EXHIBIT A

SAN MATEO COUNTY FLOOD CONTROL DISTRICT

COLMA CREEK FLOOD CONTROL ZONE

Colma Creek Flood Control Channel Wall Repair Project

Initial Study/Mitigated Negative Declaration

CDM

August 26, 2010

PUBLIC DRAFT

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LIST OF ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
BAAQMD	Bay Area Air Quality Management District
BMPs	Best Management Practices
CAAQS	California Ambient Air Quality Standards
CCS	cryptocrystalline silicate stone
CalEPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety Health Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CMA	Congestion Management Authority

CNEL	Community Equivalent Noise Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_4	methane
CWA	Federal Clean Water Act
dB	decibel
dBA	A-weighted decibel
DOC	California Department of Conservation
DTSC	Department of Toxic Substances Control
EDR	Environmental Data Resources
EIR	Environmental Impact Report
EMFAC	Emissions Factor Model
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
g	Measurement of the acceleration of gravity
GHG	greenhouse gas
HMCP	Hazardous Materials Contingency Plan
ips	inches per second

LCFS	Low Carbon Fuel Standard
L_{dn}	day-night noise level
L_{eq}	equivalent sound level
L_{max}	maximum noise level measured during a monitoring period
LOS	level of service
MG	million gallon
$\mu g/m^3$	micrograms per cubic meter
$MTCO_2e$	metric tons of carbon dioxide equivalent
NAHC	Native American Heritage Commission
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
O_3	ozone
OFFROAD	Off-road vehicle emissions inventory model
OSHA	Federal Occupational Health and Safety Administration
Pb	lead
$PM_{2.5/10}$	particulate matter
ppmv	parts per million by volume
ppv	peak particle velocity
PSM	process safety management
RCRA	Resource Conservation and Recovery Act
RWQCB	Regional Water Quality Control Board

SARA	Superfund Amendments and Reauthorization Act of 1986
SB	Senate Bill
SO_2	sulfur dioxide
SWRCB	State Water Resources Control Board
URBEMIS	Urban Emissions Model
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compounds
WMP	Waste Management Plan

INTRODUCTION

This Initial Study evaluates the potential environmental effects of the proposed repair of the Colma Creek Flood Control Channel upstream of Spruce Avenue, herein referred to as the "proposed project".

This Initial Study is being provided as part of the California Environmental Quality Act (CEQA) documentation for the County of San Mateo's consideration. The proposed project is anticipated to be classified and determined as repair of a flood control facility.

Environmental Review Process

The County of San Mateo's review and determination regarding the potential environmental impacts of the proposed project will be based on the data presented in this Initial Study. This Initial Study has been prepared to provide the environmental documentation for the County's review of the proposed project. The County of San Mateo is assuming the role of "Lead Agency" for this project in accordance with CEQA and the State CEQA Guidelines.

This document contains an "Environmental Checklist Form" for assessing potential environmental impacts of the proposed project in a modified form suggested by Appendix G of the State CEQA Guidelines. This form does not identify any significant environmental impacts, after mitigation, associated with the construction of the proposed project. This document suffices to fulfill the environmental review requirements for various other reviews and approvals by the County of San Mateo and other agencies, as noted in Item 10 of the Environmental Checklist Form.

A brief explanation is provided for all the responses contained in the Environmental Checklist Form. Supportive documentation is provided for those responses identified as "No Impact". Where appropriate, mitigation measures have been identified to reduce potentially significant impacts to a less-than-significant level.

The proposed project is not expected to result in any environmental impacts that would not be mitigated to a less-than-significant level through project design or implementation of existing federal, state or county regulations or standards. Based on this determination, the County of San Mateo is proposing to adopt a "Mitigated Negative Declaration" for the proposed project.

ENVIRONMENTAL CHECKLIST FORM

1. **Project Title:** Colma Creek Flood Control Channel Wall Repair Project

2. **Lead Agency Name and Address:**

   San Mateo County Flood Control District
   c/o County of San Mateo Department of Public Works
   555 County Center, 5th Floor
   Redwood City, CA 94063-1665

3. **Contact Person and Phone Number:**

   Mr. Mark Y. Chow, P.E.
   (650) 599-1489

4. **Project Location:**

   The proposed project is located along Colma Creek in the City of South San Francisco, California. The limits of the proposed project extend from approximately 300 feet upstream of the centerline of the Spruce Avenue Bridge at an existing transition structure to approximately 80 feet downstream of the centerline of the Spruce Avenue Bridge.

5. **Project Sponsor's Name and Address:**

   San Mateo County Flood Control District
   555 County Center, 5th Floor
   Redwood City, CA 94063-1665

6. **General Plan Designation:**

   The proposed project site lies within the Loft Overlay District in the City of South San Francisco General Plan (1999). Colma Creek is designated as "Public" land. Land use to the north of Colma Creek is designated as an overlay of "Business Commercial" and "Medium Density Residential". The land immediately to the south of the creek is designated as "Community Commercial" land and "Medium Density Residential" land.

7. **Zoning:**

   The project site is within the City of South San Francisco. In accordance with the City of South San Francisco Zoning Ordinance, the site is zoned as "P1 – Planned Industrial District".

8. Description of Project:

Project Objective

The main purpose of the proposed project is to repair the Colma Creek Flood Control Channel (Colma Creek Channel) upstream of Spruce Avenue, in the City of South San Francisco. The project would involve repair of the failing vertical north and south channel walls, including removal of the temporary bracing pipes spanning the creek channel, and construction of a U-shaped wall and concrete bottom slab.

The importance of replacement walls at the proposed project location is amplified by the historic flooding in the area. Under current conditions, if a major flood or heavy storm event were to occur, the event could cause the collapse of the compromised channel walls. A wall collapse would cause a multitude of problems, including soil and debris falling into the channel, flooding of adjacent lands, and compromise of the existing 12 inch water pipeline and 27 inch sanitary sewer lines that run adjacent to the channel.

This CEQA Initial Study/Mitigated Negative Declaration (IS/MND) analyzes the environmental impacts associated with the proposed project, which includes the construction of U-shaped walls and a concrete bottom along the Colma Creek Channel for a total distance of approximately 380 feet from upstream of the Spruce Avenue Bridge to immediately downstream of the Spruce Avenue Bridge.

Regional Project Location

The proposed project is located along Colma Creek upstream of Spruce Avenue Bridge in the City of South San Francisco, California (see Figure 1). The creek flows approximately eight miles from its headwaters in the San Bruno Mountain State and County Park south and easterly to its discharge in the San Francisco Bay. Colma Creek, Twelve Mile Creek, and their tributaries make up the Colma Creek watershed in San Mateo County. Historically, the creeks and tributaries of the Colma Creek Watershed conveyed surface runoff water from the surrounding higher peaks. Today the majority of the watershed runoff is conveyed in underground storm drains or improved creek channels. Land use in the vicinity of Colma Creek is largely comprised of urban, industrial, and residential development.

The Colma Creek Watershed is 15.7 square miles and encompasses the City of South San Francisco, the Town of Colma, portions of the cities of Daly City, Pacifica, and San Bruno, and portions of unincorporated areas of San Mateo County. The Colma Creek Watershed is formed by natural mountain ridge boundaries surrounding a lower valley floor. Colma Creek flows from its headwaters on San Bruno Mountain into the San Francisco Bay, approximately 1 mile east of the project site. Skyline Boulevard forms the watershed boundary to the west, San Bruno Mountain forms the watershed boundary to the north, and

N

0 1,500 3,000

Daly City

Colma

Daly City

South San Francisco

Project Site

San Bruno

Denotes
City Limit

Source: USGS 7.5' Quadrangle Topographic Map

Legend:

Colma Creek Flood Control Zone Boundary

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CDM

Figure 1
Location Map

the San Francisco Bay forms the watershed boundary to the east. Watershed ridge boundaries vary in elevation from 600 feet above mean sea level (msl) at Skyline Boulevard to the southwest and 1,300 feet above msl at Communication Towers to the north.

Project Location

The limits of the proposed project extend from approximately 300 feet upstream of the centerline of the Spruce Avenue Bridge at an existing transition structure to approximately 80 feet downstream of the centerline of the Spruce Avenue Bridge. The transition structure serves to reduce the velocity of the flowing creek water as the channel transitions from trapezoidal to vertical walls. The channel bottom at the Spruce Avenue Bridge is at sea level (0.0 feet elevation 1929 NGVD). The mean higher high tide at San Francisco Bay is 3.7 feet in elevation (1929 NGVD). The channel bottom reaches this elevation (3.7 feet elevation 1929 NGVD) approximately 800 feet upstream of the centerline of the Spruce Avenue Bridge. Natural resources at the proposed project site include wetlands, nesting birds, and mudflats (foraging habitat). As a result of flow interaction and the earthen bottom within the project limits, an approximately 150 foot long vegetated sediment bar has formed just upstream of the Spruce Avenue Bridge.

Land uses in the project area predominantly consist of manufacturing, offices, warehouses, airport services, and vehicle services, including auto repair shops and rental agencies. North Canal Street runs along the north side of the project corridor. The City of South San Francisco Fire Department and Administration Fire Station 61 is located downstream of the proposed project at the intersection of North Canal Street and the Spruce Avenue Bridge. The Sister Cities Pedestrian Park (Sister Cities Park), consisting of a footpath lined with grass and ornamental trees, runs along the south side of the project corridor. An apartment complex borders the Sister Cities Park to the south.

Project Background

Flooding events are historic to Colma Creek. The industrial area of City of South San Francisco in the vicinity of Colma Creek was constructed on a historic flood plain and the businesses are susceptible to flooding. In 1998, a 50-year flood event on Colma Creek caused significant property damage to nearby businesses.

The San Mateo County Flood Control District is a Countywide Special District that was created by California State legislation to finance flood control projects. The Colma Creek Flood Control Zone was created in 1964 for the purpose of constructing and maintaining approximately 4.8 miles of flood control channel that extends from the mouth of the San Francisco Bay to the City of Daly City, and which provides flood control protection for surrounding residents.

The Colma Creek Flood Control Project was established in 1974. An Environmental Impact Report (EIR) for the Colma Creek Flood Control Project was certified by the San Mateo County Board of Supervisors in June 1974. This EIR addressed the environmental impacts

associated with improving the Colma Creek Channel and reducing the likelihood of flooding for adjacent areas. This project included construction of improvements to the Colma Creek Channel from the mouth of San Francisco Bay to the city limits of the City of South San Francisco, including the segment at the proposed project site.

Since 1974, several channel improvements and bridges along the Colma Creek Channel have been constructed. Improvements have included construction of concrete channel walls, channel widening, and construction of transition structures. Construction of bridges crossing the Colma Creek Channel has included the following bridges: Linden Avenue (1974), Spruce Avenue (1975), Utah Avenue (1976), South Airport Boulevard (1999), Peninsula Corridor Joint Powers Board (Caltrain) Mainline (2003), and San Mateo Avenue (2006).

Various construction and flood control related projects in the proposed project area between the transition structure downstream to Spruce Avenue Bridge have occurred since 1974. Following is a timeline of Colma Creek Channel events that have occurred at or directly adjacent to the proposed project area.

Timeline of Colma Creek Channel Events in the Project Area

Spruce Avenue Road Bridge – 1975

In 1975 the Spruce Avenue Bridge was constructed across the channel.

Transition Structure and Trapezoidal Walls – 1979

In 1979 the reach of the channel from Orange Avenue in the City of South San Francisco downstream to the transition structure approximately 300 feet upstream of the Spruce Avenue Bridge was concrete lined, with trapezoidal sides with 1.5 to 1.0 side slopes. The transition structure includes impact blocks at the upstream end of the proposed project adjacent to the trapezoidal wall section which serve as an energy dissipation structure to reduce the velocity of the flowing water before it enters the project area. There is a drop in the bottom of the channel at the downstream end of the transition structure.

Concrete Channel Walls – 1979

The above 1979 project included the original construction of the concrete sheet pile walls at the proposed project location, an approximate 200 foot section of Colma Creek upstream of the Spruce Avenue Bridge abutments. These walls are now failing. Repairing them is the purpose of the proposed project.

Vertical Walls – 2005

In 2005 a 70-foot-wide channel with vertical walls (U-shaped wall) was constructed for approximately 3,000 feet from Spruce Avenue Bridge downstream to the San Mateo Avenue Bridge.

Ground Settlement in the Sister Cities Pedestrian Park – 2005

Minor ground settlement occurred along the southern wall of the proposed project area.

Shifting Sheet Pile Channel Walls – 2006 - 2007

In 2006 and 2007 as a result of scouring, the concrete sheet pile walls on both the north and south sides of the channel at the proposed project site moved inward toward the creek channel.

Sink Hole – 2006

A sink hole developed in North Canal Street adjacent to the north side of the Colma Creek Channel where the trapezoidal walls transition to vertical sheet pile walls (constructed in 1979). The sink hole was repaired by the City of South San Francisco.

Continued Ground Settlement in the Sister Cities Pedestrian Park – 2007

The continuation of ground settlement in the Sister Cities Pedestrian Park along the south side of the channel led to observable offset in the concrete wall joints at the transition structure.

Pavement Cracking – 2008

The pavement along North Canal Street adjacent to the northern side of the channel developed cracks. Substantial ground settlement in the pedestrian park was observed along the south side of the channel. The shifting of the concrete channel walls became more visible.

Reinforcement Bracing Pipes – 2008

In February and March of 2008, temporary bracing pipes were installed to stabilize the movement of the sheet pile walls until a permanent solution could be constructed.

Concrete Wall Cap Cracking – 2010

In March 2010, cracks were observed at the sheet pile wall cap along the south side of the channel at the project location.

Surveys and Analyses

In May 2008 Meridian Surveying Engineering performed a bathymetric survey of the 400 feet reach of Colma Creek Channel from approximately 200 feet upstream of the Spruce Avenue Bridge abutments to the existing U-shaped channel just downstream of Spruce Avenue.

The survey found:

- The downstream end of the 50 foot long transition structure (from sloped walls to vertical walls) has settled approximately 0.9 feet.
- The earth bottom immediately downstream of the transition structure had scoured from approximately 2 to 8 feet. The 8 foot scour has occurred both near the center and south side of the channel.
- The cutoff wall at the downstream end of the transition structure is 4 feet below the top of the transition slab, and the scour depth at the center of the channel at the cutoff wall is approximately an additional 1.6 feet below the bottom of the cutoff wall, for a total of approximately 5.6 feet in depth.
- There is a deposition of soil material on the south side of the channel extending from Spruce Avenue upstream approximately 150 feet. The maximum depth of this deposition is approximately 2.8 feet higher than the original bottom elevation.

Scour Analysis

Scour, as stated above, is a result of the erosive action of flowing water that excavates and carries away material from the bottom and banks of the stream. Scour at the project site is composed of three components: (1) Long-term degradation of the channel bottom, (2) General scour as a result of flow contraction or flow around a bend, and (3) Local scour at piers and abutments. General scour is different than long-term degradation in that general scour may be cyclical and/or related to the passing of a flood.

As part of the scour analysis, an Army Corps of Engineers' HEC-RAS model hydraulic analysis was performed for the 50-year flow of the channel from upstream of the transition structure to Linden Avenue downstream of Spruce Avenue. This analysis revealed that the velocity for the section downstream of the transition structure varied from 6.1 feet per second at the transition structure to 5.1 feet per second at the Spruce Avenue Bridge. The measured scour depth after 29 years (1979 to 2008) was approximately 8 feet. This indicates that the 8 feet is local scour plus general scour that occurred during large storm events. The general scour likely resulted from (1) the relative high velocity, high sediment transport capacity, and high erosive capacity of the flow from the upstream concrete channel traveling through this short earth bottom reach of the channel, as well as (2) from the turbulent flow caused by the loss of parts of two impact blocks at the upstream end of the transition structure, debris at the impact blocks, and vertical gaps in the concrete sheet pile walls at the beginning and end of this section. In addition, there may have been some long-term scour.

Geotechnical Analysis

The existing walls at the project site consist of a concrete pile system. Several areas along the wall have experienced structural damage due to age and scour. Parallel seismic tests and analyses have revealed that the embedment depth of the existing concrete panels is inadequate and a serious threat of failure exists under persistent storm and/or earthquake events.

The existing walls exhibit obvious signs of distress including leaning, bowing, and slight buckling of the concrete sheet piles as well as some lateral separation of panels especially at the ends of this reach where the panel walls abut the sturdier adjacent facilities. Soil loss and subsidence behind the wall has been observed, predominantly in areas where lateral separation has occurred. Due to the anticipated threat of further damage and in an effort to provide some protection to the roads, pedestrian park, and utilities, a temporary cross-bracing system was installed until a permanent solution could be formulated. The replication of the U-shaped channel similar to the downstream reach of the channel southwest of Spruce Avenue would eliminate the potential for scour and improve reliability.

The geotechnical analysis evaluated the following four additional wall replacement alternatives:

- New wall on piles replacing the existing wall
- New wall on piles behind the existing wall
- New sheet pile wall behind the existing wall
- Secant pile wall behind the existing wall

These alternatives would require the construction of deep piles and would have a higher cost of construction than the U-shaped channel. These alternatives do not address the issue of scouring of the earth bottom which would continue to occur. The last 3 alternatives listed above may not be possible due to limited right-of-way. In addition, the existing wall would need to be straightened upright for aesthetic purposes.

Project Construction

The proposed project construction of a U-shaped channel with concrete walls and bottom is the best engineering alternative to permanently repair the damaged walls. This construction would be similar to the segment downstream of the Spruce Avenue Bridge that was completed in 2006. Advantages include removing the risk of scouring, improving geotechnical reliability, and providing long-term functionality, while protecting the structural integrity of the upstream transition structure and the Spruce Avenue Bridge. It should also be noted that the new bottom slab would be designed to accommodate up to 2

feet of sediment load to maintain both flow capacity and aquatic habitat, similar to the downstream reach.

The proposed U-shaped wall construction would require temporary support and dewatering. Temporary support would be provided by steel sheet piles driven to adequate depths below the excavation. Due to the retained heights of the land side, horizontal bracing for the sheet piles on the channel side may be needed. The north side sheet piles would be driven with a crane positioned on North Canal Street, and the south side sheet piles would be driven with a crane positioned in the Sister Cities Park. Dewatering wells and pumps will be placed on both the north side and south side of the channel to dewater the site. Cofferdams (sandbag walls) will be temporarily installed upstream and downstream of the project construction area to address flow from the Channel into the construction site. The Channel bottom slab would be constructed, followed by the wall construction to complete the U-shaped channel. Cofferdams would be removed following construction. The contractor that constructs the U-shaped wall may utilize a different construction process and/or work sequence than that described above. However, there would be no change in (1) the extent of grading and ground disturbance, (2) the locations of the staging areas, and (3) the period of construction.

The U-shaped wall would begin at the existing transition structure, STA 132+50, and extend downstream to the existing retaining walls on both sides of the Spruce Avenue Bridge at STA 134+55 (See Figure 2). The concrete bottom slab would continue downstream under the existing Spruce Avenue Bridge to the U-shaped channel constructed in 2003 near STA 136+00. The wall length would be 205 feet on each side of the channel, and the channel bottom length would be approximately 370 feet.

The new walls and bottom slab would not be connected to any of the existing transition structure, bridge abutments, pier and retaining walls or downstream U-shaped channel or bottom slab. Separation would be by expansion joints so no loads would be imposed onto the existing structures. The top elevation would be the same as the elevation of the existing wall. The wall and slab details and dimensions from the 2003 design would be used as much as possible for the project construction. The estimated construction cost for the U-shaped channel is $2.8 million.

Grading and Ground Disturbance

The proposed project would involve grading, temporary excavation, bracing, temporary dewatering, and trenching activities associated with the construction of the U-shaped wall and concrete bottom.

Image Source: ©2009 Google™

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Figure 2
Proposed Project Layout

Staging Areas

The construction contractor shall have (1) limited use of the Sister Cities Park along the south side of Colma Creek upstream of Spruce Avenue, and (2) temporary use of the eastbound lane of North Canal Street. All construction work shall be conducted so its operations would not interfere unnecessarily with the work of public agencies or utility companies. No street shall be closed or partially closed without first obtaining the permission from the City of South San Francisco. The construction contractor shall make its own arrangement for off-site storage of equipment and employee parking.

Construction Schedule

The duration of construction is anticipated to last approximately 4 months. All construction activities would occur between 8 AM and 5 PM, Monday through Friday, consistent with the City of South San Francisco Noise Ordinance, unless alternate schedules are approved by the City.

9. **Surrounding Land Uses and Setting:** Briefly describe the project's surroundings (from the City of South San Francisco General Plan 1999).

North – Business Commercial and Residential (Low, Medium, and High) Land Use.
South – Business Commercial, Community Commercial, and Residential (Low and Medium) Land Use.
West – Residential and Park – the Orange Memorial Park is approximately 0.3 miles West.
East – Mixed Industrial Use.

10. **Other Agencies Whose Approval is Required (e.g., permits, financing approval, or participation agreement)**

Agency	Approval Required
United States Fish and Wildlife Service	Confirmation of No Effect with United States Army Corps of Engineers
California State Water Resources Control Board – San Francisco Bay Region	National Pollutant Discharge Elimination System General Construction Permit
California State Water Resources Control Board – San Francisco Bay Region	Dewatering Permit
California State Water Resources Control Board – San Francisco Bay Region	CWA Section 401 Water Quality Certification
United States Army Corps of Engineers	Clean Water Act 404 Permit/River and Harbors Act Section 10 Permit
State Historic Preservation Officer	Section 106 National Historic Preservation Act Compliance
California Department of Fish and Game	Section 1600 Streambed Alteration Agreement

11. Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or a "Less Than Significant with Mitigation Included" impact as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Geology /Soils
☐ Greenhouse Gas Emissions	☒ Hazards & Hazardous Materials	☐ Hydrology / Water Quality
☐ Land Use / Planning	☐ Mineral Resources	☐ Noise
☐ Population / Housing	☐ Public Services	☐ Recreation
☒ Transportation/Traffic	☐ Utilities / Service Systems	☐ Mandatory Findings of Significance

12. Determination: (To be completed by the Lead Agency.)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find the proposed project MAY have a significant effect(s) on the environment, but at least one effect: 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards; and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☒ I find that although the proposed project could have a significant effect on the environment, there WILL NOT be a significant effect in this case because all potentially significant effects: (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards; and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project.

Michael J. Schaller (for Mark Chow) — Signature

9/7/10 — Date

MICHAEL J. SCHALLER — Printed Name

MARK CHOW — For

EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

    a) Earlier Analysis Used. Identify and state where they are available for review.

    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

    c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
I. AESTHETICS				
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, or other locally recognized desirable aesthetic natural feature within a city-designated scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Project Setting

The proposed project is located along Colma Creek, in the vicinity of the Spruce Avenue Bridge, in the City of South San Francisco, California. The project extends from approximately 300 feet upstream of the centerline of the Spruce Avenue Bridge at an existing transition structure to approximately 80 feet downstream of the centerline of the Spruce Avenue Bridge. The project is located within the Colma Creek Watershed. The Colma Creek Watershed is formed by natural mountain ridge boundaries surrounding a lower valley floor. Colma Creek flows from its headwaters on San Bruno Mountain into the San Francisco Bay, approximately one mile east of the project site.

Land uses in the project area predominantly consist of manufacturing, offices, warehouses, airport services, and vehicle services, including auto repair shops and rental agencies. North Canal Street runs along the north side of the project corridor. The City of South San Francisco Fire Department and Administration Fire Station 61 is located downstream of the proposed project at the intersection of North Canal Street and the Spruce Avenue Bridge. The Sister Cities Park, consisting of a footpath lined with grass and ornamental trees, runs along the south side of the project corridor.

The nearest residents that have a view of the site are located in an apartment complex that borders the Sister Cities Park to the south. US Highway 101, the primary transportation corridor in the region, runs approximately 0.6 miles east of the proposed project. The San Francisco International Airport is approximately two miles southeast of the proposed project. There are three scenic highways in the area, all to the west towards the Pacific Ocean. State Route 280 runs

approximately 1.5 miles west of the project area, beginning in San Jose and continuing north to San Francisco. Approximately 22 miles of Route 280 from the Santa Clara County line to the San Bruno city limit is a California officially designated State scenic highway (DOT, 2007). Highway 1 and Highway 35 are located to the west of Route 280.

Impact Analysis

I a) There are no scenic vistas in or adjacent to the project area. There would be no impact.

I b) There are no scenic highways in the project area. The nearest scenic highway is Route 280, which runs approximately 1.5 miles west of the project area. There would be no impact.

I c) The proposed project involves the replacement of channel walls because the current channel walls are failing. Temporary steel bracing pipes are currently holding the failing walls in place. Replacement of the walls and construction of the U-shaped channel would involve the removal of these temporary bracing pipes. In addition, the area is currently cordoned off using chain link fencing. Following completion of the proposed project, the bracing pipes and chain link safety fencing would no longer exist. Removal of these safety measures would improve the visual character of the site and allow residents in the apartment complex adjacent to the Sister Cities Park a clearer view of the channel. There would be no impact.

I d) The proposed project would not create a new source of light or glare. There would be no impact.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Project Setting

The project site is an urban channel in an industrial area in the City of South San Francisco. The California Department of Conservation (DOC) Farmland Mapping and Monitoring Program (FMMP) depicts the project site as "Urban and Built Up Land" (DOC, 2008). The project site is not under Williamson Act contract (DOC, 2008). According to the California Department of Forestry and Fire Protection's Land Cover Multi-Source Data Compiled for Forest and Range Assessment, the project area is classified as 'Urban' (California Department of Forestry and Fire Protection, 2003).

Impact Analysis

II a) The project site is in an urban setting. No prime farmland or any other farmland exists within or adjacent to the project site. There would be no impact.

II b) The proposed project does not conflict with agricultural zoning. The project site is not under Williamson Act contract (DOC, 2008). There would be no impact.

II c) The proposed project is classified as 'Urban' by the California Department of Forestry and Fire Protection (2003). There is no forest land on or adjacent to the project site. There would be no impact.

II d) No forest land occurs on or adjacent to the project site. There would be no impact.

II e) No farmland occurs on or adjacent to the project site. There would be no impact.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
III. AIR QUALITY Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations: Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the air basin is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Project Setting

The proposed project is located in the San Francisco Bay Air Basin, which includes all of Napa, Contra Costa, Alameda, Santa Clara, San Mateo, San Francisco, and Marin Counties, the southern portion of Sonoma County, and the western portion of Solano County. The nine counties that comprise the air basin share common geographical features and meteorological conditions. The topography of the San Francisco Bay Air Basin is complex and features coastal mountain ranges, valleys, and bays. The City of South San Francisco is located in the Peninsula region of the San Francisco Bay Area, which is marked by a cool and windy climate.

The Bay Area Air Quality Management District (BAAQMD) is the regulatory agency responsible for assuring that national and State ambient air quality standards (NAAQS and CAAQS, respectively) are attained and maintained in the San Francisco Bay Area. Areas that do not meet the NAAQS or CAAQS are known as nonattainment areas. The region is in nonattainment for the State standards for ozone (O_3), inhalable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$). Table 1 shows the current NAAQS and CAAQS for criteria pollutants.

The BAAQMD prepared the Bay Area 2005 Ozone Strategy to show how the region will achieve compliance with the one-hour CAAQS for O_3 (BAAQMD, 2006). The 2005 Ozone Strategy consists of various control measures for stationary, mobile, and transportation sources that will

reduce O_3 emissions. The BAAQMD is also in the process of updating the 2005 Ozone Strategy with the draft release of the 2010 Clean Air Plan (BAAQMD, 2010b). In addition to updating the O_3 requirements, The 2010 Clean Air Plan will also provide control strategies to reduce emissions of particulate matter, air toxics, and greenhouse gases.

In 2003, the California Legislature enacted Senate Bill 656 (SB 656) to reduce emissions of particulate matter (PM_{10} or $PM_{2.5}$). Consistent with the requirements of the law, the California Air Resources Board (CARB) compiled a list of control measures for direct and indirect emissions of particulate matter. Individual air districts are then required to implement the control measures that are most applicable to their region. The BAAQMD adopted an implementation schedule in November 2005.

Impact Analysis

III a) The applicable air quality plans in the region include the Bay Area 2005 Ozone Strategy and the Particulate Matter Implementation Schedule adopted as part of SB 656. The BAAQMD *California Environmental Quality Act Air Quality Guidelines* (2010a) provide thresholds of significance for construction-related activities. If emissions are less than the thresholds, then emissions are considered to be less than significant and compliant with the measures in the Bay Area 2005 Ozone Strategy. A quantitative analysis of emissions and necessary mitigation measures are described in further detail in Section III(b). Construction activities are therefore not expected to conflict with or obstruct implementation of the Bay Area 2005 Ozone Strategy. BAAQMD Regulation 6 contains a series of measures designed to control fugitive dust measures associated with construction activities. The regulation was found to be equivalent to several of the control measures compiled by CARB as part of SB 656. All construction activities

Table 1: National and California Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS	NAAQS	
			Primary	Secondary
Ozone (O_3) [a]	1-Hour	0.09 ppm (180 µg/m³)	NS	NS
	8-Hour	0.070 ppm (137 µg/m³)	0.075 ppm (147 µg/m³)	Same as primary
Inhalable Particulate Matter (PM_{10})	24-Hour	50 µg/m³	150 µg/m³	Same as primary
	Annual	20 µg/m³	NS	NS
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No separate State standard	35 µg/m³	Same as primary
	Annual	12 µg/m³	15.0 µg/m³	Same as primary
Carbon monoxide (CO)	1-Hour	20 ppm (23,000 µg/m³)	35 ppm (40,000 µg/m³)	NS
	8-Hour	9.0 ppm (10,000 µg/m³)	9 ppm (10,000 µg/m³)	NS
Nitrogen dioxide (NO_2) [b]	1-Hour	0.18 ppm (339 µg/m³)	0.100 ppm (189 µg/m³)	NS
	Annual	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	Same as primary

Table 1: National and California Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS	NAAQS	
			Primary	Secondary
Sulfur dioxide (SO_2) [c]	1-Hour	0.25 ppm (655 µg/m³)	NS	NS
	3-Hour	NS	NS	0.5 ppm (1,300 µg/m³)
	24-Hour	0.04 ppm (105 µg/m³)	0.14 ppm (365 µg/m³)	NS
	Annual	NS	0.030 ppm (80 µg/m³)	NS
Lead (Pb) [d]	30-Day Average	1.5 µg/m³	NS	NS
	Calendar Quarter	NS	1.5 µg/m³	Same as primary
	Rolling 3-Month Average	NS	0.15 µg/m³	Same as primary

Source: CARB, 2010

Notes:

[a] On January 19, 2010, the EPA released a proposed rule to strengthen the 8-hour primary O_3 NAAQS to a level within the range of 0.060 to 0.070 parts per million by volume (ppmv). It also proposed to establish a cumulative, seasonal secondary O_3 NAAQS within the range of 7 to 15 ppm-hours. (75 FR 2938)

[b] On February 9, 2010, the EPA finalized a rule to supplement the current annual NO_2 standard by establishing a new 1-hour NO_2 standard at a level of 100 parts per billion (ppb), based on the 3-year average of the 98th percentile of the yearly distribution of the 1-hour daily maximum concentrations. (75 FR 6474)

[c] On June 2, 2010, the EPA finalized rule to established a new 1-hour SO_2 NAAQS of 75 parts per billion by volume, based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The EPA also revoked both the existing 24-hour and annual primary SO_2 standards. The final rule is effective 60 days after publication in the Federal Register.

[d] On November 12, 2008, the EPA revised the primary lead standard to 0.15 µg/m³ and revised the averaging period to a rolling 3-month period with a not-to-be-exceeded form, evaluated over a 3-year period. (73 FR 66964)

Key:

µg/m³ = micrograms per cubic meter
CAAQS = California Ambient Air Quality Standard
NAAQS = National Ambient Air Quality Standard
NS = no standard
ppm = parts per million

will be completed in accordance with the requirements of Regulation 6; therefore, the proposed project will not conflict with the requirements of the particulate matter air quality plan.

The City of South San Francisco has adopted an air quality element as part of its general plan (SSF, 1999). Implementing policy 7.3-1-3 indicates that the City of South San Francisco adopted the standard construction dust abatement measures included in the BAAQMD's CEQA Guidelines. Since the proposed project will be constructed in compliance with the applicable construction dust abatement measures, the proposed project is therefore consistent with the City's General Plan. Impacts would be less than significant.

III b) Construction of the proposed project would increase emissions of air pollutants from construction activities. On June 2, 2010, the BAAQMD approved revisions to its CEQA Air Quality Guidelines (BAAQMD, 2010a) that establish the following step-wise approach to determining the significance of construction related activities.

1. Comparison of project attributes with screening criteria;

2. Emissions quantification;
3. Comparison of unmitigated emissions with thresholds of significance;
4. Mitigation and emissions reduction;
5. Comparison of mitigated (basic mitigation) emissions with thresholds of significance;
6. Implement additional construction mitigation measures; and
7. Comparison of mitigated emissions with thresholds of significance.

Maximum daily emissions of criteria pollutants associated with construction activities including earthwork, haul trucks (including soil hauling and concrete transit mixers), construction worker commuting, and dewatering pumps are provided in Table 2. Annual emissions are presented in Table 3.

Equipment to be used for each phase of the proposed project includes cranes, excavators, loaders, compactors, haul trucks, and other possible heavy-duty construction equipment. Fugitive dust emissions from site grading and other cut/fill activities were calculated using an urban emissions model (URBEMIS, 2007). Emission factors from an on-road emissions factor model (EMFAC, 2007) were used for on-road trucks and construction worker vehicles. Emission factors from an off-road emissions model (OFFROAD, 2007) were used for heavy-duty off-road construction equipment. All equipment was assumed to operate eight hours per day for five days per week.

The project is also expected to use electric pumps (19 kilowatts) for dewatering purposes. Based on the amount of water that would need to be removed and a discharge capacity (gallons per minute) of a proxy pump, the number of operating hours of the pump over the course of construction was estimated to be 1,680 hours. Emissions from the pumps were not quantified for air quality impacts because localized emissions of criteria pollutants will not occur.

Table 2 summarizes emissions for total unmitigated emissions and basic mitigated emissions that include all of the emission reduction measures required by the BAAQMD. Table 3 estimates annual emissions that would occur for the project.

Table 2: Maximum Daily Project Construction Emissions (pounds per day)

Emissions Source	**CO**	**NOx**	**VOC**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Construction Equipment	15	35	4	<1	2	2
Fugitive Dust	N/A	N/A	N/A	N/A	13	3
Haul Trucks	1	4	<1	<1	<1	<1
Construction Worker Commuting	6	1	<1	<1	2	<1
Total Unmitigated Emissions	**23**	**40**	**5**	**<1**	**17**	**5**
Total Basic Mitigated Emissions[1]	**23**	**40**	**5**	**<1**	**10**	**3**
BAAQMD Threshold[2]	N/A	54	54	N/A	82	54
Basic Mitigated Emissions Exceed BAAQMD Threshold?	N/A	No	No	N/A	No	No

Notes:
[1] Fugitive dust assumes that exposed surfaces are watered twice daily and that speed is reduced to 15 miles per hour on unpaved surfaces. These assumptions are consistent with the BAAQMD's basic mitigation measures that are required on all construction projects.
[2] Thresholds for PM_{10} and $PM_{2.5}$ apply to construction equipment exhaust only.
Key:
CO = carbon monoxide
N/A = not applicable
NOx = oxides of nitrogen
PM_{10} = inhalable particulate matter
$PM_{2.5}$ = fine particulate matter
SO_2 = oxides of sulfur
VOC = volatile organic compounds

Table 3: Annual Project Construction Emissions (tons per year)

Source	CO	NOx	VOC	SO_2	PM_{10}	$PM_{2.5}$
Construction Equipment	0.11	0.27	0.03	<0.01	0.01	0.01
Fugitive Dust [1]	N/A	N/A	N/A	N/A	0.10	0.02
Haul Trucks	0.02	0.08	<0.01	<0.01	0.01	<0.01
Construction Worker Commuting	0.08	0.01	<0.01	<0.01	0.02	<0.01
Total	**0.21**	**0.33**	**0.04**	**<0.01**	**0.07**	**0.02**

Notes:
[1] Fugitive dust assumes that exposed surfaces are watered twice daily and that speed is reduced to 15 miles per hour on unpaved roads. These assumptions are consistent with the BAAQMD's basic mitigation measures that are required on all construction projects.
Key:
CO = carbon monoxide
N/A = not applicable
NOx = oxides of nitrogen
PM_{10} = inhalable particulate matter
$PM_{2.5}$ = fine particulate matter
SO_2 = oxides of sulfur
VOC = volatile organic compounds

The San Francisco Bay Air Basin is currently in nonattainment for the State ozone (O_3) and particulate matter (PM_{10} and $PM_{2.5}$) standards. Although the region is in nonattainment for O_3, the BAAQMD recognizes that these emissions are included in the regional emission inventories prepared for the 2005 Ozone Strategy; therefore, emissions of O_3 precursors (oxides of nitrogen [NOx] and volatile organic compounds [VOC]) will not contribute substantially to an existing air quality violation.

The BAAQMD has established Basic Construction Mitigation Measures that should be implemented for all construction projects, regardless of whether emissions exceed the thresholds of construction. The following control measures will be implemented, as required by the BAAQMD's CEQA Air Quality Guidelines (2010a), during all construction activities at the site.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

- A publicly visible sign shall be posted with telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

In addition to the thresholds of significance for construction, the BAAQMD also requires the evaluation of risks and hazards from construction-related activities. The significance criteria are the same as those required for operational impacts and are summarized below:

1. Compliance with qualified community risk reduction plan; OR

2. Quantitative risk requirements:

    a. Increased cancer risk of >10.0 in a million

    b. Increased non-cancer risk of > 1.0 hazard index (chronic or acute)

    c. Ambient $PM_{2.5}$ increase: > 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average

The BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards* (2010c) indicates that minor, low-impact sources can be excluded from the CEQA process for risk. One of the criterion for low-impact sources is for small construction projects that are less than six months in duration and less than one acre in size. The proposed project meets both of these criteria; therefore, emissions of toxic air contaminants and the associated risk levels are expected to be less than significant.

III c) The BAAQMD indicates in its CEQA Air Quality Guidelines (2010a) that if a project does not individually have significant operational air quality impacts, then the determination of significant cumulative impacts should be based on an evaluation of the project's consistency with the local general plan and the current version of the regional air quality plan (i.e., Bay Area 2005 Ozone Strategy). The proposed project will not have long-term operational impacts;

therefore, an evaluation of consistency with the local general plan and the Bay Area 2005 Ozone Strategy will not be required.

Emissions associated with construction activities would not exceed the thresholds of significance established by the BAAQMD. Cumulative emissions would therefore be less than significant.

III d) The proposed project will be completed in a residential neighborhood within close proximity to sensitive receptors. As described in previous sections, the proposed project will not result in significant emissions of pollutants. As a result, it will not expose sensitive receptors to substantial pollutant concentrations. Therefore impacts would be less than significant.

III e) The proposed project is not expected to create any objectionable odors. As a result, there would be no impact from the proposed project.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
IV. BIOLOGICAL RESOURCES				
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (e.g. oak trees or California walnut woodlands)?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Project Setting

Colma Creek is a naturally occurring channel that transports water and sediment from its headwaters in the San Bruno Mountain State and County Park south and then east where it drains into the San Francisco Bay. Urbanization and flood control measures have included channelization and the construction of concrete walls along the reach of the creek within the project area. Due to the industrial area and channelization of the creek, biological resources within the project area are greatly limited. An ornamental landscape occurs in the Sister Cities Park along the south side of the Colma Creek Channel. This landscape consists of a strip of manicured grass and a row of widely spaced ornamental trees. Ornamental trees also occur along the north side of the Colma Creek Channel between the channel and North Canal Street.

Within the concrete walled channel, two naturally occurring habitat types are present, coastal brackish marsh and open water/non-vegetated mudflat. As a result of scouring due to flow interaction and the earthen bottom within the project limits, an approximately 150 foot long vegetated coastal brackish marsh sediment bar has formed just upstream of the Spruce Avenue Bridge. This sediment bar contains low-quality coastal brackish marsh habitat, as described below. All other areas within the channel are open water/non-vegetated mudflat. Common waterfowl such as mallards (*Anas platyrhynchos*), Canada geese (*Branta canadensis*), and American coots (*Fulica americana*) inhabit the channel and can be seen floating in the channel during high tide. During low tide, numerous foraging species feed on invertebrates in this area, as described below.

Habitat Types and Vegetation

Coastal Brackish Marsh: Coastal brackish marsh is typically found at the interior edges of coastal bays and estuaries or in coastal lagoons and adjacent to salt marshes (Holland, 1986). This habitat type is similar to coastal salt marsh but brackish due to a freshwater input. Species composition is characterized as intermediate between freshwater marsh and coastal salt marsh wetlands. The salinity may vary considerably and can increase at high tide or during seasons of low freshwater runoff or both. Coastal brackish marsh is typically dominated by perennial, emergent, herbaceous monocots up to 2 meters in height (Holland, 1986). Plant species typical of coastal brackish marsh include: sedges **(***Carex* spp.**),** saltgrass **(***Distichlis spicata var. spicata*), rushes (*Juncus* spp.), pickleweed (*Salicornia* spp.), bulrush (*Scirpus* spp.), and broadleaf cattail (*Typha latifolia*).

The vegetated sediment bar within the Colma Creek Channel contains habitat similar to that of coastal brackish marsh habitat. A biological survey and wetland delineation were conducted on May 6th, 2010 by CDM environmental scientists, Tricia Reed and Kristin Tremain. During this site visit, the following plant species were observed: sedges, lambsquarters (*Chenopodium album*), field bindweed (*Convolvulus arvensis*), common brass buttons (*Cotula coronopifolia*), Pacific silverweed (*Potentilla anserine spp. pacifica*), common threesquare (*Scirpus pungens*), a *Senecio* (not identified), and common butterweed (*Senecio vulgaris*). Common threesquare was the dominant plant type present and covered the majority of the sediment bar.

Habitat within the project area is highly disturbed. The sediment bar and associated surrounding non-vegetated mudflats are formed by scouring upstream, as a result of flow interaction and the earthen bottom within the project limits. The scoured sediment is then washed down the channel and deposited during times of low flow. During large multi-year storm surge events the sediment bar may be partially or completely washed out. Vegetation on the bar appears brackish marsh-like and the hydrology of the project location creates a brackish mixture of storm water runoff from upstream and saline tidal effects from downstream. The project location is just downstream of the natural high-tide line. During the May 6th, 2010 site visit, it was determined that this sediment bar qualifies as wetlands under Army Corps of Engineers jurisdiction for the Arid West Region (CDM, 2010).

Open Water/Non-Vegetated Mudflat: Open water/non-vegetated mudflat habitat is composed of open water channels and non-vegetated mudflats subject to periodic tidal inundation (EIP Associates 2002a). During low tide, this habitat provides foraging opportunities for many species of shore birds and ducks which may feed on benthic invertebrates. The remaining areas of the project site contain open water/non-vegetated mudflat habitat**.**

Common Wildlife Species

Common wildlife species occurring in the channel or associated habitats include: mallard duck (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), American coot (*Fulica americana*), California gull (*Larus californicus*), Western gull (*Larus occidentalis*), Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), hooded merganser (*Lophodytes cucullatus*), snowy egret (*Egretta thula*), great egret (*Ardea alba*), and American avocet (*Recurvirostra americana*). During the late spring and early summer, the sediment bar, which is typically well vegetated with sedges, is one of the only locations for nesting opportunities for mallard ducks and Canada geese upstream from South Airport Boulevard (Spencer, 2008). Other species that have been observed using the site for nesting include Brewer's blackbird and red-winged blackbird (Spencer, 2008; CDM, 2010).

Recent nesting sites were observed on the sediment bar in the sedges during the May 6th, 2010 site visit (CDM, 2010). These nests were Canada goose nests. In addition to nests, four nesting Canada goose pairs with young on or adjacent to the sediment bar were observed during the May 6th, 2010 site visit.

Sensitive Species

Special Status Species: Special status species are plants and wildlife that are legally protected under the Federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA), or legally protected under local regulations. Special status species include those that are federal- or state-listed as endangered, threatened, and candidate, those considered fully protected and species of concern by the California Department of Fish and Game (CDFG), as well as plant species listed by the California Native Plant Society (CNPS). In compliance with the FESA and CESA, if special status species are determined to have the potential to occur at the site, consultation with the USFWS and the CDFG would be required. To assess the potential presence of listed species, species lists were obtained prior to the site investigation for the United States Geological Survey (USGS) 7.5 minute quadrangle (quad) in which the site is located, the "San Francisco South Quadrangle".

These lists were obtained from the following sources and are included in Appendix B:

- USFWS, Sacramento Office. Quad list for San Francisco South. List last updated December 01, 2009.
- CDFG, California Natural Diversity Database (CNDDB) Commercial version dated October 03, 2009.

From these lists, the likelihood of occurrence for each species was considered based on the availability of suitable habitat, previous occurrences, and site visits. The likelihood for occurrence was characterized into one of the five categories described below.

Categories of Occurrence:

Not Present: Habitat in and adjacent to the action area is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, and disturbance regime). This species has an extremely low probability of being found in the action area.

Low Potential: Few of the habitat components meeting the species requirements are present, and/or the majority of the habitat in and adjacent to the action area is unsuitable or of very poor quality. This species has a low probability of being found in the action area.

Moderate Potential: Some of the habitat components meeting the species requirements are present and/or only some of the habitat in or adjacent to the action area is unsuitable. The species has a moderate probability of being found in the action area.

High Potential: All of the habitat components meeting the species requirements are present and/or most of the habitat in or adjacent to the action area is highly suitable. The species has a high probability of being found in the action area.

Present: Species is observed in the action area or has been recorded (i.e., CNDDB, previous site studies) in the action area.

Table 4 below is a list of species with a potential for occurrence within the San Francisco South Quad listed by the USFWS, CDFG (CNDDB), and/or the CNPS. All non-marine federally listed species were included in the analysis. CNDDB species and CNPS species that occur in present habitat types (marshland, wetland, mudflats, and aquatic areas) were also considered.

Special status fish species were considered not present due to lack of suitable habitat in the channel and were therefore not included in Table 4. Special status fish species were identified from the Federal special status species San Francisco South quad list and include: Green sturgeon *(Acipenser medirostris),* Tidewater goby *(Eucyclogobius newberryi),* Delta smelt (*Hyomesus transpacificus*), Coho salmon – central CA coast *(Oncorhynchus kisutch),* Central California coastal steelhead (*Oncorhynchus mykiss)*, Central valley steelhead (*Oncorhynchus mykiss),* Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha),* Winter-run Chinook salmon (*Oncorhynchus tshawytscha)*, and Sacramento River Chinook Salmon *(Oncorhynchus tshawytscha).* Salmonids were excluded from this analysis based on a field assessment and literature review. The watershed currently does not contain suitable habitat to support salmonids (Leidy et al., 2005). Insufficient information exists to assess the historical distribution of salmonids in the Colma Creek watershed (Leidy et al., 2005).

During the sensitive species literature review, two sensitive plant species, bristly sedge (*Carex comosa*) and the marsh gum-plant (*Grindelia stricta var. angustifolia*) were identified as having potential to occur in the project area. Due to the highly disturbed unnatural status of this channel, the potential for the occurrence for these species is low. A botanical reconnaissance visit was conducted during the field site investigation on May 6th, 2010, to determine if these two sensitive plant species are present or have a moderate or greater likelihood of occurring on the sediment bar in the project area. During the botanical reconnaissance, no bristly sedge or marsh gum-plant were observed in the project area and the likelihood of these species occurring in the area was determined to be low (CDM, 2010).

Based on multiple site visits and literature reviews, no "special status" or "species of concern" fish or wildlife have been documented as occurring within the project area or vicinity (CDM, 2010; USFWS, 2010; CDFG, 2010; Spencer, 2008; EIP Associates, 2002a; Ogden Environmental and Energy Services Co., Inc., 1997).

A comprehensive list of all Federal-, State-, and CNPS-listed species in the San Francisco South USGS 7.5 minute Quadrangle can be found in Appendix B.

Table 4. Special Status Species and Their Potential for Occurrence

Species	Status	Habitat	Potential for Occurrence within Study Area
Birds			
Marbled murrelet *Brachyramphus marmoratus*	FT	Coastal areas including bays and sounds, primarily in salt water within approximately one mile of shore (Marshall, 1988). Occasionally occurs on rivers and lakes within approximately 12.5 miles of the ocean. Commonly nests in old growth stands. Eats fishes, crustaceans, and mollusks.	Low potential. Nesting habitat does not occur in project area. Although can occur on rivers and eat freshwater species, very low quality feeding habitat. Species likely would not be present. May occur as a transient.
Western snowy plover *Charadrius alexandrines nivosus*	FT	Occurs on beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds. Nests on the ground on beaches or salt or dry mud flats, with sparse/absent vegetation (NatureServe, 2009). Eats insects, small crustaceans, and other small invertebrates.	Low potential. Suitable nesting habitat is absent. Project area may provide foraging habitat during low tide. Species may occur as a transient.
Short-tailed albatross *Diomedea albatrus*	FE	Occurs in pelagic environments and can be found in terrestrial grassland environments. Nests on ground on small oceanic volcanic ash islands. Feeds on marine species including fish, squid, and crustaceans.	Not present. Suitable habitat does not occur in the project area.
California brown pelican *Pelecanus occidentalis californicus*	FE	A coastal bird. Feeds in shallow estuarine waters along sand spits, sand bars, and islets for nocturnal roosting. Dry roosting sites are essential. Nests on coastal islands, on ground, or small bushes/trees.	Low potential. Suitable nesting habitat does not occur in the project area. Sediment bar may provide low quality roosting habitat, however not always dry. Mud flats may provide low quality foraging.
California clapper rail *Rallus longirostris obsoletus*	FE, CE	Inhabits coastal salt and freshwater marsh habitats transversed by tidal sloughs in the San Francisco Bay. Often associated with dense pickleweed (*Salicornia spp.*) populations. Feeds on invertebrates in un-vegetated mud flats and mud-bottomed sloughs. Non-migratory. Nests in marshlands near tidal ponds in cordgrass, pickleweed, gum-plant, salt grass on higher ground to shelter young from storm tides (NSE, 2009).	Low potential. Patchy and narrow coastal salt marsh wetlands. Sediment bar is low quality. Majority of wetlands nearly inundated during high tide. Quality habitat is not present (consistent with determination by EIP Associates (2002b) of habitat just downstream Spruce Ave Bridge). Gum-plant not observed in project area. Mud flats in project area may provide low quality feeding habitat during low tide.

Species	Status	Habitat	Potential for Occurrence within Study Area
California least tern *Sternula antillarum*	FE	Inhabits bare or sparsely vegetated flat substrates, including sand beaches, alkali flats, landfills, or paved areas. A colonial nester, occurs along the California coast from San Francisco Bay south to Baja. Eats mainly small fishes by diving in shallow water.	Low potential. Although the project area provides flat substrates, the habitats are tidally inundated in water and thus would not be suitable nesting habitat. May forage in the project area, however likelihood low due to lack of observed fish in the channel.
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	CSC	Inhabits freshwater marshes and coastal salt marshes in the San Francisco Bay vicinity. Forages in dense vegetation along water's edge. Nests in tall grasses, tule patches, and willows.	Not present. Suitable foraging and nesting habitat does not occur in or adjacent to the project area.
California black rail *Laterallus jamaicensis coturniculus*	CT	Inhabits freshwater marshlands, wet meadows, and shallow margins of saltwater marshes bordering larger bays. Requires water depth of approximately one inch that does not fluctuate during the year and dense vegetation for nesting.	Low potential. Sediment bar is low quality and lacks dense upland vegetation for nesting. Due to tidal influence, water depth varies greatly throughout the day. Low likelihood to occur as a transient.
Alameda song sparrow *Melospiza melodia pusillula*	CSC	Salt marsh habitat bordering the southern San Francisco Bay. Inhabits marshland dominated by pickleweed. Nests in pickleweed and in Grindelia bushes above high-tide. Forages in marshlands.	Low potential. Suitable nesting habitat is not present. Foraging habitat in the project area is low quality. May occur as transient.
Mammals			
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE	Occurs in saline wetlands in the San Francisco Bay and vicinity. Often associated with pickleweed. Requires upland areas during high tide and floods. Builds loose nests in marsh habitat.	Not present. Salt marsh habitat is low quality and is a very small isolated island. No upslope habitat is present. Sediment bar is tidally inundated.
Reptiles			
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE, CE	Herbaceous wetland and riparian habitat. Also occurs in grassland, savanna, shrubland, and woodland habitats. Burrows in soil and under fallen logs/debris. Feeds in marshes and seeks cover in bankside vegetation. Eats aquatic vertebrates.	Low potential. Although occurs in herbaceous wetland, habitat in project area is low quality. May be found transiently in Chanel or basking on sediment bar. Sediment bar may provide habitat, however low quality due to small size and openness.

Species	Status	Habitat	Potential for Occurrence within Study Area
Western pond turtle *Actinemys marmorata*	CSC	Typically reside in permanent aquatic areas or upland habitat that is within 1200 feet of an aquatic site. Can travel significant distances (at least 1.2 miles) when there is a change to the aquatic habitat.	Low potential. Habitat is low quality. Channel has vertical walls, requiring entrance to the habitat via upstream/downstream. Sediment bar is low quality habitat. Low potential to occur as a transient.
Amphibians			
California red-legged frog *Rana aurora draytonii*	FL	Found in freshwater streams. This species is non-migrant and requires a permanent freshwater source with adjoining upland habitat for breeding and dispersal. It usually occurs near or in quiet permanent water of streams, marshes, ponds, lakes and other similar water bodies.	Not present. Suitable habitat is not present. The channel consists of brackish water with a fluctuating saline content due to tidal influences. No upslope habitat is present.
Invertebrates			
Mission blue butterfly *Icaricia icarioides missionensis*	FE	Occurs in California in grassland/herbaceous habitats and in sand dunes (NatureServe, 2009).	Not present. The habitat type does not occur in or adjacent to the project area.
Callippee silverspot butterfly *Speyeria callippee callippe*	FE	Northern coastal scrub habitat above 400 feet elevation. Host plant is *Viola pedunculata*. Occurs in San Mateo County in one population on San Bruno Mountain (NatureServe, 2009).	Not present. The habitat type does not occur in or adjacent to the project area.
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	FE	Occurs in coastal dune or prairie habitat. Distributed in California from San Mateo County north to Santa Rosa County. Adults typically found in areas sheltered from the wind, below 820 feet elevation, and within 3 miles of the coast.	Not present. The habitat type does not occur in or adjacent to the project area.
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT	Inhabits native grassland habitat on serpentine soil outcroppings in the San Francisco Bay. Commonly found on *Plantago erecta*. Also found on *Castilleja exserta* and *Castilleja densiflora*.	Not present. The habitat type does not occur in or adjacent to the project area.
Plants			
San Francisco lessingia *Lessingia germanorum*	FE	Occurs in dune and coastal scrub habitats; restricted to remnant sand dunes and terraces at < 300 feet elevation (NatureServe, 2009).	Not present. The habitat type does not occur in or adjacent to the project area.

Species	Status	Habitat	Potential for Occurrence within Study Area
San Francisco gum-plant *Grindelia hirstula var. maritime*	List 1B.2	Inhabits coastal salt marsh habitat throughout the Central California Coast from Napa and Sonoma counties to Monterey County. Ranges from 0 to 5600 feet in elevation (Calflora, 2009).	Low potential. Multiple populations have been observed along Colma Creek south of Spruce Avenue Bridge (EIP Associates, 2002a; Ogden Environmental and Energy Services Co., Inc., 1997). However, likelihood is greatly reduced due to the highly disturbed, unnatural status of the channel and the small, isolated, low quality habitat on the vegetated sediment bar. No individuals observed during field visit (CDM, 2010).
Bristly sedge *Carex comosa*	List 2.1	Freshwater marsh and coastal salt marsh habitat, swamps, lake edges, generally wet places. Occurs in elevation from 0 to 3300 feet. (Calflora, 2009).	Low potential. Not recorded in San Mateo County (CDFG, 2010). Sediment bar may provide low quality habitat. Near inundation during high tide reduces likelihood for occurrence. Likelihood is greatly reduced due to the highly disturbed, unnatural status of the channel and the small, isolated, low quality habitat on the sediment bar. Not observed during field visit (CDM, 2010).

Sources: CDFG, 2009; USFWS, 2009; All other sources are listed under Reference*s*.
Status: FE= Federally Endangered, FC = USFWS Candidate for Federal Listing, SE = State Endangered, ST= State Threatened, SC **=** CDFG State Species of Concern, FP= California Fully Protected Species, CH = Critical Habitat
CNPS Status: List 1B = Plants that are rare, threatened, or endangered in California and elsewhere. It is mandatory that these species be fully considered during preparation of CEQA documentation.
CNPS Threat Code: .1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat), .2 = Fairly endangered in California (20-80 percent occurrences threatened), .3= Not very endangered in California (< 20 percent of occurrences threatened or no current threats known)

Impact Analysis

IVa) Special-Status Plants

Prior to the May 6th, 2010 field survey, pertinent environmental documents concerning the proposed project area and vicinity were reviewed and special-status plant species lists were obtained. Special-status plant species are defined as those species listed as endangered, threatened, or proposed for listing, or are designated as fully protected species under one or more of the following regulatory statues: Federal Endangered Species Act, as amended (Code of Federal Regulations, Title 50, Section 17), California Endangered Species Act (California Code of Regulations Title 14, Section 670.5), California Fish and Game Code (Sections 1901, 2062, 2067) and the Native Plant Protection Act of 1977. In addition, plant species are considered to have special status if identified as locally rare species defined by CEQA guidelines 15125(c) and 15380, including those species that are designated as sensitive, declining, rare, and locally endemic or as having limited or restricted distribution by various federal, state and local agencies, organizations and watch lists. This includes consideration of some plants recorded in the Rare Plant Program as managed by CNPS.

General habitat surveys of the project area were conducted in April, 2008 by San Mateo County Biologist Brent Spencer, on February 23rd, 2010 by CDM environmental scientist Kristin Tremain, and on May 6th, 2010 by CDM environmental scientists Kristin Tremain and Patricia Reed**.** A botanical reconnaissance was conducted on May 6th, 2010 within the proposed project area. During this May 6th, 2010 survey, all areas where construction and/or operation of the proposed project would occur were investigated and evaluated for the potential to support sensitive plant species or habitats. No sensitive species were observed in the project area.

Based on multiple site visits and literature reviews, no "special status" or "species of concern" plants have been documented as occurring within or adjacent to the project area (CDM, 2010; Spencer, 2008).

Special-Status Wildlife

General habitat surveys of the project area were conducted in April 2008 by San Mateo County Biologist Brent Spencer, on February 23rd, 2010 by CDM environmental scientist Kristin Tremain, and on May 6th, 2010 by CDM environmental scientists, Kristin Tremain and Patricia Reed. Prior to the field survey, pertinent environmental documents concerning the proposed project area and vicinity were reviewed and special-status animal species lists were obtained on-line from the Sacramento office of the U.S. Fish and Wildlife Service and the California Natural Diversity Database (see Appendix B). During the survey, vegetation and habitat were visually evaluated to determine the suitability for wildlife, including special-status species that may occur in the area. Special-status animal species listed as federally- or state-endangered or threatened, as well as California Species of Special Concern that have the potential to occur based on the suitability of habitat at the project site, are listed in Table 4.

Based on multiple site visits and literature reviews, no "special status" or "species of concern" fish or wildlife have been documented as occurring within or adjacent to the project area (USFWS, 2010; CDFG, 2010; Spencer, 2008; EIP Associates, 2002a; Ogden Environmental and Energy Services Co., Inc., 1997).

Impacts to Migratory Birds

Migratory birds are federally protected by the Migratory Bird Treaty Act of 1918. Recent nesting sites were observed on the sediment bar in the sedges during the May 6th, 2010 site visit (CDM, 2010). These nests are likely Canada goose nests. Canada geese are protected under the Migratory Bird Treaty Act. In addition to nests, four nesting Canada goose pairs with young on or adjacent to the sediment bar were observed during the May 6th, 2010 site visit.

Potential impacts to migratory birds could occur if construction resulted in the disturbance of active nests. In order to reduce these impacts, mitigation measure BIO-1 would be implemented. To reduce impacts of the loss of nesting habitat on the sediment bar, mitigation measure BIO-2 would be implemented. With mitigation incorporated, there would be a less than significant impact on any special status species potentially occurring in the project area.

IV b) Although Colma Creek is in a naturally occurring riparian corridor, the channelization of the Creek and concrete walls have replaced the riparian habitat over time. Construction of the concrete bottom may permanently remove the existing vegetated sediment bar, a small amount of low-quality habitat that has formed as a result of sediment accumulation in the project area. The proposed concrete bottom slab of the channel will be designed to allow a permanent silt load of approximately 2 feet as a means for maintaining a mud-flat area as sediment re-deposits over time; however, alteration of the channel bottom and introduction of an impervious bottom may prohibit the reformation of the vegetated sediment bar as it currently exists. Habitat on the sediment bar is low quality and no special status species have been documented in the project area.

Effects to habitat downstream of the project area due to construction related runoff would be reduced through implementation of best management practices (BMPs) that prevent contact between runoff and the pollution source. Implementation of these BMPs would reduce the potential for contaminated runoff from the construction site and adverse water quality impacts downstream of the project area. Furthermore, as the use of the channel would remain the same, the construction activities associated with the proposed project would not drastically change the water quality or the runoff to downstream habitat. Potential impacts to water quality would be minimized through compliance with existing state water quality regulations as well as construction grading and erosion control ordinances required by the local agencies. Any impact to riparian habitat would be less than significant.

IV c) A wetland delineation following ACE guidelines was conducted during the field site visit on May 6th, 2010 by CDM environmental scientists Kristin Tremain and Patricia Reed. During this time, it was determined that the sediment bar qualifies as wetlands under Army Corps of Engineers (ACOE) guidelines (CDM, 2010). To account for the loss of wetland habitat

in the project area, which is providing nesting habitat to waterfowl, mitigation measure BIO-2 will be implemented. With mitigation, impacts will be less than significant.

IV d) The existing channelized nature of the project area presents an impediment to the movement of aquatic species (e.g. fish) and the aquatic habitat is very disturbed (Leidy et al., 2005). The presence of concrete walls and partial concrete bottom reduce covered areas that allow fish to hide from predators, such as birds. In addition, the shallow depth of the Creek during low tide and the presence of the dissipation structure upstream may affect fish movement and water temperature. The construction involves the removal and replacement of a concrete structure (channel walls and a portion of the bottom); no new barriers to wildlife movement would be constructed. The project area is not a wildlife nursery site.

Migratory birds are protected by the Migratory Bird Treaty Act. Potential impacts to migratory birds could occur if construction resulted in the disturbance of active nests. In order to reduce these impacts, mitigation measure BIO-1 would be implemented (as described below). With mitigation incorporated, there would be a less than significant impact.

IV e) No locally protected trees are present in the project area. Therefore the project does not conflict with any local policies or ordinances protecting biological resources. There would be no impact.

IV f) The project will not conflict with any Habitat Conservation Plan, Natural Community Conservation Plan, or any other habitat conservation plan. There would be no impact.

Mitigation Measures

Mitigation Measure BIO-1: Impacts to Migratory Birds

If construction is to occur within the nesting season for migratory birds (typically March-August), a preconstruction survey shall be performed to determine if active migratory bird nests are present within 300 feet of the construction work area (within 500 feet for raptors). The survey shall be performed by a biologist with experience conducting breeding bird surveys. If an active nest is located, construction within 300 feet of the nest (500 feet for raptor nests) will be postponed until the nest is vacated and juveniles have fledged and when there is no evidence of a second attempt at nesting.

Mitigation Measure BIO-2: Impacts to Wetlands

To reduce the impact of the loss of wetlands in the project area, a mitigation plan will be devised and implemented in accordance with the requirements of the U.S. Army Corps of Engineers Section 404 Nationwide Permit.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
V. CULTURAL RESOURCES				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in State CEQA 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA 15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Project Setting

As part of this initial study, research was conducted by William Self Associates, Inc. (WSA) to determine the presence of any cultural resources on the site, or within the vicinity. On behalf of WSA, staff at the California Historical Resources Information System, Northwest Information Center (NWIC) at Sonoma State University conducted a records search of the project vicinity on April 5th, 2010 (File No. 09-1231). The study included a review of records and maps on file at the NWIC. The records search area consisted of the project area and a surrounding ¼-mile radius. Historic maps that were reviewed included the 1869 U.S. Coast Survey Map, and the 1896, 1915 and 1942 USGS San Mateo 15-minute topographic quadrangles. In addition, the Office of Historic Preservation indices for the City of South San Francisco and the *California Inventory of Historical Resources* (March 1976) were consulted.

Previously Recorded Cultural Resources

Results of the records search indicate that there are no recorded sites within the project area. There is one previously recorded cultural resource (P-41-000497) within ¼-mile radius of the project area. P-41-000497 is a section of railroad tracks that connected the Southern Pacific alignment completed in 1864 to a line constructed approximately in the early 1890s that served the eastern section of the San Francisco Peninsula (Avina, 2000).

There are no properties within the project area or within ¼-mile of the project area listed in the Historic Property Data File or the *California Inventory of Historic Resources*.

Previous Cultural Resource Studies

Five cultural resource studies have previously been undertaken that cover portions of the project area. Three of these involved an archaeological survey. Four studies of the five have been undertaken within ¼-mile of the project area.

Results of the Field Survey

A WSA staff archaeologist conducted an intensive pedestrian survey of the project area on April 6th, 2010. The area was evaluated for the presence of historic or prehistoric site indicators. Historic site indicators include, but are not limited to, foundations, fence lines, ditches, standing buildings, objects or structures such as sheds at least 50 years in age, concentrations of materials, such as domestic refuse (glass bottles, ceramics, toys, buttons or leather shoes) or refuse from other pursuits such as agriculture (e.g., metal tanks, farm machinery parts, horse shoes) and structural materials (e.g., nails, glass window panes, corrugated metal, wood posts or planks, metal pipes and fittings, etc.). Prehistoric site indicators include, but are not limited to, areas of darker soil with concentrations of ash, charcoal, bits of animal bone (burned or unburned), shell, flaked stone, ground stone, or human bone.

No evidence of historic or prehistoric cultural materials or soils was detected within the survey area.

Impact Analysis

V a) Through the research methods identified above, no historical resource as defined in CEQA 15064.5 was identified. Therefore, it is anticipated that there would be no impact on historical resources. However, due to the potential for such resources to remain buried and unknown until the time of ground disturbance, specific pre-construction and construction measures would be required. Mitigation Measure CUL-1 outlines practices for accidental discovery of resources, such that impacts upon these, if discovered, would be less than significant.

V b) Through the research methods identified above, no archaeological resource pursuant to CEQA 15064.5 is known to occur onsite. Therefore, it is anticipated that the proposed project would have no impact on archeological resources. However, due to the potential for such resources to remain buried and unknown until the time of ground disturbance, specific pre-construction and construction measures would be required. Mitigation Measure CUL-1 outlines practices for accidental discovery of resources, such that impacts upon these, if discovered, would be less than significant.

V c) Through the research methods identified above, no paleontological resources or unique geological features are known to occur onsite. Therefore, it is anticipated that the proposed project would have no impact on these resources. However, due to the potential for such resources to remain buried and unknown until the time of ground disturbance, specific pre-construction, and construction measures would be required. Mitigation Measure CUL-1

outlines practices for accidental discovery of resources, such that impacts upon these, if discovered, would be less than significant.

V d) Through the research methods identified above, no human remains are known to occur onsite. Therefore, it is anticipated that the proposed project would have no impact on human remains. However, due to the potential for such resources to remain buried and unknown until the time of ground disturbance, specific pre-construction, and construction measures would be required. Mitigation Measure CUL-2 outlines practices for accidental discovery of resources, such that impacts upon these, if discovered, would be less than significant.

Mitigation Measures

Mitigation Measure CUL-1: Unexpected Discovery of Cultural Resources

This measure shall be implemented to reduce potential impacts on historical, archeological, and paleontological resources that are unknown but potentially discoverable at the time of ground disturbance. Prior to the initiation of construction or ground-disturbing activities, all field personnel shall be alerted to the possibility of buried prehistoric or historic cultural resources. Personnel should be instructed that upon discovery of buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archeologist should be contacted immediately. Once the find has been identified, plans for the treatment, evaluation, and mitigation of impacts to the find shall be developed if it is found to be eligible for listing on the National Register of Historic Places or the California Register of Historical Resources. Prehistoric or historic cultural materials that may be encountered during ground-disturbing include the following:

- historic artifacts, such as glass bottles and fragments, tin cans, nails, ceramic and pottery shreds, and other metal objects;
- historic structural or building foundations, walkways, cisterns, pipes, and other structural elements;
- prehistoric flaked-stone artifacts and debitage, consisting of obsidian, basalt, and/or cryptocrystalline silicate stone (CCS);
- ground stone artifacts, such as mortars, pestles, and grinding slabs;
- dark, almost black soil, with a "greasy" texture that may be associated with charcoal, ash, bone, shell, flaked stone, ground stone, and fire affected rock; and,
- human remains.

Mitigation Measure CUL-2: Unexpected Discovery of Human Remains

This measure would be implemented to reduce potential impacts on human remains that are unknown but could be discovered at the time of ground disturbance. If human remains are encountered during ground disturbance activities, work in that area must halt and the San Mateo County Coroner must be notified immediately. If the remains are determined to be Native American, then the Native American Heritage Commission (NAHC) is to be notified within 24 hours as required by Public Resources Code 5097. The NAHC will contact the designated Most Likely Descendant who will provide recommendations for the treatment of the remains within 48 hours of being granted access to the find.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
VI. GEOLOGY AND SOILS				
Would the project:				
a) Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Project Setting

The project is located on Colma Creek, with limits at approximately 300 feet upstream of the Spruce Avenue Bridge and 80 feet downstream of the bridge, within the City of South San Francisco, California. The creek's headwaters are located in the San Bruno Mountain State and County Park. The creek travels southeasterly from the headwaters, and along with its tributaries convey surface runoff from the mountainous and urban areas through underground storm drains and improved creek channels until its discharge in the San Francisco Bay. The Colma Creek Watershed drains 15.7 square miles, which encompasses the City of South San Francisco, the Town of Colma, and parts of Daly City, Pacifica, and San Bruno, and portions of unincorporated areas of San Mateo County. The Colma Creek Watershed is bounded on the west by Skyline Boulevard, on the north by the San Bruno Mountains, and on the east by the San Francisco Bay.

Impact Analysis

VI a (i) The project area is located in a known seismic zone, and the project improvements will most likely be exposed to an earthquake at some point during its design life. Significant earthquakes have occurred in the San Francisco Bay Area, and are generally believed to be triggered by crustal movement along a system of sub parallel fault zones that trend in a northwesterly direction through the San Francisco Bay Area and under the peninsula. While the City of South San Francisco is located in an Alquist-Priolo Earthquake Fault Zone, as mapped by the California Geological Survey, no habitable structures are involved in this project (California Geological Survey, 1982). Therefore, potential impacts related to earthquake fault rupture would be less than significant.

VI a (ii) As previously mentioned, the project site is located in a seismically active region. According to the California Geological Survey, peak ground acceleration at the site for an earthquake event with a 10 percent probability of exceedance in 50 years is about 0.71g (Figure 3) (California Geological Survey, 2003). This type of event could induce impacts such as property damage, loss of life, and injury if channel walls or construction machinery were to fall on workers. To reduce such impacts, construction equipment should be setback an equal distance as the channel is deep, as well as temporary support from metal piers and other bracing devices against the channel walls. Shoring design should be performed by a licensed professional engineer with experience in such projects. Adherence to the design criteria and standards would reduce the potential for incidences on site, and would reduce impacts to less than significant.

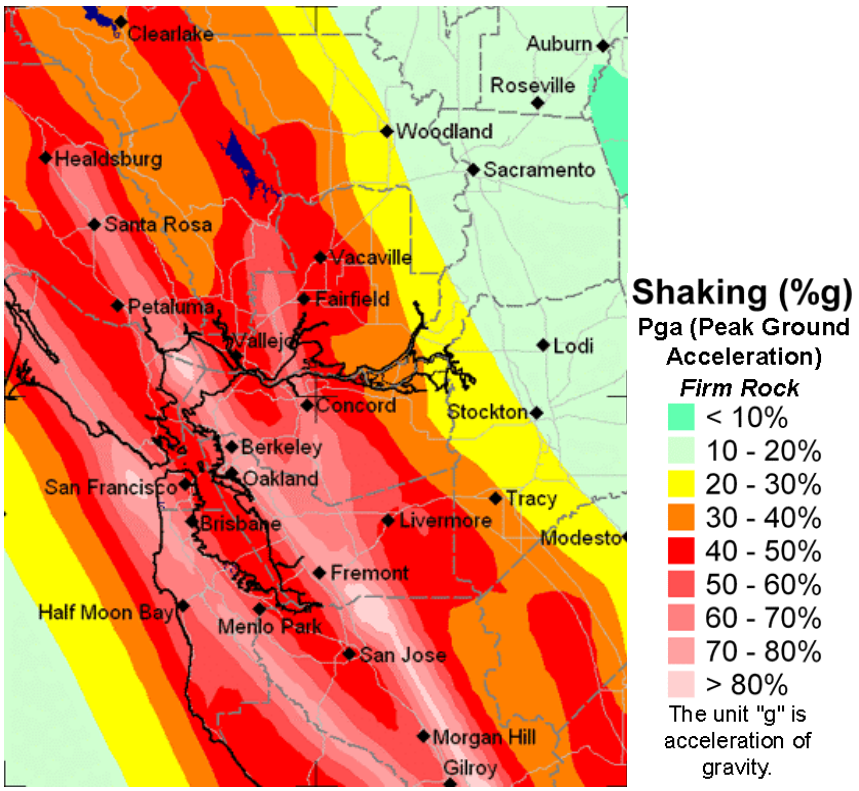


Figure 3: Site Peak Ground Acceleration
Source: California Geologic Survey, 2003.

VI a (iii) The project site is located in a known seismic zone, which has a liquefaction risk of "high" as determined by the USGS (USGS, 2010). Seismic shaking has the potential to liquefy the soil in areas that contain saturated granular sediments of a specific grain size. The loss of shear strength in low to moderate relative density areas, along with shallow groundwater, can create an environment in which soils take on a "liquid" quality. This process typically occurs in poorly packed alluvial deposits, artificial fill, and areas with a shallow water table. The design phase of the proposed project will include the completion of a geotechnical engineering investigation and report. Recommendations from the geotechnical engineering report will be incorporated into the design and construction of the project to address the liquefaction potential. By incorporating the recommendations of the geotechnical investigation into the design and construction, the exposure of people and structures to potential substantial adverse effects involving liquefaction would be considered a less than significant impact.

VI a (iv) The project is located in a region known for landslides, and is categorized as being in a moderate risk zone by the USGS (USGS, 2010). A moderate risk zone is referred to as having 1.5 to 15 percent of areas susceptible to an incident. However, in the immediate vicinity of the project ground slope is too shallow to cause an event of any significance, and the proximity to higher risk zones is negligible. The project area is comprised of level to gradually sloping streets in a heavily urban area. Any impact associated with a seismically induced landside in this area would be less than significant.

VI b) Construction of the new U-shaped channel walls and concrete bottom slab will require grading, bracing, temporary dewatering, temporary excavation, and trenching. The activities will create a potential for erosion while the construction phase is underway. However, construction BMPs will be installed to prevent erosion. Moreover, with the failing walls currently existing due to ground settlement, sink holes, and scouring, any erosion that may occur during construction will be offset by the project. Potential impacts associated with erosion or loss of topsoil would be less than significant.

VI c) Soils at the site will be disturbed during the construction phase, as previously mentioned. Installation of the new U-shaped channel walls and concrete bottom slab will remove the risk of scouring, provide more long term functionality, geotechnical reliability, and protect the structural integrity of the adjacent roads, bridge and channel structure. These structural improvements to the channel walls and bottom are designed to prevent the development of sink holes and ground settlement in the project area. The potential for unstable soils in the area after construction of the new improvements will be less than significant.

VI d) The soils and subsurface materials present on site are considered expansive (Harza Engineering Company, 1998). Soft silty clays ranged in thickness from 21 to 37 feet and have a high plasticity and high expansion potential. Construction of the improvements designed to meet standards will mitigate the future problems on foundation and walls associated with expansive soils. The potential impacts associated with expansive soils would be less than significant.

VI e) No septic tanks are being installed in conjunction with this project. As a result, no potential impacts will be associated with the use of septic tanks.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
VII. GREENHOUSE GAS EMISSIONS				
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Project Setting

Briefly stated, global climate change (GCC) is a change in the average climatic conditions of the earth, as characterized by changes in wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying

temperature changes that have occurred in the past, such as during previous ice ages. Many of the recent concerns over GCC use this data to extrapolate a level of statistical significance, specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission projections of Green House Gas (GHG) needed to stabilize global temperatures and GCC impacts. The IPCC predicted that the range of global mean temperature increase from 1990 to 2100, given six scenarios, could range from 1.4 to 5.8 degrees Celsius (°C) (IPCC, 2001). Regardless of analytical methodology, global average temperature and mean sea level are expected to rise under all scenarios.

Climate models applied to California's conditions project that, under different scenarios, temperatures in California are expected to increase by 3 to 10.5 degrees Fahrenheit (°F) (California Climate Change Center 2006). Almost all climate scenarios include a continuing trend of warming through the end of the 21st century given the substantial amounts of GHG already released, and the difficulties associated with reducing emissions to a level that would stabilize the climate. According to the 2006 California Climate Action Team Report (CalEPA, 2006), the following climate change effects are predicted in California over the course of the 21st century.

- A diminishing Sierra snowpack declining by 70 to 90 percent, threatening the State's water supply.
- Increasing temperatures, as noted above, of up to approximately 10 °F under the higher emission scenarios, leading to a 25 to 35 percent increase in the number of days ozone pollution levels are exceeded in most urban areas.
- Coastal erosion along the length of California and seawater intrusion into the Delta from a 4- to 33-inch rise in sea level. This would exacerbate flooding in already vulnerable regions.
- Increased vulnerability of forests due to pest infestation and increased temperatures.
- Increased challenges for the State's important agricultural industry from water shortages, increasing temperatures, and saltwater intrusion into the Delta.
- Increased electricity demand, particularly in the hot summer months.

As such, temperature increases would lead to adverse environmental impacts in a wide variety of areas, including: sea level rise, reduced snowpack resulting in changes to existing water resources, increased risk of wildfires, public health hazards associated with higher peak temperatures, heat waves, and deteriorated air quality.

In December 2008, the California Air Resources Board (CARB) released a Climate Change Scoping Plan (CARB, 2008) that outlines the State's strategy to achieve the 2020 GHG emissions limit mandated by Assembly Bill 32 (AB 32). AB 32 requires the State to reduce GHG emissions to 1990 levels by 2020. GHG emissions in the State are expected to increase by nearly 30 percent between the 2002-2004 levels (average emissions) and 2020 under the business-as-usual (BAU) conditions.

In a staff report entitled "California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit," CARB estimated the 1990 emission level as approximately 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) (CARB, 2007). The State would need to reduce emissions by 169 $MMTCO_2e$ in 2020 as compared to BAU to meet the emission targets; this represents a nearly 30 percent decrease in emissions from BAU.

Impact Analysis

VII a) The current version of the BAAQMD CEQA Guidelines released in 2010 contains specific criteria for GHG emissions that are used as a proxy to estimate significance in this document.

The BAAQMD is not proposing a threshold of significance for construction-related GHG emissions; however, it recommends that construction emissions are quantified and disclosed. Construction-related GHG emissions are provided in Table 5. The BAAQMD also recommends that best management practices (BMPs) be followed to mitigate any construction-related emissions to the extent possible. The following BMPs are recommended by the BAAQMD:

- Alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet;
- Local building materials of at least 10 percent; and
- Recycle at least 50 percent of construction waste or demolition materials.

Total GHG emissions associated with construction-related activities are expected to be minimal, as shown in Table 5. Furthermore, the proposed project will integrate the listed BMPs to the maximum extent possible. GHG emissions are therefore expected to be less than significant.

VII b) The BAAQMD has been very proactive in its efforts to reduce emissions of GHGs. In 2005, the BAAQMD initiated a Climate Protection Program to address climate change and climate protection through BAAQMD activities. The BAAQMD also partnered with the Institute for Local Government to develop the San Francisco Climate Action Web Portal to allow local governments to access tools and resources for implementing climate actions.

One of the goals in the Draft 2010 Clean Air Plan is to reduce emissions of GHGs to 1990 levels by 2020 and 40 percent below 1990 levels by 2035, which is consistent with the State's climate

Table 5: Summary of Annual GHG Emissions (metric tons CO_2e per year)			
Source	**CO_2**	**CH_4**	**N_2O**
Dewatering Pumps[1]	55	0.003	0.0007
Construction Equipment	497	0.10	n/a
On-Road Haul Trucks	7	0.00013	0.000019
Construction Worker Commuting	8	0.00063	0.00088
Total	**568**	**0.10**	**0.00159**
GWP	1	21	310
CO_2e Emissions	568	2	0.49
Total CO_2e	**571**		

Key:

CH_4 = methane

CO_2 = carbon dioxide

CO_2e = carbon dioxide equivalent

GWP = global warming potential

n/a = not applicable

N_2O = nitrous oxide

Notes:

1 The dewatering pumps are electric; however, indirect GHG emissions will occur from purchased electricity.

protection goals. The Draft 2010 Clean Air Plan includes the following measures to reduce emissions from construction and farming equipment:

- Expenditure of cash incentives between 2010 and 2020 to retrofit engines with diesel particulate filter or upgrade to equipment with electric, Tier III, or Tier IV off-road engines;
- Work with CARB, the California Energy Commission (CEC), and others to develop more fuel-efficient off-road engines and drive-trains; and
- Work with local communities, contractors, farmers, and developers to encourage the use of renewable electricity and renewable fuels, such as biodiesel from local crops and waste fats and oils, in applicable equipment.

Furthermore, CARB's AB 32 Scoping Plan (2008) had several measures to reduce emissions from transportation fuels, which would indirectly reduce emissions from construction equipment. These include the Low Carbon Fuel Standard (LCFS), which became effective on

January 12, 2010, which would reduce GHG emissions by reducing the full fuel-cycle carbon intensity of transportation fuels used in California.

The various plans, policies, and regulations at the state and local level do not directly require the reduction of GHG emissions from construction equipment; however, emissions will be indirectly reduced through programs like the LCFS and engine retrofits. Several rules adopted to reduce emissions of non-GHGs, such as CARB's In-Use Off-Road Diesel Vehicle Regulation (13 CCR 2449), could also reduce GHG emissions as a co-benefit. Since the construction equipment will operate in compliance with all applicable regulations for off-road equipment, the proposed project will not conflict with any plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Therefore, there would be no impact.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
VIII. HAZARDS AND HAZARDOUS MATERIALS				
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Project Setting

The project is located in Colma Creek, with limits at approximately 300 feet upstream of the Spruce Avenue Bridge and 80 feet downstream of the bridge, within the City of South San Francisco, California. The area surrounding the site is populated by light manufacturing, office-warehouses, and vehicle-service uses. Improvements to the Colma Creek Channel have been on-going since 1979 to provide flood protection to the surrounding area.

A records search, conducted by Environmental Data Resources (EDR), reviewed several standard environmental databases to identify hazardous sites within one mile of the project site. This search reported all sites that are listed on agency files for the documented use, storage, or release of hazardous materials or petroleum products, and involved a search of federal, state, tribal, and EDR proprietary environmental databases. This report identified historically contaminated properties, businesses that use, generate, or dispose of hazardous materials or petroleum products in their operations and active contaminated sites that are currently under assessment and/or remediation.

The findings of the EDR report indicate that there are several current or historic known toxic sites within 1/16th of a mile of the project site (EDR, 2010). There are several sites within a cluster around the area where proposed construction activities would take place. The presence of these sites indicates the potential for contaminated groundwater, fuel storage tanks (also identified in Ogden, 1996), and the presence of other chemicals such as Polychlorinated biphenyls (PCBs) (EDR, 2010).

Impact Analysis

VIII a) Construction of the proposed project would require excavation, grading, and movement of soils. If contaminated soils or groundwater were to come in contact with workers, equipment, or the surrounding environment, adverse health and environmental impacts could result. Additionally, during construction of the proposed project, workers and the environment could be exposed to hazardous materials such as fuels, oils, solvents, lead solder, and glues. Exposure could occur through normal use and/or if these materials were accidentally spilled or released.

Proper handling of hazardous materials is required by existing federal, state, and local regulations.

At the Federal level, the USEPA is responsible for implementation and enforcement of federal laws, including the Resource Conservation and Recovery Act of 1986 (RCRA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). At the state level, the California Environmental Protection Agency (CalEPA) Department of Toxic Substances Control (DTSC) is responsible for enforcement of the Hazardous Waste Control Act, a statute that primarily regulates the management of hazardous waste; and the Hazardous Substance Account Act, a statute that governs the cleanup of contaminated property and is modeled after CERCLA. In addition, worker safety is regulated by the Federal Occupational Health and Safety Administration (OSHA) through the Process Safety Management (PSM) Standard (29 CFR 1910.119) with requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. Worker protection is also regulated by the California Occupational Health and Safety Agency (Cal-OSHA). Cal-OSHA specifies lower quantities than the Federal PSM of hazardous materials handled that would trigger the PSM requirements at a facility.

The presence and handling of hazardous material during construction could pose a significant impact to the environment and public if appropriate handling measures, as required by the regulations identified, are not followed. Additionally, potentially significant impacts could result if unknown contaminants are discovered on site at the time of construction. However, due to the limited vertical and horizontal extent of the construction project, and the limited extent of the possible contamination, the risk of significant soil, sediment, and water contamination is expected to be small. Additionally, construction activities would remain in the confines of the Colma Creek Channel. None of the hazardous materials sites identified in the EDR report occur in the construction area. Potentially hazardous areas occur near the project area, with several located 22 feet from the Colma Creek Channel along North Canal Street (operations storing hazardous material (49/997 EDR Report), oil/solvent waste recyclers (50/997 EDR Report)). However, the risk of encountering hazardous materials is minimal if construction activities are restricted to identified work zones, and established procedures are followed.

In order to ensure the safe handling and removal of hazardous materials during construction, a waste management plan (WMP) will be prepared prior to the start of construction. The WMP is a requirement in the construction specifications which is prepared by the County Flood Control District. The WMP shall also indicate the intended salvage and recycling facilities for all construction and demolition debris from the proposed project as required by the City of South San Francisco Municipal Code Section 15.60. Compliance with this WMP requirement would reduce potential impacts stemming from the discovery of hazardous materials during construction. In order to further reduce potential impacts, a Hazardous Materials Contingency Plan (HMCP) (Mitigation Measures HAZ-1) would be developed prior to the start of construction to include standard construction measures required by federal, state, and local

policies for hazardous materials, removal of onsite debris, and confirmation of presence of pipelines on-site.

Operation of the proposed project would not result in the routine transport, use, or disposal of hazardous materials. It is not anticipated that ongoing maintenance of the proposed Colma Creek Channel improvements would require the use of any hazardous materials. Therefore, implementation of the mitigation measure described below would reduce potential impacts to less than significant.

VIII b) Construction equipment and process would require the use of hazardous materials such as fuels, glues, solvents, lubricants, and lead solder. These materials would generally be in containers designed specifically to house each material. Compliance with waste management procedures contained in the construction specifications, as prepared by the Flood Control District, would minimize the potential for contact with hazardous materials during construction. Additionally, potential spills during construction would be mitigated through measure HAZ-1 (described below), which would reduce the impact to less than significant.

VIII c) No existing or proposed school is within one-quarter mile of the project site. There would be no impact from the project on surrounding schools in regard to hazardous materials.

VIII d) The proposed project is not located on a site which is included in the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, there would be no impact.

VIII e) The proposed project is not located within an airport land use plan. The San Francisco International Airport is located approximately 2 miles from the project site. The project would not have any significant hazards for people residing or working in the project area. Noise and air issues associated with the airport would be addressed through OSHA regulations regarding work on or near heavy construction equipment at the project site. No impacts to safety would be associated with working near the airport.

VIII f) The proposed project is not located within the area of a private airstrip. There would be no impact on safety associated with any private airstrip.

VIII g) Throughout the proposed project construction, the east-bound lane of North Canal Street would be closed for the proposed project staging area. In order to address the temporary closure of the east-bound lane of North Canal Street, Mitigation Measure TRAN-1 would be implemented (see Transportation/Traffic Section). Work will be conducted as not to interfere with public agencies or utility companies that may be working in the area. After the completion of the proposed project, the east-bound lane of North Canal Street would be restored to the prior condition. Impacts would be temporary and less than significant with mitigation.

VIII h) The project site would not be in an area susceptible to wildfires, due to the heavily urban setting and general lack of combustible native vegetation. Manufacturing, offices, warehouses, and many service center shops populate the area, with little to no wild lands

adjacent or intermixed. There is no significant risk of loss, injury, or death involving wildfires, and therefore there would be no impact.

Mitigation Measures

Mitigation Measure HAZ-1: Implementation of Hazardous Materials Contingency Plan

The construction contractor (as required by the contract specifications) shall develop a HMCP to include standard construction measures required by federal, state, and local policies for hazardous materials, removal of on-site debris, and confirmation of presence of pipelines on-site. At a minimum, this plan would include the following:

a) If contaminated soils or other hazardous materials are encountered during any soil moving operation during construction (e.g., trenching, excavation, grading), construction shall be halted and the HMCP implemented.

b) Instruct workers on recognition and reporting of materials that may be hazardous.

c) Minimize delays by continuing performance of the work in areas not affected by hazardous materials operations.

d) Identify and contact subcontractors and licensed personnel qualified to undertake storage, removal, transportation, disposal, and other remedial work required by, and in accordance with, laws and regulations.

e) Forward to engineer, copies of reports, permits, receipts, and other documentation related to remedial work.

f) Notify such agencies as are required to be notified by laws and regulations within the time stipulated by such laws and regulations.

g) File requests for adjustments to contract time and contract price due to the finding of hazardous materials in the work site in accordance with conditions of contract.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
IX. HYDROLOGY AND WATER QUALITY Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒

j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Project Setting

Located in the City of South San Francisco, the project site is within the Colma Creek Watershed, a subwatershed of the San Francisco Bay Basin. The climate of this area of the San Francisco peninsula is characterized by warm, dry summers and cool, rainy winters (San Mateo County, 1998). The Colma Creek Watershed is 15.7 square miles (San Mateo County, 2007).

The City of South San Francisco is largely developed with a high proportion of impermeable surfaces (City of South San Francisco, 1999a). This creates a significant amount of surface runoff and a small amount of infiltration to groundwater. Stormwater is collected in the city's storm drain system and discharged to Colma Creek or the San Francisco Bay (City of South San Francisco, 1999a).

Colma Creek and the Colma Creek Watershed are under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB). The quality of water in the creek is affected by both point and non-point pollution sources, which are regulated by National Pollution Discharge Elimination System (NPDES) permits as authorized by the RWQCB (City of South San Francisco, 1999a). Permits specify discharge limits for certain pollutants and require local permit holding industries to pretreat some pollutants prior to discharging to treatment plants.

Stormwater discharges associated with construction and operation of the Proposed Project are permitted under the joint city and San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) (developed in 1991) (City of South San Francisco, 1999a). SMCWPPP operates under a Joint Municipal Regional Stormwater NPDES Permit (Order R2-2009-0074; NPDES Permit No. CAS612008; San Francisco Bay RWQCB, 2009)for stormwater quality management, which is authorized by the San Francisco Bay RWQCB and includes controls for new development and construction sites. Construction sites disturbing one acre or more of soil also need to be permitted under the State's Construction General Permit. The operators or owners of the project site are responsible for filing the Notice of Intent (NOI) for permit coverage (RWQCB San Francisco Region, 2009).

The project site is a creek channel, which is defined by Federal Emergency Management Agency (FEMA) as a Zone A Channel Confined flood zone. The City of South San Francisco General Plan, *Health and Safety Element*, describes that periodic flooding in the city is confined to certain areas along the creek. Given the highly urbanized nature of the city and the watershed, runoff levels are high and flooding potential increases during periods of heavy rainfall. Colma Creek handles much of the runoff generated in the city (City of South San Francisco, 1999a). A historically flood prone area is located where Colma Creek flows under the Southern Pacific Railroad (SPRR) line. Flood flows during intense rain storms back up and pond east of the train tracks causing water to move away from the creek through city streets. Extensive channel improvements, undertaken from 1999-2005 confined the high flows in Colma Creek. Currently,

the Colma Creek Channel is designed to contain a 50-year flood. The north side of Colma Creek upstream of Spruce Avenue is in Zone AH on the FEMA Flood Insurance rate Maps (FIRMS). Zone AH designates areas of shallow flooding where depths are between 1 and 3 feet during the 100-year flood. Official FEMA FIRMS have not been updated to show the improved zone designation.

Impact Analysis

IX a) Construction of the proposed project would involve grading, temporary excavation, bracing, temporary dewatering, and trenching activities. The potential exists for short-term construction related impacts on the quality of surface water runoff. Impacts to water quality during construction due to erosion if rainfall occurs would be minimized through compliance with the existing NPDES permit associated with the SMCWPPP, noted above. The proposed project would fall under Provision C.6, Construction Site Control, of the permit. The permit requires permittees to:

> Implement a construction site inspection and control program at all construction sites, with follow-up and enforcement consistent with each Permittee's respective Enforcement Response Plan (ERP), to prevent construction site discharges of pollutants and impacts on beneficial uses of receiving waters. Inspections shall confirm implementation of appropriate and effective erosion and other construct-ion pollutant controls by construction site operators/developers; and reporting shall demonstrate the effectiveness of this inspection and problem solution activity by the Permittees.

Compliance with NPDES permit regulations and implementation of BMPs as described in Section C.6c. of the permit would minimize potential construction-related water quality impacts to less than significant.

As described, construction activities would involve temporary dewatering of the creek in the vicinity of the proposed project. Dewatering would involve a number of pumps to be operated in the creek. Each pump would pump approximately 10 cubic feet per second of water and would operate for up to 24 hours per day for 10 weeks. Pumped water would be discharged back into the creek at a location downstream of the project site. The construction contractor will be required to obtain a dewatering permit from the RWQCB prior to any discharges. This will entail filing a NOI and may require water quality testing and monitoring. The construction contractor will be required to adhere to all permit conditions. It is not anticipated that any treatment of the pumped water would be required. Pumps would be checked periodically.

It is not anticipated that long-term maintenance of the proposed project would require the use of any hazardous materials. Therefore, operations would not violate water quality standards or waste discharge requirements as set by the RWQCB. Potential impacts would be less than significant.

IX b) The proposed project would not use groundwater and would not deplete groundwater supplies. The addition of approximately 11,100 square feet of impervious surface would not

constitute a significant increase in the impervious cover in the vicinity of the project site and groundwater recharge would not be affected. Therefore, groundwater resources would remain unchanged and no impact would result.

IX c) The proposed project would not entail any development or construction that would alter current drainage patterns at the project site or in the vicinity. While the proposed project involves the addition of a concrete bottom along an approximately 380 foot long portion of the Colma Creek Channel, construction would not substantially alter the course of the channel. Additionally, the proposed project would not involve construction that would cause substantial erosion or siltation. Overall, construction and operation of the proposed project would have no impact on current drainage patterns.

IX d) Construction of the concrete bottom would slightly increase the impervious surface of the watershed in the vicinity of the project area. However, the small added surface area would be inside the creek channel. The proposed project would not result in the addition of any impervious surface outside of the creek channel. Therefore, the proposed project would not substantially increase the rate or amount of surface runoff from the surrounding watershed in a manner that would result in flooding on- or off-site. The proposed project is expected to reduce localized flooding due to the construction of structurally sound channel walls, which would also provide long-term protection to roads, the pedestrian park, and utilities in the vicinity of the project site. This would be a beneficial impact to public health and safety from the proposed project.

IX e) The proposed project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide a substantial additional source of polluted runoff. The proposed project would improve the structural integrity and thus the drainage capabilities of the Colma Creek Channel. The proposed project would not add impervious surfaces to the watershed in the vicinity of the project site. Therefore, there would be no impact.

IX f) During construction activities, the measures described above under Project Setting, relating to the requirement to comply with the countywide NPDES stormwater permit conditions would minimize water quality impacts. Compliance with permit requirements including: the development of an ERP; development and implementation of site specific and pollutant specific BMPs; development of an erosion control plan; and, inspection and reporting of the effectiveness of BMPs. Impacts would be less than significant.

IX g) The project does not involve the development of housing. Therefore, this impact is not applicable to the proposed project.

IX h) Construction of the proposed project would not add any structures in the floodplain that would impede or redirect flood flows. There would be no impact.

IX i) The proposed project would decrease flooding risks due to enhanced structural integrity of the channel walls. Therefore, the project would not increase the risk of loss, injury, or death due

to flooding. This would result in a beneficial impact. See further analysis in *Geology and Soils* Section VI (a).

IX j) As described in the City of South San Francisco General Plan, the city is located in one of the most seismically active regions in the country. There are approximately 30 known faults in the Bay Area that are considered capable of generating earthquakes (City of South San Francisco, 1999a). The alluvial lowlands surrounding Colma Creek between Orange and South Linden Avenues have been determined to be susceptible to extremely high or very high levels of wave amplification by the Association of Bay Area Governments (ABAG) and USGS (City of South San Francisco, 1999a). Ground shaking related to earthquakes can cause tsunami (or tidal waves) and seiches in the San Francisco Bay. Since the creek is located in a low-lying area by the San Francisco Bay, there is a possibility for tsunami or seiche inundation. However, the proposed project is not constructing structures for human occupancy. In addition, channel structures would be designed in accordance with the requirements of the 1994 Uniform Building Code (UBC), as described in the City's General Plan (City of South San Francisco, 1999a). Therefore, no significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow would occur. No impact would result.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
X. LAND USE AND PLANNING Would the project:				
a) Physically divide an established community?	☐	☐	☒	☐
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Have a substantial impact upon the existing character of the vicinity?	☐	☐	☐	☒

Project Setting

Existing Land Uses in Project Vicinity

The proposed project is located in the southeastern area of the City of South San Francisco. The project location is between Orange and Linden Avenues, where the creek flows under the Spruce Avenue Bridge. Land use in this area is designated by the city and consists of a mixture of low density residential, medium density residential, public use, community commercial,

business commercial, and mixed industrial (City of South San Francisco, 1999b). Zoning in the vicinity of the project site is a mixture of Planned Industrial District (P-1), Industrial District (M-1), and Single Family Residential (R-1) and Medium Density Residential (R-2) (City of South San Francisco, 2003).

The project site is bordered along the south side by the Sister Cities Park, which is open to the public. The Spruce Avenue Bridge also crosses the project site. The closest residential area is an apartment complex located south of the Sister Cities Park, approximately 40 feet from the midpoint of construction along the southern wall of the creek channel.

The creek itself is maintained as a flood control channel within the Colma Creek Flood Control Zone of the San Mateo County Flood Control District.

Impact Analysis

X a) The proposed project would replace the existing concrete walls of Colma Creek in the vicinity of the Spruce Avenue Bridge. Additionally, a concrete bottom slab would be added to the portion of the channel extending from the existing transition structure to 80 feet downstream of the Spruce Avenue Bridge.

Construction activities including storage and staging of construction materials have the potential to serve as temporary physical disruptions to residents in the vicinity. The construction contractor would have limited use of the Sister Cities Park, which runs on the north side of several apartment buildings and homes that front Mayfair Avenue. The staging area would extend east to west along the park from the entrance at Spruce Avenue to the point where the transition structure is located in the channel. The area would extend 35 feet south, leaving a 5-foot area where pedestrians could still pass through.

Construction equipment and vehicles would access the project site via North Canal Street, which could cause access impacts to residents living in the vicinity of the project site. These impacts would only occur during construction (approximately 4 months in duration) and no street closures would take place without obtaining proper approvals from the City of South San Francisco. Therefore, potential impacts to nearby residents during construction would be less than significant.

Once construction is completed, the project would not physically divide an established community. Thus, there would be no long-term impact on an established community.

X b) The proposed project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project. Applicable land use plans include the City of South San Francisco's General Plan *Land Use Element*. The proposed project would not result in any changes to existing land use in the vicinity. Hence, there would be no impact on applicable land use plans, policies, or regulations.

X c) The proposed project would be constructed within a flood control facility that is owned and maintained by San Mateo County Flood Control District. As described above, land uses in the vicinity of the project location consist of residential, commercial, and industrial. The proposed project would not result in changes to these land uses. Thus, there would be no impact on the existing character of the vicinity.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XI. MINERAL RESOURCES Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Project Setting

Land use in the vicinity of the proposed project is comprised of commercial, industrial, and residential. Since the establishment of the Colma Creek Flood Control Project in 1974, several channel improvements and bridges have been constructed along the creek channel. Past projects include the construction of concrete channel walls, channel widening, and construction of transition structures to provide flood protection for the surrounding area. The proposed project is similar in nature to previous channel improvements.

According to the California Geological Survey, Division of Oil, Gas & Geothermal Resources (DOGGR), there are no plugged or active wells or geothermal resources in the vicinity of the project site (California Department of Conservation, 2009). The County's Mineral Resources map shows that the closest mineral resources to the project site include Significant Stone (classified as Mineral Resource Zone-2 by the California Geological Survey) and an active crushed or broken stone quarry. Both of these resource areas are located over a mile from the project site (San Mateo County, 1974).

Impact Analysis

XI a) Construction of the proposed project would occur in the channel and temporary staging and storage of construction equipment would be in the general vicinity of the project site. Neither construction related activities or long-term operation of the proposed project would cause a significant loss of mineral resources that would be of value to the region and the residents of the State. The project would have no impact.

XI b) The proposed project is not located on a locally-important mineral resource recovery site. Therefore, there would be no impact associated with loss of availability of resources delineated in local plans.

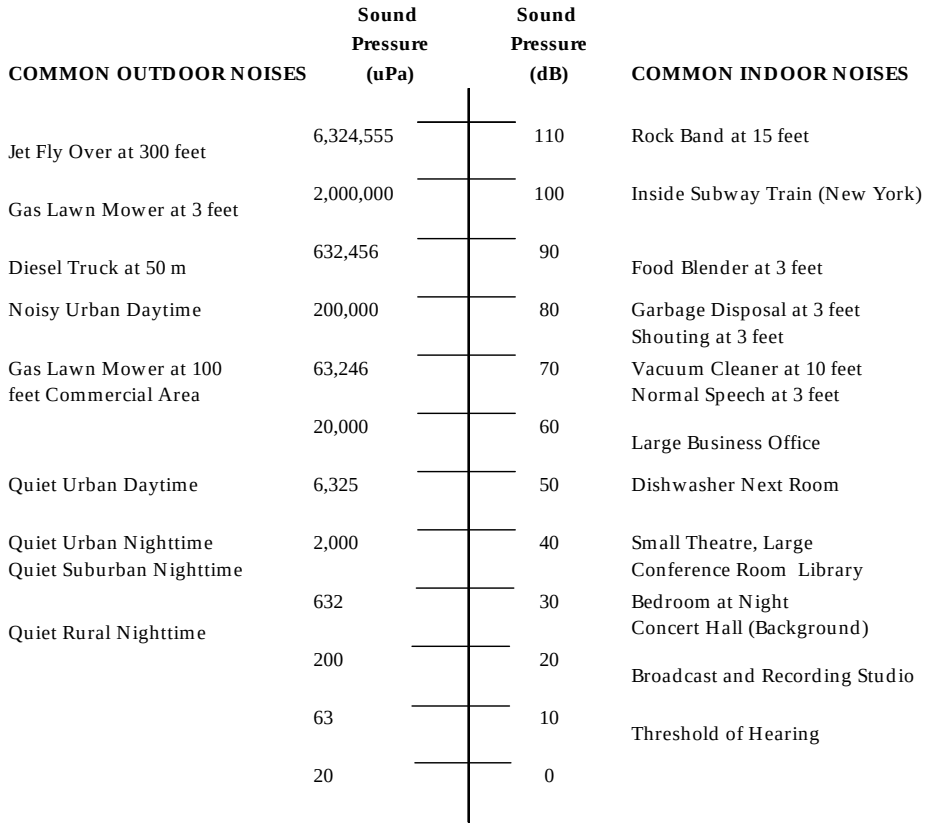
Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XII. NOISE Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Project Setting

The proposed project, located in the City of South San Francisco, is in an urban area. The nearest noise-sensitive residential receptors are several apartment buildings, approximately 50 feet from the south wall of the project site. There is also a public park (Sister Cities Park) immediately adjacent to the south channel wall.

Noise Terminology

Noise is measured in decibels (dB) and is a measurement of sound pressure level. The human ear perceives sound, which is mechanical energy, as pressure on the ear. The sound pressure level is the logarithmic ratio of that sound pressure to a reference pressure, and is expressed in decibels. Environmental sounds are measured with the A-weighted scale of the sound level meter. The A scale simulates the frequency response of the human ear, by giving more weight to the middle frequency sounds, and less to the low and high frequency sounds. A-weighted sound levels are designated as dBA. Figure 4 below shows the range of sound levels for common indoor and outdoor activities, in dBA.



Source: FHWA, 1980.

Figure 4: Common Indoor and Outdoor Noises

Because sounds in the environment usually vary with time they cannot simply be described with a single number. Two methods are used to describe variable sounds. These are exceedance levels and equivalent levels, both of which are derived from a large number of moment-to-moment A-weighted noise level measurements. Exceedance levels are values from the cumulative amplitude distribution of all the noise levels observed during a measurement period. Exceedance levels are designated L_n, where n represents a value from 0 to 100 percent.

For example, L_{50} is the median noise level, or the noise level in dBA exceeded 50 percent of the time during the measurement period.

The equivalent noise level (L_{eq}) is the constant sound level that in a given period has the same sound energy level as the actual time-varying sound pressure level. L_{eq} provides a methodology for combining noise from individual events and steady state sources into a measure of cumulative noise exposure. It is used by local jurisdictions and the Federal Highway Administration (FHWA) to evaluate noise impacts.

The day-night noise level (L_{dn}) is the energy average sound level for a 24-hour day determined after the addition of a 10-dBA penalty to all noise events occurring at night between 10:00 p.m. and 7:00 a.m. The L_{dn} is a useful metric of community noise impact because people in their homes are much more sensitive to noise at night, when they are relaxing or sleeping, than they are to noise in the daytime. The L_{dn} is used by local jurisdictions to rate community noise impacts from transportation noise sources.

In the State of California, the community noise equivalent level (CNEL) is widely used. It is similar to the L_{dn} noise level, except it weights events occurring between the evening hours of 7:00 p.m. and 10:00 p.m. by increasing noise levels by 5 dBA.

In addition to evaluating noise impacts based on complying with noise standards, project noise impacts can also be assessed by annoyance criteria, or the incremental increases in existing noise levels. The impact of increasing or decreasing noise levels is presented in Table 6. For example, it shows that a change of 3 dBA is barely perceptible and that a 10 dBA increase or decrease would be perceived by someone to be a doubling or halving of the noise level (loudness).

Table 6
Decibel Changes, Loudness, and Energy Loss

Sound Level Change (dBA)	Relative Loudness	Acoustical Energy Loss (percent)
0	Reference	0
-3	Barely Perceptible Change	50
-5	Readily Perceptible Change	67
-10	Half as Loud	90
-20	1/4 as Loud	99
-30	1/8 as Loud	99.9

Source: FHWA, 1995.

Noise Environment

The noise environment consists of the existing ambient noise levels at the project site and the relevant local regulations and policies. Existing noise levels at the project site are moderately high, consistent with the urban, residential-commercial character of the area. The dominant sources of noise are aircraft departures from San Francisco International Airport, surface traffic on North and South Canal Streets and Spruce Avenue and industrial activities. Because there is

no recent noise monitoring data available at or near the project site, data on noise levels provided in the USEPA document "Information on Levels of Environmental Noise Requisite to Protect Public Health with an Adequate Margin of Safety", March 1974, were used to estimate average ambient noise levels at the project site. According to this USEPA document, the average daytime L_{eq} is expected to be 60-65 dBA and the average nighttime Leq is expected to be 50-55 dBA with an estimated Ldn of 60-65 dBA (corresponding to an urban to noise urban residential area).

Vibration Environment

A field survey of the existing environment at the project site confirmed that there is no existing major stationary source of vibration in the area. Truck traffic on the nearby roads is the most frequent perceivable source of vibration. With no major sources of vibration in the area, the project site would be expected to have an existing vibration level of less than 0.005 inches per second (ips) peak particle velocity, which is below the level of perceptibility, shown in Table 7.

Table 7
Summary of Vibration Levels and Effects on Humans and Buildings

Peak Particle Velocity (in/sec)	Effects on Humans	Effects on Buildings
<0.005	Imperceptible	No effect on buildings
0.005 to 0.015	Barely perceptible	No effect on buildings
0.02 to 0.05	Level at which continuous vibrations begin to annoy people in buildings	No effect on buildings
0.1 to 0.5	Vibrations considered unacceptable for people exposed to continuous or long-term vibration	Minimal potential for damage to weak or sensitive structures.
0.5 to 1.0	Vibrations considered bothersome by most people, however tolerable if short-term in length	Threshold at which there is a risk of architectural damage to buildings with plastered ceilings and walls. Some risk to ancient monuments and ruins.
1.0 to 2.0	Vibrations considered unpleasant by most people	U.S. Bureau of Mines data indicates that blasting vibration in this range will not harm most buildings. Most construction vibration limits are in this range.
>3.0	Vibration is unpleasant	Potential for architectural damage and possible minor structural damage.

Source: Michael Minor & Associates, no date.

Regulatory Framework

The proposed project is located in the City of South San Francisco and the relevant local regulations and policies are the City Noise Ordinance and the Noise Element of the General Plan.

Noise Element

The City of South San Francisco 1999 General Plan Noise Element includes the following policies:

> **9-G-1** Protect public health and welfare by eliminating or minimizing the effects of existing noise problems, and by preventing increased noise levels in the future.
>
> **9-G-2** Continue efforts to incorporate noise considerations into land use planning decisions, and guide the location and design of transportation facilities to minimize the effects of noise on adjacent land uses.
>
> **9-I-1** Work to adopt a pass-by (single event) noise standard to supplement the current 65 dB CNEL average noise level standard as the basis for aircraft noise abatement programs.
>
> **9-I-2** Work to adopt a lower average noise standard for aircraft-based mitigation and land use controls.
>
> **9-I-3** Pursue additional funding sources and programs for the noise insulation retrofit of homes not completed before the expiration of the Memorandum of Understanding in 2000.
>
> **9-I-4** Ensure that new noise-sensitive uses, including schools, hospitals, churches, and homes, in areas near roadways identified as impacting sensitive receptors by producing noise levels greater than 65 dB CNEL (Figure 9-3 [of the General Plan]), incorporate mitigation measures to ensure that interior noise levels do not exceed 45 dB CNEL.
>
> **9-I-5** Require that applicants for new noise-sensitive development in areas subject to noise generators producing noise levels greater than 65 dB CNEL, obtain the services of a professional acoustical engineer to provide a technical analysis and design of mitigation measures.
>
> **9-I-6** Where site conditions permit, require noise buffering for all noise-sensitive development subject to noise generators producing noise levels greater than 65 dB CNEL. This noise attenuation method should avoid the use of visible sound walls, where practical.
>
> **9-I-7** Require the control of noise at source through site design, building design, landscaping, hours of operation, and other techniques, for new developments deemed to be noise generators.

In addition, the San Mateo County Comprehensive Land Use Plan noise/land use compatibility standards are contained in the Noise Element. This land use plan was adopted by the County Airport Land Use Commission.

City of South San Francisco Municipal Code

The key sections of the City of South San Francisco Municipal Code noise regulations (Title 8 of the code) pertaining to construction are as follows (City of South San Francisco, 2010a):

8.32.050 Special Provisions

> (d) Construction. Construction, alteration, repair or landscape maintenance activities which are authorized by a valid city permit shall be allowed on weekdays between the hours of 8 a.m. and 8 p.m., on Saturdays between the hours of 9 a.m. and 8 p.m., and on Sundays and holidays between the hours of 10 a.m. and 6 p.m., or at such other hours as may be authorized by the permit, if they meet at least one of the following noise limitations:
>
> (1) No individual piece of equipment shall produce a noise level exceeding 90 dB at a distance of 25 feet. If the device is housed within a structure or trailer on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible.
>
> (2) The noise level at any point outside of the property plane of the project shall not exceed 90 dB.

Impact Analysis

XII a) With respect to construction, the proposed daily project construction schedule would fall within the times specified by the ordinance, i.e., 8 a.m. to 8 p.m., Monday through Friday. Assuming that the construction noise regulation in Section 8.32.050(d) limiting the noise level at a distance of 25 feet or at any point outside of the property plane of the project to 90 dB or less refers to the L50 noise level, as provided for in Section 8.32.030 of the Municipal Code, and because the L50 noise level would be expected to be under 90 dBA, proposed project construction would not expose persons to noise in excess of the standards established in the local noise regulations or General Plan. No construction noise impact would result.

With respect to operations, the proposed project would not involve equipment or operations that generate long-term noise, and therefore, the proposed project would not generate long-term off-site noise levels. Therefore, the project's operation noise impact would not expose persons to noise in excess of the standards established in the local noise ordinance or General Plan and there would be no impact.

XII b) Construction activities have the potential to produce vibration levels that may be annoying or disturbing to humans and may cause damage to structures. Vibration from construction projects is caused by general equipment operations, and is usually highest during pile driving, soil compacting, jack hammering and construction related demolition and blasting activities. For the proposed project, the aforementioned higher-vibration construction activities that would occur are sheet pile driving and soil compacting. Measurements of vibration are

expressed in terms of the peak particle velocity (PPV) in the unit of ips. The PPV, a quantity commonly used for vibration measurements, is the maximum velocity experienced by any point in a structure during a vibration event. It is an indication of the magnitude of energy transmitted through vibration. PPV is an indicator often used in determining potential damage to buildings from stress associated with blasting and other construction activities. Vibration levels decrease substantially with distance. During pile driving (sheet pile installation is expected to take three weeks), the proposed project would be expected to generate vibration levels at the nearest residences 50 feet away in the range of 0.1 to 0.5 ips. According to Table 7, this is within the range of vibration tolerable to most people if short term in length, which would be the case with this project. Therefore, the vibration impact would be less than significant.

XII c) The proposed project would not increase long-term ambient noise levels in the project vicinity because the project equipment and operations would only be temporary on-site during construction and not generate long-term noise (see XII (a), above). No pumps or generators would be required to operate the system in the long term. There would be no new major permanent noise sources from the completed project. Traffic-related noise would also be minimal because maintenance traffic would consist of only an occasional visit on average. As noted, the nearest noise-sensitive receptor is about 50 feet from the project site; the project operations noise levels at the nearest off-site receptors would be no higher than without the project. Therefore, the impact would be less than significant.

XII d) For construction noise, a "substantial" noise increase (as noted in the fourth significance criterion) can be defined as interference with activities during the day and night. One indicator that construction noise could interfere with daytime activities would be speech interference, and an indicator that construction noise could interfere with nighttime activities would be sleep interference. Because no nighttime construction is proposed, this analysis need only consider daytime construction noise. The following criterion has been used to define the significance of potential daytime noise impacts:

Speech Interference: Speech interference is an indicator of impact on typical daytime and evening activities. A speech interference criterion, in the context of impact duration and time of day, is used to identify substantial increases in noise from temporary construction activities. Noise peaks generated by construction equipment could result in speech interference in adjacent buildings if the noise level in the interior of the building exceeds 45 dBA. A typical building can reduce noise levels by 25 dBA with the windows closed[1]. This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows must remain closed at all times (With windows open, a 15 dBA reduction can be assumed). Assuming a 25 dBA reduction with the windows closed, an exterior noise level of 70 dBA (L_{eq}) at receptors would maintain an acceptable interior noise environment of 45 dBA. It should be noted that such noise levels would be sporadic rather than continuous in nature, because different types of construction equipment would be used throughout the construction process.

[1] U.S. Environmental Protection Agency. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* 1974.

Construction would temporarily increase ambient noise levels in the vicinity of the project site. The table below shows typical noise from construction equipment.

Short-term construction noise levels would range from 65 to 90 dBA at 50 feet from construction activities (peak levels up to 101 dBA at 50 feet would occur when sheet pile driving is occurring), but these noise levels would be intermittent throughout the day. The dewatering pumps are expected to operate up to 50% of the time during construction, including potential operations for up to 24 hours per day for 10 weeks. Even if the pumps were to operate more than 50% of the time, they would have a minimal effect on ambient daytime and nighttime noise levels because the pumps would be submersible pumps located 5 to 10 feet below the bottom of the channel in sumps. The pumps would be electrically powered. Average noise levels over the course of construction would be substantially lower. The nearest receptors are the apartments opposite Sister Cities Park from the channel. Project construction would on average be taking place 50 to 100 feet from these residences. At these distances, construction noise levels would be reduced by up to 6 dBA and would range from 59 to 84 dBA at the outside wall of the residences, with the average noise level expected to be less than 70 dBA. Therefore, at the nearest off-site residential receptors, average noise levels indoors would be less than the 45 dBA threshold for speech interference with closed windows. With windows open, noise levels indoors would at times exceed 45 dBA, which could result in occasional speech interference. Because speech interference: 1) would be occasional, 2) would occur with windows open only, and 3) would occur during the temporary 15-week construction period only, the proposed project construction noise would not be expected to substantially interfere with daytime speech at the off-site residences, and so this would be a less than significant potential impact for daytime construction.

Table 8
Construction Operations, Equipment Types and Their Noise Levels

Equipment Type	L_{max} @ 50′ (dBA)
Scrapers	81
Dozers	82
Vibratory Compactors	83
Haul Trucks	76
Excavator	81
Small Crane	81
Drill Rigs	84
Loaders	79
Blasting	94
Rock/Screening Crushing Operations	94
Pile-driver (Impact)	101
Concrete Batch Plant	83

Source: FHWA, 2006

Transportation-related noise sources would include construction worker vehicles, visitor vehicles, deliveries and off-hauling of materials. According to the traffic analysis, the volume of construction traffic generated by these sources would be very low in relation to existing traffic

volumes. Because it takes a doubling of traffic to increase noise levels by 3 dBA, the noise generated by this short-term, low volume of traffic would increase noise levels by less than 1 dBA and, therefore, would have imperceptible noise impacts. The potential impact is less than significant.

XII e) The project site is at the boundary limit of the San Mateo County Comprehensive Airport Land Use Plan (Airport Land Use Plan) but not within two miles of a public use airport (San Francisco International Airport is at least two miles from the project site). According to the Airport Land Use Plan, airport CNEL levels are less than 65 dBA in the project area, which indicates that residents and workers are not exposed to excessive noise levels. Therefore, no impact would occur from the proposed project.

XII f) The project site is not in the vicinity of a private airstrip. Therefore, no impact would occur from the proposed project.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XIII. POPULATION AND HOUSING Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Project Setting

The City of South San Francisco is the fourth largest city in San Mateo County and has experienced steady population growth in recent years. Between 2000 and 2008, the population of the city grew from 60,552 to 63,744 (City of South San Francisco, 2010b). Land use in the vicinity of the project site is comprised of a mixture of commercial, industrial, and residential. The closest residential building is approximately 50 feet from the midpoint of construction along the southern wall of the channel. The address of the closest residence is 508 Mayfair Avenue (as determined on Google Earth).

Impact Analysis

XIII a) The proposed project entails construction of a U-shaped channel with concrete walls and installation of a concrete bottom slab in order to permanently repair the existing damaged walls. The project would remove risks associated with scouring, improve geotechnical reliability, provide long term functionality, and would protect the structural integrity of the transition structure and the Spruce Avenue Bridge. The proposed project would not include the extension of a public road or other infrastructure. Therefore, the proposed project would not induce substantial population growth in the area, either directly or indirectly. Thus, there would be no impact related to population growth.

XIII b) The proposed project would be constructed in the channel and would involve temporary staging and storage of construction equipment in limited locations in the immediate vicinity of the channel. The proposed project would not displace any existing housing, create demand for additional housing or require the construction of replacement housing. Hence, there would be no impact on existing housing or housing demand.

XIII c) Since the proposed project would be constructed in the channel, it would not cause any long-term changes in surrounding land uses. While there would be temporary staging and storage of construction equipment in the vicinity of the apartment complex south of Sister Cities Park, this would occupy a limited area and would not result in temporary or permanent displacement of any existing housing. The proposed project would not displace any people or require the construction of replacement housing elsewhere. Therefore, there would be no impact on housing or residents.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XIV. PUBLIC SERVICES Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services**:**				
a) Fire protection?	☐	☐	☐	☒
b) Police protection?	☐	☐	☐	☒
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒

Project Setting

The City of South San Francisco Fire Department is responsible for fire protection in the proposed project area. The closest fire station is The City of South San Francisco Fire Department and Administration Fire Station 61, located at the corner of Spruce Avenue and North Canal Street. The station is within the proposed project area and the response time would be less than a minute.

The City of South San Francisco Police Department provides law enforcement for the proposed project area. The police station is located on Arroyo Drive, near El Camino Real, approximately one mile from the proposed project area.

The school district that serves the proposed project area is the South San Francisco Unified School District (SSFUSD). The SSFUSD includes nine elementary schools, three middle schools, and three high schools (City of South San Francisco, 2009). The closest school to the proposed project area is South San Francisco High School, located approximately half a mile from the proposed project.

The City of South San Francisco operates approximately 319.7 acres of parks and open space throughout the city (City of South San Francisco, 2009). The closest recreation area is the Sister Cities Pedestrian Park, located parallel and adjacent to the south side of the channel, directly in the proposed project area. The park consists of a pedestrian and bicycle path lined with both grass and trees.

Impact Analysis

XIV a)

Construction Phase

During construction of the proposed project the presence of construction workers would be temporary, and the need for public services, such as emergency medical services in case of an accident, would not exceed the current demand and capacity.

During construction the eastbound lane of North Canal Street will require closure during the entirety of the proposed project. It is assumed that the Fire Department primarily uses Spruce Avenue to respond to emergencies; however the lane closure of North Canal Street may cause a minor impact. A traffic control plan will be established by the contractor, and approved by the City of South San Francisco and San Mateo County. The plan would ensure coordination with emergency response providers to provide sufficient emergency response access for the surrounding area. The City of South San Francisco may require a detour route as the eastbound lane of North Canal Street will be closed for staging area. If this detour route is necessary, it will be devised by the contractor as part of the traffic control plan.

Construction of the proposed project would require the temporary use of the Sister Cities Park, during which the section of the park located in the proposed project area would be closed. Adjacent to the south side of the channel, the park consists of a pedestrian and bicycle path lined with both grass and trees. The proposed project would block off the section of the park adjacent to the proposed project area, however, it would leave a 5-foot pedestrian path to connect the Spruce Avenue/South Canal Street intersection to the remainder of the park. The narrowing of the path would have a minor impact on pedestrian facilities and bicycle pathways.

Operation Phase

The proposed project would not increase demand for public services including emergency services, such as fire and police protection, and other services such as schools and parks. Operation of the proposed project would require only periodic maintenance, similar to the activities currently conducted at the existing channel. Therefore, no new or expanded emergency service infrastructure would need to be built in order to maintain acceptable service ratios, response times, or other performance objectives of public services. Hence, there would be no impact on public services or facilities.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XV. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Project Setting

The Sister Cities Pedestrian Park runs adjacent to Colma Creek. The park, under the City's jurisdiction, is the closest public walking/recreation facility to the project site. Running along the southern side of the channel, the park is approximately 0.5 miles in length and spans from Spruce Avenue to Orange Avenue.

The City of South San Francisco's General Plan shows other public parks in the vicinity of the channel. The closest of these is Orange Memorial Park, which is approximately 0.5 miles

northwest of the project site directly north of Orange Avenue (City of South San Francisco, 1999a).

Impact Analysis

XV a) Construction of the proposed project would not increase the use of city parks in the vicinity of the project site. The proposed project would not construct any housing or other structures that would cause a greater number of people to come to the area of the Sister Cities Park and other nearby neighborhood parks. Thus, there would be no long-term increase in use of recreational facilities that would lead to or accelerate the substantial physical deterioration of the facility. There would be no impact.

XV b) The proposed project does not include recreational facilities or the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Therefore, there would be no impact.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XVI. TRANSPORTATION/TRAFFIC Would the project:				
a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☒	☐	☐

e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☐	☐	☒

Project Setting

The project site is located between North and South Canal Streets, extending to the west and east of the Spruce Avenue Bridge (See Figure 2). Spruce Avenue, which is the primary access to the project site, is a four-lane minor arterial that extends northeast to Grand Avenue and southwest to El Camino Real/Hwy 82. Both North and South Canal streets are local two-lane roads running east and west.

Daily traffic volumes (in both directions) for the area were counted in 2005. The 2005 traffic volume for Spruce Avenue was 14,700 vehicles per day. The daily traffic volume for North Canal Street was 1,900 vehicles per day (Dennis Chuck, City of South San Francisco). The daily traffic volume for South Canal Street was 1,200 vehicles per day. Because the study area is highly developed, these volumes are not expected to have changed materially since 2005.

Methodology

Transportation and circulation impacts associated with the proposed project would occur during the construction period only. The construction period is expected to last 4 months.

Topic "b" from the checklist above specifies that, among other requirements, a LOS standard-of-significance established by the county congestion management agency, City/County of Governments of San Mateo County (C/CAG), should be used in the evaluation of potential transportation impacts. Related to this, the following policy from the City of South San Francisco General Plan (1999) provides guidance on local LOS standards: the policy requires planning for a LOS D or better on arterial and collector streets.

Existing Levels of Service

LOS definitions for various roadway types were obtained from the Highway Capacity Manual (HCM) 2000 and are presented in Table 9. LOS for roadway segments is defined as volume-to-capacity ratios. LOS for an intersection (both signalized and unsignalized) is determined by the control delay (HCM, 2000).

According to the City of South San Francisco General Plan, Spruce Avenue has a capacity of 36,000 vehicles per day. From the 2005 daily traffic data, Spruce Avenue was estimated to operate with a V/C ratio of 0.40, corresponding to a LOS of B (V/C of less than 0.47) in the vicinity of North and South Canal Streets.

Table 9
Level of Service Criteria

	Roadway	*Signalized Intersection*	*Unsignalized Intersection*
LOS	*V/C*	*Delay (seconds/vehicle)*	*Delay (seconds/vehicle)*
A	≤ 0.29	≤ 10	0-10
B	≤ 0.47	> 10-20	> 10-15
C	≤ 0.68	> 20-35	> 15-25
D	≤ 0.88	> 35-55	> 25-35
E	≤ 1.0	> 55-80	> 35-50
F	-	> 80	> 50

The HCM 2000 Edition estimates traffic volume capacities for local city roads, as shown in Table 10. Both the North and South Canal Streets are undivided two-lane streets which, according to 2005 traffic counts, operate with approximately 1,900 and 1,200 vehicles per day, respectively. Both of these traffic volumes are significantly less than an LOS of C (9,100 vehicles per day); therefore, in the worse case these two roads would operate at a LOS of B.

Table 10

Theoretical Planning Level Daily Traffic Volumes for City Roads in an Urbanized Area

Lanes	*Separation Features*	*LOS A*	*LOS B*	*LOS C*	*LOS D*	*LOS E*
2	Undivided	**	**	9,100	14,600	15,600
4	Undivided / Divided	**	**	21,400	31,100	32,900
6	Divided	**	**	33,400	46,800	49,300

Source: Transportation Research Board - National Research Council. 2000. *Highway Capacity Manual (HCM2000)* - Chapter 9 Analytical Procedures Overview, Section VI Service Volume Tables, Page 9-9, Washington D.C.

Source: Florida Department of Transportation, Systems Planning Office. 2002. *Quality/Level of Service Handbook* - Chapter 4 General Planning Analysis, Table 4-1 Generalized Annual Average Daily Volumes for Florida's Urbanized Areas (page 85), Tallahassee, Florida.

** As per HCM2000, levels of service A and B planning level volumes cannot be calculated in urbanized areas using default values.

Trip Generation Analysis

Construction Phase

The proposed project would include excavation and construction activities by a Contractor that would be supported by County staff and subcontractors. It is anticipated that trucks and construction-worker vehicles would access the project construction area primarily via Spruce Avenue. Truck routes available to construction workers include El Camino Real, (a major arterial just southwest of the proposed project area), Spruce Avenue, and North and South Canal Streets (east of Spruce Avenue). Traffic volumes on Spruce Avenue, North Canal Street,

and South Canal Street would be affected by the worker vehicle trips, truck deliveries of equipment and supplies, hauling off of excess soil (spoils) and import of fill material.

Construction traffic would involve daily truck trips to bring in materials and equipment to be used in constructing the facilities, and to bring construction workers. Approximately 1,210 cubic yards of imported soils and aggregates would then be required for site grading. The import of materials would require approximately 160 truck trips over a 10 day period, or approximately 16 trips a day. Approximately 1,600 cubic yards of concrete would be imported over 3 weeks to construct the channel, generating 16 truck trips a day. It is anticipated that there would be an average of 10 to 15 construction workers on the project site daily; worker travel to and from the project site would generate a peak number of 30 trips a day (15 trips during both a.m. [inbound only] and p.m. [outbound only] peak hours). Construction equipment and materials would be delivered to the project site during the approximate 4-month construction period.

Considering the trips generated by construction workers, hauling of fill, and equipment and materials deliveries, the total peak period project-generated vehicular trips would be approximately 19 inbound and 19 outbound trips per day, as shown in Table 11.

Table 11
Peak Construction Period Trip Generation Analysis

	Daily		*A.M. Peak Hour*		*P.M. Peak Hour*	
	Inbound	*Outbound*	*Inbound*	*Outbound*	*Inbound*	*Outbound*
Hauling Trucks (soil & aggregate import)	8	8	1	1	1	1
Construction Workers	15	15	15	0	0	15
Concrete Delivery	8	8	1	1	1	1
Total	31	31	17	2	2	17
Total Daily Trips	62		19		19	

Source: Data were acquired from the design engineer and represent the best information available at the time of the study.

Impact Analysis

XVI a)

Construction Phase

The project-related construction traffic would increase the overall vehicular volumes on Spruce Avenue by approximately 62 daily trips and 19 a.m. peak-hour trips, most of which would be worker vehicles, not heavy trucks. The project trips would contribute about 0.4 percent to the Spruce Avenue volumes, with a new V/C of 0.41 along Spruce Avenue, which corresponds to the same LOS of B. This low volume of additional trips would have a less than significant impact on roadways and intersection operations and capacities.

Therefore, the potential impact of project construction traffic on would be less than significant and no mitigation is required.

Operations Phase

Traffic generation from the proposed project operations would consist of maintenance worker traffic occasionally to visually inspect the channel. As the proposed project is to repair the existing channel, operation and maintenance after construction would not generate any new trips that currently don't exist.

XVI b) Traffic management standards, including LOS, are established in the project area by the C/CAG Congestion Management Authority (CMA), and guidance on local standards is provided in the City of South San Francisco General Plan (as described previously). The LOS standards are intended to apply to long-term traffic impacts from existing and future projects and not to short-term impacts from minor construction projects, such as the proposed project. As noted above in a), there will be no generation of additional traffic to operate and maintain the channel.

XVI c) The project site is located approximately two miles from the San Francisco International Airport (SFO); the proposed project would not change air traffic patterns or air traffic volumes. There are no above ground structures proposed for the facility to affect air traffic. Therefore, there would be no air traffic impact from the proposed project.

XVI d)

Construction Phase

The proposed project would not include any project-related public road construction nor increase hazards due to a design feature or incompatible use. Project-related truck and construction-worker traffic would share Spruce Avenue and North Canal Street with other vehicles. The use of Spruce Avenue and North Canal Street to access the proposed project site could potentially increase traffic hazard concerns due to the addition of slow moving trucks requiring access from the construction site to Spruce Avenue. The potential for conflicts with bicycle traffic along streets in the project vicinity and the Sister Cities Park could increase as well. However, the low number of peak-period daily heavy truck trips (19 vehicles per day) plus the very low number of bicyclists makes this potential impact negligible. Due to the low number of daily heavy truck trips, the potential for heavy truck traffic to degrade the current pavement condition on Spruce Avenue and North Canal Street and create an unsafe road condition is limited.

Throughout the proposed project construction, the east-bound lane of North Canal Street would be closed for the proposed project staging area. In order to address the temporary closure of the east-bound lane of North Canal Street, Mitigation Measure TRAN-1 would be implemented.

Operations Phase

After the completion of the proposed project, the east-bound lane of North Canal Street would be restored to the prior condition. There would be no design changes to Spruce Avenue and North Canal Street. Therefore, there would be no impact from the proposed project.

XVI e)

Construction Phase

The proposed access to the project site is via public roads. Construction vehicles would not be parked on the public road; vehicles would either be parked in the staging area or another designated area on site. As the peak hour period volume of construction traffic would be 19 vehicles per hour (see Section XVI a), construction traffic would not be expected to delay the response time of emergency vehicles on Spruce Avenue. However, the proposed construction would require the closure of the eastbound lane of North Canal Street, which would be used for a staging area. This closure would occur throughout the duration of the proposed project construction. A traffic control plan would be established by the contractor, as discussed in XIV a), which would address emergency vehicles.

Operations Phase

After the construction of the proposed project, all traffic lanes would be restored to its prior condition and no permanent impacts are expected.

XVI f)

Construction Phase

During construction, the proposed project would require the temporary use of a limited area of the Sister Cities Park, during which a section of the park located in the proposed project area would be closed for recreational use. Adjacent to the south side of the channel, the park consists of a pedestrian and bicycle path lined with both grass and trees. The proposed project would block of the section of the park adjacent to the proposed project area, however it would leave a pedestrian path to connect the Spruce Avenue/South Canal Street intersection to the remainder of the Sister Cities Park. Therefore, there would be no impacts on pedestrian facilities or bicycle pathways.

The proposed project is located along an existing SamTrans bus route, Route 133, connecting the local area to the South San Francisco BART Station, along Spruce Avenue. As mentioned previously, construction traffic would not significantly affect existing traffic and therefore would not increase bus times. Lane closures along Spruce Avenue are not expected and therefore would not affect the bus route. North Canal Street is not currently on a bus route, and therefore lane closures on this street would not affect the transit system.

Operations Phase

After the construction of the proposed project, the Sister Cities Park would be restored to its prior condition and no permanent impacts are expected. The proposed project would not modify the roadway system or change existing land uses. Therefore, no conflict would occur with adopted policies, plans or programs supporting alternative transportation. The proposed project would not result in a change in transit demand on Spruce Avenue. Therefore, there would be no impact on public transit service.

Mitigation Measures

Mitigation Measure TRAN-1. Implementation of Traffic Control Plan

A traffic control plan will be established by the contractor, and approved by the City of South San Francisco and San Mateo County. This traffic plan will provide for the appropriate control measures, including barricades, warning signs, speed control devices, flaggers, and other measures to mitigate potential traffic hazards. The plan would also ensure coordination with emergency response providers to provide sufficient emergency response access for the surrounding area. The City of South San Francisco may require a detour route as the east-bound lane of North Canal Street will be closed for the staging area. If this detour route is necessary, it will be devised by the contractor as part of the traffic control plan.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XVII. UTILITIES AND SERVICE SYSTEMS Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Project Setting

The proposed project is located along Colma Creek upstream of Spruce Avenue Bridge in the City of South San Francisco, California. The Colma Creek Watershed is 15.7 square miles and encompasses the City of South San Francisco, the Town of Colma, portions of the cities of Daly City, Pacifica, and San Bruno, and portions of unincorporated areas of San Mateo County. The RWQCB has jurisdiction over the proposed project site.

Impact Analysis

XVII a) The proposed project would not produce wastewater. As a result, there would be no impact associated with exceeding wastewater treatment requirements of the RWQCB.

XVII b) Portable toilet facilities would be required during construction of the proposed project and offsite sewage disposal would be conducted in accordance with local, state, and federal requirements. The current design capacity of the South San Francisco/San Bruno Sewage Treatment Plant is 13 million gallons per day, which is the capacity analyzed in the City of South San Francisco's General Plan. Operation of the proposed project would not result in the construction of wastewater treatment facilities above those analyzed in the City of South San Francisco's General Plan. Since the proposed project would not entail the construction of new water treatment facilities, there would be no impact.

XVII c) The proposed project would repair the Colma Creek Channel upstream of Spruce Avenue, in the City of South San Francisco. The project would involve repair of the failing vertical north and south channel walls, including removal of the temporary bracing pipes spanning the channel, and construction of a U-shaped wall and concrete bottom slab. Under current conditions, if a major flood or heavy storm event were to occur, the event could cause collapse of the compromised channel walls.

The proposed project would involve the repair of existing stormwater drainage facilities (i.e., the Colma Creek Channel), rather than the construction of new facilities. The construction of the U-shaped wall and concrete bottom slab would require the removal of existing sediment in the

Colma Creek Channel; therefore, it is possible that a slight expansion of the stormwater drainage facilities could occur, but the repair work would not significantly expand the facilities. Potential impacts would be less than significant.

XVII d) The proposed project would not require new water supply/resource, and would not affect the existing water supply or demand beyond that which is already analyzed in the City's General Plan. Thus, the proposed project would have no impact on water supply availability.

XVII e) The proposed project would not create a new source of wastewater, require new or expanded wastewater treatment facilities, or place future demands on wastewater treatment services. Hence, there would be no impact on wastewater treatment capacity. During construction, water in the channel would be pumped out and discharged back into the channel at a location downstream of the project site. In the case that the water includes contaminants from hazardous materials sites in the vicinity, the water would be treated in compliance with the RWQCB's dewatering permit before being discharged back into the channel. This water would not be treated at a wastewater treatment facility; there would be no impact on wastewater treatment capacity from the dewatering activities.

XVII f) The facility proposed for receiving any solid waste (primarily remaining soil from the clearing and grubbing of the site) from the proposed project is located approximately 2 miles to the east of the project site. The proposed site would have the capacity to accommodate the relatively small quantity of material. Following construction, no solid waste would be routinely generated by the proposed project. Therefore, there would be no impact on landfill capacity.

XVII g) During operation following construction, the proposed project would not generate solid waste. All solid waste from construction would be disposed of in accordance with all applicable federal, state, and local statutes and regulations. Hence, there would be no solid waste impacts.

Issues (Supporting Information Sources)	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
XVIII. MANDATORY FINDING OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Impact Analysis

XVIII a) The project involves the replacement of channel walls with a U-shaped channel and construction of a concrete bottom slab. The concrete walls already exist, thus the construction of new walls would not reduce habitat. Construction of the concrete bottom may permanently remove the existing vegetated sediment bar, a small amount of low-quality habitat discussed in the Biological Resources Section that has formed as a result of accumulated sediment in the project area. The sediment bar may naturally reform over time, however alteration of the channel bottom and introduction of an impervious bottom may prohibit the reformation of the vegetated sediment bar as it currently exists. Habitat on the sediment bar is low quality and no special status species occur in the project area. Aquatic habitat in the channel is low and no known fishes occupy the project area. The impact would be less than significant.

XVIII b) The evaluation of cumulative impacts for this Initial Study/MND considered past, present and reasonably foreseeable future projects within San Mateo County and the City of South San Francisco. Identification of these projects was accomplished through research of municipal websites as well as personal communication with South San Francisco Senior Planner

Steve Carlson (Carlson, 2010). There are no present or foreseeable city projects within a one-mile radius of the project site.

Past projects involving the Colma Creek Channel improvements altered the natural creek channel by installing concrete walls and bottom upstream and downstream of the project (see timeline of events in Project Description). Although historical construction of flood control channel improvements may have altered the watershed, the additional impact from the subject project would be minor. The project considered in this Initial Study/Mitigated Negative Declaration involves the repair of existing failing flood control channel walls and construction of a concrete bottom through a section of highly disturbed urbanized flood control channel. Therefore, cumulative impacts would be less than significant.

XVIII c) The discussion in this section, Evaluation of Environmental Effects, describes less than significant impacts with incorporation of mitigation in the areas of biological resources, cultural resources, hazards/hazardous materials, and transportation/traffic. No significant impacts or no impacts at all, were identified in the areas of aesthetics, agricultural resources, air quality, geology and soils, greenhouse gas emissions, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, and utilities. Therefore, with implementation of the Mitigation Measures described in the above sections, the proposed project would not have the potential to cause substantial adverse effects on human beings, either directly or indirectly.

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References:

Avina, Mike, 2000. Department of Parks and Recreation 523 Recording Forms for P-41-000497. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

Bay Area Air Quality Management District (BAAQMD), 2005. *Particulate Matter Implementation Schedule; Staff Report*. November 9. Accessed on April 6, 2010. Available online at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Particulate%20Matter/sb656_staff_report.ashx.

Bay Area Air Quality Management District (BAAQMD), 2006. *Bay Area 2005 Ozone Strategy; Final – Adopted*. January 4. Accessed on April 6, 2010. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Bay-Area-Ozone-Strategy/2005-Bay-Area-Ozone-Strategy.aspx.

Bay Area Air Quality Management District (BAAQMD), 2010a. *California Environmental Quality Act Air Quality Guidelines.* May. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Proposed-Guidelines.aspx.

Bay Area Air Quality Management District (BAAQMD), 2010b. *Draft Bay Area 2010 Clean Air Plan*. March. Accessed on April 6, 2010. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans.aspx.

Bay Area Air Quality Management District (BAAQMD), 2010c. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. Version 1.0. May. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Proposed-Guidelines.aspx.

Calflora: Information on California plants for education, research and conservation, based on data contributed by the Consortium of Calif. Herbaria and dozens of other public and private institutions and individuals. [web application], 2010. Berkeley, California: The Calflora Database [a non-profit organization]. Available: http://www.calflora.org/ (Accessed: Apr 08, 2010).

California Air Resources Board (CARB), 2007. *California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit*. November 16.

CARB, 2008. *Climate Change Proposed Scoping Plan: A Framework for Change*. December.

CARB, 2010. *Ambient Air Quality Standards*. February 16. Accessed on April 6, 2010. Available online at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

California Climate Change Center, 2006. *Our Changing Climate: Assessing the Risks to California*. CEC-500-2006-077. July.

California Department of Conservation (DOC), 2008. Farmland Mapping and Monitoring Program. Accessed April 5, 2010. Available online at: http://www.conservation.ca.gov/dlrp/FMMP/Pages/Index.aspx

California Department of Conservation (DOC), 2009. California Geological Survey, Division of Oil, Gas, and Geothermal Resources. Online Mapping System. Accessed April 7, 2010. Available online at: http://maps.conservation.ca.gov/doms/index.html.

California Department of Fish and Game (CDFG), 2009. California Natural Diversity Database (CNDDB) San Francisco South Quad Species List. Sacramento, CA. Commercial version dated October 03, 2009.

California Department of Forestry and Fire Protection, 2003. Land Cover Multi-Source Data Compiled for Forest and Range 2003 Assessment. Map ID: FVEGWHR_13_MAP. Accessed April 1, 2010. Available online at: http://frap.fire.ca.gov/data/frapgisdata/select.asp?theme=3

California Environmental Protection Agency (CalEPA), 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March.

California Geological Survey, 2003. Probabilistic Seismic Hazards Mapping Ground Motion Page. Accessed April 8, 2010. Available online at: http://redirect.conservation.ca.gov/cgs/rghm/pshamap/pshamap.asp?Longitude=-122.435&Latitude=37.64

California Geological Survey, 1982. Alquist-Priolo Earthquake Fault Zones. Index to Earthquake Fault Zone Maps. Accessed April 8, 2010. Available online at: http://www.conservation.ca.gov/cgs/rghm/ap/Map_index/Pages/F4B.aspx#se

California Native Plant Society (CNPS), 2010. Inventory of Rare and Endangered Plants (online edition, v7-10a). California Native Plant Society. Sacramento, CA. Accessed on Thu, Apr. 8, 2010 from http://www.cnps.org/inventory

Camp, Dresser and McKee, Inc. (CDM), 2010. Colma Creek Biological Investigation, May 2010. *In press.*

Carlson, Steve. 2010. Senior Planner for the City of South San Francisco. Telephone interview with Kristin Tremain, Biologist (CDM), Interview was held on April 8, 2010.

Chuck, Dennis, 2010. Senior Civil Engineer for the City of South San Francisco. Information was sent via email to Roger Fry on April 6, 2010.

City of South San Francisco, 2010a. Municipal Code.

City of South San Francisco, 2010b. City of South San Francisco General Plan *Housing Element.* February 2010. Accessed on June 4, 2010 from http://www.ssf.net/index.aspx?NID=360

City of South San Francisco, 2009. *South El Camino Real General Plan Amendment Draft Environmental Impact Report*. Accessed on April 8, 2010. Available from: http://ssf.net/DocumentView.aspx?DID=1107

City of South San Francisco, 2003. Zoning District Map. June, 2003.

City of South San Francisco, 1999a. *South San Francisco General Plan.*

City of South San Francisco, 1999b. Land Use Diagram. Accessed April 7, 2010. Available online at: http://www.ci.ssf.ca.us/DocumentView.aspx?DID=559.

County of San Mateo, 2007. *San Mateo County Watershed Data in a GIS*. San Mateo Countywide Water Pollution Prevention Program. July 16, 2007.

Department of Transportation (DOT), 2007. California Scenic Highway Mapping System, Scenic Highways: Route 280 – Scenic Highway. Last updated December 7, 2007. Accessed April 7, 2010. Available online at: http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm

EIP Associates. 2002a. Habitat Mitigation and Monitoring Plan for the Colma Creek Flood Control Project, San Mateo County, California. June, 2002.

EIP Associates, 2002b. Protocol California Clapper Rail (*Rallus longirostris obsoletus*) Surveys of the Colma Creek Flood Control Study Area, City of South San Francisco, San Mateo County, California. July, 2002.

Environmental Data Resources Inc., 2010. Colma Creek Upstream Spruce Avenue Road Bridge South San Francisco, CA 94080. Inquiry Number: 2722818.1s. March 16, 2010.

Federal Highway Administration, 1995. *Highway Traffic Noise Analysis and Abatement Policy and Guidance*.

Federal Highway Administration (FHWA), 1980. Highway Noise Fundamentals. September 1980.

Florida Department of Transportation, Systems Planning Office. 2002. *Quality/Level of Service Handbook* - Chapter 4 General Planning Analysis, Table 4-1 Generalized Annual Average Daily Volumes for Florida's Urbanized Areas (page 85), Tallahassee, Florida.

Holland, R.F., 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California The Resources Agency Department of Fish and Game. Sacramento, CA.

Intergovernmental Panel on Climate Change (IPCC), 2001. *Climate Change 2001: The Scientific Basis*. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change.

Leidy, R.A., G.S. Becker, and B.N. Harvey, 2005. Historical distribution and current status of steelhead/rainbow trout *(Oncorhynchus mykiss)* in streams of the San Francisco Estuary, California. Center for Ecosystem Management and Restoration, Oakland, CA.

Marshall, D. B., 1988. Status of the marbled murrelet in North America: with special emphasis on populations in California, Oregon, and Washington. U.S. Fish and Wildlife Service, Biological Report 88(30). 19 pp.

Michael Minor and Associates, Vibration Primer, no date. Accessed on April 8, 2010. Available online at: http://www.drnoise.com/PDF_files/Vibration%20Primer.pdf

Montgomery Watson Harza Engineering Company, 1998. Geotechnical Investigation Colma Creek Mainline Channel Project South San Francisco, CA. April 28, 1998.

NatureServe, 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Accessed: April 8, 2010. Available online at: http://www.natureserve.org/explorer.

Ogden Environmental and Energy Services Co., Inc., 1996. Colma Creek Flood Improvement Program Preliminary Hazardous Materials Assessment. January 1996.

Ogden Environmental and Energy Services Co., Inc., 1997. Colma Creek Flood Control Project Lower Reach Improvements Mitigated Negative Declaration. San Mateo County, CA. May, 1997.

Regional Water Quality Control Board (RWQCB) San Francisco Bay Region, 2009. Municipal Regional Stormwater NPDES Permit. Order R2-2009-0074. October 14, 2009.

San Mateo County, 1986, San Mateo County General Plan, *Mineral Resources Element*. Accessed April 7, 2010. Available online at: http://www.sforoundtable.org/P&B/pb_general_plan.html

Spencer, B., 2008. Colma Creek Flood Control Channel Wall Repair Project Summary of Biological Survey and Potential Impacts. San Mateo County, CA. April 8, 2008.

Transportation Research Board - National Research Council, 2000. *Highway Capacity Manual (HCM2000)* - Chapter 9 Analytical Procedures Overview, Section VI Service Volume Tables, Page 9-9, Washington D.C.

U.S. Environmental Protection Agency (EPA), 1996. *Compilation of Air Pollutant Emission Factors (AP-42), Fifth Edition, Volume I*. Chapter 3.3: Gasoline and Diesel Industrial Engines.

U.S. Environmental Protection Agency, 1974. *Information of Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.*

United States Department of Transportation, FHWA, 2006. Roadway Construction Noise Model.

United States Fish and Wildlife Service (USFWS), 2009. Sacramento Office. Quad list for San Francisco South. Sacramento, CA. List last updated December 01, 2009.

USFWS, 2010. Migratory Birds and Habitat Program: Migratory Bird Treaty Act. Accessed June 7, 2010. Available online at: http://www.fws.gov/pacific/migratorybirds/mbta.htm

United States Geological Survey, 2010. National Atlas Online Mapping tool. Accessed April 8, 2010. Available online at: http://www-atlas.usgs.gov/natlas/Natlasstart.asp

Appendix A: Air Quality Emissions Calculations

Summary of Unmitigated Annual Emissions (metric tons per year)

	Emissions (metric tons per year)		
Source	**CO2**	**CH4**	**N2O**
Dewatering Pumps	131	n/a	n/a
Off-road construction equipment	497	0.10	n/a
On-road haul trucks	7	0.00013	0.000019
Construction worker commuting	8	0.00063	0.00088
Total	645	0.10	0.00090
GWP	1	21	310
CO2e	645	2	0.28
Total CO2e		647	

1 short ton = 0.9072 metric tons

Unmitigated Annual Project Construction Emissions (tons per year)

Source	CO	NOx	VOC	SO2	PM10	PM2.5
Dewatering Pump	0.84	3.91	0.27	0.26	0.28	0.25
Construction Equipment	0.11	0.27	0.03	0.00	0.01	0.01
Fugitive Dust	n/a	n/a	n/a	n/a	0.03	0.01
Haul Trucks	0.02	0.05	0.00	0.00	0.01	0.00
Construction Worker Commuting	0.08	0.01	0.00	0.00	0.02	0.00
Total	1.05	4.24	0.31	0.26	0.35	0.28

Maximum Daily Unmitigated Project Construction Emissions (lbs per day)

Source	CO	NOx	VOC	SO2	PM10	PM2.5
Dewatering Pump	24	112	8	7	8	8
Construction Equipment	15	35	4	0	2	2
Fugitive Dust	n/a	n/a	n/a	n/a	13	3
Haul Trucks	1	4	0	0	0	0
Construction Worker Commuting	6	1	0	0	2	0
Total Unmitigated Emissions	47	152	12	7	25	13
Threshold	*n/a*	*54*	*54*	*n/a*	*82*	*54*

Maximum Daily Mitigated (Basic Mitigation) Project Construction Emissions (lbs per day)

Includes fugitive dust control measures only

Source	CO	NOx	VOC	SO2	PM10	PM2.5
Dewatering Pump	24	112	8	7	8	8
Construction Equipment	15	35	4	0	2	2
Fugitive Dust	n/a	n/a	n/a	n/a	6	1
Haul Trucks	1	4	0	0	0	0
Construction Worker Commuting	6	1	0	0	2	0
Total	47	152	12	7	18	11
Threshold	*n/a*	*54*	*54*	*n/a*	*82*	*54*

Maximum Daily Mitigated (Additional Mitigation Measures) Project Construction Emissions (lbs/day)

Includes Tier 4 compression-ignition engines for dewatering pumps and construction equipment control measures

Source	CO	NOx	VOC	SO2	PM10	PM2.5
Dewatering Pump	16	21	1	4	1	1
Construction Equipment	15	28	4	0	1	1
Fugitive Dust	n/a	n/a	n/a	n/a	6	1
Haul Trucks	1	4	0	0	0	0
Construction Worker Commuting	6	1	0	0	2	0
Total	39	54	6	4	10	4
Threshold	*n/a*	*54*	*54*	*n/a*	*82*	*54*

Construction Equipment Control Measures

NOx	20% reduction
PM	45% reduction

1	Areas to be graded			
	North Canal Street (north)	6,000	sq. ft	
	Colma Creek bottom	28,000	sq. ft	
	Sister Cities Park (south)	9,000	sq. ft	
	Subtotal	43,000	sq. ft	
		0.99	acres	
2	Quantity of cut soil that remains onsite	900	cy	90 cy/day
	Quantity of cut soil that is to be exported offsite	0	cy	0 cy/day
	Total cut	900	cy	90 cy/day
	Quantity of additional soils and aggregate to be imported to the site	1210	cy	
	Excavation time	2	weeks	
	Total acreage to be paved (North Canal Street)	6000	sq ft	
		0.14	acres	

No.	Task	Approx. Duration	Schedule (weeks)	4/4/2011 Week 1	4/11/2011 Week 2	4/18/2011 Week 3	4/25/2011 Week 4	5/2/2011 Week 5	5/9/2011 Week 6	5/16/2011 Week 7	5/23/2011 Week 8	5/30/2011 Week 9	6/6/2011 Week 10	6/13/2011 Week 11	6/20/2011 Week 12	6/27/2011 Week 13	7/4/2011 Week 14	7/11/2011 Week 15
				1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
1	Mobilization	1 week	1															
2	Traffic Control	n/a																
3	Install temp. sheet pile (80 ft. wide) at existing bottom downstream of Spruce Bridge to stop tide waters	1 week	2															
Upstream of Spruce Bridge																		
1	Install sheet pile walls and dewatering system (two sides, each 200 feet)	2 weeks	4															
2	Remove cross bracing pipes	2 days	4.5															
3	Remove existing walls to 2 ft. below creek bottom of new slab	2 weeks	6.5															
4	Remove soil from behind existing wall and over-excavate at bottom for new slab																	
5	Prepare subbase for new slab																	
6	Form, re-bar, and pour bottom slab	1 week	7.5															
7	Form, re-bar, and pour walls	2 weeks	9.5															
8	Remove forms and backfill behind the new walls.	1 week	10.5															
9	Cut off top of sheet pile walls to 2 ft below finish grade	2 days	11															
Downstream of Spruce Bridge																		
1	Place temporary 3 ft. high sand-bag wall downstream of new slab (in existing U-Shaped Channel)	1 day																
2	Prepare subbase for new slab	3 days																
3	Remove temporary sheet pile wall (80 ft.)	1 day	12															
4	Form, re-bar, and pour bottom slab and seal joint	2 weeks	14															
5	Remove temporary 3 ft. high sand-bag wall	1 day																
Remaining Work																		
	Re-pave North Canal Street																	
	Replace south side landscaping																	
	Intall fences on top of walls																	
	Clean up																	
	De-mobilization																	

Unmitigated Dewatering Pump Emissions

Example Pump		
Quantity	6	
Discharge Capacity	10	cfs
Rating	25	hp
Duration		
Hourly	24	hr/day
Daily	7	days/week
Project	10	weeks
Dewatering Amount	362,880,000	cubic feet
	2,714,342,400	gallons
1 cf =	7.48	gallons
Duration	1,680	hours

Emissions

Pollutant	EF (lbs/hp-hr)	Emissions (tons per year)	Emissions (lbs/day)
NOx	0.031	3.91	112
CO	6.68E-03	0.84	24
SOx	2.05E-03	0.26	7
PM10	2.20E-03	0.28	8
PM2.5	n/a	0.25	8
CO2	1.15E+00	144.90	4140
TOC			
Exhaust	2.47E-03	0.31	9
Evaporative	0.00E+00	0.00	0
Crankcase	4.41E-05	0.01	0
Refueling	0.00E+00	0.00	0
VOC	n/a	0.27	8

Size Fractions

PM10	0.96
PM2.5	0.937
Ratio	0.98

<--based on CARB Speciation Profile (PMSIZE)

Reciprocating Diesel Engine

VOC to TOG 1.168224

EPA SPECIATE Database, Version 4.2

http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf

Mitigated Dewatering Pump Emissions

Number of pumps	3	
Pump size	25	hp
	19	kW
Duration	24	hours/day
	1,680	hours/project

Emission Calculations

	Emission Factor (g/kW-hr)	Emissions (lb/day)	(tpy)	Ref
VOC	0.4	1.11	0.04	NMHC+NOx standard x 95%
NOx	7.1	21.10	0.74	NMHC+NOx standard x 5%
CO	5.5	16.29	0.57	Standard
SO2	1.2	3.69	0.13	AP-42
PM10	0.30	0.89	0.03	Standard
PM2.5	0.29	0.87	0.03	PM10 standard x speciation profile

Tier 4 Exhaust Emission Standards (grams per kilowatt-hour)

13 CCR 2423

MAXIMUM ENGINE POWER	MODEL YEAR	TYPE	PM	NMHC+ NOx	NMHC	NOx	CO
			grams per kilowatt-hour				
kW<8 [1]	2008 and later	FINAL	0.40 [2]	7.5	-	-	8
8≤kW<19[1]							6.6
19≤kW<37[1]	2008-2012	INTERIM	0.3	7.5	-	-	5.5
	2013 and later	FINAL	0.03	4.7			
37≤kW<56 [3]	2008-2012	INTERIM	0.3	4.7	-	-	5
	2013 and later	FINAL	0.03				
56≤kW<75	2012-2014 [4]	PHASE-IN	0.02	-	0.19	0.4	5
		PHASE-OUT		4.7	-	-	
		or/ ALT NOx			0.19	3.4 [5]	
	2015 and later	FINAL		-		0.4	
75≤kW<130	2012-2014[4]	PHASE-IN	0.02	-	0.19	0.4	5
		PHASE-OUT		4	-	-	
		or/ ALT NOx		-	0.19	3.4 [5]	
	2015 and later	FINAL			0.19	0.4	
130≤kW≤560	2011-2013	PHASE-IN	0.02	-	0.19	0.4	3.5
	2014 and later	PHASE-OUT		4	-	-	
		or/ ALT NOx		-	0.19	2	
		FINAL				0.4	
560 kW<GEN[6]≤900 kW	2011-2014	INTERIM	0.1	-	0.4	3.5	3.5
	2015 and later	FINAL	0.03		0.19	0.67	
GEN>900 kW	2011-2014	INTERIM	0.1	-	0.4		3.5
	2015 and later	FINAL	0.03		0.19	0.67	
ELSE[7]>560 kW	2011-2014	INTERIM	0.1	-	0.4	3.5	3.5
	2015 and later	FINAL	0.04	-	0.19		

Notes:

1 Propulsion marine compression-ignition engines below 37 kW are not subject to Tier 4 standards or requirements. All previously adopted requirements remain applicable for these engines.

[2] The Tier 4 PM standard for hand-start, air cooled, direct injection engines below 8 kW is 0.60 g/kW-hr, but is not required until 2010.

3 Engine families in this power category may alternately meet Tier 3 PM standards from 2008-2011 in exchange for introducing final PM standards in 2012.

4 Manufacturers have the option of complying with the Tier 4 standards over a two year period at 50% per year using banked Tier 2 credits or over a three year period at 25% per year without the use of Tier 2 credits. The three year phase-in period is shown. The 2014 model year cannot extend beyond December 30, 2014, when the 3 year phase-in option is used.

5 Manufacturers may comply with the standards during the transitional implementation years using either a phase-in / phase-out approach or by using the Alternate NOx approach. The three year 25% alternate NOx standard is shown in the table. The two year 50% phase-in NOx standard would be 2.3 g/kW-hr.

[6] "GEN" refers to generator engines only.

[7] "ELSE" refers to all mobile machinery excluding generator engines.

http://www.arb.ca.gov/msprog/moyer/guidelines/cmp_guidelines_part4.pdf

NOx and NMHC fraction - Table B26

NOx	95%
NMHC	5%

New Walls on Colma Creek

Phase		Description	Hours per Day	Start	End	Duration (days)
	1	Install temp. sheet pile	8	4/11/2011	4/15/2011	5
Upstream of Spruce Bridge						
	2	Install sheet pile walls and dewatering system	8	4/18/2011	4/29/2011	10
	3	Remove cross bracing pipes	8	4/28/2011	4/29/2011	2
	4	Remove existing walls	8	4/28/2011	5/11/2011	10
	5	Form, re-bar, and pour bottom slab	8	5/12/2011	5/18/2011	5
	6	Form, re-bar, and pour walls	8	5/19/2011	6/1/2011	10
	7	Remove forms and backfill	8	6/2/2011	6/8/2011	5
	8	Cut off top of sheet pile walls	8	6/9/2011	6/10/2011	2
Downstream of Spruce Bridge						
	9	Place temporary 3 ft. high sand-bag wall	8	6/13/2011	6/13/2011	1
	10	Prepare subbase for new slab	8	6/14/2011	6/16/2011	3
	11	Remove temporary sheet pile wall	8	6/17/2011	6/17/2011	1
	12	Form, re-bar, and pour bottom slab	8	6/20/2011	7/1/2011	10
	13	Remove temporary 3 ft. high sand-bag wall	8	7/1/2011	7/1/2011	1
Remaining Work						
	14	Re-pave North Canal Street	8	7/4/2011	7/5/2011	2
	15	Replace south side landscaping	8	7/6/2011	7/6/2011	1
	16	Intall fences on top of walls	8	7/7/2011	7/7/2011	1
	17	Clean up	8	7/8/2011	7/8/2011	1
	18	De-mobilization	8	7/11/2011	7/15/2011	5

Emisison Factors for Equipment

								22	23	24	26	27
					OFFROAD	Range	Lookup	Emission Factor (g/bhp-hr)				
Phase	Description	Equipment	HP	Quantity	Category	(hp)	Description	ROG	CO	NOX	SO2	PM
1	Install temp. sheet pile	Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
Upstream of Spruce Bridge												
2	Install sheet pile walls and dewatering system	Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
3	Remove cross bracing pipes	Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
4	Remove existing walls	Hydraulic Excavator	380	1	Excavators	250 and <=50	ors (>250 and	1.71E-01	5.25E-01	1.6E+00	2.08E-03	5.8E-02
		Loader	100	1	Rubber Tire	50 and <=12	Loaders (>5	4.24E-01	1.6E+00	2.57E+00	2.61E-03	2.35E-01
		Compactor	80	1	Other Const	50 and <=12	n Equipmen	4.56E-01	2.03E+00	3.06E+00	3.58E-03	2.62E-01
5	Form, re-bar, and pour bottom slab	Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
6	Form, re-bar, and pour walls	Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
7	Remove forms and backfill	Loader	100	1	Rubber Tire	50 and <=12	Loaders (>5	4.24E-01	1.6E+00	2.57E+00	2.61E-03	2.35E-01
		Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
		Compactor	80	1	Other Const	50 and <=12	n Equipmen	4.56E-01	2.03E+00	3.06E+00	3.58E-03	2.62E-01
8	Cut off top of sheet pile walls	Hydraulic Excavator	380	1	Excavators	250 and <=50	ors (>250 and	1.71E-01	5.25E-01	1.6E+00	2.08E-03	5.8E-02
Downstream of Spruce Bridge												
9	Place temporary 3 ft. high sand-bag wall	Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
10	Prepare subbase for new slab	Loader	100	1	Rubber Tire	50 and <=12	Loaders (>5	4.24E-01	1.6E+00	2.57E+00	2.61E-03	2.35E-01
		Hydraulic Excavator	380	1	Excavators	250 and <=50	ors (>250 and	1.71E-01	5.25E-01	1.6E+00	2.08E-03	5.8E-02
		Compactor	80	1	Other Const	50 and <=12	n Equipmen	4.56E-01	2.03E+00	3.06E+00	3.58E-03	2.62E-01
11	Remove temporary sheet pile wall	Loader	100	1	Rubber Tire	50 and <=12	Loaders (>5	4.24E-01	1.6E+00	2.57E+00	2.61E-03	2.35E-01
		Hydraulic Excavator	380	1	Excavators	250 and <=50	ors (>250 and	1.71E-01	5.25E-01	1.6E+00	2.08E-03	5.8E-02
		Compactor	80	1	Other Const	50 and <=12	n Equipmen	4.56E-01	2.03E+00	3.06E+00	3.58E-03	2.62E-01
12	Form, re-bar, and pour bottom slab	Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
13	Remove temporary 3 ft. high sand-bag wall	Crane	300	1	Cranes	250 and <=50	(>250 and <	1.56E-01	5.57E-01	1.49E+00	1.6E-03	5.68E-02
Remaining Work												
14	Re-pave North Canal Street	AC paver	100	1	Pavers	50 and <=12	s (>50 and <	5.86E-01	1.95E+00	3.49E+00	3.07E-03	3.09E-01

Note: Horsepower for paver default rating from URBEMIS.

Daily Emissions for Equipment

Phase	Description	Equipment	Daily Emissions (lbs/day) VOC	CO	NOX	SO2	PM10	PM2.5
1	Install temp. sheet pile	Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
Upstream of Spruce Bridge								
2	Install sheet pile walls and dewatering system	Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
3	Remove cross bracing pipes	Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
4	Remove existing walls	Hydraulic Excavator	1.15E+00	3.52E+00	1.07E+01	1.39E-02	3.88E-01	3.57E-01
4		Loader	7.48E-01	2.81E+00	4.54E+00	4.60E-03	4.14E-01	3.81E-01
4		Compactor	6.44E-01	2.86E+00	4.31E+00	5.05E-03	3.69E-01	3.40E-01
	Subtotal		2.54E+00	9.19E+00	1.96E+01	2.36E-02	1.17E+00	1.08E+00
5	Form, re-bar, and pour bottom slab	Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
6	Form, re-bar, and pour walls	Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
7	Remove forms and backfill	Loader	7.48E-01	2.81E+00	4.54E+00	4.60E-03	4.14E-01	3.81E-01
7		Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
7		Compactor	6.44E-01	2.86E+00	4.31E+00	5.05E-03	3.69E-01	3.40E-01
	Subtotal		2.22E+00	8.62E+00	1.68E+01	1.81E-02	1.08E+00	9.98E-01
8	Cut off top of sheet pile walls	Hydraulic Excavator	1.15E+00	3.52E+00	1.07E+01	1.39E-02	3.88E-01	3.57E-01
Downstream of Spruce Bridge								
9	Place temporary 3 ft. high sand-bag wall	Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
10	Prepare subbase for new slab	Loader	7.48E-01	2.81E+00	4.54E+00	4.60E-03	4.14E-01	3.81E-01
10		Hydraulic Excavator	1.15E+00	3.52E+00	1.07E+01	1.39E-02	3.88E-01	3.57E-01
10		Compactor	6.44E-01	2.86E+00	4.31E+00	5.05E-03	3.69E-01	3.40E-01
	Subtotal		2.54E+00	9.19E+00	1.96E+01	2.36E-02	1.17E+00	1.08E+00
11	Remove temporary sheet pile wall	Loader	7.48E-01	2.81E+00	4.54E+00	4.60E-03	4.14E-01	3.81E-01
11		Hydraulic Excavator	1.15E+00	3.52E+00	1.07E+01	1.39E-02	3.88E-01	3.57E-01
11		Compactor	6.44E-01	2.86E+00	4.31E+00	5.05E-03	3.69E-01	3.40E-01
	Subtotal		2.54E+00	9.19E+00	1.96E+01	2.36E-02	1.17E+00	1.08E+00
12	Form, re-bar, and pour bottom slab	Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
13	Remove temporary 3 ft. high sand-bag wall	Crane	8.28E-01	2.94E+00	7.91E+00	8.48E-03	3.01E-01	2.77E-01
Remaining Work								
14	Re-pave North Canal Street	AC paver	1.03E+00	3.44E+00	6.16E+00	5.41E-03	5.45E-01	5.02E-01
		Maximum Day	4.19E+00	1.51E+01	3.54E+01	4.05E-02	1.77E+00	1.63E+00

Annual Emissions for Equipment

Phase	Description	Equipment	Annual Emissions (tons per year) VOC	CO	NOX	SO2	PM10	PM2.5	
									1
1	Install temp. sheet pile	Crane	2.07E-03	7.36E-03	1.98E-02	2.12E-05	7.52E-04	6.92E-04	2
									3
Upstream of Spruce Bridge									4
2	Install sheet pile walls and dewatering system	Crane	4.14E-03	1.47E-02	3.95E-02	4.24E-05	1.50E-03	1.38E-03	5
									6
3	Remove cross bracing pipes	Crane	8.28E-04	2.94E-03	7.91E-03	8.48E-06	3.01E-04	2.77E-04	7
									8
4	Remove existing walls	Hydraulic Excavator	5.74E-03	1.76E-02	5.35E-02	6.97E-05	1.94E-03	1.79E-03	9
4		Loader	3.74E-03	1.41E-02	2.27E-02	2.30E-05	2.07E-03	1.91E-03	10
4		Compactor	3.22E-03	1.43E-02	2.16E-02	2.53E-05	1.85E-03	1.70E-03	11
	Subtotal		1.27E-02	4.60E-02	9.78E-02	1.18E-04	5.86E-03	5.39E-03	12
									13
5	Form, re-bar, and pour bottom slab	Crane	2.07E-03	7.36E-03	1.98E-02	2.12E-05	7.52E-04	6.92E-04	14
									15
6	Form, re-bar, and pour walls	Crane	4.14E-03	1.47E-02	3.95E-02	4.24E-05	1.50E-03	1.38E-03	16
									17
7	Remove forms and backfill	Loader	1.87E-03	7.04E-03	1.14E-02	1.15E-05	1.04E-03	9.53E-04	18
7		Crane	2.07E-03	7.36E-03	1.98E-02	2.12E-05	7.52E-04	6.92E-04	19
7		Compactor	1.61E-03	7.15E-03	1.08E-02	1.26E-05	9.24E-04	8.50E-04	20
	Subtotal		5.55E-03	2.15E-02	4.19E-02	4.53E-05	2.71E-03	2.49E-03	21
									22
8	Cut off top of sheet pile walls	Hydraulic Excavator	1.15E-03	3.52E-03	1.07E-02	1.39E-05	3.88E-04	3.57E-04	23
									24
Downstream of Spruce Bridge									25
9	Place temporary 3 ft. high sand-bag wall	Crane	4.14E-04	1.47E-03	3.95E-03	4.24E-06	1.50E-04	1.38E-04	26
									27
10	Prepare subbase for new slab	Loader	1.12E-03	4.22E-03	6.81E-03	6.90E-06	6.22E-04	5.72E-04	28
10		Hydraulic Excavator	1.72E-03	5.28E-03	1.61E-02	2.09E-05	5.83E-04	5.36E-04	29
10		Compactor	9.66E-04	4.29E-03	6.47E-03	7.58E-06	5.54E-04	5.10E-04	30
	Subtotal		3.81E-03	1.38E-02	2.93E-02	3.54E-05	1.76E-03	1.62E-03	31
									32
11	Remove temporary sheet pile wall	Loader	3.74E-04	1.41E-03	2.27E-03	2.30E-06	2.07E-04	1.91E-04	33
11		Hydraulic Excavator	5.74E-04	1.76E-03	5.35E-03	6.97E-06	1.94E-04	1.79E-04	34
11		Compactor	3.22E-04	1.43E-03	2.16E-03	2.53E-06	1.85E-04	1.70E-04	35
	Subtotal		1.27E-03	4.60E-03	9.78E-03	1.18E-05	5.86E-04	5.39E-04	36
									37
12	Form, re-bar, and pour bottom slab	Crane	4.14E-03	1.47E-02	3.95E-02	4.24E-05	1.50E-03	1.38E-03	38
									39
13	Remove temporary 3 ft. high sand-bag wall	Crane	4.14E-04	1.47E-03	3.95E-03	4.24E-06	1.50E-04	1.38E-04	40
									41
Remaining Work									42
14	Re-pave North Canal Street	AC paver	1.03E-03	3.44E-03	6.16E-03	5.41E-06	5.45E-04	5.02E-04	43
									44
		Total	3.10E-02	1.12E-01	2.72E-01	2.98E-04	1.26E-02	1.16E-02	45

New Walls on Colma Creek

1	2	3	4	5	6	7
Phase	**Description**	**Hours per Day**	**Start**	**End**	**Duration (days)**	**Hours per Year**
1	Install temp. sheet pile	8	4/11/2011	4/15/2011	5	40
Upstream of Spruce Bridge						
2	Install sheet pile walls and dewatering system	8	4/18/2011	4/29/2011	10	80
3	Remove cross bracing pipes	8	4/28/2011	4/29/2011	2	16
4	Remove existing walls	8	4/28/2011	5/11/2011	10	80
5	Form, re-bar, and pour bottom slab	8	5/12/2011	5/18/2011	5	40
6	Form, re-bar, and pour walls	8	5/19/2011	6/1/2011	10	80
7	Remove forms and backfill	8	6/2/2011	6/8/2011	5	40
8	Cut off top of sheet pile walls	8	4/18/2011	4/19/2011	2	16
Downstream of Spruce Bridge						
9	Place temporary 3 ft. high sand-bag wall	8	6/13/2011	6/13/2011	1	8
10	Prepare subbase for new slab	8	6/14/2011	6/16/2011	3	24
11	Remove temporary sheet pile wall	8	6/17/2011	6/17/2011	1	8
12	Form, re-bar, and pour bottom slab	8	6/20/2011	7/1/2011	10	80
13	Remove temporary 3 ft. high sand-bag wall	8	7/1/2011	7/1/2011	1	8
Remaining Work						
14	Re-pave North Canal Street	8	7/4/2011	7/5/2011	2	16
15	Replace south side landscaping	8	7/6/2011	7/6/2011	1	8
16	Intall fences on top of walls	8	7/7/2011	7/7/2011	1	8
17	Clean up	8	7/8/2011	7/8/2011	1	8
18	De-mobilization	8	7/11/2011	7/15/2011	5	40

Emisison Factors for Equipment

								25	28	29
					OFFROAD	Range	Lookup	Emission Factor (g/bhp-hr)		
Phase	Description	Equipment	HP	Quantity	Category	(hp)	Description	CO2	N2O	CH4
1	Install temp. sheet pile	Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
Upstream of Spruce Bridge										
2	Install sheet pile walls and dewatering system	Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
3	Remove cross bracing pipes	Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
4	Remove existing walls	Hydraulic Excavator	380	1	Excavators	250 and <=50	ors (>250 and	2.12E+02	-	1.54E-02
		Loader	100	1	Rubber Tired	50 and <=12	Loaders (>5	2.22E+02	-	3.83E-02
		Compactor	80	1	Other Consti	50 and <=12	on Equipmen	3.05E+02	-	4.12E-02
5	Form, re-bar, and pour bottom slab	Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
6	Form, re-bar, and pour walls	Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
7	Remove forms and backfill	Loader	100	1	Rubber Tired	50 and <=12	Loaders (>5	2.22E+02	-	3.83E-02
		Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
		Compactor	80	1	Other Consti	50 and <=12	on Equipmen	3.05E+02	-	4.12E-02
8	Cut off top of sheet pile walls	Hydraulic Excavator	380	1	Excavators	250 and <=50	ors (>250 and	2.12E+02	-	1.54E-02
Downstream of Spruce Bridge										
9	Place temporary 3 ft. high sand-bag wall	Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
10	Prepare subbase for new slab	Loader	100	1	Rubber Tired	50 and <=12	Loaders (>5	2.22E+02	-	3.83E-02
		Hydraulic Excavator	380	1	Excavators	250 and <=50	ors (>250 and	2.12E+02	-	1.54E-02
		Compactor	80	1	Other Consti	50 and <=12	on Equipmen	3.05E+02	-	4.12E-02
11	Remove temporary sheet pile wall	Loader	100	1	Rubber Tired	50 and <=12	Loaders (>5	2.22E+02	-	3.83E-02
		Hydraulic Excavator	380	1	Excavators	250 and <=50	ors (>250 and	2.12E+02	-	1.54E-02
		Compactor	80	1	Other Consti	50 and <=12	on Equipmen	3.05E+02	-	4.12E-02
12	Form, re-bar, and pour bottom slab	Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
13	Remove temporary 3 ft. high sand-bag wall	Crane	300	1	Cranes	250 and <=50	s (>250 and <	1.63E+02	-	1.41E-02
Remaining Work										
14	Re-pave North Canal Street	AC paver	100	1	Pavers	50 and <=12	s (>50 and <:	2.61E+02	-	5.28E-02

Note: Horsepower for paver default rating from URBEMIS.

Annual Emissions for Equipment

Phase	Description	Equipment	Annual Emissions (metric tons per year) CO2	N2O	CH4
1	Install temp. sheet pile	Crane	1.96E+00	-	1.69E-04
Upstream of Spruce Bridge					
2	Install sheet pile walls and dewatering system	Crane	3.92E+00	-	3.39E-04
3	Remove cross bracing pipes	Crane	7.84E-01	-	6.78E-05
4	Remove existing walls	Hydraulic Excavator	6.44E+00	-	4.70E-04
4		Loader	1.78E+00	-	3.06E-04
4		Compactor	1.95E+00	-	2.64E-04
5	Form, re-bar, and pour bottom slab	Crane	1.96E+00	-	1.69E-04
6	Form, re-bar, and pour walls	Crane	3.92E+00	-	3.39E-04
7	Remove forms and backfill	Loader	8.90E-01	-	1.53E-04
7		Crane	1.96E+00	-	1.69E-04
7		Compactor	9.77E-01	-	1.32E-04
8	Cut off top of sheet pile walls	Hydraulic Excavator	1.29E+00	-	9.39E-05
Downstream of Spruce Bridge					
9	Place temporary 3 ft. high sand-bag wall	Crane	3.92E-01	-	3.39E-05
10	Prepare subbase for new slab	Loader	5.34E-01	-	9.18E-05
10		Hydraulic Excavator	1.93E+00	-	1.41E-04
10		Compactor	5.86E-01	-	7.91E-05
11	Remove temporary sheet pile wall	Loader	1.78E-01	-	3.06E-05
11		Hydraulic Excavator	6.44E-01	-	4.70E-05
11		Compactor	1.95E-01	-	2.64E-05
12	Form, re-bar, and pour bottom slab	Crane	3.92E+00	-	3.39E-04
13	Remove temporary 3 ft. high sand-bag wall	Crane	3.92E-01	-	3.39E-05
Remaining Work					
14	Re-pave North Canal Street	AC paver	4.61E+02	-	9.32E-02
		Total	4.97E+02	-	9.67E-02
		GWP	1	310	21
		CO2e	4.97E+02	-	2.03E+00
		Total CO2e		5.00E+02	

Construction Equipment

Diesel Fuel	0.26	g/gallon fuel

New Walls on Colma Creek

Exhaust Emissions

Annual Emissions (tons per year)

Phase	Description	Hours per Day	Start	End	Duration (days)	Haul Truck VOC	Haul Truck CO	Haul Truck NOx	Haul Truck SO2	Haul Truck PM10 Tota	Haul Truck PM2.5 Tota	Employee Commute VOC	Employee Commute CO	Employee Commute NOx	Employee Commute SO2	Employee Commute PM10 Tota	Employee Commute PM2.5 Tota	Total VOC	Total CO	Total NOx	Total SO2	Total PM10	Total PM2.5
1	Install temp. sheet pile	8	4/11/2011	4/15/2011	5	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Upstream of Spruce Bridge																						
2	Install sheet pile walls and dewatering system	8	4/18/2011	4/29/2011	10	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
3	Remove cross bracing pipes	8	4/28/2011	4/29/2011	2	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Remove existing walls	8	4/28/2011	5/11/2011	10	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.01	0.00
5	Form, re-bar, and pour bottom slab	8	5/12/2011	5/18/2011	5	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
6	Form, re-bar, and pour walls	8	5/19/2011	6/1/2011	10	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.01	0.00
7	Remove forms and backfill	8	6/2/2011	6/8/2011	5	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
8	Cut off top of sheet pile walls	8	6/9/2011	6/10/2011	2	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Downstream of Spruce Bridge																						
9	Place temporary 3 ft. high sand-bag wall	8	6/13/2011	6/13/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Prepare subbase for new slab	8	6/14/2011	6/16/2011	3	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Remove temporary sheet pile wall	8	6/17/2011	6/17/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Form, re-bar, and pour bottom slab	8	6/20/2011	7/1/2011	10	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
13	Remove temporary 3 ft. high sand-bag wall	8	7/1/2011	7/1/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Remaining Work																						
14	Re-pave North Canal Street	8	7/4/2011	7/5/2011	2	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	Replace south side landscaping	8	7/6/2011	7/6/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Intall fences on top of walls	8	7/7/2011	7/7/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	Clean up	8	7/8/2011	7/8/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	De-mobilization	8	7/11/2011	7/15/2011	5	n/a	n/a	n/a	n/a	n/a	n/a	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Total Exhaust Emissions					0.00	0.02	0.05	0.00	0.01	0.00	0.00	0.08	0.01	0.00	0.02	0.00	0.01	0.09	0.06	0.00	0.03	0.01

New Walls on Colma Creek

Daily Emissions (lbs per day)

Phase	Description	Hours per Day	Start	End	Duration (days)	Haul Truck VOC	Haul Truck CO	Haul Truck NOx	Haul Truck SO2	Haul Truck PM10	Haul Truck PM2.5	Employee Commute VOC	Employee Commute CO	Employee Commute NOx	Employee Commute SO2	Employee Commute PM10	Employee Commute PM2.5	Total VOC	Total CO	Total NOx	Total SO2	Total PM10	Total PM2.5
1	Install temp. sheet pile	8	4/11/2011	4/15/2011	5	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
	Upstream of Spruce Bridge																						
2	Install sheet pile walls and dewatering system	8	4/18/2011	4/29/2011	10	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
3	Remove cross bracing pipes	8	4/28/2011	4/29/2011	2	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
4	Remove existing walls	8	4/28/2011	5/11/2011	10	0.24	1.22	4.31	0.01	0.44	0.18	0.07	2.10	0.21	0.00	0.60	0.10	0.31	3.32	4.52	0.01	1.05	0.27
5	Form, re-bar, and pour bottom slab	8	5/12/2011	5/18/2011	5	0.24	1.22	4.31	0.01	0.44	0.18	0.07	2.10	0.21	0.00	0.60	0.10	0.31	3.32	4.52	0.01	1.05	0.27
6	Form, re-bar, and pour walls	8	5/19/2011	6/1/2011	10	0.24	1.22	4.31	0.01	0.44	0.18	0.07	2.10	0.21	0.00	0.60	0.10	0.31	3.32	4.52	0.01	1.05	0.27
7	Remove forms and backfill	8	6/2/2011	6/8/2011	5	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
8	Cut off top of sheet pile walls	8	6/9/2011	6/10/2011	2	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
	Downstream of Spruce Bridge																						
9	Place temporary 3 ft. high sand-bag wall	8	6/13/2011	6/13/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
10	Prepare subbase for new slab	8	6/14/2011	6/16/2011	3	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
11	Remove temporary sheet pile wall	8	6/17/2011	6/17/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
12	Form, re-bar, and pour bottom slab	8	6/20/2011	7/1/2011	10	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
13	Remove temporary 3 ft. high sand-bag wall	8	7/1/2011	7/1/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
	Remaining Work																						
14	Re-pave North Canal Street	8	7/4/2011	7/5/2011	2	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
15	Replace south side landscaping	8	7/6/2011	7/6/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
16	Intall fences on top of walls	8	7/7/2011	7/7/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
17	Clean up	8	7/8/2011	7/8/2011	1	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
18	De-mobilization	8	7/11/2011	7/15/2011	5	n/a	n/a	n/a	n/a	n/a	n/a	0.07	2.10	0.21	0.00	0.60	0.10	0.07	2.10	0.21	0.00	0.60	0.10
	Red text - phases overlap; summation = maximum daily impact																						
	Total					0.73	3.67	12.93	0.02	1.33	0.53	1.19	37.72	3.75	0.05	10.81	1.77	1.92	41.38	16.69	0.06	12.15	2.30
	Maximum Daily Exhaust					0.24	1.22	4.31	0.01	0.44	0.18	0.20	6.29	0.63	0.01	1.80	0.29	0.44	7.51	4.94	0.01	2.25	0.47
	maximum phase					0.24	1.22	4.31	0.01	0.44	0.18	0.07	2.10	0.21	0.00	0.60	0.10	0.31	3.32	4.52	0.01	1.05	0.27
	less than maximum daily?					yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Haul Truck Information

Exported soil	0	cy	
Imported soil and aggregate	1,210	cy	
Total	1,210	cy	
Truck size	18	cy	
Number of haul trucks	80	trucks	
Duration of hauling	10	days	
Daily Trucks	8	trucks per day	
Number of truck trips	16	trips per day	
Trip distance	10	miles	(URBEMIS default)
Number of construction workers	15		
Construction worker trips	30	trips per day	
Trip distance	10.8	miles	(URBEMIS default)
Maximum daily trips	**46**	**trips per day**	

Source:
Memorandum from R. Fry (CDM) to K. Tremain and G. Pelletier (CDM) on March 11, 2010.

Concrete Truck Information

Imported soil and aggregate	1,600	cy
Truck size	14	cy
Number of haul trucks	114	trucks
Duration of hauling	15	days
Daily Trucks	8	trucks per day
Number of truck trips	16	trips per day
Trip distance	10	miles

Source:
Email from R. Fry (CDM) to A. Kleyman, K. Tremain, and H. Boucher (CDM) on April 9, 2010.

Summary

Emission Factor Summary (grams per mile)

					PM10					PM2.5				
Vehicle Type	**VOC**	**CO**	**NOx**	**SO2**	**PM10 Tota**	**Exhaust**	**Tire Wear**	**Brake Wear**	**Paved Road Dust**	**PM2.5 Tota**	**Exhaust**	**Tire Wear**	**Brake Wear**	**Paved Road Dust**
LDA	0.055	1.933	0.183	0.003	0.839	0.008	0.008	0.013	0.81	0.1355	0.007	0.002	0.005	0.12
LDT1	0.13	3.934	0.401	0.004	0.843	0.012	0.008	0.013	0.81	0.1395	0.011	0.002	0.005	0.12
Construction Worker	0.0925	2.9335	0.292	0.0035	0.841	0.01	0.008	0.013	0.81	0.1375	0.009	0.002	0.005	0.12
HHD	0.688	3.465	12.222	0.017	1.261	0.387	0.036	0.028	0.81	0.498535	0.356	0.009	0.012	0.12

Note:
LDA = light-duty automobile
LDT1 = light-duty truck
HHDT = heavy-heavy duty diesel
Speed = 35 mph
Year = 2011

Paved Road Dust

	Emission Factor (g/VMT)		
Conditions	**High-ADT**	**Low-ADT**	**Average**
Average	0.37	1.3	0.81
Worst-case	0.64	3.9	2.1

Source: MRI 1996
Note:
High-ADT roads are classified as arterials or major streets, whereas low-ADT roads are classified as collectors or local streets.

Speciation Profiles

PM10	0.4572
PM2.5	0.0686
Ratio	0.1500

Paved Road Dust Assumptions:

Source	*Conditions*	*ADT*
Construction Workers	*Average*	*Average*
Haul Trucks	*Average*	*Average*

REFERENCES:

California Air Resources Board (CARB). 2008. Home Page: Speciation Profiles Used in ARB Modeling. May 19. Available online at: http://www.arb.ca.gov/ei/speciate/speciate.htm

Midwest Research Institute (MRI). 1996. *Improvement of Specific Emission Factors (BACM Project No. 1); Final Report*. South Coast AQMD Contract No. 95040. MRI Project No. 3855. March 29.

New Walls on Colma Creek

Phase	Description	Hours per Day	Start	End	Duration (days)	Annual Emissions (metric tons per year)								
						Haul Truck			Employee Commute			Total		
						CO2	CH4	N2O	CO2	CH4	N2O	CO2	CH4	N2O
1	Install temp. sheet pile	8	4/11/2011	4/15/2011	5	n/a	n/a	n/a	0.56	0.00	0.00	0.56	0.00	0.00
	Upstream of Spruce Bridge													
2	Install sheet pile walls and dewatering system	8	4/18/2011	4/29/2011	10	n/a	n/a	n/a	1.13	0.00	0.00	1.13	0.00	0.00
3	Remove cross bracing pipes	8	4/28/2011	4/29/2011	2	n/a	n/a	n/a	0.23	0.00	0.00	0.23	0.00	0.00
4	Remove existing walls	8	4/28/2011	5/11/2011	10	2.92	0.00	0.00	1.13	0.00	0.00	4.05	0.00	0.00
5	Form, re-bar, and pour bottom slab	8	5/12/2011	5/18/2011	5	1.46	0.00	0.00	0.56	0.00	0.00	2.03	0.00	0.00
6	Form, re-bar, and pour walls	8	5/19/2011	6/1/2011	10	2.92	0.00	0.00	1.13	0.00	0.00	4.05	0.00	0.00
7	Remove forms and backfill	8	6/2/2011	6/8/2011	5	n/a	n/a	n/a	0.56	0.00	0.00	0.56	0.00	0.00
8	Cut off top of sheet pile walls	8	6/9/2011	6/10/2011	2	n/a	n/a	n/a	0.23	0.00	0.00	0.23	0.00	0.00
	Downstream of Spruce Bridge													
9	Place temporary 3 ft. high sand-bag wall	8	6/13/2011	6/13/2011	1	n/a	n/a	n/a	0.11	0.00	0.00	0.11	0.00	0.00
10	Prepare subbase for new slab	8	6/14/2011	6/16/2011	3	n/a	n/a	n/a	0.34	0.00	0.00	0.34	0.00	0.00
11	Remove temporary sheet pile wall	8	6/17/2011	6/17/2011	1	n/a	n/a	n/a	0.11	0.00	0.00	0.11	0.00	0.00
12	Form, re-bar, and pour bottom slab	8	6/20/2011	7/1/2011	10	n/a	n/a	n/a	1.13	0.00	0.00	1.13	0.00	0.00
13	Remove temporary 3 ft. high sand-bag wall	8	7/1/2011	7/1/2011	1	n/a	n/a	n/a	0.11	0.00	0.00	0.11	0.00	0.00
	Remaining Work													
14	Re-pave North Canal Street	8	7/4/2011	7/5/2011	2	n/a	n/a	n/a	0.23	0.00	0.00	0.23	0.00	0.00
15	Replace south side landscaping	8	7/6/2011	7/6/2011	1	n/a	n/a	n/a	0.11	0.00	0.00	0.11	0.00	0.00
16	Intall fences on top of walls	8	7/7/2011	7/7/2011	1	n/a	n/a	n/a	0.11	0.00	0.00	0.11	0.00	0.00
17	Clean up	8	7/8/2011	7/8/2011	1	n/a	n/a	n/a	0.11	0.00	0.00	0.11	0.00	0.00
18	De-mobilization	8	7/11/2011	7/15/2011	5	n/a	n/a	n/a	0.56	0.00	0.00	0.56	0.00	0.00
	Total					7.31	0.00013	0.000019	8.46	0.00	0.00	15.77	0.00	0.00
	CO2e					7.31	0.0027	0.0060	8.46	0.01	0.27	15.77	0.02	0.28
	Total CO2e					7.32			8.74			16.06		

Global Warming Potential

CO2	1
CH4	21
N2O	310

Summary

Vehicle Type	CO2	CH4
LDA	310.403	0.019
LDT1	385.503	0.033
Construction Worker	347.953	0.026
HHD	1827.808	0.032

Note:
LDA = light-duty automobile
LDT1 = light-duty truck
HHDT = heavy-heavy duty diesel
Speed = 35 mph
Year = 2011

Local Government Operations Protocol
http://www.theclimateregistry.org/downloads/2009/05/LGO_Protocol.pdf

Vehicle Type and Year	N2O (g/mi)	CH4 (g/mi)
Gasoline Passenger Cars		
Inventory Year 1999	0.05372	0.05035
Inventory Year 2000	0.0508	0.04648
Inventory Year 2001	0.04711	0.04248
Inventory Year 2002	0.04364	0.03886
Inventory Year 2003	0.04011	0.03542
Inventory Year 2004	0.0363	0.03251
Inventory Year 2005	0.03413	0.0299
Inventory Year 2006	0.0294	0.0278
Gasoline Light Trucks (Vans, Pickup Trucks, SUVs)		
Inventory Year 1999	0.09029	0.06059
Inventory Year 2000	0.08665	0.05701
Inventory Year 2001	0.07795	0.05158
Inventory Year 2002	0.07095	0.047
Inventory Year 2003	0.06295	0.04236
Inventory Year 2004	0.05593	0.03811
Inventory Year 2005	0.04935	0.03451
Inventory Year 2006	0.04331	0.03146
Gasoline Heavy-Duty Vehicles		
Inventory Year 1999	0.12126	0.26243
Inventory Year 2000	0.12262	0.23709
Inventory Year 2001	0.12546	0.21149
Inventory Year 2002	0.12721	0.19053
Inventory Year 2003	0.12685	0.17253
Inventory Year 2004	0.1178	0.15537
Inventory Year 2005	0.10984	0.13826
Inventory Year 2006	0.1031	0.12351

Vehicle Type and Year	N2O (g/mi)	CH4 (g/mi)
Diesel Passenger Cars		
Inventory Year 1999	0.001	0.0005
Inventory Year 2000	0.001	0.0005
Inventory Year 2001	0.001	0.0005
Inventory Year 2002	0.001	0.0005
Inventory Year 2003	0.001	0.0005
Inventory Year 2004	0.001	0.0005
Inventory Year 2005	0.001	0.0005
Inventory Year 2006	0.001	0.0005
Diesel Light Trucks (Vans, Pickup Trucks, SUVs)		
Inventory Year 1999	0.00144	0.00094
Inventory Year 2000	0.00145	0.00095
Inventory Year 2001	0.00146	0.00096
Inventory Year 2002	0.00147	0.00097
Inventory Year 2003	0.00147	0.00097
Inventory Year 2004	0.00148	0.00098
Inventory Year 2005	0.00148	0.00098
Inventory Year 2006	0.00149	0.00099
Diesel Heavy-Duty Trucks		
Inventory Year 1999	0.0048	0.0051
Inventory Year 2000	0.0048	0.0051
Inventory Year 2001	0.0048	0.0051
Inventory Year 2002	0.0048	0.0051
Inventory Year 2003	0.0048	0.0051
Inventory Year 2004	0.0048	0.0051
Inventory Year 2005	0.0048	0.0051
Inventory Year 2006	0.0048	0.0051

Estimated Construction Worker N2O Emissions		
Gasoline Passenger Cars	0.0294	g/mi
Gasoline Light Trucks	0.04331	g/mi
Combined	0.036355	g/mi

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Construction Unmitigated Emissions (Pounds/Day)

File Name: D:\Gwen\URBEMIS\Colma\Colma_060710.urb924

Project Name: Colma Creek

Project Location: San Mateo County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	CO2
Time Slice 4/28/2011-5/11/2011 Active Days: 10	1.97	**17.70**	8.29	**0.00**	**13.14**	0.75	**13.89**	**2.75**	0.69	**3.44**	**2,344.15**
Fine Grading 04/28/2011-05/11/2011	1.97	17.70	8.29	0.00	13.14	0.75	13.89	2.75	0.69	3.44	2,344.15
Fine Grading Dust	0.00	0.00	0.00	0.00	13.12	0.00	13.12	2.74	0.00	2.74	0.00
Fine Grading Off Road Diesel	1.79	15.27	6.80	0.00	0.00	0.67	0.67	0.00	0.61	0.61	1,865.06
Fine Grading On Road Diesel	0.15	2.39	0.76	0.00	0.01	0.09	0.10	0.00	0.08	0.08	402.60
Fine Grading Worker Trips	0.02	0.04	0.73	0.00	0.00	0.00	0.01	0.00	0.00	0.00	76.49
Time Slice 7/5/2011-7/5/2011 Active Days: 1	**2.31**	12.34	**8.93**	0.00	0.01	**1.02**	1.03	0.01	**0.93**	0.94	1,324.79
Asphalt 07/05/2011-07/05/2011	2.31	12.34	8.93	0.00	0.01	1.02	1.03	0.01	0.93	0.94	1,324.79
Paving Off-Gas	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.83	11.26	6.91	0.00	0.00	0.98	0.98	0.00	0.90	0.90	979.23
Paving On Road Diesel	0.06	0.99	0.32	0.00	0.01	0.04	0.04	0.00	0.03	0.03	167.09
Paving Worker Trips	0.05	0.09	1.71	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.48

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Phase Assumptions

Phase: Fine Grading 4/28/2011 - 5/11/2011 - Remove soil from behind existing wall and overexcavate at bottom for new slab; prepare subbase for new slab
Total Acres Disturbed: 0.99
Maximum Daily Acreage Disturbed: 0.25
Fugitive Dust Level of Detail: Low
Onsite Cut/Fill: 90 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day
On Road Truck Travel (VMT): 100
Off-Road Equipment:
1 Excavators (380 hp) operating at a 0.57 load factor for 8 hours per day
1 Plate Compactors (80 hp) operating at a 0.43 load factor for 8 hours per day
1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

Phase: Paving 7/5/2011 - 7/5/2011 - Re-pave North Canal Street
Acres to be Paved: 0.14
Off-Road Equipment:
4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day
1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Construction Mitigated Emissions (Pounds/Day)

File Name: D:\Gwen\URBEMIS\Colma\Colma_060710.urb924

Project Name: Colma Creek

Project Location: San Mateo County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Summer Pounds Per Day, Mitigated)

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	CO2
Time Slice 4/28/2011-5/11/2011 Active Days: 10	1.97	**17.70**	8.29	**0.00**	6.22	0.75	6.98	1.30	0.69	2.00	**2,344.15**
Fine Grading 04/28/2011-05/11/2011	1.97	17.70	8.29	0.00	6.22	0.75	6.98	1.30	0.69	2.00	2,344.15
Fine Grading Dust	0.00	0.00	0.00	0.00	6.21	0.00	6.21	1.30	0.00	1.30	0.00
Fine Grading Off Road Diesel	1.79	15.27	6.80	0.00	0.00	0.67	0.67	0.00	0.61	0.61	1,865.06
Fine Grading On Road Diesel	0.15	2.39	0.76	0.00	0.01	0.09	0.10	0.00	0.08	0.08	402.60
Fine Grading Worker Trips	0.02	0.04	0.73	0.00	0.00	0.00	0.01	0.00	0.00	0.00	76.49
Time Slice 7/5/2011-7/5/2011 Active Days: 1	**2.31**	12.34	**8.93**	0.00	0.01	**1.02**	1.03	0.01	**0.93**	0.94	1,324.79
Asphalt 07/05/2011-07/05/2011	2.31	12.34	8.93	0.00	0.01	1.02	1.03	0.01	0.93	0.94	1,324.79
Paving Off-Gas	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.83	11.26	6.91	0.00	0.00	0.98	0.98	0.00	0.90	0.90	979.23
Paving On Road Diesel	0.06	0.99	0.32	0.00	0.01	0.04	0.04	0.00	0.03	0.03	167.09
Paving Worker Trips	0.05	0.09	1.71	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.48

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 4/28/2011 - 5/11/2011 - Remove soil from behind existing wall and overexcavate at bottom

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

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Phase Assumptions

Phase: Fine Grading 4/28/2011 - 5/11/2011 - Remove soil from behind existing wall and overexcavate at bottom for new slab; prepare subbase for new slab
Total Acres Disturbed: 0.99
Maximum Daily Acreage Disturbed: 0.25
Fugitive Dust Level of Detail: Low
Onsite Cut/Fill: 90 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day
On Road Truck Travel (VMT): 100
Off-Road Equipment:
1 Excavators (380 hp) operating at a 0.57 load factor for 8 hours per day
1 Plate Compactors (80 hp) operating at a 0.43 load factor for 8 hours per day
1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

Phase: Paving 7/5/2011 - 7/5/2011 - Re-pave North Canal Street
Acres to be Paved: 0.14
Off-Road Equipment:
4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day
1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day
1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day
1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Construction Mitigated Emissions (Tons/Year)

File Name: D:\Gwen\URBEMIS\Colma\Colma_060710.urb924

Project Name: Colma Creek

Project Location: San Mateo County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES (Annual Tons Per Year, Mitigated)

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10 Total	PM2.5 Dust	PM2.5 Exhaust	PM2.5 Total	CO2
2011	0.01	0.09	0.05	0.00	0.03	0.00	0.04	0.01	0.00	0.01	12.38
Fine Grading 04/28/2011-05/11/2011	0.01	0.09	0.04	0.00	0.03	0.00	0.03	0.01	0.00	0.01	11.72
Fine Grading Dust	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.01	0.00
Fine Grading Off Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.33
Fine Grading On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
Asphalt 07/05/2011-07/05/2011	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Paving Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 4/28/2011 - 5/11/2011 - Remove soil from behind existing wall and overexcavate at

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

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Phase Assumptions

Phase: Fine Grading 4/28/2011 - 5/11/2011 - Remove soil from behind existing wall and overexcavate at bottom for new slab; prepare subbase for

Total Acres Disturbed: 0.99

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 90 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 100

Off-Road Equipment:

1 Excavators (380 hp) operating at a 0.57 load factor for 8 hours per day

1 Plate Compactors (80 hp) operating at a 0.43 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

Phase: Paving 7/5/2011 - 7/5/2011 - Re-pave North Canal Street

Acres to be Paved: 0.14

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Appendix B: Biological Resources USFWS and CDFG Sensitive Species Lists

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

March 19, 2010

Document Number: 100319104306

Kristin Tremain
Biologist, CDM
2295 Gateway Oaks Drive
Suite 240
Sacramento, CA 95833

Subject: Species List for Colma Creek Wall Replacement Upstream Spruce Avenue

Dear: Miss Tremain

We are sending this official species list in response to your March 19, 2010 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be June 17, 2010.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 100319104306

Database Last Updated: December 1, 2009

Quad Lists

Listed Species

Invertebrates

Euphydryas editha bayensis
Critical habitat, bay checkerspot butterfly (X)

Haliotes cracherodii
black abalone (E) (NMFS)

Haliotes sorenseni
white abalone (E) (NMFS)

Icaricia icarioides missionensis
mission blue butterfly (E)

Speyeria callippe callippe
callippe silverspot butterfly (E)

Speyeria zerene myrtleae
Myrtle's silverspot butterfly (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Eucyclogobius newberryi
tidewater goby (E)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus kisutch
coho salmon - central CA coast (E) (NMFS)

Oncorhynchus mykiss
Central California Coastal steelhead (T) (NMFS)
Central Valley steelhead (T) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Rana aurora draytonii
California red-legged frog (T)

Reptiles

Caretta caretta
loggerhead turtle (T) (NMFS)

Chelonia mydas (incl. agassizi)
green turtle (T) (NMFS)

Dermochelys coriacea
leatherback turtle (E) (NMFS)

Lepidochelys olivacea
olive (=Pacific) ridley sea turtle (T) (NMFS)

Thamnophis sirtalis tetrataenia
San Francisco garter snake (E)

Birds

Brachyramphus marmoratus
marbled murrelet (T)

Charadrius alexandrinus nivosus
western snowy plover (T)

Diomedea albatrus
short-tailed albatross (E)

Pelecanus occidentalis californicus
California brown pelican (E)

Rallus longirostris obsoletus
California clapper rail (E)

Sternula antillarum (=Sterna, =albifrons) browni
California least tern (E)

Mammals

Arctocephalus townsendi
Guadalupe fur seal (T) (NMFS)

Balaenoptera borealis
sei whale (E) (NMFS)

Balaenoptera musculus
blue whale (E) (NMFS)

Balaenoptera physalus
finback (=fin) whale (E) (NMFS)

Enhydra lutris nereis
southern sea otter (T)

Eubalaena (=Balaena) glacialis
right whale (E) (NMFS)

Eumetopias jubatus
Steller (=northern) sea-lion (T) (NMFS)

Physeter catodon (=macrocephalus)
sperm whale (E) (NMFS)

Reithrodontomys raviventris
salt marsh harvest mouse (E)

Plants

Lessingia germanorum
San Francisco lessingia (E)

Proposed Species

Amphibians

Rana aurora draytonii
Critical habitat, California red-legged frog (PX)

Quads Containing Listed, Proposed or Candidate Species:

SAN FRANCISCO SOUTH (448B)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.
(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.
(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
Critical Habitat - Area essential to the conservation of a species.
(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
(C) *Candidate* - Candidate to become a proposed species.
(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands,

please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be June 17, 2010.

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	***Actinemys marmorata*** western pond turtle	ARAAD02030			G3G4	S3	SC
2	***Amsinckia lunaris*** bent-flowered fiddleneck	PDBOR01070			G2	S2.2	1B.2
3	***Arctostaphylos hookeri ssp. franciscana*** Franciscan manzanita	PDERI040J3			G3TXC	SX	1A
4	***Arctostaphylos hookeri ssp. ravenii*** Presidio manzanita	PDERI040J2	Endangered	Endangered	G3T1	S1.1	1B.1
5	***Arctostaphylos imbricata*** San Bruno Mountain manzanita	PDERI040L0		Endangered	G1	S1.2	1B.1
6	***Arctostaphylos montaraensis*** Montara manzanita	PDERI042W0			G2	S2.2	1B.2
7	***Arctostaphylos pacifica*** Pacific manzanita	PDERI040Z0		Endangered	G1	S1.1	1B.2
8	***Astragalus tener var. tener*** alkali milk-vetch	PDFAB0F8R1			G1T1	S1.1	1B.2
9	***Banksula incredula*** incredible harvestman	ILARA14100			G1	S1	
10	***Caecidotea tomalensis*** Tomales isopod	ICMAL01220			G2	S2	
11	***Callophrys mossii bayensis*** San Bruno elfin butterfly	IILEPE2202	Endangered		G4T1	S1	
12	***Carex comosa*** bristly sedge	PMCYP032Y0			G5	S2?	2.1
13	***Chorizanthe cuspidata var. cuspidata*** San Francisco Bay spineflower	PDPGN04081			G2T2	S2.2	1B.2
14	***Chorizanthe robusta var. robusta*** robust spineflower	PDPGN040Q2	Endangered		G2T1	S1.1	1B.1
15	***Cicindela hirticollis gravida*** sandy beach tiger beetle	IICOL02101			G5T2	S1	
16	***Cirsium andrewsii*** Franciscan thistle	PDAST2E050			G2	S2.2	1B.2
17	***Cirsium occidentale var. compactum*** compact cobwebby thistle	PDAST2E1Z1			G3G4T2	S2.1	1B.2
18	***Collinsia multicolor*** San Francisco collinsia	PDSCR0H0B0			G2	S2.2	1B.2
19	***Dufourea stagei*** Stage's dufourine bee	IIHYM22010			G1?	S1?	
20	***Eucyclogobius newberryi*** tidewater goby	AFCQN04010	Endangered		G3	S2S3	SC
21	***Euphydryas editha bayensis*** Bay checkerspot butterfly	IILEPK4055	Threatened		G5T1	S1	
22	***Fritillaria liliacea*** fragrant fritillary	PMLIL0V0C0			G2	S2.2	1B.2
23	***Geothlypis trichas sinuosa*** saltmarsh common yellowthroat	ABPBX1201A			G5T2	S2	SC
24	***Gilia capitata ssp. chamissonis*** blue coast gilia	PDPLM040B3			G5T2	S2.1	1B.1

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
25	***Grindelia hirsutula var. maritima*** San Francisco gumplant	PDAST470D3			G5T2	S2.1	1B.2
26	***Helianthella castanea*** Diablo helianthella	PDAST4M020			G3	S3.2	1B.2
27	***Hemizonia congesta ssp. congesta*** seaside tarplant	PDAST4R065			G5T2T3	S2S3	1B.2
28	***Hesperevax sparsiflora var. brevifolia*** short-leaved evax	PDASTE5011			G4T2T3	S2S3	1B.2
29	***Horkelia cuneata ssp. sericea*** Kellogg's horkelia	PDROS0W043			G4T1	S1.1	1B.1
30	***Hydroporus leechi*** Leech's skyline diving beetle	IICOL55040			G1?	S1?	
31	***Ischnura gemina*** San Francisco forktail damselfly	IIODO72010			G2	S2	
32	***Lasiurus cinereus*** hoary bat	AMACC05030			G5	S4?	
33	***Laterallus jamaicensis coturniculus*** California black rail	ABNME03041		Threatened	G4T1	S1	
34	***Layia carnosa*** beach layia	PDAST5N010	Endangered	Endangered	G2	S2.1	1B.1
35	***Leptosiphon rosaceus*** rose leptosiphon	PDPLM09180			G1	S1.1	1B.1
36	***Lessingia germanorum*** San Francisco lessingia	PDAST5S010	Endangered	Endangered	G1	S1.1	1B.1
37	***Lichnanthe ursina*** bumblebee scarab beetle	IICOL67020			G2	S2	
38	***Malacothamnus arcuatus*** arcuate bush-mallow	PDMAL0Q0E0			G2Q	S2.2	1B.2
39	***Melospiza melodia pusillula*** Alameda song sparrow	ABPBXA301S			G5T2?	S2?	SC
40	***Mylopharodon conocephalus*** hardhead	AFCJB25010			G3	S3	SC
41	***Pentachaeta bellidiflora*** white-rayed pentachaeta	PDAST6X030	Endangered	Endangered	G1	S1.1	1B.1
42	***Phalacrocorax auritus*** double-crested cormorant	ABNFD01020			G5	S3	
43	***Plebejus icarioides missionensis*** Mission blue butterfly	IILEPG801A	Endangered		G5T1	S1	
44	***Rallus longirostris obsoletus*** California clapper rail	ABNME05016	Endangered	Endangered	G5T1	S1	
45	***Rana draytonii*** California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3	SC
46	***Riparia riparia*** bank swallow	ABPAU08010		Threatened	G5	S2S3	
47	***Sanicula maritima*** adobe sanicle	PDAPI1Z0D0		Rare	G2	S2.2	1B.1
48	***Silene verecunda ssp. verecunda*** San Francisco campion	PDCAR0U213			G5T2	S2.2	1B.2

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
49	***Speyeria callippe callippe*** callippe silverspot butterfly	IILEPJ6091	Endangered		G5T1	S1	
50	***Thamnophis sirtalis tetrataenia*** San Francisco garter snake	ARADB3613B	Endangered	Endangered	G5T2	S2	
51	***Trachusa gummifera*** A leaf-cutter bee	IIHYM80010			G1	S1	
52	***Triphysaria floribunda*** San Francisco owl's-clover	PDSCR2T010			G2	S2.2	1B.2
53	***Triquetrella californica*** coastal triquetrella	NBMUS7S010			G1	S1.2	1B.2

Appendix C: Cultural Resources Assessment

Performed by William Self Associates, Inc.

April 8, 2010

Mr. Henry Boucher
CDM
2295 Gateway Oaks Drive, Suite 240
Sacramento, CA 95833

RE: DRAFT Cultural Resources Assessment of the Colma Creek Flood Control Channel Wall Repair Project, South San Francisco, San Mateo County, California

Dear Mr. Boucher:

In accordance with our agreement, William Self Associates, Inc. (WSA) has implemented a records search, cultural resource field survey and assessment of the Colma Creek Flood Control Channel Wall Repair Project area, located along Colma Creek near the intersection of Spruce Avenue and North Canal Street, South San Francisco, San Mateo County, California.

As the proposed channel wall repair will involve ground disturbance, a cultural resource study was conducted in compliance with Section 21084.1 of the California Environmental Quality Act (CEQA). Given that no significant cultural resources were found during the study, our response will be in a letter format rather than a stand-alone assessment report. Therefore, general background information on the cultural setting of the area is briefly summarized.

Project Description and Location

The proposed project is located along Colma Creek upstream of Spruce Avenue Bridge in the City of South San Francisco, California (Figures 1 and 2, figures are provided in Appendix C-1). The limits of the proposed project extend from approximately 300 feet upstream of the centerline of the Spruce Avenue Bridge at an existing transition structure to approximately 80 feet downstream of the centerline of the Spruce Avenue Bridge. A section of North Canal Street and a portion of Sister Cities Park will serve as temporary staging areas.

The proposed project involves construction of a U-shaped channel with concrete walls and bottom. The U-shaped wall would begin at the existing transition structure and extend

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downstream to the existing retaining walls on both sides of the Spruce Avenue Bridge. The concrete bottom slab would continue downstream under the existing Spruce Avenue Bridge to the U-shaped channel previously constructed in 2003. The length of the proposed wall would be 205 feet on each side of the channel, and the length of the proposed channel bottom would be approximately 370 feet.

Advantages of the proposed project include removing the risk of scouring, improving geotechnical reliability, and providing long term functionality, while protecting the structural integrity of the upstream transition structure and the Spruce Avenue Bridge.

Environment

Prior to historic development of South San Francisco, the project area was situated at the junction of Colma Creek and tidal marsh (San Francisco Estuary Institute 2001; United States Coast Survey 1869). Colma Creek flows approximately eight miles from its headwaters in the San Bruno Mountain State and County Park south and easterly to its discharge in the San Francisco Bay. Colma Creek, Twelve Mile Creek, and their tributaries make up the Colma Creek watershed in San Mateo County. Historically, the creeks and tributaries of the Colma Creek Watershed conveyed surface runoff water from the surrounding higher peaks. By the 1890s, Colma Creek appears to have been channelized with the channel alignment changing several times in the 1900s (USGS 1896 1915; 1947, 1956; War Department 1939). The portion of the channel within the project area was lined with concrete in the late 1970s. The Spruce Avenue Bridge was constructed across the channel in 1975.

The vicinity of the project area remained undeveloped until the marshlands began to be filled in the early to mid-1900s (USGS 1915, 1939). Currently, land uses in the project area predominantly consist of manufacturing, offices, warehouses, airport services, and vehicle services, including auto repair shops and rental agencies. North Canal Street runs along the north side of the channel, and the Sister Cities Pedestrian Park, consisting of a footpath lined with grass and ornamental trees, is located within the southwestern portion of the project area. An apartment complex borders the Sister Cities Park to the south.

Cultural Setting

Prehistory

Research into local prehistoric cultures began in the early 1900s with the work of N. C. Nelson of the University of California at Berkeley. Nelson documented 425 shellmounds along the Bay shore and adjacent coast when the Bay was still ringed by salt marshes three to five miles wide (Nelson 1909:322ff.). He maintained that the intensive use of shellfish, a subsistence strategy reflected in both coastal and Bay shoreline middens, indicated a general economic unity in the region during

prehistoric times, and he introduced the idea of a distinct San Francisco Bay archaeological region (Moratto 1984:227). Three sites, in particular, provided the basis for the first model of cultural succession in Central California, the Emeryville Shellmound (CA-ALA-309), the Ellis Landing Site (CA-CCO-295), and the Fernandez Site (CA-CCO-259) (Moratto 1984:227).

Investigations into the prehistory of the Central Valley of California, presaged by early amateur excavations in the 1890s, began in earnest in the 1920s. In the early 20th century, Stockton-area amateur archaeologists J. A. Barr and E. J. Dawson separately excavated a number of sites in the Central Valley and made substantial collections. On the basis of artifact comparisons, Barr identified what he believed were two distinct cultural traditions, an early and a late. Dawson later refined his work and classified the Central Valley sites into three "age-groups" (Schenck and Dawson 1929:402).

Professional or academic-sponsored archaeological investigations in central California began in the 1930s, when J. Lillard and W. Purves of Sacramento Junior College formed a field school and conducted excavations throughout the Sacramento Delta area. By seriating artifacts and mortuary traditions, they identified a three-phase sequence similar to Dawson's, including Early, Intermediate, and Recent cultures (Lillard and Purves 1936). This scheme went through several permutations (see Lillard et al. 1939; Heizer and Fenenga 1939). In 1948 and again in 1954, Richard Beardsley refined this system and extended it to include the region of San Francisco Bay (Beardsley 1948, 1954). The resulting scheme came to be known as the Central California Taxonomic System (CCTS) (Fredrickson 1973; Hughes 1994:1). Subsequently, the CCTS system of Early, Middle, and Late Horizons was applied widely to site dating and taxonomy throughout central California.

As more data were acquired through continued fieldwork, local exceptions to the CCTS were discovered. The accumulation of these exceptions, coupled with the development of radiocarbon dating in the 1950s and obsidian hydration analysis in the 1970s, opened up the possibility of dating deposits more accurately. Much of the subsequent archaeological investigation in central California focused on the creation and refinement of local versions of the CCTS.

In the 1960s and 1970s, archaeologists including Ragir (1972) and Fredrickson (1973) revised existing classificatory schemes and suggested alternative ways of classifying the prehistory of California. Fredrickson (1973:113-114) proposed four "major chronological periods" in prehistoric California: the Early Lithic Period (described as hypothetical), a Paleoindian Period, an Archaic Period, and an Emergent Period. The Archaic and Emergent Periods were further divided into Upper and Lower periods. Subsequently, Fredrickson (1974, 1994) subdivided the Archaic into Lower, Middle, and Upper.

A series of "patterns," emphasizing culture rather than temporal periods, can be identified throughout California prehistory. Following Ragir, Fredrickson (1973:123) proposed that the nomenclature for each pattern relate to the location at which it was first identified, such as the Windmiller, Berkeley, and Augustine Patterns.

Various modifications of the CCTS (e.g., Bennyhoff and Hughes 1987; Fredrickson 1973, 1974; Milliken and Bennyhoff 1993) sustain and extend the system's usefulness for organizing our understanding of local and regional prehistory in terms of time and space. The cultural patterns identified in the Bay Area that in a general way correspond to the CCTS scheme are the Berkeley and Augustine patterns (for information on the Berkeley and Augustine Patterns see Fredrickson 1973, Milliken et al. 2007, Moratto 1984 and Wiberg 1997). Dating techniques such as obsidian hydration analysis or radiometric measurements can further increase the accuracy of these assignments.

Most recently, Milliken et al. (2007:99-123) developed what they term a "hybrid system" for the San Francisco Bay Area, combining the Early-Middle-Late Period temporal sequence with the pattern-aspect-phase cultural sequence. Dating of the cultural patterns, aspects, and phases was based on Dating Scheme D of the CCTS, developed by Groza (2002). Groza directly dated over 100 Olivella shell beads, obtaining a series of AMS radiocarbon dates representing shell bead horizons. The new chronology she developed has moved several shell bead horizons as much as 200 years forward in time.

Milliken et al.'s (2007) San Francisco Bay Area Cultural Sequence includes:

Early Holocene (Lower Archaic) from 8000 to 3500 B.C.
Early Period (Middle Archaic) from 3500 to 500 B.C
Lower Middle Period (Initial Upper Archaic) from 500 B.C. to A.D. 430
Upper Middle Period (Late Upper Archaic) from A.D. 430 to 1050
Initial Late Period (Lower Emergent) from A.D. 1050 to 1550
Terminal Late Period, post-A.D. 1550

No archaeological evidence dating to pre-8000 B.C. has been located in the Bay Area. Milliken et al. (2007) posit that this dearth of archaeological material may be related to subsequent environmental changes that submerged sites, buried sites beneath alluvial deposits, or destroyed sites through stream erosion. A brief summary of the approach presented by Milliken et al. (2007) follows.

A "generalized mobile forager" pattern marked by the use of milling slabs and handstones and the manufacture of large, wide-stemmed and leaf-shaped projectile points emerged around the periphery of the Bay Area during the Early Holocene Period (8000 to 3500 B.C.). Beginning around

3500 B.C., evidence of sedentism, interpreted to signify a regional symbolic integration of peoples, and increased regional trade emerged. This Early Period lasted until ca. 500 B.C. (Milliken et al. 2007:114, 115).

Milliken et al. (2007:115) identify "a major disruption in symbolic integration systems" circa 500 B.C., marking the beginning of the Lower Middle Period (500 B.C. to A.D. 430). Bead Horizon M1, dating from 200 B.C. to A.D. 430, is described by Milliken et al. (2007:115) as marking a 'cultural climax' within the San Francisco Bay Area.

The Upper Middle Period (A.D. 430 to 1050) is marked by the collapse of the Olivella saucer bead trade in central California, abandonment of many Bead Horizon M1 sites, an increase in the occurrence of sea otter bones in those sites that were not abandoned, and the spread of the extended burial mortuary pattern characteristic of the Meganos complex into the interior East Bay. Bead Horizons M2 (A.D. 430 to 600), M3 (A.D. 600 to 800), and M4 (A.D. 800 to 1050) were identified within this period (Milliken et al. 2007:116).

The Initial Late Period, dating from A.D. 1050 to 1550, is characterized by increased manufacture of status objects. In lowland central California during this period, Fredrickson (1973 and 1994, quoted in Milliken et al. 2007:116) noted evidence for increased sedentism, the development of ceremonial integration, and status ascription. The beginning of the Late Period, (ca. A.D. 1000) is marked by the Middle/Late Transition bead horizon. The Terminal Late Period began circa A.D. 1550 and continued until European settlement of the area.

Ethnography

At the time of Spanish exploration of the San Francisco Bay Area, the project area was inhabited by members of the Urebure peoples. The Urebure inhabited the San Bruno Creek area just south of San Bruno Mountain (Milliken 1995:229, 258), and were members of the Ohlone, or Costanoan, language group. The Costanoans spoke a language now considered one of the major subdivisions of the Miwok-Costanoan, which belonged to the Utian family within the Penutian language stock (Shipley 1978:82-84). Modern descendants of the Costanoan prefer to be known as Ohlone. The name *Ohlone* is derived from the Oljon group, who occupied the San Gregorio watershed in San Mateo County (Bocek 1986:8). The two terms (*Costanoan* and *Ohlone*) are used interchangeably in much of the ethnographic literature.

Costanoan designates a family of eight languages, and although linguistically linked as a family, the eight Costanoan languages comprised a continuum in which neighboring groups could probably understand each other. However, beyond neighborhood boundaries, each group's language was reportedly unrecognizable to the other. Each of the eight language groups was subdivided into smaller village complexes or tribal groups, such as the Urebure. These groups were independent political entities, each occupying specific territories defined by physiographic features. Each group

controlled access to the natural resources of its territory, which also included one or more permanent villages and numerous smaller campsites used as needed during a seasonal round of resource exploitation.

Leadership was provided by a chief, who inherited the position patrilineally and could be either a man or woman. The chief and a council of elders served mainly as community advisers. Specific responsibility for feeding visitors, providing for the impoverished and directing ceremonies, hunting, fishing, and gathering fell to the chief. Only during warfare was the chief's role as absolute leader recognized by group members (Levy 1978:487).

Extended families lived in domed structures thatched with tule, grass, wild alfalfa, or ferns (Levy 1978:492). Semisubterranean sweathouses were built into pits excavated in stream banks and covered with a structure against the bank. The tule raft, propelled by double-bladed paddles, was used to navigate across San Francisco Bay (Kroeber 1925:468).

Mussels were an important staple in the Ohlone diet, as were acorns of the coast live oak, valley oak, tanbark oak, and California black oak. Seeds and berries, roots and grasses, and the meat of deer, elk, grizzly, rabbit, and squirrel formed the Ohlone diet. Careful management of the land through controlled burning served to ensure a plentiful, reliable source of all these foods (Levy 1978:491).

The Ohlone usually cremated a corpse immediately upon death but, if there were no relatives to gather wood for the funeral pyre, interment occurred. Mortuary goods comprised most of the personal belongings of the deceased (Levy 1978:490).

The arrival of the Spanish in 1775 led to a rapid and major reduction in native California populations. Diseases, declining birth rates, and the effects of the mission system served to largely eradicate the aboriginal life ways. Brought into the missions, the surviving Ohlone, along with the Esselen, Yokuts, and Miwok, were transformed from hunters and gatherers into agricultural laborers (Levy 1978; Shoup et al. 1995). With the abandonment of the mission system and the Mexican takeover in the 1840s, numerous ranchos were established. Generally, the few Indians who remained were then forced by necessity to work on the ranchos.

In the 1990s, some Ohlone groups (e.g., the Muwekma, Amah, and Esselen further south) submitted petitions for federal recognition (Esselen Nation 2007; Muwekma Ohlone Tribe 2007). Many Ohlone are active in preserving and reviving elements of their traditional culture and are active participants in the monitoring and excavation of archaeological sites.

More extensive reviews of Ohlone ethnography are presented in Bocek (1986), Cambra et al. (1996), Kroeber (1925), Levy (1978), Milliken (1995), and Shoup et al. (1995).

Regional History

During the Mexican period, the project area was part of Rancho Buri Buri. The Rancho was granted to Don Jose Sanchez in 1835 in return for 30 years of military service, first to Spain and then Mexico. The land grant covered an area of 15,793 acres, and Sanchez farmed and raised stock on his property. Rancho Buri Buri encompassed portions of today's South San Francisco, Colma, Burlingame, San Bruno and Millbrae. (B. F. Alley 1883:211; Chandler 1973:2; Hittell 1878:73; South San Francisco Historical Society 2004:7).

Within 10 years of acquiring the Rancho, Sanchez died, leaving the land to his three sons and four daughters. In 1853, Isidro Sanchez sold approximately 1,500 acres of the Rancho's land to Alfred Edmonson. Three years later, Edmonson sold the land to a cattle baron, Charles Lux. Lux, in conjunction with a Central Coast cattle rancher, Henry Miller, raised cattle on the land, which they named Baden. Miller and Lux transported their cattle to San Francisco's Butchertown via El Camino Real, and later barges and the railroad (South San Francisco Historical Society 2004:7, 9). By 1869, the San Francisco and San Jose Railroad had been constructed to the south of the current project area. Following his death, Lux's heirs sold the ranch to Peter Iler, launching South San Francisco's industrial development.

Gustavus Swift had selected the site of South San Francisco, which was purchased by Iler in 1890, as a suitable location to establish stock yards and a market place for cattle. Iler and Swift connected with a number of Chicago capitalists and formed the South San Francisco Land and Improvement Company, and the Western Meat Company (City of South San Francisco 2010). The Western Meat Company was situated at Point San Bruno, east of the project area, and by the mid-1890s, rail lines linked South San Francisco and Point San Bruno to what was then the Southern Pacific Railroad (formerly the San Francisco and San Jose Railroad) (USGS 1896).

Other industries such as steel mills, paint factories, and brick factories soon followed. The South San Francisco Land and Improvement Company sold residential lots to local workers to construct their homes. South San Francisco was also settled by several Irish butchers from Chicago who resided in an area still known as "Irish Town" (South San Francisco Historical Society 2004:7).

During this period, the immediate vicinity of the project area remained undeveloped. The community was centered around Grand and Linden Avenues, and was concentrated north of Railroad Avenue and to the east at Point San Bruno. Colma Creek had been channelized circa the late 1800s and the western portion of the tidal marsh, near the location of the project area, was not reclaimed until the early to mid-1900s (Sanborn Map Company 1910; USGS 1896, 1915; War Department 1939). The project area remained in the hands of the South San Francisco Land and Improvement Company until at least the late 1920s (Kneese 1927).

Civil government was established in 1892, and the town of South San Francisco was incorporated in 1908. By that time, the population had expanded to 1,989 people and 14 major industries had been established (South San Francisco Historical Society 2004:7, 8).

A large shipbuilding industry emerged during World War II, although it declined after the war years passed. The immediate vicinity of the project area remained undeveloped until the 1950s and 1960s when a large number of buildings were constructed along the surrounding streets (USGS 1955, 1968). South San Francisco is currently a mix of residential and industrial communities, and land uses in the project area predominantly consist of manufacturing, offices, warehouses, airport services, and vehicle services, including auto repair shops and rental agencies (City of South San Francisco 2010).

Native American Consultation

On March 31, 2010, WSA contacted the Native American Heritage Commission (NAHC) by letter to request information on known Native American traditional or cultural properties within the project area, and to request a listing of individuals or groups with cultural affiliation to the project area.

See Appendix C-2 for NAHC response.

Results of the Records Search

On behalf of WSA, staff at the California Historical Resources Information System, Northwest Information Center (NWIC) at Sonoma State University conducted a records search of the project vicinity on April 5, 2010 (File No. 09-1231). The study included a review of records and maps on file at the NWIC. The records search area consisted of the project area and a surrounding ¼-mile radius. Historic maps that were reviewed included the 1869 U.S. Coast Survey Map, and the 1896, 1915 and 1942 San Mateo 15-minute topographic quadrangles. In addition, the Office of Historic Preservation indices for South San Francisco, and the *California Inventory of Historical Resources* (March 1976) were consulted.

Previously Recorded Cultural Resources

Results of the records search indicate that there are no recorded sites within the project area. There is one previously recorded cultural resource (P-41-000497) within ¼-mi. radius of the project area. P-41-000497 is a section of railroad tracks that connected the Southern Pacific alignment completed in 1864 to a line constructed ca. early 1890s that served the eastern section of the San Francisco Peninsula (Avina 2000a).

There are no properties within the project area or within ¼-mi. of the project area listed in the Historic Property Data File or the California Inventory of Historic Resources.

Previous Cultural Resource Studies

Five cultural resource studies have previously been undertaken that cover portions of the project area (Table 1). Three of these involved an archaeological survey. Four studies have been undertaken within ¼-mi. of the project area (Table 2).

Table 1. Studies Within the Project Area

Study #	Author	Date	Study Type	Title
S-003043	Chavez	1977	Archaeological Survey	Cultural Resources Evaluation of the Colma Wastewater Collection System, Town of Colma, San Mateo County, California.
S-013543	Clark	1992	Archaeological Survey	Initial Archaeological Evaluation of Proposed Park Additions and a Portion of the Colma Creek Channel for the Orange Memorial Park Master Plan EIR, South San Francisco.
S-017730	Rice	1995	Archaeological Survey	Colma Creek Zone Drainage Improvements Project, Cultural Resources Technical Report.
S-030037	Clark	2004	Records/Literature Search; Research Design	City of South San Francisco Wet Weather Program, Initial Historic Properties Research for Section 106 Compliance, Phase 5: Linden Storm Drain Improvements.
S-031553	Losee	2006	Records/Literature Search	Record Search Results for T-Mobile Project #SF-13210: 480 North Canal Street, South San Francisco, CA (letter report).

Table 2. Studies Within ¼-mile of the Project Area

Study #	Author	Date	Study Type	Title
S-022986	Avina	2000b	Archaeological Survey	Cultural Resources Investigation for the Nextlink Fiber Optic Project, Bayshore Boulevard Route, San Francisco and San Mateo Counties, California.
S-027930	Brown et al.	2003	Archaeological Survey	Cultural Resource Assessment of Alternative Routes for PG&E's Jefferson-Martin Transmission Line, San Mateo County, California.
S-031380	Billat	2006	Archaeological Survey	New Tower ("NT") Submission Packet FCC Form 620, SSF Fire Station. SF-05160C, 480 N Canal Street, South San Francisco, San Mateo County, CA.
S-033611	Clark	2006	Management Plan	South San Francisco Wet Weather Program: Phase II Altered APE & Effect on MOA (letter report).

Results of the Field Survey

WSA staff archaeologist, Angela Cook, conducted an intensive pedestrian survey of the project area on April 6, 2010. The area was evaluated for the presence of historic or prehistoric site indicators. Historic site indicators include, but are not limited to foundations, fence lines, ditches, standing

buildings, objects or structures such as sheds at least 50 years in age, or concentrations of materials, such as domestic refuse (glass bottles, ceramics, toys, buttons or leather shoes), or refuse from other pursuits such as agriculture (e.g., metal tanks, farm machinery parts, horse shoes) or structural materials (e.g., nails, glass window panes, corrugated metal, wood posts or planks, metal pipes and fittings, etc.). Prehistoric site indicators include, but are not limited to areas of darker soil with concentrations of ash, charcoal, bits of animal bone (burned or unburned), shell, flaked stone, groundstone, or human bone.

The project area encompasses an approximately 380 ft. long portion of the channelized Colma Creek, a stretch of North Canal Street, the Spruce Avenue bridge, and a section of Sister Cities Park (Figure 3). The internal portion of the Colma Creek Flood Control Channel was largely filled with water and was not accessible for surveying (Photos 1 and 2, photographs are provided in Appendix C-3). North Canal Street and the Spruce Avenue Bridge are entirely covered with asphalt, concrete, rocks and/or gravel and no ground surface was available for inspection (Photo 3). Sister Cities Park is a landscaped park with a paved footpath meandering through it (Photo 4). Ground surface visibility in this area averaged less than 10% due to the pavement, thick grass cover and some gravel. Patches of visible ground surface were located within the gardens and a narrow strip along the channel wall. Modern debris including glass and plastic was observed within the park.

No evidence of historic or prehistoric cultural materials or soils was detected within the survey area.

Recommendations

The results of the records search and the visual inspection of the project area indicate that the likelihood of encountering significant cultural resources within the project area is low. However, should any previously undiscovered historic or prehistoric resources be found during construction, work should stop, in accordance with CEQA regulations, until such time that the resource can be evaluated by a qualified archaeologist and appropriate mitigative action taken as determined necessary by the Lead Agency.

In the event that Native American human remains or funerary objects are discovered, the provisions of the California Health and Safety Code should be followed. Section 7050.5(b) of the California Health and Safety Code states:

> *In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27491 of the Government Code or any other related provisions*

> *of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code.*

The County Coroner, upon recognizing the remains as being of Native American origin, is responsible to contact the Native American Heritage Commission within 24 hours. The Commission has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant. Sections 5097.98 and 5097.99 of the Public Resources Code also call for "protection to Native American human burials and skeletal remains from vandalism and inadvertent destruction."

Please don't hesitate to give me a call if we may be of further assistance or answer any questions you may have regarding the survey or this report.

Sincerely,
WILLIAM SELF ASSOCIATES

James Allan, Ph.D., RPA
Principal

Attachment

References

Avina, Mike

2000a Department of Parks and Recreation 523 Recording Forms for P-41-000497. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

2000b Cultural Resources Investigation for the Nextlink Fiber Optic Project, Bayshore Boulevard Route, San Francisco and San Mateo Counties, California (S-022986). Prepared by Jones & Stokes. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

Beardsley, Richard K.

1948 Cultural Sequences in Central California Archaeology. *American Antiquity* 4(1):1–29.

1954 Temporal and Areal Relationships in Central California Archaeology. *Reports of the University of California Archaeological Survey* 24 and 25.

Bennyhoff, James A., and Richard E. Hughes

1987 Shell Bead Ornament Exchange Networks Between California and the Western Great Basin. *Anthropological Papers of the American Museum of Natural History* 64 (2):79–175. American Museum of Natural History, Washington, DC.

B. F. Alley

1883 *History of San Mateo County, California*. B. F. Alley, San Francisco, CA.

Billat, Lorna

2006 New Tower ("NT") Submission Packet FCC Form 620, SSF Fire Station. SF-05160C, 480 N Canal Street, South San Francisco, San Mateo County, CA (S-031380). Prepared by Earth Touch, Inc. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

Bocek, Barbara

1986 Hunter-Gatherer Ecology and Settlement Mobility along San Francisquito Creek. Doctoral Dissertation, Stanford University, Stanford, CA.

Brown, Kyle, Adam Marlow, James Allan and William Self

2003 Cultural Resource Assessment of Alternative Routes for PG&E's Jefferson-Martin Transmission Line, San Mateo County, California (S-027930). Prepared by William Self Associates, Inc. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

Cambra, Rose Mary, Alan Leventhal, Laura Jones, Julia Hammett, Les Field, Norma Sanchez, and Robert Jurmain

1996 Archaeological Investigations at Kaphan Umux (Three Wolves) Site, CA-SCL-732: A Middle Period Prehistoric Cemetery on Coyote Creek in Southern San Jose, Santa Clara County, California. Report on file at Caltrans District 4 Offices, Oakland, CA.

Chandler, Samuel C.

1973 *"Gateway to the Peninsula" A History of the City of Daly City, San Mateo County, California*. City of Daly City, CA.

Chavez, David

1977 Cultural Resources Evaluation of the Colma Wastewater Collection System, Town of Colma, San Mateo County, California (S-003043). On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

City of South San Fancisco

2010 History of South San Francisco. Online at http://www.ci.ssf.ca.us/index.aspx?nid=154. Accessed March 31, 2010.

Clark, Matthew R.

1992 Initial Archaeological Evaluation of Proposed Park Additions and a Portion of the Colma Creek Channel for the Orange Memorial Park Master Plan EIR, South San Francisco (S-013543). Prepared by MRC Consulting. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

2004 City of South San Francisco Wet Weather Program, Initial Historic Properties Research for Section 106 Compliance, Phase 5: Linden Storm Drain Improvements (S-030037). Prepared by Holman & Associates. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

2006 South San Francisco Wet Weather Program: Phase II Altered APE & Effect on MOA (letter report) (S-033611). Prepared by Holman & Associates. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

Esselen Nation

2007 The Ohlone/Costanoan Esselen Nation Today. www.esselennation.com/OCENToday.html. Accessed November 29.

Fredrickson, David

1973 Early Cultures of the North Coast Ranges, California. Doctoral Dissertation, Department of Anthropology, University of California, Davis.

1974 Cultural Diversity in Early Central California: A View from the North Coast Ranges. *Journal of California Anthropology* 1(1):41-53.

1994 Spatial and cultural units in central California archaeology. In *Toward a New Taxonomic Framework for Central California: Essays by James A. Bennyhoff and David A. Fredrickson*, Richard Hughes, editor. Contributions of the University of California Archaeological Research Facility 15. Berkeley, CA.

Groza, Randall G.

2002 An AMS Chronology for Central California *Olivella* Shell Beads. Master's Thesis, Department of Anthropology, San Francisco State University, CA.

Heizer, Robert F., and Franklin Fenenga

1939 Archaeological Horizons in Central California. *American Anthropologist* 41:378–399.

Hittell, John Shertzer

1878 *A History of the City of San Francisco and Incidentally of the State of California*. A. L. Bancroft & Company, San Francisco, CA.

Hughes, Richard E. (editor)

1994 *Toward a New Taxonomic Framework for Central California Archaeology. Essays by James A. Bennyhoff and David A. Fredrickson*. Contributions of the University of California Archaeological Research Facility 15, Berkeley, CA.

Kneese, George A.

1927 *Official Map of San Mateo County, California*. Compiled from Official Records and Surveys by Geo. A. Kneese, County Surveyor.

Kroeber, Alfred

1925 Handbook of the Indians of California. *Bureau of American Ethnology Bulletin* 78, Washington, D.C.

Levy, Richard

1978 Costanoan. In *Handbook of North American Indians*, vol. 8, *California*. Robert F. Heizer, editor, pp. 485–495. Smithsonian Institution, Washington, D.C.

Lillard, Jeremiah B., Robert F. Heizer, and Franklin Fenenga

1939 An Introduction to the Archaeology of central California. *Sacramento Junior College, Department of Anthropology Bulletin 2*. Sacramento, CA.

Lillard, Jeremiah B., and William K. Purves
1936 The Archaeology of the Deer Creek-Cosumnes Area, Sacramento, Co., California. *Sacramento Junior College, Department of Anthropology Bulletin* 1, Sacramento, CA.

Losee, Carolyn
2006 Record Search Results for T-Mobile Project #SF-13210: 480 North Canal Street, South San Francisco, CA (letter report) (S-031553). Prepared by Archaeological Resources Technology. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

Milliken, Randall
1995 *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769–1810*. Ballena Press, Novato, CA.

Milliken, Randall, and James A. Bennyhoff
1993 Temporal Changes in Beads as Prehistoric Grave Goods. In *There Grows a Green Tree: Papers in Honor of David A. Fredrickson*, Greg White, Pat Mikkelsen, William R. Hildebrandt, and Mark E. Basgall, editors, pp. 381-385. Center for Archaeological Research at Davis, Publication 11. University of California, Davis, CA.

Milliken, Randall, Richard T. Fitzgerald, Mark G. Hylkema, Randy Groza, Tom Origer, David G. Bieling, Alan Leventhal, Randy S. Wiberg, Andrew Gottsfield, Donna Gillette, Viviana Bellifemine, Eric Strother, Rober Cartier and David A. Fredrickson
2007 Punctuated Culture Change in the San Francisco Bay Area. In *California Prehistory: Colonization, Culture, and Complexity*, Terry L. Jones and Kathryn A. Klar, editors, pp. 99-123. Altamira Press, Lanham, MD.

Moratto, Michael J.
1984 *California Archeology*. Academic Press, Orlando, FL.

Muwekma Ohlone Tribe
2007. The Muwekma Ohlone Tribe: A Brief History and the Recognition Process. www.muwekma.org/news/index.html. Accessed November 29.

Nelson, Nels
1909 Shellmounds of the San Francisco Bay area. *University of California Publications in American Archaeology and Ethnology* 7(4):310-356. Berkeley

Ragir, Sonia R.
1972 The Early Horizon in Central California Prehistory. *Contributions of the University of California Archeological Research Facility* 15. Berkeley, CA.

Rice, Carolyn
1995 Colma Creek Zone Drainage Improvements Project, Cultural Resources Technical Report (S-017730). On file at the Northwest Information Center, Sonoma State University, Rohnert Park, CA.

Sanborn Map Company
1910 South San Francisco, San Mateo Co., Cal. Sanborn Map Company, New York, NY.

San Francisco Estuary Institute
2001 Historical Baylands, Modern Baylands. Online at http://www.sfei.org/ecoatlas/Habitat/maps/SFBay/EMB-EHB.pdf. Accessed April 1, 2010.

Schenck, W. Egbert, and E. J. Dawson
1929 Archaeology of the Northern San Joaquin Valley. *University of California Publications in American Archaeology and Ethnology 25* (4): 289-413.

Shipley, William
1978 Native Languages of California. In *Handbook of North American Indians*, Volume 8, *California*. Robert F. Heizer, editor, pp. 80-90. Smithsonian Institution, Washington, D.C.

Shoup, Laurence, Randall T. Milliken and Alan K. Brown
1995 Inigo of Rancho Posolmi: The Life and Times of a Mission Indian and His Land. On file at Woodward Clyde, Oakland, CA.

South San Francisco Historical Society
2004 *South San Francisco, Images of America*. Arcadia Publishing, San Francisco, CA.

United States Coast Survey
1869 San Francisco Peninsula. Online at the David Rumsey Map Collection, www.davidrumsey.com. Accessed December 2006.

United States Geological Survey (USGS)
1896 San Mateo Quadrangle, 15 Minute Series (Topographic).
1915 San Mateo Quadrangle, 15 Minute Series (Topographic).
1947 San Francisco South Quadrangle, 7.5 Minute Series (Topographic).

1956 San Francisco South Quadrangle, 7.5 Minute Series (Topographic).
1968 San Francisco South Quadrangle, 7.5 Minute Series (Topographic).

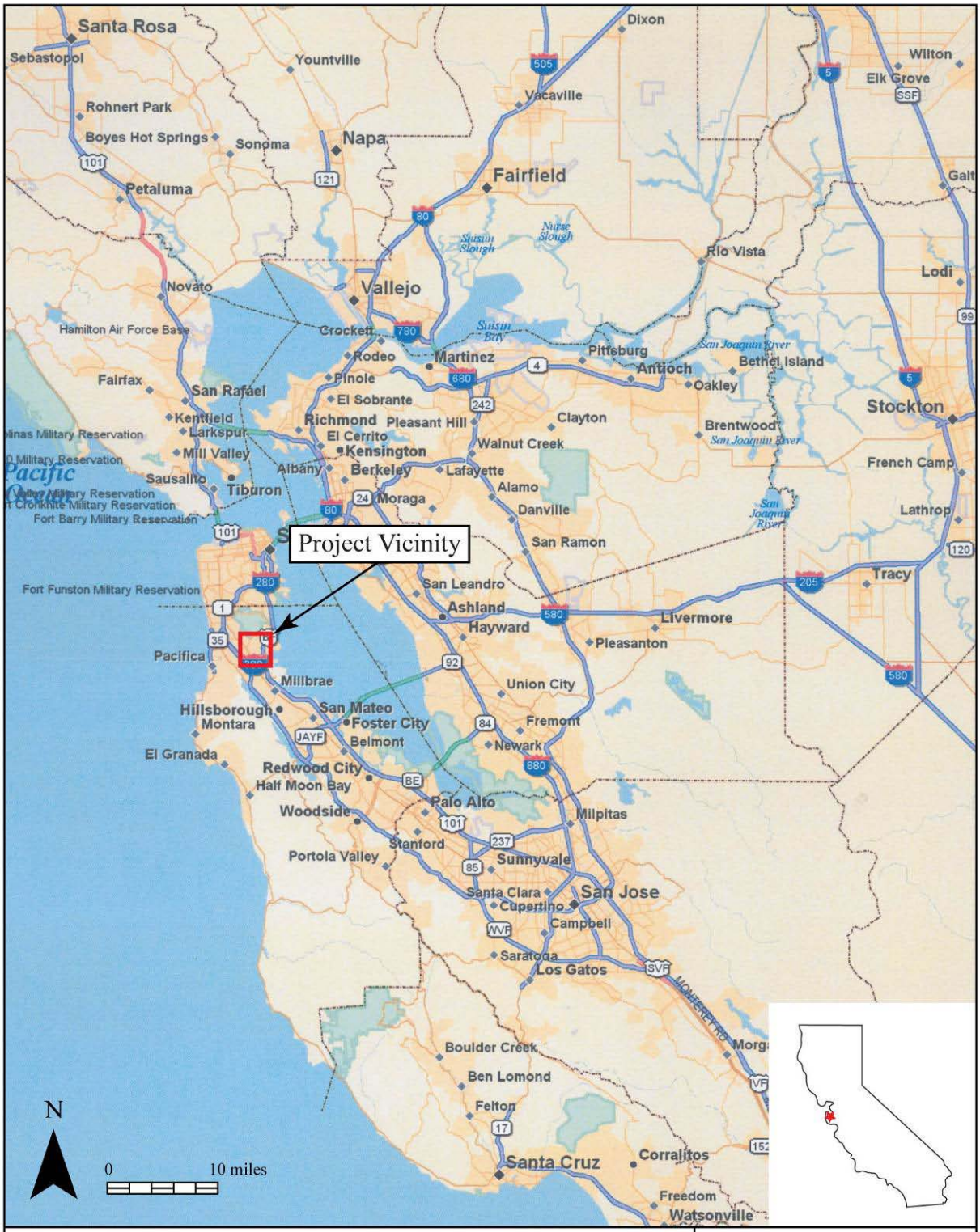
War Department, Corps of Engineers, U.S. Army
1939 San Mateo Quadrangle, 15 Minute Series (Topographic).

Wiberg, Randy S.
1997 *Archaeological Investigations at Site CA-ALA-42, Alameda County, California: Final Report.* Coyote Press, Salinas, CA.

APPENDIX C-1

Figures

List of Figures

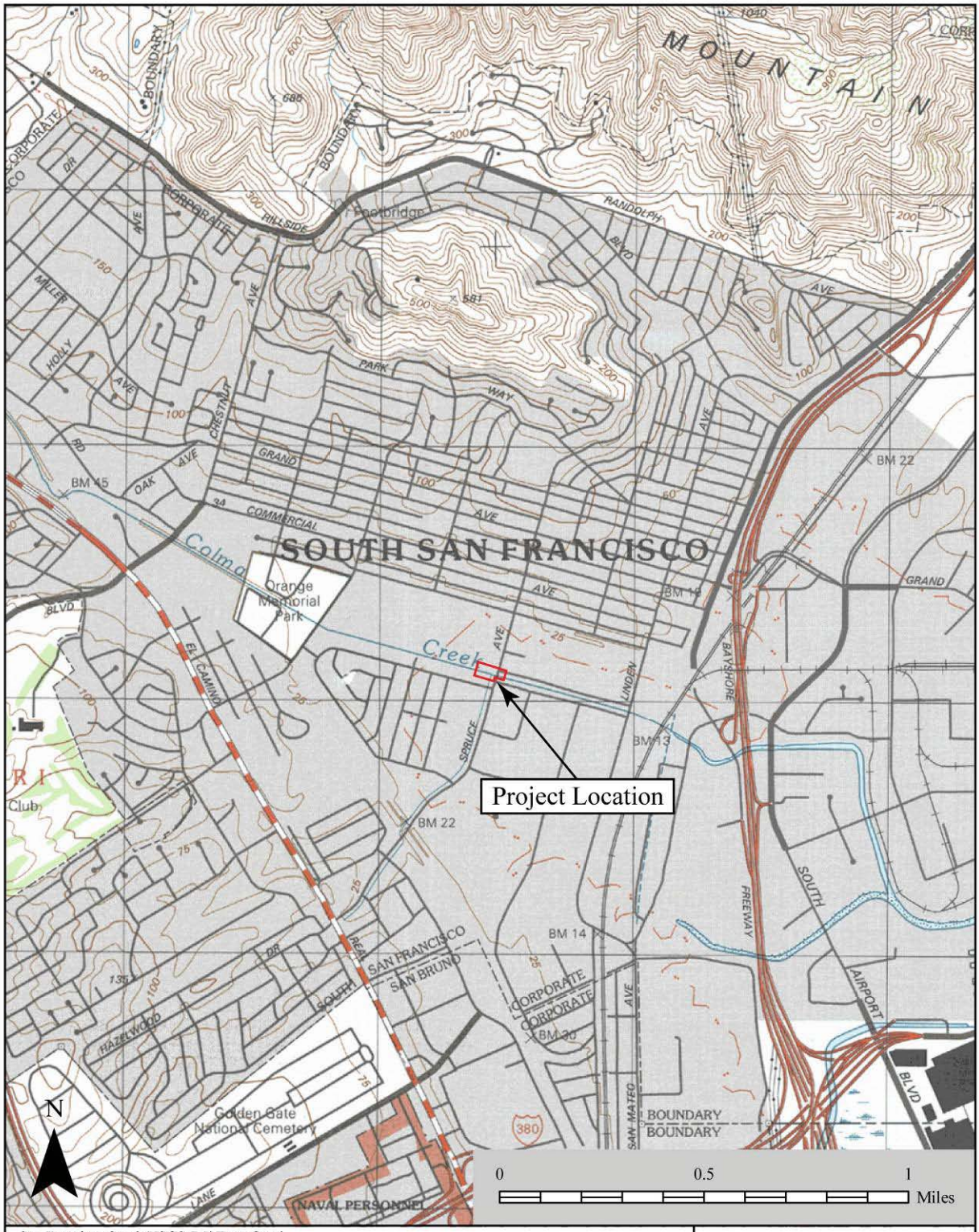


WSA

Project Vicinity Map

Figure 1

CDM
Colma Creek Flood Control
Channel Wall Repair Project
South San Francisco, CA



San Francisco South USGS 7.5' Topo Quad

WSA

Project Location Map

Figure 2

CDM
Colma Creek Flood Control
Channel Wall Repair Project
South San Francisco, CA

Google Earth, 2009.

WSA

Survey Area

Figure 3

CDM
Colma Creek Flood Control
Channel Wall Repair Project
South San Francisco, CA

APPENDIX C-2

Native American Heritage Commission Consultation
And
List of Native American Contacts

March 31, 2010

Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814
(916) 653-4082; Fax (916) 657-5390

RE: Colma Creek Flood Control Channel Wall Repair Project, South San Francisco, CA

Dear Native American Heritage Commission:

William Self Associates, Inc. (WSA) has been contracted to assess potential impacts to cultural resources as part of the Colma Creek Flood Control Channel Wall Repair Project in South San Francisco, California. The project area is located near the intersection of Spruce Avenue and North Canal Street, South San Francisco, within Township 3 South, Range 4 West of the San Francisco South 7.5' USGS topographic quadrangle, as shown on the attached map. The proposed project will involve repair of the vertical north and south channel walls, including removal of temporary bracing pipes spanning the creek channel, and construction of a U-shaped wall and concrete bottom slab. Potential staging areas will be located along North Canal Street and at Sister Cities Park.

We bring this project to the attention of the Native American Heritage Commission with the desire to obtain, from your office, pertinent information regarding prehistoric, historic and/or ethnographic land use and sites of Native American traditional or cultural value that might be known to exist within the project vicinity, as depicted in the Sacred Lands database or other files. We would also appreciate obtaining a list of interested Native American tribal entities or individuals for the project area. We have contacted the Northwest Information Center at Sonoma State University, Rohnert Park to review their files as part of the background research on the project.

We would appreciate a response, at your earliest convenience, should you have information relative to this request. Should you have any questions, I can be reached at (925) 253-9070.

Thank you again for your assistance.

Sincerely,

WILLIAM SELF ASSOCIATES

James M. Allan, Ph.D., RPA
Vice-President

Attachment

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

April 15, 2010

James Allan
WSA
Box 2192
Orinda, CA 94563

Sent by Fax: 925-254-3553
Number of Pages: 2

Re: Proposed Colma Creek Flood Control project, San Francisco County

Dear Mr. Allan:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts
San Francisco County
April 14, 2010

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Patterson , CA 95363
jakki@bigvalley.net
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Ohlone/Costanoan

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(510) 687-9393 - Fax

Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Amah/MutsunTribal Band
Irene Zwierlein, Chairperson
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Ohlone/Costanoan
Bay Miwok
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Patwin

Amah/MutsunTribal Band
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Ohlone/Costanoan

Indian Canyon Mutsun Band of Costanoan
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Ohlone/Costanoan

Muwekma Ohlone Indian Tribe of the SF Bay Area
Rosemary Cambra, Chairperson
PO Box 360791
Milpitas , CA 95036
muwekma@muwekma.org
408-434-1668
408-434-1673

Ohlone / Costanoan

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Colma Creek Flood Control Channel Wall Repair project, San FRancisco County

APPENDIX C-3

Photographs

Photo 1. Colma Creek Flood Control Channel, view west-northwest.

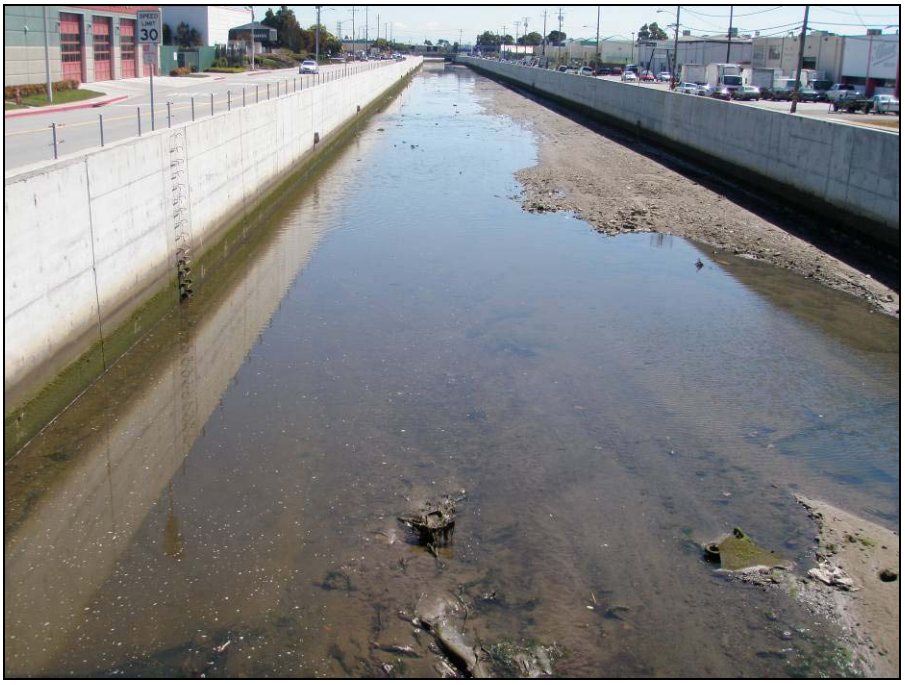

Photo 2. Colma Creek Flood Control Channel, view east-southeast.

Photos 1 and 2	Colma Creek Flood Control Channel Wall Repair Project South San Francisco, California

Photo 3. North Canal Street, view east-southeast. Colma Creek Flood Control Channel is visible in the right-hand portion of the photograph.

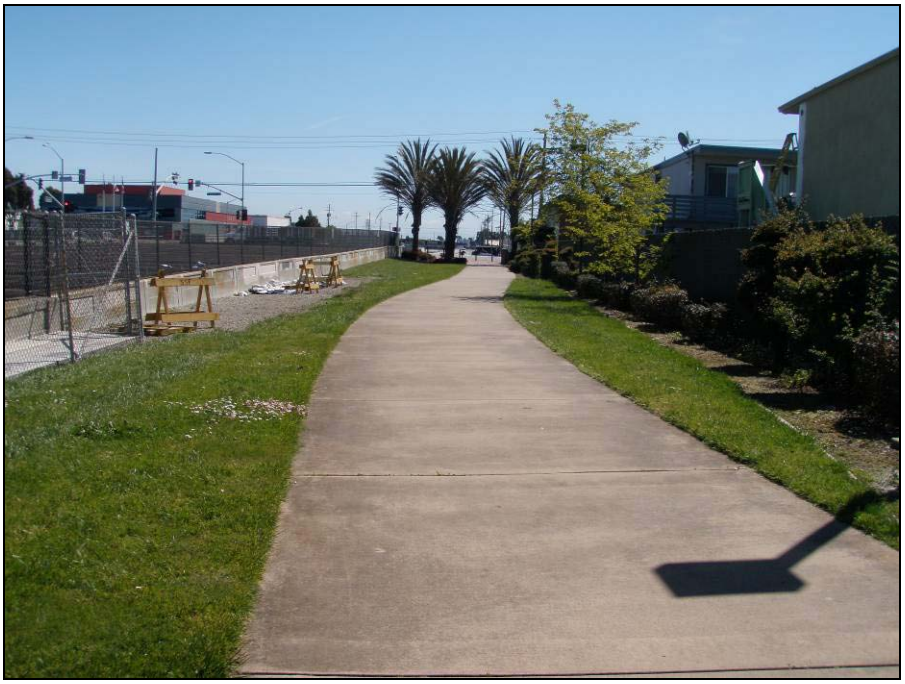

Photo 4. Section of Sister Cities Park within the survey area, view east-southeast.

Photos 3 and 4	Colma Creek Flood Control Channel Wall Repair Project South San Francisco, California