not anticipated to impact farebox recovery. OCTA intends to use Low Carbon Transit Operations Program funding from the State to backfill the loss in fare revenue, as approved by the Board on February 14, 2022. This revenue source can be included as fare revenue in the calculation of the farebox recovery.



Fiscal Year 2022-23 Budget Workshop Questions & Answers



Orange County Transportation Authority

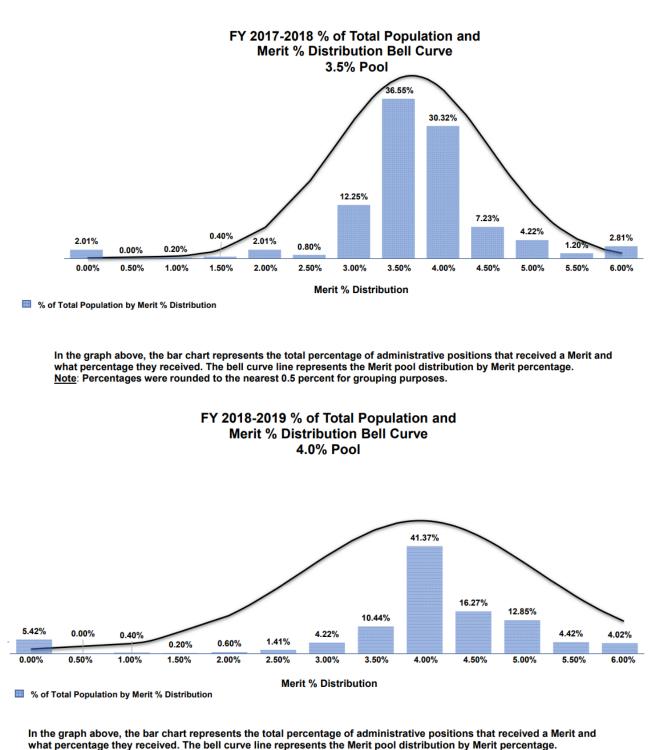
Weekday Ridership Comparison: March 11, 2020 vs April 27, 2022

| # | Route | March 11, 2020 | April 27, 2022 | Change (#) | Change (%) |
|------------|--|----------------|----------------|--------------|--------------|
| 1 | 1-Long Beach - San Clemente | 1,439 | 1,247 | -192 | -13% |
| 25 | 25-Fullerton - Huntington Beach | 1,186 | 988 | -198 | -17% |
| 26 | 26-Buena Park - Yorba Linda | 1,687 | 1,216 | -471 | -28% |
| 29 | 29-La Habra - Huntington Beach | 4,718 | 4,192 | -526 | -11% |
| 30 | 30-Cerritos - Anaheim | 2,366 | 1,127 | -1,239 | -52% |
| 33 | 33-Fullerton - Huntington Beach | 1,184 | 830 | -354 | -30% |
| 35 | 35-Fullerton - Huntington Beach | 2,596 | 1,706 | -890 | -34% |
| 37 | 37-La Habra - Fountain Valley | 3,752 | 2,757 | -995 | -27% |
| 38 | 38-Lakewood - Anaheim Hills | 3,472 | 2,894 | -578 | -17% |
| 42 | 42-Orange - Seal Beach | 4,913 | 3,552 | -1,361 | -28% |
| 43 | 43-Fullerton - Costa Mesa | 6,268 | 4,926 | -1,342 | -21% |
| 46 | 46-Long Beach - Orange | 2,122 | 1,188 | -934 | -44% |
| 47 | 47-Fullerton - Newport Beach | 6,672 | 5,636 | -1,036 | -16% |
| 50 | 50-Long Beach - Orange | 3,676 | 3,594 | -82 | -2% |
| 53 | 53-Orange - Irvine | 6,042 | 4,250 | -1,792 | -30% |
| 54 | 54-Garden Grove - Orange | 3,994 | 2,695 | -1,299 | -33% |
| 55 | 55-Santa Ana - Newport Beach | 3,846 | 3,117 | -729 | -19% |
| 56 | 56-Garden Grove - Orange | 1,426 | 1,243 | -183 | -13% |
| 57 | 57-Brea - Newport Beach | 9,415 | 7,625 | -1,790 | -19% |
| 59 | 59-Anaheim - Irvine | 2,014 | 1,329 | -685 | -34% |
| 60 | 60-Long Beach - Tustin | 5,685 | 4,152 | -1,533 | -27% |
| 64 | 64-Huntington Beach - Tustin | 6,253 | 5,248 | -1,005 | -16% |
| 66 | 66-Huntington Beach - Irvine | 6,317 | 5,482 | -835 | -13% |
| 70 | 70-Sunset Beach - Tustin | 3,099 | 1,981 | -1,118 | -36% |
| 71 | 71-Yorba Linda - Newport Beach | 2,493 | 1,516 | -977 | -39% |
| 72 | 72-Sunset Beach - Tustin | 1,689 | 1,266 | -423 | -25% |
| 76 | 76-Huntington Beach - Newport Beach | 270 | 365 | 95 | 35% |
| 79 | 79-Tustin - Newport Beach | 1,507 | 1,142 | -365 | -24% |
| 82 | 82-Mission Viejo - Rancho Santa Margarita | 370 | 299 | -71 | -19% |
| 83 | 83-Anaheim - Laguna Hills | 1,728 | 1,293 | -435 | -25% |
| 85 | 85-Mission Viejo - Dana Point | 293 | 239 | -54 | -18% |
| 86 | 86-Costa Mesa - Mission Viejo | 483 | 401 281 | -82 27 | -17% |
| 87 | 87-Rancho Santa Margarita - Laguna Niguel | 254 | | | 11% |
| 89 90 | 89-Lake Forest - Laguna Beach | 1,025 1,088 | 749 861 | -276 -227 | -27% -21% |
| | 90-Tustin - Dana Point | | | -227 | |
| 91 122 | 91-Mission Viejo - Laguna Hills | 1,324 | 1,134 | | -14% |
| 123 129 | 123-Anaheim to Huntington Beach 129-La Habra - Anaheim | 755 584 | 752 424 | -3 -160 | 0% -27% |
| 129 | | 624 | 631 | -100 | |
| 143 | 143-La Habra - Brea 150-Santa Ana to Costa Mesa | 874 | 899 | 25 | 1% 3% |
| | | | | | |
| 153 | 153-Brea - Orange | 339 | 368 | 29 | 9% |
| 167 | 167-Anaheim - Irvine | 751 | 714 | -37 | -5% |
| 177 | 177-Foothill Ranch - Laguna Hills | 333 | 315 | -18 | -5% |
| 178 | 178-Huntington Beach - Irvine 206-Santa Ana - Lake Forest | 341 | 325 | -16 -46 | -5% |
| 206 | | 46 | - | | -100% |
| 213 | 213-Brea - Fullerton - Placenta - Irvine | 37 | - | -37 | -100% |
| 453 | 453-Orange Metrolink Station - Orange | 106 | 62 | -44 | -42% |
| 463 | 463-Santa Ana Depot to Imperial Promenade | 73 | 68 | -5 | -7% |
| 472 473 | 472-Tustin Metrolink Station to Irvine | 128 | 75 | -53 -8 | -41% |
| | 473-Tustin Metrolink Station to UCI | 159 | 151 | | -5% |
| 480 | 480-Irvine Metrolink Station - Irvine Spectrum | 87 | 45 | -42 | -48% |
| 529 | 529-GWTC to FPNR - Bravo! | 1,247 | 934 | -313 | -25% |
| 543 | 543-Fullerton - Costa Mesa - Bravol | 2,615 | 2,011 | -604 | -23% |
| 560 | 560-Santa Ana to Long Beach - Bravo! | 3,240 | 2,136 | -1,104 | -34% |
| 701 | 701-Los Angeles - Huntington Beach Express | 106 | - | -106 | -100% |
| 721 | 721-Los Angeles - Fullerton Express | 74 | - | -74 | -100% |
| 794 | 794-Riverside / Corona to South Coast Metro Express | 113 | - | -113 | -100% |
| 862 | 862-Downtown Santa Ana Shuttle | 375 | 231 | -144 | -38% |
| | Total Boardings | 119,673 | 92,662 | -27,011 | -23% |

5 Fiscal Year 2022-23 Budget Workshop Questions & Answers



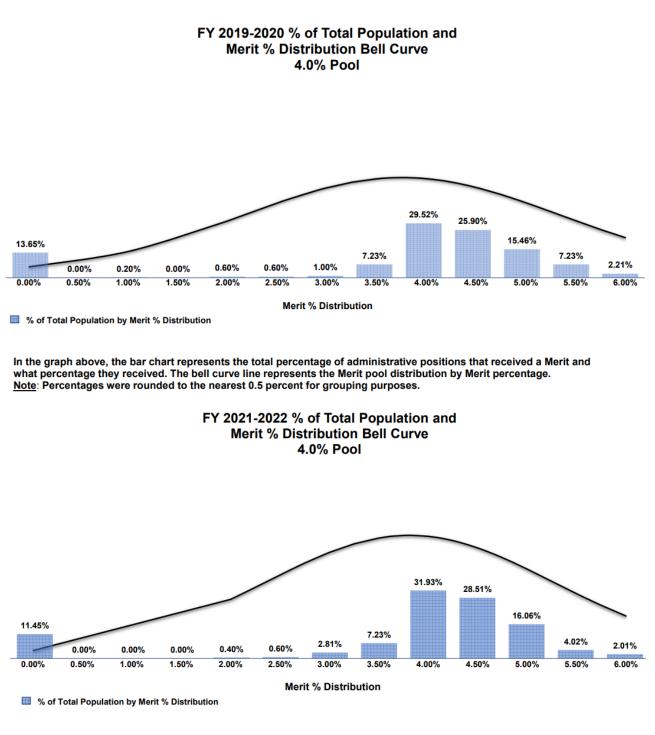
Fiscal Year 2022-23 Budget Workshop Questions & Answers



<u>Note</u>: Percentages were rounded to the nearest 0.5 percent for grouping purposes.



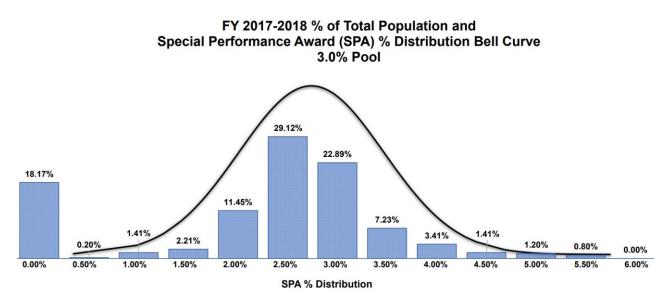
Fiscal Year 2022-23 Budget Workshop Questions & Answers



In the graph above, the bar chart represents the total percentage of administrative positions that received a Merit and what percentage they received. The bell curve line represents the Merit pool distribution by Merit percentage. <u>Note</u>: Percentages were rounded to the nearest 0.5 percent for grouping purposes.



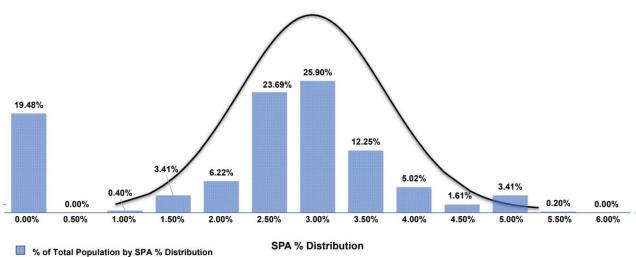
Fiscal Year 2022-23 Budget Workshop Questions & Answers



% of Total Population by SPA % Distribution

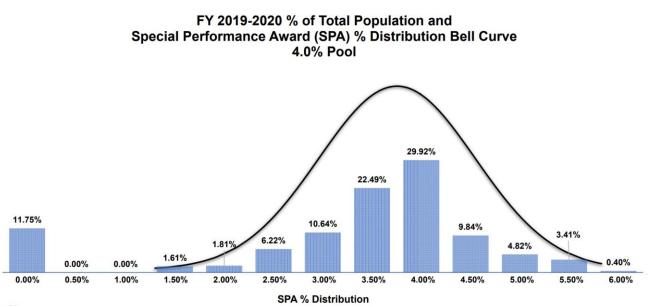
In the graph above, the bar chart represents the total percentage of administrative positions that received a SPA and what percentage they received. The bell curve line represents the SPA pool distribution by SPA percentage. Note: Percentages were rounded to the nearest 0.5 percent for grouping purposes.

> FY 2018-2019 % of Total Population and Special Performance Award (SPA) % Distribution Bell Curve 3.0% Pool



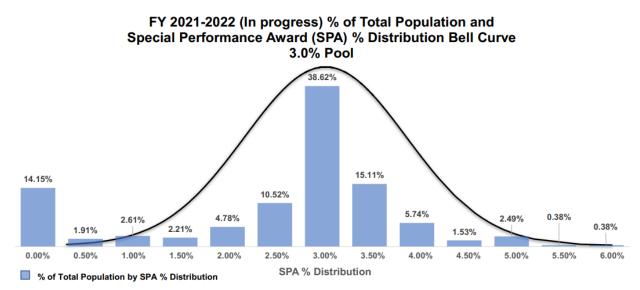
In the graph above, the bar chart represents the total percentage of administrative positions that received a SPA and what percentage they received. The bell curve line represents the SPA pool distribution by SPA percentage. Note: Percentages were rounded to the nearest 0.5 percent for grouping purposes.





9% of Total Population by SPA % Distribution

In the graph above, the bar chart represents the total percentage of administrative positions that received a SPA and what percentage they received. The bell curve line represents the SPA pool distribution by SPA percentage. <u>Note</u>: Percentages were rounded to the nearest 0.5 percent for grouping purposes.



In the graph above, the bar chart represents the total percentage of administrative positions that received a SPA and what percentage they received. The bell curve line represents the SPA pool distribution by SPA percentage. <u>Notes</u>:

* Percentages were rounded to the nearest 0.5 percent for grouping purposes.

* This fiscal year is still in progress and not all SPAs have been processed for this fiscal year.