SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT/INITIAL STUDY
FOR
MARYSVILLE RING LEVEE PROJECT
PHASE 2A SOUTH
PHASE 2C

YUBA RIVER BASIN, YUBA COUNTY, CALIFORNIA

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US Army Corps of Engineers
Sacramento District

State of California Central Valley
Flood Protection Board

State Clearing House Number 2010024001

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YUBA COUNTY, CALIFORNIA

Prepared for

US Army Corps of Engineers
Sacramento District

On Behalf of

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ACRONYMS & ABBREVIATIONS

ADT	Average Daily Trips
APE	Area of Potential Effects
BMPs	Best Management Practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CAR	Coordination Act Report
CARB	California Air Resources Board
CCAA	California Clean Air Act
CDC	California Department of Conservation
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CVFPB	Central Valley Flood Protection Board
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
EA	Environmental Assessment
EDR	Engineering Document Report
EA/IS	Environmental Assessment/Initial Study
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Environmental Site Assessment
°F	degrees Fahrenheit
FEIS/EIR	Final Environmental Impact Statement/Environmental Impact Report
FESA	Federal Endangered Species Act
FONSI	Finding of No Significant Impact
FRAQMD	Feather River Air Quality Management District
GGS	giant garter snake
GHG	greenhouse gases
GPS	global positioning system
GRR	General Reevaluation Report

HAP	Hazardous Air Pollutants
HEP	Habitat Evaluation Procedure
HTRW	Hazardous, Toxic and Radiological Wastes
L_{eq}	equivalent energy noise level
L_{dn}	day-night average noise level
Lmax	peak noise level
LOS	Levels of Service
MBTA	Migratory Bird Treaty Act
MLD	Marysville Levee District
MND	Mitigated Negative Declaration
MRL	Marysville Ring Levee
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxides
NO_X	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NSVAB	North Sacramento Valley Air Basin
O_3	Ozone
Pb	Lead
PG&E	Pacific Gas and Electric Company
PM2.5	fine particulate matter
PM10	particulate matter less than 10 microns in diameter
RD	Reclamation District
ROG	reactive organic gases
SCB	soil, cement, and betonite mixture
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SPCP	Spill Preventions and Countermeasure Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
System Evaluation	Sacramento River Flood Control System Evaluation
TAC	Toxic Air Contaminants
USACE	U.S. Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VELB	valley elderberry longhorn beetle
WRDA	Water Resources Development Act

1.0 INTRODUCTION

1.1 Introduction

Pursuant to the National Environmental Policy Act of 1969 (NEPA) and the California Environmental Quality Act of 1970 (CEQA), as amended, this Supplemental Environmental Assessment (SEA)/Initial Study (IS) has been prepared to update, discuss, and disclose potential effects, beneficial or adverse, that may result from the Marysville Ring Levee (MRL) proposed design refinements to address geotechnical concerns. The MRL Environmental Assessment/Initial Study (EA/IS) was initially prepared in 2010 to analyze the proposed MRL improvements and discuss how these improvements would be implemented in multiple phases and contracts (Figure 1). The MRL Project is a cooperative effort between the U.S. Army Corps of Engineers (USACE), the State of California Central Valley Flood Protection Board (CVFPB), and the Marysville Levee District (MLD).

Proposed levee improvements to the MRL were originally covered in the 2010 EA/IS which recommended implementation in multiple phases (Figure 1). Phase 1 was constructed in 2011 and portions of Phase 4 were constructed in 2016 and 2017. To better facilitate design and construction, Phase 2 was further subdivided into Phase 2A-North, 2A-South, 2C, and 2B. Phase 2A-North is scheduled to begin construction in late spring 2018. Future design changes in subsequent phases will be analyzed in future environmental documentation.

1.2 Project Authorization

The Yuba River Basin, California Project ("Authorized Project") was authorized for construction in the Water Resources Development Act of 1998, Pub. L. 106-53, § 101(a)(10), 112 Stat. 269, 275 (hereinafter "WRDA 1999"), as amended by the Water Resources Development Act of 2007, Pub. L. No. 110-114, § 3041, 121 Stat. 1041, 1116 (hereinafter "WRDA 2007"), and consists of three reaches: Reach 1 (Linda/Olivehurst), Reach 2 (Best Slough/Lower RD 784), and Reach 3 (Marysville).

The Yuba River Basin Project initiated a General Re-evaluation Report (GRR) to re-assess the project for new under-seepage criteria. Prior to completion of that Report, local interests began constructing improvements to the Yuba, Feather and Bear Rivers and WPIC levees in Reaches 1 and 2. Those efforts provided flood risk reduction benefits to the entire RD 784 area. The last local construction project, the Upper Yuba River Levee Improvement Project (UYRLIP) was completed in 2012. With the completion of the local work, there would be no Federal construction or additional levee improvements required for the RD 784 area, and therefore no PPA was required for improvements in Reaches 1 or 2.

During post-authorization studies, Reach 3, the Marysville Ring Levee (MRL) element, was approved for construction as a separable element of the authorized Yuba River Basin Project. An Engineering Documentation Report (EDR) was completed in April 2010 which found that, although design changes were necessary, they did not constitute a change in the project scope, and the project could proceed to construction as a separable element of the

Yuba River Basin project. As a result, a Project Partnership Agreement was executed and the project initiated Federal construction in 2010.

In order to apply credit for advance work completed in Reach 1 towards the non-Federal cost share of the Marysville Ring Levee element of the authorized project, a Post Authorization Documentation Report (PADR) was completed and approved December 2012 and a subsequent Integral Determination Report (IDR) was completed and approved in February 2014.

1.3 Purpose and Need for a Supplemental Environmental Assessment/Initial Study

This Supplemental Environmental Assessment (SEA)/Initial Study (IS), is being prepared to assess the potential direct, indirect and cumulative environmental effects associated with the levee design refinements and address the technical issues related to the seepage and stability of the MRL. This SEA/IS discusses Phase 2A-South and 2C modifications to the MRL EA/IS (USACE, 2010) Alternative 2. All phases of the MRL Project are documenting changes in design, costs, benefits and environmental effects through Design Documentation Reports (DDR) and, where necessary, supplemental environmental documents.

This SEA/IS analyzes, in detail, the following alternatives:

- **Alternative 1.** As construction has not yet commenced in the Phase 2A South and 2 C locations, the No Action Alternative remains a possible scenario for that area. Phase 1 was constructed in 2011 and portions of Phase 4 were constructed in 2016 and 2017. Phase 2A North is scheduled to begin construction in late spring 2018. No MRL actions would occur in the No Action. The safety risks would remain in this section of the levee.

- **Alternative 2.** Under this action alternative, proposed changes to the 2010 design will be implemented. The footprint of the levee would not change as a result of the improvements and implementation of the modifications would decrease flood risk to the city of Marysville to about 0.4 percent in any given year. Modifications included in the Alternative 2 are discussed in detail in Section 2.3.

This SEA/IS is in compliance with the National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA) and the California Environmental Quality Act (California Public Resources Code § 21000 et seq.) (CEQA), and provides full disclosure of the effects of the proposed action.

1.4 Project Location and Setting

The City of Marysville is located approximately 50 miles north of Sacramento, California in Yuba County and is bordered by the Yuba River to the south, Jack Slough to the north and the Feather River to the West (Figure 1). It is surrounded by 7.5 miles of levee— these levees vary in height from 17 to 28 feet and protect the City from flooding that could

occur from the above three water sources.

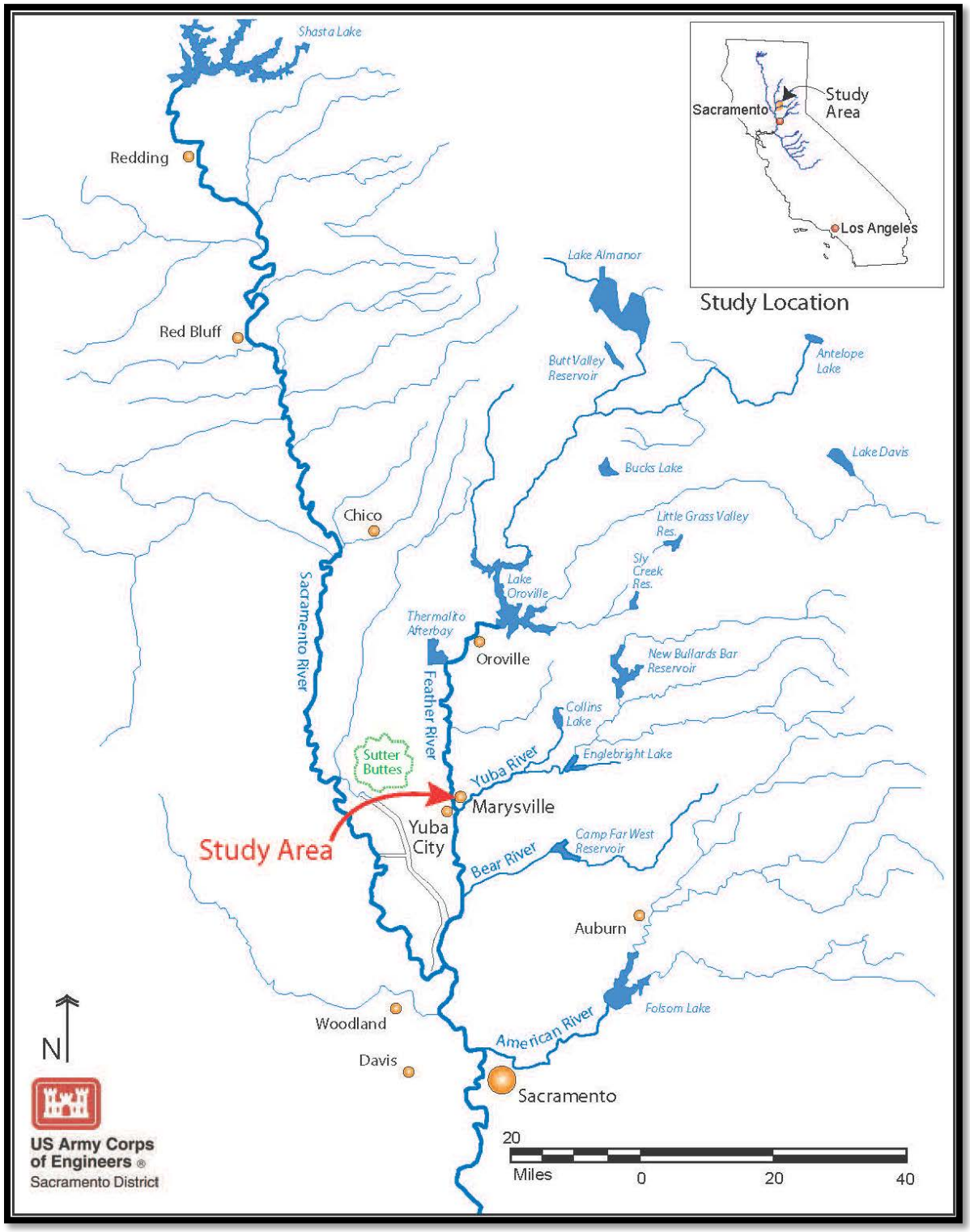

Figure 1. Site (Vicinity) Map.

1.5 Decisions to Be Made

The purpose of this SEA/IS is to determine if design changes for the proposed action, in light of new information or circumstances, could result in different effects and potentially contribute to significant effects on the human environment. This SEA/IS, prepared by the USACE and CVFPB as cooperating agencies, supplements existing analyses and updates potential environmental effects resulting from the levee design refinements and addresses the technical issues related to the seepage and stability of the MRL. The USACE and CVFPB identified and reviewed new information to determine if any resources and effects previously analyzed should be re-evaluated or if the new information could alter previous effects determinations. This SEA/IS further supports or elaborates on the analyses or information presented in existing joint NEPA/CEQA documents, but it does not change the conclusions of any of those analyses. Pursuant to 40 CFR 1506 and 32 CFR 651, the existing analyses are still valid and are incorporated by reference.

The District Engineer, commander of the Sacramento District, must decide whether or not the proposed action qualifies for a Finding of No Significant Impact (FONSI) under NEPA or whether an Environmental Impact Statement (EIS) must be prepared. In addition, the CVFPB must decide if the proposed action qualifies for a Mitigated Negative Declaration (MND) under CEQA or whether an Environmental Impact Report (EIR) must be prepared.

1.6 Scoping and Issues

This SEA/IS supplements the previous joint NEPA/CEQA document, the MRL Environmental Assessment/Initial Study (EA/IS) (USACE, 2010). It provides an evaluation of the effects of proposed design and area of potential effect (APE) changes, as well as evaluates whether those changes in the proposed action contribute to a determination of significantly different environmental effects from the original MRL EA/IS (USACE, 2010). The following issues were identified as relevant to the proposed action and appropriate for further evaluation: air quality; climate change; vegetation; threatened and endangered species; migratory birds; recreation; cultural resources, and public utilities.

1.7 Issues Eliminated from Further Analysis

Previous joint NEPA/CEQA documents (USACE, 2010) have described the Affected Environment in detail and evaluated the potential effects on resources of concern, including: geology and seismicity; topography and soil types; esthetics and visual resources; hazardous, toxic, and radiological waste; fisheries; water quality and resources; socioeconomics, land use, and environmental justice; agriculture and prime and unique farmlands; traffic and circulation; and noise. The conclusions of the existing effects analyses for most resources, except those resources discussed in more detail herein, have been determined to be valid since the construction methodologies, scope, and timing have remained the same, and relevant Federal laws have not changed in a manner that would require re-evaluation of these resources. Those environmental effects are summarized in Section 3 of the MRL EA/IS (USACE, 2010).

1.8 Laws, Regulations, and Policies

1.8.1 Federal Requirements

Bald and Golden Eagle Protection Act of 1940, as amended, 16 U.S.C. § 668- 668c, *et seq*. *Full Compliance.* This Act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." Preconstruction surveys would be conducted by a qualified Corps biologist—if any eagle nests are sighted in or near the Project Area, an appropriately sized protective buffer would be established in coordination with USFWS and the area would be avoided until the nests were no longer active.

Clean Air Act of 1972, as amended, 42 U.S.C. § 7401, *et seq*. *Full Compliance*. Section 3.1.2 of this document discusses the effects of the Project on local and regional air quality. The analysis shows that expected project-related emissions will fall under the EPA's general conformity *de minimus* thresholds. Therefore, the Project is in compliance with the Federal Clean Air Act. However, effects to local air quality are discussed in Section 3.1.

Clean Water Act of 1972, as amended, 33 U.S.C. § 1251, *et seq*. *Full Compliance.* The Proposed Project is not expected to have impacts on water quality. Compliance with Clean Water Act Section 404(b)(1) was not required because there would be no fill or discharge of material into the waters of the United States.

Fish and Wildlife Coordination Act of 1958, as amended, 16 U.S.C. § 661, *et seq*. *Partial Compliance.* The USACE has coordinated with USFWS to determine the effects on vegetation and wildlife in the Project Area. The USFWS prepared a Coordination Act Report (CAR), to address these effects for the 2010 EA/IS environmental document. A Supplemental CAR is being prepared by USFWS containing recommendations to mitigate any adverse impacts identified to fish and wildlife resources and their habitat based on revisions to the Proposed Project (Appendix A). The USACE will consider USFWS's recommendations and implement the listed measures, as appropriate.

Federal Endangered Species Act of 1973, as amended, 16 U.S.C. § 1531, *et seq*. *Full Compliance.* A list of threatened and endangered species that may be affected by the Project was obtained from the USFWS website on December 29, 2017 (Appendix B). One federally-listed species has the potential to be affected by the Project—the valley elderberry longhorn beetle (VELB). The USACE has formally consulted with USFWS and received a Biological Opinion (BO) on April 12, 2009 concurring with the USACE' determination that the Project may affect, but is not likely to adversely affect the VELB (USACE, 2010). The construction activities discussed in this SEA/IS would not result in any additional impacts to the VELB or its designated critical habitat; therefore, re-consultation was determined unnecessary.

Additionally, USACE, as the action agency, has made the determination that there would be no effect on any listed fish species under the jurisdiction of the National Marine Fisheries Service because there will be no in-water work. As a result, no formal consultation was required with NMFS under Section 7 of the Endangered Species Act.

Executive Order 11988, Floodplain Management. *Full Compliance.* This order directs all Federal agencies approving or implementing a project to consider the effects that project may have on flood plains and flood risks—this Project would not result in development of floodplains as there are no floodplains within the APE.

Executive Order 11990, Protection of Wetlands. *Full Compliance*. This order directs the USACE to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in implementing civil works. A wetland delineation was conducted by USFWS for the MRL—the Proposed Project would not affect wetlands in the area.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601, *et seq*. *Full Compliance*. On April 20, 2017, a Hazardous, Toxic and Radiological Waste (HTRW) Environmental Site Assessment (ESA) was conducted for the Project Area (Appendix D). The ESA did not identify any known contamination due to HTRW and construction activities would not affect potential HTRW sources. There is no evidence of hazardous substances or petroleum products being released into the environment along the Project Area. Therefore, construction activities would not result in any significant adverse effects.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. *Full Compliance.* The proposed Project would not adversely affect any minority or low-income populations. No relocations would be associated with this Project. Any minority or low-income populations within the Project Area would be benefited by the construction of this Project as a result of the improved flood protection to the city of Marysville.

Executive Order 13112, Invasive Species. *Full Compliance.* This order directs Federal agencies not to authorize, fund, or carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species. To avoid introduction or spread of invasive species, the USACE would ensure that appropriate control measures are implemented during Project construction that would comply with applicable State and county invasive species control regulations.

Farmland Protection Policy Act, 7 U.S.C. § 4201 *et seq*. *Full Compliance.* There would be no permanent loss of prime and unique farmlands associated with this Project. Agricultural production would continue in the area at its current level after the completion of the MRL improvements.

Magnuson-Stevens Fishery Conservation and Management Act 16 U.S.C. § 1801 *et seq*. *Full Compliance.* This legislation requires that all Federal agencies consult with

National Marine Fisheries Service regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect essential fish habitat. Essential fish habitat is defined as "*waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.*" The USACE has determined the Project would have "no effect" on federal special-status fish species and essential fish habitat.

Migratory Bird Treaty Act of 1936, as amended, 16 U.S.C. § 703 *et seq*. *Full Compliance*. The Proposed Action may result in the removal of suitable nesting habitat. To ensure the Project would not adversely affect migratory birds, preconstruction surveys by a qualified USACE biologist would be conducted. If breeding birds are found in the Project Area, a protective buffer would be delineated and USFWS and CDFW would be consulted for further actions.

National Environmental Policy Act of 1969, as amended, 42 U.S.C. § 4321, *et seq*. *Partial Compliance.* This SEA/IS is currently in partial compliance with this Act. Comments received during the public review period will be considered and incorporated into this document, as appropriate, and a comments and responses appendix will be prepared (Appendix E). The final SEA/IS will be accompanied by a signed FONSI.

National Historic Preservation Act of 1966, as amended, 16 U.S.C. § 470*, et seq*. *Partial Compliance.* Consultation on the 2A South APE has been reopened because of project refinement that will include the relocation of the Sprint fiber optic line

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of a proposed undertaking on properties that have been determined to be eligible for listing in, or are listed in, the National Register of Historic Places. The USACE has concluded that there are historic properties within the APE. The Project as proposed, would not affect the characteristics that make the Marysville Ring Levee eligible for listing in the NRHP—therefore, there would be no adverse effects to any historic properties listed in, or eligible for listing in, the National Register of Historic Places. A letter to the SHPO documenting these findings was sent on January 22, 2010. In a letter dated January 27, 2010 the SHPO concurred with the USACE findings on condition of the execution of the MOA. The MOA was executed in 2010. After the original 2010 consultation on the MRL project APE additional historic property identification measures have been undertaken. These measures include an ethnographic study, an updated cultural resources inventory and geoarchaeological subsurface testing. The additional measure were completed to update the cultural resource inventory and to address concerns regarding the potential for prehistoric sites within the APE, which were expressed by Native American tribes after Section 106 consultation was complete.

At present, the project is in partial compliance as additional Section 106 consultation is currently being undertaken to account for changes in the project APE that will facilitate the relocation of the Sprint fiber optic line. The consultation is expected to conclude by March of 2018. Once this consultation is completed, the project will be in full compliance.

Letters to potentially interested Native Americans were sent on September 21, 2009 asking for their knowledge of locations of archeological sites, or areas of traditional cultural interest or concern. In a letter dated December 15, 2009, the Enterprise Rancheria contacted the USACE

and requested information and to meet on the Proposed Project. A USACE representative contacted Mr. Ren Reynolds, EPA Planner, Site Monitor and Tribal Historic Preservation Officer of the Enterprise Rancheria (Enterprise), in late December 2009 and on February 19, 2010 to propose meeting with tribal representatives. A meeting between the Corps and Enterprise concluded on June 26, 2012. Following the meeting, USACE continues to pursue providing them with information concerning project updates and materials in advance of construction.

Project consultation with the United Auburn Indian Community (UAIC) was also initiated through a letter in 2009. A tribal visit to the project area occurred on November 11, 2013, which at the same time UAIC requested that tribal monitors be present during construction. A follow up field visit with UAIC occurred on November 18, 2014. UAIC also completed a third site visit in 2017 following consultation on a revised APE. At that time, UAIC was accompanied by the Corps' archaeological contractor during survey and geoarchaeological testing. The tribe has expressed interest in having a tribal monitor present during construction activities. The Corps continues to involve UAIC in the consultation process as project changes occur.

Noise Control Act of 1972, 42 U.S.C. § 4901 to 4918. *Full Compliance.* This Act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. Compliance with this Act is being addressed though compliance with the Yuba County Noise Ordinance and CEQA. Mitigation measures to minimize potential Project effects on sensitive receptors, including restricting hours of construction, are provided in Section 3.3.8 of the original MRL EA/IS (USACE, 2010).

Wild and Scenic Rivers Act, 16 U.S.C. § 1271 *et seq*. *Full Compliance*. There are no components of the Federal Wild and Scenic River system in the Project Area.

1.8.2 State of California Requirements

California Clean Air Act of 1988, California Health and Safety Code § 40910, *et seq*. *Full Compliance.* Section 3.1.2 of this document discusses the effects of the Proposed Project on local and regional air quality. The Project is located in a non-attainment area for State ozone and PM10 standards. The analysis shows that expected short-term Project-related emissions will exceed existing local thresholds of the CCAA as administered by the FRAQMD for NOx (ozone)—however, it is expected that emission reductions from mitigation measures and participating in FRAQMD's off-site mitigation program would reduce emissions to less-than-significant.

California Environmental Quality Act of 1970, California Public Resources Code § 21000-21177. *Partial Compliance.* The Central Valley Flood Protection Board (CVFPB), as the non-federal sponsor and CEQA lead agency, will undertake activities to ensure compliance with the requirements of this Act. CEQA requires the full disclosure of the environmental effects, potential mitigation, and environmental compliance of the Proposed Project. Adoption of this SEA/IS and FONSI/MND by the CVFPB will provide full compliance with the requirements of CEQA.

California Endangered Species Act, 14 C.C.R. § 783-786.6. *Full Compliance*. This Act requires the non-federal agency to consider the potential adverse effects to State-listed species. As a joint NEPA/CEQA document, this SEA/IS has considered the potential effects and has provided conservation measures where appropriate. With the implementation of the listed conservation measures, no affects to State-listed species are expected.

California Native Plant Protection Act of 1977, California Fish and Game Code § 1900, *et seq*. *Full Compliance*. This Act allows the Fish and Game Commission to designate plants as rare and endangered; California Rare Plant Rank 1B constitutes the majority of taxa in the CNPS Inventory (CNPS 2017), with more than 1,000 plants assigned to this category of rarity. All of the plants constituting California Rare Plant Rank 1B meet the definitions of the California Endangered Species Act under the California Department of Fish and Game Code, and are eligible for state listing. Impacts to these species or their habitat must be analyzed during preparation of CEQA environmental documents—as a joint NEPA/CEQA document, this SEA/IS has considered the potential effects and has provided conservation measures where appropriate.

Clean Water Act, Section 401(a)(1). *Full Compliance*. The Section 401 water quality certification certifies that the proposed activity would not violate State Water Quality standards. The State Water Resources Board (SWRCB) and the Central Valley Regional Water Quality Control Board (CVRWQCB), administer the Section 401 program by prescribing measures necessary to avoid, minimize, or mitigate adverse impacts of Proposed Project on water quality and ecosystems. A 25-foot buffer from the Ordinary High Water Mark (OHWM) has been established and all Project-related work, haul routes, and staging/temporary work areas would occur outside the established buffer. Additionally, preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) will prevent any significant adverse effects to water quality in the Project Area.

Assembly Bill (AB) 52, 09/2014. The California Legislature passed Assembly Bill (AB) 52, which added provisions to the Public Resources Code regarding the evaluation of impacts on tribal cultural resources under CEQA, and consultation requirements with California Native American tribes. In particular, AB 52 requires lead agencies to analyze project impacts on "tribal cultural resources," separately from archaeological resources (PRC § 21074; 21083.09). The Bill defines "tribal cultural resources" in a new section of the PRC Section 21074. AB 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (PRC § 21080.3.1, 21080.3.2, 21082.3). Finally, AB 52 requires the Office of Planning and Research to update Appendix G of the CEQA Guidelines by July 1, 2016 to provide sample questions regarding impacts to tribal cultural resources (PRC § 21083.09). No tribal cultural resources have been identified within the Marysville Ring Levee Phase 2A – South and 2C. Please see Section 1.8.1 and Section 3.5 for additional information.

Assembly Bill (AB) 1473, 07/2002. *Full Compliance.* Directs the California Air Resources Board (CARB) to establish fuel standards for non-commercial vehicles that would provide the maximum feasible reduction of GHGs. Reduction of GHG emissions from non-commercial vehicle travel.

Assembly Bill (AB) 32, 09/2006. Executive Order (EO) S-3-05, 06/2005. *Full*

Compliance. Establishment of statewide GHG reduction targets and biennial science assessment reporting on climate change impacts and adaptation and progress toward meeting GHG reduction goals. Projects required to be consistent with statewide GHG reduction plan and reports will provide information for climate change adaptation analysis.

Executive Order (EO) S-14-08, 11/2008. Senate Bill (SB) 107, 09/2006. Senate Bill (SB) 1078, 09/2002. *Full Compliance.* Establishment of renewable energy mandates and goals as a percentage of total energy supplied in the State. Reduction of GHG emissions from purchased electrical power.

Executive Order (EO) B-30-15, 04/2015. *Full Compliance.* The order established a new interim greenhouse gas (GHG) reduction target to reduce GHGs to 40% below 1990 levels by 2030 in order to meet the target of reducing GHGs to 80% below 1990 levels by 2050.

Executive Order (EO) B-10-11, 09/2011. *Full* Compliance. Directs state agencies to encourage effective cooperation, collaboration, communication, and consultation with tribes concerning the development of legislation, regulations, rules, and policies on matters that may affect Tribes in California. In November 2012 the Natural Resources Agency adopted a Final Tribal Consultation Policy that implemented the Executive Order, including but not limited to: recognition of tribal sovereignty over their territories and members, acknowledgment that tribes and tribal communities possess distinct cultural, spiritual, environmental, economic and public health interests, and unique traditional cultural knowledge about California resources, recognition of tribal interests, and defining effective consultation as open, inclusive, regular, collaborative and implemented in a respectful manner, sharing responsibility, and providing free exchange of information concerning Natural Resources Agency regulations, rules, policies, programs, projects, plans, property decisions, and activities. No tribal cultural resources have been identified within the Marysville Ring Levee Phase 2A – South and 2C. Please see Section 1.8.1 and Section 3.5 for additional information.

Executive Order (EO) S-13-08, 11/2008. *Full Compliance.* Directs the Resource Agency to work with the National Academy of Sciences to produce a California Sea Level Rise Assessment Report, and directs the Climate Action Team to develop a California Climate Adaptation Strategy. Information in the reports will provide information for climate change adaptation analysis.

Executive Order (EO) S-1-07, 01/2007. *Full Compliance.* Establishment of Low Carbon Fuel Standard. Reduction of GHG emissions from transportation activities.

Executive Order (EO) S-1-07, 08/2007. *Full Compliance.* Directs OPR to develop guideline amendments for the analysis of climate change in CEQA documents. Requires climate change analysis in all CEQA documents.

Senate bill (SB) 375, 09/2008. *Full Compliance.* Requires metropolitan planning organizations to included sustainable community strategies in their regional transportation plans. Reduction of GHG emissions associated with housing and transportation.

Senate Bill (SB) 1368, 09/2006. *Full Compliance.* Establishment of GHG emission performance standards for base load electrical power generation. Reduction of GHG emissions from purchased electrical power.

Senate Bill (SB) 1771, 09/2000. *Full Compliance.* Establishes California Climate Registry to develop protocols for voluntary accounting and tracking of GHG emissions. In 2007, the Department of Water Resources (DWR) began tracking GHG emissions for all departmental operations.

Streambed Alteration Agreement. *Full Compliance.* The Streambed Alteration Agreement is a permit for any activity that will change the natural state of any lake, river, or stream in California. This permit is regulated and enforced by Region 2 of CDFW.

Storm Water Pollution Prevention Plan. *Full Compliance.* Since the Project would disturb more than one acre of land and involve possible storm water discharge to surface waters, the contractor would be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the CVRWQCB. As part of the permit, the contractor would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) identifying best management practices to be used in order to avoid or minimize any adverse effects of construction on surface waters.

1.8.3 Local Laws, Programs, and Permit Requirements

Feather River Air Quality Management District. *Full Compliance.* Effects of the Proposed Project on local and regional air quality are discussed in Section 3.1.2. The analysis shows that short-term Project-related emissions will exceed local thresholds of the CCAA as administered by the FRAQMD for NOx (ozone). The Project is located in a non-attainment area for State ozone and PM10 standards. It is expected that emission reductions from mitigation measures and participating in FRAQMD's off-site mitigation program would reduce emissions to less-than-significant.

Yuba County General Plan. *Full Compliance.* The Project Area is located within the jurisdiction of the Yuba County General Plan and General Plan Update (Yuba County 2030), and would comply with all of the relevant local plans.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

The Yuba River Basin, California Project includes levee improvements to the MRL. The authorizing documents included the development and analysis of a full range of alternatives. Although there are proposed design refinements to the MRL, these changes did not constitute a change in project scope. As a result, a Project Partnership Agreement was executed and construction proceeded in 2010.

Proposed levee improvements to the MRL were originally covered in the 2010 EA/IS which recommended implementation in multiple phases (Figure 1). Phase 1 was constructed in 2011 and portions of Phase 4 were constructed in 2016 and 2017. To better facilitate design and construction, Phase 2 was further subdivided into Phase 2A-North, 2A-South, 2C, and 2B. Phase 2A-North is scheduled to begin construction in FY 2018. As the current phases being evaluated, this chapter summarizes the alternatives considered only for Phase 2A-South and 2C and includes a description of the proposed design changes. Future design changes in subsequent phases will be analyzed in future environmental documentation.

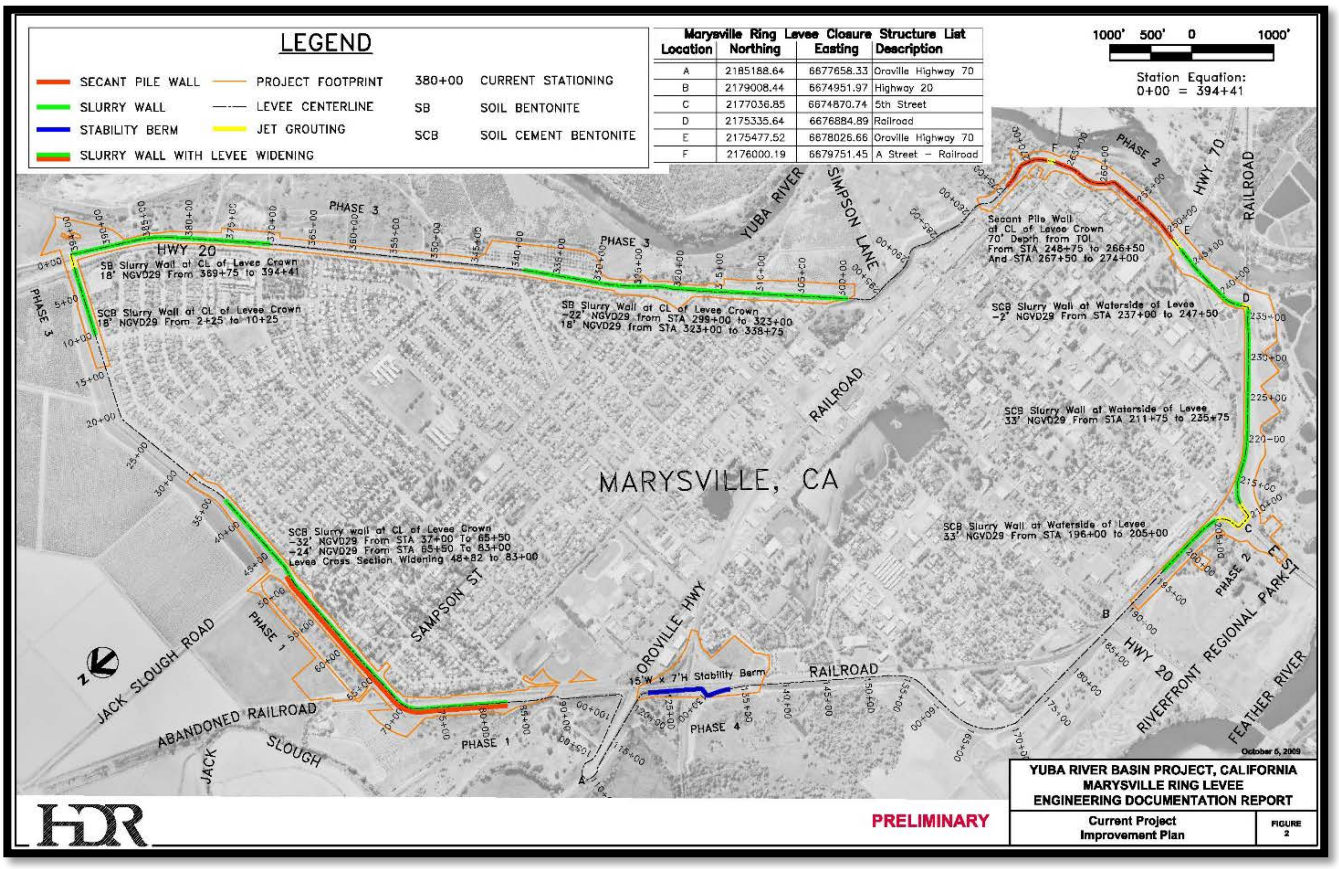

Figure 2. Map of the MRL Construction Phases as Described in the 2010 EA/IS.

2.2 SEA/IS Marysville Ring Levee Alternatives

This section describes both the no action alternative and the proposed action alternative for Phase 2A-South and 2C of the MRL Project improvements—all recently proposed design refinements and levee improvements are included and their descriptions are based on the most current information available.

2.2.1 Alternative 1 (No Action)

As construction has not yet commenced in the Phase 2A South and 2 C locations, the No Action Alternative remains a possible scenario for that area. Phase 1 was constructed in 2011 and portions of Phase 4 were constructed in 2016 and 2017. Phase 2A North is scheduled to begin construction in late spring 2018. No MRL actions would occur in the No Action. The safety risks would remain in this section of the levee.

2.2.2 Alternative 2 (Proposed Action)

To better facilitate the design and construction of the proposed levee improvements, Phase 2 as proposed in the 2010 EA/IS was subdivided into four smaller construction phases—Phase 2A-North, 2A-South, 2B, and 2C. Alternative 2 describes the proposed action alternative which includes improvements to the MRL in Phase 2A-South (Figure 3) and Phase 2C (Figure 4). Phase 2A – North remains consistent with the original MRL EA/IS (USACE, 2010) and Phase 2B will be re-evaluated in a supplemental document once design is completed. The proposed action includes the implementation of levee improvements designed to address the technical issues associated with seepage and stability of the MRL that were identified after the 2010 EA/IS was completed. Table 1 summarizes the current proposed action for Phase 2A-South and 2C not covered under the original MRL EA/IS.

There is an existing Sprint fiber optic line located in Phase 2A-South that conflicts with the proposed levee improvements—relocation of the line prior to construction would be necessary. Approximately 4,500 feet of two, 2″ conduits carrying fiber optic cables will be installed along the length of the eastern Feather River Levee on the west side of the City of Marysville. The existing cable is buried in the soil and will be removed where it conflicts with proposed improvements, and abandoned in places where it does not conflict. This work would be done by Sprint prior to construction.

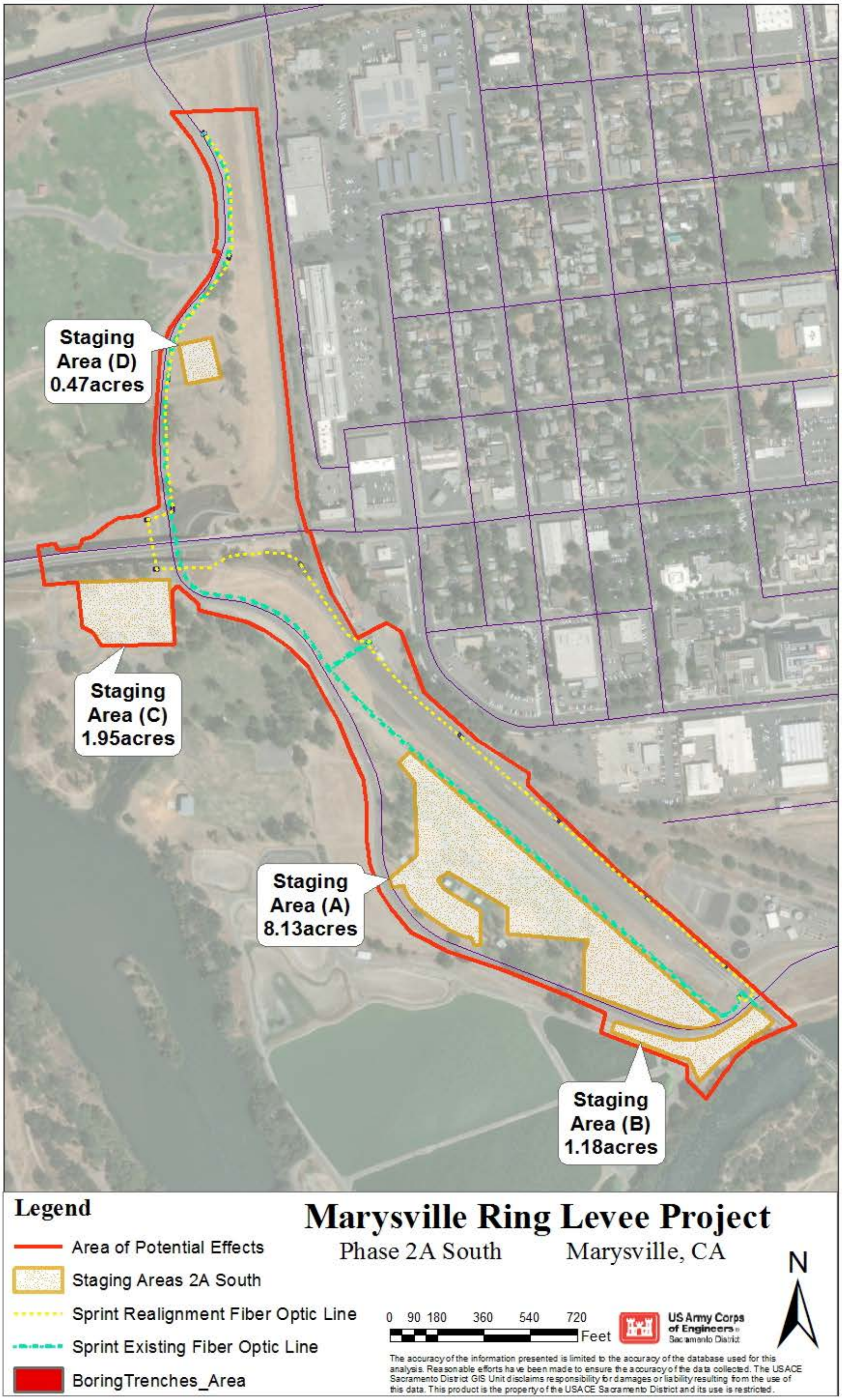

Figure 3. Phase 2A-South Project Area including Staging Areas with Acreage.

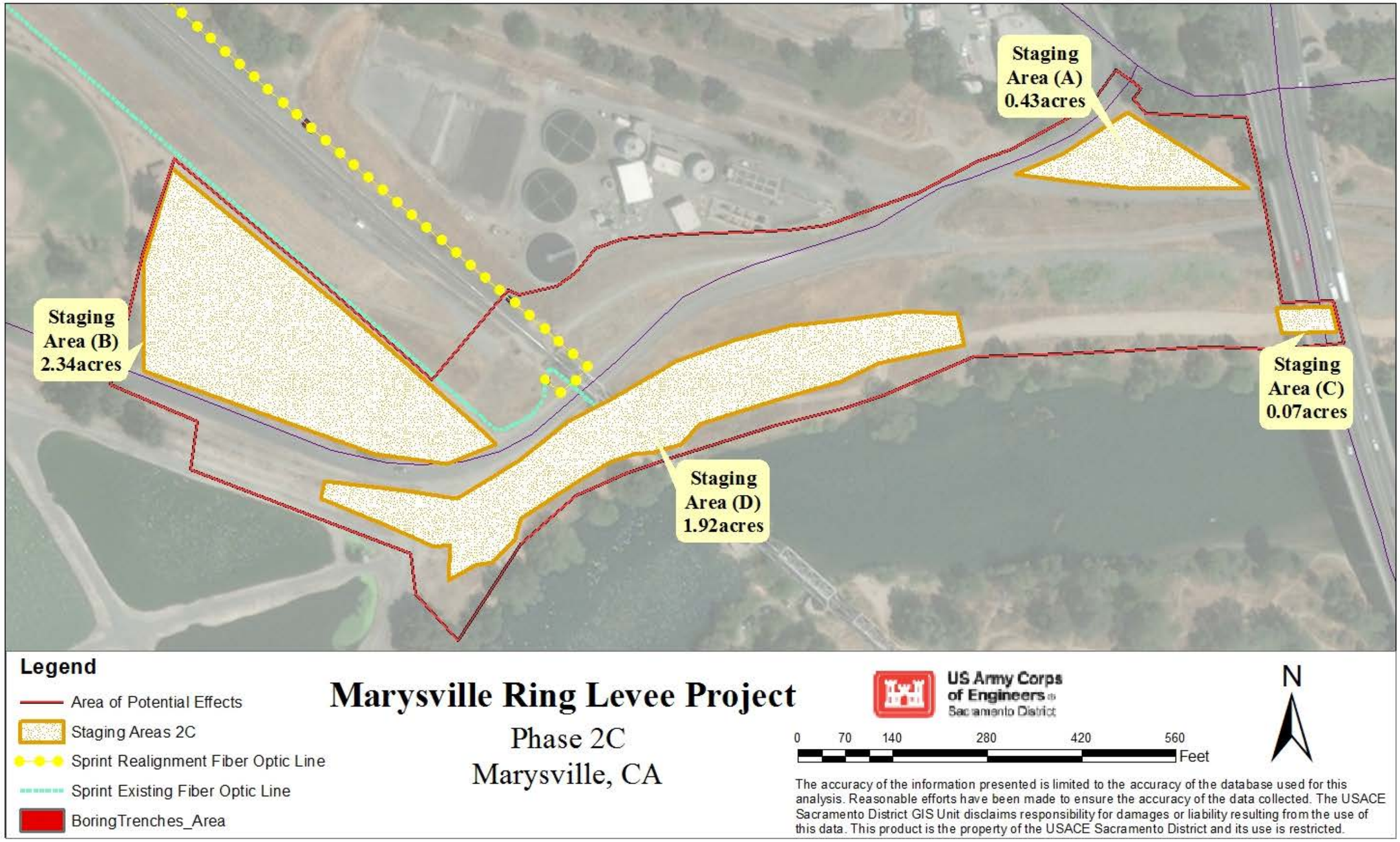

Figure 4. Phase 2C Project Area including Staging Areas with Acreage.

Table 1. Summary of the Proposed Action for Phase 2 Levee Improvements.

Proposed Action for Supplemental EA/IS Phase 2A-South and 2C Levee Improvements			
Phase	**Description**		
2A-South	*Seepage Cutoff Wall.* A soil cement bentonite (SCB) cutoff wall will be constructed on the waterside toe of the levee to address under-seepage concerns. The length of the cutoff wall will span 2,600 feet (0.49 miles), have a maximum depth of 95 feet, and a minimum thickness of 2 feet. The cutoff wall in Phase 2A-South will be constructed using method (1) discussed in the 2010 EA/IS description. *Impervious Fill.* During construction of the cutoff wall, a portion of the waterside levee slope embankment (approximately 27,400 square yards) will be stripped at a 4 inch depth to remove organic material, and approximately 1/3 of the levee embankment will be excavated. Imported impervious fill will replace the exterior portion of the excavated embankment material to address through-seepage. Up to 1.3 acres of in-kind material placed on the slope north and south of the 5th Street Bridge (Figure 5). The main differences between the EDR and the current design are listed below.		
2C	*Seepage Cutoff Wall.* A soil bentonite (SB) cutoff wall will be constructed through the center of the levee crown to address through-seepage and under-seepage concerns. The levee crown will be partially degraded by approximately 3 to 8 feet to establish a construction platform. The wall will be approximately 1,100 feet (0.21 miles) in length, a maximum depth of 87 feet, and a minimum thickness of 3 feet. The cutoff wall for Phase 2C will be constructed using method (1) discussed in the 2010 EA/IS description. Up to 2 acres of in-kind material placed on the slope south-west of the 5th Street Bridge (Figure 5). The main differences between the EDR and the current design are listed below.		
MRL Project Phase	**Features**	**2010 EA/IS**	**Current Design**
2	Location of levee improvements	1 location	Sub-divided into 4 locations: Phase 2A-North Phase 2A-South Phase 2B Phase 2C
2A-South	Wall Type	Soil Cement Bentonite	Soil Cement Bentonite
	Construction Method	Open Trench	Deep Mix Method (DMM)/In-Situ
	Alignment	Centerline of Levee	Waterside Toe
	Staging Area		1.9 Acres added (land between ball fields and paved parking lot)
	Through Seepage	Cutoff wall	Impervious Embankment
	Under Seepage	Cutoff wall	Cutoff wall
	Utility		Fiber Optic Relocation
	Bike Trail - 5th Street Bridge		Bike Trail drainage and wall
2C	Wall Type	Soil Cement Bentonite	Soil Bentonite
	Construction Method	Open Trench	Deep Mix Method (DMM)/In-Situ

Figure 5. Phase 2AS and 2C In-Kind Material Removal and Replacement.

2.3 Alternative 2 Project Descriptions

The MRL Project improvements are outlined below including construction details (e.g. number of workers, schedules, restoration and cleanup, operation and maintenance), staging and stockpile identification, as well as borrow and disposal site locality.

2.3.1 Phase 2A-South

Features

Current improvements to Phase 2A-South include construction of a soil cement bentonite (SCB) cutoff wall that will be constructed on the waterside toe of the levee, south of the 5th Street Bridge and to the east of the Feather River. The cutoff wall is situated between the 5th Street Bridge, and the Union Pacific Railroad (UPRR) Bridge that crosses the Yuba River, on the west side of Highway 70. Impervious embankment will be imported to address throughseepage concerns and the cutoff wall will address underseepage concerns.

The in-kind material placement in Phase 2A-South will be used to replace the levee crown road and would cover up to the boundary of Phase 2A-South (Figure 3). Erosion protection BMPs will be applied in areas where existing embankment protection has been removed. Additionally, there are two monitor wells that will need to be re-located outside of the UPRR right-of-way (ROW); re-location details are discussed in the Construction Methods section below.

The bike trail under the 5th Street Bridge design footprint has been reduced from the previous design. The bike trail will maintain existing alignment and slopes. A short retaining wall and drainage system existed and the bike path was realigned to match the existing path based on topography. A new drainage system and wall on the upper portion of the bike trail will be constructed.

Construction Methods

Seepage (Cutoff) Wall Construction. The SCB cutoff wall will be constructed on the waterside toe and the levee slope embankment will be excavated to provide an area for construction. The exterior portion of the excavated embankment material will be replaced with imported impervious fill material. The length of the cutoff wall will encompass approximately 195,180 square feet, spanning 2,600 feet (0.49 miles), and have an approximate volume of 14,500 cubic yards with a maximum depth of 95 feet and minimum thickness of 2 feet.

Approximately 60,000 cubic yards of material will be removed/excavated from the waterside levee slope embankment. Approximately 30,000 cubic yards of the removed/excavated material will be re-used for general levee fill and up to 16,200 cubic

yards will be re-used for impervious material to reconstruct the embankment. An additional 15,760 cubic yards of impervious material will be imported to complete the reconstruction of the embankment. Up to 10,000 cubic yards (16,000 Tons) of removed/excavated embankment material will need to be exported off-site. There are existing ramps that will be removed and relocated just south of their existing locations.

The method of construction for the cutoff wall will be the Deep Mix Method (DMM), also referred to as in-situ or by other proprietary naming conventions including deep soil mixing, triple auger method or cutter saw method–this method of construction is normally used in cases where the wall depth exceeds 80 feet. A requirement of the DMM is to construct a cutoff wall "demonstration section", to ensure the cutoff wall specifications are met. The demonstration section will be located within the footprint of the proposed alignment for the cutoff wall. The demonstration section will be 50 to 60 feet in length and will extend down to the deepest section of the cutoff wall.

To construct the wall using the DMM, levee material will be removed from the trench and brought to a nearby location, the material will be mixed with soil, Portland cement, and bentonite clay (SCB); the final material is then pumped back into the trench to create the wall.

Conventional construction equipment such as loaders, scrapers, graders, and excavators would be used to perform the degrading, reshaping, and other earthwork. Additional specialized equipment would also be necessary for this method, including a DMM Apparatus, a mixing batch plant/tubing, and a Cutter Crane.

Figure 6. Slurry (Cutoff) Wall Construction Using DMM.

Figure 7. Soil Mixer Cutting Heads.

Figure 8. Triple Auger Mixer.

Levee Crown Road Replacement. Approximately 400 cubic yards of paved levee crown patrol road will be removed during construction—200 tons of Bituminous Concrete Pavement (asphalt concrete) and 1,500 tons of Aggregate Base Course

(aggregate base) will be used to replace the expanse between the cutoff wall (Station 210+00 and Station 236+00), and along other paved areas that have been selected for replacement. It is estimated that less than 1,700 tons of material (chunks of asphalt, concrete with rebar, rocks, and other debris), will be removed from the waterside slope embankment south of the 5th Street Bridge.

Monitor Well Re-location and Installation. The monitor wells will be installed on the landside berm near the 5th Street Bridge—one will be re-located near the crown of the levee and the other will be near the UPR tracks. Monitoring well depths will be approximately 60 feet deep and will be determined at the time of drilling. The well casing will be 2″ in diameter, schedule 80 polyvinyl chloride (PVC) pipe. The monitoring wells will be equipped with a vibrating wire type pressure transducer and housed in protective covers.

Access and Staging

The Project site will be accessed via Bizz Johnson Drive (near the waste water treatment) and 14th Street (located north of the Highway 20 Bridge). F Street and Third Street will be used to access Highway 70 from Bizz Johnson Drive, and F Street and 14th Street will be used to access Highway 20. A detailed description is provided in Section 3.3.6 of the MRL EA/IS (USACE, 2010).

Multiple staging areas will be utilized during construction of Phase 2A-South for (Figure 3). The total Project Area is approximately 19 acres and the maximum area disturbed per day is approximately 4.75 acres. The staging areas are described below:

1. Staging area A is approximately 8.13 acres and includes the BMX racetrack (now over-vegetated), two baseball fields, the baseball fields paved parking lot, and UPRR ROW. Currently the area is fenced, the contractor would remove and replace with a secure fence and fence posts at a depth of 2 feet. Excavated embankment material would be stored here; the vegetation would be removed and the area leveled before stockpiling. Elderberry shrubs in this location will be protected in place along with a sewer line. The utilities and vegetation in the UPRR ROW will be protected during construction. The baseball fields would be stripped up to 4 inches to remove organic material and the excavated levee embankment material would be placed here. The light poles would be protected in place during construction. The site would be regraded and restored to its existing condition after construction. The parking lot area would be used to place two trailers with anchors up to 3 feet deep (12 anchors), as well as to stockpile excavated material, and place construction supplies. Any potential utilities would be protected in place as well as the wood posts surrounding the lot. The parking lot would be restored to its existing condition after construction is complete.
2. Staging area B is approximately 1.18 acres located on the west side of Biz Johnson near the waste water treatment ponds. This area is unpaved and would be used to store equipment and/or excavated embankment material.

The sewer lines crossing this area would be protected in place and the area would be restored to its existing condition after construction is complete.

3. Staging area C is approximately 1.95 acres; however, only 0.64 acres will be used during construction and includes the paved parking area for the Boat Ramp parking lot. The contractor would fence around the staging area with fence posts at 2 feet deep. The light posts and the underground utilities at the entrance will be protected in place. There is also a sewer line that crosses the parking lot that will be protected in place (the contractor would need to pothole to 4ft to verify the location of the lines). There are existing planters with no lighting that will be disturbed during construction; these planters will be paved over per coordination with the City of Marysville. Any damages to the paved area will be restored by removing and replacing with a combination of AC and Aggregate Base (AB), to a depth of 1ft.
4. Staging area D is approximately 0.47 acres and includes the Lion's Grove parking lot. This area will be used to place two trailers with anchors up to 3ft deep (12 anchors), and store excavated material. The paved area will be restored to its existing condition by placing a 1 inch Asphalt Concrete (AC) overlay.

2.3.2 Phase 2C

Features

Current improvements to Phase 2C (Figure 4) include construction of a soil cement bentonite (SCB) cutoff wall on the west side of Highway 70, between the highway and the UPR Bridge that crosses the Yuba River. The cutoff wall will address throughseepage and underseepage concerns. The levee will be degraded and reconstructed to existing elevation. Once the cutoff wall completed, the existing material providing erosion protection on the waterside levee slope will be replaced.

Construction Methods

Seepage (Cutoff) Wall Construction. A soil bentonite (SB) cutoff wall will be constructed through the center of the levee crown to address through-seepage and under-seepage concerns. The levee crown will be partially degraded by approximately 3 to 8 feet to establish a construction platform. The wall will encompass approximately 92,700 square feet with a length of 1,100 feet (0.21 miles), and an approximate volume of 10,300 cubic yards with a maximum depth of 87 feet and a minimum thickness of 3 feet. The cutoff wall for Phase 2C will be constructed using method (1) discussed in the 2010 EA/IS description, and identified as the DMM or in-situ construction method (Refer to Section 2.3.1 for a detailed description of this method).

Conventional construction equipment such as loaders, scrapers, graders, and excavators would be used to perform the degrading, reshaping, and other earthwork. Additional specialized equipment would also be necessary for this method, including a DMM Apparatus, a mixing batch plant/tubing, and a Cutter Crane.

Access and Staging

The Project Site will be accessed via Biz Johnson Drive where it crosses the levee near the waste water treatment plant, north of the Highway 20 Bridge. F Street and Third Street will be used to access Highway 70 from Biz Johnson Drive. F Street and 14th Street will be used to access Highway 20. A detailed description is provided in Section 3.3.6 of the MRL EA/IS (USACE, 2010).

Multiple staging areas and Temporary Work Areas (TWA) will be used during construction. The total Project Area is 12.16 acres and the maximum area disturbed per day is approximately 6.3 acres. The staging areas are described below:

1. Staging area A is approximately 0.43 acres and is located on the landslide of the levee, adjacent to Highway 70. The area will be cleared to provide space for construction, including; pot holing (10 feet), clearing, and grubbing.
2. Staging area B is approximately 2.34 acres and includes the BMX racetrack (now over-vegetated), and UPRR ROW. Currently the area is fenced, the contractor would remove and replace with a secure fence and fence posts at a depth of 2 feet. Excavated embankment material would be stored here; the vegetation would be removed and the area leveled before stockpiling. Elderberry shrubs in this location will be protected in place along with a sewer line. The utilities and vegetation in the UPRR ROW will be protected during construction.
3. Staging area C is approximately 0.7 acres and is located between the landside toe of the levee and the Yuba River, as well as the waterside of the levee under the Highway 70 Bridge. This area would be cleared to provide space for construction. This area has been identified as a temporary area work easement (TAWE), due to possible exposure to equipment movement and the short term storage of materials such as riprap, excavated soil, and geotechnical fabric; ground disturbance and heavy equipment traffic is expected. This area will be restored to existing conditions after construction is complete.
4. Staging area D is approximately 1.92 acres and is located on the west side of Biz Johnson near the waste water treatment ponds. This area is unpaved and would be used to store equipment and/or excavated embankment material. The sewer lines crossing this area would be protected in place and the area would be restored to its existing condition after construction is complete.

2.3.3 Phase 2A South and Phase 2C Common Elements

Site Preparation

Prior to construction, all construction areas would be fenced off to limit access, including the staging areas. A temporary construction easement of 20 to 100 feet from the waterside toe would be needed for the equipment working area.

Temporary erosion controls would be implemented on the waterside toe of the levee to prevent soils from running onto adjacent properties and into local waterways—similar methods would be used around the staging areas. The slopes and crown of the levee would be cleared and grubbed of all vegetation and surface material, including the existing levee maintenance road on the crown.

In April 2017, an Environmental Site Assessment (ESA) update was performed for Phase 2A-North, Phase 2A-South and Phase 2C of the MRL Project (Appendix D). The ESA update was necessary due to changes in project footprint including staging area expansion for material storage during construction, and to fulfill the CVFPB's Real Estate requirement that a report be dated within six months of the first lease offer to the property owner (for the additional staging area).

The ESA identified a waste water treatment plant (WWTP) operated by the City of Marysville adjacent to the 2A-South Project Area. Treated wastewater is discharged via underground piping to infiltration ponds located in the floodplain adjacent to the Project Site. The State Water Resources Control Board issued Order No. R5-2008-0110 for the WWTP. The order requires the City of Marysville to begin sending wastewater to the nearby Linda County WWTP. The City of Marysville is constructing a new pump station and force main, with anticipated completion in summer 2018 and connection in fall. The infiltration ponds will be decommissioned following the completion of the new collective system.

There is no evidence of hazardous substances or petroleum products being released into the environment along the Project Area. Construction of the MRL Project improvements is not likely to impact the release of substances from the WWTP site listed above. Additionally, no Recognized Environmental Conditions were observed along the Phase 2A-South/Phase 2C construction limits. Therefore, construction activities would not result in any significant adverse effects.

Restoration and Cleanup

Once the levee work is complete, all equipment and excess materials would be transported offsite via neighborhood streets and regional highways. Grass seeding and erosion control would be applied to 6 acres (for the levee embankment and disturbed areas during construction). If it is determined that the imported impervious material is not suitable for revegetation, there is an option to import top soil depending on the composition of the impervious fill material. The access ramps and staging areas would also be restored to pre-Project conditions, and any damage from construction activities would be repaired. Finally, the work sites and staging areas would be cleaned of all rubbish, and all parts of the work area would be left in a safe and neat condition suitable to the setting of the area.

Borrow and Disposal Sites

All disposal material would be temporarily stockpiled in the staging areas or disposed of at a commercial facility within 12 miles of the Project. If a commercial disposal

facility is not used, then appropriate NEPA/CEQA documentation would be required along with evidence of compliance with all other applicable laws and regulations. In addition, the USACE would have to initiate Section 106 compliance, if appropriate. The contractor would be responsible for determining and providing certification to the USACE that the material is free from contaminants and is suitable for disposal at a commercial facility.

There are three potential haul routes proposed for all material and equipment transportation: (1) Biz Johnson Drive (2) F Street and 3rd Street to access Highway 70 (3) F Street and 14th Street to access Highway 20. A detailed description is provided in Section 3.3.6 of the original MRL EA/IS (USACE, 2010).

Construction Workers and Schedule

Although the numbers of workers on site would vary during construction, a maximum of 50 construction workers would be onsite each day while the cutoff wall is being constructed. These workers would access the area via regional and local roadways and would park their vehicles at one of the identified staging areas. Construction hours would be limited to the hours from 7 a.m. to 7 p.m. up to seven days a week. The construction period is expected to last approximately a full season with an estimated duration of 4 to 6 months (April-October) to complete the project—this construction period timeline is necessary to avoid any potential adverse effects on special-status species and/or their designated critical habitats.

Operation and Maintenance

After construction is complete, responsibility would be turned over to the State of California in conjunction with the Marysville Levee Commission, the non-federal joint sponsors of the Project. This would include operation, maintenance, repair, rehabilitation, and replacement of all Project features. The Marysville Levee Commission would operate and maintain the levee in accordance with current USACE criteria. The USACE would continue to work with the Marysville Levee Commission to ensure adequate lands are available for levee maintenance of the existing MRL. Regular maintenance activities would include mowing and spraying levee slopes, controlled burns, rodent control, clearance of maintenance roads, and levee inspections.

3.0 ENVIRONMENTAL EFFECTS AND AFFECTED RESOURCES

This section describes the resources in the Project Area, as well as potential effects of the proposed alternatives on those resources. Both beneficial and adverse effects are considered, including direct and indirect effects during implementation of the Project. Each section contains a discussion of the methods used to analyze effects. In addition, the basis of significance (criteria) for each resource are identified to evaluate the significance of any adverse effects. When necessary, measures are proposed to avoid, minimize, or mitigate any significant adverse effects for each resource.

For this SEA/IS, the NEPA criteria applies to all resources and is not repeated for each individual resource. Additional detailed information may be found in the MRL EA/IS (USACE, 2010). The CEQA requirements are more specific to each resource and are listed in the original MRL EA/IS (USACE, 2010) of the CEQA Guidelines—these guidelines, as well as other applicable agency criteria and significance thresholds, are identified under the appropriate resource. Resources not considered herein will remain consistent with the 2010 EA/IS.

3.1 Air Quality

Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions (wind speed, wind direction, and air temperature) in combination with local surface topography (geographic features such as mountains and valleys) determine how air pollutant emissions affect local air quality.

This section describes the federal, State, and local air quality regulations and discusses existing air quality conditions in and around the Project Area. The existing conditions includes a detailed discussion of criteria air pollutants, as well as descriptions of the regional setting and sensitive receptors associated with the Proposed Project. Also included in this section is an evaluation of the effects of the proposed alternatives on air quality in the Project Area and a list of the mitigation measures that would be implemented to reduce air emissions to less-than-significant levels. Regulatory information is discussed below in Section 3.1.1.

3.1.1 Existing Conditions

Regulatory Setting

At the federal level, the CAA is administered by the U.S. Environmental Protection Agency (USEPA). In California, the CCAA is administered by the California Air Resources Board (CARB) at the State level and by the Air Quality Management Districts at the regional and local levels. The Feather River Air Quality Management District (FRAQMD) is the agency principally responsible for monitoring the attainment and maintenance of federal and State standards in Yuba County, and has established pollution thresholds for developmental projects within its jurisdiction (CARB 2008b).

Federal Air Quality Management. Air quality in the United States is governed by the CAA, which resulted in the adoption of federal air pollutant standards, known as National Ambient Air Quality Standards (NAAQS). The application of these standards encompass the following air pollutants: carbon monoxide (CO), ozone (O_3), sulfur dioxides (SO_2), nitrogen dioxides (NO_2), lead (Pb), particulate matter less than 10 microns in diameter (PM_{10}), and fine particulate matter ($PM_{2.5}$).

If construction of an applicable federal project results in total direct and indirect emissions that exceed the *de minimus* emission thresholds, it must be demonstrated through conformity determination procedures, that the emissions conform to the applicable SIP for each affected pollutant.

Federal projects that do not exceed the *de minimus* thresholds may still be subject to a general conformity determination if the sum of direct and indirect emissions would exceed 10 percent of the emissions of the non-attainment or maintenance area—federal projects in excess of this amount are considered "regionally significant", and thus general conformity rules apply. This allows regulatory agencies to address federal projects that would not exceed the *de minimus* levels but would have the potential to adversely affect the air quality of a region. If emissions would not exceed the *de minimus* levels and are not considered regionally significant, then the project is assumed to conform, and no further analysis or determination is required.

State Air Quality Management. In addition to being subject to the requirements of the CAA, air quality in California is also governed by more stringent regulations under the CCAA. The California air pollutant standards are known as the California Ambient Air Quality Standards (CAAQS) and are generally more stringent than the NAAQS.

California law defines toxic air contaminants (TACs) as air pollutants having carcinogenic effects. A total of 243 substances have been designated as TACs under the State Air Toxics Program. Under the CCAA, designation of attainment or non-attainment is based on pollutant levels and whether they are below or in excess of the current standards. An "unclassified" designation indicates that there is insufficient data for determining attainment or non-attainment.

Local Air Quality Management. The regional and county air districts are primarily responsible for developing local air quality plans and regulating stationary emission sources and facilities. Both the CAA and the CCAA require plans to be developed for areas designated as non-attainment (with the exception of areas designated as non-attainment for the State PM10 standard). The Project Area lies within Yuba County, which forms part of the Yuba-Sutter federal Ozone attainment area (FRAQMD 2009), and lies within the jurisdiction of the FRAQMD. Yuba County is designated as being in non-attainment for both Ozone and PM10, and is in transitional non-attainment for the 1-hr Ozone standard—all other criteria pollutants are designated as being unclassified or in attainment.

Attainment status is based on the CAAQS and whether the pollutant levels are below or in excess of the current standards. "Unclassified" indicates that there is

insufficient data for determining attainment or non-attainment.

The air quality emission thresholds for federal, State, and local emissions thresholds applicable to the MRL improvement Project are shown in Table 2.

Table 2. Air Emission Thresholds for Federal, State and Local Emissions Thresholds

Criteria Pollutant	NAAQS (Tons/Year)	CAAQS	FRAQMD (Tons/Year)	FRAQMD (Pounds/Day)
Carbon Monoxide (CO)	100	20 ppm (1-Hour)	N/A	N/A
Nitrogen Oxides (NO_x)	100	.030 ppm (Annual)	4.5	25 (Multiplied by Project Length)
Sulfur Oxides (SO)	100	.25 ppm (1-Hour)	N/A	N/A
PM10	70	20 $\mu g/m^3$ (Annual)	14.5	80
PM2.5	100	12 $\mu g/m^3$ (Annual)	N/A	N/A
[1]Reactive Organic Gases (ROG) Volatile Organic Compounds (VOC)	50	.070 ppm (8-Hour)	4.5	25 (Multiplied by Project Length)

[1]ROG/VOC = Precursor compounds to ozone and smog
Source: EPA 2016, CAAQS 2009, and FRAQMD 2010

Criteria Air Pollutants

Ozone (*O_3*). Ozone is a reactive pollutant—it is not emitted directly into the atmosphere, rather it is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NOx. ROG and NOx are precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. The NSVAB is designated as non-attainment area for ozone, based on both national and State standards.

Respirable and Fine Particulate Matter. Respirable Particulate Matter (PM_{10}) and Fine Particulate Matter ($PM_{2.5}$) represent fractions of particulate matter that can be inhaled into the air passages and the lungs and potentially cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume- producing industrial and agricultural operations, grading and construction, and motor vehicle use.

PM_{10} concentrations in Yuba County are a result of a mix of rural and urban sources including agricultural activities, industrial emissions, dust suspended by vehicular traffic, and secondary aerosols formed by reaction in the atmosphere. Particulate concentrations near residential sources generally are higher during the winter when more fireplaces are used and when meteorological conditions prevent the dispersion of directly emitted contaminants.

Regional Setting

The Project Area is located in Yuba County and is subject to the regulations and attainment goals and standards of the Northern Sacramento Valley Air Basin (NSVAB), the FRAQMD, the CARB, and the USEPA.

The closest air quality monitoring station is located on Almond Street in Yuba City. This station monitors CO, NO_2, O_3, PM10, PM2.5, and several weather parameters (CARB 2015a). Table 3 summarizes air quality data between 2008 and 2015 (any data after 2015 is considered preliminary at this time).

Table 3. Summary of Air Quality Monitoring Data in Yuba County (2008-2015).[1]

Pollutant	Year	Average Period (hr.)	Maximum Concentration	No. of Violations of State Standard
Ozone	2008	1	0.092 ppm	0
	2009	1	0.089 ppm	0
	2010	1	0.089 ppm	0
	2011	1	0.074 ppm	0
	2012	1	0.083 ppm	0
	2013	1	0.095 ppm	1
	2014	1	0.103 ppm	1
	2015	1	0.080 ppm	0
PM10	2008	24	66.9 µg/m^3	–[2]
	2009	24	50.1 µg/m3	0
	2010	24	43.3 µg/m3	0
	2011	24	57.8 µg/m3	13
	2012	24	63.0 µg/m3	6
	2013	24	58.4 µg/m^3	–
	2014	24	77.6 µg/m^3	–
	2015	24	67.2 µg/m^3	6

[1] Almond Street Monitoring Station

[2] Data not available for State Standard Violations of PM10 in Yuba City from 2008, 2013, and 2014. Source: CARB 2016a

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to the emission source, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public.

Residential areas are also sensitive to poor air quality because numerous people spend extended periods of time at home. Rideout Memorial Hospital is located near Phase 2A-South on the landside of the levee within 1000 feet of construction areas. The closest residences are also located near Phase 2A-South and include a few homes on the landside of the levee near the 5th Street Bridge with the closest homes within 500 feet of construction areas.

3.1.2 Environmental Effects

This section gives a quantitative evaluation of the types and levels of emissions associated with construction activities and also discusses the effects of the proposed alternatives on air quality.

Significance Criteria

General significance criteria have been established by the California Office of Planning and Research, to determine if the potential air quality impacts of a proposed project are significant, and would therefore require mitigation in an attempt to reduce the potential impacts to a less-than-significant level. Where available, these general criteria are supplemented with quantitative thresholds in terms of air quality parameters, separated into the three following categories:

1) Criteria pollutants relative to emission limits and ambient air quality standards;

2) TACs relative to public health impacts; and

3) Cumulative impacts.

Additionally, where available, the significance criteria established by the applicable air quality management district may be relied upon to make the following determinations (using CEQA guidelines)—adverse effects on air quality standards would be considered significant if the alternative:

Table 4. Air Quality Significance Criteria.

AQ 4-1	Would conflict with or obstruct implementation of the applicable air quality plan?

AQ 4-2	Would violate any air quality standard or contribute substantially to an existing or projected air quality violation.
AQ 4-3	Would result in a 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).
AQ 4-4	Would expose sensitive receptors to substantial pollutant concentrations.
AQ 4-5	Would create objectionable odors affecting a substantial number of people.

State of California, 2016 *California Environmental Quality Act (CEQA) Statute and Guidelines, ,* http://resources.ca.gov/ceqa/docs/2016_CEQA_Statutes_and_Guidelines.pdf

Alternative 1 (No Action)

Under this alternative, the Corps would not participate in strengthening the Marysville Ring Levee. Air quality would continue to be influenced by climatic conditions, vehicle emissions, agricultural activities, and industry.

Alternative 2 (Proposed Action)

Construction of the proposed levee improvements would result in temporary, short-term air quality effects—there would be no long-term operational emission sources other than the nominal vehicle emissions associated with routine inspection and maintenance.

Combustion emissions would result from the use of construction equipment, truck haul trips, and worker vehicle trips to and from the construction site. Exhaust emissions from these sources would include ROG, NO_x, and PM_{10}. Exhaust emissions would vary depending on the number and type of equipment, the duration of equipment use, and the number of haul trips required to and from the construction site. Combustion emissions from heavy equipment and construction worker commute trips would vary from day to day, and would temporarily contribute incrementally to regional ozone concentrations over the construction period.

For projects that occur in and around the Sacramento Valley, Sacramento Metropolitan Air Quality management District (SMAQMD) has developed emission model spreadsheets to calculate air emissions from construction activities based on various input criteria (e.g., construction phase, duration, type of equipment, project area). Due to the linear nature of the levee improvement projects undertaken by the Corps, SMAQMD has suggested the use of their Road Construction Emissions Model, Version 8.1.0 (May 2016). The outputs for this model address criteria pollutants associated with the NAAQS, as well as those associated with CAAQS, which are considered more stringent than the federal standards. The Emissions Model was used to calculate the amount of pollutant emissions estimated for each phase of construction. The emissions data was compared to FRAQMD's standard emissions thresholds and the USEPA's *de minimus* conformity thresholds (Table 5)—spreadsheet calculations are provided in Appendix C. These results, in combination with CEQA's significance criteria guidelines (2016), were used to determine the overall

significance that Project emissions would have on air quality.

Table 5. MRL Project Construction Emissions Summary Phase 2A-South and 2C.

Total Emissions	Pollutant (Tons/Phase)			
	ROG	NOx	PM_{10}	CO_2
FY 2019 Construction Activity (Phase 2A-South)				
Total Unmitigated	0.9	9.4	8.5	1,890
Total Mitigated[1]	0.9	7.6	8.3	1,890
FY 2020 Construction Activity (Phase 2C)				
Total Unmitigated	0.5	4.5	5.2	1,024
Total Mitigated[1]	0.5	3.6	5.2	1,024
Federal *De Minimis* Thresholds (Tons/Year)	50	100	100	N/A
FRAQMD Thresholds (Tons/Year)	4.5	4.5	14.5	N/A

[1] Based on on-road vehicle fleet model year 2010 or newer, a 20% reduction in NOx emissions from construction equipment, a 45% reduction in PM10 emissions from construction equipment, and Tier 4 equipment requirement for limited equipment types (SMAQMD 2016).
Note: Emissions estimates have been rounded. See Appendix C.

Based on the air quality analysis, emissions would not exceed federal thresholds with the incorporation of on-site mitigation measures, but would exceed the local (FRAQMD) thresholds for NOx. The Project would be eligible to participate in an off-site mitigation program (the Carl Moyer Program), to off-set emissions that exceed the FRAQMD thresholds. Impact to regional air quality resulting from the relatively minor construction activities associated with the Proposed Action, such as dust and exhaust from construction equipment, would be temporary, minimal, and considered deminimus with on-site mitigations.

3.1.3 Mitigation

Construction projects that substantially contribute to existing violations of state or federal air quality standards are considered to have a significant adverse impact on air quality. Although construction projects that exceed the daily average emissions standards set by the local air quality management district (FRAQMD), could result in a detrimental impacts to air quality, these projects are unlikely to have significant adverse air impacts with the implementation of mitigation measures.

The incorporation of the mitigation measures listed below, and those applicable from the 2010 EA/IS (USACE, 2010), are expected to reduce impacts to air quality and GHGs to less than significant levels. It is also expected that replacement of the paved road on top of the levee crown will contribute to the reduction of GHG by reducing or maintaining any existing levee operations and maintenance, and potentially encouraging residents to increase its recreational use instead of driving.

Table 6. Additional Air Quality Mitigation Measures.

Mitigation Number	Mitigation
AQ-1	Use diesel-fueled equipment manufactured in 2010 or later, or retrofit equipment manufactured prior to 2010 with diesel oxidation catalysts; use low-emission diesel products, alternative fuels, after-treatment products, and/or other option as they become available; use of clean fuel vehicles in vehicle fleet.
AQ-2	Dust particles, aerosols, and gaseous by-products from construction activities, including processing and preparation of materials, would be controlled at all times, including weekends, holidays, and hours when work is in progress. The contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control would be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The contractor would comply with all state and local visibility regulations.
AQ-3	A FRAQMD Plan would be submitted for approval prior to commencing site activities or delivering materials to the site. This Plan would be checked for completeness and compliance by the FRAQMD and the Contracting Officer. If satisfactory, it will be approved and copies will be returned to the contractor for submission to the FRAQMD. If unsatisfactory, it will be returned to the contractor for resubmission. No site work would start until the Plan is approved or specific authorization is obtained from the contracting officer. The FRAQMD Plan would include mitigation measures and BMPs identified in the 2010 EA/IS and this SEA/IS. After mitigation measures, any emissions over the thresholds would be reduced by the contractor by providing funds to implement an off-site mitigation program.
AQ-4	Minimize the amount of concrete for paved surfaces or utilize a low carbon concrete option. Produce concrete on-site if determined to be less emissive than transporting ready mix.
AQ-5	Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.
AQ-6	Reduce electricity use in the construction office by using compact fluorescent bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones.
AQ-7	Use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, sidewalk and curb materials). Wood products utilized should be certified through a sustainable forestry program.
AQ-8	Recycle or salvage non-hazardous construction and demolition debris (goal of at least 75% by weight).
AQ-9	Minimize vehicle and equipment idling time either by shutting off when not in use or reducing the time of idling to no more than 3 minutes, which would save fuel and reduce emissions. Provide clear signage that posts this requirement for workers at the entrances to the site.

Mitigation Number	Mitigation
AQ-10	Use SmartWay certified trucks for deliveries and equipment transport.

3.2 Greenhouse Gases

On August 1, 2016, the Council on Environmental Quality issued final guidance on considering greenhouse gas (GHG) emissions and climate change in NEPA reviews. Fundamental to this guidance are the recommendations that when addressing climate change, agencies should consider:

> (1) The potential effects of a proposed action on climate change as indicated by assessing GHG emissions (e.g., to include, where applicable, carbon sequestration); and,
>
> (2) The effects of climate change on a proposed action and its environmental impacts.

3.2.1 Existing Conditions

In the California Warming Solutions Act of 2006 (California Health and Safety Code § 35000 et seq.), the California Legislature recognized California's vulnerability to weather events triggered by global warming. The Legislature found that global warming will "have detrimental effects on some of California's largest industries." Assembly Bill 32 mandates that emissions of greenhouse gases (GHGs) be reduced to 1990 levels by 2020.

The term "greenhouse gas" refers to a gas that traps heat in the atmosphere and contribute to global climate change. The primary GHGs of concern include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O) and fluorinated compounds (Yuba County 2030). The United States is the 2nd largest contributor to worldwide CO2 emissions resulting from fossil fuel combustion (USEPA 2017)—additionally, according to State-level CO2 emissions, California is the 2nd largest emitter of energy-related CO2 in the United States (USEIA 2017). Transportation is the largest source of ozone and GHG production in the region and a reduction in vehicle emissions is necessary to achieve significant GHG reduction (Yuba County 2030).

3.2.2 Environmental Effects

Significance Criteria

The following significance criteria will be used to determine the significance of GHG emissions from this project:

- The relative amounts of GHG emissions resulting from implementation of the proposed project are substantial compared to emission standards set by adjacent air quality management districts, (10,000 metric tons CO2e per year (Placer County 2016)); or

- The amount of GHG emissions resulting from implementation of the proposed project results in a substantial effect to global climate change; or
- If the proposed project has the potential to contribute to a substantially lower carbon future.

FRAQMD has not established thresholds for GHG emissions as of the time of analysis for this Project; instead, each project is evaluated on a case-by-case basis using the most up-to-date methods of calculation and analysis. The impacts of the Project related to climate change should be evaluated using the criteria listed below. According to the CEQA Guidelines, the Project could result in significant impacts if it would do any of the following:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment;
- Exceed a threshold that is applicable to the project; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Alternative 1 (No Action)

Under this alternative, the Corps would not participate in strengthening the Marysville Ring Levee. Greenhouse gases would continue to be influenced by primary GHGs of concern.

Alternative 2 (Proposed Action)

GHG emissions associated with the Project would be entirely associated with construction. GHG emissions would be emitted from the project due to fuel combustion from onsite construction vehicles, as well as indirect emissions from the electricity used to operate machinery. In addition to the construction vehicles, there would be GHG emissions from the workforce vehicles. Workers would commute from their homes to the construction site and park in one of the staging areas. Table 5 shows the results of the emissions modeling that was conducted based on the estimates for all construction activities discussed above. The results of the modeling determined that the Project would not violate the 25,000 metric tons per year or 10,000 metric tons per year levels. Additionally, there would be minimal long-term operational emissions associated with maintenance of the Project.

In response to concerns regarding greenhouse gas emissions, the most recent version of the SMAQMD emissions calculator now generates an output for CO2. Although CO2 emissions can be calculated, there is currently no federal, state, or local (FRAQMD) thresholds to meet. The USEPA has also stated that GHG emissions below 25,000 metric tons do not commonly require reporting (USEPA 2013). However, the local neighboring county of Placer has recommended a GHG threshold of 10,000 metric tons of CO2 per year for construction and operational phases of land use and stationary source projects (Placer County 2016).

While emissions associated with this alternative would not violate the GHG reporting threshold, these emissions would still be contributing to the overall cumulative GHG emissions, as discussed in the cumulative analysis discussion (Section 4.0). As a result, the Project will implement mitigation measures, as discussed below, to increase the Project's energy efficiency and minimize the GHG emissions. The Project, with mitigation, will help reduce GHG emissions to the greatest extent feasible.

By providing decreased risk of catastrophic flooding with associated loss of infrastructure, this project is expected to prevent extra carbon production which would be associated with demolition, repair, and reconstruction of flood-induced infrastructure losses. Any project-related effects to air quality would be temporary, and mitigation measures would reduce effects to less than significant.

3.2.3 Mitigation

To successfully adapt to future changes in Yuba County's climate, the General Plan suggests several measures to provide GHG efficient development including incorporation of emission control measures recommended by the FRAQMD (Yuba County 2030). Therefore, the BMPs and mitigation measures listed in Section 3.1.3 and the 2010 EA/IS, would be implemented to minimize CO2 and other GHGs generated from Project construction.

3.3 Biological Resources

This section describes the applicable laws and regulations for environmental compliance of the Project for biological resources. This section also details the existing vegetative conditions with habitat types and their associated plant species. An evaluation of the proposed action's effect to biological resources and a list of mitigation measures are also included.

3.3.1 Existing Conditions

The Vegetation and Wildlife and Special-Status Species sections of the MRL EA/IS (USACE, 2010) sufficiently characterizes the regulatory setting for this resource. The APE for the proposed project is represented by three major land cover-types that were identified as woodland, annual grassland, and other. An updated Habitat Evaluation Procedure (HEP) analysis is being completed by the USFWS and the USACE anticipates the updated analysis in early 2018. The HEP analysis quantifies suitability and measures the aerial extent of habitat occurrence within the Project Area. There are no Jurisdictional wetlands within the Phase 2A-South and 2C APE.

3.3.1.1 Vegetation

Woodland. Woodland habitat is found on the waterside of the levee along the Yuba River in Phase 2A-South and 2C. Woodland habitat includes habitat types such as valley foothill riparian and valley oak woodland. The upper canopy is dominated by

several species including box elder (*Acer negundo*), blue elder (*Sambucus cerulean*), white alder (*Alnus rhombifolia*), northern California black walnut (*Juglans califonica var. hindsii*), sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), valley oak (*Quercas lobata*), interior live oak (*Quercus wislizeni*), Goodding's willow (*Salix gooddingii*), and other willow species. The lower shrub canopy is dense and thicket-like, with dominant species including California rose (*Rosa californica*), blackberry (*Rubus ursinus*), blue elderberry (*Sambucus mexicanus*), coyote brush (*Baccharis pilularis*), and shrub-like forms of the various willow species. Species of climbing vine such as California grape (*Vitis californica*) and virgin's bower (*Clematis ligusticifolia*) are also present in the shrub layer. The herbaceous understory ranges from very developed to sparse depending on the amount of light filtering through the upper canopies, but typically includes various grasses, sedges, and rushes.

Annual Grassland. Annual grassland habitat occurs on the landside and waterside of the levee, comprising about 60% of the Project footprint. Areas with annual grassland vegetation are dominated by a mixture of herbaceous, nonnative, weedy species. This cover type generally occurs in disturbed areas subject to periodic disturbance. Introduced grasses are the dominant plant species on the levee and surrounding areas, including: wild oats (*Avena fatua*), creeping wildrye (*Leymus triticoides*), red brome (*Bromus madritensis*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), wild barley (*Hordeum vulgare*), foxtail fescue (*Vulpia myuros*), Johnson grass (*Sorghum halepense*), Bermuda grass (*Cynodon dactylon*), western ragweed (*Ambrosia psilostachya*), tumbleweed (*Salsola tragus*), and yellow star-thistle (*Centaurea solstitialis*). The levee slopes are regularly maintained with prescribed fires and/or mowing, limiting plant cover to grasses and forbs.

Other. This cover-type is found throughout the Project and consists of roads, railways, parking lots, dirt tracks, rip-rap, buildings, and other structures. Habitat value varies considerably depending on the type of cover, and the presence of surrounding roads, railways, buildings and other structures.

Yellow Starthistle (Centaurea solstitialis L.). This is an invasive plant species that has dominated the southern portion of Phase 2C water side of the APE. Yellow starthistle seeds germinate from fall through spring, which corresponds to the normal rainy season in California. It is an annual herbaceous plant that may grow from 6 in. to 5 ft. in height, and have deep taproots. Flowers are bright yellow with sharp spines surrounding the base. Stems and leaves are covered with cottony wool. Spread of yellow starthistle is by seed and each seedhead can produce from 35 to approximately 80 seeds. However, the seeds have no wind-dispersal mechanisms so few seeds move more than two feet from the parent plant without assistance. Therefore, animals and human influences, such as vehicles, contaminated crop seed, hay or soil, and road maintenance, contribute greatly to the plant's rapid and long-distance spread.

3.3.1.2 Wildlife Communities

A wide variety of resident, migratory, and wintering species of songbirds and sparrows nest and forage in and around the vicinity of the MRL Project Area, including Bullock's oriole (*Icterus bullockii*), savanna sparrows (*Passerculus sandwichensis*) and white-crowned sparrows (*Zonotrichia leucophrys*). Suitable habitat is also available for raptors and other bird species, including Swainson's hawk (*Buteo swainsoni*), white-tailed kite (*Elanus leucurus*), red-tailed hawk (*Buteo jamaicensis*), barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), American kestrel (*Falco sparverius*), herons (*Ardea sp.*), and egrets (*Ardea and Egretta spp.*).

Habitat in the Project Area also provides cover and foraging grounds for numerous small mammal species such as raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana),* and striped skunk (*Mephitis mephitis*), California vole (*Microtus californicus*), house mouse (*Mus musculus*), and gophers (*Thomomys sp.*).

Reptiles and amphibians species include the western terrestrial garter snake (*Thamnophis elegans*), gopher snake (*Pituophis catenifer*), Pacific tree frog (*Pseudacris regilla*), and western toad (*Bufo boreas*)—there is also suitable foraging habitat for aquatic species such as the giant garter snake (*Thamnophis gigas*) and nesting habitat for western pond turtles (*Actinemys marmorata*).

3.3.1.3 Special-Status Species

Special-status species refers to both state- and federal- proposed, candidate, threatened, or endangered species and their designated critical habitats (if applicable). Special-status species lists were generated from the USFWS ECOS IPaC (Information for Planning and Consultation) website and the California Natural Diversity Data Base (CNDDB) (USFWS December 29, 2017, CNDDB January 4, 2018). The USFWS and CNDDB lists are included in Appendix B. The supplemental CAR was also reviewed for special-status species and is provided in Appendix A.

Because no instream water work would occur and there would be no interference with the movement of migratory fish, the proposed action is not expected to affect fisheries or aquatic resources. Therefore, special-status fish species are not addressed in this document. Excluding listed fish species, a total of four special-status species were identified as having the potential to occur within the Project Area. The federal and state listed special-status species that could be impacted by construction activities are listed in Table 7 with a description of status, basic habitat requirements, and potential to occur in the Project Area.

Any special-status species and/or associated designated Critical Habitat (CH) that is unlikely to occur, whose known range falls outside the Project Area, or where suitable habitat is not present, have been eliminated from further consideration in this document. These species include the bald eagle, California black rail, western yellow-billed cuckoo and CH, California red-legged frog and CH, giant garter snake, Conservancy fairy shrimp, Fisher (West Coast DPS), Foothill yellow-legged frog, great gray owl, Sierra Nevada yellow-legged frog, song sparrow (Modesto DPS), vernal pool fairy shrimp, vernal pool tadpole shrimp, Hartweg's golden sunburst, least Bell's vireo, Pine Hill flannelbush. No further discussion of these species is provided.

Table 7. Special-Status Species with Potential to Occur in the Project Area.

Species	Status	Habitat	Potential for Occurrence
Birds			
Bank Swallow (*Riparia riparia*)	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert but often populate human-made sites, such as sand and gravel quarries or road cuts. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, and lakes to dig nest hole.	Potential to occur in the Project Area; a survey will need to be conducted prior to construction.
Swainson's Hawk (*Buteo swainsoni*)	ST	Restricted to portions of the Central Valley and Great Basin regions where suitable nesting and foraging habitat is still available. Requires large, open grasslands with abundant prey in association with suitable nest trees.	Potential to occur in the Project Area; a survey will need to be conducted prior to construction.
Tricolored Blackbird (*Agelaius tricolor*)	SSC	Highly colonial species, most numerous in Central Valley and vicinity; largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	Potential to occur in the Project Area; a survey will need to be conducted prior to construction.
Insects			
Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)	FT	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus mexicana*); primarily in riparian woodland and scrub habitat.	Elderberry shrubs occur in the Project Area, providing suitable habitat for the VELB. There are 3 existing elderberry shrubs documented within the staging area for Phase 2A-South and 2C.

Listing Status Definitions:
FT = Federally Threatened
ST = State Threatened
SSC = State Species of Special Concern
1B.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

Birds

Bank swallow (*Riparia riparia*). The bank swallow is state-listed as threatened. They nest in dense colonies some of which are often quite large. Individuals usually dig their own nesting burrows in dirt or sand banks along riverbanks, lake shores, road cuts, gravel pits, or similar sites. Nest sites are in burrows excavated in steep banks and are usually 2-3 feet in length but can be up to 5 feet long. Bank swallows forage in flocks, typically flying low and feeding almost entirely in flight and over water (rarely feeds on the ground, mainly only in severe weather). They feed on a wide variety of flying insects including many flies, beetles, wasps, winged ants, small bees, true bugs, as well as some dragonflies, stoneflies, moths, and caterpillars. Potential nesting and foraging habitat exists on the riverbank and in the riparian areas along the Yuba River (Phase 2A-South).

A CNDDB records search revealed an active colony with 69-72 burrows was observed along the Feather River in June of 2010.

Swainson's hawk (*Buteo swainsonii*). The Swainson's hawk (SWHA) is state-listed as threatened. It is an uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and the Mojave Desert. They nest primarily in riparian areas adjacent to suitable foraging habitat such as agricultural fields or pastures, and have been known to use isolated trees or roadside trees (CDFG 2009a). The Swainson's hawk nests in mature trees, preferably valley oak, cottonwood, willows, sycamores, and walnuts. Suitable foraging areas for Swainson's hawk include native grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Swainson's hawks primarily feed on voles; however, they will feed on a variety of prey including small mammals, birds, and insects. Potential nesting and foraging habitat exists in the riparian areas along the Yuba River.

Although there have been recent sightings of SWHA near the Project Area, nesting occurrences have not been recorded since July 2009 (according to a CNDDB records search). A nest with young was observed during the July 2009 sighting east of the Feather River (within the Olivehurst quad).

Tri-Colored blackbird (*Agelaius tricolor*). The tri-colored blackbird is designated as a state species of special concern (SSC). The tri-colored blackbird inhabits open valleys and foothills and may be found in streamside forests, alfalfa and rice fields, marshes, and along reservoirs. This blackbird usually nests in marshes but may also nest in willow and blackberry thickets and on the ground in clumps of nettles. They forage in wet meadows, rice and alfalfa fields, and in rangelands. They commonly roost in trees or marshes. Whether they are roosting, foraging, or nesting, these birds are always found in large flocks. The tri- colored blackbird both nests and winters in interior valleys from southern Oregon (east of the Cascades) to northwest Baja California (Terres 1980). Once abundant in Yolo County, the tri-colored blackbird has been eliminated from the county and breeds only in a few scattered areas in California and Oregon.

A CNDDB records search revealed numerous sightings of tri-colored blackbirds

(within the Olivehurst quad), less than 1 mile east of Hwy 70 in June of 2014.

Migratory birds. Migratory birds which includes many species of raptors and passerines, frequently nest in trees/shrubs near the Project Area (where suitable habitat exists). Additionally, other migratory birds including many species of swallows, commonly nest underneath bridges and other structures in close proximity to various watercourses. Migratory birds are protected from disturbance during the nesting season by the Migratory Bird Treaty Act (MBTA).

Invertebrates

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*).

Elderberry shrubs are the host plant of the valley elderberry longhorn beetle (VELB), which is federally-listed as threatened. Current information on the habitat of the beetle indicates that it is found only with its host plant, the blue elderberry. The beetles mate in May, and females lay eggs on living elderberry shrubs. Larvae bore through the stems of the shrubs to create an opening in the stem, within which they pupate. After metamorphosis, the beetle chews a circular exit hole, through which it emerges (Barr 1991). Adults can be found on elderberry foliage, flowers, or stems, or on associated plants. Adult VELB feed on foliage and are active from early March through early June. The VELB requires established elderberry plants one inch in basal stem diameter at ground level. The presence of exit holes in elderberry stems is evidence of previous beetle use.

Elderberry shrubs in the Central Valley are commonly associated with riparian habitat but are also known to occur in oak woodlands and savannas, as well as in disturbed areas. USACE biologists mapped the elderberry shrub locations for Phase 2A-South and 2C on June 12, 2017. Their locations were identified using a GPS and the stem sizes for each shrub were recorded.

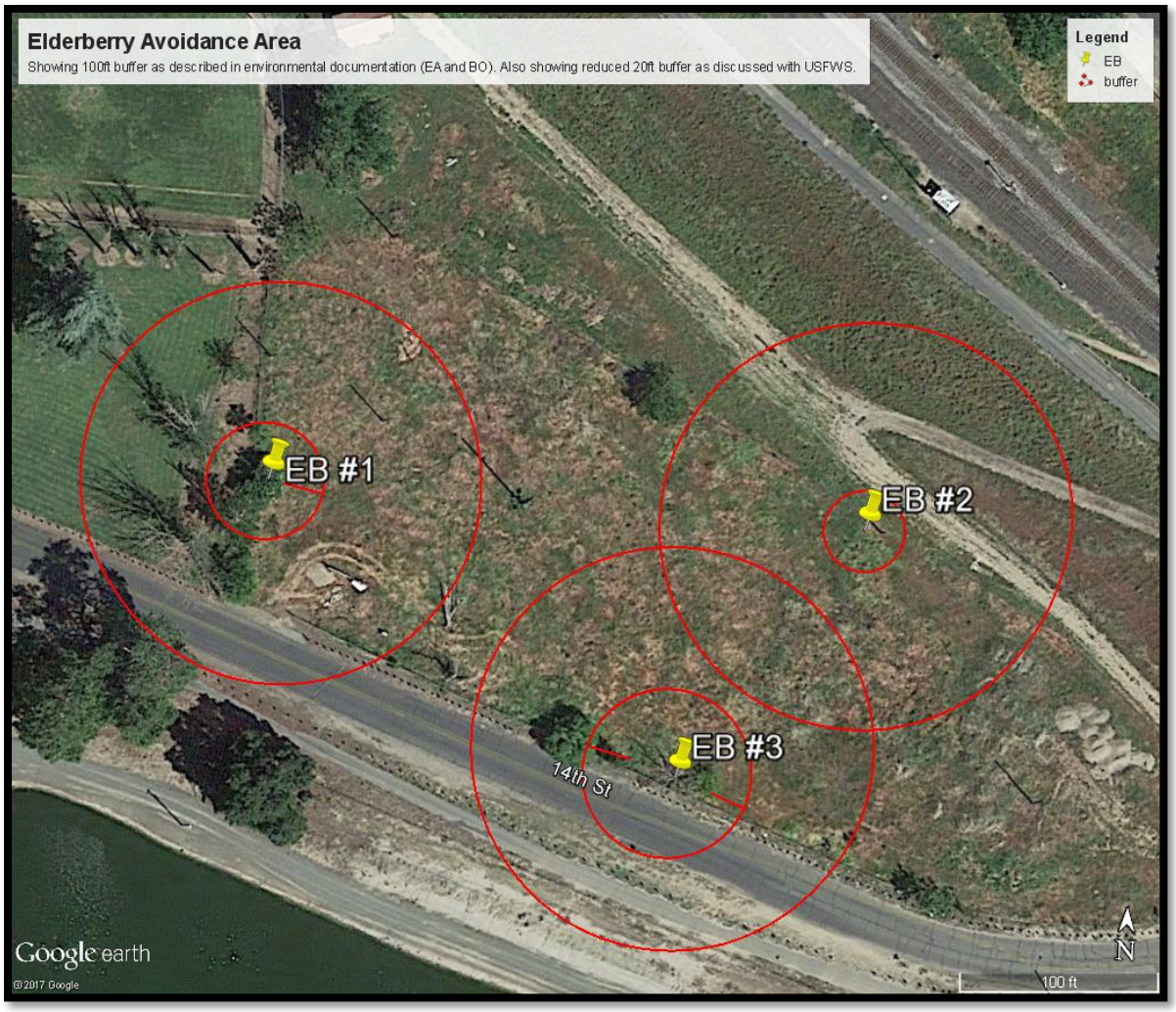

Figure 9. Elderberry Shrub Locations for Phase 2A-South and 2C.

3.3.2 Environmental Effects

Significance Criteria

Pursuant to the U.S. Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA), the significance of the effect on the quality of the human environment is determined by considering the context in which it would occur and the intensity of the action. "Context" refers to the affected region and locality in which the action would occur. Significance, therefore, varies depending on the setting of the proposed action. "Intensity" refers to the severity of the impact—impact is defined as change in the existing environmental conditions.

For the purpose of this document any adverse effects on vegetation would be considered significant if the alternative would result in any of the following:

- Substantial loss, degradation, or fragmentation of any natural communities or wildlife habitat.
- Substantial adverse impact on a sensitive natural communities including federally protected wetlands and other waters of the U.S. as defined by Section 404 of the CWA including seasonal wetlands, rice fields, and irrigations ditches through direct removal, filling, hydrologic interruption, or other means.
- Substantial reduction in the quality or quantity of important habitat, or access to such habitat, for wildlife species.
- Direct or indirect reduction in growth, survival, or reproductive success of species listed or proposed for listing as threatened or endangered under the FESA or CESA.
- Direct mortality, long-term habitat loss, or lowered reproductive success of federally or State-listed threatened or endangered animal or plant species or candidates for Federal listing.
- Direct or indirect reduction in the growth, survival, or reproductive success of substantial populations of Federal species of concern, State-listed endangered or threatened species, plant species listed by the CNPS, or species of special concern or regionally important commercial or game species.
- An adverse effect on a species' designated critical habitat.

Alternative 1 (No Action)

Under the no action alternative, the MRL improvements would not be constructed by the Corps. Therefore, this alternative would have be no effect on Federally-listed or Federal Candidate Species and State-listed or Species of Special Concern, vegetation communities, and their habitats. The vegetation communities and associated special-status species would remain the same.

Alternative 2 (Proposed Action)

3.3.2.1 Vegetation

Woodland Habitat. Woodland habitat acreage on the waterside and landside of the levee will be permanently affected by Project activities in Phase 2A-South only—riparian woodlands are identified as sensitive and important habitat for wildlife. The amount of acreage that will be affected is currently being calculated by USFWS using the HEP analysis (described in Section 3.3.1.1); however, the number will not vary significantly from the 2010 EA/IS description. Due to the relatively small loss of trees expected in comparison to the total available woodland habitat in the immediate area (approximately 35 acres), there would not be a significant effect on woodland habitat or species dependent on this habitat type. In coordination with USFWS, construction activities resulting in a loss of woodland habitat would be mitigated for (Section 3.3.3). The SEA would not be have significant effect to woodland habitat.

3.3.2.2 Special-Status Species

Bank swallow. Construction of the MRL improvements could potentially result in direct and/or indirect effects to the bank swallow if this species begins nesting adjacent to the Project Area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment. Although suitable nesting habitat exists within Phase 2A-South, project activities would occur on the levees and staging areas which are set back from the banks of the river. Implementation of avoidance measures listed in the 2010 EA/IS will ensure construction activities will not adversely affect this species or its habitat.

Swainson's hawk. Construction of the MRL improvements could potentially result in direct and indirect effects to Swainson's hawk (SWHA). SWHAs were reported nesting approximately 1.5 miles northwest of the Project Area along the Feather River in 2009. Construction of the Project could potentially result in direct and/or indirect effects to the SWHA if this species begins nesting adjacent to the Project Area prior to construction. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by adult hawks.

The CDFW has determined that hawks greater than one-fourth of a mile away would not be adversely affected by construction disturbances. However, Swainson's hawks frequently change the location of their nest site from year to year. Therefore, specific mitigation/avoidance measures are discussed in the mitigation section below, and the Project Area would be surveyed by a qualified biologist prior to construction to locate specific nest sites and identify specific avoidance and minimization measures for nests that could be adversely affected. Implementation of the avoidance and minimization measures listed in the 2010 EA/IS in addition to those listed below will ensure construction activities will not adversely affect this species or its habitat.

Tri-Colored blackbird. Construction of the MRL improvements is not likely to result in direct or indirect effects to the tri-colored blackbird. Although suitable nesting habitat exists within Phase 2A-South and 2C, construction activities are not expected to adversely affect this habitat. Implementation of avoidance measures listed in the 2010 EA/IS will ensure construction activities will not adversely affect this species or its habitat.

Migratory birds. Construction of the MRL improvements could potentially result in direct and indirect effects to swallows, passerines, raptors, as well as other migratory birds. Swallow nests have been previously observed on the undersides of Highway 70/E Street Bridge over the Yuba River, and under the 5th Street and Highway 20/Colusa Ave. bridges over the Feather River. Other migratory birds have also been seen actively nesting in trees/shrubs near project staging areas. Construction activities in the vicinity of a nest have the potential to result in forced fledging or nest abandonment by these species during the breeding season. However, with implementation of appropriate avoidance/minimization measures (discussed in Section 3.3.3), project construction is not expected to adversely affect these species or their habitat.

Valley Elderberry Longhorn Beetle. Construction of the MRL improvements could potentially result in direct and indirect affects to the VELB. Three shrubs were surveyed in 2A-South, and it was determined that no shrubs with stems greater than one inch would be directly impacted by construction in Phases 2A-South. None of these shrubs were recorded as having exit holes. These shrubs would be protected in place before construction begins. Phase 2C was surveyed in 2017 and no shrubs were found. The avoidance/minimization measures listed in the 2010 EA/IS in addition to those listed below will ensure construction activities will not adversely affect this species or its habitat.

Table 8. Potential Trees to be removed during Phase 2A-South Construction.

Species	Diameters at Breast Height (DBH)	Locations	Notes
Fremont cottonwood	44"	N 2175800.51, E 6675848.29	
Fremont cottonwood	37"	N 2175801.26, E 6675813.92	
Fremont cottonwood (*Populus fremontii*)	34"	N 2175801.99, E 6675802.22	
Fremont cottonwood (*Populus fremontii*)	34"	N 2175801.21, E 6675785.95	
Fremont cottonwood (*Populus fremontii*)	40"	N 2175553.70, E 6676302.97	
Fremont cottonwood (*Populus fremontii*) *Cluster	3" to 6"	N 2175424.25, E 6676488.10	16 trunks
Tree of Heaven (*Ailanthus altissima*) *Cluster	4" to 8"	N 2175482.54, E 6676293.05	7 trees
Palm Tree (unknown species)	8"	N 2175359.39, E 6676415.98	2' to 3' in height

3.3.3 Mitigation

Construction of the MRL Project would not affect the VELB and their habitat, but may potentially effect vegetation as well as special-status raptor species or other migratory birds.

In 2009, USACE consulted with USFWS for the VELB—however, for this SEA/IS re-consultation has been determined unnecessary, since construction of Phase 2A-South and 2C improvements would not affect existing elderberry shrubs. USACE has coordinated with the USFWS as appropriate to discuss potential mitigation measures for the VELB and its habitat. All elderberries would be protected in-place by a 20-foot buffer (USFWS-approved), and no translocations would be required. Implementation of the USFWS Conservation Guidelines would be incorporated into the Project to further minimize effects to the VELB.

Mitigation for project-related effects on woodland vegetation would occur at an

existing Corps mitigation site as described in the 2010 EA/IS. Woodland habitat has been successfully established at the site and no further monitoring would be necessary. Long-term maintenance would be accomplished by the non-Federal sponsor. The mitigation measures for biological resources and woodland vegetation listed in Table 9, in addition to those applicable from the 2010 EA/IS are expected to reduce affects to vegetation and biological resources to less-than-significant levels.

Additionally, every reasonable effort will be made to protect trees/shrubs in place to avoid/minimize any potential impacts to migratory birds. If protecting in place is not feasible, then to the greatest extent possible, trees/shrubs would be removed outside the typical nesting season (October 1st through January 31st). However, if removal of trees/shrubs is necessary during nesting season, prior to removal, a survey would be conducted to identify active nests and appropriate avoidance/minimization measures (in coordination with CDFW), would be incorporated to ensure that these species are not adversely affected during project activities.

Table 9. Additional Biological Resources Mitigation Measures.

Mitigation Number	Mitigation
BIO-1	A minimum setback (buffer) of 20 feet from the dripline of all elderberry shrubs would be established. This buffer area would be fenced, flagged, and maintained during construction. A qualified biological monitor would provide instruction on establishing the buffer zones for the shrubs.
BIO-2	Environmental awareness training would be conducted for all construction representatives and contractor personnel before they begin work. The training would include a discussion about the VELB, Swainson's hawk, as well as other raptors and migratory bird species that may occur in the project area, the need to avoid adversely affecting the elderberry shrub and other sensitive habitat, avoidance areas and measures to be implemented by workers during construction, possible penalties for non-compliance, and USACE contact information. A USACE biologist would provide the training at the project site.
BIO-3	When possible, protect in place all large mature trees in staging areas (larger than 13 diameter breast height)
VEG-1	The mitigation (in acres), required for woodland habitat loss during Project construction is currently being calculated but is not expected to change significantly from what was described in the 2010 EA/IS. This mitigation acreage is a product of the updated HEP analysis conducted by the USFWS and is additional to the woodland acreage previously mitigated for in the 2010 EA/IS.
VEG-2	All off-road equipment and vehicles used for project implementation are required to be weed-free. All equipment and vehicles will be cleaned of all attached mud, dirt, and plant parts prior to arriving to the Project. This will be done at a vehicle washing station or steam cleaning facility (power or high-pressure cleaning) before the equipment and vehicles enter the project area.
VEG-3	Weed infestations identified before project implementation that are within the project area will be hand treated or "flagged and avoided" according to the species present and project constraints.

Mitigation Number	Mitigation
VEG-4	Staging areas for equipment, materials, or crews will not be sited in weed infested areas.
VEG-5	Use weed-free equipment, mulches, and seed sources. Salvage topsoil from project area for use in onsite revegetation, unless contaminated with noxious weeds.
VEG-6	Minimize the amount of ground and vegetation disturbance in the construction areas. Reestablish vegetation on all disturbed bare ground to minimize weed establishment and infestation.

3.4 Recreation

3.4.1 Existing Conditions

The city of Marysville has approximately 266 acres of neighborhood community parks and recreation facilities that are accessible to the public (City of Marysville 2009). Parks are classified into three categories:

- **(4) Community Parks** - large parks that are designed for organized activities, sports, and large group functions, such as meetings and picnics. They are well equipped to deal with both local groups and other regional groups that draw people from outside of Marysville, such as the Yuba Sutter Youth Soccer League.

- **(8) Neighborhood Parks** - cater to the residents of those neighborhoods and provide an area for outdoor activities. Most of these parks have play equipment for children, as well as large, open play areas and benches or picnic tables.

- **(3) Passive Parks** - green spaces that are simply small landscaped parcels of city-owned property.

Within the city limits, including the levee crown, there are approximately sixteen miles of commuter and recreational bikeways. The primary function of the levee crown is for maintenance vehicles but due to its proximity to residences, pedestrians, bicyclists and equestrians use the crown of the levee for recreational purposes. There are approximately ten access points onto the levee crown from neighborhoods and surrounding parks and over seven miles of paved road for jogging, walking, and bicycling. The seven access points onto the levee are:

- Highway 20 and Levee Road
- Cheim Blvd and Olson Court (stairwell)
- East 26th Street at Jack Slough Road and the levee crown
- Sampson Lane and the levee crown
- 24th Street and old railroad grade (stairwell)
- 14th Street at Bizz Johnson Drive and the levee crown

- 5th Street Bridge and Bizz Johnson Drive
- Bizz Johnson Drive at sewer treatment plant and the levee crown
- D Street at the Bok Kai Temple (stairwell)
- 2nd Street and the levee crown
- Simpson Lane at Ramirez Street and Levee Road

In addition to parks and other recreation facilities, recreation in Marysville includes annual events. The annual events can be weekend or week-long events that occur once a year. Some of the annual events in Marysville include:

- Bok Kai Festival (March)
- Marysville Stampede in Riverfront Park (May)
- Juneteenth Celebration in Yuba Park (June)
- Antique Street Fair in Historic Downtown (June)
- Marysville Peach Festival in Historic Downtown Marysville (July)
- Youth Fishing Derby at Ellis Lake (September)
- Chinese Moon Festival in the Historic China Town (September)

3.4.2 Environmental Effects

Significance Criteria

Effects on recreational resources are considered significant if construction would result in any of the following:

- Eliminate or severely restrict access to recreational facilities and resources.
- Result in substantial long-term disruption of use of an existing recreation facility.
- Substantially diminish the quality of the recreation experience.

Alternative 1 (No Action)

Under the no-action alternative, the Corps would not participate in constructing the MRL improvements. The existing freeway/roadway network, public transportation, bicycle and pedestrian facilities, types of traffic, and circulation patterns would be expected to remain the same. However, traffic volumes are expected to increase as projected in the Highway 20 and Highway 70 Transportation Corridor Concept Reports (Caltrans 2009a; Caltrans 2009b).

Alternative 2 (Proposed Action)

Construction of levee improvements in Phase 2A-South and 2C would have short-term recreational impacts on the levee crown. The road on top of the levee would be closed to public use during the construction period, which would occur between May and October. An alternate route through the adjacent neighborhoods has be identified (Fig 10). When the construction is complete the paved road on top of the levee crown would be restored to its

pre-construction condition. The bike trail under the 5th Street Bridge will have a new permanent drainage system and wall on the upper portion of the bike trail will be constructed.

The following pedestrian access points would be fenced off and closed during construction:

- 14th Street at Biz Johnson Drive and the levee crown
- 5th Street Bridge and Biz Johnson Drive
- Biz Johnson Drive at sewer treatment plant and the levee crown
- 2nd Street and the levee crown
- Simpson Lane at Ramirez Street and Levee Road

As described in Section 2.3 Project Descriptions, there would be several staging areas for Phase 2A-South and Phase 2C. These staging areas would be used for parking, deliveries, and storage of equipment, materials, and topsoil. All staging areas would be closed off to the public during the construction period and would be restored to their previous condition after construction is complete. The areas that would be affected by construction of the Project include:

- Lion's Grove Parking Lot
- BMX Track
- Boat Ramp Parking Lot
- Baseball Fields (2) and Associated Parking Lot

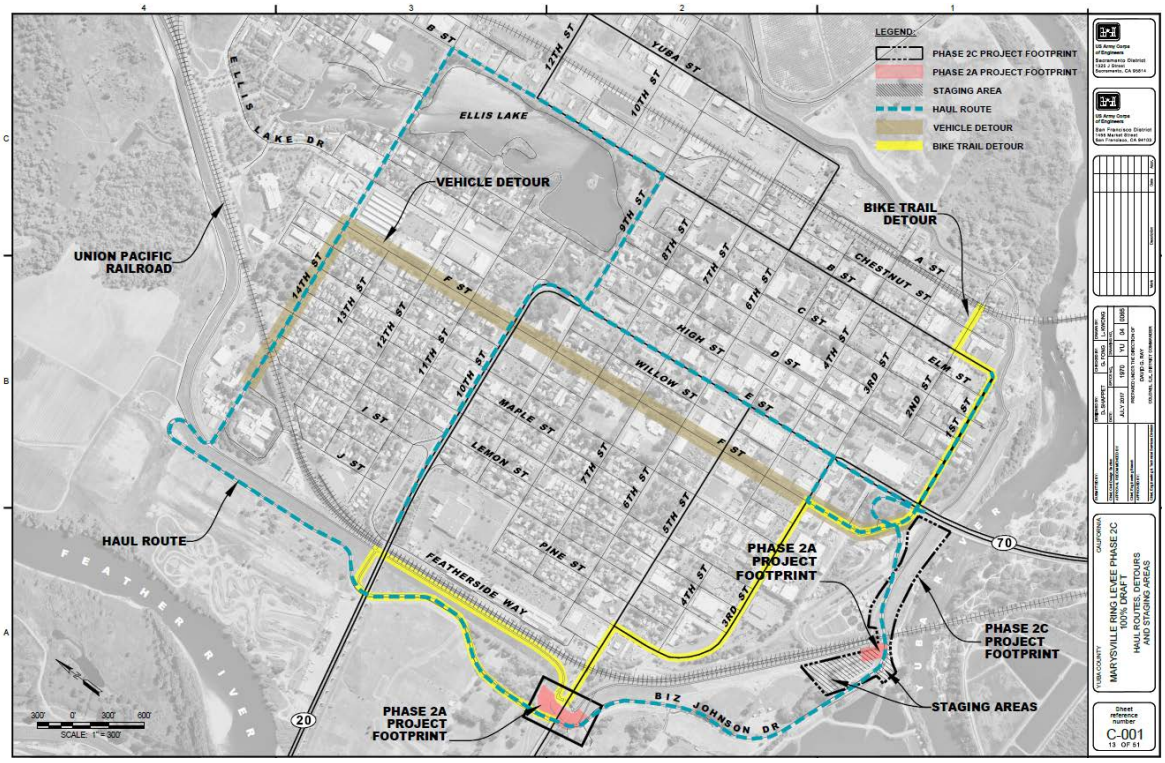

Figure 10. Bike Route Detour for Phase 2A-South and 2C.

3.4.3 Mitigation

Construction of the MRL Project would have temporary impacts as a result of the proposed action. The mitigation measures listed in Table 10 are in addition to those applicable from the 2010 EA/IS.

Table 10. Additional Recreation Mitigation Measures.

Mitigation Number	Mitigation
REC-1	Any recreational roadways and paths will be restored to the original condition once construction has been completed.
REC-2	All areas affected by construction activities would be restored to original condition following project completion.
REC-3	All closed construction areas and recreational areas will have large and identifiable closure signs to assist in public safety.
REC-4	Closed recreational routes will have detour signs to provide recreationist an alternate route.

3.5 Cultural Resources

The term cultural resources is broadly defined as the buildings, structures, objects, sites, districts, and archeological resources associated with historic or prehistoric human activity. These cultural resources are listed in, or eligible for listing in, the National Register of Historic Places (NRHP) and are referred to as "historic properties" when they have been determined eligible for listing or are listed in the NRHP. Such properties may

be significant for their historic, architectural, scientific, or other cultural values and may be of national, state, or local significance.

Cultural resources are representative of broad patterns, themes, events and people in prehistory and history. For the purposes of this Project, prehistory includes the Native groups that inhabited the Project Area before contact with the Spanish and later Europeans and white explorers; history includes the broader scope of exploration of northern California and the people and events that brought settlement to the Marysville area.

Prehistory

Centuries before modern influences settled in the area around the Yuba and Feather Rivers, the Valley Nisenan inhabited the area. The Nisenan were the dominant Native American group between modern Sacramento and Marysville. The Nisenan have ethnographic origins in the Maidu people and their homeland in the northern Sierra Nevada.

The Nisenan were a southern linguistic group of the Maidu people, sometimes referred to as the "Southern Maidu." The name "Nisenan" was a self-designation by the native groups occupying the Yuba and American River drainages (Wilson and Towne 1978). Along with the Maidu and Konkow, the Nisenan formed a subgroup of the California Penutian linguistic family. The Nisenan covered a significant portion of the Central Valley and reached into the Sierra Nevada.

The Nisenan often inhabited areas near rivers; some major areas of significance included sites on the American, Sacramento, Bear, Feather, and Yuba Rivers. The basic political unit was a village community or tribelet with one primary village and a few satellite villages under one head authority. The Nisenan mostly settled in permanent or winter settlements and followed a yearly gathering cycle that led them away from the lowlands and into the hill country each summer. During the annual gathering cycle, the Nisenan harvested acorns, nutmeg, pine nuts, buckeyes, and sunflower seeds and often stored these for long periods. Other vegetation such as greens, tule and cattail roots, brodiaea bulbs, manzanita berries, blackberries, and California grapes was harvested and eaten as they ripened. All valley groups, including the Nisenan, fished trout, perch, chub, sucker, hardhead, eel, sturgeon, and Chinook salmon. Fishing methods included hook, net, harpoon, trap, weir, and poison (Moratto 1984).

History

Early Spanish contact occurred at the southern end of Nisenan territory as the Spanish, notably José Canizares in 1776, explored Miwok land. Although there is no record of the Nisenan removal to the Spanish missions, by the late 1820's, white settlement began to encroach on Nisenan land as American and Hudson's Bay Company trappers began to trap beaver in the Nisenan territory under peaceful occupation. In 1833, a disease, believed to be malaria, swept through the Sacramento Valley and decimated the valley Nisenan. An estimated 75 percent of the native population died.

As a result, there were very few Nisenan left in the valley to face the settlers and gold miners who came soon after the epidemic.

By January 1850, the discovery of gold in Coloma, two years earlier, encouraged development in the area, and a town was established. Mary Murphy Covillaud, wife of Charles Covillaud and Donner party survivor, received the honor of having the new town of Marysville named for her (Hoover, et al. 1990). With the discovery of gold in the Nisenan territory, the remaining natives were killed; their villages were destroyed; and they were persecuted. White settlers and miners called the Nisenan "diggers" and quickly destroyed them as a viable culture (Wilson and Towne 1978).

The location of Marysville made it an ideal center of trade for the northern mines. As the head of navigation on the Feather River, Marysville had a superior location along the river because the distance to the north and east mines was minimal. As such, riverboat cargoes could be easily transported via pack-mule to gold fields at a farther distance. The strategic location resulted in the city experiencing a remarkable growth attributed to its position along the rivers (Hoover, et al. 1990).

Marysville history is intertwined with the history of the Gold Rush. Following the promise of massive fortunes, thousands of people flooded into the area starting in 1849. The Chinese came to Marysville at the same time to work the gold fields, and their influence in the city's development is still visible in the historic district of Marysville and reflected in the Bok Kai Temple built at the lower end of D Street. To the Chinese, Marysville was known as Sam Fou, or "the third city," owing to its large population, only exceeded by the populations of San Francisco and Sacramento (California Office of Historic Preservation 2002). The earlier Chinese settlers of Marysville emigrated from the Canton Province of the Kwang Tung state of China (Marysville Chinese Community 2002).

As the Chinese came to the Marysville area, they brought with them their mythologies, idols, customs, and religion. In 1854, the city's Chinese community erected the Bok Kai Mui Temple to house their gods and as a center of worship. The original temple was destroyed and a new temple, the Bok Kai Temple, was built in 1880 about two blocks from the original location. Since 1974, the Bok Kai Temple has been the focus of a continual restoration project supported by the entire Marysville community (Marysville Chinese Community 2002).

After the mining activities in the Marysville area diminished, the construction of the Central Pacific Railroad became a major source of employment for the areas Chinese community. Eventually, the Southern Pacific and Northern Pacific Railroads would be constructed through the city and served as a supply routes. Prior to the construction of the Central Pacific Railroad, engineer Theodore Judah suggested that Marysville was an ideal location to connect directly to the Central Pacific line. Although he was overruled, the railroad did eventually connect with Marysville, which further shortened the length of time supplies took to reach the city resulting in increased shipping business (Shouter 2000).

3.5.1 Existing Conditions

The history of the city of Marysville shares many common themes with other northern California towns established during the Gold Rush. Native Americans, the railroad, mining, and the Chinese all had considerable influence in Marysville's history. As a result, the majority of the known resources within the Project Area are related to these historic themes. For the purposes of this Project the archeological area of potential effects (APE) includes an area more expansive than the Project Area. There are several known historic resources that are partially within the Project Area and expand to areas outside the Project Area. Although those portions of the historic resources are not within the Project Area they must be inventoried and evaluated as being potentially affected by the proposed Project.

Existing Prehistoric and Historic Sites

Within the APE there are no known existing prehistoric sites. The lack of prehistoric sites can be attributed to the extensive development disturbance of the project area and the surrounding areas following the establishment of Marysville in 1850. The development disturbance is also expanded to include construction of the levees and flood control measures undertaken along the Yuba and Feather Rivers.

Cultural resources identification efforts for Phases 2A South and 2C have found four historic properties ─ two in the Phase 2A South APE, one in the Phase 2C APE, and two in both of the APEs. The properties in the 2A South APE consist of the Marysville Ring Levee, a segment of the Twin City Northern Electric (TCNE) Railroad and the American Bridge Company Railroad Trestle (Western Pacific Railroad Bridge). The property within the Phase 2C APE is a section of a retaining wall that is part of the Sacramento Northern Railroad. The ring levee and the railroad trestle are in both of these APEs.

The levee repair work completed on the two project phases is focused on the Marysville Ring Levee, whereas a staging area is proposed beneath the trestle and will not impact the historic resource. Consultation for the TCNE Railroad is currently ongoing, however, the property is not considered eligible to the NRHP and will be avoided through boring the Sprint line beneath it. The retaining wall is not in an area of project impacts and will also be avoided. A brief description of the historic properties is presented below. Similarly, the trestle will also be avoided by project-related impacts.

Marysville Ring Levee. After the floods of 1875 the MRL was modified from its original 1868 construction to generally the same location and design as is seen today. There have been substantial additions and modifications such as earth fill (1907, 1942 and 1956), dredge tailings (1908), and various raises and reshaping in the 134 years since the levee construction. The levee surrounds the city of Marysville in its entirety and is a standard trapezoidal shaped earthen levee. In some places railroad tracks, berms, roads and other utilities cross or run parallel to the levee. The MRL would undergo a number of different construction methods, including jet grouting, construction of slurry walls,

and construction of berms. Except for the Phase 4 construction where seepage/stability berms would be constructed, upon completion of construction it would not be outwardly visible that construction has occurred at the location. Additionally, the MRL has undergone countless physical modifications in its 134 year history in order to keep the system viable as flood protection for the city and as a result any NRHP eligibility of the levee would not be related to its visual integrity. Due to its significance as a flood protection feature for Marysville and because it has played an important role in the city's history the Marysville Ring Levee has been found eligible for listing in the NRHP.

American Bridge Company Railroad Trestle (Western Pacific Railroad Bridge). The trestle spans the Yuba River and is part of the Western Pacific Railroad. It was ordered and manufactured in 1927. A plaque on the trestle dates the bridge to 1927 though it may or may not have actually been erected in Marysville that year. Weighing in at 1,837,000 pounds, the railroad trestle consists of two single tracks through truss trispans measuring 100 feet and four single tracks through truss trispans measuring 150 feet. The American Bridge Company did not erect the structure in Marysville; they only manufactured and shipped the required materials. During the first half of the twentieth century the American Bridge Company made well over a thousand similar trestles. The trestle is likely a significant property, however, it will not be affected by the MRL project and does not require individual consideration for listing in the NRHP.

The Twin City Northern Electric Railroad. The railroad consists of an approximate, 475-feet-long curved section of an elevated, earthen berm grade. The grade is abandoned and once belonged to the TCNE Railroad. It is approximately 37-ft.-wide at its base with a surface width of 14 to 16 ft. The rails and ties have been removed and only the gravel ballast material remains on the surface. The segment connects to the active Western Pacific Railroad on its eastern end and the Biz Johnson Drive Underpass Bridge on its western end. The grade varies in height from just over 3 ft. to over 5 ft. and is situated slightly below the crown of the Marysville Ring Levee, on the land side. The Corps evaluated the historic property and taken as a whole, the TCNE segment does not retain integrity to a degree sufficient enough to contribute to the character defining aspects for which the resource could be eligible for listing in the NRHP.

The Sacramento Northern Railroad. A staging area is proposed on the northern side of the railroad grade. The staging area avoids the railroad grade and therefore, will have no potential to effect the historic property.

3.5.2 Environmental Effects

Significance Criteria

Any adverse effects on cultural resources that are listed or eligible for listing in the NRHP are considered to be significant. Cultural resources listed or eligible for listing in the NRHP are considered "historic properties" and must undergo particular evaluation of effects in order to determine if an alternative is adverse. An alternative would be considered to have a significant adverse effect on historic properties if it diminishes the

integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Types of effects include:

- Physical destruction, damage, or alteration of all or part of the historic property;
- Isolation of the historic property from or alteration of the character of the historic property's setting when that character contributes to the historic property's qualifications for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of the character with the historic property or alter setting;
- Neglect of a historic property, resulting in its deterioration or destruction; and,
- Transfer, lease, or sale of the historic property.

Alternative 1 (No Action)

Under the no action alternative, the Corps would not construct the MRL improvements. The types of noise sources and sensitive receptors would be the same as described for the existing conditions.

Alternative 2 (Proposed Action)

This alternative would have no adverse effect on existing cultural resources or historic properties that are listed or are eligible for listing in the NRHP. Only the American Bridge Company Railroad Trestle (Western Pacific Railroad Bridge) and the Marysville Ring Levee are considered to be eligible for listing in the NRHP. The project will have no direct or indirect effect to the trestle and will be avoided by the project undertaking. The levee is eligible due to its role as a flood protection feature for Marysville and because it has played an important part in the city's history. Construction of the Project would not affect those characteristics that make the levee eligible for listing in the NRHP. As a result, there would be no adverse effect to the Marysville Ring Levee.

3.5.3 Mitigation

USACE has made determinations of eligibility and effect for all of the historic properties within the APE. This determination was later shared with CVFPB and the MLD for comments. It has been determined that construction of the proposed project would have no adverse effects on any historic properties listed in, or eligible for listing in, the NRHP No mitigation for these properties is warranted. In the course of the consultation process, UAIC expressed interest in having a tribal monitor present during construction. The Corps continues to consult with interested tribes throughout the project. Although no mitigation is proposed for the project, the Corps is cognizant of the possibility of encountering previously unknown historic properties. In the event that previously unknown cultural resources are found during Project activities, work would be stopped pursuant to 36 CFR 800.13(b), "Discoveries without prior planning", to determine the significance of the find and, if necessary, complete appropriate discovery procedures.

3.6 Public Utilities

3.6.1 Existing Conditions

Public services in or near the Project Area includes street cleaning, trash pickup, potable water supply, electricity, telephone, natural gas supply, storm water discharge, and sanitary sewage. These public services are provided by local utilities and Yuba County. Significant public utility facilities in the Project Area that could be affected by construction of the MRL Improvements vary by phase, but generally include power lines leading to a substation adjacent to the Project Area, fiber optic lines, an underground natural gas distribution line, and a 60kV line.

3.6.2 Environmental Effects

Significance Criteria

A Project would significantly affect public utilities if it would:

- Disrupt or significantly diminish the quality of the public utilities for an extended period of time, or,
- Damage public utility facilities, pipelines, conduits, or power lines.

Alternative 1 (No Action)

Under the no action alternative, the Corps would not participate in the construction of the MRL Improvements. As a result, there would be no adverse effects on public utilities in the project area. There would be no change in type, quality, or availabilities of utility services in the project area.

Alternative 2 (Proposed Action)

Construction of the MRL Improvements would not disrupt or diminish the quality of any utility services in the Project Area for an extended period of time. Any utilities running on or through the levee would be either temporarily or permanently relocated without disrupting service.

There is an existing Sprint fiber optic line located in Phase 2A-South that conflicts with the proposed levee improvements—relocation of the line prior to construction would be necessary. Approximately 4,500 feet of two, 2″ conduits carrying fiber optic cables will be installed along the length of the eastern Feather River Levee on the west side of the City of Marysville. The existing cable is buried in the soil and will be removed where it conflicts with proposed improvements, and abandoned in places where it does not conflict. This work would be done by Sprint prior to construction.

3.6.3 Mitigation

No public services would be significantly disrupted as a result of construction of the MRL improvements. Utility line relocations would be conducted in a manner that would not affect any of the services provided. Since no effects to public utilities are expected, no additional mitigation would be required.

4.0 CUMULATIVE IMPACTS

NEPA and CEQA require the consideration of cumulative effects of the proposed Project, combined with the effects of other projects. NEPA defines a cumulative effect as an effect on the environment that results from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (CFR 40 Part 1508.7). The CEQA Guidelines define cumulative effects as "two or more individual effects which, when considered together, compound or increase other environmental impacts" (Section 15355).

In order to understand the contribution that past actions have on the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions to reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by summarizing all prior actions on an action-by-action basis. Focusing on individual actions would be less accurate than looking at existing conditions because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each individual action that has contributed to current conditions. By analyzing current conditions, all of the residual effects from past human actions and natural events will be captured, regardless of which particular action or event contributed to those effects.

Chapter 3.0 of the SEA/IS identifies potential direct and indirect environmental effects of the proposed action. These effects are assessed in the following analysis in terms of their potential to combine with similar environmental effects of the Projects listed below, resulting in cumulative impacts. The analysis is focused on considering the potential for those impacts identified in Chapter 3.0 to make a considerable contribution to significant adverse cumulative effects.

The extent of the geographic area that may be affected with implementation of the alternatives varies depending on the resource under consideration. Not all Projects discussed above would contribute, along with the alternatives, to cumulative environmental effects for each environmental issue area. Therefore, for each discussion below, the past, present, and reasonably foreseeable future projects that are considered are limited to those having potential effects similar to those of Alternative 2 and that could interact with impacts generated by the proposed action.

The MRL improvement Project would not have any significant adverse effects on any of the discussed resources. However, air quality has the potential for cumulative effects and is discussed below.

4.1 Geographic Scope

The geographic area that could be affected by the proposed project varies depending on the type of environmental resources being considered. When the effects of the project are considered in combination with those of other past, present, and future projects in the same geographic area to identify cumulative impacts, the other projects being considered may also vary depending on the type of environmental effects being assessed. The following are the general geographic areas associated with the different resources addressed in the analysis:

- Air Quality: regional (area under the jurisdiction of the FRAQMD, consisting of Yuba and Sutter Counties).
- Land Use and Agriculture: City of Marysville (the city is the local agency with land use authority) and Yuba County for unincorporated areas on the waterside of the levees.
- Traffic and Circulation: regional (roadways in the project area where traffic generated by multiple projects might interact on a cumulative basis).
- Cultural Resources: local area (cultural resource sites are stationary and effects are typically limited to the borders of a project site).

For air quality in the Phase 2A-South and 2C MRL Project, the potentially affected air quality region is the appropriate boundary for assessment of cumulative impacts from releases of pollutants into the atmosphere.

4.2 Past, Present and Reasonably Foreseeable Future Projects

This section describes implemented, developed, or planned projects that may result in environmental effects similar to those of the proposed project, such that these effects, when combined, constitute cumulative impacts.

4.2.1 Local Flood Control Efforts

The Yuba River Basin, California Project ("Authorized Project") was authorized for construction in the Water Resources Development Act of 1998, Pub. L. 106-53, § 101(a)(10), 112 Stat. 269, 275 (hereinafter "WRDA 1999"), as amended by the Water Resources Development Act of 2007, Pub. L. No. 110-114, § 3041, 121 Stat. 1041, 1116 (hereinafter "WRDA 2007"), and consists of three reaches: Reach 1 (Linda/Olivehurst), Reach 2 (Best Slough/Lower RD 784), and Reach 3 (Marysville).

During post-authorization studies, Reach 3, the Marysville Ring Levee (MRL) element, was approved for construction as a separable element of the authorized Yuba River Basin Project. An Engineering Documentation Report (EDR) was completed in April 2010 which found that, although design changes were necessary, they did not constitute a change in the project scope, and the project could proceed to construction as a separable element of the Yuba River Basin project. As a result, a Project Partnership Agreement was executed and the project initiated Federal construction in 2010.

The Yuba River Basin Project initiated a General Re-evaluation Report (GRR) to re-assess the project for new under-seepage criteria. Prior to completion of that Report, local interests began constructing improvements to the Yuba, Feather and Bear Rivers and WPIC levees in Reaches 1 and 2. Those efforts provided flood risk reduction benefits to the entire RD 784 area. The last local construction project, the Upper Yuba River Levee Improvement Project (UYRLIP) was completed in 2012. With the completion of the local work, there would be no Federal construction or additional levee improvements required for the RD 784 area.

Phase 1 was constructed in 2011 and portions of Phase 4 were constructed in 2016 and 2017. To better facilitate design and construction, Phase 2 was further subdivided into Phase 2A-North, 2A-South, 2C, and 2B. Phase 2A-North is scheduled to begin construction in April 2018. Additional phases 2B and 3 are anticipated to be constructed April 2020 to 2021.

4.2.2 Local Development Projects

5th Street Bridge Replacement Project

In November 2013, authorization from the Marysville City Council was received to replace the existing 5th Street Bridge. Yuba City Public Works Department, in cooperation with the California Department of Transportation (Caltrans), is replacing portions of the 5th Street Bridge and improving the approach roadways to the bridge. The proposed project would enhance safety on one of two major east-west connection corridors linking Yuba City and Marysville, as well as improve traffic operations and transportation capacity by adding two additional through lanes across the Feather River. Construction of the 5th Street Bridge Project began in November 2017 and will continue during the same construction season as Phase 2A-North of the MRL Project.

YUB-20 & 70 ADA Improvements Project

In May 2015, Caltrans proposed to upgrade existing or install new pedestrian infrastructure at various locations along SR 20 (PM 0.5/2.0) and along SR 70 (PM 14.1/15.2) in the City of Marysville in Yuba County. The proposed improvements would include: installing new or upgrading existing curb ramps, cross-walks, pedestrian crosswalk signals and driveways to ensure compliance with current Americans with Disabilities Act standards. Construction is expected during the summer of 2018.

Simmerly Slough Bridge Replacement Project

In December 2016, Caltrans proposed to replace the Simmerly Slough Bridge on SR 70 by constructing a parallel structure to the west of the existing bridge. The existing bridge will be demolished after the new bridge is constructed. Other proposed work includes realigning the approach roads at both ends of the bridge as well as constructing a new access road to Laurellen Rd. Construction is expected to begin in spring 2019.

Marysville Ring Levee Project Phase 2A North

In April 2018, the Corps, (CVFPB), and the MLD are proposing to proceed to construction on Phase 2A North. The proposed improvements include construction of a soil cement bentonite cutoff wall that will be constructed on the levee, adjacent to Lions Grove Park. Impervious embankment will be imported to address throughseepage concerns and the cutoff wall will address underseepage concerns. Public utilities will be rerouted permanently to avoid the levee alignment.

4.3 Cumulative Effects

4.3.1 Greenhouse Gases (GHGs)

No air district in California has identified a significance threshold for analyzing greenhouse gas emissions generated by a proposed project or methodology for analyzing cumulative effects related to global warming. Although the state of California has identified greenhouse gas goals through the adoption of the California Global Warming Solutions Act of 2006, the effect of greenhouse gas emissions as they relate to global climate change is inherently a cumulative impact issue. While the emissions of one single project would not cause global climate change, greenhouse gas emissions from multiple projects throughout the world could result in a cumulative effect with respect to global climate change.

Within the discussion of concerns related to global warming, carbon dioxide (CO_2) is now being tracked as one of the contributors to greenhouse gas emissions. For projects that occur in, and around, the Sacramento Valley area, the Sacramento Metropolitan Air Quality Management District (SMAQMD) has emissions models that will calculate several air emissions based on various input criteria (construction phase, duration, type of equipment, project area, etc.). FRAQMD, due to the linear nature of many of the levee repair projects being undertaken by USACE, has suggested the use of the SMAQMD Road Construction Emissions Model. The outputs of these models address criteria pollutants associated with the NAAQS, as well as those associated with the CAAQS, which are considered to be more stringent than the Federal standards.

In response to the concerns regarding greenhouse gas emissions, the most recent version of the SMAQMD Road Construction Emissions Model now generates an output for CO_2. The results from the emissions model include CO_2. It should be noted that although CO_2 emissions can now be calculated, there is no Federal standard, or any State or local threshold, to meet, which makes it difficult to fully analyze under NEPA and CEQA. Also, because the focus on CO_2 emissions is relatively recent, specific mitigation measures, as they relate to construction, are not fully developed. For these reasons, the BMPs and Mitigation Measures listed in Section 3.1.3 (Air Quality Mitigation), would also be employed to minimize CO_2/greenhouse gas emissions.

4.3.2 Air Quality

The MRL Improvements would combine with the local development, such as CalTrans Simmerly Slough, Projects to have a potential cumulative effect on air quality. It is expected that impacts from the local Projects would be similar to the Proposed Project in that effects would be due primarily to construction. Construction of these Projects would increase emissions of criteria pollutants, including VOC, NOx, CO, SO2, and PM emissions, from construction and transport of materials. Individually these Projects would mitigate emissions below significance threshold levels. If these construction Projects are implemented concurrently, the combined cumulative effects could be above CEQA thresholds for air quality emissions and the de minimus thresholds. If this were the case, without consideration for scheduling and sequence of activities, concurrent construction Projects within and adjacent to Marysville could have adverse cumulative air quality impacts, although these impacts would be temporary.

4.4 Growth-Inducing Effects

The proposed action would not directly remove obstacles to growth, result in population increases, or encourage and facilitate other activities that could significantly affect the environment. Local population growth and development would be consistent with the Land Use Element of the Yuba County General Plan Update (Yuba County 2030). The goal of the proposed action alternative is to construct levee improvements in four areas along the Marysville Ring Levee that would meet USACE requirements for levee height and width. The city is completely surrounded by levees, which prohibits it from growing outward. In addition, construction, operation, and maintenance of the improved levee would not result in a substantial increase in the number of permanent workers or employees.

5.0 COORDINATION AND REVIEW OF SEA/IS

The draft SEA/IS will be circulated for 30 days to agencies, organizations, and individuals who have an interest. Copies of the draft SEA/IS will be posted on the USACE website, made available for viewing on the CVFPB website, at local public libraries, and provided by mail upon request. This Project has been coordinated with all relevant government resource agencies including interested tribes, USFWS, SHPO, CDFW, and the California Department of Water Resources.

A public meeting is anticipated in February 2018 in the city of Marysville. The purpose of the meeting will be to present the background of the Proposed Project and new information included in the SEA/IS.

6.0 LIST OF PREPARERS

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APPENDICES

APPENDIX A

USFWS SUPPLEMENTAL COORDINATION ACT REPORT (CAR)

APPENDIX B

ENDANGERED, THREATENED, AND CANDIDATE SPECIES LIST

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: December 29, 2017
Consultation Code: 08ESMF00-2018-SLI-0761
Event Code: 08ESMF00-2018-E-02238
Project Name: Marysville Ring Levee Project (Phase 2A-South and 2C)

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).
Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish and Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2018-SLI-0761

Event Code: 08ESMF00-2018-E-02238

Project Name: Marysville Ring Levee Project (Phase 2A-South and 2C)

Project Type: ** OTHER **

Project Description: The Project is located in Marysville, Ca within Yuba County.

Project Location:

Approximate location of the project can be viewed in Google Maps:
https://www.google.com/maps/place/39.13888078904036N121.60015251838858W

Counties: Yuba, CA

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Birds

NAME	STATUS
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME | STATUS

Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7850
Habitat assessment guidelines:
https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf

Crustaceans

NAME | STATUS

Conservancy Fairy Shrimp *Branchinecta conservatio* — Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8246

Vernal Pool Fairy Shrimp *Branchinecta lynchi* — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/498

Vernal Pool Tadpole Shrimp *Lepidurus packardi* — Endangered
There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246

Flowering Plants

NAME | STATUS

Hartweg's Golden Sunburst *Pseudobahia bahiifolia* — Endangered
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/1704

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE RareFind

Query Summary:
County IS (Yuba)

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (CDFW)
CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	951	23	None	Candidate Endangered	G2G3	S1S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_ENEndangered, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Marsh & swamp, Swamp, Wetland
Ambystoma macrodactylum sigillatum	southern long-toed salamander	Amphibians	AAAAA01085	603	1	None	None	G5T4	S3	null	CDFW_SSC-Species of Special Concern	null
Ammodramus savannarum	grasshopper sparrow	Birds	ABPBXA0020	23	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Valley & foothill grassland
Asio otus	long-eared owl	Birds	ABNSB13010	46	1	None	None	G5	S3?	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Cismontane woodland, Great Basin scrub, Riparian forest, Riparian woodland, Upper montane coniferous forest
Astragalus tener var. ferrisiae	Ferris' milkvetch	Dicots	PDFAB0F8R3	18	1	None	None	G2T1	S1	1B.1	BLM_S-Sensitive	Meadow & seep, Valley & foothill grassland, Wetland
Athene cunicularia	burrowing owl	Birds	ABNSB10010	1955	1	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal prairie, Coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Bombus occidentalis	western bumble bee	Insects	IIHYM24250	282	1	None	None	G2G3	S1	null	USFS_S-Sensitive, XERCES_IM-Imperiled	null
Branchinecta lynchi	vernal pool fairy shrimp	Crustaceans	ICBRA03030	763	12	Threatened	None	G3	S3	null	IUCN_VU-Vulnerable	Valley & foothill grassland, Vernal pool, Wetland
Buteo swainsoni	Swainson's hawk	Birds	ABNKC19070	2443	36	None	Threatened	G5	S3	null	BLM_S-Sensitive, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Great Basin grassland, Riparian forest, Riparian woodland, Valley & foothill grassland

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Buxbaumia viridis	buxbaumia moss	Bryophytes	NBMUS1B040	9	1	None	None	G4G5	S1	2B.2	BLM_S-Sensitive, USFS_S-Sensitive	Lower montane coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest
Carex cyrtostachya	Sierra arching sedge	Monocots	PMCYP03M00	13	2	None	None	G2	S2	1B.2	null	Lower montane coniferous forest, Marsh & swamp,
												Meadow & seep, Riparian forest
Carex xerophila	chaparral sedge	Monocots	PMCYP03M60	15	3	None	None	G2	S2	1B.2	null	Chaparral, Cismontane woodland, Lower montane coniferous forest, Ultramafic
Cicindela hirticollis abrupta	Sacramento Valley tiger beetle	Insects	IICOL02106	6	1	None	None	G5TH	SH	null	null	Sand shore
Circus cyaneus	northern harrier	Birds	ABNKC11010	53	5	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Coastal scrub, Great Basin grassland, Marsh & swamp, Riparian scrub, Valley & foothill grassland, Wetland
Clarkia biloba ssp. brandegeeae	Brandegee's clarkia	Dicots	PDONA05053	89	11	None	None	G4G5T4	S4	4.2	BLM_S-Sensitive	Chaparral, Cismontane woodland, Lower montane coniferous forest
Clarkia mosquinii	Mosquin's clarkia	Dicots	PDONA050S0	78	1	None	None	G2	S2	1B.1	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Cismontane woodland, Lower montane coniferous forest
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Birds	ABNRB02022	155	2	Threatened	Endangered	G5T2T3	S1	null	BLM_S-Sensitive, NABCI_RWL-Red Watch List, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	Riparian forest
Delphinium recurvatum	recurved larkspur	Dicots	PDRAN0B1J0	100	1	None	None	G2?	S2?	1B.2	BLM_S-Sensitive	Chenopod scrub, Cismontane woodland, Valley & foothill grassland
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	Insects	IICOL48011	271	14	Threatened	None	G3T2	S2	null	null	Riparian scrub
Downingia pusilla	dwarf downingia	Dicots	PDCAM060C0	126	2	None	None	GU	S2	2B.2	null	Valley & foothill grassland, Vernal pool, Wetland

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Elanus leucurus	white-tailed kite	Birds	ABNKC06010	165	1	None	None	G5	S3S4	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern	Cismontane woodland, Marsh & swamp, Riparian woodland, Valley & foothill grassland, Wetland
Emys marmorata	western pond turtle	Reptiles	ARAAD02030	1291	10	None	None	G3G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Erethizon dorsatum	North American porcupine	Mammals	AMAFJ01010	508	4	None	None	G5	S3	null	IUCN_LC-Least Concern	Broadleaved upland forest, Cismontane woodland, Closed-cone coniferous
												forest, Lower montane coniferous forest, North coast coniferous forest, Upper montane coniferous forest
Eriogonum umbellatum var. ahartii	Ahart's buckwheat	Dicots	PDPGN086UY	28	6	None	None	G5T3	S3	1B.2	BLM_S-Sensitive, USFS_S-Sensitive	Chaparral, Cismontane woodland, Ultramafic
Fissidens pauperculus	minute pocket moss	Bryophytes	NBMUS2W0U0	22	3	None	None	G3?	S2	1B.2	USFS_S-Sensitive	North coast coniferous forest, Redwood
Fremontodendron decumbens	Pine Hill flannelbush	Dicots	PDSTE03030	12	2	Endangered	Rare	G1	S1	1B.2	SB_RSABG-Rancho Santa Ana Botanic Garden, SB_UCBBG-UC Berkeley Botanical Garden	Chaparral, Cismontane woodland, Ultramafic
Fritillaria eastwoodiae	Butte County fritillary	Monocots	PMLIL0V060	235	15	None	None	G3Q	S3	3.2	USFS_S-Sensitive	Chaparral, Cismontane woodland, Lower montane coniferous forest, Ultramafic
Great Valley Cottonwood Riparian Forest	Great Valley Cottonwood Riparian Forest	Riparian	CTT61410CA	56	5	None	None	G2	S2.1	null	null	Riparian forest
Great Valley Mixed Riparian Forest	Great Valley Mixed Riparian Forest	Riparian	CTT61420CA	68	3	None	None	G2	S2.2	null	null	Riparian forest

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Great Valley Valley Oak Riparian Forest	Great Valley Valley Oak Riparian Forest	Riparian	CTT61430CA	33	1	None	None	G1	S1.1	null	null	Riparian forest
Haliaeetus leucocephalus	bald eagle	Birds	ABNKC10010	327	2	Delisted	Endangered	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern, USFS_S-Sensitive, USFWS_BCC-Birds of Conservation Concern	Lower montane coniferous forest, Oldgrowth
Juncus leiospermus var. ahartii	Ahart's dwarf rush	Monocots	PMJUN011L1	13	1	None	None	G2T1	S1	1B.2	null	Valley & foothill grassland
Lasiurus blossevillii	western red bat	Mammals	AMACC05060	126	1	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, WBWG_H-High Priority	Cismontane woodland, Lower montane coniferous forest, Riparian forest, Riparian woodland
Lasiurus cinereus	hoary bat	Mammals	AMACC05030	236	1	None	None	G5	S4	null	IUCN_LC-Least Concern, WBWG_M-Medium Priority	Broadleaved upland forest, Cismontane woodland, Lower montane coniferous forest, North coast coniferous forest
Laterallus jamaicensis coturniculus	California black rail	Birds	ABNME03041	303	54	None	Threatened	G3G4T1	S1	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_NT-Near Threatened, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Brackish marsh, Freshwater marsh, Marsh & swamp, Salt marsh, Wetland
Legenere limosa	legenere	Dicots	PDCAM0C010	78	3	None	None	G2	S2	1B.1	BLM_S-Sensitive	Vernal pool, Wetland
Lepidurus packardi		Crustaceans	ICBRA10010	321	14	Endangered	None	G4	S3S4	null	IUCN_EN-Endangered	Valley & foothill grassland,
	vernal pool tadpole shrimp											Vernal pool, Wetland
Lewisia cantelovii	Cantelow's lewisia	Dicots	PDPOR04020	67	1	None	None	G3	S3	1B.2	BLM_S-Sensitive, USFS_S-Sensitive	Broadleaved upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Ultramafic
Linderiella occidentalis	California linderiella	Crustaceans	ICBRA06010	434	19	None	None	G2G3	S2S3	null	IUCN_NT-Near Threatened	Vernal pool
Lupinus dalesiae	Quincy lupine	Dicots	PDFAB2B1A0	228	1	None	None	G3	S3	4.2	null	Chaparral, Cismontane woodland, Lower montane coniferous forest, Upper montane coniferous forest

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Margaritifera falcata	western pearlshell	Mollusks	IMBIV27020	78	1	None	None	G4G5	S1S2	null	null	Aquatic
Melospiza melodia	song sparrow ("Modesto" population)	Birds	ABPBXA3010	92	1	None	None	G5	S3?	null	CDFW_SSC-Species of Special Concern	null
Monardella venosa	veiny monardella	Dicots	PDLAM18082	4	1	None	None	G1	S1	1B.1	BLM_S-Sensitive, SB_RSABG-Rancho Santa Ana Botanic Garden	Cismontane woodland, Valley & foothill grassland
Myotis yumanensis	Yuma myotis	Mammals	AMACC01020	263	1	None	None	G5	S4	null	BLM_S-Sensitive, IUCN_LC-Least Concern, WBWG_LM-Low-Medium Priority	Lower montane coniferous forest, Riparian forest, Riparian woodland, Upper montane coniferous forest
Northern Hardpan Vernal Pool	Northern Hardpan Vernal Pool	Herbaceous	CTT44110CA	126	3	None	None	G3	S3.1	null	null	Vernal pool, Wetland
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	Fish	AFCHA0209K	31	2	Threatened	None	G5T2Q	S2	null	AFS_TH-Threatened	Aquatic, Sacramento/San Joaquin flowing waters
Oncorhynchus tshawytscha pop. 6	chinook salmon - Central Valley spring-run ESU	Fish	AFCHA0205A	13	2	Threatened	Threatened	G5	S1	null	AFS_TH-Threatened	Aquatic, Sacramento/San Joaquin flowing waters
Packera layneae	Layne's ragwort	Dicots	PDAST8H1V0	52	8	Threatened	Rare	G2	S2	1B.2	SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Ultramafic
Pekania pennanti	fisher - West Coast DPS	Mammals	AMAJF01021	737	1	None	Candidate Threatened	G5T2T3Q	S2S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	North coast coniferous forest, old-growth Riparian forest
Peltigera gowardii	western waterfan lichen	Lichens	NLVER00460	26	1	None	None	G3G4	S3	4.2	USFS_S-Sensitive	Riparian forest
Pohlia flexuosa	flexuose threadmoss	Bryophytes	NBMUS5S1D0	1	1	None	None	G5	S1	2B.1	null	Lower montane coniferous forest
Pseudobahia bahiifolia	Hartweg's golden sunburst	Dicots	PDAST7P010	27	1	Endangered	Endangered	G2	S2	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Cismontane woodland, Valley & foothill grassland
Pyrrocoma lucida	sticky pyrrocoma	Dicots	PDASTDT0E0	76	1	None	None	G3	S3	1B.2	BLM_S-Sensitive, USFS_S-Sensitive	Great Basin scrub, Lower montane coniferous forest, Meadow & seep
Rana boylii	foothill yellow-legged frog	Amphibians	AAABH01050	1496	9	None	Candidate Threatened	G3	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened, USFS_S-Sensitive	Aquatic, Chaparral, Cismontane woodland, Coastal scrub, Klamath/North coast flowing

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
												waters, Lower montane coniferous forest, Meadow & seep, Riparian forest, Riparian woodland, Sacramento/San Joaquin flowing waters
Rana draytonii	California red-legged frog	Amphibians	AAABH01022	1448	1	Threatened	None	G2G3	S2S3	null	CDFW_SSC-Species of Special Concern, IUCN_VUVulnerable	Aquatic, Artificial flowing waters, Artificial standing waters, Freshwater marsh, Marsh & swamp, Riparian forest, Riparian scrub, Riparian woodland, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Rana sierrae	Sierra Nevada yellowlegged frog	Amphibians	AAABH01340	663	1	Endangered	Threatened	G1	S1	null	CDFW_WL-Watch List, IUCN_EN-Endangered, USFS_S-Sensitive	Aquatic
Rhynchospora capitellata	brownish beaked-rush	Monocots	PMCYP0N080	19	1	None	None	G5	S1	2B.2	null	Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Upper montane coniferous forest, Wetland
Riparia riparia	bank swallow	Birds	ABPAU08010	297	23	None	Threatened	G5	S2	null	BLM_S-Sensitive, IUCN_LC-Least Concern	Riparian scrub, Riparian woodland
Sagittaria sanfordii	Sanford's arrowhead	Monocots	PMALI040Q0	108	1	None	None	G3	S3	1B.2	BLM_S-Sensitive	Marsh & swamp, Wetland
Strix nebulosa	great gray owl	Birds	ABNSB12040	79	1	None	Endangered	G5	S1	null	CDF_S-Sensitive, IUCN_LC-Least Concern, USFS_S-Sensitive	Lower montane coniferous forest, Oldgrowth, Subalpine coniferous forest, Upper montane coniferous forest
Thamnophis gigas	giant gartersnake	Reptiles	ARADB36150	365	2	Threatened	Threatened	G2	S2	null	IUCN_VU-Vulnerable	Marsh & swamp, Riparian scrub, Wetland
Vireo bellii pusillus	least Bell's vireo	Birds	ABPBW01114	482	1	Endangered	Endangered	G5T2	S2	null	IUCN_NT-Near Threatened, NABCI_YWL-Yellow Watch List	Riparian forest, Riparian scrub, Riparian woodland
Wolffia brasiliensis	Brazilian watermeal	Monocots	PMLEM03020	6	1	None	None	G5	S1	2B.3	null	Marsh & swamp, Wetland

APPENDIX C

AIR QUALITY EMISSIONS SPREADSHEETS

Road Construction Emissions Model **Version 8.1.0**

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name	MRL-Phase 2A-South	
Construction Start Year	2019	Enter a Year between 2014 and 2025 (inclusive)
Project Type	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway
For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data		2) Road Widening : Project to add a new lane to an existing r 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	6.00	Months
Working Days per Month	30.00	Days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1) Sand Gravel : Use for quaternary deposits (Delta/West County)
(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)		2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta)
		3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.49	Miles
Total Project Area	18.60	Acres
Maximum Area Disturbed/Day	9.30	Acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing	20.00		187.00
	Grading/Excavation	20.00		187.00
	Drainage/Utilities/Sub-Grade	20.00	98.00	
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving	20.00	156.00	187.00

Mitigation Options

On-road Fleet Emissions Mitigation	2010 and Newer On-road Vehicles Fleet	Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation	20% NOx and 45% Exhaust PM reduction	Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml).
	Tier 4 equipment for limited equipment types	Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.75	0.60	5/1/2018	1/1/2019
Grading/Excavation	3.00	2.70	5/22/2018	1/24/2019
Drainage/Utilities/Sub-Grade	2.00	1.80	8/14/2018	4/26/2019
Paving	0.25	0.90	10/9/2018	6/26/2019
Totals (Months)	6			

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	30.00			10	300.00
Miles/round trip: Grading/Excavation	30.00			10	300.00
Miles/round trip: Drainage/Utilities/Sub-Grade	90.00			5	450.00
Miles/round trip: Paving				0	0.00

2010+ Model Year Mitigation Option Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.04	0.24	1.00	0.07	0.03	0.01	1,051.78	0.00	0.03	1,062.14
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.01	0.00	0.00	0.00	11.83	0.00	0.00	11.95
Pounds per day - Grading/Excavation	0.04	0.24	1.00	0.07	0.03	0.01	1,051.78	0.00	0.03	1,062.14
Tons per const. Period - Grading/Excavation	0.00	0.01	0.04	0.00	0.00	0.00	47.33	0.00	0.00	47.80
Pounds per day - Drainage/Utilities/Sub-Grade	0.07	0.36	1.50	0.10	0.04	0.02	1,577.67	0.00	0.05	1,593.21
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.04	0.00	0.00	0.00	47.33	0.00	0.00	47.80
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.02	0.10	0.01	0.00	0.00	106.49	0.00	0.00	107.54

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00
Miles/round trip: Paving	36.00			18	648.00

2010+ Model Year Mitigation Option Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.10	0.51	2.15	0.15	0.06	0.02	2,271.84	0.00	0.07	2,294.23
Tons per const. Period - Paving	0.00	0.00	0.01	0.00	0.00	0.00	8.52	0.00	0.00	8.60
Total tons per construction project	0.00	0.00	0.01	0.00	0.00	0.00	8.52	0.00	0.00	8.60

Worker Commute Emissions User Input	User Override of Worker Commute Default Values	Default Values		
Miles/ one-way trip	60		Calculated Daily Trips	Calculated Daily VMT
One-way trips/day	6			
No. of employees: Grubbing/Land Clearing	10		60	3,600.00
No. of employees: Grading/Excavation	20		120	7,200.00
No. of employees: Drainage/Utilities/Sub-Grade	10		60	3,600.00
No. of employees: Paving	10		60	3,600.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Grading/Excavation (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Draining/Utilities/Sub-Grade (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Paving (grams/mile)	0.03	1.33	0.15	0.05	0.02	0.00	393.83	0.01	0.01	395.91
Grubbing/Land Clearing (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Grading/Excavation (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Draining/Utilities/Sub-Grade (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Paving (grams/trip)	1.17	3.21	0.26	0.00	0.00	0.00	87.83	0.02	0.01	91.49
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.39	10.96	1.20	0.37	0.16	0.03	3,137.29	0.09	0.05	3,154.27
Tons per const. Period - Grubbing/Land Clearing	0.00	0.12	0.01	0.00	0.00	0.00	35.29	0.00	0.00	35.49
Pounds per day - Grading/Excavation	0.77	21.91	2.39	0.74	0.31	0.06	6,274.59	0.17	0.10	6,308.53
Tons per const. Period - Grading/Excavation	0.03	0.99	0.11	0.03	0.01	0.00	282.36	0.01	0.00	283.88
Pounds per day - Drainage/Utilities/Sub-Grade	0.39	10.96	1.20	0.37	0.16	0.03	3,137.29	0.09	0.05	3,154.27
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.01	0.33	0.04	0.01	0.00	0.00	94.12	0.00	0.00	94.63
Pounds per day - Paving	0.39	10.96	1.20	0.37	0.16	0.03	3,137.29	0.09	0.05	3,154.27
Tons per const. Period - Paving	0.00	0.04	0.00	0.00	0.00	0.00	11.76	0.00	0.00	11.83
Total tons per construction project	0.05	1.48	0.16	0.05	0.02	0.00	423.53	0.01	0.01	425.83

Water Truck Emissions **User Input**	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust	1		40.00		40.00
Grading/Excavation - Exhaust	1		40.00		40.00
Drainage/Utilities/Subgrade	1		40.00		40.00
Paving	1		40.00		40.00

2010+ Model Year Mitigation Option Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Grading/Excavation (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93
Paving (grams/mile)	0.07	0.36	1.51	0.10	0.04	0.02	1,590.26	0.00	0.05	1,605.93

Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.58	0.00	0.00	1.59
Pounds per day - Grading/Excavation	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	6.31	0.00	0.00	6.37
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	4.21	0.00	0.00	4.25
Pounds per day - Paving	0.01	0.03	0.13	0.01	0.00	0.00	140.24	0.00	0.00	141.62
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.53
Total tons per construction project	0.00	0.00	0.01	0.00	0.00	0.00	12.62	0.00	0.00	12.75

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			93.00	1.05	19.34	0.22
Fugitive Dust - Grading/Excavation			93.00	4.19	19.34	0.87
Fugitive Dust - Drainage/Utilities/Subgrade			93.00	2.79	19.34	0.58

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Current Equipment Tier	Type	Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Selected ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
		Model Default Tier	Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00		Model Default Tier	Model Default Tier	Off-Highway Trucks	3.85	20.90	33.13	0.83	0.77	0.07	6,615.01	2.06	0.06	6,683.55
		Model Default Tier	Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Model Default Tier	Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Pressure Washers	0.05	0.25	0.26	0.01	0.01	0.00	39.09	0.00	0.00	39.29
		Model Default Tier	Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Signal Boards	0.06	0.30	0.29	0.01	0.01	0.00	49.31	0.01	0.00	49.56
		Model Default Tier	Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Sweepers/Scrubbers	0.31	2.02	2.13	0.12	0.11	0.00	255.75	0.08	0.00	258.40
1.00		Model Default Tier	Model Default Tier	Tractors/Loaders/Backhoes	0.27	2.36	2.13	0.10	0.10	0.00	316.00	0.10	0.00	319.27
		Model Default Tier	Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing			pounds per day	4.53	25.83	37.94	1.07	0.99	0.07	7,275.17	2.25	0.06	7,350.09
	Grubbing/Land Clearing			tons per phase	0.05	0.29	0.43	0.01	0.01	0.00	81.85	0.03	0.00	82.69

	Default	Mitigation Option			Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Selected									
Grading/Excavation Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Current Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
		Model Default Tier	Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Crawler Tractors	0.63	2.61	6.68	0.17	0.16	0.01	775.49	0.24	0.01	783.53
		Model Default Tier	Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00		Model Default Tier	Model Default Tier	Excavators	0.60	6.76	5.11	0.17	0.16	0.01	1,072.06	0.33	0.01	1,083.19
1.00		Model Default Tier	Model Default Tier	Forklifts	0.18	1.21	1.26	0.07	0.06	0.00	153.79	0.05	0.00	155.38
		Model Default Tier	Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Graders	0.84	4.69	6.69	0.26	0.24	0.01	629.41	0.20	0.01	635.92
		Model Default Tier	Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.00		Model Default Tier	Model Default Tier	Off-Highway Trucks	6.92	37.63	59.64	1.50	1.38	0.12	11,907.02	3.71	0.10	12,030.40
		Model Default Tier	Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Pressure Washers	0.05	0.25	0.26	0.01	0.01	0.00	39.09	0.00	0.00	39.29

		Model Default Tier	Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Rollers	0.26	1.96	2.02	0.10	0.09	0.00	267.21	0.08	0.00	269.98
		Model Default Tier	Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Rubber Tired Loaders	0.42	1.71	4.20	0.10	0.09	0.01	619.57	0.19	0.01	626.01
		Model Default Tier	Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Signal Boards	0.06	0.30	0.29	0.01	0.01	0.00	49.31	0.01	0.00	49.56
		Model Default Tier	Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Sweepers/Scrubbers	0.31	2.02	2.13	0.12	0.11	0.00	255.75	0.08	0.00	258.40
1.00		Model Default Tier	Model Default Tier	Tractors/Loaders/Backhoes	0.27	2.36	2.13	0.10	0.10	0.00	316.00	0.10	0.00	319.27
		Model Default Tier	Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	10.53	61.49	90.40	2.60	2.40	0.16	16,084.68	4.99	0.14	16,250.93
	Grading/Excavation			tons per phase	0.47	2.77	4.07	0.12	0.11	0.01	723.81	0.22	0.01	731.29

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Current Equipment Tier	Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Selected	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
1.00		Model Default Tier	Model Default Tier	Aerial Lifts	0.04	1.09	0.57	0.01	0.01	0.00	168.94	0.05	0.00	170.70
1.00		Model Default Tier	Model Default Tier	Air Compressors	0.40	2.47	2.14	0.11	0.11	0.00	375.27	0.04	0.00	377.00
1.00		Model Default Tier	Model Default Tier	Bore/Drill Rigs	0.28	1.95	3.13	0.06	0.06	0.01	880.26	0.27	0.01	889.42
1.00		Model Default Tier	Model Default Tier	Cement and Mortar Mixers	0.06	0.31	0.29	0.01	0.01	0.00	50.52	0.01	0.00	50.77
1.00		Model Default Tier	Model Default Tier	Concrete/Industrial Saws	0.52	3.72	3.13	0.15	0.15	0.01	592.67	0.05	0.00	595.14
1.00		Model Default Tier	Model Default Tier	Cranes	0.56	2.47	5.34	0.16	0.15	0.01	568.03	0.18	0.00	573.92
		Model Default Tier	Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Generator Sets	0.51	3.75	3.29	0.14	0.14	0.01	623.04	0.04	0.00	625.56
		Model Default Tier	Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.00		Model Default Tier	Model Default Tier	Off-Highway Trucks	6.92	37.63	59.64	1.50	1.38	0.12	11,907.02	3.71	0.10	12,030.40
		Model Default Tier	Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Pressure Washers	0.05	0.25	0.26	0.01	0.01	0.00	39.09	0.00	0.00	39.29
1.00		Model Default Tier	Model Default Tier	Pumps	0.53	3.81	3.34	0.15	0.15	0.01	623.04	0.05	0.00	625.61
		Model Default Tier	Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Rough Terrain Forklifts	0.16	2.31	1.61	0.05	0.05	0.00	346.54	0.11	0.00	350.13
		Model Default Tier	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Model Default Tier	Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Signal Boards	0.06	0.30	0.29	0.01	0.01	0.00	49.31	0.01	0.00	49.56
		Model Default Tier	Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Sweepers/Scrubbers	0.31	2.02	2.13	0.12	0.11	0.00	255.75	0.08	0.00	258.40
1.00		Model Default Tier	Model Default Tier	Tractors/Loaders/Backhoes	0.27	2.36	2.13	0.10	0.10	0.00	316.00	0.10	0.00	319.27
		Model Default Tier	Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade			pounds per day	10.66	64.42	87.29	2.58	2.42	0.17	16,795.46	4.68	0.14	16,955.19
	Drainage/Utilities/Sub-Grade			tons per phase	0.32	1.93	2.62	0.08	0.07	0.01	503.86	0.14	0.00	508.66

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Current Equipment Tier	Type	Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Selected ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
		Model Default Tier	Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00		Model Default Tier	Model Default Tier	Off-Highway Trucks	3.85	20.90	33.13	0.83	0.77	0.07	6,615.01	2.06	0.06	6,683.55
		Model Default Tier	Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Pavers	0.32	2.84	2.80	0.09	0.09	0.00	458.58	0.14	0.00	463.33
1.00		Model Default Tier	Model Default Tier	Paving Equipment	0.24	2.52	2.11	0.07	0.07	0.00	406.90	0.13	0.00	411.13
1.00		Model Default Tier	Model Default Tier	Plate Compactors	0.04	0.21	0.20	0.01	0.01	0.00	34.48	0.00	0.00	34.65
1.00		Model Default Tier	Model Default Tier	Pressure Washers	0.05	0.25	0.26	0.01	0.01	0.00	39.09	0.00	0.00	39.29
		Model Default Tier	Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Rollers	0.26	1.96	2.02	0.10	0.09	0.00	267.21	0.08	0.00	269.98
		Model Default Tier	Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1.00		Model Default Tier	Model Default Tier	Signal Boards	0.06	0.30	0.29	0.01	0.01	0.00	49.31	0.01	0.00	49.56
		Model Default Tier	Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Sweepers/Scrubbers	0.31	2.02	2.13	0.12	0.11	0.00	255.75	0.08	0.00	258.40
1.00		Model Default Tier	Model Default Tier	Tractors/Loaders/Backhoes	0.27	2.36	2.13	0.10	0.10	0.00	316.00	0.10	0.00	319.27
		Model Default Tier	Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving			pounds per day	5.38	33.35	45.07	1.34	1.23	0.08	8,442.32	2.60	0.07	8,529.18
	Paving			tons per phase	0.02	0.13	0.17	0.01	0.00	0.00	31.66	0.01	0.00	31.98
Total Emissions all Phases (tons per construction period) =>					0.86	5.12	7.28	0.21	0.20	0.01	1,341.18	0.40	0.01	1,354.62

Total Emission Estimates by Phase (Mitigated)

MRL-Phase 2A-South

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.06	0.42	0.45	1.06	0.02	1.05	0.23	0.01	0.22	0.00	130.55	0.03	0.00	119.49
Grading/Excavation	0.51	3.77	4.23	4.34	0.15	4.19	0.99	0.12	0.87	0.01	1,059.81	0.23	0.01	970.10
Drainage/Utilities/Sub-Grade	0.33	2.27	2.70	2.88	0.09	2.79	0.66	0.08	0.58	0.01	649.52	0.14	0.01	594.51
Paving	0.02	0.17	0.18	0.01	0.01	0.00	0.01	0.01	0.00	0.00	52.47	0.01	0.00	48.03
Maximum (tons/phase)	0.51	3.77	4.23	4.34	0.15	4.19	0.99	0.12	0.87	0.01	1059.81	0.23	0.01	970.10
Total (tons/construction project)	0.92	6.62	7.56	8.29	0.27	8.02	1.89	0.22	1.67	0.02	1892.35	0.41	0.02	1,732.14

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Total Emission Estimates by Phase (Un-Mitigated)

MRL-Phase 2A-South

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.06	0.42	0.56	1.07	0.03	1.05	0.24	0.02	0.22	0.00	130.55	0.03	0.00	119.49
Grading/Excavation	0.51	3.77	5.24	4.43	0.25	4.19	1.08	0.21	0.87	0.01	1,059.81	0.23	0.01	970.10
Drainage/Utilities/Sub-Grade	0.33	2.27	3.36	2.95	0.16	2.79	0.72	0.14	0.58	0.01	649.52	0.14	0.01	594.51
Paving	0.02	0.17	0.22	0.01	0.01	0.00	0.01	0.01	0.00	0.00	52.47	0.01	0.00	48.03
Maximum (tons/phase)	0.51	3.77	5.24	4.43	0.25	4.19	1.08	0.21	0.87	0.01	1059.81	0.23	0.01	970.10
Total (tons/construction project)	0.92	6.62	9.39	8.46	0.44	8.02	2.05	0.38	1.67	0.02	1892.35	0.41	0.02	1,732.14

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model — Version 8.1.0

Data Entry Worksheet

Note: Required data input sections have a yellow backgrou
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white backgroun
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name	MRL-Phase 2C	
Construction Start Year	2020	Enter a Year between 2014 and 2025 (inclusive)
Project Type	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway
For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data		2) Road Widening : Project to add a new lane to an existing roadway
		3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane
		4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	6.00	Months
Working Days per Month	30.00	Days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1) Sand Gravel : Use for quaternary deposits (Delta/West County)
(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)		2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta)
		3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.21	Miles
Total Project Area	12.16	Acres
Maximum Area Disturbed/Day	6.08	Acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing	20.00		30.00
	Grading/Excavation	20.00		30.00
	Drainage/Utilities/Sub-Grade	20.00		90.00
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving	20.00		36.00

Mitigation Options

On-road Fleet Emissions Mitigation	2010 and Newer On-road Vehicles Fleet	Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation	20% NOx and 45% Exhaust PM reduction	Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml).
	Tier 4 equipment for limited equipment types	Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.50	0.60		1/1/2020
Grading/Excavation	3.00	2.70		1/17/2020
Drainage/Utilities/Sub-Grade	2.00	1.80		4/18/2020
Paving	0.50	0.90		6/18/2020
Totals (Months)	6			

Soil Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	30.00			2	60.00
Miles/round trip: Grading/Excavation	30.00			2	60.00
Miles/round trip: Drainage/Utilities/Sub-Grade	90.00			5	450.00
Miles/round trip: Paving				0	0.00

2010+ Model Year Mitigation Option Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Grading/Excavation (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Paving (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.05	0.19	0.01	0.01	0.00	207.85	0.00	0.01	209.90
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.56	0.00	0.00	1.57
Pounds per day - Grading/Excavation	0.01	0.05	0.19	0.01	0.01	0.00	207.85	0.00	0.01	209.90
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	9.35	0.00	0.00	9.45
Pounds per day - Drainage/Utilities/Sub-Grade	0.07	0.36	1.45	0.10	0.04	0.01	1,558.86	0.00	0.05	1,574.22
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.01	0.04	0.00	0.00	0.00	46.77	0.00	0.00	47.23
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.01	0.05	0.00	0.00	0.00	57.68	0.00	0.00	58.25

Asphalt Hauling Emissions **User Input**	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00
Miles/round trip: Paving	36.00			2	72.00

2010+ Model Year Mitigation Option Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Grading/Excavation (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Paving (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.01	0.06	0.23	0.02	0.01	0.00	249.42	0.00	0.01	251.88
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	1.87	0.00	0.00	1.89
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	1.87	0.00	0.00	1.89

Worker Commute Emissions **User Input**	User Override of Worker Commute Default Values	Default Values	Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	60			
One-way trips/day	6			
No. of employees: Grubbing/Land Clearing	5		30	1,800.00
No. of employees: Grading/Excavation	10		60	3,600.00
No. of employees: Drainage/Utilities/Sub-Grade	5		30	1,800.00
No. of employees: Paving	5		30	1,800.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.02	1.08	0.11	0.05	0.02	0.00	371.46	0.01	0.00	373.08
Grading/Excavation (grams/mile)	0.02	1.08	0.11	0.05	0.02	0.00	371.46	0.01	0.00	373.08
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.08	0.11	0.05	0.02	0.00	371.46	0.01	0.00	373.08
Paving (grams/mile)	0.02	1.08	0.11	0.05	0.02	0.00	371.46	0.01	0.00	373.08
Grubbing/Land Clearing (grams/trip)	1.00	2.55	0.20	0.00	0.00	0.00	84.03	0.01	0.01	86.84
Grading/Excavation (grams/trip)	1.00	2.55	0.20	0.00	0.00	0.00	84.03	0.01	0.01	86.84
Draining/Utilities/Sub-Grade (grams/trip)	1.00	2.55	0.20	0.00	0.00	0.00	84.03	0.01	0.01	86.84
Paving (grams/trip)	1.00	2.55	0.20	0.00	0.00	0.00	84.03	0.01	0.01	86.84
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.15	4.44	0.46	0.19	0.08	0.01	1,479.65	0.03	0.02	1,486.24
Tons per const. Period - Grubbing/Land Clearing	0.00	0.03	0.00	0.00	0.00	0.00	11.10	0.00	0.00	11.15
Pounds per day - Grading/Excavation	0.30	8.88	0.93	0.37	0.16	0.03	2,959.29	0.07	0.04	2,972.48
Tons per const. Period - Grading/Excavation	0.01	0.40	0.04	0.02	0.01	0.00	133.17	0.00	0.00	133.76
Pounds per day - Drainage/Utilities/Sub-Grade	0.15	4.44	0.46	0.19	0.08	0.01	1,479.65	0.03	0.02	1,486.24
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.13	0.01	0.01	0.00	0.00	44.39	0.00	0.00	44.59
Pounds per day - Paving	0.15	4.44	0.46	0.19	0.08	0.01	1,479.65	0.03	0.02	1,486.24
Tons per const. Period - Paving	0.00	0.03	0.00	0.00	0.00	0.00	11.10	0.00	0.00	11.15
Total tons per construction project	0.02	0.60	0.06	0.03	0.01	0.00	199.75	0.00	0.00	200.64

Water Truck Emissions **User Input**	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust	1		40.00		40.00
Grading/Excavation - Exhaust	1		40.00		40.00
Drainage/Utilities/Subgrade	1		40.00		40.00
Paving	1		40.00		40.00

2010+ Model Year Mitigation Option Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Grading/Excavation (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79
Paving (grams/mile)	0.07	0.37	1.46	0.10	0.04	0.01	1,571.31	0.00	0.05	1,586.79

Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.03	0.13	0.01	0.00	0.00	138.57	0.00	0.00	139.93
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	1.05
Pounds per day - Grading/Excavation	0.01	0.03	0.13	0.01	0.00	0.00	138.57	0.00	0.00	139.93
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	6.24	0.00	0.00	6.30
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.03	0.13	0.01	0.00	0.00	138.57	0.00	0.00	139.93
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	4.16	0.00	0.00	4.20
Pounds per day - Paving	0.01	0.03	0.13	0.01	0.00	0.00	138.57	0.00	0.00	139.93
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	1.05
Total tons per construction project	0.00	0.00	0.01	0.00	0.00	0.00	12.47	0.00	0.00	12.59

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			60.80	0.46	12.65	0.09
Fugitive Dust - Grading/Excavation			60.80	2.74	12.65	0.57
Fugitive Dust - Drainage/Utilities/Subgrade			60.80	1.82	12.65	0.38

Off-Road Equipment Emissions

Grubbing/Land Clearing

Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option: Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Current Equipment Tier	Type	Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Selected: ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
		Model Default Tier	Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00		Model Default Tier	Model Default Tier	Off-Highway Trucks	1.32	7.58	10.07	0.25	0.23	0.03	2,544.52	0.82	0.02	2,571.93
		Model Default Tier	Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Model Default Tier	Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Pressure Washers	0.04	0.24	0.25	0.01	0.01	0.00	39.09	0.00	0.00	39.29
		Model Default Tier	Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Signal Boards	0.06	0.30	0.29	0.01	0.01	0.00	49.31	0.01	0.00	49.56
		Model Default Tier	Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Sweepers/Scrubbers	0.27	1.99	1.86	0.10	0.09	0.00	246.18	0.08	0.00	248.83
1.00		Model Default Tier	Model Default Tier	Tractors/Loaders/Backhoes	0.21	2.30	1.70	0.07	0.07	0.00	303.87	0.10	0.00	307.14
		Model Default Tier	Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment Number of Vehicles	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab	Equipment Tier		Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing			pounds per day	1.90	12.42	14.17	0.44	0.41	0.03	3,182.97	1.01	0.03	3,216.75
	Grubbing/Land Clearing			tons per phase	0.01	0.09	0.11	0.00	0.00	0.00	23.87	0.01	0.00	24.13

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Current Equipment Tier	Type	Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Selected ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
		Model Default Tier	Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Crawler Tractors	0.57	2.45	5.85	0.15	0.14	0.01	746.04	0.24	0.01	754.08
		Model Default Tier	Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Excavators	0.51	6.74	3.98	0.13	0.12	0.01	1,031.89	0.33	0.01	1,043.01
1.00		Model Default Tier	Model Default Tier	Forklifts	0.14	1.18	1.04	0.05	0.05	0.00	148.03	0.05	0.00	149.63
		Model Default Tier	Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Graders	0.72	4.58	5.60	0.21	0.20	0.01	604.94	0.20	0.01	611.44
		Model Default Tier	Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00		Model Default Tier	Model Default Tier	Off-Highway Trucks	2.64	15.16	20.13	0.50	0.46	0.05	5,089.05	1.65	0.05	5,143.85
		Model Default Tier	Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Pressure Washers	0.04	0.24	0.25	0.01	0.01	0.00	39.09	0.00	0.00	39.29

		Model Default Tier	Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.21	1.92	1.69	0.07	0.07	0.00	257.24	0.08	0.00	260.01
		Model Default Tier	Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Loaders	0.37	1.61	3.48	0.08	0.07	0.01	596.22	0.19	0.01	602.65
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Signal Boards	0.06	0.30	0.29	0.01	0.01	0.00	49.31	0.01	0.00	49.56
		Model Default Tier	Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Sweepers/Scrubbers	0.27	1.99	1.86	0.10	0.09	0.00	246.18	0.08	0.00	248.83
1.00			Model Default Tier	Tractors/Loaders/Backhoes	0.21	2.30	1.70	0.07	0.07	0.00	303.87	0.10	0.00	307.14
		Model Default Tier	Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab													
Number of Vehicles		Equipment Tier		Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	5.74	38.49	45.86	1.40	1.29	0.09	9,111.86	2.93	0.08	9,209.51
	Grading/Excavation			tons per phase	0.26	1.73	2.06	0.06	0.06	0.00	410.03	0.13	0.00	414.43

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Current Equipment Tier		Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Selected ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
1.00		Model Default Tier	Model Default Tier	Aerial Lifts	0.04	1.09	0.51	0.01	0.01	0.00	162.62	0.05	0.00	164.37
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Bore/Drill Rigs	0.26	1.94	2.63	0.05	0.05	0.01	848.06	0.27	0.01	857.23
1.00		Model Default Tier	Model Default Tier	Cement and Mortar Mixers	0.06	0.31	0.29	0.01	0.01	0.00	50.52	0.01	0.00	50.77
1.00		Model Default Tier	Model Default Tier	Concrete/Industrial Saws	0.42	3.69	2.64	0.11	0.11	0.01	592.67	0.04	0.00	594.93
		Model Default Tier	Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Excavators	0.25	3.37	1.99	0.07	0.06	0.01	515.95	0.17	0.00	521.51
		Model Default Tier	Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Generator Sets	0.40	3.71	2.78	0.11	0.11	0.01	623.04	0.04	0.00	625.31
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00		Model Default Tier	Model Default Tier	Off-Highway Trucks	2.64	15.16	20.13	0.50	0.46	0.05	5,089.05	1.65	0.05	5,143.85
		Model Default Tier	Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Pressure Washers	0.04	0.24	0.25	0.01	0.01	0.00	39.09	0.00	0.00	39.29
1.00			Model Default Tier	Pumps	0.42	3.76	2.82	0.11	0.11	0.01	623.04	0.04	0.00	625.36
		Model Default Tier	Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rough Terrain Forklifts	0.13	2.30	1.38	0.04	0.04	0.00	333.68	0.11	0.00	337.28
		Model Default Tier	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1.00			Model Default Tier	Signal Boards	0.06	0.30	0.29	0.01	0.01	0.00	49.31	0.01	0.00	49.56
		Model Default Tier	Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Sweepers/Scrubbers	0.27	1.99	1.86	0.10	0.09	0.00	246.18	0.08	0.00	248.83
1.00			Model Default Tier	Tractors/Loaders/Backhoes	0.21	2.30	1.70	0.07	0.07	0.00	303.87	0.10	0.00	307.14
		Model Default Tier	Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment Number of Vehicles	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab	Equipment Tier		Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade			pounds per day		5.21	40.17	39.29	1.20	1.13	0.10	9,477.05	2.55	0.08	9,565.44
	Drainage/Utilities/Sub-Grade			tons per phase		0.16	1.20	1.18	0.04	0.03	0.00	284.31	0.08	0.00	286.96

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Current Equipment Tier	Type	Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Selected ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
		Model Default Tier	Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00		Model Default Tier	Model Default Tier	Off-Highway Trucks	1.32	7.58	10.07	0.25	0.23	0.03	2,544.52	0.82	0.02	2,571.93
		Model Default Tier	Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Pavers	0.25	2.81	2.18	0.07	0.07	0.00	441.26	0.14	0.00	446.02
1.00			Model Default Tier	Paving Equipment	0.21	2.52	1.70	0.06	0.05	0.00	391.54	0.13	0.00	395.76
1.00		Model Default Tier	Model Default Tier	Plate Compactors	0.04	0.21	0.20	0.01	0.01	0.00	34.48	0.00	0.00	34.65
1.00		Model Default Tier	Model Default Tier	Pressure Washers	0.04	0.24	0.25	0.01	0.01	0.00	39.09	0.00	0.00	39.29
		Model Default Tier	Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rollers	0.21	1.92	1.69	0.07	0.07	0.00	257.24	0.08	0.00	260.01
		Model Default Tier	Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Signal Boards	0.06	0.30	0.29	0.01	0.01	0.00	49.31	0.01	0.00	49.56
		Model Default Tier	Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Sweepers/Scrubbers	0.27	1.99	1.86	0.10	0.09	0.00	246.18	0.08	0.00	248.83

1.00			Model Default Tier	Tractors/Loaders/Backhoes		0.21	2.30	1.70	0.07	0.07	0.00	303.87	0.10	0.00	307.14
		Model Default Tier	Model Default Tier	Trenchers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Model Default Tier	Welders		0.34	1.77	1.26	0.05	0.05	0.00	207.48	0.03	0.00	208.76
User-Defined Off-road Equipment Number of Vehicles	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab	Equipment Tier		Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving			pounds per day		2.96	21.64	21.19	0.70	0.65	0.05	4,514.98	1.40	0.04	4,561.96
	Paving			tons per phase		0.02	0.16	0.16	0.01	0.00	0.00	33.86	0.01	0.00	34.21
Total Emissions all Phases (tons per construction period) =>						0.45	3.19	3.51	0.11	0.10	0.01	752.08	0.23	0.01	759.73

Total Emission Estimates by Phase (Mitigated)

MRL-Phase 2C

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.02	0.13	0.11	0.46	0.00	0.46	0.10	0.00	0.09	0.00	37.57	0.01	0.00	34.38
Grading/Excavation	0.27	2.14	2.12	2.82	0.08	2.74	0.63	0.07	0.57	0.01	558.79	0.13	0.01	511.60
Drainage/Utilities/Sub-Grade	0.16	1.35	1.24	1.87	0.04	1.82	0.42	0.04	0.38	0.00	379.62	0.08	0.00	347.43
Paving	0.02	0.20	0.17	0.01	0.01	0.00	0.01	0.01	0.00	0.00	47.87	0.01	0.00	43.82
Maximum (tons/phase)	0.27	2.14	2.12	2.82	0.08	2.74	0.63	0.07	0.57	0.01	558.79	0.13	0.01	511.60
Total (tons/construction project)	0.47	3.81	3.64	5.15	0.14	5.02	1.16	0.11	1.04	0.01	1023.85	0.23	0.01	937.22

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Total Emission Estimates by Phase (Un-Mitigated)

MRL-Phase 2C

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.02	0.13	0.14	0.46	0.01	0.46	0.10	0.01	0.09	0.00	37.57	0.01	0.00	34.38
Grading/Excavation	0.27	2.14	2.64	2.87	0.13	2.74	0.68	0.11	0.57	0.01	558.79	0.13	0.01	511.60
Drainage/Utilities/Sub-Grade	0.16	1.35	1.53	1.90	0.07	1.82	0.44	0.07	0.38	0.00	379.62	0.08	0.00	347.43
Paving	0.02	0.20	0.20	0.01	0.01	0.00	0.01	0.01	0.00	0.00	47.87	0.01	0.00	43.82
Maximum (tons/phase)	0.27	2.14	2.64	2.87	0.13	2.74	0.68	0.11	0.57	0.01	558.79	0.13	0.01	511.60
Total (tons/construction project)	0.47	3.81	4.51	5.24	0.23	5.02	1.24	0.19	1.04	0.01	1023.85	0.23	0.01	937.22

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

APPENDIX D

HTRW ENVIRONMENTAL SITE ASSESSMENT

ENVIRONMENTAL SITE ASSESSMENT UPDATE

MARYSVILLE RING LEVEE PROJECT
PHASE 2A North/South and 2C
MARYSVILLE, CALIFORNIA

Prepared By:

Bruce VanEtten, Senior Engineering Technician
Environmental Design Section
U.S. Army Corps of Engineers, Sacramento District

Approved By:

Date:

_____ _____

Chris Goddard, PE
Section Chief, Environmental Design Section
U.S. Army Corps of Engineers, Sacramento District

TABLE OF CONTENTS

ACRONYMS

AMSL	Above Mean Sea Level
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
CA FID	California Facility Inventory Database
CA ML	Sacramento County Master List
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESPK	US Army Corps of Engineers, Sacramento District
CHMIRS	California Hazardous Material Incident Reporting System
DTSC	Department of Toxic Substance Control
ED-ED	Environmental Design Section
EDR	Environmental Data Resources Inc.
ER	Engineering Regulation (US Army Corps of Engineers)
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
HIST	Historical UST Registered Database
HTRW	Hazardous, Toxic, and Radioactive Waste
IAW	In accordance with
LUST	Leaking Underground Storage Tank
NEPA	National Environmental Policy Act
NFA	No further Action
NPL	National Priority List (Superfund Site)
RCRA	Resource Conservation and Recovery Act
SLIC	Spill, Leaks, Investigation and Cleanup Cost Recovery
SWF/LF	Solid Waste Facilities/Landfill Sites
SWIS	Solid Waste Information System
SWRCB	State Water Resources Control Board
TSCA	Toxic Substance Control Act
USEPA	US Environmental Protection Agency
USGS	US Geological Survey
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
WDS	Waste Discharge System

1.0 EXECUTIVE SUMMARY

The methodology of ASTM 1527-13 is used to conduct an Environmental Site Assessment (ESA) to identify Recognized Environmental Conditions in order to establish the presence or likely presence of hazardous substances or petroleum products under conditions that indicate a likely release, a past release, or a material threat of a release of those substances. This practice permits the user to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on Comprehensive Environmental Response, Compensation, and Liability Act liability. The ESA also provides background information for National Environmental Policy Act (NEPA) documents and can be included in the appendix of NEPA documents or included by reference.

In 2010, USACE performed an ESA for the complete Marysville Ring Levee project. The ESA project site in 2010 comprised the entire 7.2–mile levee system including a buffer zone extending outward 200 feet from either side of the levee centerline.

Project delays necessitated an ESA update dated 28 February 2014 to meet the requirements of the ASTM standard. The ESA was only conducted for the 0.75 mile Phase 2A portion of the levee. No Recognized Environmental Conditions were identified during the 2010 original ESA or the 2014 ESA update.

Additional project delays pushed the start time of construction to 2016. A second ESA update was conducted in support of real estate actions associated with the Phase 2A project. The ESA update was conducted in accordance with ASTM E1527-13 and ER1165-2-132. No Recognized Environmental Conditions were identified at the project site during completion update.

The purpose of this update to the ESA are due to changes in the project footprint to include a larger staging area for new material to be used during construction, and the Non-Federal Sponsor Real Estate requirements that a report must be dated within six months of the first lease offer to the property owner for the additional staging area. The ESA update contained herein was conducted in accordance with ASTM E1527-13 and ER1165-2-132. No Recognized Environmental Conditions were identified at the project site during completion of this ESA update.

2.0 INTRODUCTION

2.1 PURPOSE

The Environmental Design Section (ED-ED) of the Environmental Engineering Branch of the USACE in Sacramento, California, has prepared this report for the Marysville Ring Levee Phase 2A north/south and 2C project site in the Marysville Basin in Yuba County, California. This report is

known as an update to the Environmental Site Assessment (ESA) or a Phase I ESA update.

The National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA) and the USACE regulations require that an Environmental Site Assessment (ESA) be performed on a construction project site and its surrounding area. The purpose of the ESA is to identify and document Recognized Environmental Conditions that may have adverse impacts on the proposed construction project. ASTM 1527-13 defines Recognized Environmental Conditions as "…the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of future release to the environment."

In 2010, USACE performed an ESA for the Marysville Ring Levee (MRL) project, in accordance with ASTM 1527-05. The ESA consisted of reviewing regulatory lists of Hazardous, Toxic and, Radioactive Waste (HTRW) sites, historical literature, aerial photographs, websites and conducting interviews with people who are knowledgeable about the project, the project site and the surrounding area. A site reconnaissance was also conducted as part of the ESA process.

In 2014, USACE performed an update to the 2010 ESA in order to meet the requirements of ASTM 1527-13 Section 4.6, the updated standard, which requires an ESA be updated within one year prior to the date of intended transaction. The update was only performed for the Phase 2A portion of the MRL, which was scheduled to begin construction in 2014. A data search, site reconnaissance, and interviews were conducted as part of the ESA update process.

Delays in construction start date necessitated a second ESA update in 2016. Temporary and permanent easements are required for the construction phase and operations and maintenance of the completed project.

This third update to the ESA is required due to changes in the project footprint to include a larger staging area for new material to be used during construction, and the Non-Federal Sponsor Real Estate requirements that a report must be dated within six months of the first lease offer to the property owner for the additional staging area.

2.2 DETAILED SCOPE-OF-SERVICES

The ESA project site (the site) resides within the area created by the limits of construction for the MRL Phase 2A north/south and 2C project (See Section 13.2 for a map showing the limits of construction). The ESA is concerned with identifying and documenting Recognized Environmental Conditions as defined by ASTM 1527-13 on this site and the adjacent properties using commonly known and reasonably ascertainable information, such as historical records, regulatory databases, and aerial photographs.

2.3 SIGNIFICANT ASSUMPTIONS

Since the areas surrounding the levees have been used extensively for agricultural purposes in the past, it is likely that there may be chemical fertilizers and pesticides present on farmlands located

adjacent and near the site. Because many of the substances that were legally applied in the past (e.g. DDT) also remain in the environment, it is also likely that some concentration of these substances are present today in the soils near and on the site.

2.4 LIMITATIONS AND EXCEPTIONS

The ESA does not include any sampling or testing of soil, air, water or building materials. The interiors of buildings and structures were not inspected.

2.5 SPECIAL TERMS AND CONDITIONS

The current MRL project does not involve purchase of property for commercial purposes, and as such, the conditions for the ASTM specifications are not completely applicable. The ASTM standard is used as a guide and sections that are not applicable are ignored to meet the requirements of the project. Where applicable, the format and guidance recommended by ASTM is followed as stated in standard ASTM 1527-13.

2.6 USER RELIANCE

There has been no contradictory information provided.

3.0 SITE DESCRIPTION

3.1 LOCATION AND LEGAL DESCRIPTION

The MRL project aims to improve the approximately 7.2 mile earthen levee system encircling the 1,500-acre Marysville Basin, located in Yuba County. Levee improvements have been separated into seven phases of construction (Phases 1, 2A, 2B, 2C, 3, 4A, and 4B). The location of each project phase is shown in Section 13.2. Phase 2A north/south and 2C is the focus of this ESA update.

3.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The levees were originally constructed beginning in 1862 and by 1868 a levee system completely encircled the city of Marysville. The levee heights range from an elevation of 16 to 28 feet above sea level, having been elevated from the original 5 feet during several periods of construction. The levees protect Marysville from Jack Slough in the north, the Feather River in the west, and the Yuba River in the south.

Phase 2A north is located between the levee and the Feather River from 5th street to just north of 10th street. 2A South is located between the levee and the confines of the Feather River and Yuba River from 5th street to the railroad crossing over the Yuba River. Phase 2C overlaps Phase 2A south a little and is located between the levee and the Yuba River from just south of the Railroad trellis to Highway 70. Refer to the boundary map in Section 13.2.

3.3 CURRENT USE OF THE PROPERTY

The site is currently used for levees that protect the city of Marysville from flooding. The top of the levee is used a recreational trail for cyclists and joggers. The landside of the levee contains an active railroad line that is adjacent to the levee but not included in the project. The proposed staging area on the waterside of the levee contains baseball fields, parking lots, and other associated recreational facilities.

3.4 DESCRIPTIONS OF STRUCTURES, ROADS, OTHER IMPROVEMENTS ON THE SITE

The site contains a paved surface on top of the levee for the entire length. The site is crossed by 5th Street Bridge and the Highway 20 Bridge, both of which connect the City of Marysville with Yuba City.

There is also an underground fiber optic cable crossing beneath the levee. Overhead electrical lines run parallel to the levee for a portion of the site. Several storage sheds and utility boxes are located at the site. There are also various other underground utility lines that cross the site. Available utility drawings were reviewed for this report. Two restroom facilities are located on the site, but only one of them is operational. The construction site also includes a paved parking area.

3.5 CURRENT USES OF THE ADJOINING PROPERTIES

Land use in the Marysville area is mostly developed residential. There are a few light industries to the west and south and a school in the northwest. A hospital is located on the west side of Marysville, just inside the levee. Outside the Marysville Basin is mostly agricultural use, except that Yuba City lies to the west across the Feather River and South Yuba City and Linda lie to the south across the Yuba River. The confluence of the two rivers is south and slightly west of Marysville.

Adjacent to the site there is a wastewater treatment facility and associated infiltration ponds located in the southwest portion of the city. The treatment facility and ponds are connected by piping that runs through the project site.

The portions of the site immediately adjacent to the levee area consist of multiple site uses. The water side of the levee consists of the Riverfront Park Complex, a city park that includes a golf driving range, motocross course, soccer fields, a nature area, concert pavilion, picnicking area, boat ramp, softball fields, and a BMX bicycle track. The softball fields and picnic area are located directly adjacent to the Phase 2A north/south part of the project.

On the land side of the levee, site usage consists mostly of shops, restaurants, light industry, the railroad and other various commercial and residential uses.

4.0 USER PROVIDED INFORMATION

4.1 TITLE RECORDS

Title records were not obtained as they were not required to develop a history of the previous uses of the site, per ASTM 1527-13.

4.2 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

There are no environmental liens or activity and no use limitations within the project site (EDR, 2017). The records used to ascertain this information include: the National Priority List, Federal Superfund Liens, Federal Institutional Controls/Engineering Controls Registries, State and Tribal Equivalent NPL - State Response Sites, State and Tribal Registered Storage Tank Lists – Active UST Facilities, Aboveground Petroleum Storage Tank Facilities and USTs on Indian Land, US Clandestine Drug Labs, CERCLA Lien Information, Land Use Control Information System, Environmental Liens Listing, Military Cleanup Sites Listing, Department of Defense Sites, and Formerly Used Defense Sites.

4.3 REASON FOR PERFORMING PHASE I

The use of ASTM 1527-13 is to identify Recognized Environmental Conditions in order to establish the presence or likely presence of hazardous substances or petroleum products under conditions that indicate a likely release, a past release or a material threat of a release of those substances. This practice permits the user to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on CERCLA liability

4.4 OTHER

This ESA update will follow the environmental industry practice of using the guidelines set forth in the USEPA rule concerning “All Appropriate Inquiries,” the ASTM E 1527-13 standard, and USACE Engineering Regulation (ER) 1162-2-132. ASTM E 1527-13 was designed to protect persons purchasing property from liability arising from adverse environmental conditions, but also may be used for other situations per section 4.2.1 of the standard.

5.0 RECORDS REVIEW

5.1 STANDARD ENVIRONMENTAL RECORD SOURCES

A records review was completed March 2017; this EDR report is included in Section 13.5. The standard environmental records review is summarized in Section 13.4. The sites found in the standard records review are investigated using publicly available information. Due to the nature of contaminant at each site, the cleanup status, or the distance away from Phase 2A north/south and 2C, none of these sites represent a REC.

The EDR report includes additional environmental records. A review of these records did not reveal any RECs associated with MRL Phase 2A north/south and 2C.

1. Historic Data includes the following findings, none of which presented Recognized Environmental Conditions within the project site, therefore the data is given for information only:

    a. Shell Oil (501 5th St, ~0.4 miles from site) – Leaking Underground Storage Tank (LUST) site remediation, case closed in January 2014.
    b. Daoust Chevrolet (529 5th St, ~0.35 miles from site) – LUST site investigation, case closed in 2003.
    c. Arrow Mfg. (1st and F Streets; ~0.2 miles from site) – Site screening completed 1987.
    d. Lube Stop (923 5th Street, ~0.1 miles from site) – LUST site investigation, case closed in 1996.
    e. Chevron (929 5th Street, ~0.1 miles from site) –LUST site investigation, case closed 2012.
    f. Hurst Brothers (710 3rd St; ~0.1 miles from site) – LUST site investigation; case closed in 1996.
    g. SaveMart (828 J St; <0.1 miles from site) – Ruptured truck fuel tank in August 1994 caused an estimated 150 gallons of diesel release to the storm drain.
    h. Marysville Plaza (401 E St; ~0.4 miles from site) – LUST site investigation with corrective action currently underway.
    i. Mobil 04-GPE (229 E St; ~0.3 miles from site) – LUST site investigation with corrective action currently underway. Site is listed as eligible for closure as of 9/22/2015.
    j. Sierra Central Credit Union (422 4th St; ~0.35 miles from site) – LUST site investigation with corrective action currently underway. Regulator has accepted Low-Threat Closure Application as of May 2015; administrative tasks are required to obtain closure.
    k. Rideout Hospital (726 4th St; ~0.2 miles from site) – LUST site investigation, case closed in 1998.
    l. Sewage Lift Station (1st & F St; ~0.2 miles from site) – LUST site investigation, case closed in 1996.
    m. Yuba County Government Center (915 8th St, ~0.1 miles from site) – LUST site investigation, case closed in 2004.
    n. Econo-Gas (704 10th St; ~0.35 miles from site) – LUST site investigation, case closed in 2014.
    o. Marysville Auto Body (525 1st St; ~0.2 miles from site) – Cleanup site currently under investigation.
    p. 3rd and H St (~0.15 miles from site) – Transformer failure caused ½ gallon of PCB-containing oil to be released in 2000.
    q. PG&E Gas Plant (2nd St between Elm and B St; ~0.4 miles from site) – Site does not qualify for the NPL and no further remedial action is planned.
    r. Yuba City Steel Production (526 Stevens Ave; ~0.85 miles from site) – contaminated soil was removed from the site in 1992. Site is listed as a Brownfield property.

s. 1st Stop (248 Bridge St; ~0.45 miles from site) – corrective action currently underway for a leaking UST.

A listing of historical environmental record sources for Phase 2A north/south and 2C was provided in the Radius Map Report with GeoCheck, Environmental Data Resources, Inc., March 2017. The sites found in the standard records review are investigated using publicly available information. Due to the nature of contaminant at each site, the cleanup status, or the distance away from Phase 2A north/south and 2C, none of these sites represent a REC and are not expected to adversely affect the project.

5.2 HISTORICAL USE INFORMATION ON THE PROPERTY AND ADJOINING PROPERTIES

ASTM E 1527-13 requires that an ESA consist of diligently conducting a reasonable search of all available information, performing a site reconnaissance, and interviewing people who are knowledgeable about the current and past uses of the project site and surrounding area, its waste disposal practices, and its environmental compliance history.

Specifically, the current search consisted of information from the following sources:

(1) A reconnaissance of sites along the entire Phase 2A north/south and 2C project boundaries was performed to fulfill the requirements of ASTM E 1527-13 on March 6, 2017. Photographs of significant or typical observations were made to document the reconnaissance and to provide additional visual information. These photographs are included in Section 13.3. This site reconnaissance revealed no Recognized Environmental Conditions.

(2) A search of the available records as provided by the "The EDR Radius Map™ Report with GeoCheck®" dated March 2017, is included as Section 13.4. Additional searches were conducted in the Environmental Records Search, Marysville Ring Levee Project, Marysville, Yuba County, California in 2009, and a new search was conducted for the 2014.

(3) Interviews of appropriate personnel that might have knowledge of recognized environmental conditions were conducted in 2009, 2014 and 2016. Additional interviews were deemed not necessary for this update since they did not contribute any significant information about past or present hazardous substances on the sites.

(4) From the review of topographical maps, COE concludes that, since 1888, there were no noticeable changes on the project site except for the addition of the sewage disposal facility.

(5) From review of the aerial photographs, COE concludes that there were no noticeable changes except for the structures and the effluent storage ponds.

6.0 SITE RECONNAISSANCE

6.1 METHODOLOGY AND LIMITING CONDITIONS

The extent of the March 6, 2017 site reconnaissance by Bruce VanEtten of Environmental Design Section was conducted based on previously available information as well as with the updated project limits of construction (see Section 13.2). The site reconnaissance involved walking along the top of the levee over the Phase 2A north/south and 2C portion of the project. The scoping and the time factor prohibited obtaining access to building interiors during the site visit. Photographs taken during the site visit are located in Section 13.3.

6.2 GENERAL SITE SETTING

The adjacent properties on the waterside of the Phase 2A north/south and 2C levee system are mostly used for recreation; Riverfront Park is adjacent to the entirety of the Phase 2A north/south site. Phase 2C section of the levee is approximately 1,100 feet long and located in the southern part of the MRL. This section is covered with asphalt, intersecting with Biz Johnson Drive, lying between UPRR trestle in the west and Highway 70 overpass in the east, and parallel with the Yuba River. The landside of Phase 2A north/south and 2C is generally industrial or commercial properties; an active railroad line runs parallel to the entire length of the site.

6.3 EXTERIOR OBSERVATIONS

The levees were generally littered with debris on primarily the waterside due to recent floods. A few locations along the landside appeared to have been used as illegal dumping grounds for household trash during last year's site visit but have since been cleaned up. There were no hazardous substances observed at these sites.

The objective of the site reconnaissance is to obtain information indicating the likelihood of Recognized Environmental Conditions in connection with the site. The following items were noted:

1) The City of Marysville operates a wastewater treatment plant (WWTP) adjacent to the project area. Treated wastewater is discharged via underground piping to infiltration ponds located on the in the floodplain adjacent to the project. The underground sanitary lines pass under the southeastern edge of the project site. The State Water Resources Control Board issued Order No. R5-2008-0110 for the WWTP. The order requires the City of Marysville begin sending wastewater to the nearby Linda County WWTP. The City of Marysville is constructing a new pump station and force main, with anticipated completion in 2016. The infiltration ponds will be decommissioned following the completion of the new collection system.

2) There is an abandoned bathroom facility located adjacent to the levee. The doors of this facility are welded shut to prevent unauthorized use. There is also an operational bathroom facility that is connected to the sanitary sewer system. As-built drawings for the two restrooms located within the project boundary indicate that there was originally potable water and sewer service to these buildings. These drawings indicate these water and sewer lines enter the project site from the city

of Marysville distribution systems near the 5th Street Bridge. The potable water source for the city of Marysville is treated groundwater.

3) There are some areas of the adjacent railroad lines that appear to have evidence of small petroleum spill. The long history of the rail corridor in this area increases the chances that contaminants such as creosote, petroleum products, fossil fuel combustions products, pesticides/herbicides and metals are present in the soil along and adjacent to the railroad track.
4) A storage shed was observed on the center line of the levee. The shed is used to store flood fighting materials. Due to the construction date of the shed, there is a potential that it contains lead based paint, which is a non-scope issue.
5) The railroad company has several storage sheds located adjacent to the levee. The interior of these sheds were not examined.
6) The USACE has one monitoring well located on the crown of the levee. The well is used to monitor the groundwater elevation.
7) A portion of the railroad lines adjacent to the site is used as rail car storage. On occasion, the rail company stores rail cars containing hazardous material; the city places a limit on the length of time such cars are allowed to be stored there. There have been no known instances of a hazardous material spill as a result of these activities.
8) There were several electrical service boxes observed on the site. No apparent issues were observed.
9) There is a utility pole that runs parallel to the levee north of 5th street. There were several transformers located on this line. It is unknown if these transformers contain polychlorinated biphenyls (PCBs); the transformers appeared newer and in good condition with no obvious signs of past leaks.
10) There are two softball fields that are located within the site boundaries. It is assumed that pesticides are used on these fields.
11) Several dump sites were observed, though the amount of debris was less than the 2016 site visit. Observed debris appeared to be non-hazardous municipal waste.
12) There is no evidence of releases of hazardous substances or petroleum products to the environment along the project area. None of the persons interviewed in the past recalled any releases or incidents. Once a year during the summer months, drip torches are used to burn off the grass on the levee. The fuel used is a mixture of diesel and gasoline. Environmental impact of this activity is assumed to be minimal.
13) The levee has had history of gophers burrowing in its side, potentially compromising the integrity of the levee. Squirrel bait stations are used to poison the gophers in an attempt to reduce their population.
14) The history of the Marysville area dates back to the 19th Century. There may be historic abandoned septic systems, underground storage tanks, water/utility distribution systems and wells. No potential sites were observed in the project site.

Non-Scope Issues

The following issues are listed as non-scope issues in ASTM 1527-13. They were observed during the site reconnaissance, and are being noted for completeness. There is no REC associated with any of these items.

1) Potential lead-based paint was observed on all structures present on or adjacent to the Phase 2A portion of the site. The exact construction date of these buildings is unknown.
2) Due to the age of the levees and surrounding areas, there is potential for discovery of cultural or historic resources.

6.4 INTERIOR OBSERVATIONS

Interiors of structures were not inspected since they were not part of the project scope and per section 4.5.2 of the ASTM 1527-13, time limitations prevented obtaining access from each owner of every structure.

7.0 INTERVIEWS

The purpose of conducting interviews is to obtain up-to-date information and confirm known information about Recognized Environmental Conditions in connection with the site. Since interviews conducted for the 2009, 2014 and 2016 ESA, additional interviews were deemed unnecessary for this update. In general no new information was added from the interviews than what was known from the data report.

8.0 FINDINGS

The ESA yielded the following results:

1. No Recognized Environmental Conditions were observed along the MRL Phase 2A north/south and 2C limits of construction. All of the adjacent properties on the land side appeared well maintained and clean during the site visit.
2. The private industries along the levees do not appear to use significant amounts of hazardous materials; hence the threat of releases from industrial operations is negligible. There are some reports that Union Pacific Railroad transports hazardous materials along railroad tracks adjacent to the project. No documentation of spills was located.

9.0 OPINION

The inquiry has adequately identified conditions that may be indicative of possible releases or threatened releases of hazardous substances on, at, in, or to the site. The material threat of hazardous substances release is small. The records research report indicates that there are no Recognized Environmental Conditions within the Phase 2A north/south and 2C project area.

Additional investigations in areas where hazardous materials (including petroleum products) are

currently or were historically used may be warranted if it is likely that the construction work may be impacted by such uses.

10.0 CONCLUSIONS

A Phase I Environmental Site Assessment was performed in conformance with the scope and limitations of ASTM Practice E 1527-13 for the Phase 2A north/south and phase 2C levee surrounding the City of Marysville in Yuba County, California. Any exceptions to, or deletions from this practice are described in Section 2.4 of this report. This assessment has revealed no Recognized Environmental Conditions in connection with the site.

11.0 DEVIATIONS

11.1 MULTIPLE OWNERS

Since the property in question is largely public lands or waterways, the previous year's interviews with one exception, were all government (Federal, state and local) officials.

11.2 DATA GAPS

No data gaps as defined in 40 CFR Section 312.10 were identified.

12.0 REFERENCES

(1) ASTM, E 1527-13 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Phase I ESA)

(2) Environmental Records Search Marysville Ring Levee Project Marysville, Yuba County, California, Youngdahl Consulting Group, Inc., December 2009.

(3) Feasibility Level Design Report Marysville Ring Levee Yuba River Basin, California, USACE, Sacramento District, October 05, 2009.

(4) The EDR Radius Map Report™ with GeoCheck®, Marysville Ring Levee, Phase 2A, Environmental Data Resources Inc., February 2014.

(5) The EDR Radius Map Report™ with GeoCheck®, Marysville Ring Levee, Phase 2C, Environmental Data Resources Inc., December 31, 2015.

(6) USACE, ER 1165-2-132 Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects, 26 June 1992.

(7) USACE, Environmental Site Assessment, Marysville Ring Levee Project, Phase 2A, 28 February 2014.

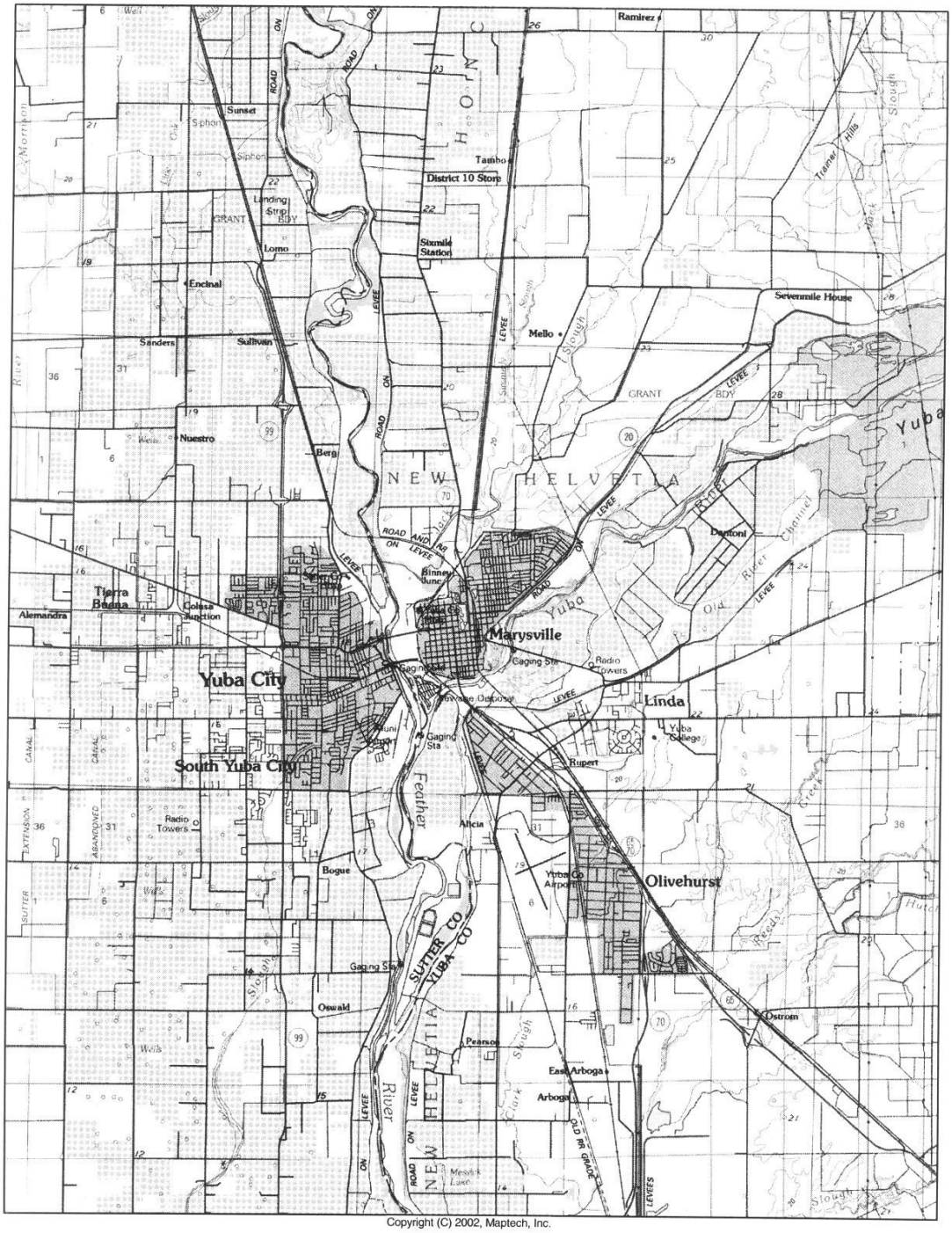
(8) USACE, Environmental Site Assessment, Marysville Ring Levee Project, Phase 2A, 01 February 2016

(9) USACE, Environmental Site Assessment, Marysville Ring Levee Project, Phase 2C, March 2016

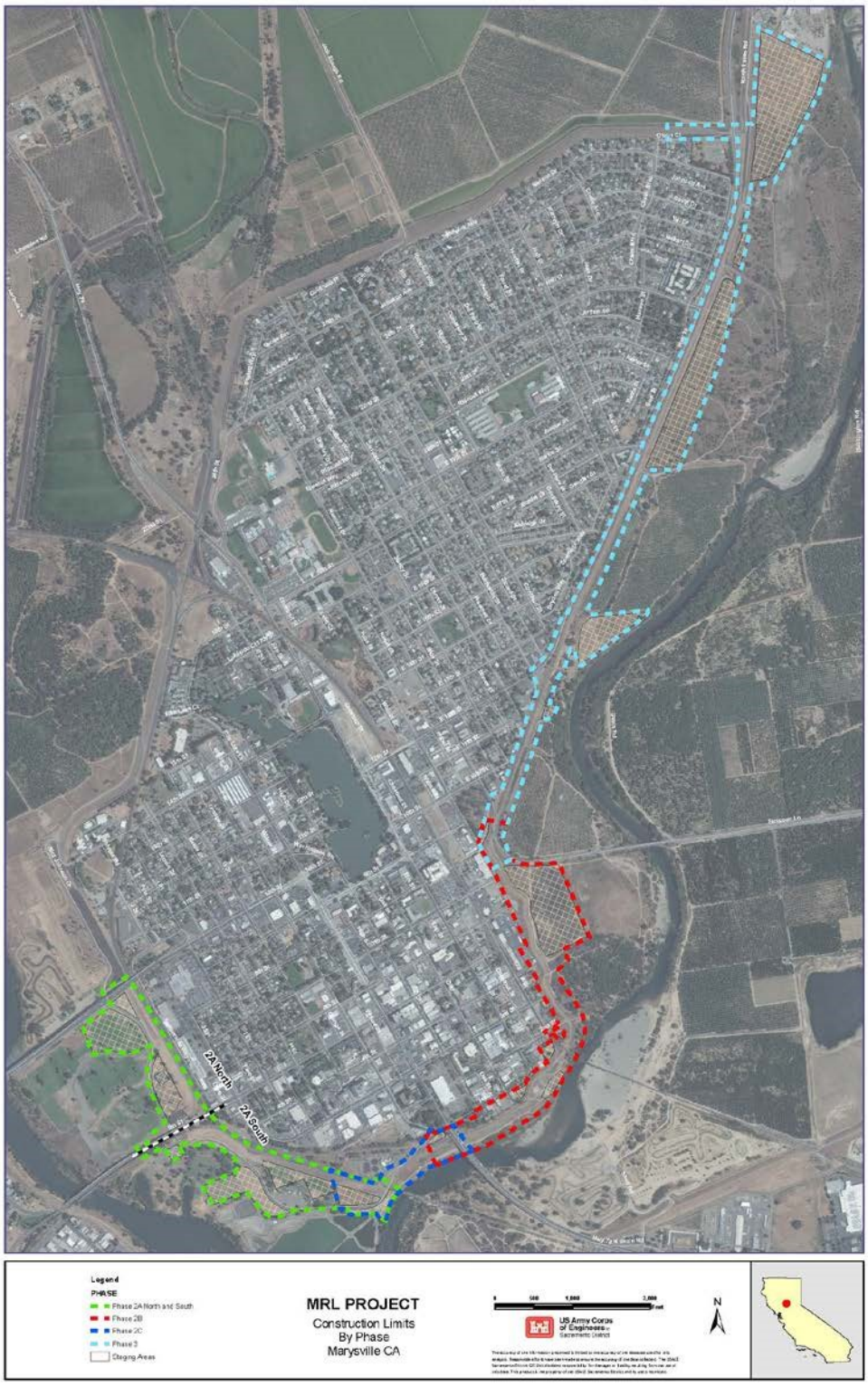
(10) USGS, Yuba City, CA 7.5 Minute Quadrangle Topographic Map, 2012.

13.0 ATTACHMENTS

13.1 MARYSVILLE, CA VINICITY MAP



13.2 PHASE 2A NORTH/SOUTH & 2C VICINITY MAP



13.3 SITE PHOTOGRAPHS

Photo 01: South side of levee after Oroville Dam release in phase 2C

Photo 02: South side of levee after Oroville Dam release in phase 2A

Photo 03: Railroad Bridge in phase 2A

13.4 HISTORICAL RESEARCH DOCUMENTATION

Standard Environmental Record Source Search Results				
Database Searched	**Approximate Minimum Search Distance[1] (miles)**	**Total Sites Plotted**	**Sites in minimum search distance**	**Site name (distance)**
Federal NPL site list	1.0	0	0	-
Federal Delisted NPL site list	0.5	0	0	-
Federal CERCLIS list	0.5	2	0	-
Federal CERCLIS NFRAP site list	0.5	6	1	PG&E gas plant(0.4miles)
Federal RCRA CORRACTS facilities list	1.0	1	0	-
Federal RCRA non-CORRACTS TSD facilities list	0.5	0		-
Federal RCRA generators list	property and adjoining properties	18	0	-
Federal institutional control/engineering control registries	property only	0	0	-
Federal ERNS list	property only	2	0	-
State- and tribal-equivalent NPL	1.0	2	1	Yuba City Steel Production (0.85mi)
State- and tribal-equivalent CERCLIS	0.5	16	1	Arrow MFG (0.1mi)
State and tribal landfill and/or solid waste disposal site lists	0.5	0	0	-
State and tribal leaking storage tank lists	0.5	73	72	Marysville Plaza(0.29mi) Mobil 04-GPE (0.2mi) Sierra Central Credi (0.25mi)

Standard Environmental Record Source Search Results				
				1st Stop (ak239/242) (0.45mi) Marysville Auto Body (0.05mi)
State and tribal registered storage tank lists	property and adjoining properties	24	0	-
State and tribal institutional control/ engineering control registries	property only	0	0	-
State and tribal voluntary cleanup sites	0.5	2	0	-
State and tribal Brownfield sites	0.5	1	1	Yuba City Steel Prod (0.85mi)

[1] From ASTM 1527-13 [2] Only open sites are examined in detail

APPENDIX E

Public Comments and Responses