NORTH BAY WATER RECYCLING PROGRAM

North Marin Water District– Novato Central Service Area Project Draft Supplemental Environmental Assessment to the Environmental Impact Statement and Addendum to the Environmental Impact Report

Prepared for

North Marin Water District
US Bureau of Reclamation
State Water Resources Control Board

August 2015

ATTACHMENT 1

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SECTION 1
Introduction

1.1 Introduction

The North Marin Water District (NMWD) has prepared this Environmental Assessment (EA) to the Environmental Impact Statement (EIS) and Addendum to the Environmental Impact Report (EIR) to address proposed changes to the approved North Bay Water Recycling Program (NBWRP)[1] Phase 1 Implementation Plan (Phase 1 project), analyzed in the NBWRP EIR/EIS (SCH No. 2008072096; ESA, 2009). This document is intended to satisfy requirements under the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), and to provide project-specific environmental documentation for the project elements proposed under a Clean Water State Revolving Fund (CWSRF) Program Application, required for review by the State Water Resources Control Board (SWRCB).

1.2 Overview and Proposed Action

The process of finalizing the design of the NMWD Recycled Water Expansion Central Service Area Project (Proposed Action) has resulted in minor changes to the approved Phase 1 pipeline distribution system alignment including the following:

1. Re-route pipeline from Novato Sanitary District Recycled Water Facility to the Vintage Oaks shopping center;

2. Highway 101 Crossing; Based on updated survey information, an appropriate crossing location has been identified. The modified pipeline would be horizontal directional drilled under Highway 101 from Redwood Boulevard to Vintage Way;

3. Extend distribution pipeline to connect to an existing surplus tank and serve existing customers on Ignacio Boulevard; and

4. Eliminate the 18-inch recycled trunk line to serve Novato High School.

A full description of the proposed modification is provided in Chapter 2, Proposed Action.

[1] Formerly known as the North San Pablo Bay Restoration and Reuse Project.

1.3 Background and Approved Projects

NBWRA is a cooperative program established in the San Pablo Bay region under a Memorandum of Understanding in August 2005 that supports sustainability and environmental enhancement by expanding the use of recycled water. NBWRA is comprised of the following participating agencies: Las Gallinas Valley Sanitary District (LGVSD), Novato Sanitary District (Novato SD), Sonoma Valley County Sanitation District (SVCSD), Napa Sanitation District (Napa SD), Napa County, Sonoma County Water Agency (SCWA), and NMWD. NMWD provides water to a population of 61,000 in and around city of Novato in Marin County.

NBWRA developed the NBWRP in conformance with the requirements of the United States Department of Interior Bureau of Reclamation's (Reclamation's) Public Law 102-575, Title XVI, which provides a mechanism for federal participation and cost-sharing in approved water reuse projects. Providing federal funding to implement the NBWRP was a Federal action, and therefore a joint EIR/EIS was prepared to comply with the National Environmental Policy Act (NEPA).

NMWD participated with NBWRA Member Agencies, in coordination with Reclamation, to prepare the Draft EIR for the NBWRP in May 2009. Sonoma County Water Agency as the CEQA Lead Agency, certified the EIR as complete and adequate under CEQA on December 8, 2009. Each Member Agency then approved the Phase 1 Project under its jurisdiction; prepared and adopted written findings of fact for each adverse environmental effect identified in the EIR; made a Statement of Overriding Considerations, as needed (discussed below); and adopted a Mitigation Monitoring and Reporting Program. As a CEQA Responsible Agency, NMWD approved the projects in its service area (i.e., the North, Central, and South Novato Service Areas) on December 15, 2009.[2] The projects under the NBWRP that were proposed (and approved) by NMWD, and will be implemented in partnership with Novato SD, are located in the Novato Central Service Area.

The *North Bay Water Recycling Project Phase 1 Implementation Plan, Environmental Impact Report/ Environmental Impact Statement* (EIR/EIS) (SCH No. 2008072096), was prepared by Environmental Science Associates and certified by Sonoma County Water Agency in December 2009 for North Bay Water Reuse Authority. Reclamation issued a final EIS for the NBWRP on June 7, 2010 and signed a Record of Decision on January 28, 2011 (Reclamation, 2011).[3] The NBWRP EIS/EIS incorporated by reference in this Draft EA/Addendum and is available for review to gain an understanding of previously completed Master Planning efforts and environmental documents completed by the NBWRA Member Agencies and applicable to the Proposed Action.

2 A copy of the Notice of Determination is provided in Appendix 1.
3 A copy of the Record of Decision is provided in Appendix 2.

1.4 Regulatory Environment

This EA/Addendum addresses minor changes in the alignment of distribution facilities examined in the NBWRP EIR/EIS pursuant to NEPA and CEQA requirements, described below.

1.4.1 NEPA Compliance

Because of the complex nature of the NBWRP, Reclamation determined that preparation of an EIS was the most appropriate form of NEPA compliance for the NBWRP. This EA supplements the environmental analysis provided in the EIS and describes the changes in the NBWRP related to the modified recycled water pipeline routes.

In accordance with the Council of Environmental Quality (CEQ) NEPA regulations, an EA provides the federal Lead Agency, Reclamation, with evidence and analysis to determine whether a full Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) is required; and to determine if a Proposed Action may result in significant adverse effects on the environment (Bureau of Reclamation, 2012). Consistent with CEQ regulations, this EA describes the purpose and need for the proposed modifications to the originally approved action and potential adverse effects. Reclamation will use this EA to supplement the previously prepared NBWRP EIR/EIS, and support a FONSI for the Proposed Action.

1.4.2 CEQA Compliance

Pursuant to CEQA Section 15164, the lead or responsible agency may prepare an addendum to a previously certified EIR if changes or modifications are necessary, but none of the conditions calling for preparation of a subsequent EIR have occurred (CEQA Guidelines §15164). A brief explanation of the decision not to prepare a subsequent or supplemental EIR pursuant to Section 15162 should be included in an addendum to the EIR, the Lead Agency's finding on the project, or elsewhere in the record. The explanation must be supported by substantial evidence (CEQA Guidelines §15164(e)). When an EIR has been certified, no subsequent EIR shall be prepared for that project unless the Lead Agency determines, on the basis of substantial evidence in light of the whole record, one or more of the following:

1. Substantial changes are proposed in the project which will require major revisions of the EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in severity of previously identified significant effects (CEQA Guidelines §15162(a)(1));

2. Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions of the EIR due to involvement of new significant environmental effects or a substantial increase in severity of previously identified significant effects (CEQA Guidelines §15162(a)(2); or

3. New information of substantial importance which was not known could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified shows the following:

a. The project will have one or more significant effects not discussed in the previous EIR;

b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative (CEQA Guidelines §15162(a)(3)).

The minor alteration of the distribution facility alignments in the Central Service Area would not trigger any of the above conditions; therefore preparation of a subsequent or supplemental EIR is not required. As previously noted in Section 1.2, the SWRCB will use this addendum with the EIR/EIS to consider the environmental effects of the project as described in the CWSRF Application.

1.4.3 State Water Resources Control Board Funding

To implement the approved projects in the Novato Central Service Area, NMWD is applying for a loan under the CWSRF administered by the SWRCB. As part of the CWSRF application process, NMWD has prepared this EA/Addendum to comply with the SWRCB's CEQA-Plus requirements, in support of NMWD's CWSRF Application.

1.5 Need for Action

The need for action, or project objective, is to:

1. Extend the NBWRP recycled water pipeline to serve the Vintage Oaks shopping center; and

2. Extend distribution pipeline to connect to an existing surplus tank and serve existing customers on Ignacio Boulevard.

1.6 Project Objectives

The purpose of the NBWRP, including the proposed Central Service Area Project (the subject of this Addendum), is to promote the expanded beneficial use of recycled water in the North Bay region to achieve the following objectives:

1. Offset urban and agricultural demands on potable water supplies;

2. Enhance local and regional ecosystems;

3. Improve local and regional water supply reliability;

4. Maintain and protect public health and safety;
5. Promote sustainable practices;
6. Give top priority to local needs for recycled water, and;
7. Implement recycled water facilities in an economically viable manner.

Reclamation's purpose is to facilitate water recycling projects within the Mid-Pacific Region to extend the beneficial use of existing water supplies. Title XVI of Public Law 102-575, as amended, provides authority for Reclamation's water recycling and reuse program (Title XVI Program), which provides funding for construction of specified water recycling projects and planning studies for the reclamation and reuse of wastewaters and naturally impaired ground and surface water in the 17 Western States and Hawaii. The Proposed Action is eligible for funding under the Title XVI Program.

1.7 Overview of the Approved Project under the NBWRP

Under the approved NBWRP, the Proposed Action was included in the Phase 1 Implementation Plan (Phase 1 project) as the Recycled Water System Expansion Project, in which Novato SD and NMWD would implement service in the Novato Central Service Area through construction of a recycled water distribution system from the Novato SD Waste Water Treatment Plant (WWTP) south to Rowland Boulevard and the Vintage Oaks shopping center, and across Highway 101 to serve urban users west of Highway 101. From Novato's SD Davidson WWTP, an 18-inch pipeline would be installed along Novato SD's existing easement, with a jack and bore crossing of US 101 from Rowland Boulevard to Redwood Boulevard. An 18-inch recycled trunk line would then extend north through Novato to deliver recycled water to Novato High School and other irrigated playing fields, with a 10-inch line extending south along Redwood Boulevard (see **Figure 1-1**). Other major affected roadways identified in the EIR/EIS include: Atherton Avenue; Olive Avenue; DeLong/Diablo Avenue; Hill Road; Novato Boulevard; and South Novato Boulevard. Chapter 3 of the NBWRP EIR/EIS presented a discussion of effects of the NBWRP for the following resource areas: Land Use and Planning, Geology, Soils, and Seismicity, Hydrology, Water Quality, Biological Resources, Cultural Resources, Transportation and Traffic, Air Quality, Noise, Hazards and Hazardous Materials, Visual Resources, Recreation, Environmental Justice, and Socioeconomics. Impacts for each of the issue areas were found to be less than significant or less than significant with incorporation of identified mitigation. Mitigation measures to address potential effects were adopted by NMWD as part of project approval process in December 2009, and would be applicable to the Proposed Action, as described in this EA/Addendum.

SOURCE: ESA, 2009

Note: Existing Tank Facilities Shown

NBWRA North Bay Water Recycling Program. 206088.01

Figure 1-1

Approved Phase 1 Project Under NBWRP - Novato Central Service Area

1.8 NBWRP EIR/EIS Findings and Statement of Overriding Considerations

As part of the project approval process, each Member Agency, including NMWD, made Findings of Fact regarding the NBWRP in December 2009 in support of the Draft EIR/EIS and the Final EIR/EIS for the NBWRP. As provided for under CEQA 15096 (a) and (f), NMWD approved the NMWD Recycled Water Expansion Project, including the North, Central, and South Novato Service Area Projects on December 15, 2009. To support this consideration and a decision on the project, NMWD prepared written findings for each impact identified in the EIR/EIS in accordance with the CEQA Guidelines §§ 15091, 15096(h). The Findings included a Statement of Overriding Considerations for any significant and unavoidable impacts associated with NWBRP.

The NBWRP (including the CWSRF Application project components) would provide recycled water for urban, agricultural, and environmental uses, and as such, would contribute to the provision of adequate water supply to support a level of growth that is consistent with the amount planned and approved within the General Plans of Marin, Sonoma and Napa Counties. No appreciable growth in population or employment would occur as a direct result of construction or operation of the proposed facilities. However, development under the General Plans accommodated by NBWRP would result in secondary environmental effects, which include effects that would be significant and unavoidable. Within the NMWD Service Area, these secondary significant and unavoidable environmental effects were identified by the Marin County and City of Novato General Plan EIRs as: potential conflicts with agricultural land use or other existing land uses, permanent loss of sensitive species or habitat, alteration of drainage patterns, impacts to water supply and water quality within unincorporated Marin County.[4] The project provides a level of recycled water supply consistent with the assumptions of the approved Marin County General Plan. As previously noted, some of the above impacts will be reduced by identified mitigation measures, but the impacts may not be reduced to a less than significant level.

In considering the Recycled Water Expansion Project, NMWD weighed the benefits of the NBWRP against the project's unavoidable environmental risks and potentially significant adverse impacts. NMWD determined that the benefits of the project outweigh its unavoidable environmental risks and unmitigated adverse effects.

1.9 Intended Use of the Document

Reclamation intends to use this EA/Addendum to consider provision of federal funding under Title XVI for implementation of the NBWRP. As Federal Lead Agency, Reclamation would use this document to amend the Record of Decision, which would document Reclamation's decision to adopt the proposed modified project.

[4] As identified in the NWBRP EIR/EIS, secondary effects of growth attributable to the project could occur if buildout under the relevant General Plans occur. The project would not directly result in significant and unavoidable environmental effects.

The SWRCB will use this EA/Addendum, in conjunction with the approved EIR/EIS, associated permits, and consultations to consider administration of CWSRF funding.

NMWD will use this EA/Addendum to approve the Proposed Action and make Findings regarding identified impacts. The analyses contained within this EA/Addendum could be used to support the acquisition of the following regulatory permits or approvals, if needed:

1. Clean Water Act Individual or Nationwide Permits (USACE);
2. Endangered Species Act Consultation (USFWS);
3. Section 401 Water Quality Certification (San Francisco Bay Regional Water Quality Control Board);
4. National Historic Preservation Act Section 106 consultation [State Historic Preservation Office (SHPO)];[5]
5. Lake and Streambed Alteration Agreement (California Department of Fish and Wildlife)
6. Local City of Novato Encroachment Permit;
7. Sonoma Marin Area Rapid Transit (SMART) Encroachment Permit;
8. Caltrans Encroachment Permit.

Acquisition of rights-of-way (ROWs) and temporary construction easements may be necessary for construction of some of the proposed facilities. Temporary construction easements would also be required for contractor staging areas and equipment and materials storage.

1.10 Agency Consultation History

1.10.1 Other Agencies

Other agencies beyond the NBWRA Member Agencies and cooperating agencies with authority over the Proposed Action may include, but are not limited to, the following: USACE, USFWS, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), SWRCB, San Francisco Bay Regional Water Quality Control Board (SFRWQCB), SHPO, California Department of Health Services, and Bay Area Air Quality Management District (BAAQMD).

1.10.2 NBWRP EIR/EIS Federal Regulatory Consultation Summary

As part of the NBWRP EIR/EIS process, Reclamation, as the NEPA Lead Agency, participated in formal consultation with NMFS and USFWS as part of the Section 7 consultation under the Federal Endangered Species Act (ESA). Reclamation is also in consultation with the California

[5] Additional permit applications and federal consultations have been initiated in parallel with this Supplemental EA/Addendum schedule.

State Historic Preservation Office (SHPO) as part of the Section 106 process under the National Historic Preservation Act. A summary of consultation status is provided below. Conditions and requirements included in the following permits are herein incorporated into the record.[6]

1. United States Fish and Wildlife Service *Biological Opinion on the Proposed North San Pablo Bay Restoration and Reuse Project in Marin, Sonoma, and Napa Counties, California*, Reference No. 81420-2009-F-1272-2, July 2010.

2. National Marine Fisheries Service, Consultation Letter of Concurrence, Reference No 2009/04759:AEM, May 6, 2010.

3. Biological Assessment/Fisheries Biological Assessment for the *North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program)*, Prepared by Environmental Science Associates (ESA). August 2009.

4. Draft Agreement for Sale of Ohlone Mitigation Bank Conservation Credits, May 17, 2011.

5. California State Historic Preservation Officer, Letter Regarding North Bay Water Reuse Authority Phase 1 Project, Marin, Sonoma, and Napa Counties, California, Project No. 09-CCAO-132, Reference No. BUR110214A, March 21, 2011.

Federal Section 7 Consultation – USFWS

Section 7 consultation with USFWS was completed with the issuance of a Biological Opinion in July 2010. Key terms and conditions, and minimization and avoidance measures applicable to the entire Phase 1 Program includes crossing of all creeks using trenchless technology, and provision of compensatory mitigation for disturbance of California red-legged frog habitat. The Central Service Area Project would have the potential to disturb 0.1 acres consisting of upland habitat along roadway pavement that may or may not be potentially affected by pipeline installation. Pursuant to the 0.1:1 compensatory mitigation ratio required under the Biological Opinion, NMWD participated with other NBWRA Member Agencies to purchase the required 0.01 acres, to meet the collective obligation for habitat credits from a Service-approved conservation bank. SCWA, on behalf of NBWRA and the Member Agencies negotiated an agreement to purchase compensatory mitigation credits.[7]

Federal Section 7 Consultation – NMFS

A Biological Assessment/Fisheries Biological Assessment (BA) was submitted by Reclamation to NMFS and USFWS August 25, 2009. Section 7 consultation with NMFS has been concluded in accordance with 50 CFR 402.13(a). Based on best available information, NMFS concurred with Reclamation's finding that the project is not likely to adversely affect ESA-listed species under the jurisdiction of NMFS (concurrence letter dated May 6, 2010). Under the FWCA, Reclamation is required to consult with NMFS on projects that propose stream modification. NMFS has no FWCA recommendations for the project regarding conservation of fish and wildlife

6 Copies of all documents are included in Appendix 3.
7 Compensatory mitigation credit information is provided in Appendix 3.

resources because NMFS has found that the project contains adequate measures to protect aquatic habitat.

National Historic Preservation Act Section 106 Consultation – State Historic Preservation Office

Due to federal funding, the NBWRP is required to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 requires federal agencies to take into account effects on historic properties. NBWRA prepared Area of Potential Effects (APE) maps and a Cultural Resources Survey Report (CRSR; Koenig and Brewster, 2011) that includes the results of background research and surface survey. Reclamation required NWBRA Member Agencies to complete Extended Phase I (XPI) subsurface cultural resources investigations in all of the NBWRP Service Areas, including in the Novato Central Service Area, in order to more accurately determine whether subsurface, or otherwise obscured, portions of several archaeological sites were located within the NBWRP APE. Results of the XPI indicated that there were no archaeological sites in the NBWRP APE. Section 106 consultation with the State Historic Preservation Officer (SHPO) was completed on March 21, 2011. The SHPO issued a letter of concurrence with Reclamation's finding of no adverse effect to historic properties.

For the Proposed Action, ESA prepared an Addendum CRSR (Koenig, 2015a) to support Reclamation's review of the proposed NBWRP Novato Central Service Area Addendum. The Addendum CRSR includes: 1) a statement of the integration of the Proposed Action APE to the greater NBWRP; 2) revised APE maps; 3) results of the updated records search at the Northwest Information Center; 4) methods and results of the surface survey; 5) an updated geoarchaeological analysis; and 6) recommendations for an XPI subsurface survey at two locations in the Proposed Action APE.

ESA completed an XPI subsurface survey to determine whether nearby archaeological resources extend into the APE (Koenig, 2015b). In summary, no archaeological resources or other evidence of past human use and occupation was identified during the surface and subsurface survey efforts. The Proposed Action would have no adverse effect to historic properties.

SECTION 2
Proposed Action

The process of finalizing the design of the Proposed Action has resulted in changes to the proposed extension of the recycled water pipeline distribution system to serve the Vintage Oaks shopping center and urban users west of Highway 101. An overview of the proposed modifications is shown in **Figure 2-1**. These facilities are described in detail below.

2.1 Description of Modified Action

As identified in the NBWRP EIR/EIS, the Proposed Action would consist of a recycled water distribution system from the Novato Sanitation District (Novato SD) Davidson Wastewater Treatment Plant (WWTP) to serve the Vintage Oaks shopping center, and across Highway 101 to serve urban users west of Highway 101. However, the process of finalizing the design of the Proposed Action has resulted in minor changes to the approved Phase 1 pipeline distribution system alignment. The approved Phase 1 project alignment is shown in Figure 1-1. The proposed changes are summarized below and shown in Figure 2-1, compared to the approved alignments identified in the NBWRP EIR/EIS.

1. **Modification 1: Re-route pipeline from Novato Sanitary District Recycled Water Facility to the Vintage Oaks shopping center.** The original pipeline route that extends from Davidson Street along the railroad to serve the Vintage Oaks shopping center would be re-routed. Under the Proposed Action, a new 18-inch diameter pipeline would be installed (via open cut trench) in Novato SD's existing utility easement within Davidson Street from the Novato SD WWTP to the intersection with Louis Drive. The pipeline would extend along Louis Drive, through the field at Slade Park, and under the Sonoma Marin Area Rapid Transit (SMART) railroad ROW (via jack and bore or horizontal directional drill, discussed below) to Franklin Street (paved path). Approximately 1.000 feet of pipe would be installed within the paved trail on Franklin Street, south to the Novato Community Hospital property. The pipeline would extend at a right angle from Franklin through the Novato Community Hospital parking lot to the cul-de-sac of Rowland Way. The pipeline would be installed within the paved right-of way on Rowland Way (including the crossing at Novato Creek, discussed below) to a connection point/turn out at Vintage Way to serve the Vintage Oaks shopping center.

2. **Modification 2: Highway 101 Crossing.** As included in the NWBRP EIR/EIS, the pipeline alignment would require a crossing at Highway 101 from Vintage Way (to Redwood Boulevard) to serve customers west of Highway 101. Based on updated survey information, an appropriate crossing location has been identified as shown on Figure 2-1. The modified pipeline would be horizontal directional drilled under Highway 101 from

Redwood Boulevard (nearest address is 1 Corinthian Court) to Vintage Way (nearest street address is 216 Vintage Way).

3. **Modification 3: Extend distribution pipeline to connect to an existing surplus tank and serve existing customers on Ignacio Boulevard.** Consistent with the approved NBWRP EIR/EIS, the pipeline would be installed north from the Highway 101 crossing on Redwood Boulevard to Rowland Boulevard, and then west to South Novato Boulevard to serve Lynwood School. South from the Highway 101 crossing at Redwood Boulevard, the pipeline would be installed within the paved roadway right of way to the NMWD easement in an existing paved path (nearest address 1158 Redwood Boulevard) that connects to Briarwood Court and continues on Redwood Boulevard to South Novato Boulevard.

   The distribution system would be modified to consist of a 12-inch diameter recycled trunk line extension at South Novato Boulevard east to the Highway 101 vehicle on-ramp to the western entrance of the Caltrans bike path (along the west side of Highway 101) and continue within the Caltrans bike path ROW south to Entrada Drive through Inn Marin property (parking lot) to Ignacio Boulevard. The pipeline would be installed within the paved roadway ROW on Ignacio Boulevard and terminate 300 feet east of the intersection at Country Club Drive (near Laurelwood Drive). A spur would also extend from Entrada Drive to the existing NMWD Norman Tank. This distribution system would use the District's existing 500,000-gallon Norman Tank for storage.

4. **Modification 4: Eliminate the 18-inch recycled trunk line to serve Novato High School.** Consistent with the approved NBWRP EIR/EIS, recycled water distribution would be constructed within the Central Service Area along Redwood Boulevard near Scottsdale Pond and south to Novato Boulevard. However, the original pipeline route approved under the NBWRP EIR/EIS that would provide service to Novato High School, which consisted of pipeline extension from Rowland Boulevard, from South Novato Boulevard to Cambridge Street, to Arthur Street, and Hill Road (including a creek crossing at Arroyo Avichi), would not be constructed. The modified recycled water line would terminate at the intersection of Rowland Boulevard and Novato Boulevard.

A comparison of project pipeline locations and lengths is provided in **Table 2-1**, which demonstrates that the proposed modifications are commensurate with the originally approved components.

TABLE 2-1
COMPARISON OF PIPELINE LENGTHS UNDER THE APPROVED NBWRP PROJECT VERSUS THE PROPOSED ACTION

Project Component	Length (miles / linear feet)
Approved NBWRP EIR/EIS pipeline – Total	5.61 miles / 29,634 ft
Proposed Central Service Area Modification – Total	5.56 miles / 29,384 ft
Approved NBWRP EIR/EIS Pipeline – Excluded Under Modified Project	2.51 miles / 13,265 ft
Proposed New Pipeline Under Modified Project	2.55 miles / 13,465 ft

SOURCE: Nute Engineering, 2014; North Marin Water District, 2015

NMWD Recycled Water Expansion Project Central Service Area . 206088.04

Figure 2-1

Proposed (Modified) Novato Central Service Area Project

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2.2 Construction

Construction, staging, and post-construction site restoration for recycled water pipeline would be consistent with the methodology presented in the approved NBWRP EIR/EIS. Construction of the Proposed Action would involve earth work, structural placement and backfilling and may include the following types of heavy equipment typical of this type of construction: grader, crane, loader, excavator, dump truck, water truck, concrete truck, generator set, paving equipment, and pickup trucks. The construction contractor would determine the specific construction equipment and vehicles to be used. Construction traffic routing would be subject to approval by the City of Novato. Construction of the Proposed Action is estimated to take 10 months and is expected to begin in March 2016. The Proposed Action would be implemented under two construction contracts – one for the pipeline east of Highway 101, and one for the pipeline west of Highway 101—that would be concurrent. Construction activities would occur from Monday through Friday[8] from 7:00 a.m. to 6:00 p.m., consistent with the City of Novato Municipal Code, with a workforce of approximately five to ten workers per contract.

2.2.1 Construction Techniques

Construction techniques would include both trenchless and open cut trench techniques. **Table 2-2** provides a list of construction techniques and locations at which they will take place; each technique is also summarized in the following section.

TABLE 2-2
CONSTRUCTION TECHNIQUES FOR PIPELINE INSTALLATION

Construction Technique	Locations
Horizontal directional drilling (HDD) (Trenchless)	Highway 101 crossing; SMART railroad ROW crossing;
Bridge Suspension (Trenchless)	Novato Creek Crossing at Rowland Way
Pipe Bursting (Trenchless) or HDD	Ignacio Boulevard between Entrada Drive and Laurelwood Drive
Open cut trench / or HDD	Culverts and creek crossings; existing paved roadway ROWs (Davidson Street, Louis Drive, Franklin Street, Rowland Way, Vintage Way, Redwood Boulevard, Rowland Boulevard, South Novato Boulevard, Entrada Drive, Ignacio Boulevard); portion of Slade Park.

Open Cut Trenching

Construction of the recycled water pipeline would involve open cut trenching, primarily within the existing paved roadway right-of way (Davidson Street, Louis Drive, Franklin Street, Rowland Way, Vintage Way, Redwood Boulevard, Rowland Boulevard, South Novato Boulevard, Entrada Drive, Ignacio Boulevard). Construction may require some activity outside the paved ROW for truck and equipment turn around, staging and laydown, and spoils sidecasting. The Proposed Action would also include open cut trenching through a portion of Slade Park. Interruptions to existing utilities such as sewer lines or other pipelines would be minimized to the extent feasible

[8] Nighttime and weekend construction is not anticipated for project construction.

through advance Underground Services Alert survey and potholing. In some areas, recycled water pipeline construction would require lane closures along roadways. To avoid lane closure to the fullest extent possible, a construction corridor of approximately 25 feet will be used.[9] Sufficient space would be available to allow the contractor to store the excavated soil to the side of the trench or load onto dump trucks for off-haul, install the pipe. The trench would be backfilled with imported material. Excess spoils would be off-hauled and disposed of at the Redwood landfill. Pipes would be staged along the alignment in advance of the recycled water pipeline installation.

The estimated trench width for a 12-inch-diameter recycled water pipeline would be approximately 30 inches and estimated trench depth would be approximately 64 inches. Open trench construction would occur at a rate of approximately 100 to 200 feet per day. During construction, vertical wall trenches would be temporarily closed at the end of each work day, either by covering with steel trench plates, backfill material, or installing barricades to restrict access depending on physical conditions and conditions of the encroachment permit (along roadways). If the area is paved prior to construction, a temporary patch or covering would be used until final repaving of the affected area occurs. Final paving would occur approximately two to six weeks after recycled water pipeline construction is complete within a given road segment.

The Proposed Action would also require crossing numerous culverts and drainage facilities. Existing culverts and drainage facilities crossing the roads will be done using conventional cut and cover construction techniques, but will be constructed during the dry season.

Trenchless Construction

Horizontal Directional Drilling

Horizontal directional drilling (HDD) is the trenchless construction method that would be used for installing underground pipelines without disturbing the ground surface. HDD would be required at the Highway 101 crossing and at the SMART railroad ROW.[10] This construction alternative may also apply at certain in-road locations to minimize surface disturbance. Using a horizontal drill rig, the pipeline is installed in two stages: (1) a small diameter pilot hole is directionally drilled along a designed directional path, and (2) the pilot hole is then enlarged to a diameter that would accommodate the pipeline and the pipeline would be pulled back through the enlarged hole. Slurry, typically bentonite (an inert clay), is used as a drilling lubricant and processed by separating solids from the slurry and discharging the clear liquid to waterways or storm drains. Any unused excavated soils would be hauled off site.

The pipeline under Highway 101 would consist of a 375-linear foot 18-inch diameter PVC pipe with 24- to 28-inch-diameter casing. The route will have a vertical radius of approximately 400 to 500 feet. This will result in a depth under Highway 101 of approximately 20 feet at the center of the highway. The sections of the casing and carrier pipes will be fused together on site prior to installation and laid along the roadway. At the completion of installation of the casing pipe, the

9 With the exception of construction within the Caltrans bike path, which is narrower.

10 In the event that geotechnical investigation or additional engineering design indicate that HDD is not feasible for these crossings, jack and bore would be an alternative trenchless construction method.

carrier pipe will be pulled through the casing. A drilling rig, a medium size excavator and other support vehicles (dump and a pickup truck) will be used at the time of boring operations. Areas of approximately 50’ x 35’ at each end of the boring will be required for set up and operations. The total time for pipe fusing and boring operations is approximately two weeks.

The pipeline under the SMART railroad ROW would consist of approximate 60-linear foot 18-inch diameter pipeline with casing. The sections of the casing and carrier pipes will be fused together on site prior to installation and laid along the roadway. At the completion of installation of the casing pipe, the carrier pipe will be pulled through the casing. A drilling rig, a medium size excavator and other support vehicles (dump and a pickup truck) will be used at the time of boring operations.

Bridge Suspension

As discussed in the NBWRP EIR/EIS, pipelines would be installed via trenchless technology (HDD, jack and bore, or bridge suspension) at major creek crossings. For the Proposed Action, pipeline suspension is the preferred construction alternative for recycled water pipeline installation at the Novato Creek crossing. Pipeline construction at this location would be installed in the structural supports underneath or on the sides of the bridge (Rowland Way). The duration of construction of this phase would be approximately three weeks. The pipe would extend off of the existing bridge wing-walls and would not require work within the riparian corridor or streambanks. No excavation would be required.

2.2.2 Staging

At various locations within the construction zones, staging areas would be required to store pipe, construction equipment, and other construction related items. Staging areas would be established in areas near construction zones that are open and easily accessed (e.g., vacant lots). Contractors are expected to negotiate short-term temporary easements for staging areas. The locations of the staging areas would be determined by the contractor and typically are located along the pipeline alignment. Potential staging areas along the pipeline alignment could occur adjacent to the proposed alignment or on a nearby vacant parcel. Generally the staging areas would be located in previously disturbed or non-vegetated areas with protection barriers to adjacent sensitive areas. The maximum size of these staging areas would be less than one acre. Additional minor staging areas could be located within the 25-foot construction corridor along the pipeline alignment. Staging areas would avoid wetlands and riparian areas. NMWD’s construction contractor will be responsible for securing appropriate staging areas; potential locations include a vacant gravel area south of the Costco store, north of Hanna Ranch, and a parking lot adjacent to Inn Marin and Entrada Drive.

2.2.3 Surface Restoration

The final phase of pipeline construction would be surface restoration. Final repaving would be performed either after the entire pipe construction is complete or after segments of pipe construction are complete. Unpaved surfaces would be restored to pre-project grade and hydroseeded with a seed mix native to Marin County, as appropriate.

2.3 Operation

2.3.1 Pre-operation System Testing

Dewatering of the pipeline as a result of hydrostatic testing during construction, as well as any dewatering as a result of operations and maintenance activities, will be discharged to land and not into any creeks, drainages, vernal pools or waterways that would require prior approval from the San Francisco Bay Regional Water Quality Control Board.

2.3.2 Recycled Water Service

The primary customers within the Central Service Area would be Vintage Oaks, Lynwood School, Homeowners Associations on the west side of Highway 101, and customers along Ignacio Boulevard, including the Marin Country (MCC), in addition to other smaller secondary users. The proposed project modifications are intended to provide additional needed storage and also provide service to existing customers along Ignacio Boulevard, including the MCC. Under the Master Recycling Permit for each Member Agency and Cooperating Agency, user agreements would include provisions for compliance with Title 22 and the State Recycled Water Policy (SWRCB, 2009) regarding storage and use of recycled water onsite at individual properties. At the MCC, irrigation for the 58 acre eighteen-hole golf course is currently supplied by a combination of MCC's own sources and potable water from NMWD. MCC's local source, includes a well and a significant amount of runoff and spring water which is captured in MCC's six storage ponds along Arroyo San Jose. MCC uses potable water purchased from NMWD as a supply during late summer/early fall months. Under the Proposed Action, NMWD would provide recycled water via the proposed 12-inch diameter pipe that would connect to the MCC irrigation pumps. MCC would irrigate directly through the connection with the NMWD system at this time. If MCC uses recycled water for onstream storage, this action would be subject to Title 22 regulation by SWRCB.

2.4 Alternatives

In 2014, a feasibility study was conducted to develop and compare engineering constraints, opportunities, and costs of potential pipeline routes to extend recycled water services to the MCC (Nute Engineering, 2014). The study considered four potential pipeline routes and associated infrastructure (storage, pumping, existing infrastructure). Ultimately, the proposed modified alignment (Alternative C), as described above, was identified as the preferred alternative because it would include a gravity connection which would not require additional pumping and could be served by the existing Zone 1 pressure zone within the Central Service area. Based on preliminary environmental review of the four alternatives, the Proposed Action requires a shorter (linear feet) pipeline, includes critical storage capacity expansion, may potentially utilize existing recycled water infrastructure, and does not require construction at additional stream crossings, which would reduce the level of potential construction related-environmental effects compared to other alternatives.

SECTION 3
Environmental Analysis

The analysis and discussion in this chapter is intended to supplement the environmental analysis provided in the approved NBWRP EIR/EIS by addressing potential effects associated with the implementation of facilities under the Proposed Action, as described in Chapter 2 of this EA/Addendum. The following information is taken from the approved NBWRP EIR/EIS, and updated as appropriate. Applicable NBWRP EIR/EIS mitigation measures are incorporated into the Proposed Action. These measures will continue to apply to the project as part of the Mitigation Monitoring and Reporting Plan (MMRP). Relevant measures are reiterated in their respective resource discussions. Mitigation measures are formatted for implementation by the appropriate NBWRA Member Agencies; in this case NMWD, would be responsible for implementing the mitigation measures.

3.1 Geology and Soils

Section 3.1 of the NBWRP EIR/EIS described the geologic, seismic, and soil conditions within the NBWRP Phase 1 project area, and identified potentially adverse effects including susceptibility of the project facilities to seismic effects, subsidence, or liquefaction, the presence of expansive soils in the project area, and erosion due to project construction. Although the modified transmission and distribution pipelines would include a different alignment from Novato SD's Davidson WWTP, the alignment would be located within the same proximity to active fault zones, and overlay similar soil and geologic features as those described relative to the NBWRP Phase 1 project; therefore, potential effects associated with surface fault rupture, landslides, lateral spreading, and liquefaction would be consistent with those described in the EIR/EIS' structural design measures for facilities near fault crossings would reduce potential adverse effects to Proposed Action-related infrastructure, as required under **Mitigation Measure 3.1.1**. In addition, consistent with the Phase 1 alignment analyzed in the EIR/EIS, the relatively flat topography within the Proposed Project area would make the earthquake-induced landslide potential very low. According to Association of Bay Area Governments (ABAG), the ground shaking potential is moderate to high (ABAG, 2015). In general the higher potential for ground shaking is found east of U.S. 101 and the moderate potential is west of U.S. 101.

Construction of the pipelines would primarily use open-trench and/or trenchless techniques, which would involve excavation and stockpiling of soils. Installation of the proposed pipelines would predominantly occur along existing roadways and additional storage and pumping capacities would occur within or adjacent to the existing WWTP facilities. Soils along these roadways do not contain native topsoils and are comprised of engineered fill associated with the

construction of the roadway. Best Management Practices (BMPs) would be implemented, including erosion control measures such as covering stockpiles, use of straw bales, silt fences, etc. that would minimize the potential for erosion and loss of topsoils. As required by EIR/EIS **Mitigation Measure 3.1.2**, the NMND would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) that would include BMPs that are designed to minimize the potential for erosion and sedimentation of stormwater runoff. Implementation of these BMPs, as required by **Mitigation Measure 3.1.2**, would reduce adverse effects with regards to the potential for erosion and loss of topsoil.

The proposed facilities would cross a range of geologic materials that have varying geotechnical engineering properties. As described in the EIR/EIS, the Soil Survey for Marin County identifies five soil map units across the action area, which include: the Bonnydoon gravelly loam (15 to 30-percent slopes), Reyes clay (0 to 2-percent slopes), Saurin-Bonnydoon complex (2 to 15-percent slopes), Xerorthents (fill), and Xerorthents-Urban land complex (0 to 9-percent slopes). These soil units occur on slopes ranging between 0 and 30-percent. In general, the soil resource base has varying hazards of erosion from water and varying potential for shrink-swell behavior. The Novato SD service area is located along the northwestern shore of San Pablo Bay. Just north of the service area is where the Petaluma River flows into the Bay. Most of the area lies within low lying marine and marsh deposits (Blake *et al.*, 2000).

In general, the proposed facilities are not located in areas that are susceptible to landslides. As discussed above, the majority of improvements would be located along existing roadways that have been previously graded or are in relatively flat locations. However, placement of additional loads to these soils, if not engineered appropriately, could result in subsidence or settlement that can damage structures and appurtenances. As discussed in the NBWRP EIR/EIS, the Proposed Action will conform with the California Building Code (CBC), which has been updated since publication of the EIR/EIS; the Proposed Action will be subject to the 2013 CBC.

Effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects related to geology and soils would be consistent with those identified in the NBWRP EIR/EIS.

3.1.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.1.1: NMWD will implement the following measures:

1. All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria, including the California Building Code (CBC) and American Waterworks Association (AWWA) criteria.

2. The project construction materials and backfill materials will be designed according to a geotechnical investigation by a California-licensed geotechnical engineer or engineering geologist to address landslide, subsidence, liquefaction, and expansive soils and seismic hazards such as ground shaking and liquefaction.

3. Implementation of industry standard geotechnical measures such as replacing excavated soils with engineered fill materials are effective means to overcome the potential for subsidence. If excavated soils are to be reused for backfill, they would still be appropriately compacted to mitigate the potential for subsidence or settlement and evaluated for expansion and amended, if necessary, to reduce the potential for expansion in accordance with accepted geotechnical practices.

4. Proposed facilities will be designed to include flexible connections, where deemed necessary, along with backfill requirements that minimize the potential for significant damage. All other associated improvements will employ standard design and construction using the most recent geotechnical practices and California Building Code (CBC) seismic criteria, which would provide conservative design criteria.

Mitigation Measure 3.1.2: NMWD will implement the following measures:

1. Consistent with SWPPP requirements, the construction contractor shall be required to implement BMPs for erosion control onsite. The use of construction BMPs will minimize the potential for erosion and loss of topsoil, and shall include, without limitation, the following:

   - Avoid scheduling construction activities during a rain event, but be prepared for sudden changes in conditions;
   - Construct berms, silt fences, straw bales, fiber rolls, and/or sand bags around stockpiled soils;
   - Cover stockpiled soils during a rain event and monitor perimeter barriers, repair as necessary;
   - Stabilize entrances to work area to prevent tracking of dirt or mud onto roadways; and
   - Implement dust control practices as appropriate on all stockpiled material.[11]

3.2 Surface Hydrology

Section 3.2 of the NBWRP EIR/EIS identified potentially adverse effects to surface hydrology, including changes to drainage patterns, increased stormwater runoff due to increased impervious surfaces, and effects to facilities associated with sea level rise. Adverse effects associated with the Proposed Action would be generally consistent with adverse effects identified in the NBWRP EIR/EIS, as the pipeline length and general geographic location is consistent compared to the Phase 1 project previously examined. However, the number of stream crossings has been reduced to exclude the Arroyo Avichi crossing under the Proposed Action. Potential effects related to surface hydrology would be reduced through implementation of EIR/EIS Mitigation Measures identified in the NBWRP EIR/EIS.

[11] Common dust control measures include watering exposed/unpaved surfaces, covering spoils and topsoil stockpiles with tarp, covering haul truck loads with tarps, reducing vehicle speeds on unpaved access routes. Appropriate best management practices will be determined based on project site-specific conditions.

As stated in the EIR/EIS, NMWD pipelines would generally be constructed within roadways, ROWs, and would involve open-cut trenching. However, such activities would be temporary and limited to areas of active construction within the construction corridor. The excavated areas would be returned to the pre-construction condition; therefore adverse effects to existing drainage patterns would not occur.

As discussed in the NBWRP EIR/EIS, construction of the project facilities particularly pipelines could affect the drainage patterns at stream crossings. However, pipelines would be installed via trenchless technology (HDD, jack and bore, or bridge suspension) at the major creek crossings, and one crossing would be excluded under the Proposed Action. Since publication of the NBWRP EIR/EIS, pipeline suspension has been identified as the preferred construction alternative for pipeline installation at the Novato Creek crossing under the Proposed Action which would avoid the riparian corridor and streambanks; no excavation would be required at this stream crossing. Additionally, EIR/EIS **Mitigation Measure 3.2.1**, which incorporates measures to protect streams from construction activities, would be implemented.

As stated in the NBWRP EIR/EIS, the Phase 1 project would not affect drainage and surface water runoff because pipelines would be located underground and would not increase impervious surface areas. In addition, the Proposed Action would not change existing drainage patterns. Post project conditions would be integrated with existing drainage systems that would be designed to avoid or further minimize effects to downstream areas and infrastructure. Implementation of EIR/EIS **Mitigation Measure 3.2.3** would ensure that adverse effects associated with stormwater run-off would not occur.

Consistent with the EIR/EIS, the Proposed Action will conform with the San Francisco Bay Area Regional Water Quality Control Board's Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), which has been amended since publication of the EIR/EIS; the Proposed Action would be subject to the Basin Plan, as amended in 2014).

Implementation of the Proposed Action would result in construction of facilities, including the modified pipeline between Novato SD's WWTP to the MCC, within the 100-year flood plain (FEMA, 2009) as shown in **Figure 3-1**. Under the Proposed Action, new facilities within 100-year flood plains would be limited to pipelines at drainages located close to the edge of the 100-year flood plain. Placement of structures within or near the mapped 100-year flood plain would have the potential to expose structures to periodic flooding and water damage.

The original sea-level rise analysis provided in the NBWRP EIR/EIS encompassed all geographic portions of the Proposed Action. Since publication of the NBRWP EIR/EIS, updated sea level rise projection data has been developed. Updated data confirms that, as previously disclosed, due to the topography, elevation, and proximity to San Pablo Bay, all areas within the Proposed Action would be at risk of potential effect as a result of a one meter sea level rise. However, pipelines would be installed underground and would not be directly susceptible to damage from sea level rise. With implementation of EIR/EIS **Mitigation Measure 3.2.4**, no adverse effects associated with sea level rise would occur.

SOURCE: Nute Engineering, 2014; North Marin Water District, 2015; FEMA

NMWD Recycled Water Expansion Project Central Service Area . 206088.04

Figure 3-1

Flood Zones in the Project Area

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Effects of the Proposed Action would not result in any new effects beyond those previously identified in the EIR/EIS, or increase the severity of effects identified. Implementation of the adopted EIR/EIS Mitigation Measures identified in the EIR/EIS and listed below would ensure that no adverse effects would occur. As such, the surface hydrology effects would be consistent with those identified in the EIR/EIS.

3.2.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.2.1: NMWD would implement the following measure during pipeline installation at stream crossings:

1. Schedule construction so as to avoid storm events to the extent feasible;
2. Use trenchless techniques such as jack and bore tunneling to avoid direct impacts to the streams;
3. Employ short-term drainage diversion and control measures such as sandbags, dikes, pumps, or other means; and
4. Following construction, restore the construction area to pre-existing conditions
5. Implement Mitigation Measure 3.5.1 (see Section 3.5).

Mitigation Measure 3.2.3: NMWD will implement the following measures:

1. Comply with the local storm drainage requirements;
2. Incorporate site design features to control any site runoff onsite; and
3. Install storm runoff, collection, and treatment system, as applicable, to control the runoff flow offsite.

Mitigation Measure 3.2.4: Design of proposed facilities shall consider sea level rise potential, and shall include appropriate measures in facility siting and design to address potential impacts related to sea level rise, similar to those applied to facility installation within 100-year flood plains. Design measures may include, but are not limited to: facility siting, access placement, access vault extension above projected water elevation, water tight vaults, and site protection.

3.3 Groundwater

Section 3.3 of the NBWRP EIR/EIS analyzed existing conditions and identified beneficial effects to long-term groundwater levels. The analysis identified no substantial adverse effects related to hydrostatic pressure on individual facilities, groundwater quality, flooding due to high groundwater levels, public health effects associated with groundwater wells, or reduced groundwater recharge due to impervious surfaces. Effects associated with the Proposed Action would be consistent with those identified in the NBWRP EIR/EIS, as the general geographic location and construction and

operation of facilities are consistent compared to the Phase 1 project previously examined. It is expected that most recycled water would be used in areas that are currently experiencing declining groundwater levels. The quantity of recycled water used to offset groundwater in these areas is not expected to substantially raise groundwater levels or cause localized flooding. Therefore, adverse effects to groundwater levels would not occur.

As described in the EIR/EIS, recycled water used in urban areas would be for landscape irrigation. Recycled water use in agricultural areas would be to irrigate vineyards, with smaller quantities used for landscaping, dairy pasture, and irrigation of farmlands. Use of this small quantity of water and percolation is not expected to affect groundwater quality. Any recycled water that percolates into the groundwater aquifer would be of a small quantity and would be naturally filtered during percolation through the soils. Adherence to Title 22 standards would ensure no recycled water is used within 50 feet of a domestic well. Therefore, adverse effects to groundwater quality from the use and storage of recycled water would not occur. Effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, groundwater effects would be consistent with those identified in the NBWRP EIR/EIS.

3.3.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.3.1: NMWD will implement the following measures:

1. All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria.

2. Implement industry standard geotechnical measures to address high groundwater conditions as appropriate to reduce the potential for impacts related to groundwater fluctuation, in accordance with accepted geotechnical practices. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios.

3.4 Water Quality

Section 3.4 of the NBWRP EIR/EIS analyzed existing conditions, regulatory framework, and effects to water quality, including incidental runoff of recycled water. The NBWRP EIR/EIS identified potential effects to water quality, including erosion and sedimentation, dewatering of shallow groundwater resources, and effects to water quality due to incidental runoff, storage facilities, and pipeline rupture. The NBWRP EIR/EIS also identified that the Phase 1 project may have potential effects to public health and agricultural uses associated with loading of specific constituents to groundwater.

Effects associated with the Proposed Action would be consistent with effects identified in the NBWRP EIR/EIS; the pipeline route modifications would not change any of the previous conclusions or result in new or more severe effects. Implementation of the Proposed Action would require earthmoving activities such as excavation, and backfilling that could result in increased erosion and discharge of sediment to neighboring surface water bodies through the disturbance of currently stable soils. One stream crossing has been eliminated from the Proposed Action, resulting in a total of six stream crossings. As such, no additional soil erosion and subsequent discharge of sediment to surface water or drainages beyond that disclosed in the NBWRP EIR/EIS would be anticipated. As identified in the EIR/EIS, pipelines would be installed at stream crossings using trenchless technology to avoid effects to surface water features and water quality. In the event that trenchless technology is not feasible, for example, at in-road culverts, trenching would be restricted to dry season conditions. Construction activities would be subject to the SWPPP and other stormwater control requirements. Implementation of BMPs to minimize effects to surface water quality, as established in **Mitigation Measure 3.4.1a**, would ensure that adverse effects to surface water features do not occur.

Although there are no additional stream crossings under the Proposed Action, all construction projects that disturb one or more acres of soil may be subject to a National Pollutant Discharge Elimination System (NPDES) Construction Activity Stormwater Permit, administered by SWRCB. NMWD would require preparation of a SWPPP requiring implementation of BMPs for erosion and sediment control. These include the use of straw waddles, silt fencing, and other control measures that would limit construction-related stormwater runoff. Because these measures would reduce the erosion of soils and release of hazardous materials into water courses, facility construction would not violate water quality standards for construction activities. Implementation of NBWRP EIR/EIS **Mitigation Measure 3.4.1a**, which includes preparation of the SWPPP and compliance with implementation and reporting measures identified in the SWPPP, would ensure compliance with state regulatory policies to minimize the potential for construction activities to have an adverse effects on stormwater quality.

Consistent with the discussion in the NBWRP EIR/EIS, recycled water produced and transported by the Proposed Action would comply with California Code of Regulations (CCR) Title 22 requirements for tertiary treated water, which prohibits over-irrigation that would cause ponding or surface runoff (NBWRP EIR/EIS **Mitigation Measure 3.4.6a**). User agreements between NMWD and customers would include specific provisions regarding use of recycled water for irrigation. In addition, the Proposed Action would include design features and operational procedures described in the EIR/EIS that would reduce the potential for effects to water quality from pipeline ruptures.

Effects of the Proposed Action would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or increase the severity of effects identified above, and implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential effects. As such, water quality effects would be consistent with those identified in the NBWRP EIR/EIS.

3.4.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.4.1a: NPDES Construction Activity Stormwater Permit. NMWD or its contractor shall comply with the provisions of the NPDES Construction Activity Stormwater permit, including preparation of a Notice of Intent to comply with the provisions of this General Permit and preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will identify implementation measures necessary to mitigate potential water quality degradation as a result of construction-related runoff. These measures will include BMPs and other standard pollution prevention actions, such as erosion and sediment control measures, proper control of non-stormwater discharges, and hazardous spill prevention and response. The SWPPP will also include requirements for BMP inspections, monitoring, and maintenance.

The following items are examples of BMPs that would be implemented during construction to avoid causing water quality degradation:

1. Erosion control BMPs, such as use of mulches or hydroseeding to prevent detachment of soil, following guidance presented in the California BMP Handbooks – Construction (CASQA 2003). A detailed site map will be included in the SWPPP outlining specific areas where soil disturbance may occur, and drainage patterns associated with excavation and grading activities. In addition, the SWPPP will provide plans and details for the BMPs to be implemented prior, during, and after construction to prevent erosion of exposed soils and to treat sediments before they are transported offsite.
2. Sediment control BMPs such as silt fencing or detention basins that trap soil particles.
3. Construction staging areas designed so that stormwater runoff during construction will be collected and treated in a detention basin or other appropriate structure.
4. Management of hazardous materials and wastes to prevent spills.
5. Groundwater treatment BMPs such that localized trench dewatering does not impact surface water quality.
6. Vehicle and equipment fueling BMPs such that these activities occur only in designated staging areas with appropriate spill controls.
7. Maintenance checks of equipment and vehicles to prevent spills or leaks of liquids of any kind.

Mitigation Measure 3.4.6a: Under the Master Recycling Permit for each Member Agency and Cooperating Agency, user agreements shall include provisions for compliance with Title 22 and the State Recycled Water Policy regarding storage and use of recycled water at individual properties.

3.5 Biological Resources

Section 3.5 of the NBWRP EIR/EIS analyzed effects to vegetation, wildlife, and wetlands. The NBWRP EIR/EIS identified potential adverse effects to wetlands, streams, riparian habitats, and waters of the U.S., disturbance of special status species and plants, and modification of protected trees. Effects associated with the Proposed Action would be consistent with effects identified in the NBWRP EIR/EIS. Since publication of the original EIR/EIS, no new regulations pertaining to biological resources have been passed. In addition, a query of relevant biological databases did not reveal additional records of special status plants or wildlife not previously covered within the original EIR/EIS (CNDDB, 2015; CNPS, 2015; USFWS, 2015). Potential effects related to biological resources would be reduced through implementation of EIR/EIS Mitigation Measures identified in the NBWRP EIR/EIS.

Habitat within the Action Area

Habitat within the Central Service Area Phase 1 Plan was evaluated by USFWS, NMFS, and CDFW and it was determined that only a small portion of the proposed alignment would be adjacent to potential habitat for sensitive species. A small approximately 300 foot portion of the linear alignment is within a paved footpath/trail at the toe of slope of a hill with non-native grassland and several mature live oak trees (USFWS, 2010). The footpath extends between Redwood Boulevard and Briarwood Court, both residential areas comprised of single family homes and landscaping. Consistent with the approved Phase 1 Action, the remainder of the modified alignment would be constructed primarily within paved roadway rights-of-way. The alignment is within the City of Novato, a developed suburban area. Approximately 200 feet of pipeline would extend from Entrada Drive uphill to the existing Norman Tank through non-native grassland and oak woodland. Habitat for sensitive species is not present; although trees along the alignment could provide breeding habitat for a variety of bird species.

Wetlands and Jurisdictional Waters

As stated in the EIR/EIS, the NBWRP Phase 1 activities could involve temporary and permanent effects to jurisdictional wetlands and other waters of the U.S. Effects to wetlands and jurisdictional waters for the Proposed Action are consistent with those identified in the EIR/EIS. Under the NBWRP Phase 1 project, pipelines would cross two streams and five unnamed tributaries and channels in the Novato SD area. However, the modified alignment under the Proposed Action avoids wetland and riparian areas, and the creek crossing at Arroyo Avichi, therefore effects associated with this crossing would be eliminated, thereby reducing effects to jurisdictional features from those originally described in the EIR/EIS. Implementation of the original EIR/EIS **Mitigation Measure 3.5.1** would further reduce effects to jurisdictional waters from implementation of the Proposed Action.

Special Status Species

The original special status species search and previous fisheries analysis for the Phase 1 project encompass all portions of the modified project area. Consistent with the EIR/EIS, special status

species have the potential to occur in the Novato service area including steelhead, chinook salmon, Pacific lamprey, Sacramento splittail, western pond turtle, Ridgeway's rail, California black rail, raptors, nesting birds, and rare plants. The Proposed Action does not incorporate any new sensitive habitats that would support special status species not previously covered in the original EIR/EIS, or increase adverse effects to these species. Additionally, the elimination of the Arroyo Avichi crossing under the Proposed Action would reduce potential effects to special status fish and aquatic species. Implementation of EIR/EIS **Mitigation Measures 3.5.2**, **3.5.5**, **3.5.9,** and **3.5.13** would further reduce effects to special status species.

As discussed in the original EIR/EIS, steelhead have been documented in upper Novato Creek and have potential to occur in Arroyo Avichi. Chinook salmon, Pacific lamprey, and Sacramento splittail have not been documented in Novato Creek or Arroyo Avichi; however there is historic distribution of these species in the region. Elimination of the Arroyo Avichi creek crossing from the Proposed Action would reduce potential effects to fish and other aquatic species. With no additional stream crossings and elimination of the Arroyo Avichi crossing, effects to special status fish species would be less than previously described in the original EIR/EIS. In addition, potential effects would be reduced through implementation of EIR/EIS **Mitigation Measure 3.5.2.**

Western pond turtles have the potential to occur in freshwater, perennial and ephemeral drainages, and ponds within the Novato SD area. Turtles and their upland breeding sites could additionally be encountered in upland habitats. As discussed in the EIR/EIS (Table 3.5-1), California red-legged frog has not been documented in Novato and effects to this species are not likely to occur. Modification of the recycled water pipeline alignment under the Proposed Action would not increase effects to western pond turtle or California red-legged frog and effects would be consistent with those previously described within the EIR/EIS; implementation of EIR/EIS **Mitigation Measure 3.5.5** would reduce potential effects to western pond turtle and California red-legged frog.

Consistent with the EIR/EIS, special status marsh birds, raptors, and nesting birds may be present within the Proposed Action area and could be affected by construction during nesting season. However, the modification of distribution pipelines in the Novato SD area under the Proposed Action would not increase effects to protected birds, and effects would be consistent with those identified in the EIR/EIS. Implementation of EIR/EIS **Mitigation Measure 3.5.9** would reduce potential effects during the nesting period.

The original special status plant search and analysis in the EIR/EIS encompassed all portions of the Proposed Action area and no special status plants are anticipated in the Novato SD Service Area. Modification of the distribution pipeline routes would not increase the potential for special status plant occurrence or increase the potential for adverse to occur to these species. Further, implementation of EIR/EIS **Mitigation Measure 3.5.13** would reduce effects to special status plant species.

Protected Trees

Consistent with the EIR/EIS, tree removal is not anticipated as a part of the Proposed Action. However, it is possible that trees, some of which may be considered protected under local regulations, may need to be trimmed or removed during construction. Effects to protected trees would be consistent with those previously described in the EIR/EIS and implementation of **Mitigation Measure 3.5.14** would reduce potential effects to trees.

Overall, effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects to biological resources would be consistent with those identified in the NBWRP EIR/EIS.

3.5.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.5.1: Implement the following measures to avoid, minimize and compensate for impacts to jurisdictional wetlands and other waters of the U.S. and impacts to riparian habitat.

Construction activities resulting in the introduction of fill or other disturbance to jurisdictional wetlands and other waters of the U.S. will require permit approval from the U.S. Army Corps of Engineers and water quality certification from the Regional Water Quality Control Board, pursuant to Section 401 of the Clean Water Act. The Proposed Project will most likely be authorized under Nationwide Permit #12 (Utility Lines) pursuant to Section 404 of the Clean Water Act. The CDFW has jurisdiction in the action area over riparian habitat, including stream bed and banks, pursuant to Sections 1600-1616 of the Fish and Game Code. Pipeline construction resulting in alteration to channel bed or banks, extending to the outer dripline of trees forming the riparian corridor, is subject to CDFW jurisdiction. The project proponent will be required to obtain a Streambed Alteration Agreement (SAA) from the CDFW. Terms of these permits and SAA will likely include, but will not necessarily be limited to, the mitigation measures listed below.

1. Specific locations of pipeline segments, storage reservoirs, and pump stations shall be configured, wherever feasible, to avoid and minimize direct and indirect impacts to wetlands and stream drainage channels. Consideration taken in finalizing configuration placement shall include:

    – Reducing number and area of stream channel and wetland crossings where feasible. Crossings shall be oriented as close to perpendicular (90 degree angle) to the drainage or wetland as feasible.

    – Placement of project components as distant as feasible from channels and wetlands.

    – For pipeline construction activities in the vicinity of wetland and stream drainage areas, the construction work area boundaries shall have a minimum 20-foot setback

from jurisdictional features[12]. Pipeline construction activities in proximity to jurisdictional features include: 1) entrance and exit pits for directional drilling and bore and jack operations; and 2) portions of pipeline segments listed as "parallel" to wetland/water features.

2. Sites identified as potential staging areas will be examined by a qualified biologist prior to construction. If potentially jurisdictional features are found that could be impacted by staging activities, the site will not be used.

3. Construction methods for channel crossing shall be designed to avoid and minimize direct and indirect impacts to channels to the greatest extent feasible. Use of trenchless methods including suspension of pipeline from existing bridges, directional drilling, and bore and jack tunneling will be used when feasible. Trenchless methods are required for all perennial drainage crossings. Construction occurring in the vicinity of riparian areas shall be delimited with a minimum 20-foot setback to avoid intrusion of construction activities into sensitive habitat.

   The following additional measures shall apply to channel crossings in which the trenching construction method is used:

   – Limiting of construction activities in drainage channel crossings to low-flow periods: approximately April 15 to October 15.

   – At in-road drainage crossings where drainages pass beneath the road in existing culverts, and where there is sufficient cover between the culvert and road surface, the new pipeline will be installed above the existing culvert without removing or disturbing it. If the pipeline must be installed below the existing culvert, then the culvert will be cut and temporarily removed to allow pipeline installation.

   – At off-road drainage crossings, the construction corridor width will be minimized to the greatest extent feasible at the crossing and at least 20 additional feet to either side of the drainage at the crossing.

   – If disturbance of the existing culvert is required, sediment curtains upstream and downstream of the construction zone shall be placed to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.

4. Implement BMPs required in **Mitigation Measure 3.4.1** to reduce risk of sediment transport into all construction areas in proximity of drainages.

5. For channels or wetlands for which soil removal is necessary (off-road crossings or wetlands to be trenched or otherwise directly disturbed), the top layer of the drainage or wetland bottom shall be stockpiled and preserved during construction. After the pipeline has been installed, the stockpiled material shall be placed back into the drainage or wetland feature to return the beds to approximately their original composition.

6. To offset temporary and permanent impacts to wetlands and other waters of the U.S., and impacts to riparian habitat, compensatory mitigation will be provided as required by regulatory permits and SAAs.

[12] Setbacks of channels with associated riparian vegetation will be from the outer dripline edge of the riparian corridor canopies and/or the upper bank edge, or per City or County code, whichever is greater.

Mitigation Measure 3.5.2: Specific measures shall be implemented to protect aquatic habitats potentially inhabited by special-status fish and California freshwater shrimp.

Sensitive fisheries and other aquatic resources shall be protected by minimizing in-stream and near-stream habitat impacts during project design, informally consulting with resource agencies (NMFS, USFWS, CDFW, and USACOE), and implementing protective measures. For Sonoma Creek, Petaluma River, Napa River, and other perennial drainages, special-status fish are presumed present. California freshwater shrimp are presumed present in Sonoma Creek. Because of the sensitivity of seasonal and ephemeral drainages, the following measures will be required to avoid and minimize impacts to aquatic habitat:

1. Project designs shall be reconfigured, whenever feasible, to avoid direct impacts to sensitive wetland areas and minimize disturbances to wetland and riparian corridors. Ground disturbance and construction footprints in these areas shall be minimized to the greatest degree feasible.

2. If trenching or directional boring stream crossing methods are used, the construction schedule of such activities shall be implemented according to conditions of the SAAs.

3. In-stream construction shall be avoided at all locations that are known, or presumed, to support threatened or endangered species, if at the time of construction such locations contain flowing or standing water.

4. In the event that equipment shall operate in any watercourse with flowing or standing water, the project proponent will ensure that they have the appropriate permit authorizations.

5. Prior to construction, a qualified biologist shall install fencing to establish a minimum 20-foot setback from sensitive habitat.

6. For work sites located adjacent to sensitive aquatic sites, a biological resource education program shall be provided by a qualified biologist, as per conditions of the SAAs.

Mitigation Measure 3.5.5: NMWD shall implement protection measures to avoid and minimize impacts to western pond turtles.

1. When working within 200 feet of stream crossings, all construction personnel shall receive awareness training relating to the protection of western pond turtles, in accordance with the SAAs. Also, to minimize the likelihood of encountering turtles in upland areas near stream crossings, construction footprints shall be minimized to the greatest extent feasible. Based on reconnaissance-level surveys, if staging and construction activities occur principally within or immediately adjacent to project alignment roads the project will be outside of principal pond turtle habitat.

2. Within 48 hours prior to the start of construction activities, a qualified biologist shall perform pond turtle surveys within suitable habitat within projected work areas. If a pond turtle nest is located within a work area, a biologist with the appropriate permits may move the eggs to a suitable facility for incubation, and release hatchlings into the creek system in late fall.

The measures proposed for protection of aquatic species and red-legged frogs (**Mitigation Measures 3.5.2** and **3.5.6**) will additionally protect western pond turtles during construction.

- Protocol-level surveys will be conducted in locations with suitable habitat to determine species presence or absence.
- Agency consultation will be initiated.
- Construction activities will occur during the non-breeding season, September 15 through January 31. The combined breeding season for all three species extends from February 1 through September 14.
- Construction personnel will receive environmental awareness training specific to the identification of clapper rails, black rails, western snowy plover and their habitat.
- Any clapper rail and western snowy plover activity will be immediately reported to the USFWS; black rail activity will be reported to the CDFW.
- Construction activities will be constrained to the smallest area possible to minimize marsh disturbance.

Mitigation Measure 3.5.9: To avoid disturbing common and special-status nesting birds, the following protection measures shall be implemented:

1. Whenever feasible, vegetation shall be removed during the non-breeding season (generally defined as September 1 to January 31).
2. For ground disturbing activities occurring during the breeding season (generally defined as February 1 to August 31), a qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities.
3. If active bird nests are found during preconstruction surveys, a 500-foot no-disturbance buffer will be created around active raptor nests during the breeding season or until it is determined that all young have fledged. A 250-foot buffer zone will be created around the nests of other special-status birds. These buffer zones are consistent with CDFW avoidance guidelines; however, they may be modified in coordination with CDFW based on existing conditions at work locations.
4. If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs that have been determined to be unoccupied by special-status birds or that are located at least 500 feet from active nests may be removed.

Mitigation Measure 3.5.13: Before the initiation of any vegetation removal or ground-disturbing activities in areas that provide suitable habitat for special-status plants, the following measures shall be implemented by NMWD:

1. A qualified botanist will conduct appropriately-timed surveys for special-status plant species, including those identified in Table 3.5.1[13], in all suitable habitats that would be potentially disturbed by the project.

2. Surveys shall be conducted following CDFW- or other approved protocol.

3. If no special-status plants are found during focused surveys, the botanist shall document the findings in a letter to the appropriate agencies and no further mitigation will be required.

   If special-status plants are found during focused surveys, the following measures shall be implemented:

   – Information regarding the special-status plant population shall be reported to the CNDDB.

   – If the populations can be avoided during project implementation, they shall be clearly marked in the field by a qualified botanist and avoided during construction activities. Before ground clearing or ground disturbance, all on-site construction personnel shall be instructed as to the species' presence and the importance of avoiding impacts to this species and its habitat.

   – If special-status plant populations cannot be avoided, consultations with CDFW and/or USFWS would be required. A plan to compensate for the loss of special-status plant species could be required, detailing appropriate replacement ratios, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures that would be implemented if the initial mitigation fails; the plan would be developed in consultation with the appropriate agencies prior to the start of local construction activities.

   – If mitigation is required, the project proponent shall maintain and monitor the mitigation area for 5 years following the completion of construction and restoration activities. Monitoring reports shall be submitted to the resource agencies at the completion of restoration and for 5 years following restoration implementation. Monitoring reports shall include photo-documentation, planting specifications, a site layout map, descriptions of materials used, and justification for any deviations from the mitigation plan.

Mitigation Measure 3.5.14: The following measures shall be implemented by NWWD to avoid or reduce impacts to heritage or other significant trees:

1. Prior to the commencement of construction activities, trees necessary to remove or at risk of being damaged will be identified.

2. A certified arborist will inventory these trees, with the results of the inventory providing species, size (diameter at breast height, or *dbh*), and number of protected trees. Also, in consultation with the appropriate County, the arborist will determine if any are heritage or landmark trees.

[13] Table 3.5-1 included in the original NBWRP EIR/EIS. No special status plants are anticipated in the Novato SD Service Area.

3. If any protected trees are identified that will be potentially removed or damaged by construction of the South Service Area Project, design changes will be implemented where feasible to avoid the impact.

4. Any protected trees that are removed will be replaced per applicable City and County tree protection ordinances. Foliage protectors (cages and tree shelters) will be installed to protect the planted trees from wildlife browse. The planted trees will be monitored as required by the ordinance, or regularly during a minimum two-year establishment period and maintenance during the plant establishment period will include irrigation. After the establishment period, the native tree plantings are typically capable of survival and growth without supplemental irrigation.

3.6 Land Use and Agricultural Resources

Section 3.6 of the NBRWP EIR/EIS analyzed land use and planning effects including short-term disruption from construction activities and long-term conversion of land uses that would apply to the Proposed Action. Effects associated with the Proposed Action would be consistent with effects identified in the NBWRP EIR/EIS, as the construction activities and general geographic location are generally consistent compared to the Phase 1 project previously examined. Potential effects related to land use and agriculture would be reduced through implementation of EIR/EIS Mitigation Measures identified in the NBWRP EIR/EIS.

Under the NBWRP Phase 1 project, proposed pipelines would be installed below the ground surface within the existing ROW along residential and commercial roads. Under the Proposed Action, the pipeline alignment would travel south from the WWTP within Davidson Street, Louis Drive, Franklin Street, Rowland Way, Vintage Way, Redwood Boulevard, Rowland Boulevard, South Novato Boulevard, Entrada Drive, and Ignacio Boulevard. Under the Proposed Action, the modified pipeline alignment would be located within some roadway ROWs not previously identified in the NBWRP EIR/EIS including: a field in Slade Park, the parking lot at Novato Community Hospital, parking lot at Inn Marin, a Caltrans bike path, and a portion of SMART railroad ROW. In addition, the original pipeline route approved under the NBWRP EIR/EIS that would provide service to Novato High School, which consisted of pipeline extension from Rowland Boulevard, from South Novato Boulevard to Cambridge Street, to Arthur Street, and Hill Road (including a creek crossing at Arroyo Avichi), would not be constructed. The modified recycled water pipeline would terminate at the intersection of Rowland Boulevard and Novato Boulevard instead. Further, in the NBWRP EIR/EIS, the distribution pipeline to serve the Homeowners Associations on the west side of Highway 101and the MCC would be installed north from the Highway 101 crossing on Redwood Boulevard to Rowland Boulevard, and then west to South Novato Boulevard to serve Lynwood School, but has been modified to be installed at South Novato Boulevard, east to the Highway 101 vehicle on-ramp to the western entrance of the Caltrans bike path (along the west side of Highway 101) and continue within the Caltrans bike path ROW south to Entrada Drive through Inn Marin property (parking lot) to Ignacio Boulevard.

Regardless of the modifications under the Proposed Action, effects to land uses are consistent with those disclosed in the EIR/EIS. The Proposed Action would include components that would be constructed within developed areas and pipelines would be installed underground within existing roadways or public ROWs, therefore the Proposed Action would not physically divide an existing community. In addition, NMWD has initiated conversations with landowners and local agencies with property within the proposed modified pipeline alignment including the Novato Community Hospital, the City of Novato, Inn Marin, Caltrans and SMART, and would obtain all appropriate easements and comply with local road encroachment permits, as necessary, for the Proposed Action.

Although construction activities could generate noise, dust, and construction traffic and could affect sensitive receptors such as residences and the Novato Community Hospital, the NBWRP as a whole would provide a net beneficial effect by off-setting urban and agricultural demand on potable water supplies, enhancing local and regional ecosystems, improving local and regional water supply reliability, maintaining and protecting public health and safety, promoting sustainable practices, and implementing recycled water facilities in an economically viable manner for the North Bay region.

As described in the NBWRP EIR/EIS, the goals and intent of the Proposed Action align with the intent of the general plan goals and policies related to protecting the environment. As detailed throughout the other sections of Section 3, of this EA/Addendum, most of the environmental effects attributable to the NBWRP would be associated with construction, and no adverse effects would occur with implementation of EIR/EIS mitigation measures. The NBWRP would, on the whole, be consistent with all affected County and City General Plans.

There are no agriculture lands, active farmlands or grazing lands within the modified pipeline alignment as the pipelines would be located entirely within existing roadways and public ROWs; therefore the Proposed Action would have no effect on these resources. Further, the Proposed Action is not subject to the Farmland Protection Policy Act. Effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. As such, the land use effects would be consistent with those identified in the NBWRP EIR/EIS.

3.7 Transportation and Traffic

Section 3.7 of the NBWRP EIR/EIS analyzed traffic and circulation effects associated with the Proposed Action and identified short-term increases in construction-related traffic. As described in the EIR/EIS, the Phase 1 project would not introduce any new land uses within the project corridor that would generate noticeable long-term changes in traffic; operational traffic would be limited to infrequent trips by maintenance personnel and by vehicles delivering chemicals to the treatment plant. Impacts associated with the Proposed Action would be consistent with effects identified in the NBWRP EIR/EIS, as the pipeline length, general geographic location, and construction techniques are consistent compared to the Phase 1 project previously examined.

Under the Proposed Action, the pipeline alignment would be modified; however, it would be located in roadways, use the same construction techniques and would have similar effects as those previously considered under the Phase 1 project. Construction, staging, and post-construction site restoration for recycled water pipeline would be consistent with the methodology presented in the approved NBWRP EIR/EIS. Consistent with the EIR/EIS, construction activities to support implementation of the Proposed Action that would generate off-site traffic during the construction period include the initial delivery of construction vehicles and equipment to the site, the daily arrival and departure of construction workers and material delivery throughout the construction period. Construction traffic would be dispersed throughout the day. Construction-generated traffic would be temporary and would not result in any long-term degradation in operating conditions on any roadways. Construction-generated trips would be consistent with those identified in the NBWRP EIR/EIS and would be short-term, which would not be substantial relative to existing traffic volumes; traffic from construction-generated trips would fall within the daily fluctuations of traffic volumes for these roadways. Therefore, adverse effects on traffic load and capacity of the street system would not occur. Due to their short-term duration, and implementation of EIR/EIS **Mitigation Measures 3.7.1a** through **3.7.1e,** no adverse effects would occur.

As discussed previously in the EIR/EIS normal access for residences, businesses, schools and emergency personnel may be temporarily affected by temporary closures of one lane of traffic (with alternate one-way traffic flow past the construction zone) on along affected roadways and flaggers would control the flow of traffic in partial-closure areas including: Davidson Street, Louis Drive, Franklin Street, Rowland Way, Vintage Way, Redwood Boulevard, Rowland Boulevard, South Novato Boulevard, Entrada Drive, and Ignacio Boulevard. In addition, there are several other roads within the local transportation system that could be used as alternate routes for overflow traffic within construction areas. As described in EIR/EIS **Mitigation Measure 3.7.1a**, a Traffic Management Plan would be prepared to direct how traffic flow is safely maintained during project construction. Additionally, implementation of EIR/EIS **Mitigation Measures 3.7.2a** and **3.7.2b** would require coordination with the appropriate local school district regarding construction schedule in the vicinity of schools and school access routes during construction. Implementation of **Mitigation Measure 3.7.1b** would require the construction contractor to establish methods for maintaining traffic flow in and along the project corridor and minimizing disruption to emergency vehicle access to land uses along the alignment. Specific requirements that may be included in the traffic control/traffic management plan regarding emergency access and access to public schools are identified under **Mitigation Measure 3.7.1b**. Implementation of **Mitigation Measures 3.7.2a, 3.7.2b,** and **3.7.1b** would ensure that potential effects associated with temporary effects on emergency access and access to public schools would be mitigated.

Although the Proposed Action would consist of a modified alignment that would involve different roadways than those identified in the EIR/EIS, it would use the same construction techniques that were previously disclosed; therefore, effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects related to transportation and traffic would be consistent with those identified in the NBWRP EIR/EIS.

3.7.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.7.1a: NMWD shall obtain and comply with local road encroachment permits for roads that are affected by construction activities.

The *Work Area Protection and Traffic Control Manual* includes requirements to ensure safe maintenance of traffic flow through or around the construction work zone, and safe access of police, fire, and other rescue vehicles (CJUTCC, 2006). In addition, the Traffic Management Plan (subject to local jurisdiction review and approval) required by **Mitigation Measure 3.7.1b**, below, would direct how traffic flow is safely maintained during project construction.

Mitigation Measure 3.7.1b: The construction contractor for each project component shall prepare and implement a Traffic Control/Traffic Management Plan subject to approval by the appropriate local jurisdiction prior to construction. The plan shall:

1. Identify hours of construction (between 8:00 AM and 7:00 PM; no construction shall be permitted between 10:00 PM and 7:00 AM)[14];

2. Identify hours for deliveries (Monday – Friday, 9:00 AM to 3:30 PM, or other hours if approved by the appropriate local jurisdiction);

3. Include a discussion of haul routes, limits on the length of open trench, work area delineation, traffic control and flagging;

4. Identify all access and parking restriction, pavement markings and signage requirements (e.g., speed limit, temporary loading zones);

5. Layout a plan for notifications and a process for communication with affected residents and businesses prior to the start of construction. Advance public notification shall include posting of notices and appropriate signage of construction activities. The written notification shall include the construction schedule, the exact location and duration of activities within each street (i.e., which lanes and access point/driveways would be blocked on which days and for how long), and a toll-free telephone number for receiving questions or complaints;

6. Include a plan to coordinate all construction activities with emergency service providers in the area at least one month in advance. Emergency service providers shall be notified of the timing, location, and duration of construction activities. All roads shall remain passable to emergency service vehicles at all times;

7. Include a plan to coordinate all construction activities with the appropriate local school district at least two months in advance. The school district shall be notified of the timing, location, and duration of construction activities. Coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods. The construction contractor for each project component shall be required to maintain vehicle, pedestrian, and school bus service during construction through inclusion of such provisions in the construction contract. The assignment of

[14] As noted in Chapter 3, Proposed Action, the Proposed Action will conform to the local City of Novato noise ordinance limits of 7:00am to 6:00pm.

temporary crossing guards at designated intersections may be needed to enhance pedestrian safety during project construction;

8. Include the requirement that all open trenches be covered with metal plates at the end of each workday to accommodate traffic and access; and

9. Specify the street restoration requirements pursuant to agreements with the local jurisdictions.

Mitigation Measure 3.7.1c: NMWD shall identify all roadway locations where special construction techniques (e.g., horizontal boring, directional drilling or night construction) will be used to minimize impacts to traffic flow.

Mitigation Measure 3.7.1d: NMWD shall develop circulation and detour plans to minimize impact to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone.

Mitigation Measure 3.7.1e: NMWD shall encourage construction crews to park at staging areas to limit lane closures in the public right-of-way.

Mitigation Measure 3.7.1f: NMWD shall consult with the appropriate public transit service providers at least one month prior to construction to coordinate bus stop relocations (as necessary) and to reduce potential interruption of transit service.

Mitigation Measure 3.7.2a: Pipeline construction near schools shall occur when school is not in session (i.e., summer or holiday breaks). If this is not feasible, a minimum of two months prior to project construction, NMWD shall coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods.

Mitigation Measure 3.7.2b: A minimum of two months prior to project construction, NMWD shall coordinate with the appropriate local school district to identify alternatives to their Safe Routes to School program, alternatives for the school busing routes and stop locations, and other circulation provisions, as part of the Traffic Control/Traffic Management Plan (see **Mitigation Measure 3.7.1a**).

3.8 Air Quality

Section 3.8 of the NBWRP EIR/EIS analyzed potential effects to air quality and determined project construction would result in significant but mitigable effects associated with emissions under CEQA from excavation activities, construction equipment exhaust, haul truck trips, and related construction worker commute trips, during installation of the proposed recycled water pipelines. Potential adverse effects associated with the Proposed Action would be consistent with effects identified in the NBWRP EIR/EIS, as the pipeline length, general geographic location, and construction techniques are consistent with those identified in the Phase 1 project. Potential

adverse effects related to air quality would be reduced through implementation of EIR/EIS Mitigation Measures identified in the NBWRP EIR/EIS. Construction equipment and methodology for installation of the recycled water pipelines were previously analyzed in the NBWRP EIR/EIS. The Proposed Action is within the same air basin (the San Francisco Bay Area Air Basin), as previously examined. All proposed construction methods would involve some earth disturbance thereby generating fugitive emissions, however fugitive dust emissions would be greatest during open trenching activities. Exhaust emissions would result from the use of equipment such as graders, cranes, loaders, excavators, dump trucks, water trucks, concrete trucks, generators, paving equipment, and pickup trucks.

Construction of the Proposed Action would involve similar equipment and methodology to construct the modified pipeline compared to the approved 5.56-mile Phase 1 project alignment. However, the Proposed Action would not incrementally increase the construction period compared to the pipeline construction analyzed in the NBWRP EIR/EIS and there would be no additional adverse effects beyond those previously identified in the EIR/EIS. Consistent with the Phase 1 project discussion, construction activities would generate short-term equipment exhaust emissions of criteria pollutants, including suspended and inhalable particulate matter, which could expose sensitive receptors to pollutant concentrations. With regard to CEQA, Phase 1projcet construction activities would need to comply with the Bay Area Air Quality Management District's (BAAQMD's) CEQA requirements for control of fugitive dust emissions. BAAQMD is the regional agency with jurisdiction over the nine-county region located in the San Francisco Bay Area Air Basin (Air Basin) and is responsible for bringing and/or maintaining air quality in the Air Basin within federal and State air quality standards. Specifically, the BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the Basin and to develop and implement strategies to attain the applicable federal and State standards since the BAAAQMD has jurisdiction over the San Francisco Air Basin. EIR/EIS **Mitigation Measure 3.8-1a** includes all applicable fugitive dust control measures that would need to be implemented for Phase 1 construction activities to be deemed less than significant under CEQA review. Additionally, while BAAQMD does not have a set threshold of significance for construction exhaust emissions, it does recommend that construction exhaust emissions are mitigated to the maximum extent feasible.

Implementation of NBWRP EIR/EIS **Mitigation Measure 3.8.1b** would mitigate construction exhaust emissions by enforcing idling restrictions, requiring the use of higher tier engines, and requiring use of other control technologies such as diesel particulate filters.

The emissions that would result under the Proposed Action would be consistent with those identified in the NBWRP EIR/EIS, and would not be expected to individually have a significant effect on global climate change or conflict with the State goals for reducing greenhouse gas emissions. As part of the EIR/EIS analysis, it is determined that the estimated CO_2 emissions (metric tons annually) are significantly under the CARB interim threshold.

3.8.1 Applicability Analysis of Federal General Conformity

To meet the General Conformity rule requirements required by NEPA, an analysis of criteria air pollutants was provided in the NBWRP EIR/EIS. To present the worst-case annual emissions, it was assumed that individual projects within each Member Agency would be constructed concurrently within the same calendar year. As shown in **Table 3-1**, maximum combined annual emissions for construction of Phase 1 projects would not exceed applicable federal de minimus thresholds; therefore, individual projects such as the Proposed Action would not exceed applicable federal de minimums thresholds. The Proposed Action was also analyzed with respect to regional emission levels. Construction emissions of carbon monoxide (CO), nitrogen dioxide (NO_2), and particulate matter less than 2.5 microns in diameter (PM2.5) are estimated to be well under the de minimus threshold levels applicable to the project area. Implementation of the Proposed Action would not generate emissions substantially higher than those identified in the NBWRP EIR/EIS. Therefore, the Proposed Action would continue to be exempt from General Conformity determination requirements and would be in compliance with the National Ambient Air Quality Standards (NAAQS) and the State Implementation Plan. Air quality modeling calculations are provided in Appendix 4.

TABLE 3-1
FEDERAL DEMINIMUS THRESHOLDS RELATIVE TO THE NBWRP PHASE 1 IMPLEMENTATION PLAN

Pollutant	Status (Attainment, Nonattainment or Unclassified)	Threshold of Significance for the Area (if applicable)	NBWRP Phase 1 Total	
			Construction Emissions (Tons/Year)	Operation Emissions (Tons/Year)
Carbon Monoxide (CO)	Attainment	100	8	<8
Ozone (O_3)	Non-Attainment	See Table Notes		
Oxides of Nitrogen (NO_x)	Attainment	100	13	<13
Particulate Matter ($PM_{2.5}$)	Non-Attainment	100	2.4	<1.1
Particulate Matter (PM_{10})	Non-Attainment	150	7	<7
Reactive Organic Gases (ROG)	Attainment	50	2	<2
Sulfur Dioxide (SO_2)	Attainment	n/a	0	0
Volatile Organic Compounds (VOC)	Attainment	See Table Notes		

NOTES:

1 Federal General Conformity criteria thresholds.
2 Project construction emissions estimates were made using URBEMIS 2007 v.9.2.4.
3 Ozone is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone.
4 URBEMIS does not calculate VOCs separately. In absence of federal conformity thresholds and estimates, this analysis assumes that VOCs and ROGs are interchangeable. ROGs and VOCs are subsets of the hydrocarbon family which is made up of compounds containing various combinations of hydrogen and carbon atoms. CARB defines which organic gases constitute ROGs while the USEPA defines which gases constitute VOCs; in general, the two groups include similar compounds. ROG means total organic gases minus CARB's "exempt" compounds; exempt compounds have low photochemical reactivity and therefore do not contribute significantly to ozone formation. Compounds that are exempt from the definition of ROG include, but are not limited to: carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, methane in addition to other low compounds with low reactivity. The term VOC originally made reference to the vapor pressure of compounds; however the current definition relies solely on a list of exempted compounds set by the USEPA.

Effects of the Proposed Action would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects related to air quality would be consistent with those identified in the NBWRP EIR/EIS.

3.8.2 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.8.1a: Construction Fugitive Dust Control Plan. NMWD shall require its contractor(s) to implement a dust control plan that shall include the following dust control procedures during construction as required by the BAAQMD:

1. Water all active construction areas at least twice daily, taking into consideration temperature and wind conditions.
2. Cover all trucks hauling soil, sand, and other loose materials *or* require trucks to maintain at least two feet of freeboard.
3. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on unpaved access roads, parking areas and staging areas at construction sites.
4. Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
5. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
6. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
7. Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
8. Limit traffic speeds on unpaved roads to 15 mph.
9. Install sandbags or other erosion control measures to prevent silt runoff to public roadways, consistent with **Mitigation Measure 3.1.2**, Erosion Control.
10. Replant vegetation in disturbed areas as quickly as possible.

Mitigation Measure 3.8.1b: Construction Exhaust Emissions Control Plan. NMWD shall require its contractor(s) to implement an exhaust emissions control plan that shall include the following controls and practices:

1. On road vehicles with a gross vehicular weight rating of 10,000 pounds or greater shall not idle for longer than five minutes at any location as required by Section 2485 of Title 13, Division 3, Chapter 10, Article 1 of the California Code of Regulations. This restriction does not apply when vehicles remain motionless during traffic or when vehicles are queuing.
2. Off road equipment engines shall not idle for longer than five minutes per Section 2449(d)(3) of Title 13, Division 3, Chapter 9, Article 4.8 of the California Code of Regulations. All

vehicle operators shall receive a written idling policy to inform them of idling restrictions. The policy shall list exceptions to this rule that include the following: idling when queuing; idling to verify that the vehicle is in safe operating condition; idling for testing, servicing, repairing or diagnostic purposes; idling necessary to accomplish work for which the vehicle was designed (such as operating a crane); idling required to bring the machine to operating temperature as specified by the manufacturer; and idling necessary to ensure safe operation of the vehicle.

3. Off road engines greater than 50 horsepower shall, at a minimum, meet Tier 2 emissions standards. When available, higher Tier engines shall be utilized. Additionally, contractor(s) shall comply with current CARB and BAAQMD regulations for off-road engines greater than 50 horsepower.

3.9 Noise

Section 3.9 of the NBRWP EIR/EIS described existing noise levels and applicable regulations and analyzed noise effects of the Proposed Action. As described in the EIR/EIS, temporary construction noise and vibration related to the Proposed Action could affect nearby sensitive receptors. Potentially adverse effects associated with the Proposed Action would be consistent with effects identified in the NBWRP EIR/EIS, as the pipeline length, construction techniques and geographic location are generally consistent with the Phase 1 project. Potential effects related to noise would be reduced through implementation of adopted EIR/EIS Mitigation Measures identified in the NBWRP EIR/EIS.

Under the Proposed Action, roadways and associated residential receptors affected by construction would include portions of Davidson Street, Rowland Way, Redwood Boulevard, Louis Drive, Novato Boulevard, Entrada Drive, and Ignacio Boulevard, as a portion of new pipelines would pass within 50 to 100 feet of these residential receptors. Other sensitive receptors located within 0.25-mile of the alignment that were previously analyzed in the EIR/EIS include the Novato Community Hospital, Noah's Ark Preschool, New Life Christian Center, Scottsdale Pond Park, Lynwood Hill Park and Slade Park. In addition, under the Proposed Action, the following sensitive receptors would be located within 0.25-mile of the proposed pipeline: Lynwood Elementary School; Loma Verde Elementary School; Marin Christian Academy; Saint Anthony's Catholic Church; Nativity of Christ Greek Orthodox Church; and Lynwood Park. Effects to Slade Park and Novato Community Hospital were previously analyzed under the EIR/EIS, as the approved NBWRP pipeline would be located adjacent to these resources; however the Proposed Action would now go through the turf field at Slade Park (approximately 100 feet from the play area) and would be located within the parking lot of the Novato Community Hospital property (approximately 40 feet from the parking area behind the hospital and 100 feet from the main hospital building and primary care offices). As discussed in the NBWRP EIR/EIS, construction equipment could generate a substantial increase in noise levels. Pipeline construction noise levels at 50 to 100 feet can be expected to be up to approximately 101 and 93.5 dBA respectively, assuming that jack and bore tunneling would be required. As such, the proposed

pipeline would be subject to implementation of EIR/EIS **Mitigation Measures 3.9.1**and **3.9.2** would reduce the nuisance caused by noise levels to the extent technically feasible, and pipeline construction activities would proceed at a linear pace, causing no one sensitive receptor to be exposed to excessive construction noise for more than a few days.

Resource	Identified in EIR/EIS?	Distance from Approved Alignment	Distance from Proposed Alignment
Lynwood Elementary School	No	60 ft	60 ft
Loma Verde Elementary School	No	1 mi	0.22 mi
Marin Christian Academy/Noah's Pre-school	No	55 ft	5 5ft
Saint Anthony's Catholic Church	No	0.2 5mi	0.25 mi
Nativity of Christ Greek Orthodox Church	No	0.43 mi	649 ft (0.12mi)
Lynwood Park	No	60 ft	60 ft
Lynwood Hill Park	Yes	Looks like it technically goes through it in google earth (along bike path)	Same as EIR/EIS
Slade Park	Yes	50 ft to park boundary - 110 ft to play area	Within play fields; 100 ft from play area
Novato Hospital	Yes	82 ft from Primary care/physical therapy offices	40 ft from back parking lot and 100 ft from actual hospital; 130/110 ft from Primary care/physical therapy offices; distance to hospital is same
New Life Christian Center	Yes	70 ft	70 ft
Scottsdale Pond Park	Yes	45 ft	Adjacent

Similar to the Phase 1 project, the modified pipeline alignment under the Proposed Action would be located within the City of Novato, and subject to local noise ordinances and adverse effects would be temporary. Although locations of sensitive receptors differ from those identified in the EIR/EIS, effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects related to noise would be consistent with those identified in the NBWRP EIR/EIS.

3.9.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.9.1: NMWD shall develop and implement a Construction Noise Reduction Plan that requires, at a minimum, the following:

1. The contractor shall locate all stationary noise-generating equipment, including hammer bore and drill rigs, as far as possible from nearby noise-sensitive receptors. Stationary noise sources located within 500 feet of noise-sensitive receptors shall be equipped with noise reducing engine housings, and the line of sight between such sources and nearby sensitive receptors shall be blocked by portable acoustic barriers.

2. The contractor shall assure that construction equipment with internal combustion engines have sound control devices at least as effective as those provided by the original equipment manufacturer. No equipment shall be permitted to have an un-muffled exhaust.

3. All construction activities within the City of Novato shall be limited to between the hours of 7 a.m. and 6 p.m. on weekdays and between 9 a.m. and 5 p.m. on Saturdays.

4. Residences and other sensitive receptors within 200 feet of a construction area shall be notified of the construction schedule in writing, at least two weeks prior to the commencement of construction activities. This notice shall indicate the allowable hours of construction activities as specified by the applicable local jurisdiction or as defined by this mitigation measure. The construction contractor shall designate a noise disturbance coordinator who would be responsible for responding to complaints regarding construction noise. The coordinator shall determine the cause of the complaint and ensure that reasonable measures are implemented to correct the problem. A contact number for the noise disturbance coordinator shall be conspicuously placed on construction site fences and entrances and included in the construction schedule notification sent to nearby residences and sensitive receptors.

Mitigation Measure 3.9.2: NMWD will implement the following measure:

1. The construction contractor shall use a trenchless technology (e.g., horizontal directional drill, lateral drilling, etc.) other than jack and bore when there are structures within 100 feet of the proposed activities. If the construction contractor provides NMWD with acceptable documentation indicating that alternative trenchless technology is not feasible for the crossing, the contractor shall develop and implement a Construction Vibration Mitigation Plan to minimize construction vibration damage using all reasonable and feasible means available, including siting the jack and bore as far as possible from all nearby structures. The plan shall provide a procedure for establishing thresholds and limiting vibration values for potentially affected structures based on an assessment of each structure's ability to withstand the loads and displacements due to construction vibrations. The plan should also include the development of a vibration monitoring plan to be implemented during construction of particular crossing.

3.10 Hazards and Hazardous Materials

Section 3.10 of the NBRWP EIR/EIS characterized the existing conditions in the Novato Central Service Area, discussed the applicable regulations and analyzed potential hazardous materials effects associated with implementation of the Phase 1 project. The EIR/EIS identified potentially adverse but mitigable effects associated with excavation of, storage, and transport of hazardous materials during construction. Potentially adverse effects associated with the Proposed Action would be consistent with those identified in the NBWRP EIR/EIS, as the pipeline length, general geographic location, and construction methods are consistent as those previously examined under the Phase 1 project. Adverse effects related to hazardous materials would be through implementation of EIR/EIS Mitigation Measures identified in the NBWRP EIR/EIS.

As discussed in Section 3.10.1 of the EIR/EIS, during project construction there is potential to encounter hazardous materials in excavated soil or shallow groundwater, since contaminants in soil have the potential to migrate via shallow groundwater from the properties identified. Construction workers and public could be exposed to hazardous materials present in excavated soil or groundwater. Implementation of EIR/EIS **Mitigation Measures 3.10.1a** through **3.10.1d**, which includes development of a contingency plan in the event of soil contamination, proper removal of impacted soil, preparation of a Health and Safety Plan that applies to excavation, and inclusion of a Dust Abatement Program, would reduce effects related to hazardous materials.

The modified pipeline alignment under the Proposed Action was largely previously encompassed in the original 2008 hazardous materials database review, which identified several facilities located within 660 feet of the alignment that may pose a threat to human health or the environment from potential releases of hazardous materials in the Novato Central Service Area (EDR, 2008). Facilities located within 660 feet (excluding closed cases) of the modified pipeline alignment under the Proposed Action that were not identified in the EIR/EIS include (SWRCB, 2015):

1. Shell Station, located at1390 South Novato Boulevard (LUST Cleanup Site: case open);
2. Seven to Seven Cleaners, located at 1432 South Novato Boulevard (LUST Cleanup Site: case open);
3. Mobil Station, located at 1400 South Novato Boulevard (LUST Cleanup Site: case open);
4. Redwood Landfill, located at Highway 101 North (Land Disposal Site: case open);

As listed above, there are known records of hazardous material sites in the vicinity of the Proposed Project alignment that were not previously disclosed in the EIR/EIS, however, the Proposed Action would not be located directly within the listed sites. Nevertheless, during excavation and subsurface activities associated with construction residual hazardous materials could be encountered. Implementation of EIR/EIS **Mitigation Measures 3.10.2a** through **3.10.2d** would reduce potential effects in the unlikely event residual hazardous materials are encountered. Use of hazardous materials during construction could result in an accidental release of fuel or oils into the environment. Implementation of EIR/EIS **Mitigation Measures 3.10.2a** through **3.10.2d**, which would require implementation of BMPs for handling hazardous materials onsite, would reduce potential effects. The Proposed Action is not located with a California Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (CAL FIRE, 2007), however there is potential for adverse effects from wildfire hazards along the pipeline route and staging areas adjacent to rural and open space areas. Implementation of **Mitigation Measures 3.10.4a** and **3.10.4b** would reduce potential effects.

Effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects related to hazards and hazardous materials would be consistent with those identified in the NBWRP EIR/EIS.

3.10.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.10.1a: Project contract specifications shall require that, in the event that evidence of potential soil contamination such as soil discoloration, noxious odors, debris, or buried storage containers, is encountered during construction, the contractor will have a contingency plan for sampling and analysis of potentially hazardous substances, including use of a photoionization detector. The required handling, storage, and disposal methods shall depend on the types and concentrations of chemicals identified in the soil. Any site investigations or remediation shall comply with applicable laws and will coordinate with the appropriate regulatory agencies.

Mitigation Measure 3.10.1b: If unknown USTs are discovered during construction, the UST, associated piping, and impacted soil shall be removed by a licensed and experienced UST removal contractor. The UST and contaminated soil shall be removed in compliance with applicable county and state requirements governing UST removal.

Mitigation Measure 3.10.1c: Prepare a project-specific Health and Safety Plan that would apply to excavation activities. The plan shall establish policies and procedures to protect workers and the public from potential hazards posed by hazardous materials. The plan shall be prepared according to federal and California OSHA regulations and submitted to the appropriate agency with jurisdiction prior to beginning site activities.

Mitigation Measure 3.10.1d: Project contract specifications shall include a Dust Abatement Program to minimize potential public health impacts associated with exposure to contaminants in soil dust.

Mitigation Measure 3.10.2a: Consistent with the SWPPP requirements, the construction contractor shall be required to implement BMPs for handling hazardous materials onsite. The use of construction BMPs will minimize any adverse effects on groundwater and soils, and will include, but not limited to, the following:

1. Follow manufacturers' recommendations and regulatory requirements for use, storage, and disposal of chemical products and hazardous materials used in construction;
2. Spill control and countermeasures, including employee spill prevention/response training;
3. Avoid overtopping construction equipment fuel gas tanks;
4. During routine maintenance of construction equipment, properly contain and remove grease and oils; and
5. Properly dispose of discarded containers of fuels and other chemicals.

Mitigation Measure 3.10.2b: The contractor shall follow the provisions of California Code of Regulations, Title 8, Sections 5163 through 5167 for General Industry Safety Orders to protect the action area from being contaminated by the accidental release of any hazardous materials and/or wastes. The local CUPA agency will be contacted for any site-specific requirements regarding hazardous materials or hazardous waste containment or handling.

Mitigation Measure 3.10.2c: Oil and other solvents used during maintenance of construction equipment shall be recycled or disposed of in accordance with applicable regulatory requirements. All hazardous materials shall be transported handled, and disposed of in accordance with applicable regulatory requirements.

Mitigation Measure 3.10.2d: In the event of an accidental release of hazardous materials during construction, containment and clean up shall occur in accordance with applicable regulatory requirements.

Mitigation Measure 3.10.4a: For applicable Member Agencies, in consultation with local fire agencies, a Fire Safety Plan will be developed for each of the service areas associated with the project. The Fire Safety Plan(s) will describe various potential scenarios and action plans in the event of a fire.

Mitigation Measure 3.10.4b: For applicable Member Agencies, during project construction, all staging areas, welding areas, or areas slated for development using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Any construction equipment that includes a spark arrestor shall be equipped with a spark arrestor in good working order. All vehicles and crews working at the project site(s) will have access to functional fire extinguishers at all times. In addition, construction crews will be required to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks.

3.11 Public Services and Utilities

Section 3.11 of the NBRWP EIR/EIS discussed existing public services and utilities, applicable regulations, and effects of the Proposed Action. The EIR/EIS determined that pipeline installation would occur predominantly within existing roadways and would temporarily disrupt normal access to homes and business along Davidson Street, Louis Drive, Franklin Street, Rowland Way, Vintage Way, Redwood Boulevard, Rowland Boulevard, South Novato Boulevard, Entrada Drive, and Ignacio Boulevard. As discussed in the EIR/EIS, access to public facilities located near the proposed pipeline alignment, including parks, schools, churches, fire stations, and a hospital could be adversely affected during pipeline installation. However, implementation of EIR/EIS **Mitigation Measure 3.11.1** would reduce potential adverse effects.

Effects of the Proposed Action would be similar to those disclosed in the EIR/EIS, however the Proposed Action would include the following changes: the modified pipeline alignment would now traverse the Novato Community Hospital's parking lot; it would be located adjacent to the Novato Fire District's headquarters building located at 95 Rowland Way, as well as Fire Station 64, located on Enfrenete Road in Novato (approximately 0.25-mile south of the alignment); and it would also traverse a field at Slade Park under the Proposed Action. Other public service facilities located near the proposed modified pipeline that were not identified in the NBWRP EIR/EIS include: Lynwood Elementary School, Loma Verde Elementary School, Marin Christian Academy, Saint Anthony's

Catholic Church, Nativity of Christ Greek Orthodox Church and Lynwood Park. Although the pipeline would be located in proximity to new specific public facilities that were not identified in the EIR/EIS, any adverse effects would be temporary, limited to access and noise related to construction, and would be commensurate with the effects disclosed in the EIR/EIS.

Pipeline construction has the potential to generate a short-term increase in demand for police and fire services if an accident were to occur during construction. Pipeline construction-related hazards would include traffic congestion, rough road conditions, open trenches, and operation of heavy construction equipment, resulting in emergency traffic and access issues. However, implementation of **Mitigation Measure 3.11.2** which requires a Traffic Control Plan and coordination with police and fire personnel would reduce associated effects.

Construction of the Proposed Action could result in damage to, or interference with existing water, sewer, storm drain, natural gas, oil, electric, and/or communication lines, potentially causing interruption in service. In most cases, service disruptions would be temporary and would not exceed one day. In addition, the Underground Service Alert system will be used to locate existing utilities and all utility lines and cables that would be disrupted during pipe installation would be identified during preliminary design. Temporary and accidental effects to smaller utility lines would be considered adverse because the affected area and duration of the effects would be short-term. Implementation of EIR/EIS **Mitigation Measures 3.11.1** through **3.11.3** would reduce any construction-related effects to public services and utilities.

Effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects related to public services would be consistent with those identified in the NBWRP EIR/EIS.

3.11.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.11.1: NMWD will coordinate with local emergency service providers in its service area to inform them of the proposed construction activities and schedule, and provide temporary alternate access routes around construction areas as necessary.

Mitigation Measure 3.11.2: Public service providers shall provide, upon request, a copy of the Traffic Control Plan to the related police and fire agencies for their review prior to construction. NMWD shall provide 72-hour notice to the local service providers prior to construction of individual pipeline segments. Discussion on the Traffic Control Plan is provided in Section 3.7, Traffic and Circulation.

Mitigation Measure 3.11.3: NMWD will identify utilities along the proposed pipeline routes and project sites prior to construction and implement the following measures:

1. Utility excavation or encroachment permits shall be obtained as required from the appropriate agencies. These permits include measures to minimize utility disruption. The service provider and its contractors shall comply with permit conditions regarding utility disruption.

2. Utility locations shall be verified through the use of the Underground Service Alert services and/or field survey (potholing).

3. As necessary, detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services.

4. In areas where the pipeline would traverse parallel to underground utility lines within five feet, the project applicant shall employ special construction techniques, such as trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the excavated areas.

5. Residents and businesses in the project corridor shall be notified of any planned utility service disruption two to four days in advance, in conformance with county and state standards.

3.12 Cultural Resources

Section 3.12 of the NBWRP EIR/EIS analyzed potential effects to cultural, archaeological, and historical resources resulting from the Phase 1 project. Reclamation concluded that a finding of no adverse effect to historic properties was appropriate for the Phase 1 project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended. The California State Historic Preservation Officer concurred with this finding in a letter dated March 21, 2011.

An ESA Registered Professional Archaeologist conducted an updated record search at the Northwest Information Center (NWIC) of the California Historical Resources Information System and a surface survey of the Proposed Action Area of Potential Effects (APE). The results of the investigation are documented in the Addendum Cultural Resources Survey Report (CRSR) for the Proposed Action (Koenig, 2015a). The Addendum CRSR includes: 1) a statement of the integration of the Proposed Action APE to the greater NBWRP; 2) revised APE maps; 3) results of the updated records search at the NWIC; 4) methods and results of the surface survey; 5) an updated geoarchaeological analysis; and 6) recommendations for an Extended Phase I (XPI) subsurface survey at two locations in the Proposed Action APE.

Records at the NWIC indicate that numerous archaeological resources have been documented within a ¼-mile radius of the Proposed Action, primarily along the Arroyo San Jose corridor. These resources are all prehistoric occupation sites with artifacts and features. Some of the sites also contain human remains. As outlined in Section 3.12 of the NBWRP EIR/EIS, ESA established an area of sensitivity assessment (ASA) that includes the APE and a 500-foot radius in order to identify locations of greater known cultural sensitivity. Three prehistoric archaeological sites (CA-MRN-166, CA-MRN-167, and CA-MRN-168) are within the Proposed Action ASA. As established with Reclamation during the Phase I project, ESA proposed an XPI

subsurface survey on Ignacio Boulevard and Entrada Drive to further establish if archaeological site components extend into the Proposed Action APE.

ESA completed an XPI subsurface survey on Ignacio Boulevard to determine whether a nearby archaeological resource (CA-MRN-166) extends into the APE. ESA identified no archaeological materials or other evidence of past human use and occupation (Koenig, 2015b). Based on these results, CA-MRN-166 does not extend into the APE.

An XPI subsurface survey was not feasible on Entrada Drive due to the constraints of numerous existing utilities. Based on a previous subsurface study (Busby et al., 1995), it appears that two nearby archaeological resources (CA-MRN-167 and CA-MRN-168) do not extend into the APE; however this is not conclusive. Despite the lessened sensitivity, there remains some potential for archaeological materials to be uncovered during ground disturbing activities on Entrada Drive.

While no archaeological sites were identified in the APE, the archaeological investigation indicates that specific locations are sensitive for buried prehistoric archaeological resources that would be considered significant resources. Project construction would involve excavation activities that could inadvertently uncover and affect archaeological materials, which would be a significant impact. Implementation of **Mitigation Measure 3.12.1** would reduce the impact to a less-than-significant level by requiring an archaeological monitor and Native American monitor during project implementation in areas delineated as sensitive for cultural resources.

Additionally, if archaeological resources or human remains are inadvertently discovered during project implementation for the remaining Proposed Action, adverse impacts could be significant. Implementation of **Mitigation Measures 3.12.1d** and **3.12.2** would reduce the impact to less-than-significant levels by setting procedures to follow in the event of an inadvertent discovery.

3.12.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.12.1: The appropriate Member Agency will incorporate the following measures:

> **Mitigation Measure 3.12.1a: Prepare a Cultural Resources Monitoring Plan.** Prior to authorization to proceed, or issuance of permits, the applicant shall prepare and submit a cultural resources monitoring plan to the appropriate jurisdiction for review and approval. Monitoring shall be required for all surface alteration and subsurface excavation work including trenching, boring, grading, use of staging areas and access roads, and driving vehicles and equipment within all areas delineated as sensitive for cultural resources [as outlined in the Extended Phase I Results Report (Koenig, 2015b)]. A qualified professional archaeologist (cultural resources monitor) that is approved by the Member Agency in consultation with all affected jurisdictions shall prepare the plan. The plan shall address (but not be limited to) the following issues:
>
> - Training program for all construction and field workers involved in site disturbance;
> - Person(s) responsible for conducting monitoring activities, including Native American monitors;

- How the monitoring shall be conducted and the required format and content of monitoring reports, including any necessary archaeological re-survey of the final pipeline alignment (including the need to conduct shovel-test units or auger samples to identify deposits in advance of construction), assessment, designation and mapping of the sensitive cultural resource areas on final project maps, assessment and survey of any previously unsurveyed areas;
- Person(s) responsible for overseeing and directing the monitors;
- Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports;
- Procedures and construction methods to avoid sensitive cultural resource areas (i.e. boring conduit underneath recorded or discovered cultural resource site);
- Clear delineation and fencing of sensitive cultural resource areas requiring monitoring;
- Physical monitoring boundaries (e.g., 200-foot radius of a known site);
- Protocol for notifications in case of encountering of cultural resources, as well as methods of dealing with the encountered resources (e.g., collection, identification, curation);
- Methods to ensure security of cultural resources sites;
- Protocol for notifying local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction.

Mitigation Measure 3.12.1b: Archaeological and Native American Monitoring. If an intact archaeological deposit is encountered, all soil disturbing activities in the vicinity of the deposit shall cease until the deposit is evaluated. The appropriate Member Agency, as necessary, shall retain the services of a Native American monitor and a qualified archaeological consultant that has expertise in California prehistory to monitor ground-disturbing within areas designated as being sensitive for buried cultural resources. The archaeological monitor shall immediately notify the appropriate Member Agency of the encountered archaeological deposit. The monitors shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, present the findings of this assessment to NBWRA and the appropriate Member Agency. During the course of the monitoring, the archaeologist may adjust the frequency—from continuous to intermittent—of the monitoring based on the conditions and professional judgment regarding the potential to impact resources.

If a Member Agency, in consultation with the monitors, determines that a significant archaeological resource is present within their jurisdiction and that the resource could be adversely affected by the NBWRP, the Member Agency shall:

- Re-design the NBWRP to avoid any adverse effect on the significant archaeological resource; *or*,
- Implement an archaeological data recovery program (ADRP) (unless the archaeologist determines that the archaeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible). If the circumstances warrant an archaeological data recovery program, an ADRP shall be conducted. The project archaeologist and the Member Agency shall meet and consult to determine the

scope of the ADRP. The archaeologist shall prepare a draft ADRP that shall be submitted to the appropriate Member Agency for review and approval. The ADRP shall identify how the proposed data recovery program would preserve the significant information the archaeological resource is expected to contain. The ADRP shall identify the scientific/historic research questions applicable to the expected resource, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, shall be limited to the portions of the historic property that could be adversely affected by the NBWRP. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical.

Mitigation Measure 3.12.1d: Inadvertent Discoveries. If discovery is made of items of historical or archaeological interest, the contractor shall immediately cease all work activities in the area (within approximately 100 feet) of discovery. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. After cessation of excavation the contractor shall immediately contact the NBWRA and appropriate Member Agency. The contractor shall not resume work until authorization is received from the appropriate Member Agency.

- In the event of unanticipated discovery of archaeological indicators during construction, the Member Agency shall retain the services of a qualified professional archaeologist to evaluate the significance of the items prior to resuming any activities that could impact the site.

- In the case of an unanticipated archaeological discovery, if it is determined that the find is unique under NHPA and/or potentially eligible for listing in the National Register, and the site cannot be avoided, appropriate Member Agency shall provide a research design and excavation plan, prepared by an archaeologist, outlining recovery of the resource, analysis, and reporting of the find. The research design and excavation plan shall be submitted to NBWRA and appropriate Member Agency and approved by the appropriate Member Agency prior to construction being resumed.

Mitigation Measure 3.12.2: Discovery of Human Remains. If potential human remains are encountered, the appropriate Member Agency shall halt work in the vicinity of the find and contact the county coroner in accordance with Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner shall contact the NAHC. As provided in Public Resources Code Section 5097.98, the NAHC shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.

3.13 Recreation

Section 3.13 of the NBWRP EIR/EIS analyzed effects to recreation and determined that construction activities could temporarily conflict with access to recreational resources. Modification of the pipeline alignment under the Proposed Action would not result in any new or more severe adverse effects to recreational resources. As discussed in the EIR/EIS, construction of the recycled water pipeline could temporarily disrupt adjacent parks and recreational facilities, but potential effects would be reduced to less than significant with implementation of EIR/EIS mitigation measures.

Consistent with effects previously discussed, recreational facilities along the alignment that would be affected by temporary closures during construction include bikeways along Novato Boulevard, Rowland Boulevard, and Redwood Boulevard. Effects to bikeways would be the same as those described in the EIS/EIS and would be reduced through identification of detour routes for the bikeways and trails during construction, as required by EIR/EIS **Mitigation Measure 3.13-1a**. Effects would also be reduced through implementation of mitigation measures identified in Sections 3.7, Transportation and Traffic, 3.8, Air Quality; and 3.9, Noise.

Under the Proposed Action, potentially adverse effects to recreation would be similar to those described in the EIR/EIS, as the pipeline alignment would be located with the same general vicinity to the parks identified in the EIR/EIS including Scottsdale Pond Park, Lynwood Park, Lynwood Hill Park and Slade Park. However, under the Phase 1 project, the pipeline alignment was to be located adjacent to Slade Park (parallel along the western side of the park). Under the Proposed Action, the alignment would enter Slade Park at the access point via open-cut trench and would be constructed along Louis Drive, across the turf field at the park, which could result in direct effects to recreational users. City of Novato's Slade Park, located at 593 Manuel Drive, includes a barbeque and picnic area, multi-use turf area, and play structure. Consistent with access effects and potential disruption to recreational resources disclosed in the EIR/EIS, open-cut trenching including site mobilization, construction, excavation, and restoration activities, would result in temporary field closures for approximately 3 days; access to play structures would be maintained and construction work areas would be delineated with fencing and signage. Temporary closures from construction activities could displace recreational users to other park locations within the vicinity, but any increase in use would be temporary in nature; therefore the Proposed Action would not displace users to other park locations, such that it would physically degrade existing recreational facilities or result in the need for new recreational facilities. Additionally, implementation of EIR/EIS Mitigation Measure 3.13-., which would require consultation with the City of Novato, and a plan indicating how public access to the park will be maintained during construction, would reduce effects related to temporary field closures. All disturbed areas would be restored to pre-construction conditions. Users of the park may also experience temporary effects from noise, dust, traffic, and visual intrusion from pipeline construction. As described above, adopted mitigation measures identified in Sections 3.7, Transportation and Traffic, 3.8, Air Quality; and 3.9, Noise, would reduce these potential effects.

Effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects related to recreation would be consistent with those identified in the NBWRP EIR/EIS.

3.13.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.13.1a: NMWD shall coordinate with the appropriate local and regional agencies to identify detour routes for the bikeways and trails during construction where feasible, as part of the Traffic Control/Traffic Management Plan (see **Mitigation Measure 3.11.1a**).

Mitigation Measure 3.13.1b: Implement **Mitigation Measures 3.8-1a** through **3.8.1b**, **Mitigation Measures 3.9.1** through **3.9-3**.

Mitigation Measure 3.13.2: Before beginning construction, the contractor will develop, in consultation with the appropriate representative(s) of the affected park's managing agency, a plan indicating how public access to the park will be maintained during construction. If needed, flaggers will be stationed near the construction activity area to direct and assist members of the public around the activity areas while maintaining access to the parks.

3.14 Aesthetics

Section 3.14 of the NBWRP EIR/EIS analyzed visual resource effects associated with implementation of the Phase 1 project and determined construction activities would temporarily affect residential views during construction, and above ground facilities could result in new sources of light and glare. Effects associated with the Proposed Action would be consistent with effects identified in the NBWRP EIR/EIS, as the pipeline length and general geographic location is consistent compared to the Phase 1 project previously examined. Proposed facilities would be limited to below-grade pipelines and appurtenances, therefore, effects related to permanent visual effects and/or light and glare would not occur. All other potential adverse effects related to aesthetics would be reduced through implementation of EIR/EIS Mitigation Measures adopted under the NBWRP EIR/EIS.

Under the Proposed Action, pipeline installation would occur from Novato SD's Davidson WWTP to the Vintage Oaks shopping center area, along Davidson Street, Rowland Way, Redwood Boulevard, Novato Boulevard, Entrada Drive and Ignacio Boulevard. In addition, a spur would also extend from Entrada Drive to the existing NMWD Norman Tank just north of Entrada Drive. Although much of the alignment would traverse residential and urban development areas, views experienced by roadway users from these roadways include scenic vistas of hillsides, oak woodlands, and other open space/park areas such as Scottsdale Pond, Slade Park, Lynwood Hill Park and Lynwood Park. Pipeline installation would progress along

local roadways, but it would be located within existing roadway ROWs, thereby reducing the likelihood for conflicts with aesthetics during construction. Construction would only affect a specific location for a short period of time.

As previously described in the EIR/EIS, the Novato SD service area does not contain any Caltrans designated scenic highways, however there are state eligible and locally-designated scenic routes within the regional vicinity including; portions of U.S. Highway 101 (east of Highway 101) and State Route 37 (east of Highway 101). In addition, portions of Novato Boulevard (from San Marin Drive to the westerly City of Novato Planning Area boundary) are locally-designated scenic routes, per the City of Novato General Plan. However, the Proposed Action would consist of construction west of Highways 101 and 37 (outside of the scenic portion) with the exception of the Highway 101 crossing (south of Rowland Avenue). Consistent with effects analyzed in the NBRWP EIR/EIS, construction of recycled water pipelines would result in short-term effects to the scenic resources listed above, as construction activities would require the use of heavy equipment and storage staging areas associated with the Proposed Action. During construction, excavated areas, stockpiled soils, and other materials within the construction easement and staging areas would temporarily alter aesthetic elements in the visual landscape. Additionally, effects from dust, excavation, drilling, and temporary road closures could reduce pedestrian access, uproot street trees, displace landscaping and streetscaping, and damage sidewalk materials. These construction activities would also be visible to the residential communities along Davidson Street, Louis Drive, Franklin Street, Rowland Way, Vintage Way, Redwood Boulevard, Rowland Boulevard, South Novato Boulevard, Entrada Drive, and Ignacio Boulevard. However, these effects would be temporary, as they would be associated with short-term construction and would be reduced with implementation of **Mitigation Measures 3.14.1a** and **3.14.1b**.,

Effects of the Proposed Action, including the modified pipeline alignment, would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. Implementation of the mitigation measures adopted under the NBWRP EIR/EIS and listed below would reduce potential adverse effects. As such, effects related to aesthetics would be consistent with those identified in the NBWRP EIR/EIS.

3.14.1 Mitigation Measures listed in the EIR/EIS

Mitigation Measure 3.14.1a: Following construction activities, disturbed areas shall be restored to baseline conditions, including repaving roadways, replanting trees, and/or reseeding with a native seed mix typical of the immediately surrounding area.

Mitigation Measure 3.14.1b: Berms around constructed reservoirs shall be vegetated with native seed mixes to soften the visual effect of the reservoirs from adjacent roadways.

3.15 Environmental Justice

Section 3.15 of the NBRWP EIR/EIS analyzed effects to environmental justice. As discussed in the EIR/EIS, the overall construction-related project effects would be short-term and temporary. Construction of the Proposed Action would involve activities and use equipment typical for any construction project and would not cause a disproportionate effect to minority and low-income communities; therefore no adverse effect is expected.

Table 3-2 presents household income and poverty status for the City of Novato and Marin County. Median household income was $77,702 in Novato, and $90,839 in Marin County. The median income for Novato is less than the median income for Marin, which is significantly higher than the median income for California ($61,094). However, the poverty rate for California is nearly double the amount within Novato and Marin (approximately 7 percent), therefore, there is not a disproportionate number of low income families within the Proposed Action area. Implementation of the Proposed Action would be completed in a linear manner, traversing several neighborhoods comprised of properties valued in the $300,000 to $800,000 range. The demographic and economic data demonstrate that the population of the Novato and the Proposed Action area are not impoverished; therefore it is not anticipated that there would be disproportionate effects to low-income neighborhoods.

TABLE 3-2
INCOME AND POVERTY STATUS FOR THE CITY OF NOVATO AND MARIN COUNTY

	Novato		Marin County		California	
Income and Poverty Status of Households (2013)	**Number**	**Percent of Total Population**	**Number**	**Percent of Total Population**	**Number**	**Percent of Total Population**
Less than $10,000	587	2.8	3,283	3.2	714,855	5.7
$25,000 to $34,999	1,569	7.6	6,766	6.6	1,137,796	9.1
$50,000 to $74,999	3,333	16.1	13,303	12.9	2,122,567	16.9
$100,000 to $149,999	3,681	17.8	17,876	17.4	1,870,135	14.9
$200,000 or more	2,519	12.2	19,155	18.6	907,915	7.2
Median Household Income ($)	77,702	--	90,839	--	61,094	--
Poverty Status – All People[1]	--	7.2	--	7.7	__	15.9
Total number of Households	20,725	--	102,912	--	12,542,460	--

NOTES:
[1] Includes individuals whose income fell below poverty status in last 12 months

SOURCE: U.S. Census Bureau, 2013a. 2009-2013 American Community Survey

Effects of the Proposed Action would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. As such, effects related to environmental justice would be consistent with those identified in the NBWRP EIR/EIS.

3.16 Socioeconomics

Section 3.16 of the NBRWP EIR/EIS describes socioeconomic conditions in the Phase 1 project and analyzes effects on the economy from implementation of the project including project construction; operation and maintenance; increased vineyard production and costs; increased recreational expenditures; and potential changes in customer water and sewer fees. As discussed in the EIR/EIS, under the Proposed Action, no adverse effects related to socioeconomics would occur, or effects from the Proposed Action would be beneficial. Short-term construction activities would create jobs and generate additional economic activity within the region during the period of construction. Recycled water use instead of groundwater or surface water for irrigation purposes would be more reliable and could support long-term agricultural production and farm income, which would be a beneficial effect to the agricultural economy.

Based on review of the demographics in the City of Novato and Marin County from the 2009-2013 American Community Survey (presented in **Table 3-3**), the majority of the population within the City is white (80 percent); 19 percent are Hispanic or Latino; 8 percent are Asian; 3 percent are Black or African American; and a small percentage (<1 percent) are American Indian and Native Hawaiian populations; these demographics are consistent with those throughout Marin County as a whole. When compared to California, Novato and Marin demographics are generally consistent with trends within the state, however, Novato and Marin County have a noticeably higher number of white populations (80 percent) than California as a whole, comprising 65 percent white. In addition, Novato and Marin County have a noticeable lower number of Hispanic people (15 to 19 percent) than California (which is 37 percent Hispanic). Therefore, the Proposed Action does not contain a disproportionate number of minority populations.

TABLE 3-3
DEMOGRAPHICS OF THE CITY OF NOVATO AND MARIN COUNTY

	City of Novato		Marin County		California	
Race[1]	**Number**	**Percent of Total Population**	**Number**	**Percent of Total Population**	**Number**	**Percent of Total Population**
White	42,643	80.9	210,423	82.6	24,810,734	65.9
Black or African American	1,920	3.6	9,522	3.7	2,666,095	7.1
American Indian or Alaska Native	676	1.3	2,681	1.1	691,892	1.8
Asian	4,286	8.1	18,899	7.4	5,680,754	15.1
Native Hawaiian or other Pacific Islander	108	0.2	1,196	0.5	285,151	0.8
Some Other Race	5,507	10.4	22,231	8.7	5,302,616	14.10
Hispanic or Latino (of any race)	10,203	19.4	39,540	15.5	14,270,345	37.9
Not Hispanic or Latino	42,501	80.6	215,103	84.5	23,388,836	62.1
Total Population	52,704	--	254,643	--	37,659,181	--

NOTES:
1 Race alone or in combination with one or more other races

SOURCE: U.S. Census Bureau, 2013b. 2009-2013 American Community Survey

Effects of the Proposed Action would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. As such, effects related to socioeconomics would be consistent with those identified in the NBWRP EIR/EIS.

3.17 Growth

Chapter 5 of the NBRWP EIR/EIS analyzed the growth inducement potential of the NBWRP and secondary effects of growth resulting from the NBWRP. As described in the EIR/EIS, no appreciable growth in population or employment would occur as a direct result of construction or operation of the proposed facilities. The Proposed Action would provide recycled water for existing irrigation uses and as such would contribute to the provision of adequate water supply to support a level of growth that is consistent with the amount planned and approved within the General Plans of the City of Novato and Marin County. No additional effects are anticipated beyond those identified in General Plan EIRs for Marin County and City of Novato. The mitigation measures listed in the Marin County and Novato General Plan EIRs and described in the NBWRP EIR/EIS for the Novato Central Service Area would apply to the Proposed Action.

Effects of the Proposed Action would not result in any new effects beyond those previously identified in the NBWRP EIR/EIS, or any increase in the severity of effects identified. As such, any secondary effects associated with the Proposed Action would be consistent with those identified in the NBWRP EIR/EIS.

3.18 Indian Trust Assets

Section 3.12 of the NWBRP EIR/EIS analyzed potential effects to Indian Trust Assets (ITAs). ITAs are legal interests in property held in trust by the U.S. for federally-recognized Indian tribes or individual Indians. Indian reservations, Rancherias, and Public Domain Allotments are common ITAs in California. The Proposed Action would not be implemented on or affect tribal lands, areas where mineral or water rights may be held by a tribe, traditional hunting or fishing grounds, or other ITAs. The closest ITA is Lytton Rancheria, which about 15 miles southeast of the Proposed Action area. Reclamation will comply with procedures contained in Departmental Manual Part 512.2, guidelines, which protect ITAs. Therefore, the Proposed Action would not adversely affect ITAs. Documentation regarding the Proposed Action’s relationship to ITAs is provided in Appendix 3.

SECTION 4
Conclusion

This EA/Addendum demonstrates that the environmental effects of the Proposed Action are consistent with those analyzed adequately in the NBWRP EIR/EIS, certified and approved by Sonoma County Water Agency and NMWD in December 2009. Based on the environmental analysis in this EA/Addendum, the Proposed Action would not result in any new adverse effects or any substantial increase in the severity of effects beyond those discussed in the NBWRP EIR/EIS. The Proposed Action would incorporate and comply with all appropriate mitigation measures that have previously been identified and incorporated into the NBWRP Mitigation Monitoring and Reporting Program. In addition, no new information of substantial importance has become available since the NBWRP EIR/EIS was prepared regarding new adverse effects or feasibility of NBWRP EIR/EIS Mitigation Measures or alternatives.

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SECTION 5
Consultation and Coordination

5.1 Federal Endangered Species Act

Section 1.10 of this EA/Addendum discusses Federal Section 7 consultation with the USFWS and NMFS during the NWRWP EIS/EIR process. According to Sec. 402.16 of the Endangered Species Act Section 7 Regulations, reinitiating formal consultation may be required if (1) new information becomes available indicating that listed species or critical habitat may be affected by the project in a manner or to an extent not previously considered; (2) current project plans change in a manner that causes an effect to listed species or critical habitat in a manner not previously considered; or (3) a new species is listed or critical habitat designated that may be affected by the action. The proposed modifications for the NBWRP do not meet these criteria and therefore further consultation with USFWS or NMFS is not necessary.

5.2 Section 106 of the National Historic Preservation Act

Section 1.10 of this EA/Addendum discusses National Historic Preservation Act Section 106 Consultation. Section 106 requires Federal agencies to take into account effects on historic properties. Section 106 consultation with SHPO for the NBWRP was completed on March 21, 2011. SHPO issued a letter of concurrence with Reclamation's finding of no significant adverse effect to historic properties and cultural resources.

Based on modifications under the Proposed Action, subsequent consultation with SHPO is necessary to modify the APE. ESA prepared a revised CRSR, dated August 2015, to address a proposed change in the APE. The CRSR confirmed that construction methods would be consistent with the methodology described for the approved NBWRP and the previous cultural resources investigations completed for the project (ESA, 2011). Reclamation initiated Section 106 consultation with the SHPO regarding the addendum to the project APE. Reclamation also sent additional letters to Native American tribes requesting information that they may have regarding sites of religious and cultural significance in the area of the NBWRP Novato Central Service Area Addendum. Section 106 consultation information for the Proposed Action is included in Appendix 3.

5.3 Clean Water Act

As noted in Section 1.10 of this EA/Addendum, the Proposed Action is subject to the Clean Water Act (CWA) Section 404. The CWA requires that a permit be obtained from USACE when discharge of dredged of fill material into wetlands and waters of the U.S. occurs. The NBWRP EIR/EIS determined that pursuit of permits to protect jurisdictional waters of the U.S., would be necessary if jurisdictional wetlands are present within the action area; however due to the nature of the Proposed Action, project activities would not include fill of jurisdictional wetlands; therefore, no additional permits would be necessary to comply with the Clean Water Act.

5.4 Safe Drinking Water Act

The Proposed Action would not be located in the boundaries of, nor would it affect a sole source aquifer.

5.5 Federal Clean Air Act

As discussed in Section 3.8 of this EA/Addendum, the Proposed Action would not generate emissions substantially higher than the federal de minimus standards, and would be exempt from General Conformity determination and would be in compliance with the NAAQS.

5.6 Coastal Zone Management Act and Coastal Barrier Resources Acts

For federal consultations, the Proposed Action is not within the California Coastal Zone and is therefore not subject to the Coastal Zone Management Act. Further, the Coastal Barrier Resources Act is not applicable to projects in California.

5.7 Farmland Protection Policy Act

The Proposed Action area does not include important farmland; the Proposed Action is therefore not subject to the Farmland Protection Policy Act.

5.8 Floodplain Management

Review of Federal Emergency Management Agency (FEMA) floodplain maps indicate that portions of the NMWD facilities would be within flood zones. A floodplain map is included in Section 3. The pipelines would be buried underground and during operation would not be significantly adversely affected by flood events. NMWD would implement the design measures to address flooding.

5.9 Migratory Bird Treaty Act

As noted in Section 3.5, the Proposed Action includes mitigation measures to address potential effects to bird species protected under the Migratory Bird Treaty Act. No additional consultation would be required.

5.10 Wild and Scenic Rivers Act

Proposed Action does not include any crossings or construction activities within Wild and Scenic Rivers, and is therefore not subject to the Wild and Scenic Rivers Act.

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SECTION 6
List of Preparers

6.1 List of Preparers

North Marin Water District

Drew McIntyre, Chief Engineer

Carmela Chandrasekera, Project Engineer

David Jackson, Project Engineer

Environmental Science Associates

Jim O'Toole, Project Director

Katie Baker, Project Manager

Michelle Williams, Technical Analyst

Jack Hutchison, Senior Transportation Engineer

Heidi Koenig, Registered Archaeological Professional

Matthew Fagundes, Air Quality and Noise Specialist

Julie Remp, Associate Biologist

6.2 List of Reviewers

US Bureau of Reclamation

Doug Kleinsmith, Natural Resource Specialist

Scott Williams, Archaeologist

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SECTION 7
References

All references included in the *Draft EIR/EIS for the North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program)*, SCH # 2008072096, Prepared by Environmental Science Associates (ESA) for the United States Bureau of Reclamation and North Bay Water Reuse Authority, May 2009, are herein incorporated by reference. Specific citations are listed below.

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APPENDIX 1

NMWD Notice of Determination

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Notice of Determination

TO:

☒ Office of Planning and Research
For U.S. Mail: P.O. Box 3044, Sacramento, CA 95812-3044
Street Address: 1400 Tenth Street, Sacramento, CA 95814

☒ County Clerk
County of: Marin
Address: 3501 Civic Center Drive, Room #247
San Rafael, CA 94903

FROM:

Public Agency: North Marin Water District
Address: 999 Rush Creek Place
Novato, CA 94945
Contact: Drew McIntyre
Phone: (415) 897-1433
Lead Agency (if different form above):
Sonoma County Water Agency
Address: 404 Aviation Blvd.
Santa Rosa, CA 95403
Contact: Marc Bautista
Phone: (707) 547-1923

FILED
DEC 16 2009
MICHAEL J. SMITH
MARIN COUNTY CLERK
BY: J. Whitney, Deputy

Subject: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2008072096

Project Title: North Bay Water Recycling Program

Project Location (include county): Sonoma, Marin, Napa Counties

Project Description: The North Bay Water Reuse Authority is proposing the North Bay Water Recycling Program (formerly known as North San Pablo Restoration and Reuse Project) to increase regional use of recycled water in the North San Pablo Bay region. The Phase 1 Implementation Plan will provide 3,757 acre-feet of recycled water annually via implementation of 6.4 mgd capacity upgrades at the participating wastewater treatment plants, construction of 46.3 miles of conveyance pipeline, an additional 65 acre-feet of storage, and 1,873 additional horsepower for increased pumping capacity. The portion of the project within North Marin Water District jurisdiction, in parternership with Novato Sanitary District, includes components of the Recycled Water System Expansion Project, including the Novato North and Central Service Area projects, which would increase tertiary capacity by 1.2 mgd at the existing tertiary treatment plant and or the Davidson wastewater treatment plant, increase pumping capacity by 259 horsepower, and require 9.8 miles of additional pipeline for conveyance of recycled water to serve the Valley Memorial Cemetery, Novato High School sports fields, and Stone Tree Golf Course, among other users.

This is to advise that the North Marin Water District has approved the above described project on
(☐ *Lead Agency* or ☒ *Responsible Agency*)

December 15, 2009 and has made the following determinations regarding the above described projects.
(*Date*)

1. The project [☒ will ☐ will not] have a significant effect on the environment.
2. ☒ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☒ was ☐ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the Negative Declaration, is available to the General Public at:
999 Rush Creek Place, Novato, CA 94945

Signature (Public Agency) Chris DeFabiele Title: GENERAL MANAGER

Date: 12/16/2009 Date Received filing at OPR:

Authority cited: Section 21083, Public Resources Code.
Reference: Section 21000-21174, Public Resources Code.

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APPENDIX 2

U.S. Bureau of Reclamation Record of Decision, January 28, 2011 and Mitigation Monitoring and Reporting Program

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United States Department of the Interior

BUREAU OF RECLAMATION
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

IN REPLY
REFER TO:
MP-700
ENV-6.00

Mr. Grant Davis
Sonoma County Water Agency
404 Aviation Blvd.
Santa Rosa, CA 95403

Subject: North San Pablo Bay Restoration and Reuse Program Final Environmental Impact Statement – Record of Decision

Dear Mr. Davis:

Enclosed for your records is the North San Pablo Bay Restoration and Reuse Program Final Environmental Impact Statement – Record of Decision, dated January 2011. If you have any questions, please contact Mr. David White at 916-978-5074 or dwhite@usbr.gov.

Sincerely,

Donald R. Glaser
Regional Director

Enclosures - 2

United States Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

Record of Decision

North San Pablo Bay Restoration and Reuse Program
Final Environmental Impact Statement

January 2011

Recommended:

Michelle H. Denning
Regional Planning Officer

Date 1/26/2011

Concur:

Michael A. Chotkowski
Regional Environmental Officer

Date 1/26/2011

Approved:

Donald R. Glaser
Regional Director

Date 1/28/2011

Attachment A: Mitigation Monitoring and Reporting Program

This attachment summarizes the mitigation measures that would be integrated into the proposed project (*i.e.*, North Bay Water Recycling Program or NBWRP) to reduce the potentially significant impacts to a less-than-significant level. Also provided is a Mitigation Monitoring and Reporting Program (MMRP) organized in a tabular format, keyed to each mitigation measure incorporated into the project. The tables following each measure provide a breakdown of how the mitigation measure would be implemented, who would be responsible, and when it would occur. The tables consist of four column headings which are defined as follows:

- *Implementation Procedure*: If needed, this column provides additional information on how the mitigation measures would be implemented.
- *Monitoring and Reporting Actions*: This column contains an outline of the appropriate steps to verify compliance with the mitigation measure.
- *Monitoring Responsibility*: This column contains an assignment of responsibility for the monitoring and reporting tasks.
- *Monitoring Schedule*: This column provides a general schedule for conducting each monitoring and reporting task, identifying where appropriate both the timing and the frequency of the action.
- *Responsible Agency*: This column states the agency, which would be responsible for implementing the mitigation measure. If the measure applies to all the Member Agencies, the responsible agency noted is "Member Agency". If the measure applies to specific agencies, the name of the agency or agencies is/are noted in the column.

Geology and Soils

Impact 3.1.1: Seismicity

In the event of a major earthquake in the Bay Area Region, the proposed facilities could be subject to fault rupture, severe ground shaking, liquefaction, or earthquake induced landslides capable of causing injury, structural damage, pipeline rupture and service interruption.

Mitigation Measure 3.1.1

The Member Agencies will implement the following measures:

- All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria, including the California Building Code (CBC) and American Waterworks Association (AWWA) criteria.

- The project construction materials and backfill materials will be designed according to a geotechnical investigation by a California-licensed geotechnical engineer or engineering geologist to address landslide, subsidence, liquefaction, and expansive soils and seismic hazards such as ground shaking and liquefaction.

- Implementation of industry standard geotechnical measures such as replacing excavated soils with engineered fill materials are effective means to overcome the potential for subsidence. If excavated soils are to be reused for backfill, they would still be appropriately compacted to mitigate the potential for subsidence or settlement and evaluated for expansion and amended, if necessary, to reduce the potential for expansion in accordance with accepted geotechnical practices.

- Proposed facilities will be designed to include flexible connections, where deemed necessary, along with backfill requirements that minimize the potential for significant damage. All other associated improvements will employ standard design and construction using the most recent geotechnical practices and California Building Code (CBC) seismic criteria, which would provide conservative design criteria.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Design improvements with current geotechnical industry standard criteria. 2. Conduct geotechnical investigation and design construction and backfill material accordingly. 3. Replace excavated soils with engineered fill or properly compacted excavated soils if reused. After placing backfill, evaluate soil's potential for expansion. 4. Design facilities fo include flexible connections.	1. Incorporate design improvements into construction specifications; Comply with CBC and AWWA. 2. Incorporate design recommendations info construction specifications. 3. Incorporate procodure into construction specifications. 4. Incorporate flexible connections into construction specifications.	1. Member Agency 2. Contractor/ Member Agency 3. Contractor/ Member Agency 4. Member Agency	1. Prior to Construction 2. Prior to Construction 3. During Construction 4. Prior to Construction	Member Agency

Impact 3.1.2: Erosion

Project construction activities could result in short-term erosion and loss of topsoils.

Mitigation Measure 3.1.2

The Member Agencies will implement the following measures:

- Consistent with Stormwater Pollution Prevention Plan (SWPPP) requirements, the construction contractor shall be required to implement BMPs for erosion control onsite. The

use of construction BMPs will minimize the potential for erosion and loss of topsoil, and shall include, without limitation, the following:

- Avoid scheduling construction activities during a rain event, but be prepared for sudden changes in conditions;
- Construct berms, silt fences, straw bales, fiber rolls, and/or sand bags around stockpiled soils;
- Cover stockpiled soils during a rain event and monitor perimeter barriers, repair as necessary;
- Stabilize entrances to work area to prevent tracking of dirt or mud onto roadways; and
- Implement dust control practices as appropriate on all stockpiled material.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Prepare a SWPPP. 2. Schedule construction to avoid rainy season. 3. Construct berms and install silt fences, straw bales, fiber rolls, and/or sand bags around stockpiled soils. 4. Cover stockpiled soils during a rain event and monitor perimeter barriers; repair as necessary. 5. Stabilize entrances to work area to prevent tracking of dirt or mud onto roadways. 6. Implement dust control practices as appropriate on all stockpiled material.	1. Incorporate erosion control BMPs into construction specifications. 2. Incorporate schedule into construction specifications. 3. Incorporate use of these measures into construction specifications. 4. Incorporate use of these measures into construction specifications. 5. Incorporate use of these measures into construction specifications. 6. Incorporate use of these measures into construction specifications.	1. Member Agency 2. Member Agency 3. Contractor/ Member Agency 4. Contractor/ Member Agency 5. Contractor/ Member Agency 6. Contractor/ Member Agency	1. Prior to Construction 2. Prior to and During Construction 3. During Construction 4. During Construction 5. During Construction 6. During Construction	Member Agency

Impact 3.1.3: Unstable Soils

Project improvements could be located on expansive soils that over time could cause damage to foundations and pipelines resulting in service disruptions.

Mitigation Measure

The Member Agencies will implement the Mitigation Measure 3.1.1.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.1.1	1. Incorporate use of these measures into construction specifications.	1. Contractor/ Member Agency	1. Prior to and During Construction	Member Agency

Impact 3.1.4: Expansive Soils

Project improvements could be located on expansive soils that over time could cause damage to foundations and pipelines resulting in service disruptions.

Mitigation Measure

The Member Agencies will implement the Mitigation Measure 3.1.1.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.1.1	1. Incorporate use of these measures into construction specifications.	1. Contractor/ Member Agency	1. Prior to and During Construction	Member Agency

Surface Hydrology

Impact 3.2.1: Changes in Drainage Patterns

Project construction could modify existing drainage patterns.

Mitigation Measure 3.2.1

The Member Agencies would implement the following measure during pipeline installation at stream crossings:

- Schedule construction so as to avoid storm events to the extent feasible;
- Use trenchless techniques such as jack and bore tunneling to avoid direct impacts to the streams;
- Employ short-term drainage diversion and control measures such as sandbags, dikes, pumps, or other means; and
- Following construction, restore the construction area to pre-existing conditions
- Implement **Mitigation Measure 3.5.1** (see Section 3.5).

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Schedule construction to avoid rainy season. 2. Integrate trenchless techniques such as jack and bore to avoid streams. 3. Employ short-term drainage diversion and control measures such as sandbags, dikes, pumps, or other means. 4. Restore site to pre-existing conditions.	1. Incorporate schedule into construction specifications. 2. Incorporate use of trenchless techniques into construction specifications. 3. Incorporate use of these measures into construction specifications. 4. Inspect final site conditions after construction and verify its condition is it equivalent to that prior to construction. Incorporated into construction specifications.	1. Member Agency 2. Contractor/ Member Agency 3. Contractor/ Member Agency 4. Contractor/ Member Agency	1. Prior to and During Construction 2. Prior to Construction 3. During Construction 4. After Construction	Member Agency

Impact 3.2.3: Increased Storm Runoff

New impervious surfaces for NBWRP would result in an increase in storm runoff.

Mitigation Measure 3.2.3

The Member Agencies will implement the following measures:

- Comply with the local storm drainage requirements;
- Incorporate site design features to control any site runoff onsite; and
- Install storm runoff, collection, and treatment system, as applicable, to control the runoff flow offsite.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Comply with the local storm drainage requirements. 2. Incorporate site design features to control any site runoff onsite.	1. Incorporate requirements into construction specifications. 2. Incorporate features into construction specifications.	1. Member Agency 2. Member Agency 3. Contractor/ Member Agency	1. Prior to Construction 2. Prior to Construction 3. During and After Construction	Member Agency

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
3. Install storm runoff, collection, and treatment system, as applicable, to control the runoff flow offsite.	3. Monitor efficacy of system and regularly maintain it.			

Impact 3.2.4: Flooding – Sea Level Rise

Sea-level rise could affect operation of project facilities.

Mitigation Measure 3.2.4

Design of proposed facilities shall consider sea level rise potential, and shall include appropriate measures in facility siting and design to address potential impacts related to sea level rise, similar to those applied to facility installation within 100-year flood plains. Design measures may include, but are not limited to: facility siting, access placement, access vault extension above projected water elevation, water tight vaults, and site protection.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Design facility to address potential impacts related to sea level rise. Design measures may include but are not limited to: facility siting, access placement, access vault extension above projected water elevation, water tight vaults, and site protection.	1. Incorporate design requirements into construction specifications.	1. Member Agency	1. Prior to construction	LGVSD/NMWD, Novato SD/ NMWD, SVCSD

Groundwater Resources

Impact 3.3.2: Hydrostatic Pressure

Proposed facilities may be affected by shallow groundwater levels and natural groundwater fluctuations.

Mitigation Measure 3.3.1

The Member Agencies will implement the following measures:

- All proposed improvements will be designed and constructed in accordance with current geotechnical industry standard criteria.
- Implement industry standard geotechnical measures to address high groundwater conditions as appropriate to reduce the potential for impacts related to groundwater fluctuation, in accordance with accepted geotechnical practices. Possible design features include drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Design improvements with current geotechnical industry standard criteria. 2. Design improvements to address high groundwater conditions in accordance with accepted geotechnical practices. Possible design features include but are not limited to: drainage blankets, perimeter pumps to temporarily decrease hydrostatic pressure, perimeter drainage trenches, and specific groundwater monitoring scenarios.	1. Incorporate design requirements into construction specifications. 2. Incorporate design requirements into construction specifications.	1. Member Agency 2. Member Agency	1. Prior to construction 2. Prior to construction	Member Agency

Water Quality

Impact 3.4.1: Short Term Construction-Related Effects

Disturbance of soils during construction of new project-related infrastructure could generate short term erosion-related water quality impacts. Construction activities could result in the accidental release of fuels or hazardous materials. Project construction activities could require dewatering that could result in the discharge of turbid waters into the local storm drain systems or nearby creeks.

Mitigation Measure 3.4.1a

NPDES Construction Activity Stormwater Permit. Member Agencies or their contractor shall comply with the provisions of the NPDES Construction Activity Stormwater permit, including preparation of Notice of Intent to comply with the provisions of this General Permit and preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will identify implementation measures necessary to mitigate potential water quality degradation as a result of

construction-related runoff. These measures will include BMPs and other standard pollution prevention actions, such as erosion and sediment control measures, proper control of non-stormwater discharges, and hazardous spill prevention and response. The SWPPP will also include requirements for BMP inspections, monitoring, and maintenance.

The following items are examples of BMPs that would be implemented during construction to avoid causing water quality degradation:

- Erosion control BMPs, such as use of mulches or hydroseeding to prevent detachment of soil, following guidance presented in the California BMP Handbooks – Construction (CASQA 2003). A detailed site map will be included in the SWPPP outlining specific areas where soil disturbance may occur, and drainage patterns associated with excavation and grading activities. In addition, the SWPPP will provide plans and details for the BMPs to be implemented prior, during, and after construction to prevent erosion of exposed soils and to treat sediments before they are transported offsite.
- Sediment control BMPs such as silt fencing or detention basins that trap soil particles.
- Construction staging areas designed so that stormwater runoff during construction will be collected and treated in a detention basin or other appropriate structure.
- Management of hazardous materials and wastes to prevent spills.
- Groundwater treatment BMPs such that localized trench dewatering does not impact surface water quality.
- Vehicle and equipment fueling BMPs such that these activities occur only in designated staging areas with appropriate spill controls.
- Maintenance checks of equipment and vehicles to prevent spills or leaks of liquids of any kind.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Submit Notice of Intent and SWPPP for the NPDES General Construction Permit 2. Incorporate BMPs in standard construction procedures	1. Comply with the SWPPP and NPDES permit requirements 2. Implement BMPs	1. Contractor 2. Contractor/ Member Agency	1. Prior to construction 2. During and following construction	Member Agency

Impact 3.4.6: Surface Water Storage

The proposed project would include storage of recycled water at existing WWTP facilities, as well as at individual user properties. Storage of recycled water quality would have the potential to affect localized surface water quality or groundwater quality.

Mitigation Measure 3.4.6a

Under the Master Recycling Permit for each Member Agency and Cooperating Agency, user agreements shall include provisions for compliance with Title 22 and the State Recycled Water Policy regarding storage and use of recycled water onsite at individual properties.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Incorporate provisions for compliance with Title 22 and State Recycled Water Policy in user agreements. 2. Comply with provisions in the user agreement	1. Execute agreement 2. Execute agreement	1. Member Agency/Users 2. Member Agency/Users	1. During project operation (recycled water use) 2. During project operation (recycled water use)	Member Agency

Mitigation Measure 3.4.6b

Prior to storage of recycled water in any "on-stream" storage facility that directly receives and releases stream flow, each Member Agency or Cooperating Agency shall enter into discussions with RWQCB regarding operational requirements to ensure operation of proposed facilities in compliance with Title 22 and the State Recycled Water Policy. It is anticipated that specific operational standards, such as pumping on-stream ponds dry prior to the onset of winter rains or other measures, would be required in order to ensure storage in compliance with Title 22.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Enter into discussions with San Francisco Bay RWQCB regarding operational requirements for the proposed facilities. 2. Comply with requirements	1. Incorporate requirements into standard operational procedures. 2. Incorporate requirements into standard operational procedures.	1. Member Agency 2. Member Agency	1. Project operation/ prior to storage of recycled water 2. Project operation	Member Agency

Impact 3.4.9: Reuse for Habitat Restoration

Disinfected tertiary-treated wastewater from the SVCSD WWTP would be delivered to the Napa Salt Marsh ponds as a dilution source for bittern ponds, thereby improving water quality.

Mitigation Measure 3.4.9a

SVCSD and Napa SD (as appropriate) shall implement the following measures:

- Prepare a Management Plan required by the San Francisco Bay RWQCB to obtain a discharge prohibition. The management plan will comply with the RWQCB Resolution 94-086. The management plan will include the following features for Ponds 7 and 7A:

  a) Facility Plan, includes project purpose and objectives, site selection factors, site sampling and analyses, planning and design elements.

  b) Operations and Maintenance plan, includes vegetation planning and harvesting, channel and bank maintenance, pump and gate maintenance, vector controls, and contingency/emergency plans; and

  c) Monitoring Program, includes monitoring of pollutants, habitat diversity, wildlife use, and vector populations.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Prepare Management Plan in compliance with RWQCB's requirements. 2. Implement the Management Plan	1a. Incorporate requirements in the Management Plan 1b. Incorporate Facility Plan, Operations and Maintenance plan, and monitoring program in the Management Plan. 2. Report results as required	1a. SVCSD/ Napa SD 1b. SVCSD/Napa SD 2. SVCSD/ Napa SD	1a. Prior to operation 1b. Prior to operation 2. During operation	SVCSD and Napa SD

Biological Resources

Impact 3.5.1: Impacts on Wetlands, Streams and Riparian Habitats

Construction of the Proposed Project could result in impacts to jurisdictional wetlands and other waters of the United States, as well as impacts to riparian habitat.

Mitigation Measure 3.5.1

Implement the following measures to avoid, minimize and compensate for impacts to jurisdictional wetlands and other waters of the U.S. and impacts to riparian habitat.

Construction activities resulting in the introduction of fill or other disturbance to jurisdictional wetlands and other waters of the U.S. will require permit approval from the U.S. Army Corps of Engineers and water quality certification from the Regional Water Quality Control Board, pursuant to Section 401 of the Clean Water Act. The Proposed Project will most likely be authorized under Nationwide Permit #12 (Utility Lines) pursuant to Section 404 of the Clean Water Act. The California Department of Fish and Game (CDFG) has jurisdiction in the project

area over riparian habitat, including stream bed and banks, pursuant to Sections 1600-1616 of the Fish and Game Code. Pipeline construction resulting in alteration to channel bed or banks, extending to the outer dripline of trees forming the riparian corridor, is subject to CDFG jurisdiction. The project proponent will be required to obtain a Streambed Alteration Agreement (SAA) from the CDFG. Terms of these permits and SAA will likely include, but will not necessarily be limited to, the mitigation measures listed below.

1) Specific locations of pipeline segments, storage reservoirs, and pump stations shall be configured, wherever feasible, to avoid and minimize direct and indirect impacts to wetlands and stream drainage channels. Consideration taken in finalizing configuration placement shall include:

   - Reducing number and area of stream channel and wetland crossings where feasible. Crossings shall be oriented as close to perpendicular (90 degree angle) to the drainage or wetland as feasible.

   - Placement of project components as distant as feasible from channels and wetlands.

   - For pipeline construction activities in the vicinity of wetland and stream drainage areas, the construction work area boundaries shall have a minimum 20-foot setback from jurisdictional features[1]. Pipeline construction activities in proximity to jurisdictional features include: 1) entrance and exit pits for directional drilling and bore and jack operations; and 2) portions of pipeline segments listed as "parallel" to wetland/water features.

2) Sites identified as potential staging areas will be examined by a qualified biologist prior to construction. If potentially jurisdictional features are found that could be impacted by staging activities, the site will not be used.

3) Construction methods for channel crossing shall be designed to avoid and minimize direct and indirect impacts to channels to the greatest extent feasible. Use of trenchless methods including suspension of pipeline from existing bridges, directional drilling, and bore and jack tunneling will be used when feasible. Trenchless methods are required for all perennial drainage crossings (i.e., Sonoma Creek). Construction occurring in the vicinity of riparian areas shall be delimited with a minimum 20-foot setback to avoid intrusion of construction activities into sensitive habitat.

   The following additional measures shall apply to channel crossings in which the trenching construction method is used:

   - Limiting of construction activities in drainage channel crossings to low-flow periods: approximately April 15 to October 15.

   - At in-road drainage crossings where drainages pass beneath the road in existing culverts, and where there is sufficient cover between the culvert and road surface, the new pipeline will be installed above the existing culvert without removing or disturbing it. If the pipeline must be installed below the existing culvert, then the culvert will be cut and temporarily removed to allow pipeline installation.

[1] Setbacks of channels with associated riparian vegetation will be from the outer dripline edge of the riparian corridor canopies and/or the upper bank edge, or per City or County code, whichever is greater.

- At off-road drainage crossings, the construction corridor width will be minimized to the greatest extent feasible at the crossing and at least 20 additional feet to either side of the drainage at the crossing.
- If disturbance of the existing culvert is required, sediment curtains upstream and downstream of the construction zone shall be placed to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.

4) Implement BMPs required in **Mitigation Measure 3.4.1** to reduce risk of sediment transport into all construction areas in proximity of drainages.

5) For channels or wetlands for which soil removal is necessary (off-road crossings or wetlands to be trenched or otherwise directly disturbed), the top layer of the drainage or wetland bottom shall be stockpiled and preserved during construction. After the pipeline has been installed, the stockpiled material shall be placed back into the drainage or wetland feature to return the beds to approximately their original composition.

6) To offset temporary and permanent impacts to wetlands and other waters of the U.S., and impacts to riparian habitat, compensatory mitigation will be provided as required by regulatory permits and SAAs.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Acquire permits from USACE, CDFG, and RWQCB. 2. Implement Best Management Practices (BMPs). 3. Stockpile excavated soil. 4. Implement compensatory mitigation.	1. Comply with regulatory permit. 2. Sign-off on inspection report and/ or MMRP. 3. Sign-off on inspection report and/ or MMRP. 4. Comply with regulatory permits and SAAs.	1. Member Agency 2. Contractor 3. Contractor 4. Member Agency	1. Prior to Construction 2. During Construction 3. During Construction 4. Prior to and During Construction	Member Agency

Impact 3.5.2: Construction Impacts on Special-status Fish and California Freshwater Shrimp

Construction of Proposed Project facilities could affect special-status invertebrate or fish species including central California coast steelhead, Chinook salmon, California freshwater shrimp, Pacific lamprey, and Sacramento splittail, or designated critical habitat for steelhead.

Mitigation Measure 3.5.2

Specific measures shall be implemented to protect aquatic habitats potentially inhabited by special-status fish and California freshwater shrimp.

Sensitive fisheries and other aquatic resources shall be protected by minimizing in-stream and near-stream habitat impacts during project design, informally consulting with resource agencies (NMFS, USFWS, CDFG, and USACOE), and implementing protective measures. For Sonoma Creek, Petaluma River, Napa River, and other perennial drainages, special-status fish are presumed present. California freshwater shrimp are presumed present in Sonoma Creek. Because of the sensitivity of seasonal and ephemeral drainages, the following measures will be required to avoid and minimize impacts to aquatic habitat:

1) Project designs shall be reconfigured, whenever feasible, to avoid direct impacts to sensitive wetland areas and minimize disturbances to wetland and riparian corridors. Ground disturbance and construction footprints in these areas shall be minimized to the greatest degree feasible.

2) If trenching or directional boring stream crossing methods are used, the construction schedule of such activities shall be implemented according to conditions of the SAAs.

3) In-stream construction shall be avoided at all locations that are known, or presumed, to support threatened or endangered species, if at the time of construction such locations contain flowing or standing water.

4) In the event that equipment shall operate in any watercourse with flowing or standing water, the project proponent will ensure that they have the appropriate permit authorizations.

5) Prior to construction, a qualified biologist shall install fencing to establish a minimum 20-foot setback from sensitive habitat.

6) For work sites located adjacent to sensitive aquatic sites, a biological resource education program shall be provided by a qualified biologist, as per conditions of the SAAs.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Consult with resource agencies. 2. Implement recommendations derived during consultation.	1. Design protective measures. 2. Comply with permit conditions; sign-off on inspection report and/or MMRP	1. Member Agency 2. Contractor	1. Prior to Construction 2. During Construction	Member Agency

Impact 3.5.3: Long term Impacts on Special-status Fish

Operation of the proposed project has the potential to affect special-status fish species due to reduced discharges from the WWTPs.

Mitigation Measure 3.5.3

Implementation of **Mitigation Measure 3.5.5** for the protection of California red-legged frogs and **Mitigation 3.5.1** for protection and restoration of wetlands would protect special-

status invertebrates that could potentially be impacted by the project. No specific mitigation is required.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.5.1. 2. Implement Mitigation Measure 3.5.5.	1. Comply with regulatory permit; sign-off on inspection report and/ or MMRP. 2. Comply with permit conditions; sign-off on inspection report and/or MMRP.	1. Member Agency/ Contractor 2. Contractor/ Qualified Biologist	1. Prior to and During Construction 2. Prior to Construction	Member Agency

Impact 3.5.4: Impacts on Special-status Invertebrates

Construction of Proposed Project facilities could impact special-status invertebrates including Myrtle's silverspot butterfly, Opler's longhorn moth, Monarch butterfly wintering sites, Ricksecker's water scavenger beetle and California brackishwater snail.

Mitigation Measure 3.5.3

Mitigation Measure 3.5.3 would reduce potential impacts on special-status invertebrates to a less-than-significant level.

Implementation of **Mitigation Measure 3.5.5** for the protection of California red-legged frogs and **Mitigation 3.5.1** for protection and restoration of wetlands would protect special-status invertebrates that could potentially be impacted by the project. No specific mitigation is required.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.5.3. 2. Implement Mitigation Measure 3.5.1. 3. Implement Mitigation Measure 3.5.5.	1. Comply with regulatory permit; sign-off on inspection report and/ or MMRP. 2. Comply with regulatory permit; sign-off on inspection report and/ or MMRP. 3. Comply with permit conditions; sign-off on inspection report and/or MMRP	1. Member Agency 2. Member Agency/ Contractor 3. Contractor/ Qualified Biologist	1. Prior to and During Construction 2. Prior to and During Construction 3. Prior to and During Construction	Member Agency

Impact 3.5.5: Impacts on Western Pond Turtle

Construction of the proposed project has the potential to impact western pond turtles in upland and aquatic habitat.

Mitigation Measure 3.5.5

Implement protection measures to avoid and minimize impacts to western pond turtles.

- When working within 200 feet of stream crossings, all construction personnel shall receive awareness training relating to the protection of western pond turtles, in accordance with the SAAs. Also, to minimize the likelihood of encountering turtles in upland areas near stream crossings, construction footprints shall be minimized to the greatest extent feasible. Based on reconnaissance-level surveys, if staging and construction activities occur principally within or immediately adjacent to project alignment roads the project will be outside of principal pond turtle habitat.

- Within 48 hours prior to the start of construction activities, a qualified biologist shall perform pond turtle surveys within suitable habitat within projected work areas. If a pond turtle nest is located within a work area, a biologist with the appropriate permits may move the eggs to a suitable facility for incubation, and release hatchlings into the creek system in late fall.

The measures proposed for protection of aquatic species and red-legged frogs (**Mitigation Measure 3.5.2 and Mitigation Measure 3.5.6**) will additionally protect western pond turtles during construction.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Conduct awareness training for construction personnel working within 200 feet of stream crossings. 2. Conduct pond turtle surveys; move eggs if necessary. 3. Implement Mitigation Measure 3.5.2. 4. Implement Mitigation Measure 3.5.6.	1. Comply with SAA permit; sign-off on inspection report and/ or MMRP. 2. Comply with regulatory permits; sign-off on inspection report and/ or MMRP 3. Comply with permit conditions; sign-off on inspection report and/or MMRP 4. Comply with SAA permit conditions; sign-off on inspection report and/or MMRP.	1. Contractor/ Member Agency 2. Qualified Staff Biologist 3. Contractor 4. Contractor/ Qualified Biologist	1. Prior to construction 2. 48 hours Prior to Construction 3. Prior to and During Construction 4. Prior to and During Construction	Member Agency

Impact 3.5.6: Impacts on California Red-legged Frog

Construction of the Proposed Project has the potential to affect California red-legged frogs, if present.

Mitigation Measure 3.5.6

Protection measures to avoid and minimize impacts on California red-legged frogs.

1) The implementation of measures identified for the protection of special-status fish and California freshwater shrimp would also protect California red-legged frogs within aquatic habitat. All protection measures identified in **Mitigation Measure 3.5.2** shall be applied to the protection of red-legged frogs at sites that provide potential aquatic habitat for this species. These include informal USFWS consultation, avoiding aquatic habitat, establishing a suitable buffer from the aquatic habitat (e.g., 50 feet), and implementing a worker education program.

2) All work activities within or adjacent to aquatic habitat that is potentially occupied by red-legged frogs will be completed between May 1 and November 1.

3) A qualified biological resource monitor will conduct a training session for construction personnel working in upland habitat near potentially occupied drainages, as per conditions of the SAAs.

4) All trash that could attract predators will be regularly contained and removed from the work site.

In the event trenchless methods cannot be employed, the project proponent would obtain appropriate permit authorizations and implement construction methods per applicable Streambed Alteration Agreements.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.5.2. 2. Complete all work within or adjacent to aquatic habitat that is inhabited by red-legged frogs between May 1 and November 1 3. Conduct training sessions for construction personnel working in upland habitat near potential occupied drainages. 4. Implement trash removal and trenchless construction methods where necessary.	1. Comply with permit conditions; sign-off on inspection report and/or MMRP. 2. Incorporate into contract specifications. 3. Comply with SAA permit conditions; sign-off on inspection report and/or MMRP. 4. Comply with SAA permit conditions; sign-off on inspection report and/or MMRP.	1. Contractor/ Qualified Biologist 2. Contractor 3. Qualified Biologist/ Construction Personnel 4. Contractor	1. Prior to and During Construction 2. During Construction 3. During Construction 4. During Construction	Member Agency

Impact 3.5.7: Impacts on Threatened and Endangered Marsh Birds

Construction of the proposed project has the potential to affect western snowy plover, California black rail and California clapper rail and their habitat in and near the project alignments.

Mitigation Measure 3.5.7

To minimize the likelihood of project effects on threatened and endangered marsh birds, the following mitigation measures will be implemented:

- Protocol-level surveys will be conducted in locations with suitable habitat to determine species presence or absence.
- Agency consultation will be initiated.
- Construction activities will occur during the non-breeding season, September 15 through January 31. The combined breeding season for all three species extends from February 1 through September 14.
- Construction personnel will receive environmental awareness training specific to the identification of clapper rails, black rails, western snowy plover and their habitat.
- Any clapper rail and western snowy plover activity will be immediately reported to the USFWS; black rail activity will be reported to the CDFG.
- Construction activities will be constrained to the smallest area possible to minimize marsh disturbance.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Conduct protocol-level surveys in areas that contain suitable nesting bird habitat 2. Initiate consultation with resource agency. 3. Adhere to construction schedule with respect to bird breeding season. 4. Conduct training sessions for construction personnel specific to identification of sensitive bird habitat. 5. In the event of presence of sensitive birds, coordinate with CDFG and/ or USFWS.	1. Incorporate survey results and recommendations into project contract specifications. 2. Develop and implement avoidance measures. 3. Incorporate into contract specifications. 4. Incorporate into contract specifications; sign-off on inspection report and/or MMRP. 5. Implement avoidance measures derived from agency coordination.	1. Qualified Staff Biologist 2. Member Agency 3. Contractor/ Member Agency 4. Qualified Biologist/ Construction Personnel 5. Contractor/ Member Agency	1. Prior to Construction 2. Prior to Construction 3. During Construction 4. Prior to Construction 5. During Construction	Member Agency

Impact 3.5.8: Impacts on Burrowing Owl

Construction of the proposed project could result in direct and indirect impacts to burrowing owls, if present in portions of the project alignment.

Mitigation Measure 3.5.8

The following measures to avoid, minimize, or mitigate impacts on burrowing owls would be incorporated into the project.

- In areas identified to provide potential burrowing owl habitat, preconstruction surveys for burrowing owls would be conducted by a qualified biologist 14-30 days prior to the start of construction. Surveys would cover grassland areas within 500-foot buffer and check for adult and juvenile burrowing owls and their habitat.

- Construction exclusion areas would be established around the occupied burrows in which no disturbance would be allowed to occur. During the non-breeding season (September 1 through January 31), the exclusion zone would extend 160 feet around occupied burrows. During the breeding season (February 1 through August 31), exclusion areas would extend 250 feet around occupied burrows. Passive relocation of owls is not proposed.

- A qualified biologist (the on-site monitor or otherwise) will monitor owl activity on the site to ensure the species is not adversely affected by the project.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Conduct surveys for adult and juvenile burrowing owls within a 500-foor buffer. 2. Establish construction exclusion areas of appropriate size, as defined by breeding seasons). 3. Monitor owl activity on construction sites.	1. Incorporate survey results and recommendations into project contract specifications. 2. Incorporate in contract specifications. 3. Summarize rosults and recommendations in daily log; sign-off on inspection report and/or MMRP.	1. Qualified Biologist 2. Contractor 3. Qualified Biologist	1. 14-30 days Prior to Construction 2. Prior and During Construction 3. During Construction	Member Agency

Impact 3.5.9: Impacts on Nesting Birds

Construction of the proposed project has the potential to affect nesting birds including Swainson's hawk, willow flycatcher, sharp-shinned hawk, Cooper's hawk, tri-colored blackbird, Bell's sage sparrow, golden eagle, northern harrier, California yellow-warbler, white-tailed kite, California horned lark, salt marsh common yellowthroat, loggerhead shrike, San Pablo song sparrow, California thrasher, rookeries, and additional bird species protected by California Fish and Game Code Section 3503 and the federal Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989).

Mitigation Measure 3.5.9

The appropriate Member Agency shall implement the following protection elements to avoid disturbing common and special-status nesting birds:

- Whenever feasible, vegetation shall be removed during the non-breeding season (generally defined as September 1 to January 31).
- For ground disturbing activities occurring during the breeding season (generally defined as February 1 to August 31), a qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities.
- If active bird nests are found during preconstruction surveys, a 500-foot no-disturbance buffer will be created around active raptor nests during the breeding season or until it is determined that all young have fledged. A 250-foot buffer zone will be created around the nests of other special-status birds. These buffer zones are consistent with CDFG avoidance guidelines; however, they may be modified in coordination with CDFG based on existing conditions at work locations.
- If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs that have been determined to be unoccupied by special-status birds or that are located at least 500 feet from active nests may be removed.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Limit vegetation removal to non-breeding season (September 1 to January 31) 2. In the event that construction occurs during the breeding season (February 1 to August 31), conduct surveys of all potential nesting habitat within 500 feet of earthmoving activities. 3. In the event that active bird nests are found during preconstruction surveys, establish a 500 foot buffer around active nest sites. Establish a 250-foot buffer around other active special-status bird nests. 4. Remove trees, if necessary, that are not occupied by special-status birds.	1. Incorporate into contract specifications. 2. Incorporate survey results and recommendations into contract specifications. 3. Comply with CDFG guidelines. 4. Sign-off on inspection report and/ or MMRP.	1. Contractor 2. Qualified Biologist 3. Contractor 4. Contractor	1. During Construction 2. Prior to Construction 3. During Construction 4. During Construction	Member Agency

Impact 3.5.10: Impacts on Salt Marsh Harvest Mouse and Suisun Ornate Shrew

Construction of the proposed project has the potential to affect salt marsh harvest mouse and suisun ornate shrew and their habitat in and near the project alignments.

Mitigation Measure 3.5.10

The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on salt marsh mammals during construction.

Where avoidance of sensitive habitat is not feasible (e.g., by bridging or bore and jack), consultation with CDFG and/or USFWS would be initiated. If species are present or presumed to be present after informal consultation with USFWS and/or CDFG, then a formal consultation and Biological Assessment in support of a Biological Opinion would be required. Such a consultation would proceed as part of the Corps 404 permitting program.

To avoid potential impacts on salt marsh harvest mouse and Suisun ornate shrew, a qualified biologist shall conduct specific preconstruction surveys prior to project initiation, following USFWS survey guidelines. The project proponent shall install exclusionary fences to prevent species movement into the project area, and a biologist with the appropriate permits to relocate these species shall live-trap mice and shrews within the enclosure and move these animals outside the fence. The biological monitor shall inspect these fences to ensure their integrity, and shall conduct an education workshop for contractors employees outlining species' biology, legislative protection, and construction restrictions to reduce potential impacts.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Consult with CDFG and/ or USFWS when avoidance of sensitive habitat is not feasible. 2. Conduct surveys for salt harvest mouse and Suisun ornate shrew. 3. Install exclusion fencing; conduct fence inspections. 4. Relocate species if necessary. 5. Conduct education workshops to inform construction personnel.	1. Compliance with recommendations and/ or Biological Assessment in support of a Biological Opinion. 2. Comply with USFWS guidelines; incorporate survey results and recommendations into contract specifications. 3. Comply with regulatory permit conditions; sign-off on inspection report and/ or MMRP. 4. Comply with regulatory permit conditions; sign-off on inspection report and/ or MMRP. 5. Incorporate into contract specifications; sign-off on inspection report and/or MMRP.	1. Member Agency/ Contractor 2. Qualified Biologist 3. Contractor/ Qualified Biologist 4. Qualified Biologist 5. Qualified Biologist/ Construction Personnel	1. Prior to Construction 2. Prior to Construction 3. During Construction 4. Prior to Construction 5. Prior to Construction	Member Agency

Impact 3.5.11: Impacts on Special-Status Bats

Construction of the proposed project has the potential to affect roosting or breeding special-status bats in and near the project alignments.

Mitigation Measure 3.5.11

The appropriate Member Agency shall implement protection measures to avoid and minimize impacts on special-status bats in and near project facilities during construction.

Concurrent with breeding bird surveys (**Mitigation Measure 3.5.8**), a qualified biologist will conduct preconstruction surveys for special-status bats at each bridge crossing location and in rural (i.e., non-road) areas where any large trees (e.g., > 24 inch diameter at breast height) will be removed. If an active roost is observed, a suitably-sized buffer (e.g., 100 to 150 feet) will be placed around the roost if it appears that trenching or other project activities may cause abandonment. Demolition activities must cease until juvenile bats are self-sufficient and will not be directly or indirectly impacted by activities.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.5.8. 2. Conduct species surveys at specified locations. 3. Establish 100-150-foot buffers around active roosts; cease demolition activities until juvenile bats are self-sufficient.	1. Summarize results and recommendations in daily log; sign-off on inspection report and/or MMRP. 2. Incorporate results and recommendations into contract specifications; sign-off on inspection report and/ MMRP. 3. Incorporate into contract specifications; sign-off on inspection report.	1. Qualified Biologist/ Contractor 2. Qualified Biologist 3. Contractor	1. Prior to and During Construction 2. Prior to construction 3. During Construction	Member Agency

Impact 3.5.12: Impacts on American Badger

Construction of the proposed project has the potential to affect American badger and its habitat in and near the project alignments.

Mitigation Measure 3.5.12

Mitigation Measure 3.5.12 would be implemented prior to ground-clearing activities to reduce potential impacts on badgers to a less-than-significant level.

Avoid and minimize impacts on badgers through preconstruction surveys prior to ground clearing and grading in annual grasslands habitat or areas that are known or suspected to support badger.

- Within 30-days prior to ground-clearing, a qualified biologist shall survey areas that provide potential badger habitat that occur within 100-feet of project activities. If no evidence of badgers presence is detected, no further mitigation is required. If active badger dens are identified within the project area, badgers will be passively relocated. If identified, vacated dens shall be temporarily covered using plywood sheets or similar materials to prevent badgers from returning to the project area during construction.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Conduct species surveys to identify potential badger habitat with 100 feet of project site. 2. In the event that badger dens are identified, passively relocate badgers.	1. Incorporate survey results and recommendations into contract specifications. 2. Comply with biologist recommendations.	1. Qualified Biologist 2. Qualified Biologist	1. 30 days Prior to Construction 2. Prior to Construction.	Member Agency

Impact 3.5.13: Impacts on Rare Plants

Project construction could result in impacts to listed and other special-status plants.

Mitigation Measure 3.5.13

Before the initiation of any vegetation removal or ground-disturbing activities in areas that provide suitable habitat for special-status plants, the following measures shall be implemented:

- A qualified botanist will conduct appropriately-timed surveys for special-status plant species, including those identified in Table 3.5.1, in all suitable habitat that would be potentially disturbed by the project.

- Surveys shall be conducted following CDFG- or other approved protocol.

- If no special-status plants are found during focused surveys, the botanist shall document the findings in a letter to the appropriate agencies and no further mitigation will be required.

  If special-status plants are found during focused surveys, the following measures shall be implemented:

  - Information regarding the special-status plant population shall be reported to the California Natural Diversity Database (CNDDB).

  - If the populations can be avoided during project implementation, they shall be clearly marked in the field by a qualified botanist and avoided during construction activities. Before ground clearing or ground disturbance, all on-site construction personnel shall be instructed as to the species' presence and the importance of avoiding impacts to this species and its habitat.

  - If special-status plant populations cannot be avoided, consultations with CDFG and/or USFWS would be required. A plan to compensate for the loss of special-status

plant species could be required, detailing appropriate replacement ratios, methods for implementation, success criteria, monitoring and reporting protocols, and contingency measures that would be implemented if the initial mitigation fails; the plan would be developed in consultation with the appropriate agencies prior to the start of local construction activities.

- If mitigation is required, the project proponent shall maintain and monitor the mitigation area for 5 years following the completion of construction and restoration activities. Monitoring reports shall be submitted to the resource agencies at the completion of restoration and for 5 years following restoration implementation. Monitoring reports shall include photo-documentation, planting specifications, a site layout map, descriptions of materials used, and justification for any deviations from the mitigation plan.

Impact 3.5.14: Impacts on Heritage and Other Significant Trees

The proposed project could affect heritage and other significant tress.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Conduct plant surveys. 2. Implement measures if special-status plants are present. 3. Mark special status plants and inform construction personnel of their presence. 4. Consult with CDFG and/or USFWS if special-status plants cannot be avoided. 5. If compensatory mitigation is required, monitor mitigation area.	1. Comply with CDFG protocol. Incorporate results and recommendations into contract specifications. In the event that no special-status plants are present, document findings in a letter to the appropriate resources agency. 2. Report information regarding present special-status plants to CNDDB. 3. Sign-off on inspection report and/or MMRP. 4. Coordination with CDFG and or USFWS; compliance with recommendations; development of a compensation plan. 5. Submit annual monitoring reports to resource agencies that include photo documentation, planting specifications, site layout map.	1. Qualified Botanist 2. Qualified Botanist 3. Qualified Botanist 4. Member Agency 5. Member Agency	1. Prior to Construction 2. During Construction 3. Prior to Construction 4. Prior to Construction 5. 5 Years Following Construction	Member Agency

Mitigation Measure 3.5.14

The following measures will be implemented to avoid or reduce impacts to heritage or other significant trees:

1. Prior to the commencement of construction activities, trees necessary to remove or at risk of being damaged will be identified.

2. A certified arborist will inventory these trees, with the results of the inventory providing species, size (diameter at breast height, or *dbh*), and number of protected trees. Also, in consultation with the appropriate County, the arborist will determine if any are heritage or landmark trees.

3. If any protected trees are identified that will be potentially removed or damaged by construction of the proposed project, design changes will be implemented where feasible to avoid the impact.

4. Any protected trees that are removed will be replaced per applicable City and County tree protection ordinances. Foliage protectors (cages and tree shelters) will be installed to protect the planted trees from wildlife browse. The planted trees will be monitored as required by the ordinance, or regularly during a minimum two-year establishment period and maintenance during the plant establishment period will include irrigation. After the establishment period, the native tree plantings are typically capable of survival and growth without supplemental irrigation.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Identify trees at risk or trees to be removed. 2. Inventory trees. 3. Consult with counties to determine if any identified trees are landmark trees. 4. Replace removed trees. 5. Monitor replacement trees.	1. Incorporate recommendations into contract specifications. 2. Record results in inspection report. 3. Record results in inspection report. 4. Comply with City and County Tree ordinances. 5. Comply with City and County Tree ordinances; sign-off on inspection report/ and or MMRP.	1. Certified Arborist/ Contractor 2. Certified Arborist 3. Member Agency 4. Member Agency 5. Member Agency/ Certified Arborist	1. Prior to Construction 2. Prior to Construction 3. Prior to Construction 4. After Construction is Completed 5. Minimum of two years following completion of construction	Member Agency

Land Use and Agricultural Resources

Impact 3.6.3: Impact to Farmland

Construction activities associated with the project could temporarily affect the agricultural use of important farmland.

Mitigation Measure 3.6.1

To support the continued productive use of Important Farmlands in the project area, the appropriate Member Agency shall ensure that the following measures are taken, during construction of the project:

- Replace soils over pipelines in a manner that will minimize any negative impacts on crop productivity. The surface and subsurface soil layers will be stockpiled separately and returned to their appropriate locations in the soil profile.

- To avoid over-compaction of the top layers of soil, monitor pre-construction soil densities and return the surface soil (approximately the top 3 feet) to within 5 percent of original density.

- Where necessary, the top soil layers will be ripped to achieve the appropriate soil density. Ripping may also be used in areas where vehicle and equipment traffic have compacted the top soil layers, such as the construction staging areas.

- Avoid working or traveling on wet soil to minimize compaction and loss of soil structure. Before construction begins, geotechnical testing will be done to determine the moisture content limit above which work should not occur. Where working or driving on wet soil cannot be avoided, roadways will be capped with spoils that will be removed at the end of construction and/or ripped and amended with organic material as needed.

- Remove all construction-related debris from the soil surface. This will prevent rock, gravel, and construction debris from interfering with agricultural activities.

- Perform soil density monitoring during backfill and ripping to minimize excessive compaction and minimize effects on future agricultural land use.

- Remove topsoil before excavating in fields. Return it to top of fields to avoid detrimental inversion of soil profiles.

- Control compaction to minimize changes to lateral groundwater flow which could affect both irrigation and internal drainage.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Replace soils over pipelines in a manner that will minimize any negative impacts on crop productivity. Stockpile surface and subsurface soil layers separately and return them to their appropriate locations in the soil profile. 2. Monitor pre-construction soil densities and return the surface soil (approximately the top 3 feet) to within 5 percent of original density. 3. Where necessary, rip the top soil layers to achieve the appropriate soil density. 4. Conduct geotechnical testing to determine the moisture content limit above which work should not occur. Where working or driving on wet soil cannot be avoided, roadways will be capped with spoils that will be removed at the end of construction and/or ripped and amended with organic material as needed. 5. Remove all construction-related debris from the soil surface. 6. Perform soil density monitoring during backfill and ripping. 7. Remove topsoil before excavating in fields. Return it to top of fields to avoid detrimental inversion of soil profiles. 8. Control compaction to minimize changes to lateral groundwater flow.	1. Incorporate procedure into construction specifications. 2. Incorporate procedure into construction specifications. 3. Incorporate procedure into construction specifications. 4. Incorporate procedure into construction specifications. 5. Incorporate procedure into construction specifications. 6. Incorporate procedure into construction specifications. 7. Incorporate procedure into construction specifications. 8. Incorporate procedure into construction specifications.	1. Contractor/ Member Agency 2. Member Agency 3. Member Agency 4. Member Agency 5. Member Agency 6. Member Agency 7. Member Agency 8. Member Agency	1. Prior to Construction/ During Construction 2. Prior to Construction/ During Construction 3. Prior to Construction/ During Construction 4. Prior to Construction/ During Construction 5. Prior to Construction/ During Construction 6. Prior to Construction/ During Construction 7. Prior to Construction/ During Construction 8. Prior to Construction/ During Construction	Member Agency

Transportation and Traffic

Impact 3.7.1: Temporary Congestion and Delays

Project construction activities could adversely affect traffic and transportation conditions in the project area.

Mitigation Measure 3.7.1a

The appropriate Member Agency for each project component shall obtain and comply with local road encroachment permits for roads that are affected by construction activities.

The *Work Area Protection and Traffic Control Manual* includes requirements to ensure safe maintenance of traffic flow through or around the construction work zone, and safe access of police, fire, and other rescue vehicles (CJUTCC, 1996). In addition, the Traffic Management Plan (subject to local jurisdiction review and approval) required by **Mitigation Measure 3.7.1b**, below, would direct how traffic flow is safely maintained during project construction.

Mitigation Measure 3.7.1b

The construction contractor for each project component shall prepare and implement a Traffic Control/Traffic Management Plan subject to approval by the appropriate local jurisdiction prior to construction. The plan shall:

- Identify hours of construction (between 8:00 AM and 7:00 PM; no construction shall be permitted between 10:00 PM and 7:00 AM);
- Identify hours for deliveries (Monday – Friday, 9:00 AM to 3:30 PM, or other hours if approved by the appropriate local jurisdiction);
- Include a discussion of haul routes, limits on the length of open trench, work area delineation, traffic control and flagging;
- Identify all access and parking restriction, pavement markings and signage requirements (e.g., speed limit, temporary loading zones);
- Layout a plan for notifications and a process for communication with affected residents and businesses prior to the start of construction. Advance public notification shall include posting of notices and appropriate signage of construction activities. The written notification shall include the construction schedule, the exact location and duration of activities within each street (i.e., which lanes and access point/driveways would be blocked on which days and for how long), and a toll-free telephone number for receiving questions or complaints;
- Include a plan to coordinate all construction activities with emergency service providers in the area at least one month in advance. Emergency service providers shall be notified of the timing, location, and duration of construction activities. All roads shall remain passable to emergency service vehicles at all times;

- Include a plan to coordinate all construction activities with the appropriate local school district at least two months in advance. The school district shall be notified of the timing, location, and duration of construction activities. Coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods. The construction contractor for each project component shall be required to maintain vehicle, pedestrian, and school bus service during construction through inclusion of such provisions in the construction contract. The assignment of temporary crossing guards at designated intersections may be needed to enhance pedestrian safety during project construction;

- Include the requirement that all open trenches be covered with metal plates at the end of each workday to accommodate traffic and access; and

- Specify the street restoration requirements pursuant to agreements with the local jurisdictions.

Mitigation Measure 3.7.1c

The appropriate Member Agency for each project component shall identify all roadway locations where special construction techniques (e.g., horizontal boring, directional drilling or night construction) will be used to minimize impacts to traffic flow.

Mitigation Measure 3.7.1d

The appropriate Member Agency for each project component shall develop circulation and detour plans to minimize impact to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone.

Mitigation Measure 3.7.1e

The appropriate Member Agency for each project component shall encourage construction crews to park at staging areas to limit lane closures in the public right-of-way.

Mitigation Measure 3.7.1f

The appropriate Member Agency for each project component shall consult with the appropriate public transit service providers at least one month prior to construction to coordinate bus stop relocations (as necessary) and to reduce potential interruption of transit service.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Obtain local road encroachment permits for roads that are affected by construction activities.	1. Incorporate permit regulations into contract specifications.	1. Member Agency 2. Member Agency 3. Member Agency 4. Contractor/ Member Agency	1. Prior to Construction 2. Prior to and During Construction	Member Agency

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
2. Implement a traffic control plan which includes the following measures such as identifying hours of construction and deliveries; identifying access and parking restriction, pavement markings and signage requirements; and planning for notifications; coordinating all construction activities with emergency service providers; 3. Identify all roadway locations where special construction techniques (e.g., horizontel boring, directional drilling or night censtruction) will be used to minimize impacts to traffic flow. 4. Develop circulation and detour plans to minimize impact to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone. 5. Encourage construction crews to park at staging areas to limit lane closures in the public right-of-way. 6. Consult with the appropriate public transit service providers at least one month prior to construction to coordinate bus stop relocations (as necessary) and to reduce potential interruption of transit service.	2. Incorporate traffic control plan measures into contract specifications. 3. Incorporate techniques into contract specifications. 4. Incorporate plans into contract specifications. 5. Incorporate parking restrictions into contract specifications. 6. Incorporate transit service notification into contract specifications.	5. Member Agency 6. Contractor	3. Prior to and During Construction 4. Prior to and During Construction 5. During Construction 6. Prior to Construction	

Impact 3.7.2: Temporary Disruption to Access

Project construction activity would temporarily disrupt circulation patterns near sensitive land uses (schools, hospitals, fire stations, police stations, and other emergency providers).

Mitigation Measure 3.7.2a

Pipeline construction near schools shall occur when school is not in session (i.e., summer or holiday breaks). If this is not feasible, a minimum of two months prior to project construction, the appropriate Member Agency for each project component shall coordinate with the appropriate local school district to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require their contractor to avoid construction and lane closures during those periods.

Mitigation Measure 3.7.2b

A minimum of two months prior to project construction, the appropriate Member Agency for each project component shall coordinate with the appropriate local school district to identify alternatives to their Safe Routes to School program, alternatives for the school busing routes and stop locations, and other circulation provisions, as part of the Traffic Control/Traffic Management Plan (see **Mitigation Measure 3.7.1a**).

Mitigation Measure 3.7.2c

Implement **Mitigation Measure 3.7.1b**.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Restrict pipeline construction near schools to times when school is not in session (i.e., summer or holiday breaks). If this is not feasible, coordinate with the appropriate local school district a minimum of two months prior to project construction to identify peak circulation periods at schools along the alignment(s) (i.e., the arrival and departure of students), and require the contractor to avoid construction and lane closures during those periods.	1. Incorporate restrictions for schools into construction schedule and construction specifications.	1. Member Agency	1. Prior to and During Construction	Member Agency

Impact 3.7.3: Temporary Disruption to Access

Project construction activity would have temporary effects on alternative transportation or alternative transportation facilities.

Mitigation Measure 3.7.3

Implement **Mitigation Measure 3.7.1f.**

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.7.1f.	1. Incorporate transit service notification into contract specifications.	1. Member Agency	1. Prior to Construction	Member Agency

Impact 3.7.4: Temporary Displacement of Parking

Project construction activity would temporarily create parking demand for construction workers and construction vehicles, and displace parking spaces.

Mitigation Measure 3.7.4

Implement **Mitigation Measure 3.7.1e.**

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.7.1e.	1. Incorporate parking restrictions into contract specifications.	1. Contractor	1. During Construction	Member Agency

Impact 3.7.5: Temporary Potential Traffic Hazards

Project construction activity would temporarily increase the potential for accidents on project roadways.

Mitigation Measure 3.7.5

Implement **Mitigation Measure 3.7.1b** through **3.7.1f.**

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.7.1b. 2. Implement Mitigation Measure 3.7.1c. 3. Implement Mitigation Measure 3.7.1d. 4. Implement Mitigation Measure 3.7.1e. 5. Implement Mitigation Measure 3.7.1f.	1. Incorporate traffic control plan measures into contract specifications. 2. Incorporate techniques into contract specifications 3. Incorporate plans into contract specifications. 4. Incorporate parking restrictions into contract specifications. 5. Incorporate transit service notification into contract specifications.	1. Member Agency 2. Contractor/ Member Agency 3. Member Agency 4. Contractor 5. Member Agency	1. Prior to and During Construction 2. Prior te and During Construction 3. Prior to and During Construction 4. During Construction 5. Prior to Construction	Member Agency

Impact 3.7.6: Road Wear

Project construction activity would increase wear and tear on the designated haul routes used by construction vehicles to access the project work sites.

Mitigation Measure 3.7.6

Roads damaged by construction shall be repaired to a structural condition equal to that which existed prior to construction activity as per conditions of the encroachment permit (see **Mitigation Measure 3.7.1a**).

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Obtain local road encroachment permits for roads that are affected by construction activities.	1. Incorporate permit regulations into contract specifications.	1. Member Agency	1. Prior to Construction	Member Agency

Air Quality

Impact 3.8.1: Temporary Construction Emissions of Criteria Pollutants

Project construction activities could result in substantial short-term criteria pollutant emissions.

Mitigation Measure 3.8.1a: Construction Fugitive Dust Control Plan

The appropriate Member Agency shall require its contractor(s) to implement a dust control plan that shall include the following dust control procedures during construction as required by the BAAQMD:

- Water all active construction areas at least twice daily, taking into consideration temperature and wind conditions.
- Cover all trucks hauling soil, sand, and other loose materials *or* require trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways, consistent with **Mitigation Measure 3.1.2**, Erosion Control.
- Replant vegetation in disturbed areas as quickly as possible.

Mitigation Measure 3.8.1b: Construction Exhaust Emissions Control Plan

The appropriate Member Agency shall require its contractor(s) to implement an exhaust emissions control plan that shall include the following controls and practices:

- On road vehicles with a gross vehicular weight rating of 10,000 pounds or greater shall not idle for longer than five minutes at any location as required by Section 2485 of Title 13,

Division 3, Chapter 10, Article 1 of the California Code of Regulations. This restriction does not apply when vehicles remain motionless during traffic or when vehicles are queuing.

- Off road equipment engines shall not idle for longer than five minutes per Section 2449(d)(3) of Title 13, Division 3, Chapter 9, Article 4.8 of the California Code of Regulations. All vehicle operators shall receive a written idling policy to inform them of idling restrictions. The policy shall list exceptions to this rule that include the following: idling when queuing; idling to verify that the vehicle is in safe operating condition; idling for testing, servicing, repairing or diagnostic purposes; idling necessary to accomplish work for which the vehicle was designed (such as operating a crane); idling required to bring the machine to operating temperature as specified by the manufacturer; and idling necessary to ensure safe operation of the vehicle.

- Off road engines greater than 50 horsepower shall, at a minimum, meet Tier 2 emissions standards. When available, higher Tier engines shall be utilized.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement BAAQMD Basic Dust Control Measures. 2. Include exhaust controls in contractor specifications. 3. Implement exhaust control measures.	1. Incorporate in contract specifications and Sign-off on inspection report and/ or MMRP that measures are being implemented. 2. Review contract specifications. 3. Sign-off on inspection report and/ or MMRP.	1. Contractor 2. Contractor 3. Contractor	1. During Construction 2. Design and prior to construction 3. During Construction	Member Agency

Impact 3.8.4: Long term Increase in GHG Emissions

Project construction and operation would increase GHG emissions potentially interfering with the State's GHG reduction goals.

Mitigation Measure 3.8.1b: Construction Exhaust Emissions Control Plan

(see p. 3.8-22 above).

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.8.1b.	1. Review contract specifications.	1. Contractor	1. Design and During Construction	Member Agency

Noise

Impact 3.9.1: Temporary construction noise

Construction activity would violate standards established in the local general plans or noise ordinances, and/or would adversely affect nearby sensitive receptors.

Mitigation Measure 3.9.1

The appropriate Member Agency shall develop and implement a Construction Noise Reduction Plan that requires, at a minimum, the following:

- The contractor shall locate all stationary noise-generating equipment, including hammer bore and drill rigs, as far as possible from nearby noise-sensitive receptors. Stationary noise sources located within 500 feet of noise-sensitive receptors shall be equipped with noise reducing engine housings, and the line of sight between such sources and nearby sensitive receptors shall be blocked by portable acoustic barriers.

- The contractor shall assure that construction equipment with internal combustion engines have sound control devices at least as effective as those provided by the original equipment manufacturer. No equipment shall be permitted to have an un-muffled exhaust.

- All construction activities within unincorporated areas shall be limited to between the hours depending upon the jurisdiction.

- Residences and other sensitive receptors within 200 feet of a construction area shall be notified of the construction schedule in writing, at least two weeks prior to the commencement of construction activities. This notice shall indicate the allowable hours of construction activities as specified by the applicable local jurisdiction or as defined by this mitigation measure. The construction contractor shall designate a noise disturbance coordinator who would be responsible for responding to complaints regarding construction noise. The coordinator shall determine the cause of the complaint and ensure that reasonable measures are implemented to correct the problem. A contact number for the noise disturbance coordinator shall be conspicuously placed on construction site fences and entrances and included in the construction schedule notification sent to nearby residences and sensitive receptors.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Develop and Implement Construction Noise Reduction Plan. 2. Appropriately locate all stationary noise-generating equipment. 3. Use appropriate equipment.	1. Incorporate into contract specifications; sign-of on inspection report and/or MMRP. 2. Incorporate into contract specifications; sign-of on inspection report and/or MMRP.	1. Contractor 2. Contractor 3. Contractor 4. Contractor 5. Contractor 6. Contractor	1. Prior to and During Construction 2. During Construction 3. During Construction 4. During Construction	Member Agency

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
4. Limit construction activities to specified work hours. 5. Notify sensitive receptors of construction schedule. 6. Designate a noise disturbance coordinator.	3. Incorporate into contract specifications; sign-of on inspection report and/or MMRP. 4. Sign-of on inspection report and/or MMRP. 5. Sign-of on inspection report and/or MMRP. 6. Incorporate into contract specifications; sign-of on inspection report and/or MMRP.		5. At least two weeks Prior to Construction 6. Prior to Construction	

Impact 3.9.2: Temporary vibration impacts

Construction activities could expose sensitive receptors to excessive ground-borne vibration levels.

Mitigation Measure 3.9.2

The appropriate Member Agency will implement the following measure:

> The construction contractor shall use a trenchless technology (e.g., horizontal directional drill, lateral drilling, etc.) other than jack and bore when there are structures within 100 feet of the proposed activities. If the construction contractor provides the Member Agency with acceptable documentation indicating that alternative trenchless technology is not feasible for the crossing, the contractor shall develop and implement a Construction Vibration Mitigation Plan to minimize construction vibration damage using all reasonable and feasible means available, including siting the jack and bore as far a possible from all nearby structures. The plan shall provide a procedure for establishing thresholds and limiting vibration values for potentially affected structures based on an assessment of each structure's ability to withstand the loads and displacements due to construction vibrations. The plan should also include the development of a vibration monitoring plan to be implemented during construction of particular crossing.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement trenchless technology, when appropriate. 2. Develop a Construction Vibration Mitigation Plan in the event that trenchless technology is not feasible.	1. Incorporate into contract specifications. 2. Incorporate into contract specifications.	1. Contractor 2. Contractor	1. During Construction 2. Prior to and During Construction	Member Agency

Impact 3.9.3: Permanent Increases to Ambient Noise Levels

Operational activities could permanently generate noise levels above existing ambient levels in the vicinity of sensitive receptor locations.

Mitigation Measure 3.9.3

The appropriate Member Agency shall implement the following measure:

> All new pump stations shall be located within enclosed structures with adequate setback and screening to achieve acceptable regulatory noise standards for industrial uses as well as to achieve acceptable levels at the property lines of nearby residences, as determine by the applicable local jurisdiction. Noise enclosures shall be designed to reduce equipment noise levels by at least 20 dBA.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Enclose pump stations with screens.	1. Incorporate into construction specifications; Sign-off inspection report and/or MMRP.	1. Contractor/ Member Agency	1. Design and Prior to Construction	Member Agency

Hazards and Hazardous Materials

Impact 3.10.1: Exposure to Hazardous Materials

Project construction could expose workers and the public to hazardous materials that could be present in the soil or shallow groundwater encountered during excavation.

Mitigation Measure 3.10.1a

Project contract specifications shall require that, in the event that evidence of potential soil contamination such as soil discoloration, noxious odors, debris, or buried storage containers, is encountered during construction, the contractor will have a contingency plan for sampling and analysis of potentially hazardous substances, including use of a photoionization detector. The required handling, storage, and disposal methods shall depend on the types and concentrations of chemicals identified in the soil. Any site investigations or remediation shall comply with applicable laws and will coordinate with the appropriate regulatory agencies,

Mitigation Measure 3.10.1b

If unknown USTs are discovered during construction, the UST, associated piping, and impacted soil shall be removed by a licensed and experienced UST removal contractor. The UST and contaminated soil shall be removed in compliance with applicable county and state requirements governing UST removal.

Mitigation Measure 3.10.1c

Prepare a project-specific Health and Safety Plan that would apply to excavation activities. The plan shall establish policies and procedures to protect workers and the public from potential hazards posed by hazardous materials. The plan shall be prepared according to federal and California OSHA regulations and submitted to the appropriate agency with jurisdiction prior to beginning site activities.

Mitigation Measure 3.10.1d

Project contract specifications shall include a Dust Abatement Program to minimize potential public health impacts associated with exposure to contaminants in soil dust.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Require that in the event that evidence of potential soil contamination such as soil discoloration, noxious odors, debris, or buried storage containers, is encountered during construction, the contractor will have a contingency plan for sampling and analysis of potentially hazardous substances, including use of a photoionization detector. Any site investigations or remediation shall comply with applicable laws and will coordinate with the appropriate regulatory agencies. 2. Remove USTs, associated piping, and any impacted soil discovered during construction. 3. Prepare a project-specific Health and Safety Plan that would apply to excavation activities. The plan shall be prepared according to federal and California OSHA regulations and submitted to the appropriate agency with jurisdiction prior to beginning site activities. 4. Implement a Dust Abatement Program.	1. Incorporate requirement into construction specifications. 2. Incorporate requirement into construction specifications; Comply with applicable county and state requirements governing UST removal. 3. Incorporate plan requirements into construction specifications. 4. Incorporate program requirements into construction specifications.	1. Contractor/ Member Agency 2. Licensed UST Removal Contractor/ Member Agency 3. Member Agency 4. Member Agency	1. During Construction 2. During Construction 3. Prior to and During Construction 4. Prior to and During Construction	Member Agency

Impact 3.10.2: Release of Hazardous Materials During Construction

Project construction could increase the potential for accidental release of hazardous materials.

Mitigation Measure 3.10.2a

Consistent with the SWPPP requirements, the construction contractor shall be required to implement BMPs for handling hazardous materials onsite. The use of construction BMPs will minimize any adverse effects on groundwater and soils, and will include, but not limited to, the following:

- Follow manufacturers' recommendations and regulatory requirements for use, storage, and disposal of chemical products and hazardous materials used in construction;
- Spill control and countermeasures, including employee spill prevention/response training;
- Avoid overtopping construction equipment fuel gas tanks;
- During routine maintenance of construction equipment, properly contain and remove grease and oils; and
- Properly dispose of discarded containers of fuels and other chemicals.

Mitigation Measure 3.10.2b

The contractor shall follow the provisions of California Code of Regulations, Title 8, Sections 5163 through 5167 for General Industry Safety Orders to protect the project area from being contaminated by the accidental release of any hazardous materials and/or wastes. The local Certified Unified Program Agency (CUPA) will be contacted for any site-specific requirements regarding hazardous materials or hazardous waste containment or handling.

Mitigation Measure 3.10.2c

Oil and other solvents used during maintenance of construction equipment shall be recycled or disposed of in accordance with applicable regulatory requirements. All hazardous materials shall be transported handled, and disposed of in accordance with applicable regulatory requirements.

Mitigation Measure 3.10.2d

In the event of an accidental release of hazardous materials during construction, containment and clean up shall occur in accordance with applicable regulatory requirements.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement BMPs for handling hazardous materials onsite. 2. Protect the project area from being contaminated by the accidental release of any hazardous materials and/or wastes. Contact the local CUPA agency for any site-specific requirements regarding hazardous materials or hazardous waste containment or handling. 3. Recycle or dispose of oil and other solvents used during maintenance of construction equipment in accordanco with applicable regulatory requirements. 4. Contain and clean up accidental releases of hazardous materials.	1. Incorporate BMPs into construction specifications; sign-off on inspection report and/or MMRP. 2. Incorporate provisions into the construction specifications. Comply with the provisions of California Code of Regulations, Title 8, Sections 5163 through 5167 for General Industry Safety Orders. Coordinata with CUPA agency and comply with their recommendations. 3. Incorporate requirement into construction specifications; Comply with regulatery requirements. 4. Incorporate requirement into construction specifications; Comply with regulatory requirements.	1. Contractor/ Member Agency 2. Member Agency 3. Member Agency 4. Member Agency	1. During Construction 2. Prior to construction 3. During construction 4. During Construction	Member Agency

Impact 3.10.4: Wildland Fire Hazard

Construction activities in grassland areas could have the potential to expose people or equipment to risk of loss, injury, or death involving wildland fires.

Mitigation Measure 3.10.4a

For applicable Member Agencies, in consultation with local fire agencies, a Fire Safety Plan will be developed for each of the service areas associated with the project. The Fire Safety Plan(s) will describe various potential scenarios and action plans in the event of a fire.

Mitigation Measure 3.10.4b

For applicable Member Agencies, during project construction, all staging areas, welding areas, or areas slated for development using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Any construction equipment that includes a spark arrestor shall

be equipped with a spark arrestor in good working order. All vehicles and crews working at the project site(s) will have access to functional fire extinguishers at all times. In addition, construction crews will be required to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Develop Fire Safety Plan. 2. Clear all staging areas, welding areas, or areas slated for development using spark-producing equipment of dried vegetation or other material that could ignite. Equip construction equipment a spark arrestor in good working order. All vehicles and crews working at the project site(s) will have access to functional fire extinguishers at all times. Require construction crews to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks.	1. Incorporate Fire Safety Plan into construction specifications. 2. Incorporate measures into construction specifications; sign-off on inspection report and/or MMRP.	1. Member Agency 2. Contractor/ Member Agency	1. Prior to Construction 2. During Construction	LGVSD/NMWD, Novato SD/NMWD

Public Services and Utilities

Impact 3.11.1: Temporary Effect on Response Times for Emergency Service Providers

Project construction activities could temporarily affect response times for emergency service providers.

Mitigation Measure 3.11.1

The Member Agencies will coordinate with local emergency service providers in its service area to inform them of the proposed construction activities and schedule, and provide temporary alternate access routes around construction areas as necessary.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Coordinate with local emergency providers to inform them of the proposed construction activities and schedule. 2. Provide alternate routes for emergency service providers around construction areas as necessary.	1. Incorporate into contract specifications 2. Sign-off on inspection report and/or MMRP	1. Member Agency/ Contractor 2. Contractor	1. Prior to construction 2. During Construction	Member Agency

Impact 3.11.2: Short-term Police and Fire Assistance

Project construction activities could require short-term police and fire protection services to assist in traffic management or in the event of an accident.

Mitigation Measure 3.11.2

Public service providers shall provide, upon request, a copy of the Traffic Control Plan to the related police and fire agencies for their review prior to construction. The appropriate Member Agency shall provide 72-hour notice to the local service providers prior to construction of individual pipeline segments. Discussion on the Traffic Control Plan is provided in Section 3.7, Traffic and Circulation.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Provide Traffic Control Plan to local emergency service providers for review. 2. Provide notice to local fire and police agencies to notify them of construction of individual segments of pipeline.	1. Sign-off on inspection report and/or MMRP. 2. Sign-off on inspection report and/or MMRP.	1. Contractor 2. Member Agency/ Contractor	1. Prior to Construction 2. 72 hours Prior to Construction at each site.	Member Agency

Impact 3.11.3: Temporary Accidental Disruption to Utility Services

Project construction could result in temporary planned or accidental disruption to utility services.

Mitigation Measure 3.11.3

The Member Agencies will identify utilities along the proposed pipeline routes and project sites prior to construction and implement the following measures:

a. Utility excavation or encroachment permits shall be obtained as required from the appropriate agencies. These permits include measures to minimize utility disruption. The service provider and its contractors shall comply with permit conditions regarding utility disruption.

b. Utility locations shall be verified through the use of the Underground Service Alert services and/or field survey (potholing).

c. As necessary, detailed specifications shall be prepared as part of the design plans to include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services shall be notified of construction plans and schedule. Arrangements shall be made with these entities regarding protection, relocation, or temporary disconnection of services.

d. In areas where the pipeline would traverse parallel to underground utility lines within five feet, the project applicant shall employ special construction techniques, such as trench wall-support measures to guard against trench wall failure and possible resulting loss of structural support for the excavated areas.

e. Residents and businesses in the project corridor shall be notified of any planned utility service disruption two to four days in advance, in conformance with county and state standards.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Acquire utility excavation or encroachment permits. 2. Verify utility locations using Underground Service Alert services and/or field survey. 3. Include procedures for excavation, support, and fill of areas around utility cables and pipes. 4. Coordinate with affected local utility services to notify them of the proposed construction activities and schedule. 5. Implement special construction techniques, as needed. 6. Notify residents and businesses in advance to inform them of proposed construction activities and schedule.	1. Comply with regulatory permit, Copies of approved permits will be available onsite. 2. Incorporate into contract specifications. 3. Incorporate in design and contract specifications 4. Incorporate into contract specifications; sign-off on inspection report and/or MMRP 5. Sign-off on inspection report and/or MMRP 6. Sign-off on inspection report and/or MMRP	1. Contractor/ Member Agency 2. Contactor 3. Contractor 4. Contractor/ Member Agency 5. Contractor 6. Contractor/ Member Agency	1. Prior to Construction 2. Prior to Construction 3. Prior to Construction 4. Prior to Construction 5. During Construction 6. Prior to Construction	Member Agency

Cultural Resources

Impact 3.12.1: Impact to Cultural Resources/Archaeological Sites

Project construction could affect existing cultural resources or uncover unknown and/or buried archaeological materials in areas of high prehistoric archaeological sensitivity.

Mitigation Measure 3.12.1

The standard Section 106 process outlined at 36 CFR Part 800 will be completed prior to supplying Federal funds to be used for construction of any facilities for the project. This includes all construction money that involves whole or in partial financing and includes both payment in advance or in reimbursement.

If project circumstances are such that it is infeasible to implement the measures identified below, a phased identification and evaluation strategy that accounts for the individual project effects will be developed in accordance with the procedures for doing so detailed in 36 CFR Part 800.4(b)(2). The alternative procedures would provide a similar level of accounting regarding the effects to cultural resources in a manner not inconsistent with the standard process provided for at 36 CFR Part 800. The alternative procedures agreed to in the Programmatic Agreement would need to be completed prior to construction of any actions that are subsidized with Federal funds. Pursuant to the Section 106 process, the appropriate Member Agency will incorporate the following measures:

Mitigation Measure 3.12.1a: Prepare a Cultural Resources Monitoring Plan

Prior to authorization to proceed, or issuance of permits, the applicant shall prepare and submit a cultural resources monitoring plan to the appropriate jurisdiction for review and approval. Monitoring shall be required for all surface alteration and subsurface excavation work including trenching, boring, grading, use of staging areas and access roads, and driving vehicles and equipment within all areas delineated as sensitive for cultural resources. A qualified professional archaeologist (cultural resources monitor) that is approved by each Member Agency in consultation with all affected jurisdictions shall prepare the plan. The plan shall address (but not be limited to) the following issues:

- Training program for all construction and field workers involved in site disturbance;
- Person(s) responsible for conducting monitoring activities, including Native American monitors;
- How the monitoring shall be conducted and the required format and content of monitoring reports, including any necessary archaeological re-survey of the final pipeline alignment (including the need to conduct shovel-test units or auger samples to identify deposits in advance of construction), assessment, designation and mapping of the sensitive cultural

resource areas on final project maps, assessment and survey of any previously unsurveyed areas;

- Person(s) responsible for overseeing and directing the monitors;
- Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports;
- Procedures and construction methods to avoid sensitive cultural resource areas (i.e. boring conduit underneath recorded or discovered cultural resource site);
- Clear delineation and fencing of sensitive cultural resource areas requiring monitoring;
- Physical monitoring boundaries (e.g., 200-foot radius of a known site);
- Protocol for notifications in case of encountering of cultural resources, as well as methods of dealing with the encountered resources (e.g., collection, identification, curation);
- Methods to ensure security of cultural resources sites;
- Protocol for notifying local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction.

Mitigation Measure 3.12.1b: Archaeological and Native American Monitoring

If an intact archaeological deposit is encountered, all soil disturbing activities in the vicinity of the deposit shall cease until the deposit is evaluated. The appropriate Member Agency, as necessary, shall retain the services of a Native American monitor and a qualified archaeological consultant that has expertise in California prehistory to monitor ground-disturbing within areas designated as being sensitive for buried cultural resources. The archaeological monitor shall immediately notify the appropriate Member Agency of the encountered archaeological deposit. The monitors shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, present the findings of this assessment to NBWRA and the appropriate Member Agency. During the course of the monitoring, the archaeologist may adjust the frequency—from continuous to intermittent—of the monitoring based on the conditions and professional judgment regarding the potential to impact resources.

If a Member Agency, in consultation with the monitors, determines that a significant archaeological resource is present within their jurisdiction and that the resource could be adversely affected by the NBWRP, the Member Agency shall:

- Re-design the NBWRP to avoid any adverse effect on the significant archaeological resource; *or*,
- Implement an archaeological data recovery program (ADRP) (unless the archaeologist determines that the archaeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible). If the circumstances warrant an archaeological data recovery program, an ADRP shall be conducted. The project

archaeologist and the Member Agency shall meet and consult to determine the scope of the ADRP. The archaeologist shall prepare a draft ADRP that shall be submitted to the appropriate Member Agency for review and approval. The ADRP shall identify how the proposed data recovery program would preserve the significant information the archaeological resource is expected to contain. The ADRP shall identify the scientific/historic research questions applicable to the expected resource, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, shall be limited to the portions of the historic property that could be adversely affected by NBWRP. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical.

Mitigation Measure 3.12.1c: Cultural Resources Assessment for Staging Areas

When locations for staging are defined the areas of potential effect should be subject to a cultural resources investigation that includes, at a minimum:

- An updated records search at the Northwest Information Center;
- An intensive survey of all areas within the lots;
- A report disseminating the results of this research; and,
- Recommendations for additional cultural resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered cultural resources.

Mitigation Measure 3.12.1d: Inadvertent Discoveries

If discovery is made of items of historical or archaeological interest, the contractor shall immediately cease all work activities in the area (within approximately 100 feet) of discovery. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. After cessation of excavation the contractor shall immediately contact the NBWRA and appropriate Member Agency. The contractor shall not resume work until authorization is received from the appropriate Member Agency.

- In the event of unanticipated discovery of archaeological indicators during construction, the Member Agency shall retain the services of a qualified professional archaeologist to evaluate the significance of the items prior to resuming any activities that could impact the site.
- In the case of an unanticipated archaeological discovery, if it is determined that the find is unique under the National Historic Preservation Act (NHPA) and/or potentially eligible for listing in the National Register, and the site cannot be avoided, appropriate Member

Agency shall provide a research design and excavation plan, prepared by an archaeologist, outlining recovery of the resource, analysis, and reporting of the find. The research design and excavation plan shall be submitted to NBWRA and appropriate Member Agency and approved by the appropriate Member Agency prior to construction being resumed.

Mitigation Measure 3.12.1e: Project-level Cultural Resources Assessment

When project-level plans are completed for the Basic System; the Partially Connected System; and the Fully Connected System, NBWRA the appropriate Member Agency will conduct a cultural resources investigation for the APE that includes, at a minimum:

- An updated records search at the Northwest Information Center (NWIC);
- An intensive cultural resources survey of the Area of Potential Effect (APE);
- A report disseminating the results of this research; and,
- Recommendations for additional cultural resources work necessary to mitigate any adverse impacts to recorded and/or undiscovered cultural resources.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Prepare Cultural Resources Monitoring Plan. 2. Moniter predetermined culturally sensitive areas; cease work if cultural artifacts or humans remains are discovered. 3. Conduct cultural resources investigation for staging areas. 4. Cease work within 100 feet of a find and inform the appropriate Member Agency in the event of an inadvertent discovery of cultural resources. 5. Conduct a project-level Cultural Resources Assessment for program-level areas.	1. Incorporate into contract specifications. 2. Incorporate into contract specifications, and make recommendations for design modification if necessary. 3. Incorporate into contract specifications. 4. Copies of DPR 422 or 523 shall be retained in Member Agency files; incorporate recommendations for design modification if necessary. 5. Incorporate into contract specifications, and make recommendations for design modification if necessary.	1. Qualified Archaeologist 2. Qualified Archaeologist and Native American Monitor 3. Qualified Archaeologist 4. Contractor/ Member Agency 5. Qualified Archaeologist	1. Prior to Construction 2. During Construction 3. Prior to Construction 4. During Construction 5. Following Project Design; Prior to Construction	Member Agency

Impact 3.12.2: Discovery of Human Remains

Project construction could result in damage to previously unidentified human remains.

Mitigation Measure 3.12.2: Discovery of Human Remains

If potential human remains are encountered, the appropriate Member Agency shall halt work in the vicinity of the find and contact the county coroner in accordance with Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner shall contact the Native American Heritage Commission (NAHC). As provided in Public Resources Code Section 5097.98, the NAHC shall identify the person or persons believed to be most likely descended from the deceased Native American. The most likely descendent makes recommendations for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. In the event of discovery of human remains, cease work and contact county coroner and NAHC if necessary.	1. Sign-off on inspection report and/ or MMRP; coordinate with NAHC.	1. Contractor/ Member Agency	1. During Construction	Member Agency

Recreation

Impact 3.13.1: Temporary Disturbance

Project construction could result in short-term disturbance adjacent to recreational facilities.

Mitigation Measure 3.13.1a

The appropriate Member Agency shall coordinate with the appropriate local and regional agencies to identify detour routes for the bikeways and trails during construction where feasible, as part of the Traffic Control/Traffic Management Plan (see **Measure 3.11.1a**).

Mitigation Measure 3.13.1b

Implement Mitigation Measures 3.8-1a through 3.8.1b, and Mitigation Measures 3.9-1 through 3.9-3.

Mitigation Measure 3.13.2

Before beginning construction, the contractor will develop, in consultation with the appropriate representative(s) of the affected park's managing agency, a plan indicating how public access to the park will be maintained during construction. If needed, flaggers will be stationed near the

construction activity area to direct and assist members of the public around the activity areas while maintaining access to the parks.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Identify and establish detours for disrupted bikeways and trails. 2. Maintain public access; station flaggers to assist in directing public. 3. Implement Mitigation Measure 3.8.1a. 4. Implement Mitigation Measure 3.8.1b. 5. Implement Mitigation Measure 3.9.1. 6. Implement Mitigation Measure 3.9.2. 7. Implement Mitigation Measure 3.9.3.	1. Coordination with local and regional agencies. 2. Coordination with local and regional agencies. 3. Incorporate in contract specifications and Sign-off on inspection report and/ or MMRP that measures are being implemented. 4. Review contract specifications. 5. Incorporate into contract specifications; sign-of on inspection report and/or MMRP. 6. Incorporate into contract specifications. 7. Incorporate into contract specifications; sign-of on inspection report and/or MMRP.	1. Contractor/ Member Agency 2. Contractor/ Member Agency 3. Contractor 4. Contractor 5. Contractor 6. Contractor 7. Contractor/ Member Agency	1. Prior to and During Construction 2. Prior to and During Construction 3. Design and Prior to Construction 4. Design and prior to Construction 5. Prior to and During Construction 6. Prior to and During Construction 7. Design and Prior to Construction	Member Agency

Aesthetics

Impact 3.14.1: Temporary Impact to Scenic Vistas

NBWRP construction activities could temporarily affect scenic vistas or corridors in the NBWRP area.

Mitigation Measure 3.14.1a

Following construction activities, disturbed areas shall be restored to baseline conditions, including repaving roadways, replanting trees, and/or reseeding with a native seed mix typical of the immediately surrounding area.

Mitigation Measure 3.14.1b

Berms around constructed reservoirs shall be vegetated with native seed mixes to soften the visual effect of the reservoirs from adjacent roadways.

Mitigation Measure 3.14-1c

Design elements shall be incorporated to enhance visual integration of the booster pump station and distribution pump station with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain. Highly reflective building materials and/or finishes shall not be used in the designs for proposed facilities.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Restore disturbed areas to baseline conditions by repaving, replanting, and reseeding land. 2. Incorporate buffers, integrate natural design elements, and use appropriate building materials.	1. Inspect final site conditions after construction and verify its condition is it equivalent to that prior to construction. Incorporated into construction specifications. 2. Review construction specifications.	1. Contractor/ Member Agency 2. Contractor	1. After Construction 2. Design and During Construction	Member Agency

Impact 3.14.2: Impact to Views Along Scenic Roadways

Implementation of NBWRP could affect views along eligible or designated Caltrans Scenic Highways, or locally-defined scenic routes.

Mitigation Measures

The appropriate Member Agency will implement the following measures:

Mitigation Measure 3.14.1a
Mitigation Measure 3.14.1b

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.14.1a. 2. Implement Mitigation Measure 3.14.1b.	1. Review construction specifications. 2. Review construction specifications and landscape design.	1. Contractor/ Member Agency 2. Contractor	1. After Construction 2. Design and During Construction	Member Agency

Impact 3.14.3: Source of Light or Glare

NBWRP components could introduce new sources of light and glare on the project sites.

Mitigation Measures

The appropriate Member Agency will implement the following measures:

Mitigation Measure 3.14.3a: The exterior lighting installed around the operational and capacity storage reservoirs, distribution pump station, storage tanks, and booster pump station shall be of a minimum standard required to ensure safe visibility. Lighting also shall be shielded and directed downward to minimize impacts of light and glare.

Mitigation Measure 3.14.3b: All exterior lighting is directed downward and oriented to insure that limited light source is directly visible from neighboring residential areas. If necessary, landscaping would be provided around proposed facilities. The vegetation would be selected, placed, and maintained to minimize off-site light and glare onto surrounding areas.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Incorporate shielded, downward-oriented, low intensity light sources in design. 2. Plant vegetation to act as a natural buffer around areas that require lighting.	1. Review construction specifications. 2. Review construction specifications.	1. Member Agency 2. Member Agency	1. During Design 2. During Design and After Construction	Member Agency

Impact 3.14.4: Long-term Impact to Aesthetic Character

Development of the proposed facilities, particularly pump stations and storage reservoirs, would permanently alter the aesthetic character of the project area.

Mitigation Measures

The appropriate Member Agency will implement the following measures:

Mitigation Measure 3.14.4a: After construction of any facility that is above grade and visible to sensitive receptors, visual screening and vegetation measures will be implemented to reduce impacts to scenic views. Trees or other suitable vegetation along the fenceline of the facility should be incorporated to reduce the industrial appearance of the structures. Similarly, berms for new storage ponds or pond reconfiguration will be re-vegetated to reduce the barren appearance of the berms.

Mitigation Measure 3.14.4b: Dark colored, non-reflective building materials should be used for project components that cause potentially significant impact from glare to visual resources.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Install screens and vegetation, and trees along fenceline; seed reconfigured berms with native grasses. 2. Integrate natural design elements, and use appropriate building materials.	1. Review construction specifications and landscape design. 2. Review construction specifications.	1. Contractor/ Member Agency 2. Contractor/ Member Agency	1. Design and After Construction 2. Design and During Construction	Member Agency

Cumulative Impacts

Impact 4.1. Construction-related Cumulative Impacts.

Concurrent construction of several projects within the Sonoma, Napa, and Marin County areas could result in cumulative short-term impacts associated with construction activities. If implemented at the same time as other construction projects, construction of facilities under all three of the alternatives could contribute to potential short-term cumulative effects associated with erosion, cultural resource disturbance, disturbance of adjacent land uses, traffic disruption, dust generation, construction noise, aesthetics, air quality, biological resources, hazardous materials, water quality, public services and utilities. However, construction-related impacts would not result in long term alteration of the environment, and could be mitigated to less than significant levels through the use of mitigation measures identified throughout Chapter 3 of the Draft EIR.

Mitigation Measure

The appropriate Member Agency will implement the following measure:

> **Mitigation Measure 4.1a:** Member Agencies shall coordinate construction activities along selected alignments to identify overlapping pipeline routes, project areas, and construction schedules. To the extent feasible, construction activities shall be coordinated to consolidate the occurrence of short-term construction-related impacts.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Coordinate construction activities to identify overlapping routes and construction schedules.	1. Incorporate into contract specifications.	1. Member Agency	1. Prior to Construction	Member Agency

Impact 4.5

Concurrent construction of NBWRP with other projects proposed in the Sonoma, Napa, and Marin County area, and other water and wastewater infrastructure projects, could result in cumulative long-term impacts to biological resources.

Mitigation Measures

Mitigation Measures in Section 3.5.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Implement Mitigation Measure 3.5.1. 2. Implement Mitigation Measure 3.5.2. 3. Implement Mitigation Measure 3.5.3. 4. Implement Mitigation Measure 3.5.5. 5. Implement Mitigation Measure 3.5.6. 6. Implement Mitigation Measure 3.5.9.	1. Comply with regulatory permit; Sign-off on inspection report and/ or MMRP. 2. Comply with regulatory permit; Sign-off on inspection report and/ or MMRP. 3. Comply with regulatory permit; Sign-off on inspection report and/ or MMRP. 4. Comply with regulatory permit; Sign-off on inspection report and/ or MMRP. 5. Comply with regulatory permit; Sign-off on inspection report and/ or MMRP. 6. Incorporate into contract specifications.	1. Member Agency/ Contractor 2. Member Agency/ Contractor 3. Member Agency/ Contractor 4. Member Agency/ Contractor 5. Member Agency/ Contractor 6. Contractor/ Qualified Biologist	1. Prior to and During Construction 2. Prior to and During Construction 3. Prior to and During Construction 4. Prior to and During Construction 5. Prior to and During Construction 6. Prior to and During Construction	Member Agency

Growth Inducement and Secondary Effects of Growth

Impact 5.1. Direct and Indirect Impacts on Growth.

NBWRP would provide recycled water for urban, agricultural, and environmental uses, and as such, would contribute to the provision of adequate water supply to support a level of growth that is consistent with the amount planned and approved within the General Plans of Marin, Sonoma and Napa Counties. No appreciable growth in population or employment would occur as a direct result of construction or operation of the proposed facilities. However, development under the General Plans accommodated by the proposed project would result in secondary environmental

effects, which include effects that would be significant and unavoidable. No additional impacts are anticipated beyond those identified in General Plan EIRs for each County.

Mitigation Measure 5.1a

In order to maintain consistency with the Napa County General Plan, Napa County and Napa SD will approve the MST Local Options 1 and/or 2. This will provide approximately 530 AFY of recycled water that would be available for the existing users in the MST area. Trunk facilities may accommodate service of up to 1,400 AFY of service to existing agricultural irrigators only. Any expansion of service beyond the 1,400 AFY or provision of service to new land uses would be subject to approval by the County Planning Department and the Napa County Board of Supervisors.

Implementation Procedure	Monitoring and Reporting Actions	Monitoring Responsibility	Monitoring Schedule	Responsible Agency
1. Conduct additional land use and CEQA analysis prior to service to un-irrigated parcels or beyond above 1400 AFY.	1. CEQA approval process.	1. Napa County and Napa SD	1. Prior to Project Approval	Napa County/ Napa SD

APPENDIX 3

NBWRP EIR/EIS Federal Regulatory Consultation

a. United States Fish and Wildlife Service Biological Opinion on the Proposed North San Pablo Bay Restoration and Reuse Project in Marin, Sonoma, and Napa Counties, California, Reference No. 81420-2009-F-1272-2, July 2010.

b. National Marine Fisheries Service, Consultation Letter of Concurrence, Reference No 2009/04759:AEM, May 6, 2010.

c. Biological Assessment/Fisheries Biological Assessment for the North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program), Prepared by Environmental Science Associates (ESA), August 2009.

d. Agreement for Sale of Ohlone Mitigation Bank Conservation Credits, May 17, 2011.

e. California State Historic Preservation Officer, Letter Regarding North Bay Water Reuse Authority Phase 1 Project, Marin, Sonoma, and Napa Counties, California, Project No. 09-CCAO-132, Reference No. BUR110214A, March 21, 2011

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APPENDIX 3a

United States Fish and Wildlife Service Biological Opinion on the Proposed North San Pablo Bay Restoration and Reuse Project in Marin, Sonoma, and Napa Counties, California, Reference No. 81420-2009-F-1272-2, July 2010

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
81420-2009-F-1272-2

Memorandum

To: Regional Environmental Officer, Mid-Pacific Region, Bureau of Reclamation, Sacramento, California (Attn: Doug Kleinsmith)

From: for Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Biological Opinion on the Proposed North San Pablo Bay Restoration and Reuse Project in Marin, Sonoma, and Napa Counties, California

This is in response to the Bureau of Reclamation's (Reclamation) August 25, 2009, request for concurrence from the U.S. Fish and Wildlife Service (Service) that the proposed North San Pablo Bay Restoration and Reuse Project in Marin, Sonoma, and Napa Counties, California is not likely to adversely affect the endangered soft birds-beak (*Cordylanthus mollis mollis*) (bird's-beak), endangered showy Indian clover (*Trifolium ameonum*) (clover), endangered California freshwater shrimp (*Syncaris pacifica*) (shrimp), threatened California red-legged frog (*Rana aurora draytonii*) (California red-legged frogs), threatened western snowy plover (*Charadrius alexandrinus nivosus*) (plover), California black rail (*Laterallus jamaicensis coturniculus*) (black rail), endangered California clapper rail (*Rallus longirostris obsoletus*) (clapper rail), and endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) (harvest mouse). Your request was received by the Service on August 28, 2009. In addition, we are concerned about the potential effects of the proposed action on the endangered California least tern (*Sternula antillarum browni*), endangered Contra Costa goldfields (*Lasthenia conjugens*) (goldfields), endangered Sonoma sunshine (*Blennosperma bakeri*), and endangered Sebastopol meadowfoam (*Limnanthes vinculans*) (meadowfoam). The black rail is not Federally listed as threatened or endangered, thus it will not be addressed further in this document. This document is issued under the authority of the Endangered Species Act, as amended (16 U.S.C. § 1531 *et seq.*) (Act).

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the plover. The proposed action may affect, but is not likely to adversely affect the least tern. This is based on the following factors:

1. Project activities will not degrade or remove any suitable habitat for these species.

TAKE PRIDE IN AMERICA

2. During the plover nesting season (March 1 through September 15), no project related activities will be conducted within 500 feet sites known to be used by plovers for nesting.

3. During the least tern nesting season (April 15 through September 15), no project related activities will be conducted within 500 feet of sites known to be used by least terns for nesting.

4. Specifically, no project related activities will be conducted from March 1 through September 15 within 500 feet of the levee between ponds 7 and 7a.

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the shrimp. Our concurrence is based on the following factor:

1. Project related activities will not disturb any undercut stream banks, emergent vegetation, or overhanging vegetation that is suitable to the shrimp because all stream crossings will be accomplished using trenchless techniques.

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the bird's-beak and clover. We also believe the proposed action may affect, but is not likely to adversely affect the goldfields, Sonoma sunshine, and meadowfoam. This is based on the following factor:

1. Although potential vernal pool habitat and historical and extant occurrence of Sonoma sunshine, meadowfoam, and goldfield exist near the proposed pipeline route near Arnold Drive in Sonoma County and potential habitat for the bird's-beak and clover exist in near the pipeline route in the Napa-Sonoma Marsh restoration area, appropriately timed protocol level rare plant surveys will be completed for all areas subject to project related activities. If listed plants are found, no project related activities will occur that may affect them and Reclamation will reinitiate consultation with the Service.

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the clapper rail. Our concurrence is based on the following factors:

1. Project activities will not degrade or remove any suitable habitat for this species.

2. During the clapper rail nesting season (February 1 through September 1), no project related activities will be conducted within 500 feet of potential clapper rail habitat.

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the harvest mouse. Our concurrence is based on the following factors:

1. An isolated strip (2 feet wide) of pickleweed habitat (0.14 acre) will be temporarily disturbed as a result of project related activities near ponds 7 and 7a. This strip of pickleweed habitat is unlikely to support the harvest mouse due to its narrow linear configuration and because it is surrounded by unvegetated habitat.

2. All vegetation within salt marsh habitat will be removed by hand.

3. Exclusion fencing will be erected between all project related activities and adjacent salt marsh habitat to prevent harvest mice from entering the project area.

4. Project related activities adjacent to salt marsh habitat will not occur during extreme high tide events to ensure upland refugial habitat for the harvest mouse is available during these times.

We do not concur with your determination that the proposed action may affect, but is not likely to adversely affect the California red-legged frogs. Suitable foraging, upland dispersal, and refugial habitat for this species are found within the action area and suitable breeding habitat, unobstructed by barriers, is located within the known dispersal distance of the species. This document represents the Service's biological opinion on the effects of the proposed action on the California red-legged frogs.

This biological opinion is based on: (1) the North San Pablo Bay Restoration and Reuse Project Biological Assessment (BA) dated August 2009; (2) a revised project description provided to the Service by ESA on January 22, 2010; (3) various telephone and email correspondence between the Service, ESA, and Reclamation; (4) a site visit attended by the Service, ESA, and the Sonoma County Water Agency (SCWA); and (5) other information available to the Service.

Consultation History

August 28, 2009:	The Service received the BA and the letter from Reclamation requesting our concurrence with their determinations.
October 29, 2009:	The Service attended a telephone call with ESA to discuss pipeline routes, the potential presence of listed species, and minimization and avoidance measures.
December 16, 2009:	The Service emailed ESA a list of discussion issues, and provided ESA information regarding tern nesting at the Napa Salt Marsh Restoration Area.
December 22, 2009:	The Service attended a telephone conference call with ESA, Reclamation, and SCWA to discuss the format of the biological opinion.
December 22, 2009:	The Service left a telephone message with ESA indicating that a specific pipeline routes would need to be chosen.
January 8, 2010:	The Service met with ESA to discuss minimization and avoidance measures, potential presence of listed species, and pipeline alignment alternatives.
January 11, 2009:	The Service provided ESA with additional information regarding tern and plover nesting on the levee between ponds 7 and 7a.

January 12, 2010:	The Service attended a site visit with ESA and SCWA.
January 22, 2010:	The Service received an updated project description from ESA.
January 26, 2010	The Service discussed the conversion of 24 acres of vineyard to a storage pond with ESA.
February 24, 2010	The Service raised concerns with ESA about indirect effects of land use conversion on listed species and a change in the project description that would ensure all future recycled water hookups would be compliant with the Act.
March 19, 2010	The Service met with representative from Reclamation to discuss indirect effects of the proposed project and changing the project description.
May 9, 2010	Reclamation sent an email to the Service agreeing with the project description.

BIOLOGICAL OPINION

Description of the Proposed Action

The purpose of the North Bay Water Recycling Program (NBWRP) is to provide recycled water for agricultural, urban, and environmental uses, which will reduce the need for local and imported surface and groundwater and reduce the amount of treated effluent water released into San Pablo Bay. The NBWRP was established under a Memorandum of Understanding in August 2005, between the Las Gallinas Valley Sanitary District (LGVSD), Novato Sanitary District (Novato SD), Sonoma Valley County Sanitation District (SVCSD), Napa Sanitation District (Napa SD), and Sonoma County Water Agency (SCWA). Additional agencies supporting the NBWRA through contribution of funds and staff time include North Marin Water District (NMWD) and Napa County.

Title XVI of Public Law 102-575, as amended, provides a mechanism for Federal participation and cost-sharing in water reuse projects. Through PL 111-11, Congress authorized the NBWRP for construction as a Title XVI project and authorized the Secretary of the Interior, acting through the Bureau of Reclamation, to fund the planning, design, and construction of the NBWRP. Reclamation will fund the associated Federal cost share of the construction activities of the NBWRP beginning in Federal fiscal year 2010. The NBWRP consists of local projects to be implemented by each of the member agencies, as described below.

The NBWRP project area extends approximately 10 to 15 miles inland from San Pablo Bay within Marin, Sonoma, and Napa Counties, from Point San Pedro in Marin County to Milliken Canyon located 28 miles to the northeast in eastern Napa County, and encompasses about 318 square miles of land. Urban centers in the action area are San Rafael and Novato in Marin County, the City of Sonoma in Sonoma County, and the City of Napa in Napa County. The topography of the action area consists of gently sloping river valleys, separated by northwest

trending mountain ranges with steep slopes and peaks exceeding elevations of 2,500 feet above mean sea level. Flat lying mudflats and marshlands border San Pablo Bay. The majority of the action area is within Napa, Sonoma, and Novato Valleys and the foothills bounding these valleys.

Napa SD: Milliken, Sarco, and Tulucay Creeks Service Area

Project actions within the Milliken, Sarco, and Tulucay Creeks (MST Creeks) Service Area would include expansion of the Napa SD Waste Water Treatment Plant's (WWTP) tertiary treatment capacity by 4.5 million gallons per day. This would include expansion of the filtration system by installing parallel filter cells adjacent to the existing filter building and the construction of a new booster pump station at the Napa SD Soscol WWTP; construction of four new booster pump stations constructed along existing roadways, and the construction of approximately 16.6 miles of new distribution pipeline in existing roadways. A looped system using existing roadways would be constructed, with one segment extending west along First Avenue and the second segment extending east along Third Avenue; both segments would then merge along Hagen Road north of the Napa Valley Country Club. Pump stations would be located on Imola Avenue, Wild Horse Valley Road, East 3rd Avenue, and 3rd Avenue. Pipeline installation would include the following roadways: Imola Avenue, 4th Avenue, Kreuzer Lane, Coombsville Road, Wild Horse Road, First Avenue, North 3rd Avenue, Second Avenue, Third Avenue, East 3rd Avenue, North Avenue, Olive Hill Lane, Loma Heights Road, Hagen Road. Pipelines would be installed within the roadway; based on field reconnaissance, approximately 0.1 mile of the pipeline routes would be located off-road, within the road shoulder. The potential disturbance of undeveloped areas and roadside vegetation was estimated based on a 25 foot construction easement, and assumed that construction would extend to the roadway right of way fence line. Based on field reconnaissance and aerial photos, potential disturbance of vegetation within potential California red-legged frogs habitat is estimated at 0.32 acre (Table 1).

SVCSD: Sonoma Valley Recycled Water Project (SVRWP) Service Area

Actions in the SVRWP Service Area would include the construction of additional 62 acre-feet of storage on a 24 acre site that currently supports vineyard adjacent to and north of the existing SVCSD WWTP, construction of a pump station within the WWTP fenceline, installation of approximately 5.2 miles of new pipeline in western Sonoma Valley. The pipeline would originate from the SVCSD WWTP, extend southwest to Highway 12 along existing property lines and driveways, cross Highway 12, then extend west and northwest through vineyard and an open space area to Arnold Drive. The pipeline would continue north on Arnold Drive, and end just north of Leveroni Road. Secondary pipelines or segments would extend from the main pipeline on the following roadways: Highway 116, Watmaugh Road, and Leveroni Road. Pipelines would be installed within the roadway; based on field reconnaissance, approximately 3.7 miles of the pipeline routes would be located off-road within SVCSD's existing easement, which traverses private property, and includes both vineyard and undeveloped areas. The potential disturbance of undeveloped areas and roadside vegetation was estimated based on a 25 foot construction easement, and assumed that construction would extend to the roadway right of way fence line. Based on field reconnaissance and aerial photos, potential disturbance of vegetation within potential California red-legged frogs habitat is estimated at 4.9 acres (Table 1).

SVCSD: Napa Salt Marsh Restoration Area

The California Coastal Conservancy, U.S. Army Corps of Engineers, and California Department of Fish and Game have proposed and are implementing a salinity reduction and habitat restoration project for the 9,460-acre Napa River Unit of the Napa-Sonoma Marshes Wildlife Area. The Napa River Unit is located at the northeast edge of San Pablo Bay, adjacent to the Napa River. Actions in the Napa Salt Marsh Restoration Area include the construction of a pipeline to provide recycled water to ponds 7 and 7a for habitat enhancement, construction of 8.3 miles of new pipeline and the replacement of 0.6 mile of pipeline from the existing SVCSD WWTP to existing SVCSD storage reservoirs located near the intersection of the Northwestern Pacific Railroad Authority (Railroad) and Ramal Road. The recycled water would be used at ponds 7 and 7a to dilute the extremely salty water currently within these ponds prior to discharging the salt water into the Napa River The conversion of ponds 7 and 7a to salt marsh habitat was covered by a previous biological opinion (Service file number 1-1-03-F-0044). Pumping would be provided by new pumps at the WWTP. The associated pipeline would include replacement of approximately 0.6 miles of aging pipe between the SVCSD WWTP and a junction structure along the Railroad line, and extending an 18 inch pipeline approximately 3.6 miles parallel to the existing 18-inch pipeline between the junction structure and the existing storage reservoirs.

From the existing storage reservoirs, a new pipeline would be constructed approximately 4.7 miles to the existing salt pond mixing chamber. This would include approximately 0.25 miles of pipeline installed north along an access road to Ramal Road. The alignment would then extend 1.75 miles east along Ramal Road. The pipeline would then extend south approximately 0.3 mile to access an existing reservoir. At this point it would transverse 0.4 mile east to Buchli Station Road. The pipeline would run south on Buchli Station Road for approximately 1.0 mile, until it reaches the Huichica Creek entrance of the Napa-Sonoma Marshes Wildlife Area (NSMWA) and extends 1.0 mile south to the center of the access road for ponds 7 and 7a. The potential disturbance of undeveloped areas and roadside vegetation was estimated based on a 25 foot construction easement. Based on field reconnaissance and aerial photos, potential disturbance of vegetation with the potential to provide California red-legged frogs habitat is estimated at 10.2 acres (Table 1). At the mixing chamber, a 400-square-foot outfall structure will be constructed at the mixing chamber southeast of salt pond 7a, with an overall construction disturbance area measuring roughly 2,500 square feet. There would be minimal disturbance to ruderal or grassland vegetation and all vegetation removal will be by hand.

Novato SD: North Marin Water District Urban Recycled Water Plan North/Central Area

The North Marin Water District (NMWD) Urban Recycled Water Plan (URWP) North/Central service area in Marin County would provide recycled water for urban landscaping in the City of Novato through incremental expansion of tertiary capacity at the existing Novato Recycled Water Treatment Facility, a new booster pump station within a developed area of Atherton Avenue, rehabilitation of the existing 0.5 million gallon Plum Street Tank, relocation of some existing treatment facilities to the Novato SD WWTP, and construction of approximately 10.8 miles of new pipeline within the urban areas of Novato. The potential disturbance of undeveloped areas

and roadside vegetation was estimated based on a 25 foot construction easement, and assumed that construction would extend to the roadway right of way fence line. Based on field reconnaissance and aerial photos, potential disturbance of vegetation with the potential to provide California red-legged frogs habitat is estimated at 1.7 acres (Table 1).

LGVSD: North Marin Water District Urban Recycled Water Plan South Area

The LGVSD-NMWD URWP South Area would deliver recycled water to the Hamilton Field area. Facilities would include construction of a 0.7 million gallon per day tertiary treatment upgrade at the existing LGVSD WWTP, construction of a new booster pump station onsite, and construction by NMWD of a pipeline distribution system from the LGVSD WWTP north to serve the Hamilton Field area. This system would consists of a loop of 6-inch pipeline along South Oakwood Drive and Casa Grande Drive, a 12 inch pipe along Hangar Avenue to South Palm Drive, and a 10-inch pipe on Palm Drive. Recycled water storage would be provided by retrofitting the existing 0.5-million gallon Reservoir Hill Tank. All of these facilities would be constructed within existing roadways in urbanized environments. The overland portion of this distribution pipeline would extend north from LGVSD WWTP 2.5 miles through grazing land adjacent to the Northwest Pacific Railroad (NWPRR) right-of-way, or potentially within the railroad right of way itself, connecting to the Coast Guard Housing Loop at Palm Drive. The potential disturbance of undeveloped areas and roadside vegetation was estimated based on a 25-foot construction easement, and assumed that the alignment would be outside of the railroad right of way. Based on field reconnaissance and aerial photos, potential disturbance of vegetation with the potential to provide California red-legged frogs habitat is estimated at 1.7 acres (Table 1).

All pipelines would be installed within public rights of way, and would be located within paved roadways to the degree feasible. Disturbance to vegetation from overland routes was estimated based on a 25-foot wide construction easement. Disturbance to roadside vegetation was estimated by assuming that construction would extend to the road right of way fenceline. Estimated temporary vegetation disturbance is summarized by pipeline facility in Table 1. All disturbed areas would be restored to pre-existing conditions. Additionally, compensation would be provided at a 0.1:1 ratio for temporary effects to vegetation with potential to provide California red-legged frog upland refugial habitat.

Table 1. Pipeline Length, Vegetation Disturbance, and Compensation.

Service Provider	Service Area	Pipeline Length (miles)	In-Pavement Disturbance (miles)	Off-Pavement Disturbance (miles)	Total Vegetation Disturbed (acres)	Compensation at 0.1:1 (acres)
Napa SD	MST Creeks	16.6	16.5	0.1	0.32	0.03
SCVSD	Napa Salt Marsh	8.9	5.5	3.4	10.2	1.02
	SVRWP	5.2	1.5	3.7	4.9	0.49
Novato SD	NMWD North/Central	10.8	9.9	0.9	1.7	0.17
LGVSD	NMWD South	6.3	4.5	1.8	5.4	0.54
Total		47.8	37.9	9.9	22.5	2.25

Minimization and Avoidance Measures

The applicant proposes to implement the following measures to minimize and avoid adverse effects to the California red-legged frogs in areas determined to be California red-legged frog habitat:

1. Construction activities will be confined to the dry season. No project related activities will occur within 48 hours of precipitation. No project related activities will occur from November 1 through April 31.

2. All streams will be crossed using trenchless techniques.

3. A qualified biologist, approved by the Service (Service-approved biologist), will train all project staff regarding habitat sensitivity, identification of California red-legged frogs, and these minimization and avoidance measures before the start of construction. All employees or contractors must complete this training prior to beginning any project-related work. A Service-approved biologist is defined as any person who has completed at least four years of university training in wildlife biology or a related science and/or has demonstrated field experience with California red-legged frogs. The training must include the minimization and avoidance measures that are being implemented to avoid and minimize adverse affects to listed species as they relate to the project, the penalties for non-compliance, and the boundaries of the project area.

4. Within 15 calendar days, prior to the onset of activities, the applicant shall submit the names and credentials of any biologists who would conduct activities specified in the following measures. No earthmoving or other project activities will begin until written approval from the Service has been received that the biologists are qualified to conduct the work.

5. Within 15 calendar days, prior to the onset of activities and the start of construction, a Service-approved biologist will conduct pre-construction surveys for California red-

legged frogs. If listed species are found, the Service will be contacted and the Service-approved biologist will be allowed sufficient time to move any animal(s) from the work site to a safe location before work activities begin. Only Service-approved biologists will participate in activities associated with the capture, handling, and monitoring of California red-legged frogs. Any biologist involved with the surveying/handling will employ sterilization techniques appropriate to avoid the transmission of diseases to or from the site.

6. A Service-approved biologist will be present at the work site until all California California red-legged frog removal, work instruction, and habitat disturbance has been completed. After this time, the applicant or contractor will designate a person to monitor on-site compliance with all minimization measures. The Service-approved biologist will ensure that this individual receives the training outlined in minimization and avoidance measure number three and in the identification of the California red-legged frog. The Service-approved biologist and on-site monitor will have the authority to and shall halt any action that might result in effects that exceed the levels anticipated by the Service during review of the proposed action. If work is stopped, the Service will be notified within one working day of the incident by the approved biologist or on-site biological monitor.

7. Vehicle speed will be limited to 10 miles per hour within the project footprint.

8. Vehicular traffic will be confined to existing roads, designated project staging areas, and the project footprint.

9. To prevent inadvertent entrapment of listed species, all excavated steep-walled holes or trenches will be sufficiently covered at the end of each workday with plywood or similar materials that prevent entrapment of California red-legged frogs. All holes will be inspected for entrapped California red-legged frogs daily, prior to any work activities, and before any such trenches or holes are filled.

10. Pipes measuring four (4) inches or greater in diameter that are stored at the site will be sealed at each end to prevent any listed species from becoming trapped in such pipes.

11. Before construction begins, the project engineer and a Service-approved biologist will identify locations for equipment, personnel access, and materials staging to minimize disturbance to California red-legged frog habitat.

12. All construction equipment must be in good working condition, showing no signs of fuel or oil leaks.

13. All fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 65 feet from any riparian or aquatic habitat.

14. Machinery operators must have spill clean-up supplies on-site and be knowledgeable in their proper use and deployment.

15. In the event of a spill, operators must immediately cease work, start clean-up, and notify the appropriate authorities.

16. Erosion control fabric will consist of natural fibers that will biodegrade over time. No mesh erosion control fabric that contains mesh holes smaller than ¾ inch by 1½ inch will be installed. Only loosely woven jute, used to contain straw and prevent erosion, will be used.

17. Prior to the close of the work window, temporarily disturbed areas will be revegetated with native species specific to the project location.

18. No trash will be deposited on the site during construction activities. All trash will be placed in trash receptacles with secure lids or stored in vehicles, and removed at the end of each work day from the project site.

19. Following construction, all construction debris will be removed from work areas.

20. To compensate for the temporary disturbance of 22.5 acres of California red-legged frog habitat, the applicant will purchase 2.25 acres of California red-legged frog habitat credits from a Service-approved conservation bank, as outlined in Table 1. Credits will be purchased within 6 months of ground breaking activities.

21. Prior to initiating any ground breaking activities at the Sonoma Valley Recycled Water Project Service Area for the purpose of constructing the 24-acre water storage pond where a vineyard currently exists, California red-legged frog protocol surveys will be conducted along 4,000 linear feet of Schell Creek, from 8th Street to San Louis Road. If evidence of California red-legged frogs is found within this reach of Schell Creek, the applicant will compensate for the permanent loss of California red-legged frog dispersal habitat by purchasing California red-legged frog habitat credits from a Service-approved conservation bank at a ratio of 1:1.

22. The North Bay Water Reuse Authority will not provide recycled water hookups from the proposed project for any land that is undeveloped on the date of signature of this biological opinion, land that has not been converted to or planted with crops or other cultivated plants on the date of signature of this biological opinion, or for any property that would undergo land-use conversion as a result of the recycled water hookup, unless the development, land-use conversion, or proposed land use is in compliance with the Act. Compliance will be verified by one of the following: (1) authorization for incidental take issued by the Service via section 7 or section 10 of the Act; or (2) a letter from the Service indicating the development or land-use conversion is not likely to adversely affect any listed species.

Analytical Framework for the Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on three components: (1) the *Status of the Species* and *Environmental Baseline*, which evaluates the species' range-wide condition, the factors responsible for that condition, and the survival and

recovery needs; and evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (2) the *Effects of the Action*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (3) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on it.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the species' current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the listed species in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the species, and the role of the action area in the survival and recovery of the species as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed action, the action area includes all areas directly disturbed by project related trenching activities, the area to be converted to a 25 acre water storage pond, and areas within 50 feet of project related activities that will be affected by vibration and noise.

Status of the Species and Environmental Baseline

California red-legged frog

The California red-legged frog was listed as a threatened species on May 23, 1996 (Service 1996). Please refer to the final rule and the *Recovery Plan for the California Red-legged Frog* (*Rana aurora draytonii*) (Service 2002) for additional information on this species.

The California red-legged frogs is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

California red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). They breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). Individuals

occurring in coastal drainages are active year-round (Jennings *et al.* 1992), whereas those found in interior sites are normally less active during the cold season.

Adult California red-legged frogs typically use dense, shrubby, or emergent riparian vegetation closely associated with deep (2.3 feet), still, or slow-moving water (Hayes and Jennings 1988). However, frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The largest densities of California red-legged frogs currently are associated with deep pools with dense stands of overhanging willows and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). California red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat. During other parts of the year, habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer (Fellers 2005). According to Fellers (2005), this can include vegetated areas with coyote bush (*Baccharis pilularis*), California blackberry (*Rubus ursinus*) thickets, and root masses associated with willow and California bay trees (*Umbellularia californica*). Sometimes the non-breeding habitat used by California red-legged frogs is extremely limited in size. For example, non-breeding California red-legged frogs have been found in a 6 foot wide coyote bush thicket growing along a tiny intermittent creek surrounded by heavily grazed grassland (Fellers 2005). Sheltering habitat for California red-legged frogs is potentially all aquatic, riparian, and upland areas within the range of the species and includes any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

Adult California red-legged frogs are often associated with permanent bodies of water. However, while many frogs remain at permanent breeding ponds year-round, Fellers and Kleeman (2007) found that nearly half of all females in certain populations disperse away from these areas into other suitable non-breeding locations. Once at these areas, individuals may remain there for the majority of the year, returning to breeding ponds for only several weeks at a time. While California red-legged frogs do not have a distinct breeding migration back to these breeding areas, the number of dispersing individuals appears to increase with rainfall (Fellers 2005; Fellers and Kleeman 2007). Dispersal distances to and from breeding habitat are typically less than 0.5 mile, with a few individuals moving up to 1-2 miles (Fellers 2005). Movements are typically along riparian corridors, however dispersal from breeding habitats to riparian areas often requires the species to traverse across less desirable habitats such as open fields where grazing, farming or other high intensity management activities may occur (Fellers and Kleeman 2007). Dispersing frogs in northern Santa Cruz County traveled distances from 0.25 miles to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al.* 2003). Because of the ability of California red-legged frogs to move through a range of different habitats as well as the life history needs required by this species, equal protection of suitable breeding and non-breeding areas as well as the migration corridors that connect them is vital to the recovery and survival of the species (Fellers and Kleeman 2007).

Egg masses contain about 2,000 to 5,000 moderate sized (0.08 to 0.11 inch in diameter), dark reddish brown eggs and are typically attached to vertical emergent vegetation, such as bulrushes (*Scirpus* spp.) or cattails (Jennings *et al.* 1992). California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1994).

Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at 3 to 4 years of age (Storer 1925; Jennings and Hayes 1985). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations of red-legged frogs fluctuate from year to year. When conditions are favorable California red-legged frogs can experience extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, California red-legged frogs may temporarily disappear from an area when conditions are stressful (e.g., drought). At these locations, the rare individuals that disperse over long distances via riparian and overland corridors become necessary to repopulate temporarily abandoned but still suitable regions (Fellers and Kleeman 2007).

The diet of the California red-legged frog is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. According to their data, vertebrates, such as Pacific tree frogs (*Pseudacris regilla*) and California mice (*Peromyscus californicus*), represent over half the prey mass eaten by larger frogs, although invertebrates were the most numerous food items (Service 2002). Hayes and Tennant (1985) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. Adult California red-legged frogs have often been observed spending daylight hours taking shelter in still pools and associated vegetation or thermoregulating in full sunlight on rocks or other highly exposed surfaces (Fellers and Kleeman 2007). Feeding activity probably occurs along the shoreline and on the surface of the water (Hayes and Tennant 1985). The diet of California red-legged frog tadpoles is not well studied, but their diet is probably similar to other Ranid tadpoles that feed on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Jennings *et al.* 1992; Kupferberg 1996a, 1996b; Fellers 2005).

The historic range of the California red-legged frog extended coastally from the vicinity of Point Reyes National Seashore, Marin County, California, and inland from the vicinity of Redding in Shasta County, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985; Hayes and Krempels 1986). The California red-legged frog was historically known from 46 counties but is currently only found in 22 of them (Service 2002). California Red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators.

Habitat loss and alteration, over-exploitation, and introduction of exotic predators were significant factors in the species' decline in the early to mid-1900s. Agriculture, urbanization, mining, overgrazing, recreation, timber harvest, nonnative plants, impoundments, water diversions, degraded water quality, and introduced predators have resulted in substantial degradation and loss of California red-legged frog breeding ponds, upland habitat, and dispersal corridors. These factors have resulted in the isolation and fragmentation of habitats within many watersheds, often precluding dispersal between sub-populations and jeopardizing the viability of metapopulations (broadly defined as multiple subpopulations that occasionally exchange individuals through dispersal, and are able to "rescue" small populations and colonize available empty habitat patches).

The fragmentation of existing habitat and the continued colonization of existing habitats by nonnative species may represent the most significant current threats to California red-legged frogs. However, California red-legged frog populations are usually threatened by more than one factor. Pounds *et al.* (2006) discussed dramatic increases in fatalities of Ranid populations worldwide due to outbreaks associated with a chytrid fungus, *Batrachochytrium dendrobatidis* (Bd). These outbreaks are thought to be associated with rapid global climate change, which creates climatic conditions that are more favorable to the fungus (Pounds *et al.* 2006). Bd has been identified in the San Francisco Bay area and further research is currently underway to determine the extent and effects of these outbreaks. The increasing discrepancies in seasonal temperature and precipitation variations will produce deeper rivers with higher velocities in the spring and reduced aquatic habitat with higher eutrophication rates during the summer. The consequence of these changes will likely be a decline in California red-legged frog breeding habitat throughout California.

Some current habitat loss has been compensated in developed areas through artificially created habitat such as golf course restoration ponds, and juvenile and adult California red-legged frogs have been found in these human-created habitats. However, habitat created near urban areas where predators such as bullfrogs (*Rana catesbeiana*) and raccoons (*Procyon lotor*) are able to increase in population size may not be suitable for the long-term survival or successful reproduction of local frog populations (H.T. Harvey and Associates 1997). Other factors such as contaminants and lack of dispersal corridors connecting habitat patches may also prevent long-term survival of populations in created habitat patches (H.T. Harvey and Associates 1997).

Predation by introduced species is also a significant threat to the California red-legged frog. Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs (*Rana aurora aurora*) once bullfrogs became established at the same sites (Jennings and Hayes 1990; Twedt 1993). This has been attributed to both predation and competition. Twedt (1993) documented bullfrog predation of juvenile northern California red-legged frogs, and suggested that bullfrogs could prey on subadult Northern California red-legged frogs as well. In addition to predation, bullfrogs may have a competitive advantage over California red-legged frogs, since bullfrogs are larger, possess more generalized food habits (Bury and Whelan 1984), have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977), and larvae are unpalatable to predatory fish (Kruse and Francis 1977). In addition to competition, bullfrogs interfere with California red-legged frog reproduction. Both California and northern California red-legged frogs have been observed in amplexus with (mounted on) both male and

female bullfrogs (Jennings and Hayes 1990; Twedt 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat. Upon establishment within a given area, bullfrogs become difficult to eradicate. Historically, gigging methods or pellet guns were utilized by land managers to reduce populations. However, research suggests that these methods are only effective when applied in concert with biannual draining of perennial habitats and/or the flooding of riparian areas every five years (Doubledee *et al.* 2003). Red swamp crayfish (*Procambarus clarkii*), signal crayfish (*Pacifastacus leniusculus*), and several species of warm water fish including sunfish (*Lepomis* spp.), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) may similarly affect California red-legged frogs through predation and competition (Lawler *et al.* 1999).

The urbanization of land within and adjacent to California red-legged frog habitat has also affected this species. Declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks California red-legged frog dispersal, and the introduction of predatory fishes and bullfrogs. The conversion and isolation of perennial pool habitats resulting from urbanization is also an ongoing adverse affect to California red-legged frogs. Mao *et al.* (1999 cited in Fellers 2005) reported northern California red-legged frogs infected with an iridovirus, a pathogen that was also detected in sympatric three-spined sticklebacks (*Gasterosteus aculeatus*) in northwestern California.

The recovery plan for the California red-legged frog identifies eight Recovery Units (Service 2002). The establishment of these Recovery Units is based on the Recovery Team's determination that various regional areas of the species' range are essential to its survival and recovery. The status of the California red-legged frog will be considered within the smaller scale of Recovery Units as opposed to the overall range. These Recovery Units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the recovery plan is to protect the long-term viability of all extant populations within each Recovery Unit. Within each Recovery Unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that, combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy will allow for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

Environmental Baseline: The MST Creeks Service Area is located in the eastern portion of the City of Napa, between the Lake Barryessa and the Jameson Canyon - Lower Napa River core areas for the California red-legged frogs (Service 2002). There are 6 occurrence records for the California red-legged frog in Napa County (CNDDB 2010) that represent 3 known metapopulations. These 3 metapopulations are separated from each other by more than 15 miles, with one metapopulation located in the foothills of southern portion of the county, the second metapopulation located a few miles south of Lake Barryessa in the central portion of the County, and the third metapopulation located in northern portion of the county. Due to the large amount of private property in Napa County and a lack of surveys targeting amphibians, there is little information on the status and distribution of this species in the County. However, within the

MST Service Area are suitable breeding, foraging, upland dispersal and refugial habitat for the California red-legged frog and this area is between two areas known to be occupied by the California red-legged frog. Many of the current threats to the California red-legged frog within the MST Creeks Service Area are consistent with the threats that are responsible for reducing the habitat quality within the action area. These ongoing threats include predation by and competition with non-native invasive animal species such as bullfrogs and habitat loss and/or reduced habitat quality from vineyard development, urbanization, and infrastructure improvement projects.

The SVRWP Service Area and Napa Salt Marsh Restoration Area are contiguous with each other and are located just west of the Petaluma Creek - Sonoma Creek core area for the California red-legged frog (Service 2002) in Sonoma and Napa Counties. There are 3 California red-legged frog occurrences within 3 miles of the SVRWP Service Area (CNDDB 2010). Two of these occurrences are within 1 mile of the proposed pipeline route. Within and adjacent to the action area are numerous ponds capable of supporting California red-legged frog breeding, in addition to suitable foraging, dispersal, and refugial habitat. However, many of the ponds are located on private property and have not been surveyed. The proposed 24-acre storage pond site is currently an established vineyard, adjacent to the SVCSD WWTP and Schell Creek. Although vineyards are not typically thought of as providing suitable foraging habitat, if California red-legged frogs do occur in Shell Creek, this area would provide suitable upland dispersal habitat for this species. The current threats to this species and the factors responsible for its current condition in the SVRWP Service Area and Napa Salt Marsh Restoration Area are identical to those described for the MST Creeks Service Area.

The Novato SD's North, Central and South Service Areas are contiguous with each other and are located between the Point Reyes Peninsula and the Petaluma Creek - Sonoma Creek core areas for the California red-legged frog (Service 2002) in Marin County. Although much of these service areas are highly urbanized, areas with freshwater habitat, on the fringes of the urban areas, contain suitable breeding, foraging, dispersal, and refugial habitat for the California red-legged frogs. Numerous California red-legged frog occurrences are located within 7 miles of the Novato SD's North, Central and South Service Areas; most of which are located to the east, north, and northwest. The factors responsible for the current state of the California red-legged frog population within this portion of the action area include loss of habitat and/or reduced habitat quality due to urbanization, infrastructure improvement projects, and water impoundment projects and competition with non-native invasive species such as bullfrogs.

In general, much of the potential California red-legged frog habitat that will be disturbed throughout the action area is located adjacent to gravel or paved roadways. These areas typically consist of ruderal vegetation within and adjacent to roadside drainage ditches. Although roadside drainages are unlikely to contain California red-legged frog breeding habitat, drainage ditches do provide suitable dispersal and foraging habitat for California red-legged frogs because they provide relatively moist conditions that reduce the likelihood of desiccation and potentially increase prey densities.

Effects of the Proposed Action

The proposed action will result in the temporary disturbance of 22.5 acres of California red-legged frog habitat. Adult and juvenile California red-legged frogs hiding in cracks, crevices, and small mammal burrows within the project footprint are most likely to be killed or injured by ground disturbing activities and from being crushed beneath heavy equipment, because preconstruction surveys would be unable to detect them. California red-legged frogs could also become injured or entrapped in trenches and pits if trench covers are not installed properly. In addition, the use of trenchless techniques will minimize direct mortality and injury as a result of project related activities.

Preconstruction surveys for California red-legged frogs and relocation outside of the action area will reduce the likelihood of direct injury or mortality caused by ground disturbing activities. However, capturing and handling these animals to remove them from a work area may result in the harassment of these individuals. Stress, injury, and mortality may occur as a result of improper handling, containment, and transport of individuals. Proper handling techniques, implemented by a Service-approved biologist, should minimize the likelihood of harassment to the California red-legged frog.

Habitat disturbance will be relatively temporary, with most areas experiencing disturbance for less than a few weeks. These areas will quickly return to pre-construction conditions within a few months. However, construction noise, vibration, and increased human activity may interfere with normal behaviors. Although the Service is not aware of any studies that have specifically addressed the effects of noise and vibration on California red-legged frogs, Demmitt and Ruibal (1980) found that vibration from an electric motor consistently induced nearly 100 percent emergence of Couch's spadefoot toad (*Scaphiopus couchi*) from dormancy in deep as well as shallow burrows. Construction activities, such as operating heavy equipment near occupied refugial habitat may disturb these animals and cause them to seek refuge at alternative sites. California red-legged frogs that leave their upland refugial habitat to seek alternative sites would be highly susceptible to desiccation while in transit.

To compensate for the temporary loss of 22.5 acres of habitat, the applicant will purchase credits from a Service-approved conservation bank at a ratio of 0.1 to 1. In some cases, purchasing credits from a conservation bank may have an advantage over onsite compensation by consolidating small parcel losses to create larger, less fragmented, and more sustainable habitat patches. If California red-legged frog are found during protocol surveys in Schell Creek, the conversion of the vineyard to a 24-acre storage pond for reuse water (unsuitable to California red-legged frog breeding, foraging, dispersal, or other essential behaviors), will result in the permanent loss of dispersal habitat. To compensate for this potential loss of dispersal habitat, the applicant will purchase credits from a Service-approved conservation bank at a ratio of 1 to 1.

Cumulative Effects

Cumulative effects are those impacts of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The global average temperature has risen by approximately 0.6 degrees Centigrade during the 20th Century (IPCC 2001, 2007; Adger *et al.* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (IPCC 2001, 2007; Adger *et al.* 2007), and that it is "very likely" that it is largely due to manmade emissions of carbon dioxide and other greenhouse gases (Adger *et al.* 2007). Ongoing climate change (Inkley *et al.* 2004; Adger *et al.* 2007; Kanter 2007) likely imperils the California red-legged frog and the resources necessary for its survival, since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Conclusion

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the proposed project is not likely to jeopardize the continued existence of the California red-legged frog. The Service has come to this conclusion because habitat disturbance will be temporary and return to pre-construction conditions within a relatively short period of time and the applicant proposes to compensate for adverse effects by purchasing credits from a Service-approved conservation bank.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. The Service defines harass as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act, provided such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by Reclamation so that they become binding conditions of any grant or permit issued to the applicant, as

appropriate, in order for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates incidental take of the California red-legged frogs will be difficult to detect or quantify for the following reasons: its elusive nature, small size, cryptic coloration, seasonal fluctuations in population numbers, and this species occurs in habitat that makes it difficult to detect. The Service is estimating that no more than one California red-legged frog per service area will be subject to incidental take in the form of injury or death as a result of project related activities. All California red-legged frogs within the 22.5 acres of temporarily disturbed habitat will be subject to incidental take in the form of harm, harassment, and capture. All California red-legged frogs within 50 feet of the project footprint will be subject to incidental take in the form of harassment. If California red-legged frogs are found within Schell Creek as a result of protocol surveys, all California red-legged frogs within the area proposed to be a 24-acre storage pond will be subject to incidental take in the form of harm, harassment, capture, injury, and death. Upon implementation of the reasonable and prudent measures, incidental take of the California red-legged frog associated with the proposed North San Pablo Bay Restoration and Reuse Project Development project will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the California red-legged frogs.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the effects of take on the California red-legged frog:

> Adverse effects to the California red-legged frog and its habitat shall be minimized to the maximum extent feasible.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, Reclamation shall ensure that the applicant complies with the following terms and conditions, which implement the *Reasonable and Prudent Measure* described above. This Term and Condition is non-discretionary.

The following Term and Condition implements the Reasonable and Prudent Measure:

> Reclamation shall adhere to the *Description of the Proposed Action* through the NBWRP-specific funding agreement. As the funding agreement will require the recipient to remain compliant with all pertinent rules, regulations, and permits (including this biological opinion), awarding the funding agreement will ensure the NBWRP remains compliant with the avoidance and minimization measures of this biological opinion.

Reporting Requirements

The Service must be notified within 24 hours of the finding of any injured or dead California red-legged frogs or any unanticipated damage to its habitat associated with the proposed action. Injured California red-legged frogs shall be cared by a licensed veterinarian or other qualified person, such as the Service-approved biologist for the proposed action. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. Dead animals should be sealed in a zip lock bag containing a piece of paper indicating the location, date and time when it was found, and the name of the person who found it; and the bag should be frozen in a freezer in a secure location. The Service contact persons are Division Chief, Endangered Species Program, at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600 and Resident Agent-in-Charge of the Service's Law Enforcement Division at telephone (916) 414-6660.

The applicant shall submit a post-construction compliance report prepared by the on-site biologist to at the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting the avoidance and minimization measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California red-legged frogs, if any; (v) occurrences of incidental take of these listed species, if any; (vi) documentation of employee environmental education; and (vii) other pertinent information.

CONSERVATION RECOMMENDATIONS

Conservation recommendations are suggestions of the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of new information. These measures may serve to further minimize or avoid the adverse effects of a proposed action on listed, proposed, or candidate species, or on designated critical habitat. They may also serve as suggestions on how action agencies can assist species conservation in furtherance of their responsibilities under section 7(a)(1) of the Act, or recommend studies improving an understanding of a species' biology or ecology. Wherever possible, conservation recommendations should be tied to tasks identified in recovery plans. The Service is providing you with the following conservation recommendation:

1. Reclamation should use American Recovery and Reinvestment Act funding to implement California red-legged frogs habitat restoration projects.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed and/or proposed species or their habitats, the Service requests notification of the implementation of these recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed North San Pablo Bay Restoration and Reuse Project. As provided in 50 CFR § 402.16 and in the terms and conditions of this biological opinion, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions concerning this biological opinion on the proposed North San Pablo Bay Restoration and Reuse Project, please contact Ben Solvesky or Ryan Olah at the letterhead address, at telephone number (916) 414-6600, or email Ben_Solvesky@fws.gov or Ryan_Olah@fws.gov.

cc:
Scott Wilson, California Department of Fish and Game, Yountville, California

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APPENDIX 3b
National Marine Fisheries Service, Consultation Letter of Concurrence, Reference No 2009/04759:AEM, May 6, 2010

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802- 4213

May 6, 2010

In response, refer to:
2009/04759:AEM

Donald R. Glaser
Regional Director
U.S. Department of the Interior
Bureau of Reclamation, Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

Dear Mr. Glaser:

Thank you for your letter of August 25, 2009, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) as amended (16 U.S.C. 1531 *et seq.*) regarding the North Bay Water Recycling Program (NBWRP) in areas of Marin, Sonoma, and Napa counties, California. This response also serves as a consultation pursuant to the Fish and Wildlife Coordination Act of 1934 (FWCA), as amended. The Bureau of Reclamation (Reclamation) proposes to provide funding to the North Bay Water Recycling Authority's (NBWRA) Member and Cooperating Agencies under the Title XVI Water Recycling and Reuse Program to implement Phase 1 actions of the North San Pablo Bay Restoration and Reuse Project (Reclamation File No. MP-150 ENV-7.00).

NMFS has reviewed the Biological Assessment/Fisheries Biological Assessment (BA) provided with Reclamation's letter of August 25, 2009, the draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS) for the North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Water Project) (ESA 2009), and additional information received via telephone conversations and electronic mail in January and February, 2010. Reclamation's proposed action for this consultation consists of projects collectively referred to as Phase 1 projects in the draft EIR/EIS for the NBWRP. Phase 1 projects were assessed in the draft EIR/EIS and they have been identified by NBWRA Member Agencies as priority projects within their individual service areas. In addition to the Phase 1 projects, the draft EIR/EIS presents three Alternatives which are incrementally larger than Phase 1 actions and are expected to be implemented in the future. However, only Phase 1 projects have been approved by the NBWRA's Member Agency Board members and approved for funding. Therefore, Reclamation only proposes to fund Phase 1 projects at this time and has requested that NMFS only consult on Phase 1 projects (D. Kleinsmith and J. O'Toole, personal communication, February 2010).

Projects included in Phase 1 of the NBWRP will expand the use of recycled water in Marin, Sonoma, and Napa counties by expanding water reuse facilities at four Member Agencies: (1) Las Gallinas Valley Sanitation District (LGVSD) in Marin County; (2) Novato Sanitation District (Novato SD) in Marin County; (3) Sonoma Valley County Sanitation District (SVCSD) in Sonoma County; and (4) Napa Sanitation District (Napa SD) in Napa County. Among them, they serve 13 water recycling service areas that cover approximately 318 square miles of land. All of the Member Agencies currently either have tertiary treatment capability or are in the process of developing tertiary treatment capability by 2010. Phase 1 projects will expand recycled water production capabilities of Member Agencies through facility upgrades. These projects include: (1) construction and installation of new pipelines to deliver recycled water; (2) construction of additional storage and pumping facilities; and (3) capacity upgrades at existing wastewater treatment plants (WWTP).

Phase 1 projects of the NBWRP includes actions in or near Miller Creek, Novato Creek, Rodgers Creek, Carriger Creek, Sonoma Creek, Schell Creek, Huichica Creek, Tulucay Creek, Sarco Creek, Kreuse Creek, Murphy Creek, Arroyo Avichi Creek, Fowler Creek, Napa River and their tributaries, Schell Slough, and San Pablo Bay. Construction activities are scheduled to be restricted to the period between June 15 and November 1 in wetted stream channels, or April 15 through November 1 if the stream channel is dry. The project elements proposed in individual service areas may be found in detail within the BA and draft EIS/EIR for this project.

Compared to 2002 values, Phase 1 projects will provide an additional 46 miles of new pipeline, 1,873 HP of pumping capacity, treatment facilities providing 6.4 million gallons per day (mgd) of tertiary capacity, 65 acre-feet (AF) of storage, and 3,757 acre-feet per year (AFY) of recycled water. Recycled water will be produced by tertiary treatment of effluent using a variety of filtration and disinfection methods pursuant to Article 4 in Title 22 of the California Code of Regulations, which sets water quality standards and treatment reliability criteria for recycled water. Tertiary treated water produced by each Member Agency will be used within their individual service area for various irrigation needs, including, but not limited to, urban landscaping, dairy and pasture, orchards, farms, and vineyards. Facility upgrades at SVCSD will also provide recycled water to the Napa Salt Marsh area for habitat enhancement. Treated effluent from the Member Agency WWTPs is also discharged into sloughs or major tributaries, where it ultimately flows into San Pablo Bay, or effluent is discharged directly into San Pablo Bay. The construction of new pumping and storage facilities will occur above the higher high water mark. All facilities are designed to meet the flow and water quality limits of Member Agencies' existing Waste Discharge Permit issued by Regional Water Quality Control Boards. Furthermore, the NBWRA Member Agencies have proposed conservation measures applicable to the control the control of sediment, hydrocarbon, and turbidity in nearby waterways during construction and installation of pipelines. These measures may be found in detail within the BA for this project. Pertinent measures associated with waterways include the following:

1. Trenchless construction methods will be utilized for installing underground pipelines that cross streams that may contain ESA-listed species or critical habitat.
2. A qualified biological monitor will be on site during all underground pipeline

construction near streams where ESA-listed species or critical habitat may occur. The biological monitor will halt construction if contaminants are introduced to the stream.

3. Silt fencing will be installed in all areas where construction occurs within 100 feet of streams where ESA-listed species or critical habitat may occur.
4. A spill prevention plan for potentially hazardous materials will be prepared and implemented.
5. Equipment and materials will be stored at least 50 feet from waterways.
6. Proper and timely maintenance for vehicles and equipment used during construction will be provided to reduce the potential for mechanical breakdowns leading to a spill of materials into waterways.
7. In the event that directional drilling is used for pipeline installation, a Frac-Out Contingency Plan shall be prepared and approved by NMFS prior to construction.

Reclamation has requested NMFS' concurrence with its determination that proposed Phase 1 projects are not likely to adversely affect ESA-listed species.

Endangered Species Act

Available information indicates that the following listed Distinct Population Segments (DPS) or Evolutionarily Significant Units (ESU) of salmon, steelhead, and sturgeon and their designated critical habitats may occur in the project area:

Central California Coast steelhead DPS (*Oncorhynchus mykiss*)
threatened (71 FR 834, January 5, 2006)
critical habitat (70 FR 52488, September 2, 2005)

North American Green Sturgeon southern DPS (*Acipenser medirostris*)
threatened (71 FR 17757, April 7, 2006)
critical habitat (74 FR 52300, November 9, 2009)

Sacramento River winter-run Chinook salmon ESU (*Oncorhynchus tshawytscha*)
endangered (70 FR 37160, June 28, 2005)
critical habitat (58 FR 33212, June 16, 1993)

Central Valley spring-run Chinook salmon ESU (*Oncorhynchus tshawytscha*)
threatened (70 FR 37160, June 28, 2005)

Central Valley steelhead DPS (*Oncorhynchus mykiss*)
threatened (71 FR 834, January 5, 2006)

Listed salmon and steelhead occur seasonally near several Phase 1 project sites. San Pablo Bay serves primarily as a migration corridor for adult and juvenile salmonids between the ocean and their natal streams. Winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley steelhead migrate through San Pablo Bay to and from their natal streams in the Central Valley. Central California Coast (CCC) steelhead also migrate through San Pablo Bay and they are known to spawn and rear in the following San Pablo Bay tributaries where Phase 1 projects will occur: Miller Creek, Novato Creek, Rodgers Creek, Carriger Creek, Sonoma Creek, Schell Creek, Huichica Creek, Tulucay Creek, Murphy Creek, Sarco Creek, Fowler Creek, and

Napa River and their tributaries. Adult salmon and steelhead migration takes place primarily during the winter and early spring months. Juvenile salmon and steelhead migrate downstream from their natal streams, through San Pablo Bay to the ocean primarily during the late winter and spring months. Adult and juvenile CCC steelhead, winter-run Chinook, spring-run Chinook, and Central Valley steelhead may be present during the ongoing operations and construction of Phase 1 projects. More information regarding the life history of salmon and steelhead can be found in Busby *et al.* (1997 and 1996, respectively).

The southern distinct population segment (DPS) of North American green sturgeon spawn in the deep turbulent sections of the upper reaches of the Sacramento River. Adult green sturgeon return from the ocean every one to two years to spawn, and generally show fidelity to their upper Sacramento River spawning sites. They migrate through San Pablo bay into Sacramento River to spawn. Their spawning period is from March to July, with a peak in mid-April to mid-June (Moyle *et al.* 1992). As juvenile green sturgeon age, they migrate downstream and live in the lower delta and bays, spending from three to four years there before entering the ocean. Juvenile and adult green sturgeon may be present in the project area during ongoing operations and construction of the project. The life history of green sturgeon in California is summarized in Adams *et al.* (2002) and NMFS (2005).

NMFS has evaluated the proposed project for potential adverse effects to listed anadromous salmonids and threatened green sturgeon and designated critical habitat. The proposed project may affect listed fish and critical habitat through degradation of water quality during construction activities and the future operation of the projects. Construction activities are proposed to occur during the period between June 15 and November 1 near wetted streams and April 15 to November 1 near dry channels. Construction of storage and pumping facilities, and upgrades to existing treatment facilities will not take place in-water or directly adjacent to waterways. The only construction activities in or near stream channels are associated with pipeline crossings. For pipeline crossings of streams, the project proposes to use jack and bore tunneling or directional drilling. These methods are collectively referred to as trenchless techniques and are explained in more detail in the draft EIR/EIS for the project. Trenchless techniques are less intrusive than open trench methods since there is no surface disturbance. However, directional drilling uses a mud slurry during the drilling operation to lubricate the drilling head and stabilize the bore path that, if released into the waterway, can be harmful to fish. The mud slurry usually consists of a mixture of freshwater and bentonite clay-- a naturally occurring clay mineral that forms a mud when mixed with water. Frac-out, or the inadvertent release of mud slurry into the surrounding area and waterways, can expose fish to very fine clay particles. Exposure to these fine particles may result in short-term disruptions in feeding, migration, or spawning activities. To reduce the potential for Frac-outs to occur, contractors will review geotechnical information at each stream crossing and explore site conditions to establish suitable drilling locations prior to pipeline installation. Furthermore, NBWRP contractors will provide a Frac-out contingency plan to NMFS prior to directional drilling activities. With the incorporation of local geotechnical

information, the Frac-out contingency plan, and the proposed timing of activities, the potential adverse effects of the pipeline crossing construction activities to streams and listed fish are discountable.

The future operation of the NBWRP projects may have indirect effects to listed anadromous salmonids and sturgeon through changes to the quantity and quality of freshwater effluent discharged by Member Agency WWTPs and application of recycled water near streams. NBWRP Member Agencies currently operate WWTPs which discharge freshwater to San Pablo Bay, Schell Slough, and tidally influenced portions of Miller Creek and Napa River from September through May when CCC steelhead, winter-run Chinook, spring-run Chinook, Central Valley steelhead, and green sturgeon may be present. Effluent from these WWTPs contain contaminants such as, metals, cyanide, and conventional pollutants, which at high levels, can alter fish behavior and effect sensory systems involved in growth, reproduction, and survival. Contaminants can also affect prey sources through contamination or reduced availability. The NBWRP is anticipated to have beneficial effects by reducing the amount of effluent discharged from the Member Agency WWTPs because a portion of water that would have been discharged would be reused for recycled water applications. Thus, with the completion of the NBWRP, the amount of contaminants and freshwater released into these waterways with listed fish species will be reduced and assist in preserving their saline water quality properties. For the above reasons, NMFS anticipates that indirect effects to listed anadromous salmonids and sturgeon associated with future wastewater discharge changes at Member Agency WWTPs will result in improvements over existing baseline conditions.

Regarding the application of recycled water near waterways, Phase 1 of the NBWRP will use recycled water for irrigation in areas adjacent to waterways where listed anadromous salmonids and green strurgeon may be present. This may affect listed fish and their habitat by introducing contaminants found in recycled water to nearby waterways. As discussed above, recycled water may contain contaminants that, at high levels, can alter fish behavior and effect sensory systems and prey sources. However, past water quality records show that Member Agency pre-treated effluent contaminant concentrations are below thresholds that are harmful to fish. Additionally, Phase 1 of the NBWRP will result in upgrades to Member Agency treatment capacities so that recycled water would be treated to tertiary-treatment standards that are expected to further reduce these contaminant concentrations. Thus, recycled wastewater applied near waterways is expected to have low contaminant levels and NMFS anticipates that the effects of using recycled water for irrigation will be insignificant.

Regarding designated critical habitat, Phase 1 projects include pipeline crossings on the following waterways designated as critical habitat for CCC steelhead: Rodgers Creek, Carriger Creek, Sonoma Creek, Schell Creek, Huichica Creek, Tulucay Creek, Murphy Creek, Sarco Creek, Fowler Creek, and Napa River. In addition, Member Agency WWTP outfall locations are located in San Pablo Bay, Schell Slough, and tidally influenced portions of Miller Creek and Napa River which are designated critical habitat for the southern DPS of North American Green Sturgeon. San Pablo Bay is also designated as critical habitat for Sacramento River winter-run Chinook salmon and CCC steelhead. Primary constituent elements (PCE) of designated critical

habitat for CCC steelhead, winter-run Chinook and the southern DPS of green sturgeon include: water quantity, water depth, water flow, food resources, migratory corridor, sediment quality, floodplain connectivity, natural cover, salinity conditions, and water quality. Potential effects to designated critical habitat include short-term disturbance to the streambed from construction activities and changes in the quantity and quality of effluent from Member Agencies' ongoing WWTP operations. Construction near streams is not expected to degrade critical habitat PCEs due to the use of jack and bore tunneling or directional drilling for pipeline crossings. These techniques are expected to avoid disturbance to the banks and beds of streams designated as critical habitat. Ongoing operations of NBWRP Member Agencies may result in the introduction of contaminants in areas designated as critical habitat. However, contaminant levels in WWTP effluent and recycled water used for irrigation are expected to be minor given current treatment standards and upgrades to Member Agency treatment capacities. Furthermore, decreasing the amount of freshwater released from WWTPs into saline areas will reduce the potential for saltwater communities to be converted to freshwater or brackish communities. Thus, the project is expected to improve critical habitat near WWTP discharge locations by decreasing the amount of contaminants and freshwater discharged into these waterways. The expected levels of disturbance from operations and construction on designated critical habitat are minor and are not expected to affect migration, rearing, or spawning of CCC steelhead, green sturgeon, or Sacramento River winter-run Chinook. Overall, the project is not expected to result in adverse impacts to designated critical habitat. No ongoing impacts to designated critical habitat are expected from this project.

Based upon the best available information, NMFS concurs with Reclamation's finding that the proposed project is not likely to adversely affect ESA-listed fish species under the jurisdiction of NMFS. Regarding designated critical habitat, NMFS has determined the proposed project is not likely to adversely affect PCEs associated with CCC steelhead, Sacramento River winter-run Chinook salmon, and the southern DPS of green sturgeon designated critical habitat. This concludes consultation in accordance with 50 CFR §402.13(a) for the proposed Phase 1 actions of the North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program [NBWRP]) in Marin, Sonoma, and Napa Counties, California. However, further consultation may be required if: (1) new information becomes available indicating that listed species or critical habitat may be affected by the project in a manner or to an extent not previously considered; (2) current project plans change in a manner that causes an effect to listed species or critical habitat in a manner not previously considered; or (3) a new species is listed or critical habitat designated that may be affected by the action.

Fish and Wildlife Coordination Act

The purpose of the Fish and Wildlife Coordination Act (FWCA) is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development [16 U.S.C. 661]. The FWCA establishes a consultation requirement for federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C 662(a)]. Consistent with this consultation requirement, NMFS provides recommendations and comments

to federal action agencies for the purpose of conserving fish and wildlife resources. NMFS has no FWCA recommendations to offer regarding this project, because the project contains adequate measures to protect aquatic habitat.

If you have any questions regarding these consultations or require additional information, please contact Amanda Morrison of my staff at (707) 575-6083, or by electronic mail at Amanda.Morrison@noaa.gov.

Sincerely,

for Rodney R. McInnis
Regional Administrator

cc: Ryan Olah, USFWS, Sacramento, California
Chuck Armor, CDFG, Napa, California
Doug Kleinsmith, USBOR, Sacramento, California
Copy to File Administrative Record # 151422SWR2009SR00470

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Personal Communication

Kleinsmith, D. 2010. Bureau of Reclamation, Natural Resource Specialist. Sacramento, CA.

O'Toole, J. 2010. ESA, North Bay Water Group Manager. Petaluma, CA.

APPENDIX 3c

Biological Assessment/Fisheries Biological Assessment for the North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program), Prepared by Environmental Science Associates (ESA), August 2009

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NORTH SAN PABLO BAY RESTORATION AND REUSE PROJECT (NORTH BAY WATER RECYCLING PROGRAM)

Biological Assessment/ Fisheries Biological Assessment

Prepared for
Bureau of Reclamation

North Bay Water Reuse Authority

August 2009

Member Agencies

Contributing Agencies

NORTH SAN PABLO BAY RESTORATION AND REUSE PROJECT (NORTH BAY WATER RECYCLING PROGRAM)

Biological Assessment/ Fisheries Biological Assessment

Prepared for
Bureau of Reclamation

North Bay Water Reuse Authority

August 2009

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206088.01

ESA

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CHAPTER 1
Introduction

1.1 Purpose and Need for the Biological Assessment

This Biological Assessment (BA) initiates permitting consultation for a prioritized subset of projects under the North Bay Water Recycling Program (NBWRP) regional cooperative action. These actions are defined to a level of detail that allows for project-level environmental review. The BA was prepared in support of the proposed action in accordance with Section 7(a)(2) of the Federal Endangered Species Act (Act) of 1973 as amended (16 USC 1531-1543), at the request of the U.S. Army Corps of Engineers (USACOE). Potential effects of the North Bay Water Recycling Program Phase 1 Implementation Plan projects (proposed action) on federal candidate and listed threatened and endangered species and their critical habitat in the counties of Marin, Sonoma, and Napa, California are documented.

Appendix B contains the Fisheries Biological Assessment documenting potential effects of the proposed action on federal candidate and threatened and endangered fish species and their critical habitat in the counties of Marin, Sonoma, and Napa, California. The Fisheries Biological Assessment was prepared in support of the proposed action in accordance with Section 7(a)(2) of the Federal Endangered Species Act (Act) of 1973 as amended (16 USC 1531-1543), at the request of the National Marine Fisheries Service (NMFS). Duplicative information has been eliminated from the Fisheries Biological Assessment, and information relating to the Introduction, Purpose and Need, Project Sponsor, Description of the Proposed Action, and Consultation History only appears in *Chapter 1, Introduction* of this BA.

The California black rail is a state-listed threatened species and has no federal status. It is included in this BA to supply the biological resource information required for a Consistency Determination between the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS), if required.

1.2 Project Sponsor

Implementation of the larger action for which this BA evaluates a prioritized subset of projects would likely require external funding assistance, so the investigation and development of the action is being carried out in conformance with the requirements of the U.S. Department of the Interior's Bureau of Reclamation Public Law 102-575, Title XVI, which provides a mechanism for Federal participation and cost-sharing in approved water reuse projects. The proposed Federal Action is the provision of federal funds by the Bureau of Reclamation under the Title XVI

Program to North Bay Water Reuse Authority Member and Cooperating Agencies for the implementation of water recycling projects examined in the EIR/EIS, a subset of which is examined in this BA. The Sonoma County Water Agency (SCWA) serves as contract administrator for the North Bay Water Reuse Authority and is the lead agency for this proposed action under the regulations of the California Environmental Quality Act (CEQA).

CEQA contact information is as follows:

Sonoma County Water Agency P.O. Box 11628 Santa Rosa, CA 95406-1628	Contact:	Marc Bautista Project Manager www.nbwra.org (805) 781-1288

The Department of the Interior, Bureau of Reclamation (Reclamation) will be the federal lead agency for this project under NEPA. NEPA contact information is as follows:

Bureau of Reclamation Division of Environmental Affairs 2800 Cottage Way Sacramento, CA 95825	Contact:	Doug Kleinsmith (916) 978-5034

1.3 Description of the Proposed Action

The proposed action is located north and west of San Pablo Bay in northern California. San Pablo Bay is the northernmost reach of San Francisco Bay and borders Marin, Sonoma, Napa and Solano counties. The action area extends from San Pablo Bay to areas approximately 10 miles inland within Marin, Sonoma and Napa counties, reaching from south Novato in Marin County northeast to portions of rural Sonoma Valley and the City of Sonoma, continuing east to Napa's upper Tulucay region. The proposed action includes (1) construction and installation of new pipelines to deliver recycled water; (2) additional storage facilities to store and pump recycled water; and (3) capacity upgrades at existing wastewater treatment plants (WWTPs). **Figure 1** depicts the action area and the locations of new pipelines, pump stations, and storage facilities.

Project Background

Five participating agencies organized themselves under a Memorandum of Understanding in August 2005 as the North Bay Water Reuse Authority (NBWRA). Additional agencies supporting the NBWRA through contribution of funds and staff time include North Marin Water District (NMWD) and Napa County. These Member Agencies collectively prioritized the projects within their individual service areas to establish an implementation plan that identified the order in which projects pending approval under the North San Pablo Bay Restoration and Reuse Project (North Bay Water Recycling Program; SCH# 2008072096) would be implemented. Actions defined to a level of detail allowing for project-level environmental review were identified in the EIR/EIS and collectively referred to as Phase 1 Projects. These Phase 1 Projects are the focus of this BA.

Goals of the Proposed Action

The goal of the NBWRP is to expand the use of recycled water in Marin, Sonoma and Napa counties through a regional approach that is cooperative and sustainable. The project would provide recycled water for agricultural, urban, and environmental uses as an alternative to using potable water supplies. Specific project objectives include:

- Offset urban and agricultural demands on potable supplies
- Enhance local and regional ecosystems
- Improve local and regional water supply reliability
- Promote sustainable practices
- Give top priority to local needs for recycled water
- Implement recycled water facilities in an economically viable manner

Member Agencies and Service Areas

As explained in the Project Background, above, the regional cooperative action is comprised of five member agencies and multiple service areas. The five member agencies are Sonoma County Water Agency, Napa Sanitation District (Napa SD), Sonoma Valley County Sanitation District (SVCSD), Novato Sanitation District (Novato SD), and Las Gallinas Valley Sanitation District (LGVSD). Among them they serve thirteen water recycling service areas that span three contiguous counties and cover approximately 318 square miles of land.

Table 1-1 below identifies the Member Agencies, the service areas [relative to Phase 1 projects] that each Member Agency has responsibility for, and the project elements being constructed under Phase 1 of the NBWRP regional cooperative action.

TABLE 1-1
MEMBER AGENCIES, SERVICE AREAS, AND PROJECT IMPLEMENTATION PLAN

		New Pipeline (miles)	Capacity Increase (mgd)	New Pump Stations	New Storage (AF)
LGVSD	NMWD URWP South Service Area	5.9	0.7	1	--
Novato SD	NMWD URWP North/Central Service Area	9.8	1.2	2	--
SVCSD	Sonoma Valley Recycled Water Project Service Area	5.2	0	1	65
	Napa Salt Marsh Restoration Service Area	7.9	0	0	--
Napa SD	MST Service Area	17.5	4.5	5	--
Total		**46.3**	**6.4**	**1,873**	**65**

SOURCE: CDM, 2009; Napa SD, 2009

SOURCE: USGS; CDM, 2008

North Bay Water Recycling Program. 206088

Figure 1

Member Agency Service Areas and Proposed Facilities in the Action Area

Project Components in Member Agency Service Areas

Project components include construction of 46.3 miles of new pipeline, installed mostly within existing roadways, increased storage capacity at existing storage ponds, expanded treatment capacities at existing wastewater treatment plants, and construction of new pump stations within developed footprints (see Table 1). Project components by member agency service areas are discussed below.

Napa SD- Milliken-Sarco-Tulucay Area

The Napa SD- Milliken-Sarco-Tulucay Creeks (MST) Area is a limited region located in Napa County east of Napa proper consisting of 4,335 acres of vineyards, urban landscaping, golf courses and cemetaries. Vegetation communities in the action area include developed areas, non-native annual grassland, valley oak and coast live oak woodlands, mixed conifer/oak woodlands, and riparian vegetation along numerous intermittent and perennial streams.

To address regional groundwater overdraft, actions in this service area include construction of a new booster pump station at the existing Napa SD Soscol Wastewater Treatment Plant, four new booster pump stations constructed along existing roadways, and approximately 17.5 miles of new pipeline. Pipelines would be installed within existing roadways, along one of two route options.

Sonoma Valley County Sanitation District- Sonoma Valley Recycled Water Project Service Area

Actions in the Sonoma Valley County Sanitation District (SVCSD)- Sonoma Valley Recyled Water Project Service Area include additional water storage at the existing SVCSD Wastewater Treatment Plant, construction of additional pumping capacity for distribution, and installation of approximately 5.2 miles of new pipeline in western Sonoma Valley. Pipelines would traverse vineyards near the SVCSD Wastewater Treatment Plant, but would otherwise be installed within existing roadways.

The action area supports vineyards, ornamental landscaping, non-native annual grassland, valley oak and coast live oak woodlands, and riparian vegetation along numerous intermittent and perennial streams.

SVCSD- Napa Salt Marsh Restoration Area

The California Coastal Conservancy**,** USACOE, and CDFG have proposed and are implementing a salinity reduction and habitat restoration project for the 9,460-acre Napa River Unit of the Napa-Sonoma Marshes Wildlife Area. The Napa River Unit is located at the northeast edge of San Pablo Bay, adjacent to the Napa River. The purpose of the project is to restore a mosaic of habitats, including tidal habitats and managed ponds, and provide for better management of ponds to support populations of fish and wildlife. The habitat of this area is heavily influenced by the Napa River, numerous sloughs and tidal channels, and San Pablo Bay, which is located about

7 miles to the south. The Napa Salt Marsh Restoration Area is characterized by salt ponds; open water; fresh, brackish, and salt water marshes; non-native grasslands and ruderal areas.

Actions in the SVCSD-Napa Salt Marsh Restoration Area in southern Napa County would consist of a pipeline connection between the SVCSD and the Napa Salt Marsh Restoration Area for the purpose of supplying recycled water to Pond 7 and Pond 7A to enhance habitat. Proposed actions in this area include construction of a new pipeline from the existing SVCSD Wastewater Treatment Plant to the existing SVCSD storage reservoirs located near the intersection of the Northwestern Pacific Railroad Authority and Ramal Road. Three potential route options have been identified. Approximately 7.9 miles of new pipeline would be installed in off-road areas and within existing roadways.

Novato Sanitation District- North Marin Water District Urban Recycled Water Plan North/Central

The Novato Sanitation District (Novato SD)-North Marin Water District (NMWD) Urban Recycled Water Plan (URWP) North/Central service area in Marin County would provide recycled water for urban landscaping in the City of Novato through incremental expansion of tertiary capacity at the existing Novato Recycled Water Treatment Facility, a new booster pump station within a developed area of Atherton Avenue, rehabilitation of the existing 0.5 million gallon Plum Street Tank, relocation of some existing treatment facilities to the Novato SD Wastewater Treatment Plant, and construction of approximately 9.8 miles of new pipeline.

New pipeline would be installed within existing roadways, except for a 0.67-mile off-road segment that follows the Northwestern Pacific Railroad tracks across Novato Creek. At the Novato Creek crossing site, the pipeline may be suspended from the railroad bridge or may be installed using bore and jack tunneling. In either case, the construction impact area will be restricted to outside the creek corridor and associated emergent vegetation zone.

The Novato SD service area has an urbanized core, but also supports non-native annual grassland, coast live oak and oak savannahs, riparian willows along canal drainages, and seasonal wetlands.

LGVSD- North Marin Water District Urban Recycled Water Plan South

The LGVSD-NMWD URWP South Service Area in Marin County would deliver recycled water to the Hamilton Air Force Base redevelopment area and agricultural needs to the immediate south with a 0.7 million gallons per day tertiary treatment upgrade at the existing LGVSD wastewater treatment plant, construction of a new onsite booster pump station, and construction of a pipeline distribution system along one of three route options. Approximately 5.9 miles of pipeline would be installed within existing roadways and through agricultural lands.

The action area is about 1 mile inland from San Pablo Bay, and supports freshwater marsh, perennial wetlands, seasonal wetlands, nonnative annual grassland, and riparian willows along the Northwestern Pacific Railroad drainage. Optional pipeline routes are 0.4 mile from northern coastal salt marsh to the east and south, but buffered by the agricultural features situated between.

1.4 Consultation History

This BA was prepared based on the documented, observed, or suspected presence of threatened and endangered plant and wildlife species in the immediate vicinity of the project, and in anticipation of proposed activities that will or could potentially affect these species and waters of the U.S., including wetlands. Final documents prepared under NEPA and CEQA that document threatened and endangered species in the action area are identified in **Table 1-2, CEQA History**, below.

TABLE 1-2
CEQA HISTORY

Project Name	Document Type	Year Completed
North Bay Water Recycling Program EIR/EIS	EIR/EIS	2009
Sonoma Valley Recycled Water Master Plan	EIR	2007
Napa River Salt Marsh Restoration Project	EIS	2004
SVCSD Sewer Trunk Main Replacement Project	BA	2008
Novato Sanitary District Wastewater Facility Plan Project	EIR	2005

The following summarizes the project consultation history to date:

- November 22, 2005 – ESA Technical Memorandum: Results of Rare Plant Survey for the Sonoma Valley Recycled Water Project Along Proposed Pipeline Alignment Alternatives, addressed to Amy Harris Mai, Sonoma County Water Agency.

- Spring through Fall, 2008 – Emails among SCWA (Dave Cook and Yvette Okeefe), ESA, and USFWS on California red-legged frog presence in the Sonoma Valley relating to SVCSD Sewer Truck Main Replacement project.

- December 8, 2008 – Letter entitled “Species List for the North Bay Water Recycling Program Project” mailed to N. Dvorak from the USFWS Sacramento Office.

- December 12, 2008 – Communications between ESA biologist Brian Pittman and CDFG biologist regarding the suppressed location of a California red-legged frog mapped and displayed as the entire Sears Point 7.5 minute quadrangle in the California Natural Diversity Database (CNDDB).

CHAPTER 2

Covered Threatened and Endangered Species and Critical Habitat in the Action Area

2.1 Survey Dates and Surveying Personnel

Environmental Science Associates (ESA) conducted reconnaissance-level surveys of the action area between January and June 2008. Surveys identified species present in the action area and habitat elements that could support listed plant or wildlife species that were not directly observed. Streams and wetlands within and adjacent to the action area were also described and recorded. Surveys were conducted by ESA biologist Melanie Vanderhoof with assistance from ESA plant ecologist Martha Lowe. Survey dates within each service area are listed below in **Table 2-1**.

TABLE 2-1
SURVEY DATES IN EACH SERVICE AREA

Napa SD- MST Area	SCVSD		LGVSD NMWD URWP North/Central	Novato SD NMWD URWP South
	Napa Salt Marsh Restoration Area	Sonoma Valley Recycled Water Project		
January 9, 2008 January 10, 2008	February 25, 2008 April 16, 2008	May 5, 2008 May 16, 2008 May 22, 2008 June 11, 2008	April 22, 2008 April 25, 2008 April 29, 2008	April 22, 2008 April 25, 2008 April 29, 2008

2.2 Survey Methods

The Sonoma Valley Recycled Water Project Final Environmental Impact Report (ESA, 2006a; SCH #2005092083), the Sonoma Valley County Sanitation District (SVCSD) Sewer Trunk Main Replacement Project Biological Assessment (ESA, 2008), the Novato Sanitary District Wastewater Facility Plan Project Final Environmental Impact Report (ESA, 2005a; SCH #2004072033), and the Napa River Salt Marsh Restoration Project EIR/EIS (Jones and Stokes, 2004; SCH #1998072074) provided detailed analyses of local biological resources and potential project effects in the action area, and were consulted to prepare an initial list of plant and wildlife species considered for the current project. The California Natural Diversity Database (CDFG, 2009) was consulted concerning sensitive botanical and wildlife resources in the project vicinity. In addition, the California Native Plant Society (CNPS) online inventory (CNPS, 2009) was reviewed to identify sensitive plants in the general project region.

2.3 Threatened and Endangered Plant Species in the Action Area

Based on data supplied by the CNPS Electronic Database and the CNDDB, two endangered plant species have the potential to occur in the action area and are analyzed in this BA:

Soft bird's beak (*Cordylanthus mollis* spp. *mollis*)	FE/State Rare
Two-fork clover = Showy Indian clover (*Trifolium amoenum*)	FE/--

The federally listed Sonoma sunshine (*Blennospermi bakeri*) and Contra Costa goldfields (*Lasthenia conjugens*) are excluded from further consideration based on previous rare plant surveys conducted in May 2005 for the Sonoma Valley Recycled Water Project EIR (ESA, 2005), with negative survey findings. More details are provided in the *Species Considered but not Covered* section of this BA. Figure B-1 provides a visual comparison of the 2005 survey area and the proposed action area. Rare plant survey results are included in Appendix B.

No other threatened or endangered plants were identified as having the potential to occur in the action area.

2.4 Threatened and Endangered Wildlife Species in the Action Area

A comprehensive literature search was augmented by reconnaissance field surveys in 2008 to ascertain the likelihood of encountering federal endangered (FE) and federal threatened (FT) wildlife species in the action area. The Sonoma Valley Recycled Water Project EIR (ESA, 2005) and Novato SD Wastewater Facility Plan EIR (ESA, 2006) identified threatened and endangered wildlife species with potential to occur in the SCVSD, Novato SD, and LGVSD action areas. CNDDB records identified additional threatened and endangered species with potential to occur in the Napa Salt Marsh Restoration Area. Based on the known distribution of federally listed and candidate species in the project vicinity, and observations of potential habitat within and adjacent to the action area, effects on the following six wildlife species are analyzed in this BA:

California freshwater shrimp (*Syncaris pacifica*)	FE
California red-legged frog (*Rana draytonii*)	FT
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT
California black rail (*Laterallus jamaicensis coturniculus*)	--/CT[1]
California clapper rail (*Rallus longirostrus obsoletus*)	FE
Salt marsh harvest mouse (*Reithrodontomy raviventris*)	FE

The federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*) is considered absent from the action area based on CNDDB records, distance from the action area, and ESA staff experience with the Napa vernal pool fairy shrimp population. More details are provided in the *Species Considered but not Covered* section of this BA.

[1] California black rail is a state threatened species.

2.5 Critical Habitat

Critical habitat for these species is not present within the action area and no critical habitat areas would be affected by the proposed action. Critical habitat is designated within ten miles for soft bird's beak, Contra Costa goldfields, vernal pool fairy shrimp and California red-legged frog. Additionally, critical habitat for steelhead occurs in the action area and is discussed in the Fisheries Biological Assessment.

CHAPTER 3
Species Accounts

3.1 Covered Species

Table 3-1 identifies the threatened and endangered species covered by this BA and their distribution by member agency and service area. **Figure 2** provides an overview of threatened and endangered species in the action area. No listed species are present in the LGVSD and Napa SD member agency service areas. Actions discussed in this BA will focus on the Novato SD and SCVSD member agencies' service areas.

TABLE 3-1
THREATENED AND ENDANGERED SPECIES POTENTIALLY IN THE ACTION AREA

		Soft Bird's Beak	Two-Fork Clover	CA Freshwater Shrimp	CA Red-legged Frog	Western Snowy Plover	CA Black Rail	CA Clapper Rail	Salt Marsh Harvest mouse
LGVSD	NMWD URWP South	--	--	--	--	--	--	--	--
Novato SD	NMWD URWP North/Central	--	--	--	--	--	X	X	X
SVCSD	Sonoma Valley Recycled Water Project	--	--	X	X	--	--	--	--
	Napa Salt Marsh Restoration Area	X	X	--	--	X	X	X	X
Napa SD	MST Area	--	--	--	--	--	--	--	--

SOURCE: CDFG, 2009

3.1.1 Soft Bird's Beak

Status

Soft bird's beak is a federal endangered species, listed on November 20, 1997 (62 FR 61916).

North Bay Water Recycling Program. 206088

SOURCE: USGS; CDM, 2008; CDFG, 2009

Figure 2

Overview of Threatened and Endangered Species in the Action Area

General Ecology and Distribution

Soft bird's beak is found in coastal salt marshes at elevations of 0 to 3 meters with a blooming period of July through November. Soft bird's beak is endemic to the San Pablo and Suisun Bays. This listed subspecies was historically found in high tidal marshes along the Petaluma and Napa Rivers east through the Carquinez Strait to Suisun Bay and the San Joaquin-Sacramento River Delta, spanning Marin, Sonoma, Napa, Solano, Contra Costa, and Sacramento Counties.

Soft bird's beak is presently known from fewer than 15 populations and is limited to the edges of San Pablo Bay, Suisun Marsh, and the Petaluma River. The species is threatened by non-native plants, erosion, trampling, and marsh drainage.

Action Area Occurrence

Local Species Distribution

Seven populations of soft bird's beak are reported from the North Bay (CDFG, 2009), distributed among Marin, Sonoma, Napa and Solano counties. Two populations occur along the Petaluma River watershed but are thought to be extirpated (CDFG, 2009). Two populations in Solano County near Mare Island and Little Island in Napa Slough are also thought to be possibly extirpated based on follow-up surveys of initial records reported to the CNDDB (CDFG, 2009). An extant population occurs in Fagan Slough east from the action area, across the Napa River. Two populations occur in the Napa Salt Marsh action area and are discussed in more detail below.

Species Potential in the Proposed Action Area

SVCSD- Napa Salt Marsh Restoration Area

A population of soft bird's beak occurs in the salt and brackish marsh immediately east of the proposed Napa Salt Marsh pipeline after it enters the Restoration Area (CDFG, 2009; **see Figure 3**), mapped within the proposed alignment along salt pond 7A's levee access road. Follow-up surveys to the initial record reported to the CNDDB have not been conducted (CDFG, 2009) and further surveys are needed to identify if the population still exists. Surveys were not performed in support of this BA due to site inaccessibility.

A second population, believed extirpated (CDFG, 2009), historically occurred in a brackish marsh near the junction of Huichica Creek and Napa Slough, in the immediate vicinity of the proposed Napa Salt Marsh Pipeline Option A. Follow-up surveys performed in 1966, 1968-1970, 1986, and 1993 did not find soft bird's beak at this location (CDFG, 2009). Though soft bird's beak may reappear, only a small amount of potential habitat remained in 1986. Additional diking and draining has occurred at this location (CDFG, 2009) and this species does not typically occur in diked wetlands without tidal action (Federal Register, 2007). The site is partially privately owned (CDFG, 2009).

SOURCE: USDA, 2005; CDM, 2008; CDFG, 2009; ESA, 2008

NBWRA North Bay Water Recycling Program. 206088.01

Figure 3

Soft Bird's Beak Occurrences and Remaining Undeveloped Habitat in the SVCSD-Napa Salt Marsh Restoration Area

Pipeline Option A follows an existing railroad route, skirting agricultural lands and salt marsh habitat just north of the Napa Salt Marsh Restoration Area. In contrast, Option B follows rural Ramal Road through developed vineyards. Option C is a small sub-loop within developed vineyards that offers additional water storage flexibility for vineyard owners. Both Options A and B traverse soft bird's beak habitat as mapped in the CNDDB (CDFG, 2009). However, habitat has changed since the original recording date of 1952. Remaining undeveloped habitat is mapped in Figure 3. Pipeline Option A, following the railroad route, is adjacent to potential habitat for most of its length and passes through a small portion of potential habitat. Option B avoids any potential habitat by being restricted to rural roads and developed vineyards. Thus, Option A has the greatest likelihood for encountering soft bird's beak in this portion of the action area.

Both Options converge at Buchli Station Rd. to head south along the Napa Salt Marsh Restoration Area access road to its terminus at the mixing chamber near salt pond 7A. An undated record of soft bird's beak occurs adjacent to the access road on the east (CDFG, 2009) and potential habitat is still present. However, the pipeline would be installed within the existing access road and the deposition area to salt pond 7A traverses ruderal vegetation. Therefore, it is unlikely that this species would be encountered in this portion of the action area.

3.1.2 Two-fork (Showy Indian) Clover

Status

Two-fork clover is a federal endangered species, listed on October 22, 2007 (62 FR 54791).

General Ecology and Distribution

Historically, two-fork clover ranged from Mendocino County south to Sonoma, Marin, Alameda and Santa Clara counties, and east to Napa and Solano counties. The species was found in a variety of habitats including low wet swales, grasslands and grassy hillsides. It typically grows in moist, heavy soils below 328 feet elevation, with a blooming period of April through June. Historical habitat has been lost to urbanization and agriculture.

Action Area Occurrence

Local Species Distribution

Only three two-fork clover populations are recorded in the North Bay (CDFG, 2009), all of them in southern Napa County on the Cuttings Wharf and Napa USGS 7.5 minute quadrangles. In urban Napa, a population occurs in a non-specific area at least 0.5 mile west of the nearest project extent in the Napa SD action area. This population is believed extant, but is based on a 1951 sighting and no follow-up fieldwork has been recorded. A second population occurs 4.5 miles east of the Napa Salt Marsh Restoration Area, and is also based on a 1952 collection with no recorded subsequent fieldwork. The third population, possible extirpated, occurs in the Napa Salt Marsh action area and is discussed in more detail below.

Species Potential in the Proposed Action Area

SVCSD- Napa Salt Marsh Restoration Area

A population of two-fork clover, possibly extirpated, occurs at the Napa Salt Marsh Restoration Area. The population is mapped within the proposed Napa Salt Marsh southern pipeline Options A, B, and C (CDFG, 2009) but the exact location of the record is unknown. First recorded in 1952, follow-up surveys of this population in 1979 and 1987 were negative. The 1987 survey location is noted on **Figure 4**, at a distance of 1,400 feet east of the action area.

Most of the surrounding land has been developed, but remaining potential habitat is mapped in Figure 4. As with soft bird's beak discussed above, Option A has the greatest potential to encounter this species in the action area as it follows a railroad route that skirts cropland, grassland, and salt marsh habitat. Where Options A and B converge to enter the Napa Salt Marsh Restoration Area, potential habitat occurs on either side of the access road. Although unlikely due to the small number of known occurrences in the action area, this species grows in a variety of habitats and could be encountered in the action area.

3.1.3 California Freshwater Shrimp

Status

The California freshwater shrimp is both a state and federal endangered species, federally-listed on October 31, 1988 (53 FR 43884).

General Ecology and Distribution

The California freshwater shrimp is endemic to 17 coastal streams in Marin, Sonoma, and Napa counties north of San Francisco Bay, California. Characteristic of coastal drainages, streams that support California freshwater shrimp present a broad range of stream conditions and water temperatures. They have been found in low elevation (less than 380 feet) and low gradient (generally less than 1 percent) perennial coastal streams (USFWS, 1998).

Shrimp are generally found in stream reaches where banks are structurally diverse with undercut banks, exposed roots, overhanging woody debris, or overhanging vegetation. Optimal habitat conditions for the shrimp occur under stream conditions with 12 to 35 inches in depth with exposed live roots (e.g., alder and willow trees) along undercut banks (greater than 6 inches) with overhanging stream vegetation and vines (USFWS, 1998). Such areas provide cover from swift currents as well as some protection from high sediment concentrations associated with high stream flows.

Adults reach sexually maturity by the end of their second summer of growth. Thereafter, they breed once a year in the fall. Females produce about 50 to 120 eggs, which remain attached to their mother throughout the winter.

J:\GIS\Projects\206xxx\206088_North_San_Pablo_Bay_Reuse_Project\MXD\NOP\Figure_7_salt_ponds.mxd Map Date:7/22/08 Map Author: WSM

SOURCE: USDA, 2005; CDM, 2008; CDFG, 2009; ESA, 2008

NBWRA North Bay Water Recycling Program. 206088.01

Figure 4

Two-fork Clover Occurrences and Remaining Undeveloped Habitat in the SVCSD Napa Salt Marsh Restoration Area

Action-area Occurrence

Local Species Distribution

Three occurrences of California freshwater shrimp occur within the project service areas, with two of them in Sonoma County and one in Napa County. All occurrences are presumed extant. In the Sonoma Creek watershed, California freshwater shrimp are widely documented in mainstem Sonoma Creek approximately 1.5 miles north of the crossing location, and are documented from a single tributary drainage, Yulupa Creek, on the southwestern edge of Annadel State Park roughly 7.5 miles northwest of the SVCSD action area. No other tributaries to Sonoma Creek are known to support this species. Within the Huichica Creek watershed in Napa County, this species is documented from the middle reaches of Huichica Creek approximately 1.5 miles north of the nearest proposed pipeline route.

Species Potential in the Proposed Action Area

SVCSD- Sonoma Valley 1A

As identified by the CNDDB (CDFG, 2009), California freshwater shrimp are known to occur in Sonoma Creek near Maxwell Park, though probably inhabit downstream reaches as well. A 1999 habitat assessment for this species identified 38-linear feet of suitable shrimp habitat within 75 feet of the Watmaugh Road Bridge (Stabler, 1999). Potential habitat presumably occurs at the Sonoma Creek crossing site along the Hwy 116-to-SVCSD Treatment Facility route.

Additionally, larger tributaries to Sonoma Creek with perennial (and possibly seasonal) water may support shrimp. Thus, potential habitat may be present in Schell Creek adjacent to the SVCSD Treatment Facility, and in Fowler Creek at Watmaugh Road and the Hwy 116-to-SVCSD Treatment Facility route. However, habitat is considered marginal at these locations because ephemeral flows cease at some point during the year and often go subsurface. During formal consultation on a related action-area project, the USFWS concluded that the species' presence cannot be definitively ruled out and requested that the presence of California freshwater shrimp be assumed in Schell Creek (USFWS, 2008b; see **Figure 5**).

SVCSD- Napa Salt Marsh Restoration Area

California freshwater shrimp occur in the spring-fed mid-reaches of Huichica Creek (CDFG, 2009). The action-area stream crossing will traverse the lower tidal reach of Huichica Creek. California freshwater shrimp are not known from these lower reaches where the salinity gradient is likely too high to support the species.

SOURCE: USGS; NAIP, 2005; NHD, 2004; ESA, 2009; CDFG, 2009; USFWS, 2008

North Bay Water Recycling Program. 206088

Figure 5

California Freshwater Shrimp and California Red-legged Frog Occurrences and their Presumed Presence in Action-area Streams

3.1.4 California Red-legged Frog

Status

The California red-legged frog is a federal threatened species, listed on May 23, 1996.

General Ecology and Distribution

The California red-legged frog is principally a pond frog that can be found in quiet permanent waters of ponds, pools, streams, springs, marshes, and lakes. Moist woodlands, forest clearings, and grasslands also provide suitable habitat for this species in the non-breeding season (Stebbins, 1985). Adult frogs seek waters with dense shoreline vegetation, such as cattails, that provide good cover (Miller et al., 1996; USFWS, 2002), but may be found in unvegetated waters as well.

Red-legged frogs breed from January to May. Eggs are attached to vegetation in shallow water and are deposited in irregular clusters (USFWS, 2002). Tadpoles grow to three inches before metamorphosing. Red-legged frogs are active year-round along the coast but inland populations may aestivate from late summer to early winter. Adults consume insects such as beetles, caterpillars and isopods, while tadpoles forage on algae and detritus.

Action Area Occurrence

Local Species Distribution

Local populations of California red-legged frog are restricted to the western foothills of Sonoma Valley. This species is not known from the Sonoma Valley floor or from portions of the Mayacmas Mountains east of Sonoma; the nearest California red-legged frog population east of the proposed action area is at American Canyon, greater than 4.5 miles east of the Napa Salt Marsh Restoration Area and roughly 6.0 miles south of the Napa SD action area. Several red-legged frogs are recorded from the Sears Point area over 5 miles south of the town of Sonoma, and there are two records from the Petaluma River watershed along Lakeville Highway, between Ellis Creek and Highway 37. A population is described from a stock pond and intermittent drainage upstream from Tolay Creek, near the intersection of Highway 116 and Adobe Road. A population approximately 0.8 mile west of the SVCSD action area and east of Sonoma County Transfer Station Road is described in further detail below.

Species Potential in the Proposed Action Area

SVCSD- Sonoma Valley 1A

The only population of California red-legged frog known from the action area is from the immediate vicinity of the Sonoma County Transfer Station on the west side of Highway 116, and from a ponded portion of adjacent Champlin Creek (see Figure 5). This red-legged frog population is located approximately 0.8 mile west of the closest project element. Champlin Creek is an ephemeral drainage that drains to Rodgers Creek south of Watmaugh Road, and then into Fowler Creek. Thus, during high flow periods there is habitat contiguity between these three drainages that may provide red-legged frog dispersal among them. This species could also

potentially occur in Sonoma Creek; however, when found in stream habitats red-legged frogs occur more characteristically in lower-order tributary drainages such as Champlin Creek.

Based on the distribution of red-legged frog in the action area and potential habitat, this species may be expected near the two Fowler Creek crossing sites; at either of two Rodgers Creek crossing sites; and less likely (due to habitat discontinuity) at the Schell Creek crossing site located west of the SVCSD treatment facility. Due to extreme seasonal flows in Sonoma Creek and this species' inclination for smaller order streams, red-legged frogs are likely absent from the proposed Sonoma Creek crossing site. However, during formal consultation on a related action-area project, the USFWS concluded that species' presence cannot be definitively ruled out and requested that the presence of California red-legged frog be assumed in Schell Creek (USFWS, 2008b; see Figure 5).

3.1.5 Western Snowy Plover

Status

The western snowy plover was designated a federally threatened species on March 5, 1993 (58 FR 12864).

General Ecology and Distribution

The western snowy plover is a small, 6-inch migratory shorebird found on sandy marine and estuarine shores and at some inland nesting locations. Small numbers are year-round inhabitants at salt ponds on the San Francisco Bay (CDFG, 2005). The threatened Pacific Coast population is defined as those nesting adjacent to the tidal waters of the Pacific Ocean, known to breed from Washington to Baja California (USFWS, 2008c). This species gleans insects and amphipods from the dry sand of upper beaches, but occasionally forages in kelp or in wet sand for young sand crabs. They also feed on brine flies at salt ponds. Western snowy plovers rely on camouflage for cover, crouching motionless when danger is suspected.

For nesting they require friable soil, usually sand or gravel, above the high tide line, preferring to nest on coastal beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries (CDFG, 2005). They are uncommon nesters at dry salt ponds and salt pond levees, but such nesting has become more common in response to human disturbances (USFWS, 2008c). Most snowy plovers are nest-site-faithful and return to the same area every year (Warriner et al., 1986). Nests are shallow depressions sometimes lined with pebbles, gravel, or fragments of glass. They are frequently located near or under driftwood, rocks, or defoliated bushes.

The breeding season is March 1 through September 30 (USFWS, 2008c), clutches average 3 eggs, and parents share incubation duties. Western snowy plovers are polyandrous and the female often abandons the brood, leaving the male to raise the precocial chicks while she mates again for a second clutch. Chicks usually fledge within 31 days (Erlich et al, 1988).

Western snowy plovers are preyed upon at all life stages by gulls, ravens, coyotes, and skunks. The encroachment of non-native European beachgrass (*Ammophila arenaria*) has also reduced available nesting habitat (USFWS, 2008c). The greatest threats are human disturbance, with the breeding season coinciding with the warmest summer months and peak human recreation at sandy beaches.

Action Area Occurrence

Local Species Distribution

Along North Bay fringes of Marin, Sonoma, and Napa counties western snowy plover breeding is known only from the Napa Salt Marsh Restoration Area and is described below in more detail.

Species Potential in the Proposed Action Area

SVCSD- Napa Salt Marsh Restoration Area

This species is present in the action area and may be directly and indirectly affected by the project. Nesting western snowy plovers are documented 100 feet from the nearest pipeline extent, both east and west of the proposed Napa Salt Marsh pipeline (CDFG, 2009; see **Figure 6**). In 1992, six birds were observed nesting on sparsely vegetated, sandy islands between Huichica Creek and Coon Island. Breeding has also been documented at the Salt Pond 7A levee, adjacent to the Napa Salt Marsh pipeline, owned by Cargill and Leslie Salt and managed by CDFG.

3.1.6 California Black Rail

Status

The California black rail has been a state threatened species since 1971 and is a former Federal Species of Concern.

General Ecology and Distribution

The sparrow-sized California black rail is a year-round resident of saline, brackish and freshwater emergent wetlands in the San Francisco Bay Area, the Sacramento-San Joaquin Delta, and a few other locations, including small, isolated populations in southeastern California and western Arizona (CDFG, 2005). This species is found in tidal wetlands and brackish marshes dominated by pickleweed (*Salicornia virginica*) and bulrush (*Scirpus* spp.), and in freshwater marshes with bulrush, cattails (*Typha* spp.), and saltgrass (*Distichlis spicata*) as dominant vegetation. Heard but rarely seen, black rail live and breed in the high wetland zone, an area with minimal water-level fluctuation. They pick isopods, athropods and insects from the mud or from vegetation. Breeding season is from March through June, and the majority of breeding in northern California is thought to occur along San Pablo Bay. They make deep, loose cup nests at ground level or slightly elevated in pickleweed or other dense vegetation, with an average clutch size of six eggs in California.

Black rails are preyed upon by raptors, large wading birds, and domestic cats. In areas where transitional vegetation between the high wetland zone and the upland zone is absent, predation

J:\GIS\Projects\206xxx\206088_North_San_Pablo_Bay_Reuse_Project\MXD\NOP\Figure_7_salt_ponds.mxd Map Date:7/22/08 Map Author: WSM

SOURCE: USDA, 2005; CDM, 2008; CDFG, 2009

NBWRA North Bay Water Recycling Program. 206088.01

Figure 6

Threatened and Endangered Wildlife in the Napa Salt Marsh Restoration Area

can be intense (Evens and Page, 1991). Habitat loss is the greatest threat to this species, and the loss of higher wetlands and transitional wetlands throughout San Francisco Bay is thought to be responsible for eliminating breeding populations in the southern parts of the Bay (CDFG, 2005).

Action Area Occurrence

Local Species Distribution

This species has been documented in tidally influenced salt marshes within Napa River, Napa Slough, Fagan Slough, Steamboat Slough, Petaluma River, Novato Creek, Tolay Creek marsh, China Camp marsh, and marshes adjacent to Highway 37 (CDFG, 2009). The highest abundances are found in marshes along the Petaluma and Napa Rivers, but the entire fringe of North San Pablo Bay supports California black rail at low-to-medium densities (Evens and Nur, 2002).

Approximately 1.2 miles east of the proposed Napa Salt Marsh pipeline, California black rail is known from Fagan Slough and Steamboat Slough. Surveys in 1989, 2004, and 2005 have repeatedly detected rails at this location in association with pickleweed, marsh gumplant (*Grindelia stricta*), bulrush, and Pacific cordgrass (*Spartina foliosa*). Occurrences in the Napa Salt Marsh action area are discussed in more detail below.

Species Potential in the Proposed Action Area

SVCSD- Napa Salt Marsh Restoration Area

This species is present in the action area, having been detected at several locations in the Napa Salt Marsh Restoration Area, and could be indirectly affected by the project. During breeding bird surveys conducted by the Point Reyes Bird Observatory in 2004, California black rail were detected at 5 stations at Fly Bay and Coon Island, located to the immediate east and southeast of the proposed Napa Salt Marsh pipeline (CDFG, 2009; see Figure 6). During 2005 they were detected at 3 stations. Previously, this species had been directly observed or detected during surveys in 1985, 1988, and 1989.

A single rail was observed in Napa Slough in 1977, resulting in a large, generally-mapped occurrence south and west of the proposed Napa Salt Marsh pipeline at a distance of approximately 1,200 feet. Though much of the mapped area is now farmed or comprised of defunct salt ponds, appropriate habitat persists in the slough corridor.

Novato SD- NMWD URWP North/Central

This species may be present in the action area and could be adversely affected. The presence of suitable emergent salt marsh vegetation in Novato Creek at the pipeline crossing east of Highway 101 (see **Figure 7**) and the proximity of known black rail occurences suggests that black rails may be present in the action area. Per the CNDDB, California black rail are recently known from Novato Creek approximately 1.5 miles east and downstream from the Novato Creek crossing, as well as at the mouth of Novato Creek three miles from the action area.

North Bay Water Recycling Program. 206088

SOURCE: USGS; NAIP, 2004; CDM, 2008; CDFG, 2009

Figure 7

California Clapper Rail Occurrences in the Action Area (Novato SD-NMWD URWP North/Central)

3.1.7 California Clapper Rail

Status

The California clapper rail is a federal and state endangered species, federally listed on October 13, 1970 (35 FR 16047).

General Ecology and Distribution

California clapper rails can be found year-round in coastal wetlands and brackish areas around San Francisco and Monterey Bays. These medium-sized birds require emergent wetlands and mud flats for survival, preferring salt marshes dominated by Pacific cordgrass and pickleweed. They can also be found in brackish or freshwater marshes where dense bulrush or cattails grow (CDFG, 2005). Clapper rails will forage in higher marsh vegetation along the mudflat interface and in tidal creeks, feeding on crabs, mussels, clams, snails, insects, spiders, worms, and even mice and dead fish. Clapper rails nest in lower tidal zones where cordgrass grows abundantly and tidal sloughs are nearby, building a nesting platform concealed by a canopy of woven cordgrass, pickleweed, or gumplant, or of cattail or bulrush in fresh and brackish waters. In the Bay Area, the breeding season varies but is typically described from February 1 through August 31 (USFWS, 2008c; Joy Albertson, prior communication), with an average clutch size of 7.6 with 38% hatching success (CDFG, 2005).

Adult California clapper rails are preyed upon by raptors and mammals, while introduced Norway rats predate on eggs and young. In northern California, populations may fluctuate according to rainfall patterns (CDFG, 2005). Agricultural and urban development, accompanied by the filling and diking of wetlands, has led to the destruction of emergent wetland habitat and particularly cordgrass marshes.

Action Area Occurrence

Local Species Distribution

Clapper rail distribution in the North Bay is patchy and discontinuous, occurring primarily in small, isolated habitat fragments. There are 23 recorded occurrences throughout the San Pablo Bay fringes of Marin, Sonoma, Napa and Solano Counties (CDFG, 2009). In 2005, Point Reyes Bird Observatory Conservation Science (PRBO) performed a comprehensive, area-wide survey of the North Bay and compared results to a more limited set of 1992/1993 surveys to examine temporal and spatial patterns in California clapper rail populations (PRBO, 2005). Survey results found rails in Gallinas Creek, Napa River, Petaluma River, Wildcat Creek, and Heerdt and Muzzi marshes, but rails were noticeably absent from Suisun Bay, Pt. Pinole, Sonoma Creek, or Fagan Slough where they were detected in the early 1990s.

Species Potential in the Proposed Action Area

SVCSD- Napa Salt Marsh Restoration Area

This species is present in the action area. In 2005, a large population was detected at Coon Island, which sits adjacent to the proposed Napa Salt Marsh service area pipeline on the southeast (see Figure 6). Coon Island is contiguous with Fly Bay to the immediate north, another area with documented clapper rail populations (CDFG, 2009). Coon Island has experienced increased breeding-season rail densities over the last two years (PRBO, 2006) and may be the population center in the Napa River system (Avocet Research Associates, 2004; 2005). The importance of this Coon Island population is highlighted in contrast with declining clapper rail populations at downstream marshes (Avocet Research Associates, 2004; 2005).

Novato SD- NMWD URWP North/Central

This species may be present in the action area. The proximity of known occurrences and the presence of suitable emergent salt marsh vegetation indicate that clapper rails may be present at the pipeline crossing east of Highway 101 (see Figure 7). Populations occur along Novato Creek, with 20 individuals detected in 2006 (PRBO, 2006). CNDDB records corroborate populations within Novato Creek both upstream and downstream from Highway 37 (CDFG, 2009).

3.1.8 Salt Marsh Harvest Mouse

Status

The salt marsh harvest mouse was federally listed as endangered on October 13, 1970 (35 FR 16047) and is a state endangered species.

General Ecology and Distribution

The salt marsh harvest mouse is found only in a few northern California locations. There are two subspecies, the southern subspecies (*R. r. raviventris*) found in salt marshes of San Francisco Bay and a few locations in Corte Madera and Richmond, and the northern subspecies (*R. r. halicoetes*) found in the salt marshes of San Pablo and Suisun Bays. Movement among marshes is infrequent if it occurs at all (CDFG, 2005). This species is critically dependent on dense cover, preferring pickleweed, and is seldom found in cordgrass or alkali bulrush (*Scirpus maritimus*) (USFWS, 2008c). The value of pickleweed increases with depth, density and the degree of intermixing with fat hen (*Chenopodium spp*.) and alkali heath (*Frankenia grandifolia*) (CDFG, 2005). Transitional upper tide zones with peripheral halophytes are used to escape high tides, and even adjoining grasslands are used during the highest winter tides (USFWS, 2008c).

The salt marsh harvest mouse eats grass, leaves, seeds, and stems of plants, including pickleweed and saltgrass. Fresh water is required, but both subspecies can drink brackish or salty water for short periods (CDFG, 2005). They are primarily nocturnal, but some afternoon activity does occur (CDFG, 2005). Breeding takes place between March and November, and there are 1 to 2 litters per year with an average litter size of four. This species does not burrow. The northern subspecies makes a minimal nest of grass and sedge, often built over an old bird’s nest (USFWS, 2008b).

Salt marsh harvest mice are preyed upon by owls, hawks, gulls, weasels, and other mammals. The greatest threat to their continued survival is habitat reduction and degradation. Historically, tidal marshes and open mudflats surrounding San Pablo Bay neared 80,000 acres. There has been an 82 percent reduction in North Bay wetlands since the 1800s, with most of it diked, drained and claimed for agricultural use. The resulting changes in salinity and vegetation support only small, disconnected salt marsh harvest mouse populations (USFWS, 2008c). Small, fragmented habitats that are completely submerged during high tides and lack transitional upper tidal zones likely result in breeding failures and increased predation.

Action Area Occurrence

Local Species Distribution

The northern subspecies is found on the upper portions of the Marin peninsula; in the Petaluma, Napa and Suisun marshes; as well as in patchy and discontinuous populations on Contra Costa County's northern coastline (Goals Project, 2000). In Marin County, bay fringes at the mouth of Novato Creek supported salt marsh harvest mouse in the mid-1970s (Goals Project, 2000), and 1986 trappings were successful at the mouth of Gallinas Creek in McInnis Park (CDFG, 2009). Mare Island in Sonoma county supports a high density of the species, which can also be found along the Petaluma River, Sonoma Creek, and Tolay Creek. In Napa county, salt marsh harvest mouse can be found in Deman, Fagan and Napa Sloughs, as well as at Coon Island.

Species Potential in the Proposed Action Area

SVCSD- Napa Salt Marsh Restoration Area

This species is present in the action area, recorded from adjacent salt marshes after Options A and B converge to enter the Napa Salt Marsh Restoration Area. Trappings along the periphery of Edgerly Island were successful in 1997 following a history of 1970s trappings at Coon Island and Fly Bay, areas which are sandwiched between the proposed pipeline on the west and Edgerly Island on the east (CDFG, 2009; see Figure 6).

3.2 Species Considered but not Covered

3.2.1 Sonoma Sunshine

Status

Sonoma sunshine is a federal endangered species, listed on December 2, 1991.

General Ecology and Distribution

Sonoma sunshine is a California endemic, restricted to vernal pools, shallow depressions, and intermittent swales within mesic valley and foothill grasslands on the Santa Rosa Plain and the adjacent Sonoma Valley of Sonoma County. Its blooming period is March through May. This species is threatened by urbanization, irrigation with wastewater effluent, and conversion of

habitat to agricultural lands, as well as possible threats by non-native plants, foot traffic and road maintenance.

At least 30 percent of the historic occurrences of Sonoma sunshine have been eliminated or seriously damaged and most of the remaining sites are under threat. At least two of five known occurrences of Sonoma sunshine in Sonoma Valley have been extirpated. Westward expansion of the City of Santa Rosa threatens 50 to 70 percent of the remaining Sonoma sunshine habitat. There are currently 22 populations believed to be extant; other populations have been extirpated.

Local Occurrences

An extant population is located approximately 0.6 miles west of the pipeline route along Highway 12, south of Newcomb Street. However, rare plant surveys conducted in May 2005 in support of the SVRWP EIR failed to identify this species in or near the alignment. Surveying botanists found no populations of Sonoma sunshine in the action area, thus this species would not be affected. The technical memo relating the results of those rare plant surveys is included in Appendix B, along with **Figure B-1** which demonstrates that the 2005 rare plant survey area encompasses all portions of the action area that provide potential habitat for Sonoma sunshine.

3.2.2 Contra Costa Goldfields

Status

Contra Costa goldfields is a federal endangered species, listed on June 18, 1997.

General Ecology and Distribution

Contra Costa goldfields grow in vernal pools within open grassy areas in woodlands and valley grasslands. Its blooming period is March through June. This species has been extirpated from Santa Barbara and Santa Clara counties by agricultural land conversion, urbanization and creek channelization. Nearly all of the remaining populations are imminently threatened by urban development or agricultural land conversion. Currently, 22 populations are believed to be extant in Sonoma, Napa, Marin, Mendocino, Contra Costa, Alameda, Solano and Monterey counties.

Local Occurrences

A population of Contra Costa goldfields, believed extirpated, occurs 1.2 miles west of the Napa SD pipeline route along Highway 121 near Napa State Hospital. Several thousand plants were present in 1994, but the site was subsequently developed into agricultural lands and in 2003 it was deemed that few, if any, plants remained (CDFG, 2009).

A population occurs in Sonoma County approximately 1.5 miles west of the proposed SVCSD alignment, but would not be impacted by the project. Rare plant surveys were conducted in May 2005 for the Sonoma service area as part of the SVRWP EIR (see Figure B-1). Surveying botanists did not identify Contra Costa goldfields in the action area and this species would not be

affected by the proposed project. The technical memo relating all species observed during surveys is included here in Appendix B, Table A-1, along with Figure B-1 which demonstrates that the 2005 rare plant survey area encompasses all portions of the action area that provide potential habitat for Contra Costa goldfields.

3.2.3 Vernal Pool Fairy Shrimp

Status

The vernal pool fairy shrimp is a federal threatened species, listed on September 19, 1994.

General Ecology and Distribution

The ecology of fairy shrimp species is highly adapted to vernal pools, puddles, and similar shallow, ephemeral aquatic habitat. They are most frequently found in pools measuring less than 0.05 acre. These are most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands. Vernal pool fairy shrimp eggs, or cysts, are protected from desiccation through dry months by a hard covering that surrounds each egg. Following a combination of continuous immersion in water, low temperatures and other environmental cues, vernal pool fairy shrimp quickly hatch, reproduce and lay their eggs before the seasonal aquatic habitat dries out. Adult shrimp reach maturity in 18 to 41 days under ordinary conditions, with a life span of approximately 70 to 139 days (Eng and Belk, 1999). The short-lived pools and puddles that host this species persist for only 6 to 7 weeks in winter and 2 to 3 in spring, and are otherwise dry (Eriksen and Belk, 1999). Vernal pool fairy shrimp have been collected from early December to early May.

Fairy shrimp are preyed upon by insects, amphibians and migratory birds. Agricultural and urban development has led to the destruction of vernal pools and other seasonal aquatic habitat and the decline of the vernal pool fairy shrimp in California. The vernal pool fairy shrimp is currently known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California, and in two vernal pool habitats within the "Agate Desert" area of Jackson County, Oregon (USFWS, 2005b).

Local Occurrences

Vernal pool fairy shrimp are known from only one location in Napa County. They occur at the south end of the Napa Airport, across the Napa River and 2.7 miles east of the Napa Salt Marsh pipeline action area. Vernal pool fairy shrimp will not be impacted by project activities.

CHAPTER 4

Potential Project Effects and Reasonable and Prudent Measures to Minimize Incidental Take

The purpose of this BA is to determine if the construction and operation of the proposed action will have an adverse effect on federal listed species, and to analyze those effects on the species and their designated critical habitat. This section of the BA identifies and analyzes project effects on listed species in the action area, and proposes reasonable and prudent measures that will be incorporated to address and reduce those potential effects. **Appendix C** provides a table of the reasonable and prudent measures as they apply to each member service agency.

4.1 Listed Plants

4.1.1 Potential Project Effects

Though neither species has been identified in the action area, the proposed action has a low potential to directly impact soft bird's beak and two-fork clover at staging areas, during vegetation removal, and during project construction in the SVCSD-Napa Salt Marsh Restoration Area (see Figures 3 and 4). However, surveys at the Napa Salt Marsh Restoration Area have not identified the species and they are unlikely to be present in or along the access road to salt pond 7A.

4.1.2 Reasonable and Prudent Measures

Prior to vegetation removal or any other ground disturbance, appropriately-timed botanical surveys will be conducted by a qualified botanist along the Pipeline Option A route if chosen as the preferred option, and along the access road to salt pond 7A. Surveys will be limited to suitable habitat areas that could potentially be disturbed by the action, and conducted according to CDFG or other approved protocol. If no special-status plant species are found, the botanist will document the findings in a letter to the appropriate agencies and no further mitigation is required.

If either soft bird's beak or two-fork clover are found during focused surveys and project effects to plant populations are anticipated, Reclamation will consult with USFWS to ensure that effects are avoided or minimized.

4.2 California Freshwater Shrimp

4.2.1 Potential Project Effects

Trenchless crossing methods will be employed at all aquatic stream crossings known or presumed to support California freshwater shrimp: Sonoma Creek, Schell Creek, Felder Creek, and Fowler Creek (see Figure 5). Trenchless methods may not be feasible at other stream-crossing locations and open-trench construction could be required. During the course of construction activities both near and at stream crossings, the potential exists for accidental spills of drilling muds such as bentonite, gasoline, oil or other toxic substances. During directional drilling activities, drillhead lubricants sometimes escape to the surface through soil fractures and spill into upland or aquatic environments. The release of such materials into streams can be damaging to aquatic environs depending upon the sensitivity of the receiving waters, the timing of the spill, the magnitude of the release and the promptness and scale of cleanup activities. In the event of a spill, impacts could also be experienced during cleanup activities. Such impacts could include direct mortality from escaped materials or cleanup equipment, and temporary degradation of habitat.

4.2.2 Reasonable and Prudent Measures

The following reasonable and prudent measures will be implemented to minimize the potential for effects on California freshwater shrimp:

1. Trenchless methods will be employed at crossings that may support California freshwater shrimp: Sonoma Creek, Schell Creek, and Fowler Creek crossings;

2. All activities across waterways will be restricted to low-flow periods of June 15 through November 1. If the channel is dry, construction can occur as early as April 15 (in accordance with CDFG and RWQCB permit requirements). Restricting construction activities to this work window will minimize effects to California freshwater shrimp;

3. If trenchless methods cannot be implemented and the channel is not dry, water from around the section of trench that is within the actively flowing channels will be diverted. This will reduce the potential for sediment or other pollutants to enter the waterways and to affect downstream resources;

4. Sediment curtains will be placed downstream of the construction zone to prevent disturbed sediment from being transported and deposited outside of the construction zone;

5. If ground water is encountered, or if water remains in the channel after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. The pump(s) will be screened according to NMFS fish screening criteria for anadromous salmonids (NMFS, 1997b);

6. Silt fencing will be installed in all areas where construction occurs within 100 feet of known or potential California freshwater shrimp habitat;

7. Spoil sites will be located so they do not drain directly into the waterways. If a spoil site drains into a water body, catch basins will be constructed to intercept sediment before it reaches the channels. Spoil sites will be graded to reduce the potential for erosion;

8. A spill prevention plan for potentially hazardous materials will be prepared and implemented. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting of any spills. If necessary, containment berms will be constructed to prevent spilled materials from reaching the creek channels;

9. Equipment and materials will be stored at least 50 feet from waterways. No debris such as trash and spoils will be deposited within 100 feet of wetlands. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, will be located outside of the stream channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream will be positioned over drip pans;

10. Proper and timely maintenance for vehicles and equipment used during construction will be provided to reduce the potential for mechanical breakdowns leading to a spill of materials into or around the creeks. Maintenance and fueling will be conducted in an area that meets the criteria set forth in the spill prevention plan (i.e., away from the creeks);

11. Fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 20 meters (60 feet) from site riparian habitat or water bodies;

12. A qualified biological monitor will be on site during all stream crossing activities. The biological monitor will be authorized to halt construction if effects to California freshwater shrimp are evident;

13. Project sites will be restored to pre-construction channel conditions, including streambed composition, compaction, and gradient. Channel banks will be returned to original grade slope and appropriate bank stabilization techniques will be implemented to reduce the potential for erosion and sedimentation;

14. Project sites will be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan describing pre-project conditions, restoration and monitoring success criteria will be prepared prior to construction.

Following implementation of the above reasonable and prudent measures, the proposed action is not likely to adversely affect California freshwater shrimp.

4.3 California Red-legged Frog

4.3.1 Potential Project Effects

In the absence of focused red-legged frog surveys for Sonoma action area stream crossings, this species shall be presumed present within available aquatic habitat and adjoining upland environs at Rodgers Creek, Fowler Creek, and Schell Creek (see Figure 5). This species is known to occur in Champlin Creek.

Upland construction methods in the vicinity of these crossing sites are expected to be minimally invasive, utilizing open trench methods either within or adjacent to existing roadways. The

USFWS programmatic biological opinion for impacts to California red-legged frogs (USFWS, 1999) identifies typical effects that could occur as a result of the proposed action, including:

- injury or mortality from being crushed by earth moving equipment, debris, and worker foot traffic;
- work activities, including noise and vibration, causing frogs to leave suitable habitat;
- mortality as a result of the accidental spill of hazardous materials or from careless fueling or oiling of vehicles or equipment near sensitive upland or aquatic habitats;
- or, injury or mortality as a result of improper handling, containment, or transport of individuals.

4.3.2 Reasonable and Prudent Measures

Aquatic resources will be protected by minimizing in-stream and near-stream habitat impacts and implementing protective measures. The following measures, extracted from the USFWS *Programmatic Formal Endangered Species Act Consultation on Issuance of Permits under Section 404 of the Clean Water Act or Authorization under the Nationwide Permit Programs that May Affect the California Red-legged Frog* (USFWS, 1999), will be implemented to protect California red-legged frogs that may be present in aquatic habitat including Champlin Creek, Schell Creek, Rodgers Creek, and Fowler Creek.

1. In-stream construction will be avoided at streams presumed or known to support California red-legged frog;
2. Reclamation shall ensure the appropriate permit authorizations are secured for stream crossings, and a qualified biological resource monitor shall be present at all times to alert construction crews to the possible presence of California red-legged frog during construction operations;
3. At least 15 days prior to onset of activities, Reclamation shall submit the name(s) and credentials of biologists who would conduct activities authorized by the BO. No project activities shall begin until Reclamation has received written approval from the USFWS that the biologist(s) is approved to conduct the work;
4. A qualified biologist shall survey the project site (i.e., at stream crossings where aquatic impacts are expected) two weeks prior to the onset of earthmoving activities. If California red-legged frog tadpoles or eggs are found, the approved biologist shall contact the USFWS to determine if moving any of these life-stages is appropriate. In making this determination the USFWS shall consider if an appropriate relocation site exists. If the USFWS approves moving animals, the approved biologist shall be allowed sufficient time to move frogs from the project site before work activities begin. Only Service-approved biologists shall participate in activities associated with the capture, handling, and monitoring of California red-legged frogs;
5. A Service-approved biologist shall be on-site during earth-moving activities near identified habitat for California red-legged frog and shall inspect work areas each morning. A “no take” approach shall be taken for work activities. The Service-approved biologist shall be contacted if any California red-legged frogs are observed. If California red-legged frogs are

encountered during construction activities, they shall be relocated by the Service-approved biologist. Construction activities shall cease until the area is determined to be free of California red-legged frogs;

6. A qualified biologist shall conduct a training session for construction personnel working near appropriate habitat prior to the onset of construction activities. At a minimum, the training shall describe the California red-legged frog and their habitat, their importance, and the measures that are being implemented to conserve these species as they relate to the proposed action;

7. All work activities within or adjacent to aquatic habitat shall be completed between April 1 and November 1;

8. Removal or containment of trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly; and

9. Fueling and maintenance of vehicles and other equipment and staging areas shall occur at least 20 meters (60 feet) from site riparian habitat or water bodies.

Following implementation of the above reasonable and prudent measures, the proposed action is not likely to adversely affect individuals or habitat for California red-legged frog.

4.4 Western Snowy Plover

4.4.1 Potential Project Effects

Construction activities within 500 feet of potential snowy plover nesting habitat would occur during the non-breeding season. The southern terminus of the proposed Napa Salt Marsh pipeline would be installed within a salt pond levee/access road, temporarily and directly impacting potential western snowy plover nesting habitat (see Figure 6). Nesting plovers are sensitive to visual and auditory disturbances. Construction activities within line-of-sight of active nests and at disruptive noise levels can cause temporary flight, reproductive failure, and/or nest abandonment; plovers may even abandon chicks if disturbed (LeFur, prior personal communication, 2008). With implementation of seasonal avoidance measures, the project will have minimal or negligible effects to western snowy plover.

4.4.2 Reasonable and Prudent Measures

To minimize the likelihood of project effects on western snowy plover, the following reasonable and prudent measures will be implemented at the Napa Salt Marsh Restoration Area:

1. Construction activities within 500 feet of breeding areas will occur during the non-breeding season (September 15 through end of February);

2. Construction activities outside the Napa Salt Marsh Restoration Area and not on salt pond levees, greater than 500 feet from nesting areas, can occur at any time;

3. Construction personnel will receive environmental awareness training specific to the identification and habitat requirements of western snowy plover and measures being implemented to protect the species;

4. Construction activities will be constrained to the smallest area possible to minimize disturbance to potential nesting habitat.

With implementation of the above reasonable and prudent measures, the proposed action is not likely to adversely affect this listed species or its critical habitat

4.5 California Clapper Rail and California Black Rail

4.5.1 Potential Project Effects

The proposed action has the potential to adversely effect rails during project construction. Potential effects include direct mortality from equipment, entrapment in pipe sections or trenches, and harassment due to noise and vibrations. If nesting rails were present in the action area at the time of construction, then construction activities involving heavy equipment operation could result in adverse effects including temporary flight and/or the abandonment of territories or nests.

Breeding-season surveys in 2005 confirmed rail presence in marshes immediately adjacent to the SVCSD-Napa Salt Marsh Restoration Area (see Figure 6). Direct impacts on rails or their habitat would be avoided by restricting the work area to the existing access road. A 400-square-foot outfall structure would be constructed at the mixing chamber southeast of salt pond 7A, with an overall construction impact zone measuring roughly 2,500 square feet. There would be a minimal impact on ruderal or grassland vegetation including fennel (*Foeniculum vulgare*), wild radish (*Raphanus sativus*), milk thistle (*Silybum marianum*), and curly dock (*Rumex crispus*), potential removal of 1 to 2 coyote brush (*Baccharis pilularis*), and potential removal of a narrow two-foot fringe of pickleweed.

Breeding-season surveys in 2005 confirmed rail presence in marshes adjacent to the Novato SD-NMWD URWP North/Central service area's Novato Creek crossing, where rails or their habitat could be directly impacted by the project (see Figure 7). At the Novato Creek crossing site, the construction impact area will be restricted to outside the creek corridor and associated emergent vegetation zone.

The implementation of several reasonable and prudent measures, including seasonal avoidance, will decrease the likelihood of adverse effects on these species.

4.5.2 Reasonable and Prudent Measures

1. Construction activities within 500 feet of potential nesting habitat will occur during the non-breeding season (September 1 through end of January);

2. Activities proposed in upland (i.e., interior) portions of the site greater than 500 feet from potential nesting habitat may occur at any time.

3. Construction activities will be confined to within the levee access road at the Napa Salt Marsh Restoration Area, and to areas outside the Novato Creek corridor and associated emergent vegetation zone at the Novato Creek crossing.

4. Construction personnel will receive environmental awareness training specific to the identification of rails and their habitat.

Following implementation of the above measures, construction of the project is not likely to result in adverse effects on California clapper rail or California black rail individuals or their habitat.

4.6 Salt Marsh Harvest Mouse

4.6.1 Potential Project Effects

Due to the proximity of the project to salt marsh habitat where salt marsh harvest mouse is known to occur, the action may result in adverse effects on salt marsh harvest mouse. The pipeline will be installed within the existing access road and the impact area confined to approximately 25 feet in width to avoid direct impacts on pickleweed vegetation. A 400-square-foot outfall structure will be constructed at the mixing chamber southeast of salt pond 7A, with an overall construction impact zone measuring roughly 2,500 square feet **(see Figure 8)**. There will be a minimal impact on ruderal or grassland vegetation as noted above, including removal of fennel, wild radish, milk thistle, and curly dock, potential removal of 1 to 2 coyote brush, and potential removal of a narrow, two-foot-wide fringe of pickleweed.

4.6.2 Reasonable and Prudent Measures

To avoid potential adverse effects on salt marsh harvest mouse, the following reasonable and prudent measures will be performed in portions of the action area that support emergent salt marsh vegetation:

1. A qualified biologist will conduct specific preconstruction surveys prior to project initiation, following USFWS survey guidelines;

2. Project activities will be confined to within the levee access road, except for construction of the outfall structure at the salt pond mixing chamber;

3. The biological monitor will conduct an environmental awareness training for contractors outlining the biology, legislative protection and construction restrictions relating to salt marsh harvest mouse;

4. Silt fencing will be installed on both sides of the access road, where suitable habitat is present, to deter the species movement into the construction area, and to prevent spoils from entering the salt marsh.

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SOURCE: Google Earth, 2006; ESA, 2009

Figure 8

Aerial Overview of Proposed Napa Salt Marsh Restoration Area Pipeline and Outfall Structure

5. Every morning prior to the start of construction, a qualified biologist will inspect all open trenches within 250 feet of emergent pickleweed habitat for trapped mice;

6. At the close of each workday, escape ramps/boards will be provided in all open trenches.

7. A qualified biologist will be onsite during vegetation removal and during morning trench inspections, and otherwise available during the course of the construction work.

Following implementation of the above measures, construction of the project is not likely to result in adverse effects on salt marsh harvest mouse individuals or their habitat.

4.7 Cumulative Effects

As identified in the NBWRP EIR/EIS, the SVCSD Sewer Trunk Main Replacement Project MND, and the Novato Sanitary District Wastewater Treatment Facility Plan EIR documents prepared under CEQA, effects to biological resources are mostly minimal and localized. The projects identified in the cumulative impacts analyses occur primarily in urban areas that do not support sensitive biological resources. Other individual projects in the local area, including the Napa River Salt Marsh Restoration Project and the SVCSD Sonoma Valley Recycled Water Project, could adversely affect biological resources in Sonoma Valley or the Sonoma-Napa Marshlands but project effects would be localized and mitigable, and overall beneficial to threatened or endangered plant and wildlife species (e.g., marsh enhancement projects).

Cumulative projects in the local area are identified to include:

- North Marin Water District and Novato Sanitation District Stone Tree Golf Course Ponds
- Marin Municipal Water District Desalination Project
- North Sonoma County Agricultural Recycling Program
- North Coast Integrated Regional Water Management Plan
- Napa Sanitation District Milliken Sarco-Tulocay Recycled Water Project
- PG & E Lakeville-Sonoma Transmission Line Project
- Napa River Salt Marsh Restoration Project
- SCWA Water Supply, Transmission and Reliability Project
- Commercial and Residential Development Projects
- SVCSD Sonoma Valley Recycled Water Project
- SVCSD Treatment Facility Upgrade Project

These projects may occur during a similar timeframe as the proposed action. However, implementation of the mitigation measures identified in the applicable CEQA documents would reduce proposed action effects to less-than-considerable. The measures outlined in this BA would further reduce the proposed action's contribution to cumulative environmental effects to less-than-significant.

CHAPTER 5
Determination

With implementation of reasonable and prudent measures proposed as part of the NBWRP and included in this BA, the proposed action is not likely to adversely affect soft bird's beak, two-fork clover, California freshwater shrimp, California red-legged frog, western snowy plover, California black rail, California clapper rail, or salt marsh harvest mouse.

There is a very low likelihood for two-fork clover and soft bird's beak to occur in the action area. The proposed action will avoid effects to listed plants by performing appropriately-timed botanical surveys in suitable habitat throughout the action area prior to vegetation removal, groundbreaking, or other construction-related activities. If listed plants are discovered, Reclamation will consult with the USFWS to address adverse effects, if any.

The proposed action will avoid effects on California freshwater shrimp and California red-legged frog by using trenchless pipeline installation methods at Sonoma Creek, Fowler Creek, Rodgers Creek, and Schell Creek stream crossings. Trenchless pipeline installation methods will also be used at Champlin Creek crossings, if not dry during the construction period. Trenchless methods will result in no habitat intrusion or alteration and are anticipated to have no direct effect on aquatic species. California freshwater shrimp and/or California red-legged frog are not known or expected to occur at other aquatic stream crossing locations where trenching could occur. Proposed upland activities would minimally endanger individual frogs and the implementation of reasonable and prudent measures described in this BA will minimize the potential for harming frogs that could be encountered in upland areas. With use of trenchless construction methods at sensitive stream crossings and protection measures in upland areas, the proposed action is not likely to adversely affect, California freshwater shrimp or California red-legged frog.

The proposed action is not likely to affect nesting western snowy plover, California clapper rail and California black rail through implementation of seasonal avoidance measures. Construction activities will be restricted to the non-breeding season. With use of seasonal avoidance measures, the proposed action would have "no effect" on nesting western snowy plover, California clapper rail and California black rail.

The proposed action is not likely to affect salt marsh harvest mouse through conducting specific preconstruction surveys prior to project initiation, restricting construction activities to within the salt pond access road, installing exclusion fencing on both sides of the access road, installing escape ramps within open trenches, and having a qualified biologist identify and remove mice from open trenches each morning before the start of construction. With implementation of these

measures the proposed action could affect, but is not likely to adversely affect, salt marsh harvest mouse.

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APPENDIX A

Fisheries Biological Assessment

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CHAPTER 1
Summary of Findings and Conclusions

1.1 Listed Species in the Action Area

A comprehensive literature search and reconnaissance-level field surveys conducted in 2008 and 2009 provided information on the likelihood of encountering threatened or endangered fish species in the North Bay Water Recycling Program (NBWRP) action area. Two salmonid species are known to occur within the action area: the federally threatened central California coast (CCC) steelhead trout (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) and the federally endangered Central Valley Evolutionarily Significant Unit (ESU) of chinook salmon (*O. tschawytscha*).

1.2 Species Considered but Excluded

Three species were considered but excluded from further consideration in this BA: the federal and state-threatened Delta smelt (*Hypomesus transpacificus*); the federally-endangered tidewater goby (*Eucyclogobius newberryi*); and the federally-threatened Southern Distinct Population Segment of North American green sturgeon (*Acipenser medirostris*).

Delta smelt are primarily restricted to the Delta and Suisun Bay portions of San Francisco Estuary but may be washed into the Bay during high outflow periods (Moyle, 2002). The only records for Delta smelt in a watershed tributary to the San Francisco Estuary are from lower tidal reaches of the Napa River and associated marshes, where they may persist in low numbers (Leidy, 2007). This reach of the Napa River and associated marshes are south of the action area and the proposed action does not involve crossing the Napa River.

Tidewater goby were historically present in Novato Creek, which would be crossed by the proposed action east of Highway 101. Although Leidy suggests lower Novato Creek should be sampled for tidewater goby (Leidy, 2007), this population is believed extirpated (CDFG, 2008). Recolonization is unlikely since the nearest tidewater goby occurrence is more than 18 miles south on the Pacific Coast (CDFG, 2008). Additionally, direct effects to Novato Creek will be avoided through trenchless installation techniques, including potential suspension from existing bridges and restricting work activities to areas outside the creek channel.

Green sturgeon in the Pacific Ocean range from Ensenada, Mexico north to the Bering Sea. They are found in rivers from the Sacramento River north to British Columbia. The only known spawning in California takes place in the Klamath and Sacramento Rivers (Moyle, 2002).

Migratory habitat for green sturgeon is known to occur in San Pablo Bay, and proposed critical habitat includes San Pablo Bay and all tidally-influenced areas, as well as tributaries upstream to the head of tide (Federal Register, 2008). However, green sturgeon are not expected in action-area stream crossings. The only estuarine stream crossing occurs at Novato Creek at the approximate head of tide, and action-related activities would not occur within the channel.

1.3 Critical Habitat in the Action Area

A final rule for steelhead critical habitat was issued by the National Marine Fisheries Service (NMFS) in September 2005 addressing seven distinct population segments (DPSs) of West Coast Salmonids (NMFS, 2005). Designated critical habitat for CCC steelhead DPS includes the Sonoma Creek Hydrologic Subbasin, which encompasses Sonoma Creek, Schell Creek, Huichica Creek and Napa River watersheds. Within this subbasin, seven critical habitat streams are crossed at least once by the proposed action. These streams are listed below in **Table 1.1** and identified in **Figure A-1**.

Delta smelt and winter- and spring-run Central Valley chinook have critical habitat designations within ten miles of the action area, but the proposed action does not affect critical habitat for these species.

TABLE 1.1
CENTRAL CALIFORNIA COAST STEELHEAD TROUT
CRITICAL HABITAT STREAMS POTENTIALLY AFFECTED BY THE PROPOSED ACTION

Service Area	Creek	Watershed
SVCSD- Recycled Water Project Service Area	Sonoma	Sonoma Creek
	Fowler	
	Rodgers	
	Schell	Schell Creek
SVCSD- Napa Salt Marsh Restoration Area	Huichica	Huichica Creek
Napa SD- MST Service Area	Murphy	Napa River
	Tulucay	

SOURCE: (NMFS, 2005; CDM, 2008)

1.4 Essential Fish Habitat in the Action Area

Central Valley Chinook, Winter and Spring Run

The Magnuson-Stevens Fishery Conservation and Management Act manages the fisheries for coho, chinook and Puget Sound pink salmon through implementation of Fisheries Management Plans. These Fisheries Management Plans identify Essential Fish Habitat (EFH) in California for coho and chinook salmon. There is no EFH for listed chinook in the action area. While the EFH

SOURCE: Hydrarca, 2000; USGS; ESRI, 2006; CDM, 2008; USFWS, 2005

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Figure A-1

Overview of Steelhead Critical Habitat Streams in the Action Area

designation is applicable to *non-listed* Central Valley chinook (fall and late fall runs) in the action area at Sonoma Creek, Napa River, and Novato Creek, the EFH designation for listed winter- and spring-run Central Valley chinook applies only to San Pablo Bay (see **Figure A-2**).

Central valley chinook migrate along the Sacramento River, through San Pablo Bay into the San Francisco Bay where they enter or exit the Pacific Ocean. Major tributaries to San Pablo Bay include Sonoma and Novato Creeks, which offer fall-run migration and rearing habitat, and the Napa River, whose upper reaches provide fall-run chinook with opportunistic/intermittent spawning, holding and rearing habitat (PFMC, 2000; NMFS, 1998a).

1.5 Summary of Effects of the Proposed Action

The NBWRP would include 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage to provide 3,755 AFY of recycled water. This would result in a corresponding reduction in discharge at each of the WWTPs, which discharge to tributaries of North San Pablo Bay. Implementation of Phase 1 projects would have an estimated 2020 discharge reduction of 6,121 AFY for all the WWTPs combined.

Water quality would not be substantially or adversely affected by implementation of the proposed action. When compared to projected 2020 discharge levels, implementation of the NBWRP would substantially reduce discharges to North San Pablo Bay and its tributaries, as identified below on an individual member agency basis. When compared against the future no action scenario, which considers that some of the NBWRP projects may be implemented without federal funding under Title 16 (the Bureau of Reclamation's Federal Action), the identified discharge reductions would be less, but remain a beneficial effect. Additionally, use of recycled water would provide offset of potable water supplies currently used for irrigation purposes, including both local surface water diversions for agricultural uses, and regional surface water diversions from the Russian River system for urban irrigation uses.

- Reduces discharge of tertiary treated effluent in the Novato SD-NMWD URWP North/Central service area by an estimated 1,983 acre-feet per year (AFY)
- Reduces discharge of tertiary treated effluent in the LGVSD-NMWD URWP South service area by an estimated 548 AFY
- Reduces discharge of tertiary treated effluent in the SVCSD-Recycled Water Project service area by an estimated 1,452 AFY
- Delivers up to 3,460 AFY of tertiary treated effluent to the SVCSD-Napa Salt Marsh Restoration Area
- Reduces discharge of tertiary treated effluent in the Napa SD-MST service area by an estimated 2,137 AFY.

The proposed pipeline alignments cross numerous intermittent, seasonal, and perennial drainages throughout the member agency service areas. Most of the crossings will occur on seasonal and

SOURCE: Hydrarca, 2000; USGS; ESRI, 2006; CDM, 2008; USFWS, 2005

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Figure A-2

Chinook Essential Fish Habitat in the Action Area

intermittent streams that are expected to be dry at the time of construction. Therefore, the potential direct effects from construction of the proposed action would only occur at those stream crossings where steelhead and chinook are known or presumed present, or where critical or essential fish habitat has been designated. A total of fifteen pipeline crossing locations were identified as habitat potentially supporting salmonids, or as designated critical or essential fish habitat.

It is presumed that all construction will occur in road rights-of-way and that trenchless methods will be employed at all perennial stream crossings. However, further investigation may reveal that open trench methods will be necessary at some locations. Of the 67 total stream crossings, pipelines cross nine streams that are known to support, or to have historically supported, threatened or endangered fish: Sonoma, Fowler, Rodgers, Schell, Huichica, Murphy, Tulucay Novato and Miller Creeks. Pipelines at these locations will be installed using underground construction techniques such as bore and jack tunneling or directional drilling. Direct effects to Novato and Sonoma Creeks will be avoided through trenchless installation techniques, including potential suspension from existing bridges and restricting work activities to areas outside the creek channel.

The following potential effects to steelhead, chinook, or their designated critical or essential fish habitat could result, to varying degrees depending on installation type, from open trench pipeline crossings, trenchless underground stream crossings, and above-ground suspended pipeline crossings:

- Injury or mortality from being crushed by earth-moving equipment, construction debris, and worker foot traffic;
- Injury or mortality as a result of improper capture, handling, containment, or transport of individuals during preconstruction capture and relocation activities;
- Injury or mortality resulting from short-term sedimentation and turbidity that may occur during construction and removal of cofferdams;
- Injury or mortality during dewatering activities;
- Injury or mortality as a result of the accidental spill of hazardous materials or careless fueling or oiling of vehicles or equipment near sensitive upland or aquatic habitats;
- Temporary destruction of steelhead, chinook, or designated critical habitat or essential fish habitat through alterations of the stream substrate, downstream sedimentation, and the loss of riparian vegetation and stream function as fishery habitat;
- Injury or mortality resulting from short-term sedimentation and turbidity from the inadvertent release of contaminants;
- Temporary reduction in food availability due to the inadvertent release of contaminants.

1.6 Summary of Determination

This BA identifies a total of fifteen locations where the proposed pipeline alignment crosses drainages that are known or presumed to support steelhead, chinook, or their designated critical or essential fish habitat. The project will minimize the likelihood of direct effects to salmonids at these locations through the use of underground pipeline installation methods (bore and jack, directional drilling techniques) or above-ground suspension where bridges are present. However, if underground pipeline installation methods are infeasible at certain locations, open trenching may be required and direct effects on steelhead, chinook, or their designated critical habitat or essential fish habitat would be likely. Potential effects will be minimized through the implementation of reasonable and prudent measures described in **Section 3.2** of this BA. With implementation of reasonable and prudent measures proposed as part of the NBWRP, the project may affect, but is not likely to adversely affect, steelhead, chinook, or their designated critical or essential fish habitat.

CHAPTER 2
Existing Environment and Species Description

2.1 Survey Dates and Personnel

Environmental Science Associates (ESA) biologist Melanie Vanderhoof conducted reconnaissance-level surveys of accessible areas along the project corridor on the dates provided in **Table 2.1** below.

TABLE 2.1
SURVEY DATES IN RESPECTIVE RECYCLED WATER SERVICE AREAS

SCVSD- Sonoma Valley Recycled Water Project Area	SCVSD- Napa Salt Marsh Restoration Area	Napa SD- Milliken-Sarco-Tulucay Area	Novato SD/LGVSD- NMWD URWP[1] North/Central and South
May 5, 2008 May 16, 2008 May 22, 2008 June 11, 2008	February 25, 2008 April 16, 2008	January 9, 2008 January 10, 2008	April 22, 2008 April 25, 2008 April 29, 2008

[1] North Marin Water District Urban Recycled Water Plan

2.2 Survey Methods

Sonoma, Napa and Marin County tributaries to San Pablo Bay are well-studied and no focused fish surveys were conducted in support of this Biological Assessment. The following discussion of the environmental setting and species distribution is based on information gathered during reconnaissance surveys conducted in Spring 2008; relevant environmental documents such as the *Sonoma Valley Recycled Water Project EIR* (ESA, 2005); Bay Area fish surveys conducted by Robert Leidy (Leidy, 1999; 2005; 2007); information from the National Marine Fisheries Service (NMFS, 2005) and the Pacific Fishery Management Council (PFMC, 2000); and from resources available on the KRIS website.

2.3 Existing Environment in the Action Area

The NBWRP action area encompasses portions of Marin, Sonoma and Napa counties. Stream crossings would occur in the following watersheds:

- Novato Creek Watershed
- Miller Creek Watershed

- Sonoma Creek Watershed
- Schell Creek Watershed
- Huichica Creek Watershed
- Napa River Watershed

Within each watershed, the proposed alignment crosses numerous seasonal, intermittent and perennial drainages. Most perennial drainages in the Sonoma and Napa county action areas are known or presumed to support salmonids. Literature reviews and reconnaissance surveys identified fifteen locations where the proposed pipeline crosses drainages known or presumed to support these species. A summary of these locations is provided in **Table 2.2** below, followed by watershed descriptions.

TABLE 2.2
ACTION-AREA STREAMS THAT SUPPORT SALMONIDS AND ARE POTENTIALLY AFFECTED BY THE PROPOSED ACTION

Service Area	Watershed	Creek	Critical Habitat (CH), Essential Fish Habitat (EFH)	Steelhead (ST), Chinook (CHK)	Map Intersection Point[1]
SVCSD – Recycled Water Project Service Area	Sonoma Creek	Sonoma	CH EFH	ST, CHK	D
		Fowler	CH	ST	E, F
		Rodgers	CH	ST	G, H
	Schell Creek	Schell	CH	ST	I, J, K
SVCSD – Napa Salt Marsh Restoration Area	Huichica Creek	Huichica	CH	ST	L
Napa MST	Napa River	Murphy	CH	ST	M
		Tulucay	CH	ST	N
		Kreuse	--	Unknown	O
LGVSD – NMWD North/Central	Novato Creek	Novato Creek	EFH	ST, CHK	A
		Arroyo Avichi	--	Unknown	B
Novato SD – NMWD South	Miller Creek	Miller Creek	--	ST, CHK	C

[1] See Figures 3, 4, 5 and 6

SOURCE: (NMFS, 2005; CDM, 2008; ESA, 2009)

2.3.1 Sonoma Creek Watershed

The Sonoma Creek watershed drains an area of approximately 170 square miles between ridges of the Sonoma Mountains, and includes tributaries Dowdall, Malone, Carriger, Felder, Champlin, Fowler, and Rodgers Creeks. Sonoma Creek, the principal drainage, extends for approximately 31 miles from its headwaters in Sugarloaf Ridge State Park, flowing though redwood and fir forests, oak woodlands, chaparral and grasslands and the City of Sonoma before flowing into San Pablo Bay through a system of tidal sloughs.

Within the Sonoma Creek watershed, the proposed action crosses occupied or presumed-occupied steelhead and chinook habitat at Sonoma Creek, Fowler Creek, Rodgers Creek, and three unnamed tributaries (see **Figure A-3, crossings D, E, F, G, and H**). With the exception of the unnamed tributaries, these drainages offer high-quality salmonid habitat.

Designated steelhead critical habitat streams in the Sonoma Creek watershed include Sonoma Creek, Fowler Creek, and Rodgers Creek (NMFS, 2005; see Figure 1).

2.3.2 Schell Creek Watershed

The Schell Creek watershed drains an area of approximately 21.2 square miles and includes tributaries Nathanson and Haraszthy Creeks and Arroyo Seco. Schell Creek, the principal drainage, extends for approximately 3.5 miles from its headwaters on the floor of Sonoma Valley, flowing southeast through agricultural fields before flowing into Schell and Steamboat Sloughs in northernmost San Pablo Bay’s tidal network.

Within the Schell Creek watershed, the proposed action crosses occupied or presumed-occupied steelhead and chinook habitat at three Schell Creek crossing sites. Schell creek has historically supported steelhead (NMFS, 2005; **see Figures A-3 and A-4, crossings I, J and K**).

Schell Creek is a designated steelhead critical habitat stream (NMFS, 2005; see Figure 1).

2.3.3 Huichica Creek Watershed

The Huichica Creek watershed represents about 7 square miles of drainage area through the rolling hills, dairy pastures and vineyards of California's Napa Valley, Carneros region, in southern Napa County. Huichica Creek flows for approximately 7.5 miles before entering a system of tidal sloughs connected with both Sonoma Creek and the Napa River and issuing into San Pablo Bay. Huichica Creek enters Sonoma Creek via Hudeman and Second Napa Sloughs, and enters the Napa River via Hudeman and Napa Sloughs (Leidy, 2007).

Within the Huichica Creek watershed, the proposed action crosses occupied or presumed-occupied steelhead and chinook habitat at one Huichica Creek crossing site (see **Figure A-4, L crossings)**.

Huichica Creek is designated steelhead critical habitat (NMFS, 2005; see Figure 1).

North Bay Water Recycling Program. 206088

SOURCE: Hydrarca, 2000; USGS; ESRI, 2006; CDM, 2008; USFWS, 2009

Figure A-3

Stream Crossings in the SVCSD-Sonoma Valley Recycled Water Project Service Area

SOURCE: Hydrarca, 2000; USGS; ESRI, 2006; CDM, 2008; USFWS, 2005

North Bay Water Recycling Program. 206088

Figure A-4

Stream Crossings in the SVCSD-Napa Salt Marsh Restoration Area

2.3.4 Napa River Watershed

The Napa River watershed drains an area of approximately 426 square miles between ridges of the eastern Sonoma Mountains and the western Vaca Mountains, and includes tributaries Dry, Redwood, Sulphur, Conn, Soda, Milliken, Napa, Murphy, Tulucay and Kreuse Creeks. Napa River, the principal drainage, extends for approximately 55 miles from its headwaters near Mt. St. Helena in the Mayacamas Range, flowing though oak and pine woodlands, chaparral, grasslands and the City of Napa before issuing into San Pablo Bay near the City of Vallejo.

Within the Napa River watershed, the proposed action crosses occupied or presumed-occupied steelhead habitat at Murphy Creek and Tulucay Creek (see **Figure A-5, crossings M and N)**. Kreuse Creek is also crossed, but whether salmonids are present is unknown (see Figure A-5, **crossing O**).

Murphy and Tulucay Creeks are designated steelhead critical habitat streams (NMFS, 2005; see Figure 1).

2.3.5 Novato Creek Watershed

The Novato Creek watershed is the largest in eastern Marin County with a basin of 45 square miles and includes Stafford Lake; tributaries Arroyo San Jose, Arroyo Avichi, Rush, Leveroni, Bowman Canyon, Warner, and Vineyard Creeks; and Bel Marin Keys Lagoon and Simmons Slough. Novato Creek, the principal drainage, extends for approximately 17 miles from its headwaters, flowing through oak woodlands, grasslands, and the City of Novato before flowing into San Pablo Bay just south of the Petaluma River mouth.

Within the Novato Creek watershed, the proposed action crosses occupied or presumed-occupied steelhead and chinook habitat at crossing sites including Novato Creek and Arroyo Avichi (see **Figure A-6, crossings A and B**).

There are no designated critical habitat streams for steelhead in the Novato Creek drainage (NMFS, 2005; see Figure 1).

2.3.6 Miller Creek Watershed

The Miller Creek watershed drains an area of approximately 12 square miles. Miller Creek flows for approximately seven miles from its headwaters above the Gallinas Valley through forests, oak woodlands, and bayland before entering San Pablo Bay at John. F. McInnis County Park in Novato.

Within the Miller Creek watershed, the proposed action crosses occupied or presumed-occupied steelhead habitat at Miller Creek and potentially crosses up to fourteen unnamed tributaries (see Figure A-6, **crossing C**).

There are no designated critical habitat streams for steelhead in the Miller Creek watershed (NMFS, 2005; see Figure 1).

SOURCE: Hydrarca, 2000; USGS; ESRI, 2006; CDM, 2008; USFWS, 2005

North Bay Water Recycling Program. 206088

Figure A-5

Stream Crossings in the Napa SD-MST Action Area

SOURCE: Hydrarca, 2000; USGS; ESRI, 2006; CDM, 2008; USFWS, 2005

North Bay Water Recycling Program. 206088

Figure A-6

Stream Crossings in the Novato SD and LGVSD Service Areas

2.4 Status and Description of the Species

2.4.1 Central California Coast Steelhead Trout

Status

Central California Coast steelhead trout are a state threatened species, first listed on August 18, 1997 (62 FR 43937) and then reaffirmed on January 5, 2006 (71 FR 834).

General Ecology and Distribution

Steelhead are found throughout the San Pablo-Suisun-San Francisco Bay estuarine complex. The Central California Coast Distinct Population Segment (DPS) includes steelhead in the counties of Lake, Mendocino, Sonoma, Napa, Marin, San Francisco, San Mateo, Alameda, Contra Costa, San Joaquin, Monterey, San Benito, Santa Clara, Santa Cruz and San Luis Obispo, and is further divided into Central and South-Central DPSs with overlapping distributions. Combined, these DPSs occupy 76 hydrologic subareas (70 FR 52529).

Steelhead exhibit great variability in their life history correlating to high variability in ocean and stream conditions. As a result, they can use a wide variety of stream habitats throughout the year (Moyle, 2002). Steelhead migrate from the ocean to streams when winter rains breach sand bars and other barriers to passage and lower the water temperatures for successful spawning (Moyle, 2002). When possible, steelhead return to the ocean after spawning, as they are capable of repeat spawning, unlike other pacific salmon. Steelhead eggs will incubate for up to 4 months in gravel nests before hatching into fry. Juvenile steelhead eat crustaceans and insects, and the adult diet includes small fish.

Water quality plays a significant role in steelhead survival. Water temperature has been identified as a factor affecting growth and survival of juveniles. In-stream and overhead cover (e.g., undercut banks, downed trees, and overhanging tree branches) are important for juvenile rearing. Steelhead are sensitive to poor water quality caused by pollution and sedimentation. Eggs require aeration, and silt will smother both eggs and fish.

A primary threat affecting population abundance of steelhead has been loss of access to historic spawning and juvenile rearing habitat. Changes in habitat quality and availability, exposure to contaminants, predation mortality, physical impediments to migration, changes in land use practices, and competition and interactions with hatchery-produced steelhead have all been identified as factors affecting steelhead abundance.

Action Area Occurrence

Fish surveys were not performed in support of the project; however, based on prior surveys both adult steelhead and smolts are seasonally present in ephemeral and perennial streams throughout the member agency service areas. A detailed discussion by service area is provided below.

SCVSD – Recycled Water Project Area

The Sonoma Creek and Schell Creek watersheds have historically hosted steelhead runs and presently support steelhead in various age classes in some tributaries. The Sonoma Creek Hydrological Subbasin, which includes both watersheds, was extensively surveyed in the 1960s with surveys in subsequent years performed along various stream reaches. Surveys performed by the Sonoma Ecology Center in 2002 found steelhead present in Sonoma Creek; Friends of Sonoma Creek rescued steelhead fry from Fowler Creek during a dry summer in 1986; Rodgers Creek was documented to support steelhead in 1975, although a 1984 survey noted severe degradation by cattle, upstream water diversions, and an absence of fish; and portions of Carriger Creek contain steelhead presently (Leidy, 2005). Steelhead were present in Nathanson Creek through 1976, and though no steelhead were captured during a 1981 spot survey Leidy deems natural propagation is still likely to occur (Leidy, 2005). Schell Creek was categorized in 1976 by CDFG as a migratory corridor to better habitat in other upstream reaches; a 1981 survey had negative findings (Leidy, 2007). Felder Creek was sampled in 1981 with negative survey findings (Leidy, 2005).

Based on the above survey findings and NMFS critical habitat designation, the following action-area streams are considered to provide occupied steelhead habitat: Sonoma Creek, Fowler Creek, Rodgers Creek, and Schell Creek (NMFS, 2005). Streams and crossings in the SVCSD Recycled Water Project Service Area are identified in Figure A-3.

SCVSD – Napa Salt Marsh Restoration Area

The Napa Salt Marsh pipeline would intersect Huichica Creek at one of two locations: at its junction with Ramal Road between Merazo and Buchli Stations, or at its junction with the Southern Pacific railroad tracks (south of Ramal Road) between Merazo and Buchli Stations (see Figure A-4, L crossings). In 1980, Ellison defined it as a moderately-sized drainage providing spawning and nursery habitat (NMFS, 2000). Surveys by Ecotrust and FONR in 2002 demonstrated steelhead persistence in the creek, including areas of high density (Leidy, 2005). Streams and crossings in the SCVSD-Napa Salt Marsh Restoration Area are identified in Figure A-4.

Napa SD – MST Service Area

The proposed Napa SD-MST pipelines would intersect Murphy and Tulucay Creeks. Murphy Creek flows west from the Wild Horse Valley range where it joins with Spencer Creek to form Tulucay Creek, which is intersected in its upper reaches. Ecotrust and Friends of the Napa River surveyed both streams in 2001 and found steelhead to be present (Leidy, 2005). Figure A-5 identifies stream crossings in this action area.

The proposed pipeline would also intersect Kreuse Creek and numerous unnamed tributaries, none of which have critical habitat designation. Habitat quality and fish sampling data was not located for these streams, thus steelhead presence or absence could not be verified.

Novato SD – NMWD URWP North/Central

Adult and juvenile steelhead have been observed in upper Novato Creek (Leidy, 2005), and they seasonally pass through lower reaches in the action area. Arroyo Avichi has not been adequately sampled for steelhead (Leidy, 2005) and species' presence is not known. Leidy's assessment of the Novato watershed overall is that it has not been adequately sampled, but it historically supported and continues to support anadromous steelhead populations. Multiple age classes have been found during recent sampling, and the watershed appears to offer spawning and rearing habitat (Leidy, 2007). Streams and crossings in this action area are identified in Figure A-6.

LGVSD – NMWD URWP South

An upper Miller Creek survey in 2002 confirmed the presence of steelhead (Leidy, 2005). Other Miller Creek surveys found a few juvenile steelhead present (NMFS, 2000; Leidy, 2005). Streams and crossings in this action area are identified in Figure A-6, with a single crossing in the lower reaches of Miller Creek and crossings at up to 14 unnamed tributaries depending on which pipeline option is chosen.

2.4.2 Chinook Salmon, Central Valley ESU

Status

NMFS recognizes five California chinook salmon ESUs: Southern Oregon and California coastal; Upper Klamath and Trinity Rivers; Central Valley fall-run; Central Valley spring-run; and Sacramento River winter-run. The action area does not fall within defined ESU areas. San Pablo Bay provides migratory habitat for Sacramento River winter run chinook, Central Valley spring run chinook, and Central Valley fall and late-fall runs of chinook.

The Sacramento River winter run is federally and state endangered; the Central Valley spring run is federally threatened; and the Central Valley fall and late-fall runs are NMFS and state species of concern.

General Ecology and Distribution

Chinook salmon are anadromous fish, spending three to five years at sea before returning to fresh water to spawn. Adults use San Francisco Bay waters as migratory corridors to reach their upstream spawning grounds, while juveniles utilize the Bay when journeying to the Pacific Ocean. The Sacramento River winter run migrates through San Francisco Bay from December through April. Spawning is confined to the mainstem Sacramento River and occurs from mid-April through mid-July. The Central Valley spring-run enters the Sacramento River from March to July. Adults hold in cool water habitats through the summer and then spawn in the fall from late August through early October. The Central Valley fall-run and late fall-run enter the Sacramento and San Joaquin Rivers from July through December and spawn from October through December; both runs exhibit an anadromous life history, migrating as fry and yearlings. Fall-run chinook are the most abundant of the Central Valley races.

Chinook are infrequently observed in larger Bay tributaries; spawning runs of chinook salmon within the San Francisco Bay are usually confined to the perennial mouths of larger watersheds (Leidy, 2007) including Sonoma and Novato Creeks, where the lower reaches provide fall-run migration and rearing habitat, and the Napa River, where upper reaches provide opportunistic spawning, holding, and rearing habitat (PFMC, 2000; NMFS, 1998a). They occur mainly during wet years and appear to be of fall-run hatchery origin (NMFS, 1998).

Historic use of Bay tributaries may have been uncommon, due to the small size of most streams (NMFS, 1998). Furthermore, 82 percent of small Bay sloughs and marshes have been filled in; water pumps and reallocations have diverted juveniles; estuary function has been severely altered; urban streams are channelized; and pollutant loads have decreased habitat quality.

However, the Bay itself continues to provide migration and juvenile rearing habitat for all runs. The presence of suitable spawning and rearing habitat in Bay watersheds, and the short residency time of juveniles, suggests that Bay streams have the potential to support successfully reproducing runs of chinook salmon (Leidy, 2007).

Action Area Occurrence

The action area does not fall within defined ESU areas, presumably due to the oceanic access provided by San Pablo Bay and the potential to find comingled ESUs in the Bay and its larger tributaries. The project area is east of the mapped Central Valley and Sacramento River ESUs (NMFS, 2008a), which travel through San Pablo Bay on their way to and from the Pacific Ocean. Chinook are occasionally found in the larger tributaries to San Pablo Bay, and spawning runs are reported to be of fall-run hatchery origin (NMFS, 1998).

No definitive origin was identified for the chinook infrequently observed in action-area streams. They are most likely Central Valley fall run (NMFS, 1998), but could be from other listed runs. Juvenile Central Valley fall run chinook are “unambiguous ocean-type” chinook adapted for spawning in the lower reaches of large rivers and their tributaries, spawning and emigrating during fall through spring to avoid warm summer water temperatures (Moyle, 2002). Moyle asserts that juvenile stream residency times vary from one to seven months; they emerge from the gravel in spring and move downstream within a few months to rear in mainstem rivers or the Bay estuary complex before heading out to sea (Moyle, 2002). However, Sonoma County fisheries biologist Shawn Chase states the juveniles spend, on average, two to four months in fresh water before migrating to the ocean, and few, if any, juvenile Chinook salmon will be in the project area during the summer construction period (SCWA, pers. comm., 2009).

The action area is south of the mapped coastal chinook ESU, which has its southern border defined by the Russian River Watershed and is separate from watersheds in lower Sonoma County (NMFS, 2008a); for this reason, chinook found in action-area streams are not presumed to be coastal chinook.

Chinook salmon have been observed spawning in several creeks within the action area, and the proposed action crosses three tributaries known to at least occasionally contain chinook salmon: Sonoma Creek, Novato Creek and Miller Creek.

SCVSD – Recycled Water Project Area

The historic use of Sonoma Creek by chinook salmon was likely by small and/or sporadic runs (NMFS, 1998a). Chinook, believed to be Central Valley fall run, were observed in Sonoma Creek at its confluence with Carriger Creek in 1997 (NMFS, 2000). In 1998, chinook salmon were observed spawning in Sonoma Creek downstream of the Watmaugh Bridge (Katzel et al., 2001). These chinook observations could be strays that occasionally enter Sonoma Creek to spawn; principal spawning areas are expected to be in upper Sonoma Creek, but the lower portion is apparently used in drier years (NMFS, 1998). It is unknown whether chinook use any of the tributary streams (NMFS, 1998).

SCVSD – Napa Salt Marsh Restoration Area

Occurrence data for chinook salmon in Huichica Creek was not located, but is noticeably absent from published fish surveys. Leidy notes that within San Francisco Bay, spawning runs of Chinook salmon are typically confined to the perennial, lowermost reaches of larger watersheds like the Petaluma and Napa Rivers, but asserts that the presence of suitable spawning and rearing habitat in Bay watersheds, and the short residency time of juveniles, suggests that Bay streams have the potential to support successfully reproducing runs of Chinook salmon (Leidy, 2007). Leidy's fish surveys from 1992 through 1998 document chinook occurrences throughout the Napa Slough (Leidy, 1999), for which Huichica Creek is a significant tributary drainage.

Napa SD – MST Service Area

Chinook are not known from the Napa SD action area. It is unknown whether chinook use any of the tributary streams to the Napa River, or whether they are present in Murphy, Tulucay and Kreuse Creeks (NMFS, 1998). The historic use of the Napa River by chinook salmon was likely by small and/or sporadic runs. Chinook, believed to be Central Valley fall run, have been observed in the Napa River as far upstream as the base of Kimball Canyon Dam near Calistoga as recently as 1997. Occasional spawning has been noted, possibly by strays.

LGVSD – NMWD URWP South

Juvenile chinook are known to occur in Miller Creek in small numbers, and both adults and juveniles have been noted in portions of Miller Creek upstream from the action area as recently as 2003 (NMFS, 2008b).

Novato SD – NMWD URWP North/Central

Chinook salmon, believed to be central valley fall run, have been observed in Novato Creek over a 20- year period in the vicinity of Highway 101; it is unknown whether they spawn in Novato Creek (NMFS, 2000).

2.4.3 Species Considered but Excluded

Tidewater Goby

Status

The tidewater goby is a federal endangered species and a California species of concern.

General Ecology and Distribution

The tidewater goby is a benthic fish that inhabits shallow lagoons and the lower reaches of coastal streams. Tidewater gobies can range up to two kilometers from an estuary, upstream into fresh water. It differs from other species of gobies in California in that it is able to complete its entire life cycle in fresh to brackish water (Moyle et al., 1995). Tidewater gobies typically inhabit areas of slow-moving water, avoiding strong wave actions or currents. Particularly important to the persistence of the species in lagoons is the presence of backwater, marshy habitats, as well as annual sand bar formation, to avoid being flushed out to the ocean during winter flood flows. However, populations often recover very quickly from such flood events (Lafferty et al., 1999). If sandbars are breached during storm events, tidewater gobies can survive in marine environments for a short amount of time, allowing the species to colonize or re-establish in lagoons and estuaries following flood events (USFWS, 2007). Water temperatures generally range from 8 to 22°C and water depths are usually less than three feet (Moyle et al., 1995). Tidewater gobies favor salinities less than 10 parts per thousand (ppt), but can survive at levels up to 40 ppt (USFWS, 2007). Their life span is thought to be one year, although individuals in the northern part of the range may live up to three years (Moyle et al., 1995). Spawning may occur year round but is less frequent in December through March. Female gobies may spawn up to 12 times over the course of several months (Regents of U. of CA, 2003).

Historically, the tidewater goby occurred in at least 110 California coastal lagoons from Tillas Slough near the Oregon border to Agua Hedionda Lagoon in northern San Diego County. The species is currently known to occur in about 85 locations, although the number of sites fluctuates with climatic conditions. Today, the most stable populations are in lagoons and estuaries of intermediate sizes (2 to 50 hectares) that have remained relatively unaffected by human activities (USFWS, 2007). The decline of the tidewater goby is primarily due to urban, agricultural and industrial development in and surrounding coastal wetlands, the alteration of habitats and degrading water quality (USFWS, 2007).

Action Area Occurrence

Novato SD – NMWD URWP North/Central

Tidewater goby were historically found in Novato Creek where it passes beneath Highway 101, and the proposed action crosses Novato Creek within historical habitat. This population is believed to be extirpated (CDFG, 2008). Although Leidy suggests lower Novato Creek should be sampled for tidewater goby (Leidy, 2007), recolonization is unlikely since the nearest tidewater goby occurrence is more than 18 miles south on the Pacific Coast (CDFG, 2008). Moreover, direct effects to Novato Creek will be avoided through trenchless installation techniques,

including potential suspension from existing bridges and restricting work activities to areas outside the creek channel.

Delta Smelt

Status

The delta smelt is a federal and state listed threatened species.

General Ecology and Distribution

Delta smelt are endemic to the upper San Francisco Estuary, found primarily in the Delta and the Suisun Bay, as well as upstream through Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties. Historically, they are thought to have extended from Suisun Bay upstream to the City of Sacramento on the Sacramento River and Mossdale on the San Joaquin River. This species used to be one of the most common pelagic fish in the upper Sacramento-San Joaquin Estuary (Moyle, 2002). Delta smelt occur from the tidal freshwater reaches of the Delta to the Napa River and eastern San Pablo Bay (Bennett, 2005).

Delta smelt are an euryhaline species that mostly live along the freshwater edge of the saltwater-freshwater interface, where the salinity is approximately 2 ppt (USFWS, 2007a). Smelt can survive, however, in water with salinities ranging from 0 to 19 ppt (Regents of U. of CA, 2003). Smelt are short-burst swimmers that feed on plankton and are typically found in places with low water velocities, where the water is cool and well oxygenated (Regents of U. of CA, 2003). Life spans are approximately one year.

Shortly before spawning, adults migrate upstream from the brackish-water habitat associated with the saltwater-freshwater interface and disperse widely into river channels and tidally influenced backwater sloughs (USFWS, 2007a). They spawn in shallow, fresh or slightly brackish water upstream of the mixing zone from February to July, and fish begin moving up the Delta as early as September or October (Regents of U. of CA, 2003). Smelt have been recorded spawning in different parts of the Napa River Estuary (USFWS, 2007a).

Factors thought to have contributed to the decline of the species include reductions in freshwater outflow, entrainment losses to water diversions, entrainment at power plant intakes, installment of riprap along river banks, changes in the abundance and composition of food organisms, environmental contaminants, and competition and predation from exotic invasive aquatic species (USFWS, 2007a).

Action Area Occurrence

SVCSD – Napa Salt Marsh Restoration Area

Delta smelt has not been reported and is not expected to occur in the action area. The nearest known population is approximately 5 miles south of the action area, inhabiting large main channels and open areas of the Bay that provide cool, well-oxygenated but low-velocity microhabitats where planktonic organisms are concentrated. In the 1990s, Delta smelt were

observed in White Slough and other areas roughly five miles south of the proposed Napa Salt Marsh Restoration Area pipeline (CDFG, 2008). In 2004, they were observed in Pond 2A, also roughly five miles south of the proposed pipeline. Delta smelt are infrequently found in the Napa River and open areas of San Pablo Bay during high outflow periods, but they do not establish permanent populations there (Moyle, 2002; Bennett, 2005).

North American Green Sturgeon- Southern DPS

Status

The Southern Distinct Population Segment (DPS) of the North American green sturgeon is federally listed as a threatened species.

General Ecology and Distribution

The green sturgeon is the most widely distributed member of the sturgeon family and the most marine-oriented of the sturgeon species. Green sturgeons range in the nearshore waters from Mexico to the Bering Sea and are common occupants of bays and estuaries along the western coast of the United States (Moyle et al., 1995). Adults in the San Joaquin Delta are reported to feed on benthic invertebrates including shrimp, amphipods and occasionally small fish while juveniles have been reported to feed on opossum shrimp and amphipods (Moyle et al., 1995). Adult green sturgeons migrate into freshwater beginning in late February with spawning occurring in March through July, and peak activity in April and June. The only known spawning locations in California are in the Sacramento and Klamath Rivers (Moyle, 2002). After spawning, juveniles remain in fresh and estuarine waters for 1 to 4 years and then begin to migrate out to the sea (Moyle et al., 1995).

Action Area Occurrence

Novato SD – NMWD URWP North/Central

Juvenile and adult green sturgeon are known to occur in San Pablo Bay, but it is unknown whether they occur in tributaries to the Bay. There are no confirmed records of green sturgeon from action area streams, though the Napa River-Sonoma Creek marsh complex and Novato Creek are contiguous with San Pablo Bay where they are known to occur (Leidy, 2007; Moyle, 2002; Federal Register, 2008). Proposed critical habitat encompasses San Pablo Bay and all tidally-influenced areas up to the elevation of mean higher high water, including tributaries upstream to the head of tide (Federal Register, 2008). With the exception of the Novato Creek crossing, action-area crossings occur in freshwater habitats.

At Novato Creek, the stream crossing occurs at the head of tide and green sturgeon are not documented from here. Furthermore, impacts to the stream channel will be avoided by suspending the pipeline from the existing Northwestern Pacific Railroad bridge and restricting construction activities to areas outside of the creek channel.

CHAPTER 3

Potential Project Effects and Reasonable and Prudent Measures to Minimize Incidental Take

3.1 Direct Effects on Salmonids and Critical Habitat

The NBWRP pipeline alignments cross numerous intermittent, seasonal, and perennial drainages throughout the recycled water service areas. Most of the crossings will occur on seasonal and intermittent streams that are expected to be dry at the time of construction. Therefore, the potential direct effects from construction of the proposed action would only occur at those stream crossings where salmonids are known or presumed to be present, or where critical or essential fish habitat has been designated. A total of fifteen stream crossings in the action area were identified as potentially supporting listed salmonids or as designated critical or essential fish habitat.

Under the proposed action, trenchless methods will be employed at all perennial stream crossings, and seasonal streams will be dry during construction. However, further investigation may reveal that open trench methods will be necessary at some perennial locations. At these locations, surface and/or groundwater flows would be diverted during trenching, pipe-laying, and backfilling activities. A temporary diversion channel or pipe would divert flows around the construction area. In addition to diverting surface flows, underground flows and groundwater would be collected and pumped to a point downstream of the construction site.

After completing construction across the creek, all diversion facilities would be removed and the stream bottom restored to near its original condition. All dewatering operations would comply with State Water Resources Control Board (SWRCB) requirements and requirements of other jurisdictional agencies. In order to meet these requirements, bypass water may be pumped directly around work areas, or it may be pumped to a temporary sedimentation basin to later be returned to the channel. If retained off-channel, the remaining sediment would be dried and either left onsite or removed, depending on the landowner's preference. If left onsite, the sediment would be placed in a location where it would not drain into the stream. The pipeline would be installed within an excavated trench approximately below the scour depth of the stream bed (to be determined). The pipe would be concrete-encased and the trench backfilled to the level of the existing streambed with cobble and native materials.

Anticipated equipment includes excavators for trenching and pipe-laying, trucks for hauling material, concrete pumper trucks, and pumps, hoses, and other miscellaneous construction equipment. Once the water diversion system is in place and the construction site is dewatered, all equipment would operate within the dewatered area or entirely outside the channel.

The following potential effects to steelhead, chinook, or their designated critical or essential fish habitat may result from open trench pipeline crossings:

- Injury or mortality from being crushed by earth-moving equipment, construction debris, and worker foot traffic;
- Injury or mortality as a result of improper capture, handling, containment, or transport of individuals during preconstruction capture and relocation activities;
- Injury or mortality resulting from short-term sedimentation and turbidity that may occur during construction and removal of cofferdams;
- Injury or mortality during dewatering activities;
- Injury or mortality as a result of the accidental spill of hazardous materials or careless fueling or oiling of vehicles or equipment near sensitive upland or aquatic habitats;
- Temporary destruction of salmonid habitat through alterations of the stream substrate, downstream sedimentation, and the temporary loss of riparian vegetation and stream function as fishery habitat.

Of the 67 total stream crossings, the proposed action would cross nine streams documented to support, or to have historically supported, threatened or endangered fish: Sonoma, Fowler, Rodgers, Schell, Huichica, Murphy, Tulucay, Novato and Miller Creeks. Pipelines will be installed using trenchless methods such as bore and jack tunneling, directional drilling, or suspension. While underground pipeline installation methods avoid most of the potential effects associated with open-trench construction, salmonids may be effected by potential releases of construction materials into the watercourse. Bentonite clay, used as a lubricant during underground drilling activities, may enter bedrock fissures and subterranean connections to the streambed. The following potential effects to steelhead, chinook, or their designated critical or essential fish habitat may result from inadvertent bentonite releases during underground stream crossings at perennial drainages:

- Injury or mortality resulting from short-term sedimentation and turbidity that may occur during bentonite spills;
- Temporary reduction in food availability due to smothering of aquatic invertebrates during bentonite spills.

The following effects to steelhead, chinook, or their designated critical habitat or essential fish habitat may result from construction of above-ground suspended pipeline crossing:

- Injury or mortality as a result of the accidental spill of hazardous materials or careless fueling or oiling of vehicles or equipment near sensitive upland or aquatic habitats;
- Temporary destruction of steelhead, chinook, or designated critical habitat or essential fish habitat through alterations of the stream substrate, downstream sedimentation, and the loss of riparian vegetation and stream function as fishery habitat.

3.2 Reasonable and Prudent Measures to Minimize Incidental Take

3.2.1 Trenchless Stream Crossings

The following reasonable and prudent measure will be implemented to minimize the potential for effects to salmonids resulting from underground pipeline construction at trenchless crossing sites:

1. All underground construction activities in the vicinity of potential salmonid occurrences will be restricted to the low-flow period of June 15 through November 1. If the channel is dry, construction can occur as early as April 15 (in accordance with CDFG and RWQCB permit requirements). Restricting construction activities to this work window will minimize potential effects to migrating adult and smolt salmonids resulting from bentonite releases.

2. A qualified biological monitor will be on site during all underground pipeline construction activities in the vicinity of potential salmonid occurrences. The biological monitor will have the authority to halt construction if contaminants are identified in-stream.

3.2.2 Suspended Pipelines

The following reasonable and prudent measure will be implemented to minimize the potential for effects to salmonids resulting from construction of suspended pipelines:

1. All construction activities across waterways will be restricted to low-flow periods of June 15 through November 1. If the channel is dry, construction can occur as early as April 15 (in accordance with CDFG and RWQCB permit requirements). Restricting construction activities to this work window will minimize effects to migrating adult and smolt salmonids, if present.

2. Silt fencing will be installed in all areas where construction occurs within 100 feet of known or potential salmonid habitat.

3. Spoil sites will be located so they do not drain directly into the waterways. If a spoil site drains into a water body, catch basins will be constructed to intercept sediment before it reaches the channels. Spoil sites will be graded to reduce the potential for erosion.

4. A spill prevention plan for potentially hazardous materials will be prepared and implemented. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting of any spills. If necessary, containment berms will be constructed to prevent spilled materials from reaching the creek channels.

5. Equipment and materials will be stored at least 50 feet from waterways. No debris such as trash and spoils will be deposited within 100 feet of wetlands. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, will be located outside of the stream channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily, to prevent leaks of materials that if

introduced to water could be deleterious to aquatic life. Vehicles will be moved away from the stream prior to refueling and lubrication.

6. Proper and timely maintenance for vehicles and equipment used during construction will be provided to reduce the potential for mechanical breakdowns leading to a spill of materials into or around the creeks. Maintenance and fueling will be conducted in an area that meets the criteria set forth in the spill prevention plan (i.e., away from the creeks).

7. A qualified biological monitor will be on site during construction activities. The biological monitor will be authorized to halt construction if effects to salmonids or their critical or essential fish habitat are evident.

8. Project sites will be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan describing pre-project conditions, restoration and monitoring success criteria will be prepared prior to construction.

3.2.3 Open Trench Construction

The following reasonable and prudent measures will be implemented to minimize the potential for effects on salmonids resulting from open-trench construction:

1. All trenching activities across waterways will be restricted to low-flow periods of June 15 through November 1. If the channel is dry, construction can occur as early as April 15 (in coordination with CDFG and RWQCB permit requirements). Restricting construction activities to this work window will minimize effects to migrating adult and smolt salmonids.

2. If the channel is not dry, water from around the section of trench that is within the actively flowing channels will be diverted. This will reduce the potential for sediment or other pollutants to enter the waterways and to effect downstream resources.

3. Sediment curtains will be placed downstream of the construction zone to prevent suspended sediment from being transported and deposited outside of the construction zone.

4. Prior to construction of the diversion and placement of the sediment curtains, a qualified biologist will conduct fish relocation activities, and immediately release captured fish to a suitable habitat near the project site. Capture and relocation activities will be conducted in accordance with the *Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act* (NMFS, 2000).

5. If ground water is encountered, or if water remains in the channel after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. The pump(s) will be screened according to NMFS fish screening criteria for anadromous salmonids (NMFS, 1997b). A qualified biologist will be on-site during such pumping activities to ensure that any fish that may have remained within the construction area are relocated to suitable habitat near the project site.

6. Silt fencing will be installed in all areas where construction occurs within 100 feet of known or potential salmonid habitat.

7. Spoil sites will be located so they do not drain directly into the waterways. If a spoil site drains into a water body, catch basins will be constructed to intercept sediment before it reaches the channels. Spoil sites will be graded to reduce the potential for erosion.

8. A spill prevention plan for potentially hazardous materials will be prepared and implemented. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting of any spills. If necessary, containment berms will be constructed to prevent materials from reaching the creek channels.

9. Equipment and materials will be stored at least 50 feet from waterways. No debris such as trash and spoils will be deposited within 100 feet of wetlands. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, will be located outside of the stream channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life. Vehicles will be moved away from the stream prior to refueling and lubrication.

10. Proper and timely maintenance for vehicles and equipment used during construction will be provided to reduce the potential for mechanical breakdowns leading to a spill of materials into or around the creeks. Maintenance and fueling will be conducted in an area that meets the criteria set forth in the spill prevention plan (i.e., away from the creeks).

11. A qualified biological monitor will be on site during all open-trench stream crossing activities. The biological monitor will be authorized to halt construction if effects to salmonids are evident.

12. Project sites will be restored to pre-construction channel conditions, including streambed composition, compaction, and gradient. Channel banks will be returned to original grade slope and appropriate bank stabilization techniques will be implemented to reduce the potential for erosion and sedimentation. A plan describing pre-project conditions and restoration methods will be prepared prior to construction.

13. Project sites will be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan describing pre-project conditions, restoration and monitoring success criteria will be prepared prior to construction.

Following implementation of the above reasonable and prudent measures, the proposed action is not likely to adversely affect salmonids, or their critical or essential fish habitat.

3.3 Incidental Take

Section 9 of the federal Endangered Species Act and federal regulation pursuant to Section 4(d) of the Act prohibit the “take” of endangered or threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS as an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential

behavioral patterns including breeding, spawning, rearing, migrating, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of a federal agency's action is not considered to be prohibited "take" under the Act provided that such "take" is in compliance with the terms and conditions of an Incidental Take Statement.

3.3.1 Amount or Extent of Take

Trenchless construction methods such as bore and jack tunneling and directional drilling are planned at all perennial stream crossings; however, further geotechnical investigations may reveal that trenchless methods are not feasible at all locations. "Take" of threatened salmonids during the implementation of the NBWRP is expected to be confined to capture and relocation activities associated with the installation of stream flow diversions and dewatering of work sites only in those instances where trenchless construction methods are not feasible.

Electrofishing methods typically used in pre-construction capture and relocation activities associated with open-trench construction are known to be potentially harmful to fish. Potential effects include stress, disease transmission, injury, or death. If open-trench construction is required, then protocols for capturing and relocating fish will be implemented such that unintentional mortality of listed juvenile salmonids is not likely to exceed 3% (NMFS, 2003).

In addition, juvenile salmonids are likely to be harmed or killed downstream of some of the project sites by increases in sediment and turbidity and accidental releases of injurious materials into waterways. The number of salmonids that may be incidentally taken at these sites during project activities would be minimal, but cannot be accurately quantified due to (1) the uncertainty of locations where open-trench construction may be required (2) the unknown level of harm or mortality that might occur when juvenile fish are displaced to other habitat areas of the stream, (3) the uncertainty of salmonid presence in action areas, and (4) the unknown level of harassment, harm, or mortality resulting from rewatering of the construction areas and accidental releases of bentonite and/or hydraulic fluids.

3.4 Indirect Effects on Salmonids and Critical Habitat

3.4.1 Reduced Effluent Discharge

Phase 1 projects would include 46 miles of new pipeline, 1,655 HP of pumping capacity, treatment facilities providing 4.3 mgd of tertiary capacity, and 65 AF of storage to provide 3,755 AFY of recycled water. This would result in a corresponding reduction in discharge at each of the WWTPs, which discharge to tributaries of North San Pablo Bay. Analysis of Phase 1 recycled water use and corresponding changes in estimated discharge assumed 2020 inflow and discharge conditions for the WWTP, which include increased inflow over time. Implementation of Phase 1 projects would have an estimated 2020 discharge reduction of 6,121 AFY for all the WWTPs combined.

Table 3.1 presents the anticipated change in discharge for each WWTP under Phase 1. This analysis developed for the EIR/EIS, and considers two baselines for analysis. The CEQA baseline compares the existing discharge conditions, using the best available discharge data for all of the WWTP (2002) to Phase I conditions. The NEPA baseline considers the "future without project" as its baseline. This future without project baseline assumes that a subset of the projects, which have already completed CEQA analysis, would be implemented irrespective of the federal action, which is funding by the Bureau of Reclamation under the Title 16 program. Therefore, in general, the change in discharge under this NEPA analysis scenario is lower.

TABLE 3.1
PHASE 1 DISCHARGE COMPARED TO
CEQA NO PROJECT AND NEPA NO ACTION BASELINE

	Napa SD	SVCSD	Novato SD	LGVSD	Total	Salt Ponds
No Project (2002)	5,515	2,805	5,267	1,906	15,492	0
No Project (2020) Discharge	7,402	4,334	8,406	2,768	22,911	0
Phase 1 Discharge	5,265	2,882	6,423	2,220	16,790	3,460
Phase 1 Discharge vs 2002 Discharge	**-250**	**+77**	**+1,156**	**+314**	**+1,298**	**+3,460**
Phase 1 Discharge vs 2020 Discharge	**-2,137**	**-1,452**	**-1,983**	**-548**	**-6,121**	**+3,460**
No Action Discharge (2020)	6,338	2,882	6,574	2,257	18,051	3,257
Phase 1 Discharge	5,265	2,882	6,423	2,220	16,790	3,460
Phase 1 Discharge NEPA Increment	**-1,073**	**+0**	**-151**	**-38**	**-1,261**	**+203**

SOURCE: CDM, 2009

Table 3.2 provides a breakdown of the anticipated change in discharge on a monthly basis, for each of the WWTPs, compared to existing (2002) conditions (CEQA Baseline) and future without the project conditions (NEPA Baseline). A discussion of impacts by Member Agency is provided below.

LGVSD/NMWD

Under Phase 1, LGVSD would deliver 202 AFY of tertiary treated recycled water to the Hamilton Field urban areas in southern Novato. Compared to the CEQA baseline, Phase 1 would provide 202 AFY of recycled water, with a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 would reduce 2020 discharge by an estimated 548 AFY. When compared to the No Action Alternative (NEPA Baseline), the estimated net reduction in discharge would be 38 AFY.

TABLE 3.2
CHANGE IN MONTHLY WWTP DISCHARGE UNDER PHASE 1 VERSUS NO ACTION (AFY)

	LGVSD		Novato SD		SVCSD		Napa SD	
	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)	Change from No Project (2002)	Change from No Action (2020)
January	51	0	157	0	121	0	70	0
February	46	0	142	0	110	0	63	0
March	50	-2	154	-3	53	0	-33	-103
April	36	-14	115	-25	-139	0	-538	-589
May	34	-18	111	-30	0	0	0	0
June	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0
September	0	0	78	-48	0	0	0	0
October	0	0	99	-38	0	0	0	0
November	47	-3	146	-5	-189	0	102	-381
December	50	-1	155	-2	122	0	70	0
Total	314	-38	1,157	-151	77	0	-267	-1,073

SOURCE: CDM, 2009.

This incremental reduction of treated effluent would be distributed over discharge months during the wet season, and is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance in Miller Creek. Discharge is currently restricted during summer months; therefore, local habitat conditions are adapted to fluctuating discharge levels. Furthermore, San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay.

Novato SD/NMWD

Compared to the CEQA baseline, Phase 1 would provide 542 AFY of recycled water, with a corresponding reduction in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge an estimated 1,983 AFY. When compared to the No Action Alternative (NEPA baseline), the net reduction in discharge would be an estimated 151 AFY.

This incremental reduction of treated effluent would be distributed over discharge months during the wet season, and is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance. Discharge is currently restricted during summer months; therefore, local habitat conditions are adapted to fluctuating discharge levels. San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated

wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay.

SVCSD

Compared to the CEQA baseline, Phase 1 would provide 874 AFY of recycled water, with a corresponding decrease in discharge. Additionally, SVCSD would provide flows to the Napa Salt Ponds, of up to 3,460 AFY (depending upon year type). Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 1,452 AFY. Compared to the No Action Alternative (NEPA baseline), Phase 1 would not reduce SVCSD discharge, as these projects would likely be implemented by SVCSD under the No Action Alternative.

Under Phase 1, SVCSD would deliver 874 AFY of tertiary treated recycled water to the Sonoma Valley Recycled Water Project, and additional tertiary treated recycled water to the Napa Salt Marsh Restoration Area. Phase 1 of the proposed project would reduce SVCSD's discharge from storage facilities in the fall.[1] This incremental change in discharge of treated effluent would only occur during the wet season and is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance in Schell Slough, downstream sloughs, and lower Sonoma Creek. Discharge is currently restricted during summer months; therefore, local habitat conditions are adapted to fluctuating discharge levels. Furthermore, San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay.

Napa SD

Compared to the CEQA baseline, Phase 1 would provide 2,137 AFY of recycled water, with a corresponding decrease in discharge. Analysis of Phase 1 recycled water use and corresponding changes in discharge assumed 2020 inflow and discharge conditions for the WWTP, which would increase over time. When incorporated into projected 2020 flow conditions, Phase 1 this would reduce 2020 discharge by an estimated 2,137 AFY. Compared to the No Action Alternative (NEPA baseline), Phase 1 would reduce Napa SD discharge by an estimated 1,073 AFY.

This incremental reduction in treated effluent discharge would be spread over the winter discharge months, is not expected to result in a substantial overall reduction in the amount of special-status fish species habitat or species abundance in the Napa River. Furthermore, San Pablo Bay is a highly dynamic, tidally-influenced system and the incremental loss of treated wastewater is not expected to result in changes to the abundance or composition of special-status fish species in the Bay.

3.4.2 Growth Inducement Potential and Secondary Effects of Growth

With respect to the project's potential to induce urban development, Chapter 5 of the NBWRP Draft EIR/EIS concluded that the proposed project would not induce unplanned growth, and the secondary effects of growth would be consistent with those discussed in the applicable General Plans and General Plan EIRs. The proposed project would not result in a direct increase in population or employment, but recycled water use under the NBWRP would offset potable water demand and assist in providing water supply that is planned under the local General Plans and that could provide for new use and development that is projected to occur and is consistent with the local General Plans. Potentially adverse secondary effects could result from development of planned land uses in the project area. Because the proposed project would not induce growth beyond that discussed in the local General Plans and General Plan EIRs, the secondary effects of growth would be consistent with those discussed in the General Plans and General Plan EIRs.

NBWRP member agencies do not have the authority to control land use and growth within their recycled water service areas, or to mitigate for the secondary effects of those land use decisions. Marin, Sonoma, and Napa Counties, and the incorporated cities of San Rafael, Novato, Sonoma, and Napa have primary land use jurisdiction and responsibility to regulate growth through the land use planning and development approval processes. Local land use plans and specific development plans have been adopted and approved, with the local lead agency adopting a statement of overriding consideration for any significant and unavoidable effects. The proposed action would not increase the nature, number, or severity of significant effects associated with planned development.

3.4.3 Cumulative Effects

Cumulative effects include potential effects of future State, tribal, local, or private actions reasonably certain to occur within the watershed(s). Future Federal actions unrelated to the proposed project are not considered in this section because they require separate agency consultation pursuant to Section 7 of the Federal Endangered Species Act.

Cumulative effects of the proposed action would largely be associated with secondary effects related to urban development discussed above. These effects include new sources of sedimentation, depletion of ground water resources, and increased run-off from non-permeable surfaces.

Water quality would not be substantially or adversely affected by implementation of the proposed action. When compared to projected 2020 discharge levels, implementation of the NBWRP would substantially reduce discharges to North San Pablo Bay and its tributaries, as identified below on an individual member agency basis. When compared against the future no action scenario, which considers that some of the NBWRP projects may be implemented without federal funding under Title 16 (the Bureau of Reclamation's Federal Action), the identified discharge reductions would be less, but remain a beneficial effect. Additionally, use of recycled water would provide offset of potable water supplies currently used for irrigation purposes, including

both local surface water diversions for agricultural uses, and regional surface water diversions from the Russian River system for urban irrigation uses.

- Reduces discharge of tertiary treated effluent in the Novato SD-NMWD URWP North/Central service area by an estimated 1,983 acre-feet per year (AFY)
- Reduces discharge of tertiary treated effluent in the LGVSD-NMWD URWP South service area by an estimated 548 AFY
- Reduces discharge of tertiary treated effluent in the SVCSD-Recycled Water Project service area by an estimated 1,452 AFY
- Delivers up to 3,460 AFY of tertiary treated effluent to the SVCSD-Napa Salt Marsh Restoration Area
- Reduces discharges of tertiary treated effluent in the Napa SD-MST service area by an estimated 2,137 AFY.

CHAPTER 4
Determination

This BA identifies a total of fifteen sites where the proposed pipeline alignment crosses drainages that are known or assumed to support listed salmonids and/or their designated critical or essential fish habitat. It is presumed that all construction will occur in existing roadways, where present, and that trenchless methods will be employed at all perennial stream crossings. However, further investigation may reveal that open trench methods will be necessary at some locations, and direct effects to listed salmonids and their designated critical and essential fish habitat would be likely. Direct effects associated with pipeline crossings at Novato and Sonoma Creeks will be avoided through trenchless installation techniques, including potential suspension from existing bridges and restricting work activities to areas outside the creek channel. The project will minimize the likelihood of direct effects to the species at Fowler, Rodgers, Schell, Huichica, Murphy, Tulucay, and Miller Creeks through the use of underground pipeline construction methods such as bore and jack and directional drilling.

Potential effects on listed salmonids and their critical or essential fish habitat at all of the crossing locations will be minimized through the implementation of reasonable and prudent measures described in **Section 3.2** of this BA.

With implementation of reasonable and prudent measures proposed as part of the NBWRP, the project is not likely to adversely affect listed salmonids or their critical and essential fish habitat.

CHAPTER 5.0
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5.2 Report Preparer

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APPENDIX B

Botanical Survey Report

Technical Memorandum

date November 22, 2005

to Amy Harris Mai

from Yolanda Molette

subject Results of Rare Plant Survey for the Sonoma Valley Recycled Water Project (204032) along Proposed Pipeline Alignment Alternatives

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Executive Summary

The purpose of this technical memorandum is to document the results of a presence/absence rare plant survey for the Sonoma Valley Recycled Water Project, Sonoma County, California. The Sonoma County Water Agency is preparing an Environmental Impact Report (EIR) for the project on behalf of the Sonoma Valley County Sanitation District (SVCSD). The project is located throughout Sonoma Valley within the SVCSD service area. The purpose of the proposed project is to provide a reliable recycled water distribution system serving water users in Sonoma Valley.

Environmental Science Associates (ESA) botanists, Yolanda Molette, Mark Fogiel, Martha Lowe, and Chris Rogers, conducted a presence/absence plant survey May 17, 2005 through May 20, 2005 in accordance with the U.S. Fish and Wildlife Service (USFWS) *Guidelines for Conducting and Reporting Botanical Inventories*. The rare plant survey area was conducted along the proposed pipeline alignment alternatives within 25 feet from the edge of both sides of the roadway pavement or undeveloped areas. In addition, the proposed booster pump station site on Napa Road was surveyed. The 37-acre parcel north of the SVCSD treatment plant for the proposed operational and capacity storage reservoirs was surveyed by wildlife biologist Brian Pittman, CWB, on June 21, 2005.

The project area is within a rural residential setting. The project area supports vineyards, ornamental landscaping, non-native annual grassland, valley oak and coast live oak woodlands, and riparian vegetation along numerous intermittent and perennial streams. Some streams support in-stream wetland vegetation. **Attachment A** includes a list of species observed in the project area.

The rare plant survey targeted 15 special-status species. Of these species, six species were removed due to lack of suitable habitat within the project area to support these species. The remaining species were targeted for the rare plant survey, including Napa false indigo, Sonoma sunshine, narrow-anthered California brodiaea, dwarf downingia, largeleaf filaree, legenere, Jepson's leptosiphon, Mt. Diablo cottonweed, and oval-leaved viburnum. None of the target species or those listed in **Attachment B** were observed in the project area. The disturbed nature

of the undeveloped portions of the project site in combination with presence of non-native annual grasses, such as ripgut brome, soft chess, and wild oat, that favor disturbed areas likely prohibit the establishment of the target special-status species. The lack of vernal pools prohibits the presence of Sonoma sunshine, dwarf downingia and legenere.

1.0 Introduction

The purpose of this technical memorandum is to document the results of a presence/absence rare plant survey for the Sonoma Valley Recycled Water Project (project). The Sonoma County Water Agency (Agency) is preparing an EIR for the project on behalf of the SVCSD.

1.1 Project Purpose

The project is located throughout Sonoma Valley within the SVCSD service area (**Figure 1**). The purpose of the proposed project is to provide a reliable recycled water distribution system serving water users in Sonoma Valley. The proposed project would consist of constructing, operating and maintaining recycled water pipelines, storage reservoirs, a booster pump station, distribution pumps, associated connecting pipelines, and other appurtenances (**Figure 2**). Most of the project components would be located in the existing roadways.

1.2 Site Characteristics

Regional Characteristics

The project area lies within the Outer North Coast Ranges sub-region of the California Floristic Province (Hickman, 1993).[1] In general, this region is characterized by mosaics of upland oak and mixed evergreen forests, native and non-native grasslands, chaparral, upland scrub communities, marsh and wetland communities, and riparian scrubs, woodlands and forests. The Outer North Coast Ranges experience a mediterranean climate, with most of the precipitation occurring in the winter and early spring months. Compared to the coast of California, this region has colder winters and hotter summers. The Outer North Coast Ranges include the Mayacamas Mountains, a rugged mountain range dominated by a series of northwest-trending ridges and steep canyons. The central ridge of the northwest-trending Mayacamas Mountains forms the boundary between Lake County on the east and Sonoma County on the west and extends into Mendocino County. The Mayacamas Mountains along with the Sonoma Mountains to the west together form Sonoma Valley.

[1] Geographic subdivisions are used to describe and predict features of the natural landscape. The system of geographic units is four-tiered: provinces, regions, sub-regions, and districts. Three floristic provinces cover the State of California: California Floristic Province, Great Basin, and Desert. The California Floristic Province is the largest and is made up of six regions with most of the state and small portions of Oregon, Nevada and Baja California, Mexico.

SOURCE: SCWA, 2005d

Sonoma Valley Recycled Water Project . 204032

Figure 1
Sonoma Valley County Sanitation District
Service Area

SOURCE: SCWA, 2005d

Sonoma Valley Recycled Water Project . 204032

Figure 2
Proposed Project Components

Local Project Characteristics

Vegetation

The project area supports vineyards, ornamental landscaping, non-native annual grassland, valley oak and coast live oak woodlands, and riparian vegetation along roadways. The project also features numerous intermittent and perennial streams. Some streams support in-stream wetland vegetation, including native and non-native species. Non-native annual grassland is the dominant vegetation type along roadways and is mowed along some roadways.

Soils

The Huichica-Wright-Zamara soil association is the major underlying surface soil in the project area (USDA, 1972). This soil association is somewhat poorly drained to well-drained with nearly level loams to silty clay loams. Huichica soils form about 35 percent of the association, with Wright soils forming about 30 percent and Zamora soils making up for 25 percent. The remaining soil includes Clear Lake, Yolo, Pajaro, Cole and Cortina soils.

Hydrology

The project area is located within the Sonoma Creek watershed, which drains an area of approximately 170 square miles between the ridges of the Sonoma Mountains. The watershed is bound by the Petaluma River watershed on the west, the Napa River watershed on the east, and the Russian River watershed on the north. Land use within this watershed is predominantly rural with open space, grazing, and agriculture, especially viticulture (wineries). Sonoma Creek originates in southeastern Sonoma County, extends south through the County, and discharges to San Pablo Bay through a system of tidal sloughs. Numerous creeks and tributaries within the project area convey flows to Sonoma Creek and Schell Creek, which also discharges to San Pablo Bay via tidal sloughs.

3.0 Methodology

ESA botanists, Yolanda Molette, Mark Fogiel, Martha Lowe, and Chris Rogers, conducted a presence/absence rare plant survey May 17, 2005 through May 20, 2005 following the U.S. Fish and Wildlife Service's *Guidelines for Conducting and Reporting Botanical Inventories*. The rare plant survey was conducted during the blooming period of all of the target species as well as during the period when some species (listed in **Attachment B**) were identifiable outside of its blooming period. The rare plant survey area was conducted along the proposed pipeline alignment within 25 feet from the edge of both sides of the roadway pavement or undeveloped areas. The rare plant survey methods included identifying every species encountered to the extent necessary to determine rarity. A list of all species observed in the project area is provided in **Attachment A**. In addition, the 37-acre parcel north of the SVCSD treatment plant for the proposed operational and capacity storage reservoirs was surveyed by wildlife biologist Brian Pittman, CWB, on June 21, 2005 (**Figure 3**)

SOURCE: Parcels: Sonoma County Water Agency, 2005
Aerial Photo: AirPhotoUSA, 2004

Sonoma Valley Recycled Water Project . 204032

Figure 3
Operational and Capacity
Storage Reservoirs Study Area

3.1 Regulatory Framework

Special-status species have varying degrees of legal protection under both federal and California Endangered Species Acts (FESA and CESA), and recognition under the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). USFWS and California Department of Fish and Game (CDFG) share responsibility for management and protection of biological resources. Under separate state and federal legislation, each agency conducts a detailed review of any project that could affect a special-status species. If a species listed as endangered or threatened may be affected under CESA, the state lead agency (as defined by CEQA) must initiate formal consultation with the CDFG, as applicable under state law. If a species listed as endangered or threatened may be affected under FESA, the federal lead agency must initiate formal consultation with the USFWS, as applicable under federal law. In the absence of federal involvement, FESA does not provide any greater protection to listed plants on private lands than already received under CESA. Species of special concern are not subject to the same consultation requirements as listed endangered, rare, or threatened species. However, USFWS and CDFG do encourage informal consultation for these species because their listing status may become elevated prior to completion of the CEQA process.

The legal framework and authority for the state's program to conserve plants are woven from various legislative sources, including CESA, the California Native Plant Protection Act (Fish and Game Code Section 1900 – 1913), CEQA, and the Natural Communities Conservation Planning Act.

California Native Plant Society (CNPS) maintains a list of special-status plant species based on collected scientific information. Designation of these species by CNPS has no legal status or protection under federal or state endangered species legislation. CNPS designations are defined as List 1A (plants presumed extinct); List 1B (plants rare, threatened, or endangered in California and elsewhere); List 2 (plants rare, threatened, or endangered in California, but more numerous elsewhere); List 3 (plants about which more information is needed - a review list); and List 4 (plants of limited distribution - a watch list). In general, plants appearing on CNPS List 1A, 1B or 2 meet the criteria of Section 15380 of the CEQA Guidelines; thus, adverse substantial effects to these species would be considered significant. Additionally, plants constituting CNPS List 1A, 1B or 2 meet the definitions of CDFG Code Section 1901 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act).

3.2 Target Species

A list from USFWS was obtained and the California Natural Diversity Data Base (CNDDB) and CNPS electronic databases were searched to update the previous list of potentially occurring special-status plant species that were identified in the Draft Sonoma Valley Recycled Water Feasibility Study. Based on the results of the searches, a total of 15 special-status plant species were considered in evaluating which special-status species to target for the rare plant survey (see **Attachment B**). Of these species, six species were removed due to lack of suitable habitat within the project area to support these species. The remaining species were targeted for the rare plant

survey, including Napa false indigo, Sonoma sunshine, narrow-anthered California brodiaea, dwarf downingia, largeleaf filaree, legenere, Jepson's leptosiphon, Mt. Diablo cottonweed, and oval-leaved viburnum (**Table 1**). Sonoma sunshine is formally listed and protected under the FESA and CESA. The remaining target special-status species are informally listed as federal species of local concern and/or CNPS List 1B, 2 or 3.

TABLE 1

TARGET SPECIAL-STATUS SPECIES SURVEYED IN THE SONOMA VALLEY RECYCLED WATER PROJECT AREA

Species	Federal Status State Status CNPS Status	Habitat	Blooming Period
Napa false indigo (*Amorpha californica var. napensis*)	Species of Local Concern None CNPS List 1B	Openings in broadleafed forest, chaparral, cismontane woodland	April - July
Sonoma sunshine (*Blennosperma bakeri*)	Endangered Endangered CNPS List 1B	Mesic grasslands, vernal pools, intermittent swales	March - May
Narrow-anthered California brodiaea (*Brodiaea californica* var. *leptandra*)	Species of Local Concern None CNPS List 1B	Openings in broadleafed forest, chaparral, lower montane coniferous forest	May - July
Dwarf downingia (*Downingia pusilla*)	None None CNPS List 2	Mesic grasslands, vernal pools	March – May
Largeleaf filaree *Erodium macrophyllum*	None None CNPS List 2	Cismontane woodland, valley and foothill grassland	March - May
Legenere (*Legenere limosa*)	None None CNPS List 1B	Vernal pools	April - June
Jepson's leptosiphon =Jepson's linanthus (*Leptosiphon jepsonii*=*Linanthus jepsonii*)	Species of Local Concern None CNPS List 1B	Openings in chaparral, cismontane woodland (usually volcanic or periphery of serpentinite)	April - May
Mt. Diablo cottonweed (*Micropus amphibolus*)	None None CNPS List 3	Grasslands, broadleafed upland forest, chaparral, cismontane woodland (shallow soil, rocky areas)	March –-May
Oval-leaved viburnum (*Viburnum ellipticum)*	None None CNPS List 2	Openings in chaparral, cismontane woodland, lower montane coniferous forest	May - June

SOURCE: CNPS, 2005; CDFG, 2005; USFWS, 2005.

4.0 Results

None of the target species (Napa false indigo, Sonoma sunshine, narrow-anthered California brodiaea, dwarf downingia, erodium, legenere, Jepson's leptosiphon, Mt. Diablo cottonweed, and oval-leaved viburnum) or other special-status species listed in **Attachment B** were observed along the proposed pipeline alignment alternatives. The disturbed nature of the undeveloped portions of the project site in combination with the presence of non-native annual grasses, including ripgut brome, soft chess, and wild oat, that favor disturbed areas likely prohibit the establishment of the target special-status species. The lack of vernal pools prohibits the presence of Sonoma sunshine, dwarf downingia and legenere.

Most occurrences of the target species in Sonoma Valley are extirpated due to development, vineyards, and filling of wetlands. No further surveys for the target special-status plant species are recommended within the limits of the project site or project construction as described and depicted in this technical memorandum. Although no special-status plant species were observed within the limits of the project site and project construction, native trees and shrubs are present and should be protected, to the extent feasible, with appropriate fencing material and designated as sensitive areas during construction.

5.0 CEQA Appproach

None of the target species (Napa false indigo, Sonoma sunshine, narrow-anthered California brodiaea, dwarf downingia, erodium, legenere, Jepson's leptosiphon, Mt. Diablo cottonweed, and oval-leaved viburnum) or other special-status species listed in **Attachment B** were observed along the proposed pipeline alignment alternatives. The proposed project would not impact special-status plant species within the project area. Therefore, no further impact analysis is required for the EIR.

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ATTACHMENT A

List of Species Observed in the Sonoma Valley Recycled Water Project Area

TABLE A-1

LIST OF SPECIES OBSERVED IN THE SONOMA VALLEY RECYCLED WATER PROJECT AREA MAY 17 – 20, 2005

Species	Common name	Family
Acacia dealbata	Mimosa Fabaceae	
Acacia melanoxylon	blackwood acacia	Fabaceae
*Aesculus californica**	California buckeye	Hippocastanaceae
*Alisma lanceolatum**	Lance-leaved water plantain Alismataceae	
*Alnus rhombifolia**	white alder	Betulaceae
Amsinckia menziesii var. *intermedia**	common fiddleneck	Hydrophyllaceae
Anagallis arvensis	scarlet pimpernel	Primulaceae
Arbutus unedo	strawberry tree	Ericaceae
*Artemisia douglasiana**	mugwort Asteraceae	
Arundo donax	giant reed	Poaceae
Avena barbata	wild oat	Poaceae
Avena fatua	slender oat	Poaceae
*Baccharis pilularis**	coyote brush	Asteraceae
Brassica nigra	black mustard	Brassicaceae
Briza major	big quaking grass	Poaceae
Briza minor	little quaking grass	Poaceae
*Bromus carinatus**	California brome	Poaceae
Bromus catharticus	rescuegrass Poaceae	
Bromus diandrus	ripgut brome	Poaceae
Bromus hordeaceus	soft chess	Poaceae
Calendula arvensis	field marigold	Asteraceae
Carduus pycnocephalus	Italian thistle	Asteraceae
Cedrus sp.	cedar Cupressaceae	
Centaurea calcitrapa	purple star-thitstle	Asteraceae
Chamomilla suaveolens	pineapple weed	Asteraceae
Cichorium intybus	chicory Asteraceae	
Clarkia sp.	garden varietly clarkia	Onagraceae
*Claytonia perfoliata**	miner's lettuce	Portulacaceae
Conium maculatum	poison hemlock	Apiaceae
Convolvulus arvensis	bindweed Convolvulaceae	
Cotoneaster franchetii	cotoneaster Rosaceae	
Cotoneaster pannosa	cotoneaster Rosaceae	
Cupressus macrocarpa	Monterey cypress	Cupressaceae
Cupressus sempervirens	Italian cypress	Cupressaceae
*Cyperus eragrostis**	umbrella sedge	Cyperaceae
Daucus sp.	Apiaceae	
*Dichelostemma congestum**	ookow Lilaceae	
Dipsacus sativus	Fuller's teasel	Dipsacaceae
*Eleocharis acicularis**	spikerush C	yperaceae
*Eleocharis macrostachya**	spikerush C	yperaceae
Epilobium ciliatum ssp. *ciliatum**	willow herb	Onagraceae
*Equisetum hyemale**	scouring rush	Equisetaceae
Eremocarpus setigerus	doveweed Euphorbiaceae	
Erodium cicutarium	red-stemmed filaree	Geraniaceae
*Eschscholzia californica**	California poppy	Papavaraceae

TABLE A-1 (continued)

LIST OF SPECIES OBSERVED IN THE SONOMA VALLEY RECYCLED WATER PROJECT AREA MAY 17 – 20, 2005

Species	Common name	Family
Eucalyptus globulus	blue gum	Myrtaceae
Foeniculum vulgare	fennel Apiaceae	
*Fraxinus latifolia**	Oregon ash	Oleaceae
*Galium aparine**	goosegrass Rubiaceae	
Genista monspessulana	French broom	Fabaceae
Geranium dissectum	geranium Gera	niaceae
*Gnaphalium purpureum**	purple cudweed	Asteraceae
Hedera helix	English ivy	Araliaceae
Hordeum marinum gussoneanum	Mediterranean barley	Poaceae
Hordeum murinum	barley Poaceae	
Hypochaeris glabra	smooth cat's-ear	Asteraceae
*Juglans californica**	California black walnut	Juglandaceae
*Juncus balticus**	baltic rush	Juncaceae
*Juncus bufonius**	toad rush	Juncaceae
*Juncus effusus**	bog rush	Juncaceae
*Juncus xiphioides**	irisleaf rush	Juncaceae
Lactuca serriola	prickly lettuce	Asteraceae
*Leymus triticoides**	creeping ryegrass	Poaceae
Lolium multiflorum	Italian ryegrass	Poaceae
Lotus corniculatus	birdfoot trefoil	Fabaceae
*Lotus purshianus**	spanish lotus	Fabaceae
*Ludwigia peploides**	water primrose	Onagraceae
*Lupinus bicolor**	dove lupine	Fabaceae
Lythrum hyssopifolium	loosestrife, lythrum	Lythraceae
Malva nicaeensis	bull mallow	Malvaceae
*Marah fabaceus**	manroot Cucurbitaceae	
Medicago polymorpha	California burclover	Fabaceae
*Mimulus aurantiacus**	sticky monkeyflower	Scrophulariaceae
Nerium oleander	oleander Apoc	ynaceae
*Pentagramma triangularis**	goldenback fern	Pteridaceae
Phalaris aquatica	harding grass	Poaceae
Picris echioides	bristly ox-tongue	Asteraceae
Pilularia americana	American pillwort	Marsileaceae
Pinus radiata	Monterey pine	Pinaceae
*Plagiobothrys stipitatus**	valley popcornflower	Boraginaceae
Plantago lanceolata	English plantain	Plantaginaceae
Plantago major	common plantain	Plantaginaceae
Poa annua	annual blue grass	Poaceae
Polygonum amphibium	water smartweed	Polygonaceae
Polypodium sp.	Polypodiaceae	
Polypogon monospeliensis	beard grass	Poaceae
Populus alba	white poplar	Salicaceae
Populus fremonii ssp. *fremontii**	Fremont cottonwood	Salicaceae
Prunus sp.	cherry Rosacaeae	
Prunus sp.	plum Rosacaeae	

TABLE A-1 (continued)

LIST OF SPECIES OBSERVED IN THE SONOMA VALLEY RECYCLED WATER PROJECT AREA MAY 17 – 20, 2005

Species	Common name	Family
Pyracantha angustifolia	firethorn Rosacaeae	
*Quercus agrifolia**	coast live oak	Fagaceae
*Quercus kelloggii**	black oak	Fagaceae
*Quercus lobata**	valley oak	Fagaceae
*Ranunculus muricatus**	prickley buttercup	Ranunculaceae
Raphanus sativus	wild radish	Brassicaceae
Robinia pseudoacacia	black locust	Fabaceae
*Rorripa nasturtium-aquaticum**	watercress Brassicaceae	
*Rosa californica**	California rose	Rosaceae
Rosa sp.	ornamental rose	Rosaceae
Rubus discolor	Himalayan blackberry	Rosaceae
Rumex acetosella	sheep-sorrel Polygonaceae	
Rumex congumeratus	green dock	Polygonaceae
Rumex crispus	curly dock	Polygonaceae
Rumex pulcher	fiddle dock	Polygonaceae
*Salix laevigata**	Red willow	Salicaceae
*Salix lasiolepis**	arroyo willow	Salicaceae
*Sambucus mexicana**	elderberry Caprifoliaceae	
*Sanicula bipinnatifida**	purple sanicle	Apiaceae
Senecio vulgaris	common groundsel	Asteraceae
*Sequoia sempervirens**	coast redwood	Taxodiaceae
Silybum marianum	milk thistle	Asteraceae
Sonchus asper	prickly sow thistle	Asteraceae
Spergula arvensis	spurrey Car	yophyllaceae
*Symphoricarpos albus**	snowberry Caprifoliaceae	
*Toxicodendron diversilobum**	poison oak	Anacardiaceae
Tragopogon porrifolius	salsify Asteraceae	
Trifolium hirtum	rose clover	Fabaceae
*Typha sp.**	cattail T	yphaceae
*Umbellularia californica**	California bay	Lauraceae
Verbascum blattaria	moth Mullein	Scrophulariaceae
Veronica peregrina ssp. *xalapensis**	speedwell Scrophulariacea	e
Vicia sativa ssp. nigra	vetch Fabaceae	
Vinca major	greater periwinkle	Apocynaceae
*Vitis californica**	California wild grape	Vitaceae
Vitis sp.	wine grape	Vitaceae
Vulpia myuros	vulpia Poaceae	
Zigadenus sp.	star lily	Liliaceae

ATTACHMENT B

U.S. Fish and Wildlife Service, California Natural Diversity Database, and California Native Plant Society Lists of Special-Status Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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

July 6, 2005

Document Number: 050706105616

Yolanda Molette
Environmental Science Associates
225 Bush Street
San Francisco, CA 94104

Subject: Species List for Sonoma Valley Recycled Water Project

Dear: Ms. Molette

We are sending this official species list in response to your July 6, 2005 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. You have stated that this list is not for consultation with the Fish & Wildlife Service.

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, candidate and special concern 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 October 04, 2005.

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 sacramento.fws.gov/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

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: 050706105616

Database Last Updated: June 20, 2005

Quad Lists

SONOMA (500C)

Listed Species

Invertebrates

Syncaris pacifica - California freshwater shrimp (E)

Fish

Hypomesus transpacificus - delta smelt (T)
Oncorhynchus mykiss - Central California Coastal steelhead (T)
Oncorhynchus mykiss - Central Valley steelhead (T)
Oncorhynchus tshawytscha - Central Valley spring-run chinook salmon (T)
Oncorhynchus tshawytscha - winter-run chinook salmon, Sacramento River (E)

Amphibians

Rana aurora draytonii - California red-legged frog (T)

Birds

Haliaeetus leucocephalus - bald eagle (T)
Sterna antillarum (=albifrons) browni - California least tern (E)
Strix occidentalis caurina - northern spotted owl (T)

Mammals

Reithrodontomys raviventris - salt marsh harvest mouse (E)

Plants

Blennosperma bakeri - Baker's stickyseed [=Sonoma Sunshine] (E)

Proposed Species

Fish

Oncorhynchus tshawytscha - Critical Habitat, Central Valley spring-run chinook (Proposed) (PX)

Candidate Species

Fish

Oncorhynchus tshawytscha - Central Valley fall/late fall-run chinook salmon (C)
Oncorhynchus tshawytscha - Critical habitat, Central Valley fall/late fall-run chinook (C)

Species of Concern

Invertebrates

*Hydrochara ricksecker*i - Ricksecker's water scavenger beetle (SC)

Fish

Pogonichthys macrolepidotus - Sacramento splittail (SC)
Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Rana aurora aurora - Northern red-legged frog (SC)
Rana boylii - foothill yellow-legged frog (SC)
Spea hammondii (was Scaphiopus h.) - western spadefoot toad (SC)

Reptiles

Clemmys marmorata marmorata - northwestern pond turtle (SC)

Birds

Agelaius tricolor - tricolored blackbird (SC)
Amphispiza belli belli - Bell's sage sparrow (SC)
Athene cunicularia hypugaea - western burrowing owl (SC)
Baeolophus inornatus - oak titmouse (SLC)
Chaetura vauxi - Vaux's swift (SC)
Cypseloides niger - black swift (SC)
Elanus leucurus - white-tailed (=black shouldered) kite (SC)
Empidonax traillii brewsteri - little willow flycatcher (CA)
Falco peregrinus anatum - American peregrine falcon (D)
Lanius ludovicianus - loggerhead shrike (SC)
Melanerpes lewis - Lewis' woodpecker (SC)
Numenius americanus - long-billed curlew (SC)
Riparia riparia - bank swallow (CA)
Selasphorus rufus - rufous hummingbird (SC)
Selasphorus sasin - Allen's hummingbird (SC)
Toxostoma redivivum - California thrasher (SC)

Mammals

Corynorhinus (=Plecotus) townsendii townsendii - Pacific western big-eared bat (SC)
Eumops perotis californicus - greater western mastiff-bat (SC)
Myotis evotis - long-eared myotis bat (SC)
Myotis thysanodes - fringed myotis bat (SC)
Myotis volans - long-legged myotis bat (SC)
Myotis yumanensis - Yuma myotis bat (SC)

Plants

Amorpha californica var. napensis - Napa false indigo (SLC)
Arctostaphylos bakeri ssp. bakeri - Baker's manzanita (SC)
Arctostaphylos canescens ssp sonomensis - Sonoma manzanita (SLC)

Brodiaea californica var leptandra - narrow-anthered California brodiaea (SLC)
Ceanothus sonomensis - Sonoma ceanothus (SC)
Lupinus sericatus - Cobb Mountain lupine (SLC)

GLEN ELLEN (501D)

Listed Species

Invertebrates

Syncaris pacifica - California freshwater shrimp (E)

Fish

Hypomesus transpacificus - delta smelt (T)
Oncorhynchus kisutch - coho salmon - central CA coast (E)
Oncorhynchus mykiss - Central California Coastal steelhead (T)
Oncorhynchus mykiss - Central Valley steelhead (T)
Oncorhynchus tshawytscha - California coastal chinook salmon (T)
Oncorhynchus tshawytscha - Central Valley spring-run chinook salmon (T)
Oncorhynchus tshawytscha - winter-run chinook salmon, Sacramento River (E)

Amphibians

Ambystoma californiense - California tiger salamander (T)
Rana aurora draytonii - California red-legged frog (T)

Birds

Haliaeetus leucocephalus - bald eagle (T)
Sterna antillarum (=albifrons) browni - California least tern (E)
Strix occidentalis caurina - northern spotted owl (T)

Mammals

Reithrodontomys raviventris - salt marsh harvest mouse (E)

Plants

Blennosperma bakeri - Baker's stickyseed [=Sonoma Sunshine] (E)

Proposed Species

Fish

Oncorhynchus tshawytscha - Critical Habitat, Central Valley spring-run chinook (Proposed) (PX)

Amphibians

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

Candidate Species

Fish

Oncorhynchus tshawytscha - Central Valley fall/late fall-run chinook salmon (C)
Oncorhynchus tshawytscha - Critical habitat, Central Valley fall/late fall-run chinook (C)

Species of Concern

Invertebrates

Carterocephalus palaemon ssp. - Sonoma arctic skipper (SC)
*Hydrochara ricksecker*i - Ricksecker's water scavenger beetle (SC)

Fish

Hysterocarpus traski pomo - Russian River tule perch (SC)
Lampetra tridentata - Pacific lamprey (SC)
Pogonichthys macrolepidotus - Sacramento splittail (SC)
Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Rana aurora aurora - Northern red-legged frog (SC)
Rana boylii - foothill yellow-legged frog (SC)
Spea hammondii (was Scaphiopus h.) - western spadefoot toad (SC)

Reptiles

Clemmys marmorata marmorata - northwestern pond turtle (SC)
Phrynosoma coronatum frontale - California horned lizard (SC)

Birds

Agelaius tricolor - tricolored blackbird (SC)
Amphispiza belli belli - Bell's sage sparrow (SC)
Athene cunicularia hypugaea - western burrowing owl (SC)
Baeolophus inornatus - oak titmouse (SLC)
Chaetura vauxi - Vaux's swift (SC)
Cypseloides niger - black swift (SC)
Elanus leucurus - white-tailed (=black shouldered) kite (SC)
Empidonax traillii brewsteri - little willow flycatcher (CA)
Falco peregrinus anatum - American peregrine falcon (D)
Lanius ludovicianus - loggerhead shrike (SC)
Melanerpes lewis - Lewis' woodpecker (SC)
Numenius americanus - long-billed curlew (SC)
Riparia riparia - bank swallow (CA)
Selasphorus rufus - rufous hummingbird (SC)
Selasphorus sasin - Allen's hummingbird (SC)
Toxostoma redivivum - California thrasher (SC)

Mammals

Corynorhinus (=Plecotus) townsendii townsendii - Pacific western big-eared bat (SC)
Eumops perotis californicus - greater western mastiff-bat (SC)
Myotis evotis - long-eared myotis bat (SC)
Myotis thysanodes - fringed myotis bat (SC)
Myotis volans - long-legged myotis bat (SC)

Myotis yumanensis - Yuma myotis bat (SC)

Plants

Linanthus jepsonii - Jepson's linanthus (SLC)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed (in the Federal Register) 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 Marine 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.
(CA) Listed by the State of California but not by the Fish & Wildlife Service.
(D) *Delisted* - Species will be monitored for 5 years.
(SC) *Species of Concern*/(SLC) Species of Local Concern - Other species of concern to the Sacramento Fish & Wildlife Office.
(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.

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS/R-E-D
1 ***Amorpha californica var. napensis*** Napa false indigo	PDFAB08012			G4T2	S2.2	1B/2-2-3
2 ***Blennosperma bakeri*** Sonoma sunshine	PDAST1A010	Endangered	Endangered	G1	S1.2	1B/2-3-3
3 ***Brodiaea californica var. leptandra*** narrow-anthered California brodiaea	PMLIL0C090			G4?T2T3	S2S3.2	1B/2-2-3
4 ***Ceanothus sonomensis*** Sonoma ceanothus	PDRHA04068			G2	S2.2	1B/3-2-3
5 ***Downingia pusilla*** dwarf downingia	PDCAM060C0			G3	S3.1	2/1-2-1
6 ***Legenere limosa*** legenere	PDCAM0C010			G2	S2.2	1B/2-3-3
7 ***Leptosiphon jepsonii*** Jepson's leptosiphon	PDPLM09140			G2	S2.2	1B/2-2-3
8 ***Lupinus sericatus*** Cobb Mountain lupine	PDFAB2B3J0			G2	S2.2	1B/2-2-3
9 ***Viburnum ellipticum*** oval-leaved viburnum	PDCPR07080			G5	S2.3	2/2-1-1

Sonoma and Glen Ellen Quads

CNPS Inventory of Rare and Endangered Plants

Status: Plant Press Manager window with 12 items - Mon May 16 16:22:21 2005

Reformat list as: Standard List - with Plant Press controls

ECOLOGICAL REPORT

scientific	family	life form	blooming	communities	elevation	CNPS
Amorpha californica var. napensis	Fabaceae	perennial deciduous shrub	Apr-Jul	•Broadleafed upland forest (BUFrs) (openings) •Chaparral (Chprl) •Cismontane woodland (CmWld)	120 - 2000 meters	List 1B
Arctostaphylos bakeri ssp. bakeri	Ericaceae	perennial evergreen shrub	Feb-Apr	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) / often serpentinite	75 - 300 meters	List 1B
Arctostaphylos canescens ssp. sonomensis	Ericaceae	perennial evergreen shrub	Jan-Apr	•Chaparral (Chprl) •Lower montane coniferous forest (LCFrs) / sometimes serpentinite	180 - 1675 meters	List 1B
Blennosperma bakeri	Asteraceae	annual herb	Mar-May	•Valley and foothill grassland (VFGrs) (mesic) •Vernal pools (VnPls)	10 - 110 meters	List 1B
Brodiaea californica var. leptandra	Liliaceae	perennial bulbiferous herb	May-Jul	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) •Lower montane coniferous forest (LCFrs)	110 - 915 meters	List 1B
Ceanothus sonomensis	Rhamnaceae	perennial evergreen shrub	Feb-Apr	•Chaparral (Chprl) (sandy, serpentinite or volcanic)	215 - 800 meters	List 1B
Chorizanthe valida	Polygonaceae	annual herb	Jun-Aug	•Coastal prairie (CoPrr) (sandy)	10 - 305 meters	List 1B
Erigeron biolettii	Asteraceae	perennial herb	Jun-Sep	•Broadleafed upland forest (BUFrs) •Cismontane woodland (CmWld) •North Coast coniferous forest (NCFrs) / rocky, mesic	30 - 1100 meters	List 3
Erodium macrophyllum	Geraniaceae	annual herb	Mar-May	•Cismontane woodland (CmWld) •Valley and foothill grassland	15 - 1200 meters	List 2

				(VFGrs) / clay		
Lupinus sericatus	Fabaceae	perennial herb	Mar-Jun	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs)	275 - 1525 meters	List 1B
Micropus amphibolus	Asteraceae	annual herb	Mar-May	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs) / rocky	45 - 825 meters	List 3
Viburnum ellipticum	Caprifoliaceae	perennial deciduous shrub	May-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs)	215 - 1400 meters	List 2

APPENDIX C

Table of Reasonable and Prudent Measures

TABLE C-1
REASONABLE AND PRUDENT MEASURES TO BE IMPLEMENTED BY EACH MEMBER AGENCY

Reasonable and Prudent Measures	Service Districts			
	LGVSD	**Novato SD**	**SVCSD**	**Napa SD**
WILDLIFE				
Preconstruction Surveys				
4.1.2 (SBB[a], TFC[b])			X	
4.3.2-4 (CRLF[c])			X	
4.6.2-1(CCR[d], CBR[e])		X		
Daily Preconstruction Inspections				
4.6.2-5 (CCR, CBR)		X		
4.6.2-6 (SMHM[f])		X	X	
Consultation and reporting to regulatory agencies				
4.1.2 (SBB, TFC)			X	
4.5.2-4 (CCR, CBR)		X		
Environmental Awareness Training				
4.3.2-6 (CRLF)			X	
4.4.2-3 (CFS[g])			X	
4.5.2-5 (CCR, CBR)		X		
4.6.2-3 (SMHM)		X	X	
Qualified Biologist available during construction				
4.2.2-12 (CFS)			X	
4.3.2-2 (CRLF)			X	
4.3.2-5 (CRLF)			X	
4.6.2-7 (SMHM)		X	X	
Litter Removal				
4.2.2-9 (CFS)			X	
4.3.2-8 (CRLF)			X	
Silt Fencing				
4.2.2-6 (CFS)			X	
4.6.2-4 (SMHM)		X	X	
Other Water Quality Control Measures				
4.2.2-3 (CFS)			X	
4.2.2-4 (CFS)			X	
4.2.2-5 (CFS)			X	
4.2.2-7 (CFS)			X	
Proper siting and spill prevention for vehicle fueling, maintenance, and staging				
4.2.2-8 (CFS)			X	
4.2.2-9 (CFS)			X	
4.2.2-10 (CFS)			X	

TABLE C-1
REASONABLE AND PRUDENT MEASURES TO BE IMPLEMENTED BY EACH MEMBER AGENCY, CONT.

Reasonable and Prudent Measures	Service Districts			
	LGVSD	**Novato SD**	**SVCSD**	**Napa SD**
WILDLIFE, CONT.				
Proper siting and spill prevention for vehicle fueling, maintenance, and staging, cont.				
4.2.2-11 (CFS)			X	
4.3.2-9 (CRLF)			X	
4.2.2-13 (CFS)			X	
4.2.2-14 (CFS)			X	
Restricted construction during breeding season and avoidance of nesting habitat				
4.4.2-1 (WSP[h])			X	
4.5.2-1 CCR, CBR)		X		
4.5.2-2 (CCR, CBR)		X		
Confined Constructions activities to minimize footprint of disturbed area				
4.4.2-2 (WSP)			X	
4.4.2-4 (WSP)			X	
4.5.2-3 (CCR, CBR)		X		
4.6.2-2 (SMHM)		X	X	
Avoidance of Instream/ Aquatic Habitat				
4.2.2-1(CFS)			X	
4.2.2-2 (CRLF)			X	
4.3.2-1 (CRLF)			X	
4.3.2-7 (CRLF)			X	
FISHERIES				
Pre-construction fish relocation	X	X	X	X
3.2.3-4 (ST[i])	X	X	X	X
Pump Screening for dewatering activities	X	X	X	X
3.2.3-5 (ST)	X	X	X	X
Sediment Control	X	X	X	X
3.2.3-2 (ST)	X	X	X	X
3.2.3-3 (ST)	X	X	X	X
Silt Fencing	X	X	X	X
3.2.2-2 (ST)	X	X	X	X
3.2.3-6 (ST)	X	X	X	X
Spill Prevention Plan	X	X	X	X
3.2.2-4 (ST)	X	X	X	X
3.2.3-8 (ST)	X	X	X	X

TABLE C-1
REASONABLE AND PRUDENT MEASURES TO BE IMPLEMENTED BY EACH MEMBER AGENCY, CONT.

Reasonable and Prudent Measures	Service Districts			
	LGVSD	**Novato SD**	**SVCSD**	**Napa SD**
FISHERIES, CONT.				
Proper Storage, Fueling, and Maintenance of equipment and materials	X	X	X	X
3.2.2-5 (ST)	X	X	X	X
3.2.2-6 (ST)	X	X	X	X
3.2.3-9 (ST)	X	X	X	X
3.2.3-10 (ST)	X	X	X	X
Restricted Construction Periods	X	X	X	X
3.2.1-1 (ST)	X	X	X	X
3.2.2-1 (ST)	X	X	X	X
3.2.3-1 (ST)	X	X	X	X
Qualified Biologist onsite during construction	X	X	X	X
3.2.1-2 (ST)	X	X	X	X
3.2.2-7 (ST)	X	X	X	X
3.2.3-11 (ST)	X	X	X	X
Site Restoration	X	X	X	X
3.2.2-8 (ST)	X	X	X	X
3.2.2-12 (ST)	X	X	X	X
3.2.3-13 (ST)	X	X	X	X
Proper location of spoil sites	X	X	X	X
3.2.2-3 (ST)	X	X	X	X
3.2.3-7 (ST)	X	X	X	X

a SBB – Soft bird's beak
b TFC – Two-forked clover
c CRLF – California red-legged frog
d CCR – California clapper rail
e CBR – California black rail
f SMHM – Salt marsh harvest mouse
g CFS – California Freshwater Shrimp
h WSP – Western snowy plover
i ST – Steelhead
* Note: these abbreviations have been developed for use in this table only, and are not necessarily common abbreviations.

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APPENDIX 3d
Agreement for Sale of Ohlone Mitigation Bank Conservation Credits, May 17, 2011

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AGREEMENT FOR SALE OF CONSERVATION CREDITS

Bank SERVICE File No. 1-1-00TA-3256
Bank CDFG Tracking No. 1802-2000-050-3

This Agreement for Sale of Conservation Credits ("Agreement") is made and entered into this 17th day of May, 2011 ("Effective Date"), by Robert N. Fletcher and Patricia A Fletcher, husband and wife as joint tenants, Richard S. Fletcher, and C. Nelson and Betty S. Fletcher, Trustees of the C. Nelson and Betty S. Fletcher Revocable Inter Vivos Trust, dated July 21, 1976, DBA Ohlone Preserve Conservation Bank ("Bank"), and Sonoma County Water Agency, c/o North Bay Water Reuse Authority ("Project Applicant") as follows:

Recitals

A. The Bank has developed the Ohlone Preserve Conservation Bank located in Alameda County, California; and

B. The Bank was approved by the U.S. Fish and Wildlife Service and the California Department of Fish and Game June 23rd, 2005 and is currently in good standing with these agencies; and

C. The Bank has received approval from the U.S. Fish and Wildlife Service ("Service") and The California Department of Fish and Game ("CDFG") to offer California red-legged frog, Alameda whipsnake, and California tiger salamander Conservation Credits ("Credits") for sale as compensation for the loss of California red-legged frog, Alameda whipsnake, or California tiger salamander habitat through the Ohlone Preserve Conservation Bank Bank Agreement ("Bank Agreement"); and

D. The Bank has authorized Robert N. Fletcher to act as General Manager and to process sales agreements, collect funds and disburse funds relating to the sale of Credits of the bank; and

E. Project applicant is seeking to implement the project described on Exhibit "A" attached hereto ("Project"), which would unavoidably and adversely impact the California red-legged frog (CRLF), and seeks to compensate for the loss of CRLF habitat by purchasing CRLF Credits from the Bank; and

F. Project Applicant has been authorized by the Service, File No. 8140-2009-F-1272-2 to purchase from the Bank two and three-tenths (2.3) acres of CRLF Credits upon confirmation by the Bank Owner of Credit availability /adequate balance of Credits remaining for sale; and

G. Project Applicant desires to purchase from Bank and Bank desires to sell to

Project Applicant two and three-tenths (2.3) acres of CRLF Credits. Bank hereby confirms Credit availability /adequate balance of Credits remaining for sale;

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. Bank hereby sells to Project Applicant and Project Applicant hereby purchases from Bank two and three-tenths (2.3) acres of CRLF Credits for the purchase price of $40,250.00. Upon payment of the purchase price, the Bank will then deliver to Project Applicant an executed Bill of Sale in the manner and form as attached hereto and marked Exhibit "B". The purchase price for said Credits shall be paid by check or other method approved by Bank.

2. The sale and transfer herein is not intended as a sale or transfer to Project Applicant of a security, license, lease, easement, or possessory or non-possessory interest in real property, nor the granting of any interest of the foregoing.

3. Project Applicant shall have no obligation whatsoever by reason of the purchase of the Credits, to support, pay for, monitor, report on, sustain, continue in perpetuity, or otherwise be obligated or liable for the success or continued expense or maintenance in perpetuity of the Credits sold, or the Bank. Pursuant to the Bank Agreement and any amendments thereto, Bank shall monitor and make reports to the appropriate agency or agencies. As required by law, Bank shall monitor and make reports to the appropriate agency or agencies on the status of any Credits sold to Project Applicant. Bank shall be fully and completely responsible for satisfying any and all conditions placed on the Bank or the Credits by all state or federal jurisdictional agencies.

4. The Credits sold and transferred to Project Applicant shall be non-transferable and non-assignable, and shall not be used as compensatory mitigation for any other Project or purpose, except as set forth herein.

5. Project Applicant must submit payment within ~~thirty (30)~~ 105 days of the Effective Date of this Agreement. If Project Applicant fails to submit payment within the ~~thirty (30)~~ 105 day period, this Agreement will be considered null and void.

6. Upon acquisition of the Credits, the sale is final and under no circumstances shall the Bank be obligated to re-purchase any or part of the Credits.

7. Upon purchase of the Credits specified in paragraph E above, the Bank shall submit to the parties listed in the Notice section of the Bank Agreement / Bank Enabling Instrument, copies of the: a) Agreement for Sale of Conservation Credits; b) Description of Project to be Mitigated (Exhibit A); c) Bill of Sale (Exhibit B); d) Payment Receipt (Exhibit C); and e) an updated ledger. The updated inventory / ledger must detail: i) Project Applicant; ii) Project Name; iii) Status (sale complete/sale not complete); iv) Credit Sale Date; v) Service File Number and /or CDFG tracking number; vi) U.S. Army Corps of Engineers File Number (if applicable); vii) Total Number of Credits Authorized to Sell; viii) Total Number of Credits Sold

to Date (inclusive); and ix) Balance of all Credits Available. The inventory / ledger should include all sales data from bank opening/establishment to the present.

IN WITNESS WHEREOF, the parties have executed this Agreement the day and year first above written.

BANK

Ohlone Preserve Conservation Bank

By: _____ Date: 6/1/11
Robert N. Fletcher, General Manager

PROJECT APPLICANT

Sonoma County Water Agency

By: _____ Date: _____

Print Name: _____

Title: _____

Exhibit "A"

DESCRIPTION OF PROJECT
TO BE MITIGATED

North Bay Water Recycling Program Project, Service File 8140-2009-F-1272-2.

Project components include construction of 41.1 miles of new pipeline, installed mostly within existing roadways, increased storage capacity at existing storage ponds, expanded treatment capacities at existing wastewater treatment plants, and construction of new pump stations within developed footprints. Facilities would be implemented in Napa, Sonoma and Marin Counties, as described in USFWS Biological Opinion 8140-2009-F-1272-2.

Exhibit "B"

BILL OF SALE

Sales No.1053

Bank Service File No. 1-1-00TA-3256

Bank CDFG Tracking No. 1802-2000-050-3

Project Applicant Service File No. 8140-2009-F-1272-2

In consideration of $40,250.00, receipt of which is hereby acknowledged, Ohlone Preserve Conservation Bank does hereby bargain, sell and transfer to Sonoma County Water Agency two and three-tenths (2.3) acres of CRLF Credits in the Ohlone Preserve Conservation Bank in Alameda County, California, developed and approved by the U. S. Fish and Wildlife Service and the California Department of Fish and Game.

Ohlone Preserve Conservation Bank represents and warrants that it has good title to the Credits, has good right to sell the same, and that they are free and clear of all claims, liens, or encumbrances.

Ohlone Preserve Conservation Bank covenants and agrees with the buyer to warrant and defend the sale of the Credits hereinbefore described against all and every person and persons whomsoever lawfully claiming or to claim the same.

Ohlone Preserve Conservation Bank

By: _____ Dated: _____
Robert N. Fletcher, General Manager

Exhibit "C"

OHLONE PRESERVE CONSERVATION BANK

PAYMENT RECEIPT

PARTICIPANT INFORMATION

Name: Sonoma County Water Agency

Address: P.O. Box 11628
Santa Rosa, CA 95406-1628

Telephone: 707-526-5370

Contact: Kevin Booker, Principal Engineer

PROJECT INFORMATION

Project Description: North Bay Water Recycling Project, Napa, Sonoma and Marin Counties, California.

Service File Number: 8140-2009-F-1272-2

Species/Habitat Affected: California red-legged frog

Credits to be Purchased: Two and three-tenths (2.3) acres of CRLF Credits

Payment Amount: $40,250.00

Project Location: Within existing roadways, increased storage capacity at existing storage ponds, expanded treatment capacities at existing wastewater treatment plants, and construction of new pump stations within developed footprints in 3 county area.

County/Address: Napa, Sonoma and Marin Counties

PAYMENT INFORMATION

Payee: Ohlone Preserve Conservation Bank

Payer: Sonoma County Water Agency

Amount: $40,250.00

Method of payment: Cash _____ . Check No. _____ Money Order No. _____

Received by: _____ Date: _____
(Signature)

Name: Robert N. Fletcher

APPENDIX 3e

California State Historic Preservation Officer, Letter Regarding North Bay Water Reuse Authority Phase 1 Project, Marin, Sonoma, and Napa Counties, California, Project No. 09-CCAO-132, Reference No. BUR110214A, March 21, 2011

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OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

BUREAU OF RECLAMATION
OFFICIAL FILE COPY
RECEIVED
MAR 23 2011
CODE | ACTION | SURNAME & DATE
150 ✓ 3-23-11

March 21, 2011

In Reply Refer To: BUR110214A

Michael A. Chotkowski
Regional Environmental Officer
United States Department of the Interior
Bureau of Reclamation
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, CA 95825-1898

Re: North Bay Water Reuse Authority NBWRA) Phase I Project, Marin, Sonoma, and Napa Counties, California (Project No. 09-CCAO-132).

Dear Mr. Chotkowski:

Thank you for seeking consultation with me regarding the above noted undertaking. Pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act (NHPA), the Bureau of Reclamation (BUR) is the lead federal agency for this undertaking and is seeking my comments on the effects that the proposed project will have on historic properties. The project will be implemented in part by the BUR using American Recovery and Reinvestment Act (ARRA) funds and title XVI funds. The BUR has identified this use of federal expenditures as an undertaking subject to compliance with Section 106 regulations.

The proposed project is Phase I of the NBWRA program that is designed to provide recycled water for agricultural, urban, and environmental uses as an alternative to discharging recycled water into San Pablo Bay. The main components of the proposed undertaking are the construction of 41 miles of recycled water conveyance pipeline, seven booster pumps, upgrades to treatment capacity at existing wastewater treatment plants, and the retrofit of two existing storage tanks. The BUR has determined that the Area of Potential Effects (APE) consists of approximately 220 acres, which includes a 50-foot wide corridor along the proposed pipeline route and necessary staging and access locations. The vertical APE for the pipeline installations will be approximately 8-feet except at locations of jack and bore and directional drilling which will extend to a maximum of 20 feet. In addition to your letters of February 14, 2011 and March 18, 2011, you have submitted the following reports as documentation of your efforts to identify and evaluate historic properties in the project APE:

- *North Bay Water Reuse Authority North Bay Water Recycling Program, Marin, Sonoma, and Napa Counties Cultural Resources Survey Report* (Heidi Koenig and Brad Brewster, ESA – Cultural Resources Group: January 25, 2011a).

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• *North Bay Water Reuse Authority North Bay Water Recycling Program, Marin, Sonoma, and Napa Counties Cultural Resources Survey Report Confidential Attachment 2* (Heidi Koenig and Brad Brewster, ESA – Cultural Resources Group: January 25, 2011b).

• *North Bay Water Reuse Authority North Bay Water Recycling Program, Marin, Sonoma, and Napa Counties Archaeological Extended Phase I Report* (Heidi Koenig, ESA – Cultural Resources Group: January 25, 2011).

• *Memorandum: Supplementary Information for North Bay Water Recycling Program Cultural Resources* (Heidi Koenig, ESA to Kevin Booker and Marc Bautista, SCWA: March 14, 2011).

Identification efforts, including records search and field survey, concluded that there are no archaeological sites located within the project APE. Eight previously recorded archaeological sites were, however, plotted on maps at the Northwest Information Center at locations near the APE. Although there were no surface manifestations of any of these sites observed during the field survey, subsurface techniques, including 2-inch geoprobes and 4-inch augers, produced negative findings at all eight locations.

Efforts directed toward identification of built-environment historic properties resulted in the identification of four previously documented historic properties and four newly identified historic period cultural resources. The four previously recorded historic properties are the Hamilton Army Air Field Discontiguous Historic District (listed on the NRHP under criteria A and C in 1998, site #98001347) in Marin County, the Napa State Hospital in Napa County, several segments of the Northwestern Pacific Railroad in Marin County and Sonoma County, and a segment of the Southern Pacific Railroad-Schellville Branch in Sonoma County. The BUR has concluded that the project effects in the vicinity of the Hamilton Army Air Field Discontiguous Historic District and the Napa State Hospital will be restricted to transitory visual impacts during project construction only. As the proposed pipeline will be installed under the existing railroad grades using either directional drilling and/or jack and bore techniques, none of these documented linear historic properties will be adversely affected.

The four newly identified built-environment cultural resources are the Loma Heights Road Bridge, the Coombsville Road Culvert #1, the Coombsville Road Culvert #2, and the Hagen Road Culvert, all located in Napa County. The BUR has applied the four criteria of eligibility for the NRHP and has determined that none of these four properties are eligible under any criteria. After reviewing your consultation letters and supporting documentation, I have the following comments:

1) I concur that your identification of an Area of Potential Effects is appropriate pursuant to 36 CFR Part 800.4(a)(1) and that your efforts to identify and evaluate historic properties in the APE represent a reasonable and good faith effort in accordance with 36 CFR Part 800.

2) I further concur that the Loma Heights Road Bridge, the Coombsville Road Culvert #1, the Coombsville Road Culvert #2, and the Hagen Road Culvert are *not* eligible for the NRHP under any criteria.

3) I further concur that the two segments of the Northwestern Pacific Railroad NPRR), including Trestle 16, located within the APE in Marin County are not individually eligible for the NRHP under any criteria and would not be contributors to the NRHP eligibility of the overall NPRR should it be so determined at a future date.

4) I acknowledge that, for the purposes of this undertaking only, the BUR is treating the Napa State Hospital, a segment of the Northwestern Pacific Railroad in Sonoma County, and a segment of the Southern Pacific Railroad-Schellville Branch in Sonoma County as eligible for the NRHP for the purposes of this undertaking

In conclusion, based on my comments above and my review of your Section 106 consultation letters and supporting documentation, I have no objection to your proposed finding of No Adverse Effect for this undertaking. Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the BUR may have additional future responsibilities for this undertaking under 36 CFR Part 800. Thank you for seeking my comments and for considering historic properties in planning your project. If you require further information, please contact William Soule, Associate State Archeologist, at phone 916-445-7022 or email wsoule@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

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APPENDIX 4

Air Quality Modeling Calculations

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URBEMIS Construction Assumptions – No Action Alternative

Due to the lack of data on exact construction phasing of the No Action Alternative, a number of assumptions were made to determine worst case annual construction emission associated with construction. These assumptions are outlined below.

Construction of Pipelines

To estimate worst case emission from pipeline construction throughout the project area, it was assumed that each sanitary district would construct pipeline projects concurrently. It was assumed that construction of each pipeline would progress at a rate of 250 feet per day and that work would be completed in 'spreads'. The first spread of equipment would demolish the existing roadway and remove the excavated material. The second spread would excavate the trench required to install the proposed pipeline. The third spread would install the proposed pipeline and the final spread would backfill the trench and re-pave the disturbed portion of the road. It was assumed that work would be completed along a line so each spread would be used each day at different locations along the pipeline. Equipment estimates for each spread are demonstrated in Table 1 below. It was assumed that each piece of equipment would operate 8 hours per day which represents a conservative analysis.

TABLE 1
CONSTRUCTION EQUIPMENT ESTIMATES

Equipment	Demolish Roadway	Excavate Trench	Install Pipe	Re-pave Roadway
Air Compressors			1	
Concrete/Industrial Saw	2			
Cranes			1	
Excavators		1		
Forklifts			2	
Graders		1		
Pavers				1
Paving Equipment				2
Plate Compactors				1
Rollers				2
Rubber Tired Dozers		1		
Tractors/Loaders/Backhoes	2	2	1	1
Water Trucks		1		
Welders			3	
Haul Trucks	1	28		

It is important to note that the equipment counts demonstrated in Table 1 represent the set of equipment used to construct one pipeline. Therefore the total pieces of equipment being utilized in the district the on the worst-case day would be three times the amount of equipment presented in Table 1 (assuming that no new pipeline would be constructed in connection with the LGVSD under the No Action Alternative).

To estimate the amount of material to be exported during demolition of the roadway it was assumed that the asphalt is 1 foot thick. Assuming that a 5 foot wide strip of asphalt is removed, a total of 1250 cubic feet of material would be removed per day (250 feet long x 5 feet wide x 1 foot deep = 1250 cubic feet).

To estimate the amount of dirt handled during trench excavation it was assumed that the trench would be 6 feet deep by 5 feet wide resulting approximately 7500 cubic feet or roughly 280 cubic yards of excavation each day. It was assumed that all excavated material would be exported and that new soil would be imported to fill the trench. It was assumed that 270 cubic yards of fill would be needed for each 250 foot segment since the pipe will take up a small volume of the trench.

The number of construction work days for the worst case year was determined by dividing the proposed pipe length associated with each WWTP by the estimated number of feet to be completed per day (250 feet). Therefore it was assumed that Novato SD pipeline construction would take approximately 92 days, SVCSD pipeline construction would take approximately 131 days and Napa SD construction would take approximately 74 days.

Construction of New Storage Facilities

It was assumed that excavation of new storage ponds would occur at a rate of approximately 550 cubic yards of material exported per day. Therefore, the excavation of the new 1.5 acre-foot storage facility in the Novato SD would take approximately 5 days each assuming that approximately 2,000 cubic yards of soil is excavated to create a 1.5 acre-foot storage pond. The storage ponds at SVCSD would provide 65 acre-feet of new storage, and would require removal of approximately 100,000 cubic yards of material. At a rate of 550 cubic yards per day this would take approximately 181 work days.

The construction equipment mix assumed to be used for excavation of the proposed storage ponds includes the following: two (2) rubber tired dozers, two (2) tractors/loaders/backhoes, one (1) grader, and one (1) water truck. It was assumed that all equipment would run 8 hours a day which represents a conservative analysis.

Upgrades to Existing WWTPs

To evaluate emissions associated with upgrades to existing WWTPs it was assumed that each site would be graded and prepared over approximately 1 month. It was assumed that equipment used would include the following: one (1) grader, one (1) rubber tired dozer, one (1) tractor/loader/backhoe, and one (1) water truck. To be conservative, it was assumed that all equipment would operate for 8 hours per day. It was assumed that no modifications would be made to the LGVSD WWTP under the No Action Alternative.

URBEMIS Construction Assumptions – Phase 1

Assumptions used to estimate construction emissions from Phase 1 were similar to those used to evaluate emissions from construction of the No Action Alternative. However, for Phase 1 it was assumed that construction of facilities in the LGVSD would require an additional spread (resulting in four spreads working concurrently during the worst case year).

Additionally, since a greater number of new facilities would be constructed under Phase 1, it was assumed that during the worst case year pipeline construction in SVCSD and Napa would take place throughout the entire year. For LGVSD and Novato, pipeline construction would take place for approximately six months and ten months respectively during the worst case year. The analysis presented in the Air Quality Section assumes that all of these activities would occur concurrently in the same year, a worst case scenario.

URBEMIS - PHASE 1 CONSTRUCTION EMISSIONS

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: G:\206xxx\D206088.00 - North San Pablo Bay\0 D206088.01 Phase II\04 Work Products\04.1 Working Documents\EIR-EIS\Air Quality\URBEMIS\Phase1NovatoSD.urb924

Project Name: North San Pablo Recycled Water

Project Location: Bay Area Air District

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (tons/year unmitigated)	1.81	13.31	8.09	0.00	7.78	0.83	8.61	1.63	0.77	2.39	1,346.93

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009	1.81	13.31	8.09	0.00	7.78	0.83	8.61	1.63	0.77	2.39	1,346.93
Asphalt 01/01/2009-10/22/2009	0.47	2.78	1.72	0.00	0.00	0.24	0.24	0.00	0.22	0.22	222.14
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	0.46	2.75	1.48	0.00	0.00	0.24	0.24	0.00	0.22	0.22	201.55
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79
Paving Worker Trips	0.01	0.01	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.80

URBEMIS - PHASE 1 CONSTRUCTION EMISSIONS

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Building 01/01/2009-10/22/2009	0.45	2.76	2.33	0.00	0.01	0.17	0.18	0.00	0.16	0.16	348.15
Building Off Road Diesel	0.39	2.16	1.24	0.00	0.00	0.15	0.15	0.00	0.14	0.14	194.89
Building Vendor Trips	0.04	0.56	0.36	0.00	0.00	0.02	0.02	0.00	0.02	0.02	94.28
Building Worker Trips	0.02	0.04	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.98
Demolition 01/01/2009-10/22/2009	0.15	0.96	0.68	0.00	0.06	0.08	0.14	0.01	0.08	0.09	98.48
Fugitive Dust	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.01	0.00
Demo Off Road Diesel	0.15	0.90	0.53	0.00	0.00	0.08	0.08	0.00	0.07	0.07	80.36
Demo On Road Diesel	0.00	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.37
Demo Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.75
Fine Grading 01/01/2009-01/07/2009	0.02	0.17	0.09	0.00	0.18	0.01	0.19	0.04	0.01	0.05	16.25
Fine Grading Dust	0.00	0.00	0.00	0.00	0.18	0.00	0.18	0.04	0.00	0.04	0.00
Fine Grading Off Road Diesel	0.02	0.13	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	10.84
Fine Grading On Road Diesel	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.03
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
Mass Grading 01/01/2009-10/22/2009	0.68	6.30	3.09	0.00	7.38	0.32	7.70	1.54	0.29	1.83	633.27
Mass Grading Dust	0.00	0.00	0.00	0.00	7.37	0.00	7.37	1.54	0.00	1.54	0.00
Mass Grading Off Road Diesel	0.56	4.48	2.32	0.00	0.00	0.25	0.25	0.00	0.23	0.23	383.64
Mass Grading On Road Diesel	0.11	1.81	0.57	0.00	0.01	0.07	0.08	0.00	0.06	0.06	233.51
Mass Grading Worker Trips	0.01	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.12

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Mass Grading 01/05/2009-01/30/2009	0.04	0.33	0.18	0.00	0.15	0.02	0.17	0.03	0.02	0.05	28.64
Mass Grading Dust	0.00	0.00	0.00	0.00	0.15	0.00	0.15	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.04	0.33	0.16	0.00	0.00	0.02	0.02	0.00	0.02	0.02	27.62
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02

Phase Assumptions

Phase: Demolition 1/1/2009 - 10/22/2009 - Road Removal

Building Volume Total (cubic feet): 265302

Building Volume Daily (cubic feet): 1250

On Road Truck Travel (VMT): 17.36

Off-Road Equipment:

2 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Fine Grading 1/1/2009 - 1/7/2009 - Excavation of a new storage facility

Total Acres Disturbed: 3

Maximum Daily Acreage Disturbed: 0.75

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 550 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 500

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/1/2009 - 10/22/2009 - Pipeline Trench Excavation

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Total Acres Disturbed: 3

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 550 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 549.76

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/5/2009 - 1/30/2009 - Upgrades to Existing WWTP

Total Acres Disturbed: 3

Maximum Daily Acreage Disturbed: 0.75

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 1/1/2009 - 10/22/2009 - Repaving and site finishing

Acres to be Paved: 3

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

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

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2 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Building Construction 1/1/2009 - 10/22/2009 - Pipeline Installation

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day