

# **Water Recycling Project**

## **Draft Initial Study/Mitigated Negative Declaration**

**Prepared for the  
North Coast County Water District  
Pacifica, CA**

**April 2004**

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**Prepared for the  
North Coast County Water District  
Pacifica, CA**

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**April 2004**

## **Mitigated Negative Declaration**

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DATE: April 28, 2004  
SUBJECT: Mitigated Negative Declaration

Pursuant to the California State Public Resources Code and the California Environmental Quality Act (CEQA) Guidelines, as amended to date, the North Coast County Water District (District) submits a Mitigated Negative Declaration for the North Coast County Water District Water Recycling Project (Project).

### **PROJECT OVERVIEW**

The proposed Water Recycling Project (Project) will provide treated water from the City of Pacifica's Calera Creek Water Recycling Plant to irrigation sites within the City of Pacifica. The Water District prepared a Conceptual Water Reclamation Plan in 1997 to determine the potential demand for recycled water in the community and what type of infrastructure would be needed to deliver the recycled water to these potential users. The total annual irrigation demand for recycled water in the Water District is estimated to be about 63 million gallons (MG). The Sharp Park Golf Course is by far the largest potential recycled water customer, and is expected to use approximately 83% of the 63 MG. Other significant users of irrigation water include parks, schools, and CalTrans for landscaping along Highway 1.

The Sharp Park Golf Course is operated and maintained by the San Francisco Recreation and Park Department. Although the golf course is located within the Water District's service area, the City and County of San Francisco supplies water for its irrigation. In 1999, the San Francisco Public Utilities Commission (SFPUC) prepared two reports that evaluated alternative water supplies for the Sharp Park Golf Course. These two reports presented results that matched those of the two reports prepared by the Water District-- that recycled water from the Calera Creek Water Recycling Plant was a viable alternative to the current supply.

### **FINDINGS**

The District, having reviewed the Initial Study for the proposed project, consisting of the attached Initial Study, finds that:

#### **Biological Resources**

1. The project site represents potential foraging and nesting habitat for raptor species such as Swainson's hawk and white-tailed kite. If raptors establish territories on the project site, construction activities may adversely affect these species. The project will mitigate for this impact by requiring a pre-construction survey for raptor nests shall be conducted by a qualified biologist within the 30 days prior to construction activities to establish the status of these species on the project site. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey, the site shall be resurveyed

- Avoidance. Avoid nesting season construction. Construction should be scheduled to avoid the nesting season to the extent feasible. The nesting season for most birds, including raptors and shrikes, in the San Francisco Bay Area extends from January through August.
- Pre-construction/Pre -disturbance Surveys. If it is not possible to schedule demolition and construction between August and January, then pre-construction surveys for nesting birds should be conducted by a qualified ornithologist to ensure that no nests will be disturbed during project implementation. This survey should be conducted no more than 14 days prior to the initiation of demolition/construction activities during the early part of the breeding season (January through April) and no more than 30 days prior to the initiation of these activities during the late part of the breeding season (May through August). During this survey, the ornithologist will inspect all trees and other potential habitats (e.g. grasslands, buildings) in and immediately adjacent to the impact area for nests. If an active nest is found sufficiently close to work areas to be disturbed by these activities, the ornithologist, in consultation with CDFG, will determine the extent of a construction-free buffer zone to be established around the nest, typically 250 feet, to ensure that no nests of species protected by the Migratory Bird Treaty Act or State Code will be disturbed during project implementation.
- Inhibiting Nesting. Potential nesting substrate (e.g. bushes, trees, grass, burrows) that will be removed by the project should be removed before the start of the nesting season (February) to help preclude nesting. Pre-removal surveys are required for some species. Removal of vegetation or structures slated for removal by the project should be completed outside of the nesting season, which extends from February through September.

2. Construction activities have the potential to impact the adjacent wetland habitats along the pipeline corridor through Sharp Park through sedimentation and/or erosion of fill materials introduced during construction. These activities have the potential to adversely impact red-legged frog breeding and foraging habitat. Most of the sensitive-status wildlife species with the potential to occur are associated with the riparian corridors, ponds and wetlands within the project site. In order to prevent take of a federally listed species, and potential impacts to other special-status species known from the project area, the applicant shall schedule construction of the pipeline crossing of Sanchez Creek when the creek is dry, or during the dry months (June 1 to October 15) when the likelihood of frog/snake dispersal is low. Incorporation of this measure will also decrease potential sedimentation and erosion concerns during and after construction. Further, the project shall employ Best Management Practices (BMPs) before, during and after construction as detailed in listed in the Hydrology BMPs in Chapter II, Project Description, Section D, Mitigation Incorporated into the Project. Implementation of these BMPs will ensure that effects from runoff into perennial drainages (the two branches of Sanchez Creek) do not exceed standards of significance.

3. Wetlands, streams and pond habitats in the project area have the potential to be affected by changes in water use, storage and supply proposed by this project. Specifically, the loss of chlorinated water supplied to Sanchez Creek (above the irrigation pond) from a 10" pipe connected to the SFPUC pipeline has the potential to decrease breeding and foraging habitat for two listed species within the Sanchez Creek

watershed: the California red-legged frog and the San Francisco garter snake, as well as the western pond turtle, a state species of special concern. The project will mitigate for this impact by requiring the project applicant to contract with a California red-legged frog/San Francisco garter snake expert and have breeding season surveys (January 15 to March 15) conducted at the irrigation pond to determine whether the frog and/or snake are breeding at the pond, prior to cessation of SFPUC water deliveries to the impoundment pond and the lower reaches of Sanchez Creek. This time frame should be compatible with the project construction schedule, which at this point has not been determined.

At the same time the pond can be assessed for its role as foraging habitat for both species as well as for the western pond turtle, and the amount of breeding habitat for CRLF and SFGS can be assessed at the Horse Stable Pond and Laguna Salada. Depending upon the results of those surveys, a management plan shall be prepared which identifies flows needed to maintain breeding/foraging habitat for the species found to use the irrigation pond. If the irrigation pond is determined to be important for breeding/foraging for these sensitive species, consultation with both the USFWS and CDFG shall be made to determine if any permits or authorization are necessary. In addition, the NCCWD may have to provide a means to divert water from the new water tank to the irrigation pond to match current levels, in order to maintain the habitat. Specific tasks to be carried out at the irrigation pond, Horse Stable pond and Laguna Salada should include:

#### Irrigation Pond

- Determine if the CRLF is present by conducting surveys during the breeding season (requires USFWS approval).
- Determine if non-native fish are present.
- If the CRLF is present, determine if it is breeding or using the site for sheltering and foraging. The USFWS may consider the loss of a breeding site to be more significant than loss of sheltering and foraging habitat, since the CRLF may still use the upper Sanchez Creek drainage for sheltering and foraging after the Impoundment Pond goes dry.
- Contact CDFG to determine if western pond turtles should be trapped and relocated to Horse Stable Pond, Laguna Salada or another locations.

#### Sanchez Creek/Horse Stable Pond/Laguna Salada

- Determine if the project will reduce flow into Sanchez Creek and thereby reduce water levels at Horse Stable Pond and Laguna Salada.
- Determine if the amount of breeding habitat for CRLF will be reduced.

Additional mitigation to reduce impacts in this regard includes determining through surveys or interviews with creek managers if Calera Creek provides breeding habitat for the CRLF. If it does provide breeding habitat, determine if a 10% reduction of flow would eliminate or reduce CRLF breeding. If so, the USFWS may consider loss of CRLF breeding habitat to be significant, since it may also reduce habitat quality for the SFGS, which often forage on CRLF. Consult with both USFWS and CDFG to determine if any permits or authorizations will be required if reduced flows will impact the CRLF and/or SFGS

4. The construction of the recycled wastewater pipeline has the potential to cause sediment transport, erosion and pollution through ground-breaking activity and/or accidental gas or oil spills or leaks (from heavy machinery) during construction. Lowering of water levels and flow within streams and wetlands of the project area has the potential to adversely affect jurisdictional hydrologic features and decrease the extent of wetland and/or stream habitat in the project area. Sedimentation and erosion from the project site have the potential to fill wetlands associated with the watercourses adjacent to the project site, degrade water quality and reduce habitat quality for associated plant and wildlife species. The project will mitigate for this impact by requiring the project applicant to prevent erosion and sedimentation to the adjacent riparian corridor from the introduction of "fill" soils and construction activities by maintaining a 50-foot buffer of all such activities from the break in slope associated with the top of the bank of the drainage. Further, the project applicant shall prevent erosion and sedimentation to the riparian habitats by installing silt fences, haybales and other BMPs as outlined in the geology section of this checklist (GEO-1).

The project applicant shall seed the banks at the water tank site and associated buffer regions immediately after construction and fill activities are completed with fertile seed of creeping ryegrass (*Leymus triticoides*). This native, perennial species is already present in the project area. The addition of this plant on the riparian banks will greatly reduce the potential for significant sediment transport to the drainage.

Construction activities shall occur during the dry/low flow season between June 1 and October 15 in order to decrease the risk of sediment transport and erosion related to pipeline construction activities within the project area.

5. Other possible effects include the lowering of the irrigation pond water levels through the loss of SFPUC Pipeline water that currently feed to Sanchez Creek above the irrigation pond. According to Sean Sweeney (pers. comm.) the City of San Francisco does not intend to maintain flows to the impoundment pond if that system is bypassed by the new system (which is proposed). Without such flows the pond could dry up during the dry season. This could impact the California red-legged frog if it breeds in that pond, as well as the western pond turtle which is known to occur at the pond, as well as other wildlife species that utilize the pond habitat. However, drying the pond could have an advantage of eliminating nonnative bullfrogs, should they occur.

Implementation of the previous mitigation measure that determines if the irrigation pond, Sanchez Creek and Horse Stable Pond/Laguna Salada support habitat for sensitive species shall be required. After this has been determined, the appropriate water level to maintain viable populations shall be established by consulting with the biologists and the District's engineers and hydrologists. Recommendations made by these experts shall be implemented, and water from the new water tank will be diverted to ensure that this water level is kept at all times.

6. The project will not require filling of any jurisdictional or non-jurisdictional wetlands. See the discussion above regarding potential impacts of flow reductions to project water bodies. Since the water to be removed from the impoundment pond is not "natural" flow, but rather deliberate input from a potable water pipeline, it is not clear if removing the water is in violation of the Clean Water Act. Consultation with the USACE and RWQCB is required to make this determination. Even though the removal of water

is not considered fill under section 404, draining the irrigation pond should be considered in light of a potential violation(s) in that: 1) 33 CFR Part 328.3(4) discusses the "impoundment of waters otherwise defined as waters of the United States..." as part of the definition of waters of the U.S. 2) the Endangered Species Act may apply, 3) there are lacustrine fringe wetlands associated with the pond, and 4) how the pond is drained could result in a discharge to downstream waters (i.e. if the impoundment is breached/removed vs. drained by the intake pipe at the pond center). The project will mitigate for this impact by requiring the Mitigation Measures detailed in 4 and 5 above. Further it shall be required that the project applicant contact the USACE and RWQCB to determine if those projects are under the jurisdiction of those agencies. Obtain any permits or authorization required by those agencies once consultation is made.

7. Recorded migration corridors or stream channels used by special-status fish or wildlife species occur on and around the existing project site. However, the project would not introduce new barriers to movement of terrestrial or aquatic species. The potential dewatering of the golf course irrigation impoundment pond could affect a wildlife nursery site if red-legged frogs or San Francisco garter snakes are found to breed in the pond. This impact is addressed above and the project will mitigate for this impact by requiring the mitigation measures detailed in item 6 above.

### **Cultural Resources**

8. The current project design seeks to avoid impacts to the large deposit of prehistoric archaeological material adjacent to the CCWRP by implementing the following avoidance measures:

- the proposed 10 inch water line from the existing pumping plant to the exit road at Route 1 will be placed in existing engineered fill that was prepared for the road; and
- the fill used to build the existing roadway is of sufficient depth to allow the placement of the recycled pipeline in the fill layer. However, impacts to SMA 268 could still occur, since the edge of this site is within 10 feet of the pump station, and is located within 15 feet of the existing road to the CCWRP.

Therefore, prior to the initiation of construction or ground-disturbing activities, the District's contractor shall fence the perimeter of archaeological site SMA 268 and inform all construction personnel of excavation limits and location of the aforementioned site.

### **Geology and Soils**

9. Strong ground-shaking at the pipeline alignments and storage tank site will probably occur during the design life of the project as a result of a major earthquake on one of the active faults in the region, including the San Andreas. The project would mitigate this impact by requiring a complete geotechnical report be prepared by a qualified geotechnical consultant for the water tank site, and all recommendations found in this study shall be included as conditions of site approval. The study shall specifically address potential hazards of sighting a water tank and include recommendations on specific structural design features to assure the water tank is not compromised during a strong ground-shaking event.

10. Soil liquefaction is a phenomenon in which loose, saturated, cohesionless soils (silts and sands) below the water table are subject to a temporary, but essentially total loss of shear strength under the reversing, cyclic-shear strains associated with earthquake shaking. The wastewater treatment plant site where the pump station is located and where the pipeline originates is situated on an area of combination artificial fill and marine terrace materials. According to the Rogers-Pacific geotechnical study for the 1994 Wastewater Treatment EIR, this geologic feature is “typically suitable for pipelines and light structures.”

As stated above, the generalized soils located at the wastewater treatment plant site are predominantly terrace deposits, both natural and artificial marine terrace materials and fill materials. These soils are composed of a broad assortment of soil types including silty clays along wetlands and creeks, sandy loam and gravel along the Highway 1 corridor and loam within the canyon slope of Sanchez Creek. The underlying parent material is greenstone within the Franciscan formation (metasedimentary). Accordingly, the potential for liquefaction of these soils during the maximum credible earthquake is considered low. Based on the information in Wieczorek et al. (1985), the steeper portions of the pipeline alignment on roadways near the irrigation pond and the recycled wastewater storage tank placement site show a low susceptibility to slope failure under seismic loading; while the flatter portions making up the majority of the alignment exhibit very low susceptibility. Implementation of Mitigation Measure detailed in item 10 above will avoid impacts or reduce them to less than significant levels.

11. According to the Geotechnical Engineering and Geologic Hazards Study prepared for the 1994 Wastewater Treatment Plan EIR, no significant deposits of loose, cohesionless soils exist beneath the pump station site. No such study has been prepared for the water tank site. Because no geotechnical study has been prepared for the water tank site, potential impacts relating to soil instability could occur. Implementation of Mitigation Measure detailed in item 10 above will avoid impacts or reduce them to less than significant levels.

12. It is unclear at this time whether the water tank site or any portion of the pipeline alignment will be located on expansive soil. Therefore, application of the mitigation measure detailed in item 10, above, shall apply. Implementation of this Mitigation Measure will ensure that the water tank and pipeline alignment will not be adversely affected by being located on expansive soil, and that no significant impacts will occur.

13. In addition to the mitigation measures listed above, the design features of the project which include mitigation measures and Best Management Practices (BMPs) directly incorporated into the project description either avoid, minimize, or reduce environmental effects to a point of less-than-significance; and

14. A Mitigated Negative Declaration will be filed as the appropriate CEQA document of the Project.

#### BASIS OF FINDINGS

Based on the environmental evaluation presented herein, the Project will not cause significant adverse effects related to aesthetics, air quality, agricultural resources, hazards and hazardous materials, hydrology/water quality, land use/planning, mineral resources, noise, population/housing, public services, recreation, transportation/traffic,

and utilities/service systems. In addition, substantial adverse effects on humans, either direct or indirect, will not occur. The Project does not affect any important examples of the major periods of California prehistory or history. Nor will the Project cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal.

Along with the designs of individual activities, BMPs incorporated into the project descriptions for the Project avoid, minimize, and reduce impacts to air quality, biological resources, geology and soils, and hydrology and water quality to less-than-significant levels.

Based on the Initial Study, the project designs and incorporated BMPs avoid, minimize, and reduce impacts to biological resources to a less-than significant level.

Attached is the Initial Study prepared for the Project. The public can review documents used in preparation of the Initial Study at North Coast County Water District, 2400 Francisco Boulevard, P.O. Box 1039, Pacifica, CA 94044-6039; attn: George Kanakaris, General Manager.

**WATER RECYCLING PROJECT  
INITIAL STUDY/MITIGATED NEGATIVE DECLARATION**

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# I. Introduction

This section describes the purpose of an Initial Study (IS), the decision process to prepare a Negative Declaration (ND) or a Mitigated ND (MND), the additional requirements for State Revolving Fund (SRF) applicants, a brief description and objectives of the Recycled Water Project (Project), and a short discussion of the role of other participating agencies.

## A. Purpose Of The Initial Study

This IS has been prepared by the North Coast County Water District (Water District), the Lead Agency for the project. The IS has been prepared pursuant to the California Environmental Quality Act (CEQA) for the Project. CEQA lists seven purposes of an IS [CEQA Guidelines 15063(c)]:

1. Provide the Lead Agency with information to use as the basis for deciding whether to prepare an Environmental Impact Report (EIR) or a Negative Declaration (ND).
2. Enable a Lead Agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a ND.
3. Assist in the preparation of an EIR, if one is required.
4. Facilitate environmental assessment early in the design of a project.
5. Provide documentation of the factual basis for the finding in a ND that a project will not have a significant effect on the environment.
6. Eliminate unnecessary EIRs.
7. Determine whether a previously prepared EIR could be used with the project.

## B. Decision To Prepare A Negative Declaration Or Mitigated Negative Declaration

According to CEQA Guidelines Section 15070, a public agency shall prepare a proposed ND or a Mitigated ND when:

1. The IS shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or
2. The IS identifies potentially significant effects, but:
  - Revisions in the project plans made before a proposed Mitigated ND and IS are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and
  - There is no substantial evidence, in light of the whole record before the agency, that the project as described may have a significant effect on the environment.

### **C. “CEQA Plus” Issues for State Revolving Fund Applicants**

The project has received a Water Recycling Facilities Planning Grant from the State Water Resources Control Board (SWRCB), which requires that an environmental review be consistent with the SWRCB's State Revolving Fund (SRF) Grant Regulations. Therefore, in addition to the Initial Study Checklist per Appendix G of the CEQA Guidelines, the project is subject to the SRF environmental process. This SRF process involves answering detailed information to obtain clearance for the following nine issues. A discussion of each of these issues and all of the other SRF Grant requirements for environmental documentation is found in Chapter IV, CEQA Plus Issues, of this document.

- 1) species protected under the Federal Endangered Species Act;
- 2) wetlands;
- 3) wild and scenic rivers;
- 4) coastal zone areas;
- 5) floodplains;
- 6) important agricultural land;
- 7) cultural resources;
- 8) non-attainment areas for air quality; and noise and nuisance, if endangered species are affected.

### **D. Project Overview, Purpose and Need**

The Water District is responsible for the delivery of water to the approximately 40,000 residents of the City of Pacifica as well as commercial and institutional customers in Pacifica and nearby San Bruno, pursuant to the California Water Code. The great majority of the Water District's water (98%+) is purchased from the San Francisco Public Utilities Commission (SFPUC), which operates a regional wholesale water supply system. With the continuing population growth in California and the experience of water shortages in the drought years of 1987 through 1992, the State Legislature has formally recognized the importance of utilizing recycled water (tertiary treated water from a sewage treatment plant, also known as “non-potable”) to help meet the State's water supply needs. In fact, the legislature has established a goal of recycling one million cubic feet of water annually by 2010 and has prohibited the use of potable water for landscape irrigation wherever suitable recycled water is available at a reasonable cost.

In response to these legislative mandates and to the recognized capacity limitation of the San Francisco water supply system as now configured, both the Water District and the SFPUC have investigated alternative water sources, including recycled water. The recently completed Calera Creek Water Recycling Plant (CCWRP) in Pacifica produces treated effluent that meets the Department of Health's requirements for landscape irrigation, and this effluent is currently discharged to an adjacent created wetland area. An EIR was prepared and certified for the Wastewater Facilities Plant at Calera Creek in 1994. This proposed recycling water project was contemplated in the program-level EIR for the CCWRP; this document is the project-level report.

The Recycled Water Project proposed by the Water District is contemplated in three phases, as listed in Chapter II, Project Description. Phase 1, which is the subject of this document, would provide recycled water from the Recycling Plant for irrigation of the Sharp Park Golf Course, the Sharp Park Beach Promenade, Fairway Park, Highway One landscaping, and turf playing fields at Oceana High School and Ingrid B. Lacy Middle School. The project includes a pumping station at the plant, a 28 feet high by 55 feet in diameter, 400,000 gallon recycled water storage tank and approximately 17,000 lineal feet of pipelines. The access area will measure a total of 75 feet in diameter (the tank diameter plus an additional 10 feet of access all around the tank for maintenance. The water storage tank would be located on City of San Francisco Recreation and Park Department (SFRPD) property in the vicinity of the existing

Sharp Park Archery Range. A below-ground storage tank containing potable water from the SFPUC system already exists at this site. This tank would be decommissioned (removed), the pipeline abandoned from the San Francisco Jail to the water tank site, and the new tank storing recycled water would be located at the site of this existing tank. A component of this Phase is the abandonment of the existing SFPUC potable water pipeline from the SFPUC Filtration Plant in Millbrae to the San Francisco Jail and replacing this line with a Water District potable line. This component is the subject of separate environmental review that will be completed within 2004.

## **E. Participating Agencies**

The following section summarizes participating agencies that will receive treated wastewater for irrigation purposes.

### **1. City of Pacifica**

As described above, the use of tertiary treated wastewater for irrigating lands in Pacifica was contemplated in the 1994 Wastewater Facilities Plan EIR. At that time it was determined that there would be adequate flows from the treatment plant to serve the irrigation needs of several entities including: the SFRPD for the golf course, Caltrans for Highway landscaping, and for school districts for irrigating playing fields. The Water District and City of Pacifica have a signed agreement that allows the City to supply the treated wastewater to the Water District as described in this project description.

The City will also be a user of the recycled water once the storage and distribution system is completed. The Phase 1 water will be used to irrigate turf and landscaping at the Pacifica Promenade, Fairway Park, and will also be used by the local School Districts to irrigate turf at Oceana High School and Ingrid B. Lacy Middle School (see below for more information on the School Districts). The proposed amount of water that each entity will use is shown in Table II-1 on page II-4

Sharp Park is located entirely within the City of Pacifica jurisdictional boundaries, and therefore is subject to City of Pacifica General Plan policies and zoning ordinances.

### **2. City and County of San Francisco**

The Water District and the SFPUC are in the process of negotiating an agreement for use of the recycled water, for the installation of a water storage tank at the Archery Range for storing the water, and for the installation of a new water pipeline to distribute the water into the golf course irrigation system. The SFRPD is the primary user of the Phase 1 recycled water and is a key player in implementing the project.

### **3. Local School Districts**

Phase 1 of the proposed project will supply recycled water to two schools: Ingrid B. Lacy Middle School, which is within the Pacifica School District (grades K-8) and Oceana High School, which is within the Jefferson Union High School District (grades 9-12).

### **4. California Department of Transportation (CalTrans)**

The Water District currently furnishes potable water from local and imported sources to CalTrans for irrigating freeway landscaping on State Highway 1 (Highway 1), which consists of the median strips and slopes within the CalTrans right-of-way.

A Memorandum of Understanding (MOU) between the Water District and CalTrans will need to be negotiated before the Water District can supply recycled water for Highway 1 landscaping. This MOU will stipulate that the Water District will deliver to CalTrans recycled water, to the extent that it is made available to the Water District. If for any reason this recycled water will not be available at any time under this agreement, the Water District will then provide potable water to supply the recycled water system. Under this MOU, CalTrans will be responsible for payment of such water supplies and also any water meters, backflow preventors, or valve assemblies that need to be installed at the CalTrans' point of delivery for CalTrans to use recycled water for this landscaping.

## **F. Report Organization**

Section II describes the project location, environmental setting, and elements of the proposed project, including best management practices to avoid, minimize, or reduce impacts to a less-than-significant level. Section III is the Environmental Checklist, complete with answers to the Checklist that determine the level of effect. This section also contains any mitigation measures that will reduce stated impact to less than significant levels. Section IV contains the "CEQA Plus" components (Tables IV-1 and IV-2) addressing the issues presented in the State Revolving Fund (SRF) Outline. Section V lists persons who contributed to the preparation of this document and Section VII lists references used in the preparation of this document.

## II. Project Description

### A. Overview

The proposed Water Recycling Project (Project) will provide treated water from the City of Pacifica's CCWRP to irrigation sites within the City of Pacifica. The Water District prepared a Conceptual Water Reclamation Plan in 1997 to determine the potential demand for recycled water in the community and what type of infrastructure would be needed to deliver the recycled water to these potential users. The total annual irrigation demand for recycled water in the Water District is estimated to be about 63 million gallons (MG). The Sharp Park Golf Course is by far the largest potential recycled water customer, and is expected to use approximately 83% of the 63 MG. Other significant users of irrigation water include parks, schools, and CalTrans for landscaping along Highway 1.

In 2001, the Water District prepared a report entitled "A Water Recycling Plan for Pacifica" (Kennedy Jenks Consultants, August 2001). Much of the background information contained in this project description is from either this report or the Conceptual Water Reclamation Plan (1997).

The Sharp Park Golf Course is operated and maintained by the San Francisco Recreation and Park Department (SFRPD). Although the golf course is located within the Water District's service area, the City and County of San Francisco supplies water for its irrigation. In 1999, the San Francisco Public Utilities Commission (SFPUC) prepared two reports that evaluated alternative water supplies for the Sharp Park Golf Course. These two reports presented results that matched those of the two reports prepared by the Water District-- that recycled water from the CCWRP was a viable alternative to the current supply.

### Assumptions Used in Analysis

Some uncertainties about the project have been discovered in the course of putting together the project description. In order to conduct a thorough environmental analysis of the project a few assumptions are being made regarding the uncertainties. They are:

- Phase 1 of the Project would provide recycled water from the Recycling Plant for irrigation of the Sharp Park Golf Course, the Sharp Park Beach Promenade, Fairway Park, Highway One landscaping, and turf playing fields at Oceana High School and Ingrid B. Lacy Middle School. A new above-ground storage tank will contain the recycled water; the below-ground storage tank containing potable water from the SFPUC system that already exists at this site will be decommissioned and removed.
- The SFRPD will use the recycled water at the Sharp Park Golf Course even though the on-site water tests have not been completed. The greens test is scheduled to be conducted in Summer 2004. If this test determines that the recycled water is not acceptable for irrigating the greens, potable water will be supplied to the greens from the Water District's potable water system.
- If periodic flushing of the greens/fairways is required, water will be provided to the Golf Course from the Water District's potable water system.
- The new system can handle the peak flow requirements of the golf course which is 500,000 gallons per day.
- The new water supply will connect to the Golf Course irrigation system at two points near the irrigation pump station, adjacent to the 6<sup>th</sup> green (east side of Hwy. 1), and along Francisco Boulevard on the 3<sup>rd</sup> fairway (west side of Hwy. 1), just below the earth dam (below the pond) and no recycled water will be piped to the pond or the short segment of creek above the pond.

- The existing source of irrigation used by the SFRPD will no longer flow into the pond, as the SFPUC potable water pipeline from the San Francisco Jail will be abandoned. This will likely result in the drying out of the pond except when it fills from natural rainwater runoff during the wet season.
- The recycled water has acceptable levels of salts for turf and landscape irrigation, but a higher nitrogen load than the existing water supply.

### **Use of the 1994 Calera Creek Wastewater Facilities Plan EIR in this document**

The City of Pacifica prepared the Wastewater Facilities Plan EIR (1994) for the upgrading or replacement of its sewage treatment plant and disposal facilities. This new facility (the CCWRP) is located on a hillside south of Mori Point Ridge, west of Highway 1. That program EIR contemplated the use of recycled water for many of the City's recreation areas and highway medians, thus many of the issues considered in this Initial Study have been analyzed at a program level.

### **B. Location and Setting**

Pacifica is located on the Pacific coast side of the San Francisco Peninsula, three miles south of San Francisco in San Mateo County (see Figure II-1. Site Location). The City is framed by the ridges of the Coast Range on the east and the Pacific Ocean on the west. The City comprises a combination of secluded valleys and open hillsides set against a coastline of long beaches and rugged headlands. The geographically distinct portions of Pacifica are linked by two major transportation corridors, State Highway 1 and Sharp Park Boulevard. Highway 1 is also the through corridor between San Francisco and Half Moon Bay. Sharp Park Boulevard connects to Interstate 280 and also links the city with other portions of the San Francisco Peninsula to the east. Land use in the Pacifica area is primarily low-density residential and open space. There are few commercial uses and no major industry. Major portions of the City are devoted to public recreation such as the Milagra Ridge and Mori Point Recreation Areas, several City and State beaches, San Pedro County Park, Pomo Park, and the Sharp Park Golf Course.

### **Calera Creek Water Recycling Plant (CCWRP)**

As stated on page I-2, the SWRCB is providing funds for this project through the "Water Recycling Facilities Grant Program". The grant requirements state that a description of the plant be provided, and is as follows. The City of Pacifica's CCWRP is located on a hillside south of Mori Point Ridge, west of Highway 1 and is accessed via Highway 1 and Rio del Mar Avenue. The "state-of-the-art" plant utilizes a Sequential Batch Reactor (SBR) because the process is mechanically simple and effectively allows a high-quality effluent to be produced with a minimum number of steps. No primary sedimentation or chemical additions are necessary to reduce the biochemical oxygen demand (BOD), solids, and nitrogen to levels which would permit multiple discharge and reclamation options. The process also lends itself to environmental controls for noise and odor. The "batch" process differs from the continuous flow activated sludge processes in that the water is treated in "batches" as a tank is filled, aerated and the sludge allowed to settle, at which point the clear liquid is decanted, and the tank is re-filled.

The new plant was designed with enough process redundancy and backup storage to adequately treat high winter flows and prevent inadequately treated sewage from being discharged in the event of a plant malfunction. The plant has 4 reactor tanks with a capacity of 1.6 million gallons each, two sludge digesters, and equalization storage of about 5 million gallons.

The plant also has a tertiary sand filtration system for additional clarification and disinfects the effluent with ultraviolet light. The treated wastewater is a fully treated Title 22 effluent suitable for unlimited reuse as landscape irrigation water, without limitations of human contact. In Spring 2004, the SFPUC will change its disinfectant agent from chlorine to chloramine throughout the system. The chloramines will be destroyed during the wastewater treatment process at CCWRP (John Rayner, pers. comm.)

The treated wastewater is discharged into Calera Creek just south of the CCWRP. The degraded wetland that existed there prior to CCWRP construction has been reconstructed and now supports a combination of riparian, freshwater marsh and pond habitats with greater value to wildlife. The pond habitat was specifically designed to support red-legged frog and Pacific tree frog populations which serve as prey for the San Francisco garter snake.

### **C. Proposed Project**

There are three phases contemplated in the overall water recycling plan, although only the first phase is subject to this environmental analysis<sup>1</sup>. The 3 phases are described below. At full implementation of the 3-phase reclaimed water system two water storage tanks will be required, one serving the central and northern portions of the District and one serving the southern portion of the District (see Figure II-2, Existing Potable Water Supply Pipeline System and Figure II-3, Recycled Water System and Modification to Potable Water Supply Pipelines).

**PHASE 1** (the proposed project and subject of this document) will serve the central portion of the City of Pacifica. Recycled water customers will include the Sharp Park Golf Course, the Sharp Park Beach Boulevard Promenade, Fairway Park (baseball diamonds), Highway 1 landscaping (CalTrans median) between Sharp Park and Paloma Avenue, Oceana High School and Ingrid B. Lacy Middle School (see Figure II-4, Proposed Recycled Water Pipeline, North Area, and Table II-1, below). Elements of this phase include: booster pumping facilities at the CCWRP, demolition and removal of a 20-foot by 80-foot underground water storage tank, construction of a new 400,000 gallon recycled water above-ground storage tank and approximately 17,000 lineal feet of reclaimed water transmission and distribution pipelines. Included in this phase will be the possible extension of the Water District's potable water service to provide irrigation water for tees and greens at the golf course.

Staging areas for this phase will be located in an area acceptable to the Water District, the San Francisco Public Utilities Commission and the City of Pacifica. These staging areas will most likely be in the SFPUC lands (Sharp Park) east of Highway 1, but it is possible that temporary staging areas for pipes and vehicles will need to be located closer to the pipeline trenches. All construction areas (open trenches) will be covered with a metal plate at the end of each day.

Also included in this phase will be the pipeline and connection from the pump station to the southern extension along the western side of Highway 1 (see Figure II-6, Pump Station Location). There is an existing 8" line in one segment of the extension on the western side of Highway 1 that was installed for this purpose when the Highway 1 bike lane was implemented in 2001. This will be used to irrigate Caltrans landscaping along Highway 1 and along the bike path. It is expected that the rest of the southern extension that will eventually serve parks and schools in the Linda Mar area of the City and will be implemented within the next five years, depending on availability of funds.

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<sup>1</sup> Environmental review of the subsequent phases cannot occur at this time, as the project description is unknown and thus unforeseeable.

**Table II-1  
Summary of Past Water Usage  
Based on Meter Readings  
In 1993-1996 and 2000-2003**

Description	Annual Usage, in Million Gallons (MG)			Peak Month (in MG)	Date of peak month
	Range	Average	Median		
1. Sharp Park Golf Course	34-53	39	37	5.9	10/03
2. Schools and Parks <sup>1</sup>	13-14	8.7	8.9	2.2 <sup>3</sup>	9/03
a. Without Ingrid B. Lacy Middle School	9-10	7.9	8.2	1.6 <sup>3</sup>	9/03
3. Caltrans <sup>2</sup>	0.1-2	0.5	0.3	0.5 <sup>3</sup>	7/01
<b>Notes:</b>					
1. Includes Oceana High School, Ingrid B. Lacy Middle School, Beach Blvd. Promenade and Fairway Park, Oceana High School numbers here also include the potable water used at the High School. Since Ingrid B. Lacy Middle School replaced Sharp Park Elementary School (same site) in 2003, irrigation usage has dramatically increased.					
2. Caltrans usage/meter readings are highly variable as illustrated by the 0.1-2 mg/year range (meters DEP 8, 10, 11 and 12)					
3. NCCWD reads meters every other month. Peak month is calculated by dividing peak reading by 2. Month listed is the first in the 2-month cycle.					

The following paragraphs describe the components of Phase 1: The Recycled Water Pump Station; the Primary Distribution Pipeline to Water Reservoir; Water Storage Tank at Sharp Park; and the Water Distribution System.

### 1. Recycled Water Pump Station

The Recycled Water Pump Station will be located at the Cascade Aerator structure on the CCWRP site (see Figure II-6, Pump Station Location). The pump station is expected to include two, approximately 700 gallon per minute, 100 horsepower pumps and will have facilities to feed a disinfectant, sodium hypochlorite solution, into the recycled water. The location of the pump station is shown on Figure II-6. This pump station is located clearly outside of the archaeological site shown in this Figure. The pipeline from the pump station will be located under the road to the CCWRP and thus will be in an area of disturbed soil (engineered fill).

As stated elsewhere in this Chapter, the Wastewater Facilities Plan EIR (1994) identified the total amount of tertiary treated wastewater that would flow into Calera Creek after the Wastewater Facility was built. The EIR states that:

“at an average dry-weather flow from the plant of 3.6 mgd, with 0.3 mgd going to the [Water Recycling Project], 3.3 mgd represents about 5.1 cfs. At peak dry-weather flow of 6.0 mgd, 5.7 mgd represents about 8.8 cfs. Under summer flow conditions, the creek volume with a depth of 6 to 18", and about 1/10 acre of pond area, each 2 1/2 to 5 feet deep would be about 1.5 to 3 million gallons. This indicates that the dwell time, the time for the total flow of the plant to traverse the distance from the point of discharge to the ocean would be about twelve hours to one day.

In the winter, the tertiary effluent would be combined with and diluted by natural runoff. Winter runoff in the stream has not been precisely measured but varies from about 50 to

60 cfs (32.3 mgd - 38.8 mgd) on the average, to over 200 to 300 cfs (129 - 194 mgd) during a major storm event. Effluent flow in the winter will vary between the dry weather values to a storm peak of 20 mgd. (The contribution of stormwater infiltration will be reduced by about 20% if the sewer system is given needed repairs.) Flow in the peak month was reported in the Facilities Plan as 7.3 mgd. At this rate, the dilution provided by the storm runoff would be between 4.4:1 and 5.3:1 under winter average flow conditions, with dilution as high as 6.4:1 to 9.4:1 during a peak storm event. The stream volume under winter low conditions would be about 12 to 15 million gallons, yielding a dwell time for the effluent of about 2 days.”

## **2. Primary Distribution Pipeline to Water Reservoir**

From the pump station to the Pacifica Beach Promenade, the reclaimed water pipeline will be installed in street and highway rights-of-way. As shown in Figures II-7, the route would be from the CCWRP out to Highway 1, then north on the west side of Highway 1 to Bradford Way, then to Francisco Boulevard, under the Highway 1 at the golf cart tunnel, north on Lundy Way and then east on Archery Range Road up to the new above-ground reservoir site (also the site of the existing below ground water tank, to be removed). About 3,000 feet of new pipeline will be installed in the existing Archery Range road that goes up to the reservoir site. The pipeline will “t” from Francisco Boulevard at the golf cart tunnel that runs under Highway 1. At the golf cart tunnel the pipeline will either be buried or will be jack and bored under the highway. The pipeline will be 12” in diameter and will be either high density Polyethylene or Ductile Iron pipe.

Minimal natural lands will be disturbed in the pipeline installation, as all of the proposed pipeline will be installed in existing road rights-of-way in to the recycled water storage tank. No gradient is needed on the pipeline as it will be connected to the new pump station. Because this is a pipeline installation, the trench will either be backfilled or plated in traffic areas at the close of each workday, to ensure no evening interruption of vehicle travel during the construction process.

## **3. Water Storage Tank at Sharp Park**

The above-ground water storage tank will be located in the vicinity of the existing Sharp Park Archery Range. This tank will be circular and will be approximately 28 feet high by 55 feet in diameter. A below-ground storage tank containing potable water from the SFPUC system already exists at this site, and will be removed. A temporary pipeline will be installed to bypass the existing tank so that it can be taken out of service. The tank will then be abandoned and portions of the structure removed as required to facilitate site grading and construction of the new tank. The temporary pipeline will remain in service to provide irrigation water to the golf course until the recycled water system commences operation. The temporary pipeline will be less than 50 feet long. The existing pipeline from the San Francisco Jail will be abandoned (drained and left in place). The grading to install the new water tank is estimated to be about 250 cubic yards. The new water tank will be made of welded steel and will sit on a concrete foundation. A maximum of 5 new emergency lights will be at the water tank site; this lighting will be manually controlled (as opposed to motion-sensitive).

## **4. Water Distribution System**

### **a. Sharp Park Golf Course Irrigation**

Both the Sharp Park Golf Course and the San Francisco County Jail in San Bruno receive water from the existing Sharp Park Golf Course water supply pipeline, which is shown on Figure II-2 Existing Potable Water Supply Pipeline. Currently, potable chlorinated water from the Harry C. Tracy Water Treatment Plant (WTP) is pumped from the plant through a 60-year

old pipeline that runs along Skyline Boulevard for 2½ miles to the San Francisco Jail. From the jail, the pipeline continues over the ridgeline and into the existing small, underground reservoir located above the archery range (see Photo II-1, Existing Irrigation Pond at Sharp Park (below) and Figure II-2 Existing Potable Water Supply Pipeline), which is adjacent to the Sharp Park Golf Course. The water from the tank flows into Sanchez Creek, which flows into the irrigation pond shown in Photo II-1 and on Figure II-2. The water is dechlorinated (out gases) in the irrigation pond. From the pond, a 10" cast iron pipe delivers the water to the golf course for irrigation. The elevation of the pond is too low to supply the entire golf course by gravity, so a pump station located near the sixth green provides the required boost in water pressure for irrigating the golf holes at higher elevations.

Sanchez Creek, which gets most of its natural runoff water from a tributary coming in below the irrigation pond to the south, flows in a pipe under the golf course until about the 4<sup>th</sup> hole, and continues above ground until it reaches the southern end of Laguna Salada at Horse Stable pond.

The Sharp Park Golf Course will be the primary user of the Phase 1 water supply. Use of recycled water will supplant use of potable water coming from the Harry C. Tracy Treatment Plant in Millbrae. The existing subgrade water tank that now holds the potable water will be removed as required and the new water tank installed in its place. A new water pipeline will be installed to the water tank (See Figure II-7). There will no longer be a need for the open water irrigation pond and the project will result in the decommissioning of a portion of the existing 10-inch water supply pipeline. The 10-inch pipe inlet in the irrigation pond will be plugged and



**Photo II-1 Irrigation Pond below Water Tank Site.**

the pipe abandoned in place from the pond to the fairway on the third hole (west side of Highway 1).

As stated elsewhere in this document, usage in gallons of water per day (gpd) in Phase 1 is expected to average about 300,000 gpd (see Table II-1 on page II-4) during summer months. The golf course can use up to 500,000 gallons of water daily for irrigation during peak days during the dry season (Sean Sweeney, pers. comm.)

#### **b. The Sharp Park Beach Promenade and Playing Fields at Schools Within Pacifica**

The Beach Promenade will be served through a wastewater pipeline that was recently installed during construction of the new sewage force main from the old sewage treatment plant. Minimal trenching will occur at the end of this new wastewater pipeline, to connect the pipeline to the proposed recycled water system pipeline. The pipeline will tie into the existing irrigation system at Beach Boulevard Park.

The other areas that could use recycled water include Oceana High School, Ingrid B. Lacy Elementary School, Beach Boulevard Park and Fairway Park. Based on a summary of past water usage, annual usage for these areas ranges from 13-14 million gallons of water, with the peak (summer) monthly use averaging 2.2 million gallons (John Rayner, Kennedy Jenks Consultants, personal comm.)

#### **c. Highway One Landscaping**

Based on recent meter readings by NCCWD, it is estimated that up to 500,000 gallons per month during the peak season would be used for median landscaping (John Rayner, Kennedy Jenks Consultants, personal comm.)

**PHASE 2** To serve the southern portion of the District, an 8-inch line is proposed from the Southern Extension pipeline to a new 100,000 gallon tank in Linda Mar. All other distribution lines in this area would be 6-inch. A small booster pump would be required to feed Oddstad Park which is at a higher elevation than the tank.

The estimated total maximum daily demand in Phase 2 is 120,000 gallons and the maximum rate of flow is 300 gallons per minute (gpm). A reservoir site with an elevation of 340 feet would also serve most of the southern portion. One potential site is near the existing Tapis Tank of the District. This is located near Oddstad Park and is centrally located in this portion of the District. The Tapis Tank has a base elevation of 340 feet. Locating the reservoir at this elevation provides gravity service up to an elevation of approximately 260 feet which includes most of the District.

This phase is not scheduled yet, and will be scheduled at a later date. It is not considered in this environmental document.

**PHASE 3** would connect to Phase 1 at Oceana High School and go north to serve the northern portions of the City. From the Sharp Park connection point the transmission would be an 8-inch line for the remainder of the system in the northern portion of the District. A booster pump would be required along the upper end of this line to provide service above elevation 260 feet.

This phase is not scheduled yet, and will be scheduled at a later date. It is not considered in this environmental document, as there is not sufficient information.

## D. Mitigation Measures Incorporated Into The Project

The 1994 EIR listed mitigation measures that have been implemented as part of the construction and operation of the Calera Creek Recycled Water Plant. Since this program EIR contemplated the recycled water project in general terms, many of the mitigation measures identified in the EIR are relevant to the construction and operation of the recycled water project. In addition, relevant regulatory agencies, including the City of Pacifica, have Best Management Practices (BMPs) to avoid or reduce both construction and operation-related impacts. These are as follows:

### Aesthetics

No BMPs or 1994 EIR Mitigation Measures are applicable. See the relevant section discussion in Chapter III of this document.

### Air Quality

Standard Bay Area Air Quality Management District (BAAQMD) Best Management Practices (BMPs) for construction sites would be implemented to ensure that the emissions of particulate material are controlled to a less than significant level (BAAQMD, 1996).

Applicable Best Management Practices include:

1. Water all active construction areas at least twice daily and more often during windy periods and less often during rainy periods.
2. Cover all trucks hauling soil, sand and other loose materials and require all trucks to maintain at least two feet of freeboard.
3. Pave, apply water twice daily and less often during rainy periods, or apply (non toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
4. Sweep daily (preferably with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
5. Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.

### Biology

No BMPs or 1994 EIR Mitigation Measures are applicable. See the relevant section discussion in Chapter III of this document.

### Cultural Resources

The following impact listing and mitigation measure is from the 1994 EIR:

**Impact:**            **Disturbance or destruction of a significant cultural resource site, as defined by the eligibility criteria for the National Register of Historic Places.**

**Measure CULT-1:** Site avoidance is recommended. If avoidance is impossible, then implement testing program, and analysis pursuant to Section 106 of the Antiquities Act. Implement data recovery if the site is determined by the USACE to be eligible for nomination to the NRHP.

## **Geology and Soils**

No BMPs or 1994 EIR Mitigation Measures are applicable. See the relevant section discussion in Chapter III of this document. However, the following BMPs from

## **Hazards, Hazardous Materials, Public Health and Safety**

Fueling for vehicles used in the project construction will be subject to standard construction Best Management Practices (BMPs) as specified in the “Blueprint for a Clean Bay” (Bay Area Stormwater Management Agencies Association [BASMAA]). While it is recognized that any stormwater runoff will not enter the San Francisco Bay, relevant BMPs from that publication are listed here. Also listed here are General Construction and Site Supervision BMPs (published by the San Mateo Countywide Stormwater Pollution Prevention Program [STOPPP]). Implementation of these BMPs and others that local contractors commonly use will avoid impacts related to upset of hazardous waste or reduce potential impacts from upset of hazardous waste to less than significant levels.

## **Planning BMPs**

- Schedule excavation and grading activities for dry weather periods.
- Locate and protect storm drains in the vicinity of the site with berms or filters during wet weather periods. Make sure all subcontractors are aware of the locations of the storm drains to prevent pollutants from entering them.
- Control the amount of runoff crossing the site (especially during excavation) by using berms or temporary or permanent drainage ditches to divert water flow around the site. Reduce stormwater runoff velocities by constructing temporary check dams or berms where appropriate.
- Train employees and subcontractors in using best management practices.

## **Good Housekeeping Practices**

- Keep all liquid paint products and wastes away from the gutter, street, and storm drains.
- Designate one completely contained area for auto parking, vehicle refueling, and routine equipment maintenance. The designated area should be well away from streams or storm drain inlets, and bermed if necessary. Make major repairs and wash vehicles at an appropriate off site facility.
- Keep materials out of the rain – prevent runoff contamination at the source. Cover exposed piles of soil or construction materials with plastic sheeting or temporary roofs.
- Keep pollutants off exposed surfaces. Place trashcans and recycling receptacles around the site to minimize litter.
- Dry sweep paved surfaces that drain to storm drains, creeks, or channels. If pavement flushing is necessary, use silt ponds or other techniques to trap sediment and other pollutants.
- Clean up leaks, drips and other spills immediately so they do not contaminate soil or groundwater or leave residue on paved surfaces. Use dry cleanup methods whenever possible. If you must use water, use just enough to keep the dust down.

- Cover and maintain dumpsters. Check frequently for leaks. Place dumpsters under roofs or cover with tarps or plastic sheeting secured around the outside of the dumpster. A plastic liner is recommended to prevent leakage of liquids. Never clean out a dumpster by hosing it down on the construction site.
- Make sure portable toilets are maintained in good working order by the leasing company and that wastes are disposed of properly. Check toilets frequently for leaks.

### **Materials/waste handling BMPs**

- Use recyclable materials whenever possible. Arrange for pick-up of recyclable materials such as concrete, asphalt, scrap metal, solvents, degreasers, cleared vegetation, paper, rock, and vehicle maintenance materials such as used oil, antifreeze, batteries and tires.
- Dispose of all wastes and demolition debris properly. Many construction materials can be recycled. Materials and debris that cannot be recycled must be taken to an appropriate landfill or disposed of as hazardous waste. Never bury waste materials or leave them in the street or near a creek or stream bed.

### **Hydrology**

The following BMPs from the STOPPP will avoid or reduce construction-related impacts:

- Avoid paving and seal coating in wet weather, or when rain is forecasted to prevent materials that have not cured from contacting stormwater runoff.
- Cover and seal catch basins and manholes when applying seal coat, slurry seal, or similar materials.
- Protect drainage ways by using earth dikes, straw bales, sand bags, or other controls to divert or trap and filter runoff.
- Cover stockpiles and other construction materials with plastic tarps. Protect from rainfall and prevent runoff with temporary roofs or plastic sheets and berms.
- Check all equipment for leaks and repair leaking equipment properly.
- Perform major maintenance, repairs, and washing of equipment away from the construction site.
- Clean up all spills and leaks using “dry” methods (with absorbent materials/rags), or dig up and remove contaminated soil.
- Collect and recycle or appropriately dispose of excess abrasive gravel or sand.
- Avoid over-application of water trucks for dust control.

### **Land Use and Planning**

No BMPs or 1994 EIR Mitigation Measures are applicable. See the relevant section discussion in Chapter III of this document.

**Noise**

No BMPs or 1994 EIR Mitigation Measures are applicable. See the relevant section discussion in Chapter III of this document.

**Public Services**

No BMPs or 1994 EIR Mitigation Measures are applicable. See the relevant section discussion in Chapter III of this document.

**Recreation**

No BMPs or 1994 EIR Mitigation Measures are applicable. See the relevant section discussion in Chapter III of this document.

**Transportation/traffic**

The following impact listing and mitigation measure is from the 1994 EIR:

**Impact: Increased congestion on already heavily congested section of east side of Highway 1 for two weeks during construction of effluent pipeline, due to need for closure of one north-bound lane.**

**Measure TRA-1: Prohibit lane closure during peak traffic hours.**

**Utilities and Service systems**

No BMPs or 1994 EIR Mitigation Measures are applicable. See the relevant section discussion in Chapter III of this document.

**E. “CEQA-Plus” Issues****State Water Resources Control Board’s Basic Outline for Environmental Documents**

Because this document is subject to State Revolving Funds (SRF) it reflects the State Water Resources Control Board’s (SWRCB) “Basic Outline For Environmental Documents”. The SRF applicable fund requirements will also be addressed; making this document what the SWRCB calls “CEQA-Plus”.

The State Water Resources Control Board Outline lists project-specific information that must be disclosed, when applicable, in all environmental documents, including Initial Studies, prepared for projects under their jurisdiction. Table II-2 (following) lists all outline items for the Project Description, with a determination of applicability for each in this project, and a summary of either why the item is not applicable, or where the item can be found within this document. Section IV of this document contains two tables that provide a listing that shows where each of the Environmental Setting and Primary and Secondary Issues are discussed, and a summary of each issue.

**Table II-2  
State Revolving Funds (SRF) Outline listing  
SRF Project Description Requirements**

<b>SRF Outline Project Description</b>	<b>Applicable For This Project?</b>	<b>Location In This Document</b>	<b>Summary, as applicable</b>
<b>A. Describe Project Objectives that Qualify the Project for SRF Funding</b>			
1. Correction of any water quality problems associated with wastewater treatment or disposal facilities a) Public health hazards b) Pollution of impaired water bodies		N/A N/A	a-b) Not applicable for this recycled water project. This project is not proposed to correct any water quality problems associated with wastewater treatment or disposal facilities.
2. Compliance with water quality regulations a) Waste Discharge Requirements b) NPDES permits c) Cease and Desist orders		N/A N/A N/A	a-c) Water Quality regulation compliance is not affected by this recycled water project.
3. Preventative measures for impaired and unimpaired water bodies	✓	Description contained in this Section, analysis contained in Section III of this document.	Project effects on water bodies, including Calera Creek, Sanchez Creek and the irrigation pond are listed in this document in Section III-4, Biological Resources, and Section III-8, Hydrology.
4. Capacity increase		N/A	No increase in capacity is proposed
5. Wastewater recycling	✓	Description contained in this Section.	
<b>B. Explain How Objectives will be accomplished</b>			
1. New facilities	✓	Description contained in this Section	
2. Upgrading existing facilities	✓	Description contained in this Section.	
3. Correction of inflow and infiltration problems		N/A	None Known
<b>C. Describe Any Existing Facilities</b>			
1. Facilities (give physical dimensions and area of existing site) a) Treatment facilities b) Collection and/or Conveyance systems	✓	Description of existing irrigation facilities, including the potable water tank at Sharp Park is contained in this	The SBR tanks, filter building and equalization storage reservoir at the CCWRP are located on 4 acres at the

SRF Outline Project Description	Applicable For This Project?	Location In This Document	Summary, as applicable
c) Storage d) Appurtenant structures e) Effluent discharge facilities f) Sludge disposal facilities		Section, brief summary of the CCWRP is described here	North Quarry site in Pacifica, CA.
2. Condition of facilities	✓	Description of existing irrigation facilities, including the potable water tank at Sharp Park is contained in this Section, brief summary of the CCWRP is described here	Excellent. The CCWRP is described as “state-of-the-art”.
3. Level of treatment	✓	Description contained in this Section	Tertiary
4. Present effluent quality	✓	Description contained in this Section	
5. Present capacity of facilities a) Average Dry Weather Flow (ADWF) capacity b) Peak Wet Weather Flow (PWWF) capacity	✓  ✓	Description contained in this Section	Wastewater Facilities Plan EIR (1994) states that “at an average dry-weather flow from the plant of 4-8 mgd, with 0.3 mgd going to the [Water Recycling Project]. PWWF is 27 mgd.
6. Present inflow of wastewater (ADWF and PWWF)	✓		0.5 ASWF and 22.0 MGD PWWF
<b>D. New Facilities (describe any facilities that will be constructed, removed or modified and facility operations)</b>			
1. Facilities (give physical dimensions and area of project site) a) Treatment facilities b) Collection and/or Conveyance systems c) Storage d) Appurtenant structures e) Effluent discharge facilities f) Sludge disposal facilities	✓	Description contained in this Section	Proposed project is the 17,000 lineal feet of recycled water pipeline, pump station at the Calera Creek Water Recycling Plant, and new water storage tank at Sharp Park.
2. Proposed treatment level	✓	Description contained in this Section	Proposed project includes adding sodium hypochlorine to provide chlorine residue in recycled water
3. Proposed effluent quality (describe qualitatively and quantitatively)	✓	Total Nitrogen: avg. 1-4 m/l	No change in effluent quality is proposed as

SRF Outline Project Description	Applicable For This Project?	Location In This Document	Summary, as applicable
		Turbidity averages: 1-2 NTU Suspended solids: avg. 1-4 m/l BOD: avg. 1-4 m/l	part of this recycled water project for effluent discharged to Calera Creek
<p>4. Capacities (give in terms of ADWF and PWWF)</p> <p>a) Design capacity (show how capacity was calculated)</p> <p>b) Any increase needed to serve existing development</p> <p>c) Population basis for capacity determination (include year)</p> <p>(1) Current population</p> <p>(2) Projected population</p>	✓	<p>a) See the <i>Draft Conceptual Water Reclamation Plan, 1997</i>, prepared by Kennedy Jenks.</p> <p>b) N/A</p> <p>c) N/A</p>	b-c) Recycled Water project is designed to serve City recreational facilities with non-potable water for irrigation, in order to conserve potable water.
<p><b>E. Project Approvals (discuss the roles of planning and regulatory agencies which have permit or funding authority over the proposed project)</b></p>	✓	Description contained in this Section, analysis contained in Section III of this document.	
<p><b>F. Project Location (description of the precise location and boundaries, preferably topographic. and detail map)</b></p>	✓	Contained in this Section.	
1. Existing facilities	✓	Contained in this Section.	
2. New facilities	✓	Contained in this Section.	
3. Storage sites	✓	Contained in this Section.	
4. Staging Areas	✓	Contained in this Section.	
5. Effluent discharge sites	✓	Contained in this Section.	
6. Disposal sites		N/A	
7. Affected service area	✓	Contained in this Section.	
8. Reuse sites (for water recycling)	✓	Contained in this Section.	

Figure II-1. Site Location

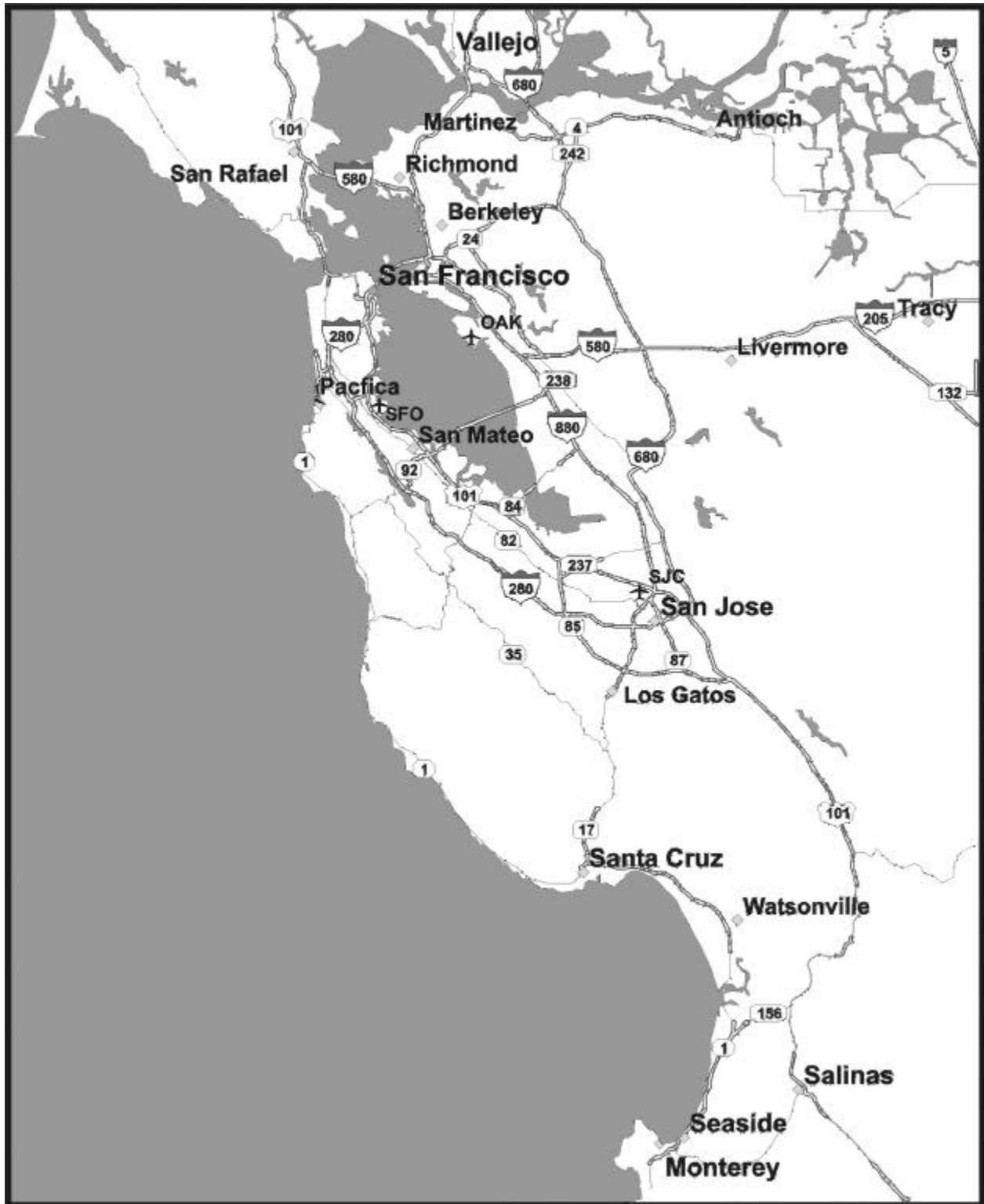


Figure II-2. Existing Potable Water Supply Pipeline

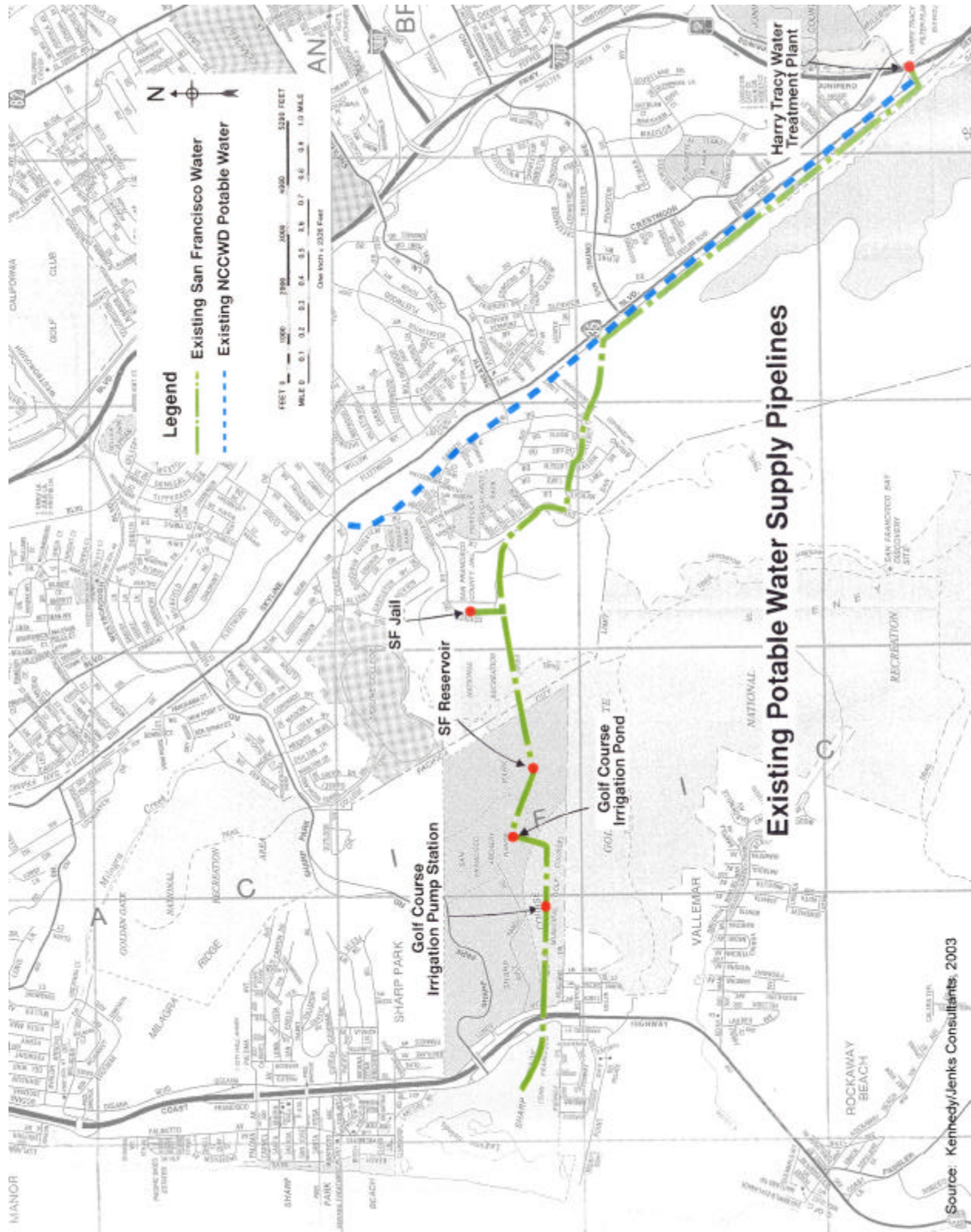


Figure II-3. Recycled Water Distribution System and Modifications to Potable Water Supply Pipelines

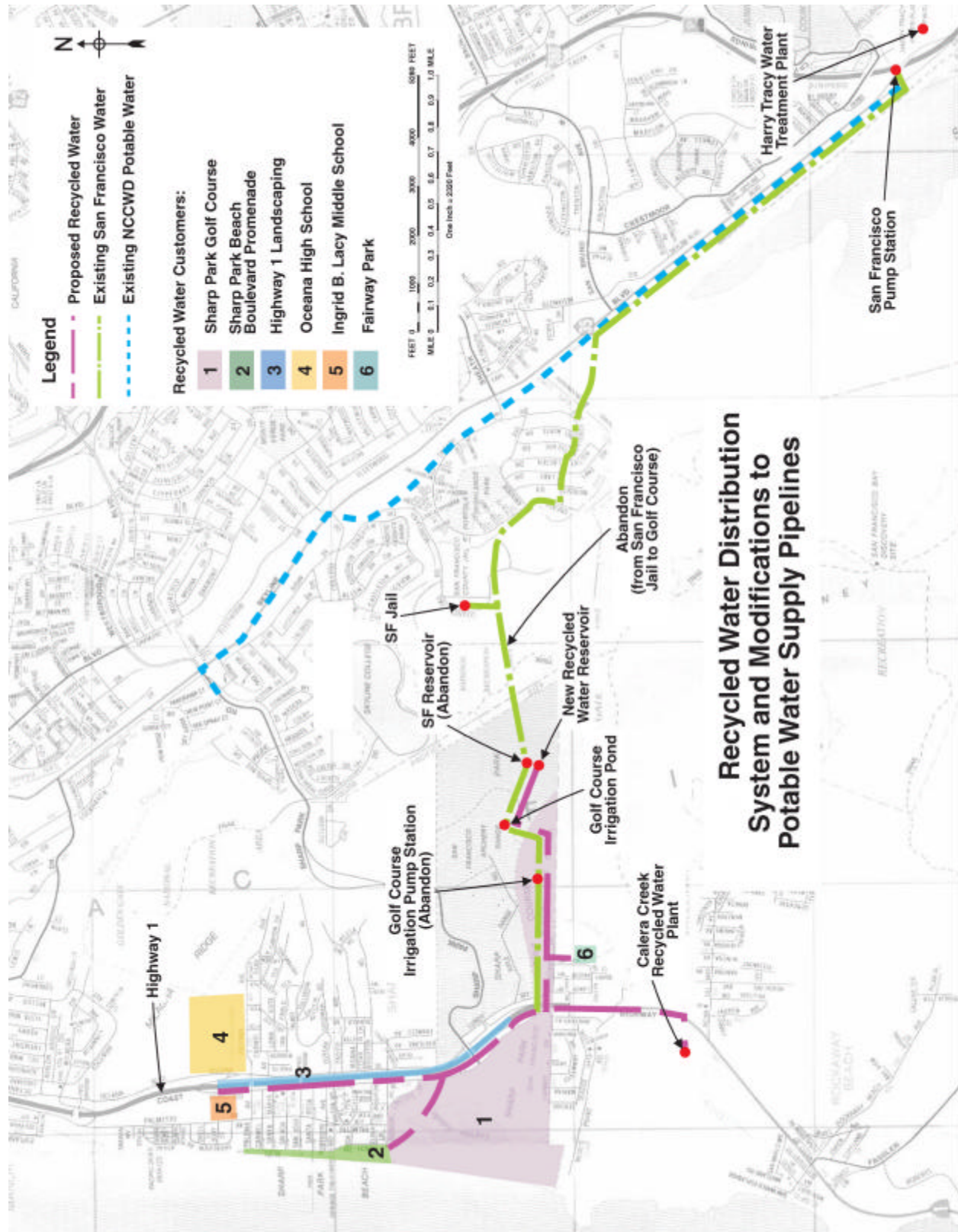


Figure II-4. Proposed Recycling Plan, North Service Area

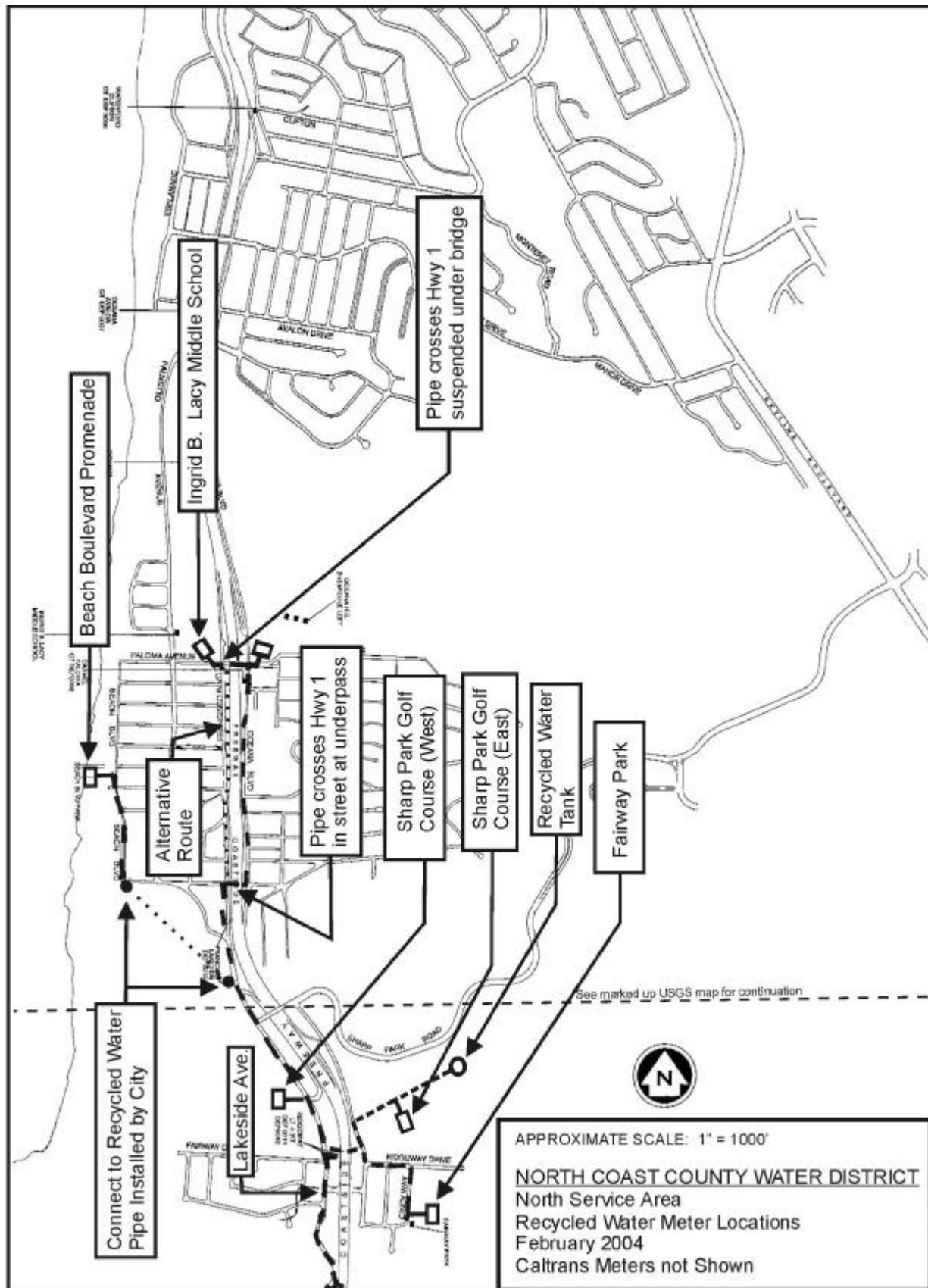




Figure II-6. Pump Station Location

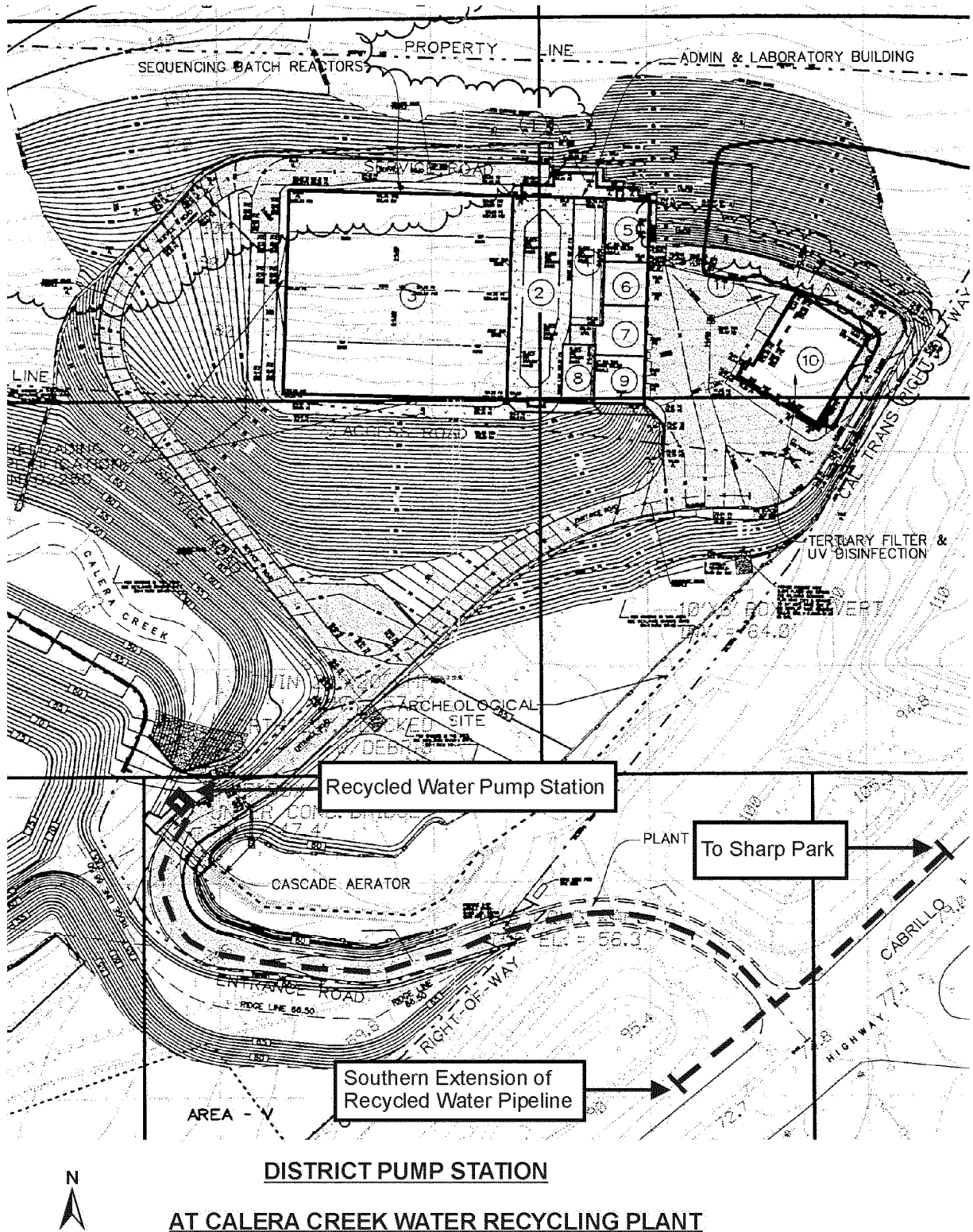
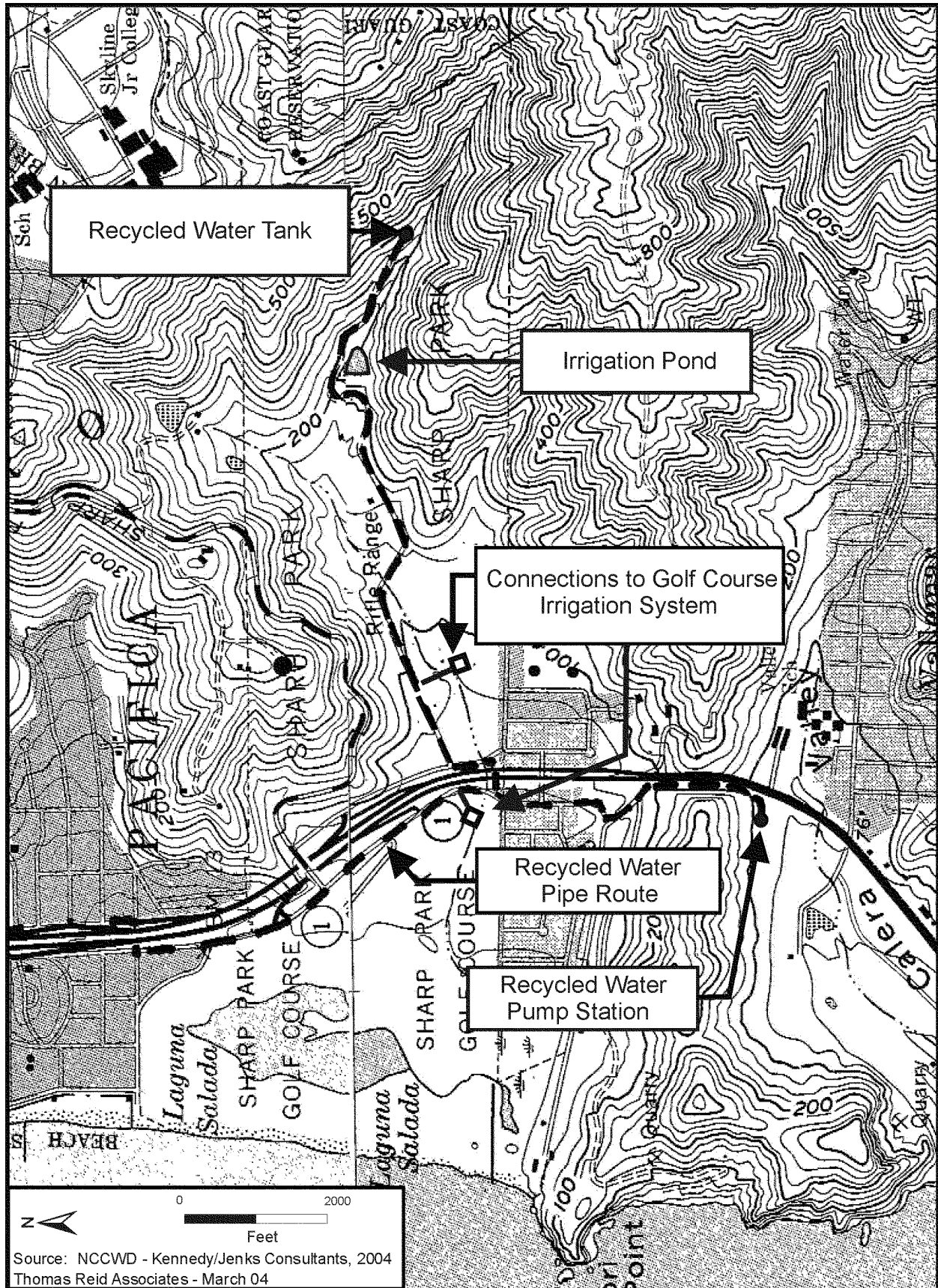


Figure II-7, Pipeline Alignment From Highway 1 to Proposed Recycled Water Tank.



ENCW\_Fig7\_032604.cdr

### III. Environmental Checklist Form And Responses

#### 3.1 BACKGROUND

1. **Project Title:** North Coast County Water District Water Recycling Project
2. **Lead Agency Name and Address:**  
North Coast County Water District  
2400 Francisco Boulevard  
P.O. Box 1039  
Pacifica, CA 94044-6039
3. **Contact Person and Phone Number:**  
George Kanakaris, General Manager, (650) 355-3462
4. **Project Location:** City of Pacifica, CA
5. **Project Sponsor's Name and Address:**  
North Coast County Water District  
2400 Francisco Boulevard  
P.O. Box 1039  
Pacifica, CA 94044-6039
6. **General Plan Designation:** Various
7. **Zoning:** Various
8. **Description of the Project:** See Section II, Project Description, of the Initial Study
9. **Surrounding Land Uses and Setting:** Various. See Section II, Project Description, of the Initial Study
10. **Other public agencies whose approval is required:**  
City of Pacifica, Development Permit (for project areas east of Highway 1)  
City of Pacifica, Coastal Development Permit (for project areas west of Highway 1)  
Regional Water Quality Control Board  
California Department of Fish and Game  
California Department of Transportation (CalTrans)

In addition, there will need to be water supply agreements between NCCWD, San Francisco Public Utilities Commission (SFPUC) and the San Francisco Recreation and Park Department (SFRPD), as well as real property agreements between the NCCWD and the SFRPD for pipeline easements across Sharp Park and use of the storage tank site above the archery range.

### 3.2 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

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

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Aesthetics                      | <input type="checkbox"/> Agriculture Resources                         | <input type="checkbox"/> Air Quality               |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources                 | <input checked="" type="checkbox"/> Geology /Soils |
| <input type="checkbox"/> Hazards & Hazardous Materials   | <input checked="" type="checkbox"/> Hydrology / Water Quality          | <input type="checkbox"/> Land Use / Planning       |
| <input type="checkbox"/> Mineral Resources               | <input type="checkbox"/> Noise   | <input type="checkbox"/> Population / Housing      |
| <input type="checkbox"/> Public Services                 | <input type="checkbox"/> Recreation                                    | <input type="checkbox"/> Transportation/Traffic    |
| <input type="checkbox"/> Utilities / Service Systems     | <input checked="" type="checkbox"/> Mandatory Findings of Significance |  |

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>I. AESTHETICS</b> -- Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Environmental Setting**

The pipeline route from the new pump station at the Calera Creek Water Recycling Plant to the new water tank in the upper Sharp Park Archery Range is characterized as either going on existing road rights-of-way or along the maintenance road from the Archery Range access at Lundy Way to the Sharp Park Golf Course/Archery Range entrance road. The pipeline will then follow this road up to the water tank location. A new 10" pipe will connect from the tank to the Golf Course irrigation system. As most, if not all of the proposed 17,000 lineal feet of new pipeline will be installed in existing road rights-of-way, no natural lands will be disturbed. The new pipe will be set in typical utility trenches approximately 4 ½ feet deep by 3 feet wide, and buried. The water tank location is characterized by steep slopes heavily forested with Monterey Pines (*Pinus radiata*) and Blue Gum Eucalyptus (*Eucalyptus globulus*)(See Photo III-1, Water Tank Location, below).

There are no sensitive visual receptors in the area of the proposed water tank; Sharp Park Road is approximately 1 mile to the north-northwest from this site, up and over a steep ridge. Also on the other side of this ridge is a currently open parcel designated the "East Fairway Park-Valleamar-Rockaway Land Use Plan" in the City's General Plan as "Open Space Residential." To the south-southeast is the Sweeney Ridge open space area, which is the Discovery Site of the San Francisco Bay by Gaspar de Portola in 1769. This area has multiple jurisdictions, including the City of Pacifica (private undeveloped lands), the Golden Gate National Recreation Area (Sweeney Ridge), and the San Francisco Watershed, a State Fish and Game Preserve. There are no viewpoints or developments on the slopes above this site, as all of the surrounding ridges are within the parklands.

As stated in the Project Description section of this document, 5 new emergency lights are proposed at the water tank site. These would be manually controlled (not motion sensitive) and would only be used in an emergency situation.



**Photo III-1 Water Tank Location.** The existing potable water tank (partially underground) is shown at left, behind the Monterey Pine Trunk at photo left. It is expected that these three pine trees (and three others just outside the photo area) will be removed as part of the tank removal and new tank construction.

### Discussion:

*Would the project:*

**a) Have a substantial adverse effect on a scenic vista?**

**No impact.** The proposed recycled water distribution system consists of underground pipelines, pumps at the Calera Creek Water Recycling Plant, and a water tank that would be hidden amongst dense trees above the archery range at Sharp Park. None of these would have a substantial adverse effect on a scenic vista.

**b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?**

**No impact.** Highway 1 (SR-1) is not a State Scenic Highway in this area (the State Scenic highway designation in San Mateo County is from the Santa Cruz County line to South City limits of Half Moon Bay and does not extend further north beyond Half Moon Bay. <http://www.dot.ca.gov/hq/LandArch/scenic/schwy1.html>). No part of the proposed recycled water distribution system would be viewable from a state scenic highway once construction is finished. Construction equipment (backhoe, etc.) would create a minor, temporary aesthetic impact. This does not constitute substantial damage to scenic resources.

**c) Substantially degrade the existing visual character or quality of the site and its surroundings?**

**Less than significant impact.** Six trees over a ¼ acre area would have to be removed above the archery range at Sharp Park to make room for the construction of the 400,000-gallon capacity water tank. While this would produce a visual impact in the immediate vicinity of the proposed water tank, dense trees would make the impact invisible to visitors to the archery range, or any other part of Sharp Park or Pacifica. All other visual impacts would be construction related, and thus temporary. Therefore, the project would not significantly degrade the existing visual character or quality of the site and its surroundings.

**d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?**

**No Impact.** The project would require the construction of lighting at the water tank site. However, the lights will only be illuminated when workers are present during emergency conditions. Therefore, daytime or nighttime views of the area will not be affected.

<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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**II. AGRICULTURE RESOURCES --**

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion:**

*Would the project:*

**a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?**

**No Impact.** None of the areas proposed to be either part of the pipeline alignment or the tank location are on agricultural lands or can be classified as Farmland of any of the above types.

**b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?**

**No Impact.** As indicated above, the site is not located on or adjacent to agricultural lands. According to the City of Pacifica General Plan, there are no known Williamson Act contracts in the City of Pacifica.

**c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?**

**No Impact.** As indicated above, the site is not located on or adjacent to agricultural lands, and the project will not have any affect upon existing agricultural operations, as none exist in the vicinity.

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

**Environmental Setting:**

The proposed project site is located in the Bay Area Air Quality Management District (BAAQMD). The BAAQMD monitors and enforces District, State of California and Federal air quality standards. Currently, the Bay Area is in attainment (meets the established standards) for all national standards set forth in the federal Clean Air Act.

However, it is not in attainment (exceeds the established standards) for the California Clean Air Act (CCAA) standards for two pollutants: ozone (one-hour standard) and fine particulate matter less than 10 microns in diameter (PM<sup>10</sup> - both annual mean and 24-hour standards). All other pollutants are designated as "attainment" or "unclassified" for federal standards and as an "attainment" area for the state standard.

The closest air data collection station is in Redwood City (Bay Area Air Quality Management District website, <http://gate1.baaqmd.gov/aqmet/AQSiteYearly.aspx>). This location does not provide complete air quality analysis for areas in Pacifica, however, since there is a big ridge of the Santa Cruz Mountains, including Sweeney Ridge, that separates the two cities. This mountainous ridge not only limits prevailing westerly winds from the Pacific Ocean from reaching Redwood City in the same manner as they do in Pacifica, it also serves as a barrier to trap ozone, particulate matter and carbon monoxide. Generally, then the air quality is better in Pacifica than at this air data station in Redwood City.

The climate in Pacifica is generally characterized as Mediterranean, with cool, wet winters and warmer, dry summers. Coastal fog is very prevalent during the summer months. Average rainfall is approximately 23 inches (<http://www.worldclimate.com/cgi-bin/data.pl?ref=N37W122+2200+046599C>), mostly in winter (with some fog drip counting as precipitation) and average temperatures in the area ranging from approximately 50 mean degrees in January to approximately 60 mean degrees in September, the most fog-free month.

The Bay Area Air Quality Management District website states that “The Bay Area 2001 Ozone Attainment Plan for the national 1-hour ozone standard (adopted 10/24/01) includes two commitments for further planning: (1) a commitment to conduct a mid-course review of progress toward attaining the national 1-hour ozone standard by December 2003, and (2) a commitment to provide a revised ozone attainment strategy to U. S. EPA by April 2004. In addition, the California Clean Air Act (CCAA) requires the District to update the Clean Air Plan for attaining the State 1-hour ozone standard every three years. The District Board of Directors adopted the most recent update in December 2000.”

“The current ozone planning process is intended to update both the ozone attainment strategy for the national standard and the plan for the State ozone standard. In updating these documents, the District will assess progress toward both ozone standards, review air pollution control strategies, and determine what additional control strategies will be needed.”

While project activities would contribute to temporary PM<sup>10</sup> emissions caused by construction activities related to pipeline installation and water tank construction, BAAQMD Best Management Practices for construction sites would be implemented to ensure that the emissions of particulate material are controlled to less than significant level.

#### **Discussion:**

*Would the project:*

**a) Conflict with or obstruct implementation of the applicable air quality plan?**

**No Impact.** The project is a temporary construction project, and will not result in new population or growth or inconsistencies with the existing air quality management plan for the region. The project will not produce long-term vehicular transportation impacts or stationary source emissions that could impede implementation of the CCAA. The project is a short duration activity to provide recycled water to a new storage tank in Sharp Park, and associated pipeline and pump infrastructure and will not conflict with nor obstruct implementation of air quality plans; thus, no impact will occur.

**b) Violate any air quality standard or contribute to an existing or projected air quality violation?**

**Less Than Significant Impact.** The project site is located in the Bay Area Air Quality Management District (BAAQMD). Currently, the Bay Area, which includes San Mateo County, is in attainment for all national air quality standards, but is in non-attainment for two pollutants under state standards--ozone (one-hour standard) and fine particulate matter (PM<sup>10</sup>-both annual mean and 24-hour standards).

Project construction will result in disturbance and/or construction on approximately 4.5 acres over 3 to 5-month period. According to BAAQMD CEQA Guidelines, projects that implement all of the control measures for construction activities as identified in the Guidelines (Table 2 of BAAQMD CEQA Guidelines, April 1996) will not result in a significant impact (Bay Area Air Quality Management District, April 1996). The project proposes implementation of

BMPs to adhere to BAAQMD requirements. These BMPs are listed in Section IID Air Quality of this document.

**c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

**d) Expose sensitive receptors to substantial pollutant concentrations?**

**Less Than Significant Impact.** The project will not result in an increase in population or result in a new source of stationary or ongoing permanent mobile emissions. Given the short-duration, the nature of construction activities and implementation of BMPs, consistent with BAAQMD guidelines, the project will not significantly contribute to existing or projected air quality violations, and thus, will not result in a cumulatively considerable net increase for ozone or PM<sup>10</sup>, or expose sensitive receptors to substantial pollutant concentrations.

**e) Create objectionable odors affecting a substantial number of people?**

**No Impact.** The recycled water pipeline project and new water tank will not result in generation of odors to recreational users of the archery range (adjacent to the proposed water tank site.) No residents live in the general vicinity of the water tank site, and the proposed pipeline is not expected to leak, which could be the only source of odors to residents adjacent to the pipeline alignment. Tertiary treated effluent such as Pacifica's, which uses UV light for disinfection rather than chlorination, should not have an appreciable odor that would be detectable at any of the sites where the effluent was used for irrigation, such as the high school or golf course.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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**IV. BIOLOGICAL RESOURCES --**

Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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## Environmental Setting

A site assessment was conducted by a TRA biologist on August 12, 2003. The site assessment was conducted on foot and all areas of the project site were evaluated for the presence of jurisdictional “waters of the U.S.” and isolated wetland features, the potential to support regionally occurring special-status species, and the presence of any other biologically sensitive resources.

### Site Description

The project site is located in San Mateo County in the San Francisco South and Montara Mountain 7.5 min USGS Quadrangles, T3&4S R6W. The proposed site is situated within the central and southern sections of the City of Pacifica. The site is located on coastal alluvial and marine terraces along county, city and private roadways adjacent to Calera and Sanchez Creeks. The project area includes sections of Sharp Park Golf Course, Sharp Park Archery Range and lands adjacent to the Calera Creek Wastewater Treatment Plant. Major hydrological features in and around the project area include the irrigation pond Horse Stable Pond, Laguna Salada, Sanchez Creek and the lower portion of Calera Creek. The climate is characterized by dry, mild summers and wet, cool winters. Annual precipitation in the Pacifica area averages 23 inches (Worldclimate, 2003). Elevations range from sea level to 400' and the soils at the site include beach sands, marine terrace deposits, assorted colluvium, artificial fill and estuarine mud (TRA, 1994).

The project vicinity supports a variety of upland and wetland communities, including plantation Monterey pine forests, mixed willow stands, riparian red alder forests, ponds and creeks, bulrush and cattail wetlands, disturbed roadsides and California annual grasslands. A complete description of these communities is included in Appendix A, Biological Resources. The pipeline alignment will primarily traverse existing roadways but will also go through the Sharp Park Archery Range. The pipeline through the Archery Range will go under the existing maintenance road, and the water tank will be installed at the site of the existing potable water tank. The Archery Range supports mixed willow stands, riparian red alder forests, ponds and creeks, bulrush and cattail wetlands. The water tank site is located within a plantation Monterey pine forest.

Prior to conducting the field visit, TRA biologists conducted a search of the California Department of Fish and Game's (CDFG) Natural Diversity Data Base (CNDDDB) for the project area and surrounding quadrangles and compiled a list of special status species with potential to occur in the area. During the field survey, a TRA biologist walked through the entire project area, and assessed the plant communities and potential wildlife habitats present. The biologist also conducted a reconnaissance-level survey for special-status species identified during the pre-field investigation as having the potential to occur in and surrounding the project site and assessed the potential of the vegetation communities present to support these species. A list of all sensitive species occurring or with the potential to occur in the project area is presented in Table II in Appendix A.

#### *Definitions of Special-Status Species*

Special-status species are plants and animals that are legally protected under state and federal Endangered Species Acts (ESAs) or other regulations and species that are considered sufficiently rare by the scientific community to qualify for such listing. These species are in the following categories:

- plants or animals listed or proposed for listing as threatened or endangered under the federal ESA (50 Code of Federal regulations [CFR] 17.12 [listed plants], 17.11 [listed animals] and various notices in the Federal Register [FR])

- [proposed species]).
- plants or animals that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40, February 28, 1996);
  - plants or animals designated as “special concern” (former C2 candidates) by Region 1 of the U.S. Fish and Wildlife Service (USFWS);
  - plants or animals listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 California Code of Regulations [CCR] 670.5);
  - plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);
  - plants that meet the definitions of rare and endangered under CEQA (State CEQA Guidelines, Section 15380);
  - plants considered under the California Native Plant Society (CNPS) to be “rare, threatened or endangered in California” (Lists 1A, 1B, and 2 in CNPS 2001);
  - plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in CNPS 2001), which may be included as special-status species on the basis of local significance or recent biological information;
  - animal species of special concern to CDFG; and
  - animals fully protected in California (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

### Special-Status Plant Species

Table I in Appendix A includes a list of the special-status plant species, their status, habitat association(s) and the potential for the species to occur in the project area. No special-status plant species were observed within the project area during the field visit. Habitat suitability for sensitive-status species was assessed by a qualified botanist, who determined that there is low potential for rare plant occurrences in the project area within the roadways and road easements where direct impacts from construction activities will occur. The existing conditions within these areas are largely disturbed and these habitats are dominated by non-native and common ruderal species.

### Special-Status Wildlife Species

Table II in Appendix A includes a list of the special-status wildlife species, their status, habitat association(s) and occurrence for species that have the potential to occur within the project area. No other sensitive-status wildlife species were located during the survey. The site has the potential to provide foraging and nesting habitat for Cooper’s hawk, Sharp-shinned hawk and other riparian-associated bird species, including, short-eared owl, yellow warbler and salt marsh yellow throat. Numerous special-status bird species have been observed in and around the project area, including Swainson hawk (rare occurrence), sharp-shinned hawk, Cooper's hawk, loggerhead shrike, salt marsh yellowthroat, great blue heron, great egret, northern harrier and white-tailed kite. No raptor nests were observed during the field survey. However, a red-tailed hawk was observed foraging near Mori Point. The wetlands within the riparian corridors and marshes at the site also provide habitat for the California red-legged frog (*Rana aurora draytonii*), the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), and the fork-tailed damselfly (*Ishnura gemina*). Breeding, foraging and dispersal habitat for these species occur in the project area and these species have been located within the project area during previous surveys and studies (TRA, 1994).

### California Red-legged Frog/San Francisco Garter Snake Evaluation

The California red-legged frog (CRLF) is a federally listed threatened species and a California species of special concern. The San Francisco garter snake (SFGS) is listed by both the State and Federal governments as an endangered species. As such, take of these species is subject to regulations of both the state and federal endangered species acts. Of the species considered in this Initial Study, these two have the greatest potential to be impacted by project activities, in particular the reduction of flows in existing water bodies where they may breed and/or forage.

Red-legged frog and San Francisco garter snake expert, Mark Allaback, visited the project area including the Impoundment Pond, Horse Stable Pond and portions of Sanchez and Calera Creeks in August 2003. The purpose of the site visit was to determine if habitat for special-status species including the SFGS and CRLF may be affected by the proposed project if the irrigation pond goes dry and if flow is reduced into Calera and Sanchez Creeks. Reduced flow into Sanchez Creek may negatively affect both Horse Stable Pond and Laguna Salada, which are located in proximity of the mouth of the creek and are assumed to have a hydrological connection. Portions of both the Calera and Sanchez Creek riparian systems west of Highway 1 are known or assumed to support both the SFGS and CRLF.

Potential breeding habitat for CRLF is present at the irrigation pond. It is a perennial pond approximately 1-acre in size that is formed by an earthen berm. It appeared to be several feet deep. Some shallow areas support small patches of cattails, while most of the perimeter vegetation is over-hanging and composed primarily of plants in the Mixed Willow Series as mentioned above. Floating aquatic vegetation was present and the pond receives a mixture of sun and shade. Nearby lands are mostly undeveloped although an archery range is present about 1,000 feet downstream. Much of the surrounding upland consisted of invasive species including the Eucalyptus and Monterey Pine Series as mentioned above. Western (= Pacific) pond turtles (*Clemmys (=Actinemys) marmorata*), listed by the state as a Species of Special Concern, are known to inhabit the pond (TRA, pers. observ.). It is unknown if fish have been introduced to the pond. If non-native, predatory fish are present, the site may not provide breeding habitat for the CRLF or breeding efforts may be greatly reduced. The CRLF may also use the irrigation pond for sheltering and foraging without breeding.

Unless the irrigation pond provides breeding habitat for the CRLF, it seems unlikely that it is regularly used by the SFGS. The highest numbers of SFGS tend to be associated with CRLF breeding sites, since the snakes prey primarily on frogs. The irrigation pond also lacks extensive freshwater marsh habitat that is preferred by the SFGS. Finally, the surrounding uplands are primarily forested, and the SFGS is usually observed near a pond or marsh in coastal scrub and/or more open habitats where it finds areas to bask.

Both the CRLF and SFGS have been known to inhabit Laguna Salada and Horse Stable Pond, which are situated within 1,000 feet of each other near the southwest corner of the Sharp Park Golf Course (City of Pacifica, 1994, CNDDDB, 2003). They support extensive freshwater marsh vegetation. Sanchez Creek flows into Laguna Salada and the lower reaches of the drainage are also likely to be inhabited by the SFGS and CRLF. There is habitat connectivity between Sanchez and Calera Creeks throughout the Mori Point area, which is undeveloped.

Calera Creek west of Highway 1 consists of willow riparian habitat and is the site of a significant wetland restoration effort (L.C. Lee & Associates 2003). Much of the nearby floodplain has been disturbed since the area was part of a quarry operation and is now composed of mostly ruderal vegetation. Some ponds were constructed near Calera Creek as part of a mitigation plan for construction of the Pacifica Sewage Treatment Plant. CRLF were observed on 6 August 1998 at the ponds and have been regularly seen along Calera Creek and at the ponds every year (Davidson and Fiedler, pers. comm.). Calera Creek and the nearby

ponds west of Highway 1 provide habitat for the SFGS, although there have been no reports of any observations (L.C. Lee & Associates, 2003).

## **Discussion:**

### ***Would the project:***

**a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?**

### **Less than Significant Impact with Mitigation Incorporated.**

Habitats with the potential to support or be used by a sensitive-status species occur within or adjacent to the proposed project site. The project site where pipeline construction will occur includes roadways associated with the Sharp Park Archery Range and residential and city streets (including Francisco Blvd.) The project vicinity provides a mosaic of high, medium and low quality habitat for sensitive-status wildlife species due to the surrounding urban developments, land uses and the nature of the habitats present. Due to the fact that construction activities will occur in previously heavily disturbed and artificially constructed landscapes including the State Highway 1 corridor, easements along existing roadways and within the roadways of the Sharp Park Archery Range, the potential for adverse affects to sensitive-status plant species is low. Vegetation to be removed by the project is limited to the water tank site which supports the Monterey pine plantation forest with an understory of mixed native and nonnative shrubs. The approximate size of the water tank construction area is estimated to be less than ¼ acre.

**Impact Bio-1a.** The project site represents potential foraging and nesting habitat for raptor species such as Swainson's hawk and white-tailed kite. If raptors establish territories on the project site, construction activities may adversely affect these species.

**Impact Bio-1b.** Construction activities have the potential to impact the adjacent wetland habitats along the pipeline corridor through Sharp Park through sedimentation and/or erosion of fill materials introduced during construction. These activities have the potential to adversely impact red-legged frog breeding and foraging habitat should they occur in the project area. Most of the sensitive-status wildlife species with the potential to occur are associated with the riparian corridors, ponds and wetlands within the project site.

**Impact Bio-1c.** Wetlands, streams and pond habitats in the project area have the potential to be affected by changes in water use, storage and supply proposed by this project. Specifically, the loss of chlorinated water supplied to Sanchez Creek (above the irrigation pond) from a 10" pipe connected to the SFPUC pipeline has the potential to decrease breeding and foraging habitat for two listed species within the Sanchez Creek watershed: the California red-legged frog and the San Francisco garter snake, as well as the western pond turtle, a state species of special concern.

**Mitigation Measures:**

**Measure BIO-1a.** A pre-construction survey for raptor nests shall be conducted by a qualified biologist within the 30 days prior to construction activities to establish the status of these species on the project site. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey, the site shall be resurveyed. The survey shall adhere to the following protocols:

- **Avoidance.** Avoid nesting season construction. Construction should be scheduled to avoid the nesting season to the extent feasible. The nesting season for most birds, including raptors and shrikes, in the San Francisco Bay Area extends from January through August.
- **Pre-construction/Pre -disturbance Surveys.** If it is not possible to schedule demolition and construction between August and January, then pre-construction surveys for nesting birds should be conducted by a qualified ornithologist to ensure that no nests will be disturbed during project implementation. This survey should be conducted no more than 14 days prior to the initiation of demolition/construction activities during the early part of the breeding season (January through April) and no more than 30 days prior to the initiation of these activities during the late part of the breeding season (May through August). During this survey, the ornithologist will inspect all trees and other potential habitats (e.g. grasslands, buildings) in and immediately adjacent to the impact area for nests. If an active nest is found sufficiently close to work areas to be disturbed by these activities, the ornithologist, in consultation with CDFG, will determine the extent of a construction-free buffer zone to be established around the nest, typically 250 feet, to ensure that no nests of species protected by the Migratory Bird Treaty Act or State Code will be disturbed during project implementation.
- **Inhibiting Nesting.** Potential nesting substrate (e.g. bushes, trees, grass, burrows) that will be removed by the project should be removed before the start of the nesting season (February) to help preclude nesting. Pre-removal surveys are required for some species. Removal of vegetation or structures slated for removal by the project should be completed outside of the nesting season, which extends from February through September.

**Timing:** At least 30 days prior to construction

**Monitoring to ensure measure was implemented:**

City of Pacifica. Construction cannot start unless survey has been submitted to City Planning and Building Department.

**Significance after Mitigation:** Less than significant

**Measure BIO-1b1.** In order to prevent take of a federally listed species, and potential impacts to other special-status species known from the project area, the applicant shall schedule construction of the pipeline crossing of Sanchez Creek when the creek is dry, or during the dry months (June 1 to October 15) when the likelihood of frog/snake dispersal is low. Incorporation of this measure will also decrease potential sedimentation and erosion concerns during and after construction.

**Timing:** During construction phase

**Monitoring:** City of Pacifica

**Significance after Mitigation:** Less than significant

**Measure BIO-1b2.** The project shall employ Best Management Practices (BMPs) before, during and after construction as listed in the Hydrology BMPs in Chapter II, Project Description, Section D, Mitigation Incorporated into the Project. Implementation of these BMPs will ensure that effects from runoff into perennial drainages (Sanchez Creek) not exceed standards of significance.

**Timing:** During construction phase  
**Monitoring:** City of Pacifica  
**Significance after Mitigation:** Less than significant

**Measure Bio-1c1.** Prior to cessation of SFPUC water deliveries to the impoundment pond and the lower reaches of Sanchez Creek, the project applicant shall contract with a California red-legged frog/San Francisco garter snake expert and have breeding season surveys (January 15 to March 15) conducted at the irrigation pond to determine whether the frog and/or snake are breeding at the pond. This time frame should be compatible with the project construction schedule, which at this point has not been determined.

At the same time the pond can be assessed for its role as foraging habitat for both species as well as for the western pond turtle, and the amount of breeding habitat for CRLF and SFGS can be assessed at the Horse Stable Pond and Laguna Salada. Depending upon the results of those surveys, a management plan shall be prepared which identifies flows needed to maintain breeding/foraging habitat for the species found to use the irrigation pond. If the irrigation pond is determined to be important for breeding/foraging for these sensitive species, consultation with both the USFWS and CDFG shall be made to determine if any permits or authorization are necessary. In addition, the NCCWD may have to provide a means to divert water from the new water tank to the irrigation pond at levels required to avoid significant impacts to the habitat. Specific tasks to be carried out at the irrigation pond, Horse Stable pond and Laguna Salada should include:

#### Irrigation Pond

- Determine if the CRLF is present by conducting surveys during the breeding season (requires USFWS approval).
- Determine if non-native fish are present.
- If the CRLF is present, determine if it is breeding or using the site for sheltering and foraging. The USFWS may consider the loss of a breeding site to be more significant than loss of sheltering and foraging habitat, since the CRLF may still use the upper Sanchez Creek drainage for sheltering and foraging after the Impoundment Pond goes dry.
- Contact CDFG to determine if western pond turtles should be trapped and relocated to Horse Stable Pond, Laguna Salada or another locations.

#### Sanchez Creek/Horse Stable Pond/Laguna Salada

- Determine if the project will reduce flow into Sanchez Creek and thereby reduce water levels at Horse Stable Pond and Laguna Salada.
- Determine if the amount of breeding habitat for CRLF will be reduced.

**Timing:** At least 30 days prior to construction  
**Monitoring to ensure measure was implemented:**  
 City of Pacifica. Construction cannot start until surveys have been conducted and, if necessary, a management plan has been submitted to the City Planning and Building Department.  
**Significance after Mitigation:** Less than significant

**Measure Bio-1c2.** Determine through surveys or interviews with creek managers if Calera Creek provides breeding habitat for the CRLF. If it does provide breeding habitat, determine if a 10% reduction of flow would eliminate or reduce CRLF breeding. If so, the USFWS may consider loss of CRLF breeding habitat to be significant, since it may also reduce habitat quality

for the SFGS, which often forage on CRLF. Consult with both USFWS and CDFG to determine if any permits or authorizations will be required if reduced flows will impact the CRLF and/or SFGS

**Timing:** At least 30 days prior to construction

**Monitoring to ensure measure was implemented:**

City of Pacifica. Construction cannot start unless survey has been submitted to City Planning and Building Department.

**Significance after Mitigation:** Less than significant

**b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?**

**Less than Significant Impact with Mitigation Incorporated.**

The pipeline construction and recycled wastewater irrigation activities that are proposed for this project have the potential to have a significant impact on adjacent riparian corridors, ponds and wetlands in the project area. The loss of between 300,000 to 500,000 gallons a day of recycled wastewater from Calera Creek does not have the potential to reduce the extent of wetland habitat and viability within the Calera Creek Ecosystem Restoration Expansion Project, because this loss was contemplated in the 1994 Wastewater Treatment Plant EIR. The remaining flow of between 3.1 to 3.3 mgd released by the plant is more than sufficient to maintain the current habitat within the restoration project area.

**Impact Bio-2a.** The construction of the recycled wastewater pipeline has the potential to cause sediment transport, erosion and pollution through ground-breaking activity and/or accidental gas or oil spills or leaks (from heavy machinery) during the entire construction period. Lowering of water levels and flow within streams and wetlands of the project area has the potential to adversely affect jurisdictional hydrologic features and decrease the extent of wetland and/or stream habitat in the project area. Sedimentation and erosion from the project site have the potential to fill wetlands associated with the watercourses adjacent to the project site, degrade water quality and reduce habitat quality for associated plant and wildlife species.

**Impact Bio-2b.** Other possible effects include the lowering of the irrigation pond water levels through the loss of SFPUC Pipeline water that currently feed to Sanchez Creek above the irrigation pond. According to Sean Sweeney (pers. comm.) the City of San Francisco does not intend to maintain flows to the impoundment pond if that system is bypassed by the new system (which is proposed). Without such flows the pond could dry up during the dry season. This could impact the California red-legged frog if it breeds in that pond, as well as the western pond turtle which is known to occur at the pond, as well as other wildlife species that utilize the pond habitat. However, drying the pond could have an advantage of eliminating nonnative bullfrogs, should they occur.

**Mitigation Measures:**

**Measure BIO-2a1.** The District's contractor shall prevent erosion and sedimentation to riparian habitat by installing silt fences, haybales and other BMPs as listed in the Hydrology BMPs in Chapter II, Project Description, Section D, Mitigation Incorporated into the Project. Implementation of these BMPs will ensure that effects from runoff into perennial drainages (Sanchez Creek) not exceed standards of significance.

**Timing:** During construction phase

**Monitoring:** City of Pacifica

**Significance after Mitigation:** Less than significant

**Measure BIO-2a2.** The project District's contractor shall seed the banks at the water tank site and associated buffer regions immediately after construction and fill activities are completed with fertile seed of creeping ryegrass (*Leymus triticoides*). This native, perennial species is already present in the project area. The addition of this plant on the riparian banks will greatly reduce the potential for significant sediment transport to the drainage.

**Timing:** During construction phase

**Monitoring:** City of Pacifica

**Significance after Mitigation:** Less than significant

**Measure BIO-2a3.** Construction activities shall occur during the dry/low flow season between June 1 and October 15 in order to decrease the risk of sediment transport and erosion related to pipeline construction activities within the project area.

**Timing:** During construction phase

**Monitoring:** City of Pacifica

**Significance after Mitigation:** Less than significant

**Measure BIO-2b.** Implementation of Measure BIO-1-c1 will determine if the irrigation pond, Sanchez Creek and Horse Stable Pond/Laguna Salada support habitat for sensitive species. After this has been determined, the appropriate water level to maintain viable populations shall be established by consulting with the biologists and the District's engineers and hydrologists. Recommendations made by these experts shall be implemented, and water from the new water tank will be diverted to ensure that this water level is kept at all times.

**Timing:** During construction phase

**Monitoring:** City of Pacifica

**Significance after Mitigation:** Less than significant

**c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

**Less than Significant Impact with Mitigation Incorporated.** The project will not require filling of any jurisdictional or non-jurisdictional wetlands. See discussion in b) above regarding potential impacts of flow reductions to project water bodies. Since the water to be removed from the impoundment pond is not "natural" flow, but rather deliberate input from a potable water pipeline, it is not clear if removing the water is in violation of the Clean Water Act. Consultation with the USACE and RWQCB is required to make this determination. Even though the removal of water is not considered fill under section 404, draining the irrigation pond should be considered in light of a potential violation(s) in that: 1) 33 CFR Part 328.3(4) discusses the "impoundment of waters otherwise defined as waters of the United States..." as part of the definition of waters of the U.S. 2) the Endangered Species Act may apply, 3) there are lacustrine fringe wetlands associated with the pond, and 4) how the pond is drained could result in a discharge to downstream waters (i.e. if the impoundment is breached/removed vs. drained by the intake pipe at the pond center).

**Mitigation Measures:** Also see Mitigation Measures BIO-2a through 2b above.

**Measure BIO-2c1.** Contact the USACE and RWQCB to determine if these projects are under the jurisdiction of those agencies. Obtain any permits or authorization required by those agencies once consultation is made.

**Timing:** Prior to construction phase

**Monitoring:** To be determined

**Significance after Mitigation:** Less than significant

**d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?**

**Less than Significant Impact with Mitigation Incorporated.** Recorded migration corridors or stream channels used by special-status fish or wildlife species occur on and around the existing project site. However, the project would not introduce new barriers to movement of terrestrial or aquatic species. The potential dewatering of the golf course irrigation impoundment pond could affect a wildlife nursery site if red-legged frogs or San Francisco garter snakes are found to breed in the pond. This impact is addressed in b) 2b above and the implementation of mitigation measure Bio-2b would reduce the impact to less than significant levels.

**e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

**Less than Significant Impact.** The proposed project will be in conformance with relevant City Zoning Codes, both for areas within the City's Local Coastal Plan (LCP) and in other areas. The project will provide the City with a Heritage Tree Management Plan for the water tank site in Sharp Park, thus will be in conformance with the City's Heritage Tree Ordinance. Therefore, the proposed project will not conflict with any local policies or ordinances.

### **1. City of Pacifica Zoning Code**

The pipeline project and water tank site traverse many zoning designations within the City of Pacifica. The portions of the pipeline that are relevant to biological resources are 1) the alignment along Highway 1 and near the Calera Creek Wastewater Treatment Plant, which are both within the City of Pacifica's Coastal Zone, and 2) the portions of the pipeline alignment and the Recycled Water Storage Tank site within Sharp Park. The alignment along Highway 1 and the area near the proposed Water Tank are within a Public Facility Zone and have a separate set of governing regulations. All other zoning areas along the pipeline alignment are listed in Section III-9, Land Use, below.

#### Local Coastal Plan areas

Section 9-4.4403 of the City's Zoning Code contains the City's codes for ensuring Habitat preservation within the Local Coastal Plan. These codes are intended to protect, maintain, enhance, and restore environmentally sensitive habitat, including wetlands. Subsection b) requires a survey if the site is or may be located within 100 feet of an environmentally sensitive habitat area or has the potential to negatively impact the long-term maintenance of the habitat. Subsection e) sets development standards for wetlands and wetland buffer areas prohibiting new development within a recognized wetlands habitat area.

**Conformance:** Multiple surveys of the site, conducted individually by TRA biologist Casey Stewman and BioSearch biologist Mark Allaback have been completed in meeting this requirement. Thus, the project is in conformance with this subsection b) of Section 9-4.4403 of the City's LCP Zoning Code.

The project would conform to subsection e) of the abovementioned Code because the habitats within the proposed pipeline alignment and recycled wastewater storage area have been determined to not fall under the definition of wetlands in the City LCP and by extension are not wetlands under the zoning code.

The project does not have the potential to negatively impact the long-term maintenance of the wetland habitat within the Calera Creek Wetland and Riparian Ecosystem Restoration through removal of 300,000 to 500,000 gallons a day of treated wastewater, as this represents at most a 15% reduction in existing flow (the 1994 Wastewater Treatment Plan EIR states that existing dry weather flow is 3.6 - 5.7 million gallons per day (mgd) and existing wet weather flow is 32 mgd - 38 mgd.)

### Sharp Park

Wetlands contained within Sanchez Creek adjacent to or crossed by the recycled wastewater pipeline alignment and the irrigation pond within the Sharp Park Archery Range occur in the Public Facility Zoning, or P-F Zone, as defined in Article 21 of the City's Zoning Code. The Development Regulations contained in this Article do not contain specific codes for grading and drainage (to protect sensitive wetlands and wetlands habitat), other than "Development regulations in the P-F District shall be as... (a) specified in the use permit and site development permit;" and (b)(1) the proposed use shall be of such size, design, and operating characteristics as will make it compatible with surrounding uses with respect to bulk, scale, design, coverage, density, noise, the generation of traffic, and environmental impacts."

## **2. City of Pacifica Local Coastal Plan (LCP) Policies**

Only LCP Policy 12 is applicable to the proposed project. It is listed as follows:

### **LCP Policy 12**

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of wastewater discharge and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

**Conformance:** The project conforms to LCP Policy 12. The project as proposed removes no native or wetland vegetation, while removing only heavily disturbed habitats dominated by non-native herbaceous species. These habitats are judged to have low function and value and hence do not meet LCP criteria. The project area does have wetlands meeting LCP criteria. There are natural streams, estuaries or lakes affected by the proposed project. All surface storm water runoff from the project area within the LCP will be directed into the City's storm water drainage system. This water is discharged through the wastewater treatment plant, which provides treatment prior to discharge to the ocean. Implementation of the Mitigation Measures in this section will ensure conformance to this LCP Policy.

## **3. City of Pacifica Heritage Tree Ordinance**

The relevant sections of the Heritage Tree Ordinance are as follows:

### **Chapter 12. Preservation of Heritage Trees. Sec. 4-12.04**

"No person shall cut down, destroy, remove, or move a heritage tree, or engage in new construction within the dripline of a heritage tree growing on private property or City-owned property, without a permit. As used in this section, "destroy" shall include substantial trimming which threatens the healthy growth and development of the tree." The City of Pacifica has determined that the Heritage Tree Ordinance shall be adhered to in Sharp Park (owned by the

City and County of San Francisco) (Michael Crabtree, pers. comm.).

#### **Sec. 4-14.05 (e)**

“In order to mitigate the adverse effects of tree removal, a tree removal permit may be conditioned upon tree relocation on-site, planting of replacement trees, or payment of fees in lieu thereof if on-site replacement is not feasible. No applicant shall be required to expend more on the replacement trees than the appraised value of the trees for which a permit is required. The Director shall determine the replacement value of the trees. If a fee in lieu thereof is imposed, the Director shall determine the value of the number and size of trees necessary to offset the loss of the heritage tree. If on-site replacement is not feasible, the Director may condition the permit on payment of such a fee in order to mitigate the tree loss without replacement plantings off-site. The applicant may be required to submit an evaluation, appraisal or replacement plan prepared by a qualified horticulturist, arborist, or licensed landscape architect.”

#### **Sec. 4-12.07**

The project applicant must submit a tree protection plan.

**Conformance.** The City of Pacifica criteria for heritage trees is that any tree with a circumference over 50" (approximately 16" in diameter) measured at 24" above the natural grade is considered a heritage tree. Six Monterey pine (*Pinus radiata*) trees associated with the historic pine plantation in the Sharp Park Archery Range will be removed in order to place the Recycled Wastewater Storage Tank. The trees are approximately 20 to 30 feet in height and range from approximately 1 to 2 feet in diameter at breast height (DBH). Trees with circumference over 50" (approximately 16" in diameter) measured 24" above the natural grade are considered heritage trees by the City of Pacifica Heritage Tree Ordinance. Two of the six trees on the site meet the criteria, and are heritage trees. This is not considered a significant impact for the following two reasons: 1) the project will require a Development Permit from the City and must provide a Tree Protection Plan pursuant to Section 4-12.07 of the Heritage Tree Ordinance, and 2) this site is heavily forested with Monterey pine trees already and planting additional trees is not necessary. The city will determine whether additional trees will need to be planted as part of the Tree Protection Plan required by the Heritage Tree Ordinance rather than say they won't need to plant any trees.

#### **4. San Mateo County**

**Not Applicable.** San Mateo County has a Local Coastal Plan that contains development standards and protocol for delineating and avoiding wetlands. Because the proposed project is entirely within the City of Pacifica, the County's Local Coastal Plan is not applicable.

#### **5. U.S. Army Corps of Engineers (COE)**

**Not Applicable.** No wetlands will be subject to fill within the project area that have the potential to fall under the jurisdiction of the U.S. Army Corps of Engineers. Therefore, COE policies requiring permits for filling of wetlands are not relevant, and are not affected by the proposed project.

**f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?**

**No Impact.** The proposed project will not conflict with any existing habitat conservation

plans or natural community conservation plans in the City of Pacifica or County of San Mateo. At the present time, no impact will occur in this regard.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>V. CULTURAL RESOURCES --</b>				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in ?15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to ?15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Discussion:**

An archaeological literature review for this project was undertaken by Miley Holman at the Northwest Information Center (NWIC) located at Sonoma State University during the last week of September 2003 (file no. 03-215). The records indicate that there have been numerous archaeological surveys of the pipeline route between the recycling plant and the vicinity of the Sharp Park Golf Course which have resulted in the recording of two prehistoric archaeological sites, Sma-162 and 268, and one historic site, C-302, the historic Vallemar Railroad Station, and one possible prehistoric site in the Sharp Park vicinity.

Additionally, there have been at least two archaeological literature reviews done by Thomas Reid Associates for the Calera Parkway Improvements project, which cover most of the proposed route of the pipeline. In 2000 (file 00-137) the Northwest Information Center (NWIC) reported that there had been three archaeological studies which covered portions of the current pipeline project (Melandry 1986:S-8244; O'Connor and Melandry 1988:S-9715; Orkins and Schwaderer 1994:S-15828). The project review concluded that the area should be considered archaeologically sensitive for prehistoric occupation sites and recommended further archival and field research.

An updated review was done in 2003 by Thomas Reid Associates (file no. 02-882) for the Calera Parkway Improvements project which restated the findings of the 2000 literature review concerning archaeological sensitivity based upon the proximity of Sma-162 and 268, recommending further field study.

The most recent literature review conducted by this author in September 2003 (file no. 03-215) concentrated on the actual proposed route of the pipeline from the recycled water plant at its southernmost end up to the Sharp Park rifle range where a new storage tank will be built, and the portion of the pipeline which will run into the Sharp Park Golf Course to the old sewer treatment plant at its northern end and ultimately to Oceana High School and the Sharp Park elementary school along routes which have not been clearly defined to date. One new archaeological survey report by Matthew Clark (2002) was obtained for the proposed Pacifica Village Center project area which was to have been built west of the recycled water plant; because it involved archaeological sites Sma-268 and 162, this report contains the most comprehensive discussion of these sites done to date.

No additional cultural resources have been recorded for the proposed pipeline route other than those currently mapped: Sma-268, 162 and C-302. Of these three resources, only one, Sma-268, is actually located on or near the projected route of the pipeline at its exit from the recycled water plant at Highway 1. The other two sites, Sma-162 and C-302, are not located inside the projected route of the pipeline. Finally, there is the issue of the potential for the discovery of additional prehistoric archaeological site deposits along a portion of the line in the vicinity of the Sharp Park Golf Course and rifle range access road, based upon the observations of a previous archaeological researcher in the area, Cindy Desgrandchamps (1978) and based upon the environmental setting of this general area. These issues will be discussed below.

#### **SMA-268:**

This is an archaeological site first recorded by Melandry and Compton during a Caltrans survey in 1986, although the site had been known about since 1963, when improvements to Route 1 (culvert placement) revealed an extensive archaeological deposit containing as many as 50 bodies (Clark 2002:11). Survey conditions were poor in 1986, but based upon field observations and the newspaper accounts of the discovery in the roadway, Melandry drew the borders of Sma-268 extending out into the Route 1 right of way.

The site was re-recorded by Orlins and Schwaderer in 1993 for the water recycling plant construction and wetlands construction project. Clark describes their work below:

They described it as a “habitation site: dark brown midden with many shell fragments, mammal bone, fire affected rock” (1993:1) entirely north of the creek. On the site record Orlins and Schwaderer also describe the site as partially “covered with up to 27” of fill and overburden.” Having relocated the site, Orlins and Schwaderer recommended extended subsurface reconnaissance, carried out in September 1993 with a backhoe. Eight backhoe trenches were excavated, delimiting the site and revealing about 60-65 cm of apparently intact shell midden. Although Orlins and Schwaderer state that the bank of Calera Creek forms the southerly and easterly site boundary” (1994:10), no trenches were excavated east of the creek into the berm of the Caltrans right-of-way....” (2002:10-11)

In short, Orlins and Schwaderer stopped at the right of way probably due to the complexity of obtaining Caltrans permits and never explored the possibility that the archaeological site extended east and north along the right of way north of the entrance to the recycling plant, where the 50 bodies and extensive artifactual material was found in 1963.

**ARCHAEOLOGICALLY SENSITIVE AREAS:**

North of Calera Creek the proposed pipeline will follow the western side of Route 1 through a cut in the hills to the Sharp Park Golf Course, the former location of the Laguna Salada, a wetland and estuary, which was destroyed by the construction of the golf course. While early development of this area prevented formal archaeological surveys, it must be assumed that this area was and is extremely archaeologically sensitive. Archaeological sites could still exist buried under fill and landscaping all along the former edges of the Laguna, which extended east of Route 1 into the existing golf course.

There is some documentation of archaeological resources in the area: in 1978 Cindy Desgrandchamps recorded SMA-162 on a berm directly south of Calera Creek outside of the present project area, noting that it was probably a redeposit of archaeological materials from elsewhere:

“Midden material is remains of one or more archaeological sites originally located in the Sharp Park area. Midden removed during construction of Rte.1 through Sharp Park & redeposited at present location as road fill for later highway projects. (1978:3).”

Desgrandchamps evidently looked inside the Caltrans right-of-way in the Sharp Park vicinity, but found only scant evidence of midden there.

The full Holman report is contained in Appendix B.

*Would the project:*

**a-d a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5; b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5; c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or, d) Disturb any human remains, including those interred outside of formal cemeteries?**

**Less than Significant Impact with Mitigation Incorporated.**

**Impact CUL-1.** The current project design seeks to avoid impacts to the large deposit of prehistoric archaeological material adjacent to the CCWRP by implementing the following avoidance measures:

- the proposed 12 inch water line from the existing pumping plant to the exit road at Route 1 will be placed in existing engineered fill that was prepared for the road; and
- the fill used to build the existing roadway is of sufficient depth to allow the placement of the recycled pipeline in the fill layer. However, impacts to SMA 268 could still occur, since the edge of this site is within 10 feet of the pump station, and is located within 15 feet of the existing road to the CCWRP.

Therefore, the following mitigation measure will apply:

**Mitigation Measure:**

**Measure CUL-1.** Prior to the initiation of construction or ground-disturbing activities, the District's contractor shall fence the perimeter of archaeological site SMA 268 and inform all construction personnel of excavation limits and location of the aforementioned site.

**Timing:** Before construction phase starts

**Monitoring to ensure compliance:**

City of Pacifica Department of Public Works

**Significance after Mitigation:** Less than significant

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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**VI. GEOLOGY AND SOILS --**

Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Existing Setting

The proposed recycled wastewater pipeline and recycled wastewater storage tank project area occurs on the following primary soil and or geologic types, as shown in page 98a of the Pacifica General Plan: 1) Artificial fill of man-made origin; 2) Terrace deposits at the wastewater treatment plant and south of Sharp Park Golf Course (between the Golf Course and Mori Point); 3.) Franciscan greenstone at the pipeline corridor between the wastewater treatment plant through the Highway 1 roadcut at the Mori Point Ridge; and 4) Colluvium in hillside areas. More detailed descriptions of these materials are included below.

1. Artificial fill in the project area consists of miscellaneous earth materials of varying composition and thickness. Field inspections of the project area during the preparation of the 1994 Wastewater Facilities Plan EIR by the geological consultant Rogers Pacific showed sandy loams, gravel and other materials along the Highway 1 roadway. Slope stability varies with texture and composition. Earthquake stability is poor-to-good, depending on local conditions. Fill is typically suitable for pipelines and light structures.
2. Marine terrace materials are weakly consolidated, slightly weathered sand and gravel deposits. These are generally less than 30 feet thick and occur on flat, gently sloping platforms along the Pacific coast. Severe gullying occurs in artificial cuts in marine terrace deposits.
3. Franciscan greenstone consists of greenish-gray to buff colored, fine to coarse-grained sandstone (graywacke) and lithic rock with interbedded siltstone, shale and local conglomerate. Siltstone and shale constitute less than 20% of the unit, but in places form sequences tens of meters thick. Total thickness of the unit is unknown but is at most likely several hundreds of meters.
4. Colluvium is an unconsolidated, heterogeneous material deposited by mass wasting on the lower portions of steep slopes. Colluvium is subject to downslope creep. It probably covers most upland slopes in San Mateo County, but is restricted in the project area to deposits at the base of steep slopes and in small gullies. Locally, the colluvium may be as much as 30' thick. It may also contain organic debris. Colluvium interlaces with and grades into alluvial deposits in canyon bottoms at the bases of slopes.

### Discussion:

*Would the project result in:*

**a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:**

**i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.**

**Less Than Significant Impact.** A review of available geologic maps for the project area indicate that the site is not located within an Alquist-Priolo Earthquake Fault Zone. The nearest Alquist-Priolo Earthquake Fault Zone is found along Skyline Boulevard west of the project site along the San Andreas Fault. It is about 1.5 miles away.

**ii) Strong seismic ground shaking?**

**Less Than Significant Impact with Mitigation Incorporation.** The recycled water pump station, pipeline corridor and water tank sites are all located in the seismically active San Francisco Bay Region. Significant earthquakes have occurred in the San Francisco Bay Area and are believed to be associated with crustal movements along a system of subparallel fault zones that generally trend in a northwesterly direction. The water tank site is located approximately 1½ mile southwest, 7 miles north, and 17 and 26 ½ miles southwest, respectively, of the active San Andreas, San Gregorio, Hayward and Calaveras faults. In addition, the potentially active Seal Cove Fault is located approximately 7 miles offshore.

**Impact GEO-1.**

Strong ground-shaking at the pipeline alignments and storage tank site will probably occur during the design life of the project as a result of a major earthquake on one of the active faults in the region, including the San Andreas.

**Mitigation Measure GEO-1.**

A complete geotechnical report shall be prepared by a qualified geotechnical consultant for the water tank site, and all recommendations found in this study shall be included as conditions of site approval. The study shall specifically address potential hazards of siting a water tank and include recommendations on specific structural design features to assure the water tank is not compromised during a strong ground-shaking event.

**Timing:** Prior to project approval

**Monitoring:** City of Pacifica, evidence of review of the geotechnical engineering and geological hazard study shall be submitted in writing by the City Engineer to the City Planner

**Significance after Mitigation:** Less than significant

**iii) Seismic-related ground failure, including liquefaction?**

**Less Than Significant Impact with Mitigation Incorporation.** Soil liquefaction is a phenomenon in which loose, saturated, cohesionless soils (silts and sands) below the water table are subject to a temporary, but essentially total loss of shear strength under the reversing, cyclic-shear strains associated with earthquake shaking. The wastewater treatment plant site where the pump station is located and where the pipeline originates is situated on an area of combination artificial fill and marine terrace materials. According to the Rogers-Pacific geotechnical study for the 1994 Wastewater Treatment EIR, this geologic feature is “typically suitable for pipelines and light structures.”

As stated above, the generalized soils located at the wastewater treatment plant site are predominantly terrace deposits, both natural and artificial marine terrace materials and fill materials. These soils are composed of a broad assortment of soil types including silty clays along wetlands and creeks, sandy loam and gravel along the Highway 1 corridor and loam within the canyon slope of Sanchez Creek. The underlying parent material is greenstone within the Franciscan formation (metasedimentary). Accordingly, the potential for liquefaction of these soils during the maximum credible earthquake is considered low. Based on the information in Wieczorek et al. (1985), the steeper portions of the pipeline alignment on roadways near the irrigation pond and the recycled wastewater storage tank placement site show a low susceptibility to slope failure under seismic loading; while the flatter portions making up the majority of the alignment exhibit very low susceptibility. Implementation of Mitigation Measure GEO-1 as listed above will avoid impacts or reduce them to less than significant levels.

**iv) Landslides?**

**Less Than Significant Impact.** The majority of the pipeline route travels along existing roadways. A small section of the pipeline near the site of the proposed water tank includes densely vegetated slopes. However, these slopes do not exhibit a high landslide risk from either water storage tank placement or pipeline construction. The pipeline will be constructed within the Sharp Park Archery Range access road that crosses over to the north side of Sanchez Creek and will proceed uphill to the site for the recycled wastewater storage tank on an upper terrace beneath a Monterey pine stand. The slopes below the road where construction will occur are densely vegetated (90-100% cover) with shrubs and small trees. The depth of pipeline alignment excavation is not expected to cause significant effects to any toe-slope or other geomorphic feature that could raise the potential for landslide processes anywhere along the pipeline construction corridor. Implementation of Mitigation Measure GEO-1 will determine if any special engineering practices are required to assure stability of the water tank.

**b) Result in substantial soil erosion or the loss of topsoil?**

**Less Than Significant Impact.** The majority of the project site exhibits evidence of prior ground disturbance, which is likely associated with the grading operations for the highway, road construction and weed abatement practices. The majority of the project site consists of roadsides and roadways in relatively flat areas that do not have a high susceptibility to erosive processes. Most of the runoff generated from the site flows toward the adjacent perennial drainages or enters into stormwater systems. With the presence of adjacent perennial drainages and wetlands, erosion control during project construction will be essential. Implementation of the Hydrology BMPs listed in Chapter II, Project Description, Section D, Mitigation Incorporated into the Project will ensure that effects from runoff into perennial drainages (Sanchez Creek) not exceed standards of significance.

The water tank site is the only area subject to any sizable amount of grading. In addition to implementation of BMPs as mentioned above, Mitigation Measure Bio-2a-2 will ensure that significant levels of sediment not be transported into Sanchez Creek at the water tank site. The other areas to be served with recycled water in Phase 1 will have pipeline alignments along existing city streets.

**c) Be located on strata or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?**

**Less Than Significant Impact with Mitigation Incorporation.** According to the Geotechnical Engineering and Geologic Hazards Study prepared for the 1994 Wastewater Treatment Plan EIR, no significant deposits of loose, cohesionless soils exist beneath the pump station site. No such study has been prepared for the water tank site. Because no geotechnical study has been prepared for the water tank site, potential impacts relating to soil instability could occur. Implementation of Mitigation Measure GEO-1 as listed above will avoid impacts or reduce them to less than significant levels.

**d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property?**

**Less Than Significant Impact with Mitigation Incorporation.** It is unclear at this time whether the water tank site or any portion of the pipeline alignment will be located on expansive soil. Therefore, application of Measure GEO-1, above, shall apply. Implementation of this mitigation measure will ensure that the water tank and pipeline alignment will not be adversely affected by being located on expansive soil, and that no significant impacts will occur.

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

**No Impact.** The proposed project does not propose the use or construction of an on-site wastewater treatment facility, such as septic tanks or alternative wastewater disposal systems.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>VII. HAZARDS AND HAZARDOUS MATERIALS</b> - Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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intermixed with wildlands?

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## Regulatory Definition

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. Chemical and physical properties such as toxicity, ignitability, corrosivity, and reactivity, cause a substance to be considered hazardous. These properties are defined in the California Code of Regulations (CCR), Title 22, Sections 66261.20-66261.24. A “hazardous waste” is any hazardous material that is discarded, abandoned, or to be recycled. The criteria that render a material hazardous also make a waste hazardous (California Health and Safety Code, Section 25117).

According to this definition, fuels, motor oil, and lubricants in use at a typical construction site and lead built up along roadways could be considered hazardous. Excavation may expose buried hazardous materials resulting from prior use of the proposed site or adjacent property.

## Discussion:

*Would the project:*

### **a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

**Less than significant impact.** The project will not result in the transportation of hazardous materials.

To document and alleviate possible concerns about the use of recycled water for irrigating the public facilities in this project, a literature search on the use of recycled water and health hazards was prepared. The findings all point to the same conclusion: the tertiary treated (recycled) water is not a hazardous material and thus does not pose a health and safety hazard to children, adults, and/or the environment.

The following is a summary of that literature search:

#### **1. The California Department of Health Services (DHS)**

The California Department of Health Services (DHS) regulates the health aspects of potential public contact with sewage effluent. Reclaimed water is regulated in accordance with the requirements of the Regional Water Quality Control Board (RWQCB) and with the Wastewater Reclamation Criteria (Title 22, Division 4, and Section 60301 through 60355) of the California Administrative Code. The purpose is to prevent direct ingestion of reclaimed wastewater by the public or the contamination of a public water supply.

Water used in the proposed recycled water project will comply with the most stringent water quality limitations for effluent listed in Title 22, those associated with nonrestricted recreational impoundments. Jeff Stone of the Recycled Water Unit of the DHS states in a memorandum to Toby Roy and Brian Bernados of the San Diego District (Appendix D) “Currently allowed uses of recycled water under the restricted use category include (but are not

limited to) body contact recreation, irrigation of food crops and irrigation of parks, playgrounds and schoolyards. The Department considers a properly filtered and disinfected water meeting the tertiary 2.2 requirements to be essentially pathogen free.

The *Treatment Technology Report for Recycled Water* (DHS, 2003) (<http://www.dhs.ca.gov/ps/ddwem/publications/waterrecycling/treatmenttechnology.pdf>), provides general guidance that is consistent with the Water Recycling Criteria and serves as the basis for DHS review and acceptance of treatment technologies for compliance with the filtration and disinfection requirements of the Criteria. As noted by Asano et al <sup>(1)</sup>, "To achieve efficient virus removal or inactivation in tertiary treatment, two major criteria must be met: 1) the effluent must be low in suspended solids and turbidity prior to disinfection to prevent shielding of viruses and chlorine demand, and 2) sufficient disinfectant must be applied to the wastewater."

The same standards would apply if the water were to be used for the irrigation of parks, playgrounds, schoolyards or other areas where the public has similar access to the grounds, under Section 60313 (b) of Title 22.

## 2. Summary of Issues of other Recycled Water Projects in California

Our literature search included analysis of the *Addendum to the Mitigated Negative Declaration for the Redwood City Recycled Water Project*, prepared for the City of Redwood City (2003). According to this report, there is no data indicating that the proper use of recycled water for intended purposes has caused any illness or compromised human health in California.

This report listed two important pieces of data: 1) representative projects and their effects, and 2) analysis of the most common public health and safety concerns.

### a. Representative projects

The representative projects in this Addendum were selected because their location, climate type, land use, wastewater source, level of wastewater treatment, level of tertiary treatment, and recycled water uses are nearly identical to those proposed for Pacifica. The Addenda contains a table that summarizes the representative project compared and is listed in its entirety in Table III-1, below.

**Table III-1  
Comparison of Redwood City's Proposed Recycled Water Project to Representative Bay Area Recycled Water Projects**

Parameters	Marin Municipal Water District	South Bay Water Recycling/City of Santa Clara <sup>1</sup>	City of Sunnyvale	City of Palo Alto	SBSA Redwood City First-Step Project
Years in Operation	20	14	15	15	3
Community Population	175,000	1,060,000	132,000	59,000	80,000
Capacity (AF/yr & MGD)	2 MGD 870 AF/yr	10 MGD 6,000 AF/yr	8 MGD 2,170 AF/yr	4 MGD	0.25 MGD 73 AF/yr (3.9 MGD or 1,946 AF/yr proposed)
No. of Existing Customers	318	390	80	3	12 (120 proposed)
<b>Uses:</b>					

Schoolyard Irrigation	X	X	X		
Park/Golf Course Irrigation	X	X	X	X	X
Streetscape Irrigation	X	X	X		X
HOA Irrigation	X	X			Proposed
Landscape Impoundments	X	X	X	X	X
Car Washes/Laundries	X				
Industrial Uses & Cooling	X	X	Proposed		Proposed
Internal Plumbing/Toilets	X	X	X		Proposed
<b>Performance Criteria:</b>					
No. of Permit Violations	none	none	none	none	none
No. of Reported Illnesses	none	none	none	none	none
No. of Successful Lawsuits	none	none	none	none	none
No. of Disconnects	none	none	none	none	none
No. of Landscape Failures	none	none	none	none	none
Initial Public Concerns/Resistance?	Yes	Yes	Yes	Yes	Yes

### b. Analysis of the Most Common Public Health and Safety Concerns

There are four significant issues that cause the most public concern: 1) risk from pathogens; 2) presence of pharmaceuticals and endocrine disruptors in the recycled water; 3) presence of carcinogenic compounds in the recycled water; and 4) hazardous exposure to children. Each of these concerns is discussed below, in the following format:

- Identification of the issue, with the author
- Identification of Public Concern; and
- Findings

#### 1) Risk from Pathogens (James Crook, Ph.D., P.E.)

**Statement of the Issue:** Will use of recycled water for landscape irrigation project present a public health risk to the community from microbiological contaminants?

**Public Concern:** Recycled water used for landscape irrigation may contain pathogenic microorganisms that are harmful to humans.

**Findings:** Pathogens are present in untreated municipal wastewater but can be reduced to immeasurable levels by conventional wastewater treatment processes. There have been no documented cases of illness in California (or elsewhere in the U.S.) resulting from the use of recycled water to irrigate urban areas. Refer to Appendix C, *Addendum to the Mitigated Negative Declaration for the Redwood City Recycled Water Project*, for further details.

#### 2) Potential Presence of Pharmaceuticals and Endocrine Disruptors in Recycled Water (James Crook, PhD, P.E.)

**Statement of the Issue:** Do pharmaceuticals and endocrine disruptors present a health risk if recycled water is used for landscape irrigation?

**Public Concern:** Recycled water used for landscape irrigation may contain pharmaceutically active compounds and endocrine disruptors that could be harmful to humans.

**Findings:** Pharmaceuticals and endocrine disruptors in water have been shown to have adverse effects on aquatic animals. Human health effects associated with long term ingestion of these types of compounds, at the low concentrations potentially present in drinking water, have not been documented and are uncertain at this time. Contact with, or infrequent/inadvertent ingestion of tertiary treated recycled water containing low levels of pharmaceuticals and endocrine disruptors would appear to present substantially less risk than that associated with long term ingestion of drinking water containing similar levels of such substances. Refer to Appendix C for further details.

### 3) Potential Presence of Carcinogenic Compounds in Recycled Water (James Crook, Ph.D., P.E.)

**Statement of the Issue:** Do carcinogenic compounds present a health risk if recycled water is used for landscape irrigation in an urban area?

**Public Concern:** Recycled water used for landscape irrigation may contain carcinogenic compounds that are harmful to humans.

**Findings:** Several disinfection byproducts, such as the trihalomethanes, and other chemical contaminants are known to be carcinogenic upon long-term ingestion; however, a review of the literature provides no indication that they have been implicated as having any adverse effects resulting from nonpotable uses of recycled water, such as landscape irrigation. Most of these contaminants are present in tertiary treated wastewater at levels that are lower than maximum contaminant levels specified in drinking water standards. Fears of chronic health effects (associated with long term ingestion of water containing DBPs or other carcinogens) are unfounded for recycled water projects directed at nonpotable applications of the water, since there will be no long term ingestion of the recycled water. Refer to Appendix C for further details.

### 4. Exposure of Hazardous Risks to Children (James Crook, Ph.D., P.E.)

**Statement of the Issue:** Does the use of recycled water used for landscape irrigation present risks to children?

**Public Concern:** Recycled water used for landscape irrigation may contain microbial pathogens or chemical contaminants that are harmful to children.

**Findings:** The recycled water from the CCWRP wastewater treatment plant is subject to strict criteria to insure that it will not contain measurable levels of pathogenic microorganisms. Data from the CCWRP facility indicate that all requirements are consistently met. Children's activities that may result in contact with the recycled water are expected and the water quality criteria to be met take this into account. A review of the scientific literature did not provide any documentation of illness or disease to children (or adults) resulting from any recycled water landscape irrigation project in the U.S. Refer to Appendix C for further details.

No unusual hazardous materials are to be employed during trench excavation or assembly of the pipeline or storage tank. Fuels and lubricants used by equipment in the construction process are handled using BMPs to prevent soil and water contamination.

**b) Create a significant hazard to the public or the environmental through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?**

**Less than significant impact.** Neither the construction nor the operation of the recycled water project would create significant hazards to the public from the release of hazardous materials. As described in a) above, the tertiary treated water is not considered a hazardous substance and in fact is safe for aquatic organisms to live in. Although public swimming is not recommended in the treated wastewater, public contact with the water poses no health risk.

No unusual hazardous materials are to be employed during trench excavation or assembly of the pipeline or storage tank. Fuels and lubricants used by equipment in the construction process are handled using BMPs to prevent soil and water contamination.

**c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?**

**No impact.** The project will be serving recycled water to two schools: Oceana High School and Sharp Park Elementary School. However, as stated above, the project will not involve any hazardous materials, substances or waste.

**d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?**

**No Impact.** Neither the water tank site nor the pipeline alignment is located on a hazardous material site.

**e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?**

**No Impact.** There are no airports within two miles of the project site. The nearest public airport is San Francisco International Airport, approximately 5.25 miles to the east. The nearest private airport is Half Moon Bay Airport, approximately 6.5 miles to the south. This project would not have any impact on these airports and would not alter safety hazards for people associated with them.

**f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

**No Impact.** There are no private airports within the vicinity of the project site.

**g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

**No Impact.** The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

**h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?**

**No Impact.** This project will not result in increased wildfire threat and will not change

exposure to wildland fires.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>VIII. HYDROLOGY AND WATER QUALITY – Would the project:</b>				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion:**

The Sanchez Creek watershed comprises 844 acres (1.3 square miles). The upper watershed comprises moderate-to-steep slopes, and the lower watershed near the coast includes flatter floodplain terraces. The flatter portions make up about 29% of the total area, and have largely been developed as golf course, roads and residences. The upper portion remains undeveloped. The channel of Sanchez Creek drains the watershed, and flows for a distance of 1.7 miles from the drainage divide to the Horse Stable Pond near the ocean (Phil Williams Associates, 1992).

Flow in the watershed includes runoff from precipitation (about 27 - 30 inches per year) and a contribution of SFPUC water, which the City of San Francisco pumps to a storage facility in the upper watershed. This water then flows by gravity through a pipeline to another reservoir from which it serves both domestic drinking water, irrigation water for the Sharp Park Golf Course. Drinking water for the golf course clubhouse and rifle/archery range has been supplied by the NCCWD since 1999 (John Rayner, pers. comm.). A 10-inch water line currently supplies irrigation water to the golf course. Overflow from the golf course irrigation system is currently the only source of dry-season flow in the creek. Once the recycled water system is in operation, this existing 10-inch water line will be plugged. This will prevent a future break in the existing pipe from draining the irrigation pond.

Most of the Sanchez Creek watershed drains into either of the two lagoons comprising Laguna Salada or the Horse Stable Pond. The bottoms of the lagoons are at or slightly below sea level at elevation +1 foot to -about -2, and the water depth varies with location and season from about 3 feet to 7 feet.

*Would the project:*

**a) Violate any water quality standards or waste discharge requirements; or, f) Otherwise substantially degrade water quality?**

**Less Than Significant Impact.** Overall, there should be no adverse effects on water quality in Sanchez Creek system below the discharge point or in the Horse Stable Pond or Laguna Salada. BMPs are listed in Section II, Project Description that will ensure that construction-related water quality effects not exceed standards of significance.

Some of the treated water to be discharged into Sanchez Creek would flow to the Horse Stable Lagoon. Its effect would be to dilute the existing salinity in this lagoon, as it is adjacent to the Pacific Ocean. This effect would be beneficial to the red-legged frog populations and the San Francisco garter snake.

The only impacts of concern from the proposed discharge of tertiary effluent to Laguna Salada are the impacts of the water itself on endangered species habitat. Table WQ-2 in the 1994 Wastewater Facilities Plan EIR compared existing water quality in the lagoons and Horse Stable Pond to the water quality limits in the treated effluent, according to the proposed NPDES permit. Results indicate that organic carbon (BOD) is far higher in the lagoon and Horse Stable Pond than in the tertiary effluent; chloride, alkalinity and total dissolved solids are in a similar range between the effluent and the lagoon. The expected levels of metals are all expected to be lower in the effluent than were measured in the lagoons. Pesticide levels were not measured in the lagoons but there are not expected to be any appreciable levels of these substances in the effluent since there are no sources for these compounds in Pacifica's wastewater.

The effluent water quality should be better than existing lagoon water quality, with the exception of the additional nutrients (nitrogen and phosphorus) in the wastewater. Because the nitrogen in the wastewater would replace other sources of nitrogen already being used to fertilize the golf course, the nitrogen in the wastewater would not add incremental nitrogen to the lagoon system. Overall, the impacts of wastewater discharge should not produce adverse impacts to vegetation, wildlife or endangered species.

The Water District will have to obtain a waste discharge permit from the Regional Water Quality Control Board in order to discharge the wastewater into the Sanchez Creek watershed.

**b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local ground water table level (for example, the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?**

**Less Than Significant Impact.** Of the water applied to the golf course, the only portion, which will end up in the lagoons, is the portion, which percolates to the groundwater. The remainder will either be utilized by the plants metabolically or be returned to the atmosphere through evapotranspiration (see Table WQ-3 in the 1994 Wastewater Facilities Plan EIR). There will not be any runoff since the effluent will be applied only during the dry season when there is a water deficit, and no runoff. It is anticipated that the recycled water will provide all of the irrigation requirements at the golf course. However, the possibility exists that tees and greens may need to be irrigated with potable water from connections to the Water District's system. The total amount of water reaching the lagoon by percolation should be no different than at present where all of the irrigation requirements are provided using SFPUC water.

The levels of fertilizer now delivered to the fairways are lower than is customary for many golf courses and only about 25% of the recommended delivery rate for these products (S. Sweeney, pers. comm.). Based on the water quality measurements in Laguna Salada taken for the 1994 Wastewater Facilities Plan EIR, the nitrogen being placed on the golf course is not causing excessive levels of nitrate in the lagoons. The contribution of nitrate to the fairways from the tertiary effluent would be less than the amount of nitrogen being delivered at present (from fertilizer). Therefore, the nitrogen is unlikely to be leached into the groundwater and end up in the lagoons. Also working against leaching to groundwater is the fact that the soils of the golf course are heavy alluvial clays which filter and trap some of the excess nitrogen.

Neither organic forms of phosphate nor orthophosphate contaminates groundwater, and orthophosphate is readily adsorbed by surface soils. Although the levels of phosphate applied with the tertiary effluent will be up to 5 times the levels currently applied to the fairways, the phosphate should not result in adverse biostimulation of the lagoons.

**c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which**

**would result in substantial erosion or siltation on- or off-site?**

**No Impact.** The project will not alter existing drainage patterns such that substantial erosion or siltation would occur on or off-site. The recycled water will be piped from the Calera Creek Water Recycling Plant outfall to a water tank and will be discharged into a piped irrigation system. The BMPs employed during the construction phase of the project will ensure that excavation for construction will not cause substantial offsite siltation. These BMPs are listed in the Hydrology subsection of Chapter II, Project Description, under Section D, Mitigation Incorporated into the Project.

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

**No impact.** There would be no pumping of treated water into the Sanchez Creek system in the winter so there would be no effect on flooding.

**e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?**

**Less Than Significant Impact.** The recycled water will be piped from the Calera Creek Water Recycling Plant through a series of pipelines to the site of the irrigation lands. Since the water can be turned on and off at various places, including its source and at the water tank, and since irrigation water is to be supplied during the dry season, no recycled water will be entering storm water facilities during time when the storm water system is running at capacity. Only excess irrigation water would enter storm water facilities and only when irrigation water is actively being used (i.e. during the dry season, and not during times when rainfall events are common).

**f) Otherwise substantially degrade water quality? See discussion with a) above.**

**g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?**

**No Impact.** The project is not a housing project.

**h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?**

**No Impact.** The proposed project would not place housing or structures that would impede or redirect flood flows within a 100-year flood hazard area.

**i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?**

**No Impact.** There are no levees or dams proposed.

**j) Expose people or structures to inundation by seiche, tsunami, or mudflow?**

**No Impact.** The proposed project will not result in construction of permanent habitable structures or development and will not place housing or expose people or structures to flood

hazards.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>IX. LAND USE AND PLANNING –</b>				
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Existing Setting**

As shown in Figure II-3, the proposed pipeline project originates at the pump station at the existing wastewater treatment plant, then turns north to travel along the western side of Highway 1 until turning east at the Sharp Park Golf Course tunnel under Highway 1 to go to the water tank site. Recycled water is stored in this tank until needed at the following sites under Phase 1: Sharp Park Golf Course, Oceana High School, Highway 1 landscaping, Fairway Park, and the Sharp Park Promenade. The approximately 17,000 lineal feet of pipeline traverse diverse City of Pacifica General Plan Districts and Zoning Designations. In addition, Highway 1 is the eastern jurisdictional boundary of the California Coastal Commission, and as such, the City’s Local Coastal Plan Zoning overlay and policies also apply in all project areas west of Highway 1.

Other relevant Plans and Policies include those of the US Army Corps of Engineers (USACE), for project jurisdictional wetlands; the US Fish and Wildlife Service for Federally Listed Sensitive Species; the California Coastal Commission policies, for application of a Coastal Development Permit for the pipeline from the pump station and the California Department of Fish and Game for State Listed Sensitive Species. An overview of each jurisdiction is in this section, for relevant policies related to jurisdictional wetlands, please refer to the Hydrology subsection of this Chapter; for Sensitive Species issues, please refer to the Biology subsection of this Chapter.

City of Pacifica General Plan and Local Coastal Program

The City of Pacifica guides long-range land use planning decisions through the establishment of goals and policies contained in the City General Plan (Updated October 1997). The General Plan Land Use Element divides the City into Inland Areas and Coastal Neighborhoods; the latter being also subject to the City’s Local Coastal Land Use Plan. These two general areas are, in turn, divided into 8 inland neighborhoods and 6 coastal neighborhoods. The Coastal Zone extends from the eastern edge of Highway 1 to the Pacific

Ocean, and the project site is located within this Coastal Zone, in the Fairmont West neighborhood (page 51, Pacifica General Plan, Updated 1997).

The wastewater treatment plant and pump station and all areas to the west of Highway 1 north to Clarendon Avenue are located in the Sharp Park Golf Course-West Fairway Park-Mori Point-Rockaway Beach District. The Sharp Park School site is located in the West Sharp Park District. Both of these Districts are on the west side of Highway 1 and as such are within the Coastal Zone.

The pipeline areas that continue east from the pump station and Highway 1 alignment travel through Sharp Park to the water tank site; all of this area is within the East Fairway Park-Valleamar-Rockaway District. Oceana High School is within the East Sharp Park District. Proposed Highway 1 landscaping is within both the East Fairway Park-Valleamar-Rockaway District and the East Sharp Park District.

#### California Coastal Commission

The California Coastal Act of 1976 (Act) requires protection of land and water resources and avoidance of impacts resulting from landform alteration. The Act imposes restrictions on any development in Environmentally Sensitive Habitat Areas, such as wetlands. The Act requires any person proposing to undertake development in the Coastal Zone to obtain a Coastal Development Permit. The Coastal Commission retains permit jurisdiction over any portion of a project that is in state waters, on land up to the mean high tide line, or on lands subject to the public trust. If development is proposed within these areas, a Commission permit is required. Additionally, a proposed project may be appealable to the Commission under the appeal provisions of Coastal Act Section 30603.

Because the wastewater recycling plant, pump station and pipeline from the pump station and pipelines to the Sharp Park Beach Boulevard Promenade and the Sharp Park Elementary School are in the Coastal Zone, the project will need to obtain a Coastal Development Permit from the City of Pacifica.

#### San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay RWQCB has jurisdiction over the City of Pacifica. The mission of the Regional Water Quality Control Boards (RWQCBs) is to develop and enforce water quality objectives and implementation plans that will best protect the beneficial uses of the State's waters, recognizing local differences in climate, topography, geology and hydrology. Regional Boards develop "basin plans" for their hydrologic areas, issue waste discharge requirements, take enforcement action against violators, and monitor water quality. RWQCBs also review and issue, waive, or deny Section 401 Water Quality Certification for projects requiring Corps Section 404 permits for fill of wetlands and other Waters of the U.S. Section 401 refers to the section of the Clean Water Act that gives states the authority to certify that a proposed activity is in conformance with state water quality standards. Requirements of the respective RWQCBs would govern any wetlands disturbance or grading related to the proposed wastewater recycling project.

### California Department of Fish and Game (CDFG)

The mission of CDFG is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend for their ecological values and for their use and enjoyment by the public. Provisions of the California Endangered Species Act (CESA) protect state-listed threatened and endangered species. The Fish and Game Commission is charged with establishing a list of endangered and threatened species. CDFG regulates activities that may result in "take" of individuals (i.e., "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of "take" under the California Fish and Game Code, but CDFG has interpreted "take" to include the killing of a member of a species which is the proximate result of habitat modification. Implementation of Mitigation Measure Bio-1c1 should ensure that the endangered species issues (California Red-legged Frog and San Francisco Garter Snake) are addressed.

Activities that result in the diversion or obstruction of the natural flow of a stream, or substantially change its bed, channel, or bank, or utilize any materials (including vegetation) from the streambed require that the project applicant enter into a Streambed Alteration Agreement with CDFG, under section 1600-1603 of the California Fish and Game Code. The CDFG potentially extends the definition of stream to include intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams mapped on USGS quads, and watercourses with subsurface flows. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. It is not expected that the proposed project will result in Streambed Alteration, thus no 1601 permit is necessary.

### U.S. Fish and Wildlife Service/National Marine Fisheries Service

The Federal Endangered Species Act (FESA) establishes a broad public and federal interest in identifying, protecting and providing for the recovery of threatened or endangered species. The Secretary of the Interior and the Secretary of Commerce are designated in the FESA as responsible for identifying endangered and threatened species and their critical habitat, carrying out programs for the conservation of these species, and rendering opinions regarding the impact of proposed federal actions on listed species. The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) are charged with implementing and enforcing the FESA. USFWS has authority over terrestrial and continental aquatic species, and NMFS has authority over species that spend all or part of their life cycle at sea, such as salmonids.

Section 9 of FESA prohibits the unlawful "take" of any listed fish or wildlife species. Take, as defined by FESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such action." The USFWS regulations define harm to mean "an act which actually kills or injures wildlife." Such an act "may include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR § 17.3). Take can be permitted under FESA under sections 7 and 10. Section 7 provides a process for take permits for federal projects or projects subject to a federal permit, and Section 10 provides a process for incidental take permits for projects without a federal nexus. The ESA does not extend the take prohibition to federally listed plants on private land, other than prohibiting the removal, damage or destruction of such species in violation of state law.

The USFWS also oversees the implementation of the Migratory Bird Treaty Act of 1918, which prohibits the destruction or possession of individual birds, eggs or nests without a

scientific collecting or special purpose permit from the Service. The USFWS is related to the project because of the potential impact of water flow reduction on California Red Legged Frog and San Francisco Garter Snake habitat. See discussion in Section III-4, Biological Resources.

#### U.S. Army Corps of Engineers (COE)

The Corps works to provide protection of the nation's aquatic environment through the regulation of activities in waters of the United States under the federal Rivers and Harbors Act and the Clean Water Act (Act). Section 10 of the Rivers and Harbors Act requires permits for any work or structures in navigable waters of the United States, including wetlands within or adjacent to these waters. Both dredging and filling are regulated activities under the Act. Navigable waters are defined as those waters that are subject to the ebb and flow of the tide, or that are presently, have been, or may be used for transport of interstate or foreign commerce.

The Clean Water Act is a broad statute with the goal of maintaining and restoring waters of the United States. Among many provisions for the control of water pollution, the Act also requires permits for filling of or discharge of dredged materials into waters of the United States. Section 404 of the Clean Water Act establishes a permit program for the discharge of fill or dredged material into waters of the United States. Waters of the United States include navigable waters, interstate waters, and all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries of any of these waters, and wetlands that meet these criteria or that are adjacent to any of these waters or their tributaries. The COE may be involved in this project, if the irrigation pond dewatering falls within their jurisdiction. Draining the irrigation pond should be considered in light of a potential violation(s) in that: 1) 33 CFR Part 328.3(4) discusses the "impoundment of waters otherwise defined as waters of the United States..." as part of the definition of waters of the U.S. 2) the Endangered Species Act may apply, 3) there are lacustrine fringe wetlands associated with the pond, and 4) how the pond is drained could result in a discharge to downstream waters (i.e. if the impoundment is breached/removed vs. drained by the intake pipe at the pond center). Consultation with the COE is recommended as a mitigation measure under Mitigation Measure Bio-2c.

#### **Discussion:**

*Would the project:*

#### **a) Physically divide an established community?**

**No Impact.** The project does not have any components or characteristics (such as a highway) that would physically divide an established community. The recycled water distribution system will mostly be installed within existing underground facilities. The new underground pipeline segment to be constructed to the new water tank at the San Francisco Archery Range/Sharp Park Golf Course is totally contained within existing open space lands. The water tank will be constructed on the site which currently supports an existing underground storage tank. The tank will not be visible to the surrounding community, only the patrons of the archery range and golf course.

**b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?**

**Less than Significant Impact.**City of Pacifica General Plan and Local Coastal Plan

The City does not have General Plan or Coastal Act policies which directly address the proposed project of recycled water pipeline and water tank installation and use of recycled water in public landscaping projects, including Sharp Park Golf Course. One of the Local Coastal Plan policies addresses the protection of biological and coastal resources that is related to the wetlands at Calera Creek (within the City's Local Coastal Plan jurisdiction)(LCP Policy 12, see also Section III-4, Biology, above), and one of the Community Design Element Policies addresses the City's scenic and visual amenities, which include Highway 1, a State-designated Scenic Highway. These policies and conformance of the proposed project are discussed below.

**LCP Policy 12**

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of wastewater discharge and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging wastewater reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

**Conformance:** The project pipeline may affect wetlands meeting LCP criteria at Calera Creek below the Wastewater Treatment Plant. Implementation of Mitigation Measures BIO-1c1 and BIO-1c2 will reduce impacts to biological productivity of potentially affected wetlands and at Calera Creek to less than significant levels.

**Community Design Element Policy 3**

Protect the City's irreplaceable scenic and visual amenities.

**Conformance:** The project pipeline that will traverse Highway 1 will be completely undergrounded. Thus, the project pipeline is in conformance with this policy.

As stated in Section III-1, Aesthetics, above, the remainder of the pipeline will also be undergrounded and the construction phase of water tank will not be seen by any sensitive receptors.

City of Pacifica Zoning Codes

**Conformance:** Public facilities like pipelines are permitted in each district that the pipeline traverses. The project pipeline alignment and water tank site will require a building permit and a Conditional Use Permit for the pipeline and water tank in Sharp Park pursuant to Section 9-4.2101 (b)(3). The project pipeline from the pump station to the 20 inch abandoned force main sleeve will require a Coastal Development Permit from the Coastal Commission.

**c) Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan?**

**No Impact.** See discussion in the Biology subsection of this Chapter.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>X. MINERAL RESOURCES --</b> Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion:**

*Would the project result in:*

- a) **Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?**

**No Impact.** Since the project involves the installation of a water-transmission pipeline, booster pumps and a storage tank, no known mineral resources will be mined or used in any phase of this project. Therefore there would be no loss of availability of a known mineral resource. The pipeline route is in engineered fill and does not go through any known mineral resources that could be disrupted. There are no important mineral resources at the storage tank site.

- b) **Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?**

**No Impact.** In 1987, the State of California’s Mining and Geology Board identified Pacifica Quarry and Mori Point in Pacifica as “construction aggregate resource areas of regional significance” due to their potential to produce mineral aggregate materials, and the City of Pacifica’s General Plan acknowledges the Board’s designation of these sites.

However, neither of the sites supports active mineral extraction activities and the proposed pipeline project will not directly impact these locations, so the project would not result in the loss of availability of any locally important mineral resource recovery sites.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>XI. NOISE</b> -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Environmental Setting**

The City of Pacifica is characterized as relatively quiet, with the major noise sources along the pipeline route being the vehicles that traverse Highway 1. The water tank location is located in a small wooded valley and thus the only loud ambient noise source is from overflights from San Francisco International Airport. The ridgelines directly above the tank site are part of the Sharp Park; no sensitive receptors are located on these ridges.

**Regulatory Environment**

The City of Pacifica has adopted standards for evaluating the compatibility of new land uses with the existing on-site noise environment. According to the 1997 General Plan, 60 dB CNEL defines Noise Impact Areas. The noise standards are the basis for the development of land use compatibility guidelines.

If the noise level of a project falls within “Normally Acceptable” or “Conditionally Acceptable” the project is considered compatible with the noise environment. “Normally Acceptable” implies that no mitigation will be needed. “Conditionally Acceptable” implies that minor soundproofing of the structure (as appropriate) may be needed to meet the City noise

standards. If the noise level of a project falls within “Normally Unacceptable,” substantial noise mitigation will be necessary to meet the noise standards. If the noise levels fall within “Clearly Unacceptable,” the project is considered clearly incompatible with the noise environment and should not be approved. The City compatibility standards can serve as criteria for measuring project impact if the noise produced by the project would raise a surrounding area above an acceptable CNEL.

**a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?**

**Less Than Significant Impact.** The project would not expose people in the community to permanently excessive noise levels. Residents that live near the pipeline project site will be subjected to construction noise for a period of up to one month. Most of the noise will be generated by heavy machinery (a backhoe) that will be used in the construction process. The machinery will have the standard noise muffling devices and construction will be limited to weekdays (M-F) from 8:00 a.m. to 6:00 pm in areas near residences.

**b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?**

**No Impact.** The water transmission lines, pumps at the Water Recycling Plant, or water tank at Sharp Park will not be a source of ground borne vibration or ground borne noise levels. None of the construction activities will use equipment that will generate excessive ground borne vibration or noise levels.

**c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? or**

**d. A substantial temporary or periodic increase in ambient noise levels in the project above levels existing without the project?**

**No Impact.** See Response “a,” above.

**e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?**

**No Impact.** The proposed project is not within the area of any Airport Land Use Plan. The site is approximately five miles west of San Francisco International Airport and 7 miles north of Half Moon Bay Airport. The project site is not significantly affected by noise from aircraft over flights.

**f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?**

**No Impact.** The proposed project is not within the vicinity of a private airstrip. Table III-1 shows typical noise levels of construction equipment at a distance of 25 feet. As is shown from the typical noise levels, no individual piece of equipment is expected to exceed 110 dBA at a distance of 25 feet.

Table III-1. Typical Noise Levels of Construction Equipment

<b>Equipment</b>	<b>Noise Levels at 25 Feet (dB)</b>
Backhoes/Grade-all	78-99
Loaders	78-90
Dump Trucks	89-100
Cement Trucks	89-100
Chain Saws	90-100
Pavement Breakers	82-92
Jackhammers	88-103
Pile Drivers	100-110
Pumps*	75-77
Generators*	77-89

Source: Santa Clara Valley Water District, Matadero/Barron Creeks Remediation Project, Screen Check DEIR, August 2001.

\*Source: USEPA, 1971, 50 foot estimates (dB) + 6 dB for distance halving.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>XII. POPULATION AND HOUSING –</b>				
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion:**

*Would the project:*

**a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?**

**No Impact.** The proposed project, which consists of installing a water-transmission pipeline, booster pumps and a storage tank, involves short-term construction work. The project does not include any new residential or commercial development that would result in substantial population growth. The renovation and extension of the existing pipeline infrastructure would provide irrigation water to existing facilities and would not induce new development.

**b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?**

**No Impact.** The trenching activities associated with the proposed project are temporary and will not displace existing housing or necessitate the construction of replacement housing. The permanent pipeline and storage tank will not displace any housing.

**c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

**No Impact.** The project will be built in an existing public rights-of-way and on public land, and will not displace any people.

<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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**XIII. PUBLIC SERVICES --**

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i)	Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii)	Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii)	Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv)	Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
v)	Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion:**

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or need for new or physical altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

**i) Fire protection;**

**No Impact:** The proposed project would not require the provision or alteration of any facilities or the need for new facilities. The specific street routing of the pipeline and its underground placement are not expected to have any impact on service ratios, response times or other performance objectives, nor would the project increase the need for fire protection. There is nothing about the project that would produce an incremental fire hazard. Therefore there would be no impact on City of Pacifica fire protection services.

During construction, it is possible that the proposed project might temporary adversely affect fire department response times to a fire or other emergency by an unknown factor, but it is not considered to be significant, because of the temporary nature of the construction activities. Construction hours will be 8-5, Monday thru Friday, and will not occur on weekends. Because of the nature of the project, the pipeline installation in City streets will proceed fairly

quickly, and it is estimated that the construction duration at any one location will be less than 1 week.

**ii) Police protection;**

**Less Than Significant Impact:** The City of Pacifica's police department recently relocated to a new facility, so the proposed project would not require the provision or alteration of any facilities or the need for new facilities. In responding to service and emergency calls, the police department frequently must accommodate street closures or re-routings due to street repair or construction. It is possible that the proposed project might temporarily adversely affect police response times by an unknown factor, but it is not considered to be significant, because of the temporary nature of the construction activities. Construction hours will be 8-5, Monday thru Friday, and will not occur on weekends. Because of the nature of the project, the pipeline installation in City streets will proceed fairly quickly, and it is estimated that the construction duration at any one location will be less than 1 week.

**iii) Schools;**

**No Impact.** The proposed project does not include the construction of any new housing units and will not result in any increase in Pacifica's population or increased numbers of students served by local schools. The project would therefore have no impact on City of Pacifica schools.

**iv) Parks;**

**No Impact:** The proposed project would not require the provision or alteration of any recreational facilities or the need for new facilities. The project will not cause an increase in population, or result in a decrease in existing recreational opportunities. Therefore, the project will have no impact on City of Pacifica Parks.

**v) Other public facilities?**

**No Impact.** No other public facilities would be adversely affected by the proposed project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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**XIV. RECREATION --**

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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**Discussion:**

*Would the project:*

**a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

**No Impact.** The project will not cause an increase in population or in the use of existing neighborhood or regional parks or recreational facilities, nor result in substantial physical deterioration to any recreational facilities. Therefore, the project will have no impact on these recreational resources.

**b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?**

**No Impact.** The project does not propose the construction or expansion of any recreational facilities. As a result, there will be no adverse physical effect on the environment resulting from the alteration or creation of any new or existing facilities.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>XV. TRANSPORTATION/TRAFFIC --</b>				
Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Discussion:**

*Would the project:*

**a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (for example, result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections); or,**

**b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?**

**Less than Significant Impact.** The project is a public works project and will not increase or decrease traffic or otherwise affect vehicle trips. There may be a short-term local impact on traffic during construction if construction of a segment of new pipeline requires traffic controls. In such a case, a traffic management plan would be prepared by the contractor hired to install the pipe. There would be no impact on Highway 1 during construction, so the current LOS D would not be exceeded.

**c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location, that results in substantial safety risks?**

**Less Than Significant Impact.** The proposed project will result in minor traffic increases associated with workers traveling to and from the worksite over the duration of construction period as well as construction related trucks going to and from sites. The primary construction areas include the San Francisco Archery Range where the new water tank will be constructed, and the local roadways where a pipeline will be installed from the existing pipeline near the Sharp Park Golf Course to Sharp Park Elementary and Oceana High School and the Calera WRP where the pump station will be constructed. These are not congested areas that would be impacted by the small number of construction workers and vehicles involved in the construction project.

The project will result in limited increases in traffic on vicinity roads for the 3 to 5 month construction period. A traffic management plan will be prepared by the construction contractor to deal with possible traffic reroutes during construction.

Given the temporary and short-term duration of the activities, increased traffic is not considered significant. The project does not require any changes to roadway design nor will it permanently generate increased vehicle trips or traffic congestion. The project will conform to all City of Pacifica codes and regulations governing working in the City's roadways.

**d) Substantially increase hazards due to a design feature (for example, sharp curves or dangerous intersections) or incompatible uses (for example, farm equipment)?**

**No Impact.** The pipeline will be installed adjacent to the state highway and will not directly impact the highway right of way itself. No permanent incompatible uses will be added to the area.

**e) Result in inadequate emergency access?**

**No Impact.** The project will not result in inadequate emergency access. The project when completed will be completely underground, except for the water tank which is situated in a remote location.

**f) Result in inadequate parking capacity; or,**

**g) Conflict with adopted policies, plans, or programs supporting alternative transportation (for example, bus turnouts, bicycle racks)?**

**Less than Significant Impact.** The project will not conflict with adopted alternative transportation plans. If construction work to install the pipeline happens to block a bus turnout or bike lane, the traffic management plan prepared by the construction contractor will assure that an alternative turnout/bike route is provided during the construction period.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>XVI. UTILITIES AND SERVICE SYSTEMS</b> – Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Discussion:**

*Would the project:*

**a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;**

**No Impact.** The proposed project, consisting of the installation of a water-transmission pipeline, booster pumps and a storage tank, involves short-term construction work. The project

uses treated wastewater, and does not generate any additional wastewater that requires a treatment facility.

**b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;**

**No Impact.** The project does not require or result in the construction or expansion of new or existing water supply or wastewater treatment facilities.

**c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;**

**No Impact.** The project does not require or result in the construction of new storm water drainage facilities or the expansion of current facilities.

**d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;**

**No Impact.** Water resources are not affected by the proposed project. Since the project will replace an irrigation system currently using potable water supplies with a new pipeline network utilizing non-potable water, the availability of fresh-water supplies in the service area, such as SFPUC water, will be effectively increased.

**e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's demand in addition to the provider's existing commitments?**

**No Impact.** The capacity of the local wastewater treatment plant serving Pacifica is not affected by the proposed project.

**f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs; or,**

**No Impact.** Minimal solid waste will be generated by the construction phase of the proposed project. The completed project will not generate solid waste. The project will not affect the capacity of the landfill that serves the City of Pacifica.

**g) Comply with federal, state, and local statutes and regulations related to solid waste?**

**No Impact.** There is minimal solid waste generated by the proposed project. The project is not affected by federal, state and local regulations related to solid waste.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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**XVII. MANDATORY FINDINGS OF SIGNIFICANCE --**

<p>a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Discussion:**

**a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?**

**Less Than Significant Impact with Mitigation Incorporation.** See Biology section above for a discussion of biological impacts of the project, including those on special status species. Implementation of the mitigation measures listed in this section will avoid or reduce impacts to less than significant levels.

**b) Have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects.)**

**Less Than Significant Impact.** The project is not related to any other proposed or foreseeable future projects that would have a cumulatively significant impact. The project and its impacts were foreseen as long ago as the time the EIR was prepared for the wastewater treatment plant itself. These impacts were evaluated and found to be mitigated to a less-than-significant level. In addition, the project has a net public benefit and is part of the long-term objective in the State of California to reuse wastewater and reduce the demand for potable water for purposes that can satisfactorily be served by recycled wastewater.

**c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?**

**Less Than Significant Impact.** As evaluated in this Initial Study, the proposed project would either have no impact or less-than-significant impacts on human beings, either directly or indirectly. Short-term construction-related impacts will be minimized or avoided with implementation of the Mitigation Measures incorporated into the Project (Section IID) and the Mitigation Measures that will be applied as a result of this project (as contained in this Section)

**DETERMINATION:**

On the basis of this initial evaluation:

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

\_\_\_\_\_  
George Kanakaris, General Manager  
North Coast County Water District

\_\_\_\_\_  
Date

## IV. CEQA Plus Issues

This section contains the “CEQA Plus” components (Tables IV-1 and IV-2) addressing the issues presented in the State Revolving Fund (SRF) Outline. The following text is from the Environmental Documentation Outline, as listed on the State Water Resources Control Board (SWRCB) website (<http://www/swrcb.ca.gov/funding/docs/envguide.doc>).

“The Outline details the steps that must be taken by applicants to comply with the environmental review requirements for the State Revolving Fund (SRF) Loan Program administered by the SWRCB, Division of Clean Water Programs (Division). Generally, the process set forth here is accomplished through compliance with the California Environmental Quality Act (CEQA). In addition, the SRF Loan Program is partially funded by the U.S. Environmental Protection Agency (EPA) and is therefore subject to federal environmental regulations. To comply with applicable federal statutes and authorities, the EPA established specific “CEQA-Plus” requirements in the Operating Agreement with the SWRCB for administering the SRF Loan Program. These requirements are clearly emphasized in these guidelines and apply to projects receiving SRF assistance.”

“The guidelines presented here are intended to supplement the CEQA Guidelines with specific requirements for environmental documents which will be acceptable to the SWRCB when reviewing applications for wastewater treatment facility loans; they are not intended to supersede or replace the CEQA Guidelines.”

“For SWRCB funded projects, the applicant is usually the "Lead Agency" as defined under CEQA and will be responsible for the preparation, circulation and consideration of the environmental document prior to approving the project. The SWRCB and other agencies having jurisdiction over the proposed project are "responsible agencies" under CEQA and are accountable for reviewing and considering the information in the environmental document prior to approving any portion of the project.”

As further stated in these guidelines “The applicant may use a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report (EIR) to comply with CEQA documentation requirements. The applicant may use a previously prepared document accompanied by a checklist used to determine if the project is adequately covered by the document.” Therefore, the following tables offer pertinent SRF information in “checklist” form.

**Table IV-1**  
**Checklist for Environmental Documentation**  
**Submitted to the Environmental Services Unit**  
**of the State Water Resources Control Board (SWRCB)**

<b>Item Number</b>	<b>Description</b>	<b>Comments</b>
1.	Eight copies of the CEQA document for review and federal consultation	Eight copies of this CEQA document will be sent to the SWRCB directly.
2.	Any biological reports or documents incorporated by reference	See Appendices in document.
3.	A copy of the Notice of Completion that was circulated to the State Clearinghouse	This NOC will be included in the submittal.
4.	A copy of the Notice of Intent for the Negative Declaration	This NOI will be included in the submittal.
5.	Three copies of any cultural resources technical studies completed for the CEQA document	Three copies of Appendix B, Cultural Resources Data will be included in the submittal.
6.	Two copies of the Adopted Mitigated Negative Declaration (MND)	Two copies of the Adopted MND will be included in this submittal.
7.	The Adopted Mitigation, Monitoring and Reporting Plan (MMRP)	A copy of the MMRP will be included in this submittal.
8.	Any comments received on the CEQA document and the applicant's responses (as applicable)	Comments and responses to the CEQA document will be included in this submittal.
9.	The Notice of Determination (NOD) filed with the Governor's Office of Planning and Research (OPR)	A copy of the NOD filed with the OPR will be included in this submittal.
10.	The Resolution adopting the Mitigated Negative Declaration	The Resolution adopting the MND will be included in this submittal.

**Table IV-2  
SRF Outline  
CEQA-Plus Requirements**

Subject	Requirements	Comments
<b>I. General Requirements</b>		
1. Species protected under the Federal Endangered Species Act (item #13a in the SRF Outline)	To comply with Section 7 of the Federal Endangered Species Act (FESA), the SRF projects will be reviewed during the facilities planning process to determine if the project may affect any federally listed species. The applicant will need to provide the SWRCB Environmental Services Unit (RSU) with any species lists, biological assessments and other documents that disclose information on the project's effect on sensitive species at the earliest date. The ESU will confer informally with the US Fish and Wildlife Service and/or the National Marine Fisheries Service as appropriate.	Please see Appendix A, Species List. This listing has both Federally-listed species and State-listed species. The Biological section of the IS/MND contains an Existing Setting section that discloses information on the project's effect on sensitive species and identifies mitigation measures that avoid impacts or reduce impacts to sensitive species to less than significant levels.
2. Cultural Resources (item # 13b in the SRF Outline)	<p>Applicants for SRF funds are required to demonstrate to the satisfaction of the SHPO that the project complies with Section 106 of the National Historic Preservation Act. The following items are required:</p> <ol style="list-style-type: none"> <li>1. Area of Potential Effects (APE). The project's APE includes all construction areas, borrow pits, haul roads, staging areas, etc., as well as the "built environment" in close proximity to the construction area, which may be subject to indirect effects. The APE is typically depicted on topographic maps and large-scale project plans, although aerial photographs are sometimes an effective "base map" alternative.</li> </ol> <p>The Division's CRO will consult with the SHPO to determine which of the following items are needed to ensure compliance with Section 106:</p> <ol style="list-style-type: none"> <li>1. A 7.5' USGS topographical map section with the APE clearly delineated, as well as a request letter that describes the proposed undertaking. A records search "buffer zone" of 1/2 mile beyond the APE limits is usually sufficient for this purpose.</li> <li>2. The applicant's designated researcher should include copies of all materials received from the Information Center, as well as all correspondence, in the documentation submitted for review to the Division's CRO.</li> <li>3. The dates of construction of all elements of the built environment in and adjacent to the APE should be determined during pre-field research.</li> <li>4. Documentation of Native American consultation is required under Section 106.</li> </ol>	<p>The NCCWD will provide APE maps that show all "all construction areas, borrow pits, haul roads, staging areas, etc., as well as the "built environment" in close proximity to the construction area, which may be subject to indirect effects" and will be depicted on topographic maps and large-scale project plans.</p> <ol style="list-style-type: none"> <li>1, 2. Appendix B contains the Archaeological and Cultural Resources Report. A 7.5' USGS topographical map will be prepared for submission.</li> <li>3. The dates of construction of all elements of the built environment will be determined during the pre-field research.</li> <li>4. Native American consultation shall be initiated during this process.</li> </ol>

Subject	Requirements	Comments
	<p>This includes a letter from the applicant or their consultant to the Native American Heritage Commission (NAHC) requesting a review of its Sacred Lands Inventory files. Native American consultation should include discussion of any potential project impacts to archaeological sites or traditional cultural places known to the Native American representative or the project archaeologist.</p> <p>5. The applicant may need to submit documentation of a cultural resources field survey conducted by a qualified archaeologist throughout the APE. The survey report should conform to the outline provided in the California Office of Historic Preservation’s Preservation Planning Bulletin 4(a), December 1989. A copy of the APE map depicting “area surveyed” and the boundaries of all known cultural resources relative to the project’s impact area, should be included in the survey report.</p> <p>6. A Determination of Eligibility may be necessary for any cultural resource that cannot be avoided during project construction. Findings of Effect and mitigation proposals are necessary if a resource is determined to be NRHP-eligible and cannot be preserved through avoidance measures. The applicant’s SRF loan contract may include special provisions for protection of cultural resources in and adjacent to the APE.</p>	<p>5. The NCCWD will submit any and all field surveys as necessary. These field surveys would be performed by Mr. Miley Holman of Holman Associates.</p> <p>6. A Determination of Eligibility will be prepared as necessary.</p>
<p>3. Public Participation (item #14 in the SRF Outline)</p>	<p>Public participation and review are essential to the CEQA process (Section 15087). Each public agency should include wide public involvement, formal and informal, consistent with its existing activities and procedures, to receive and evaluate public reactions to environmental issues related to its project. Public comments or controversies that are not addressed during the planning of a proposed project could result in the need for a subsequent environmental document at a later stage or lead to legal challenges, thus delaying the project and raising the cost significantly</p>	<p>The CEQA process allows for the public process, and a 30-day review period will occur in late April to late May.</p>
<p><b>II. Environmental Setting</b></p>		
<p><b>A. Relationship of Project to Other Planning Documents</b>                      Include a discussion of all the following detailed elements as applicable; if an element is not present within the described area, give reasons or verify with investigative results. Consider all facilities; conveyance lines; storage, discharge, and disposal site(s); staging areas; affected service area; and water recycling reuse sites when applicable)</p>		
<p>1. Water quality control plans                      a) Basin Plan                      b) Watershed</p>	<p>Include beneficial uses of the receiving waters as given in the applicable Basin Plan.</p>	<p>The Project complies with the Basin Plan, Watershed Management Plan and Calera Creek Wastewater Treatment Plan.</p>

<u>Subject</u>	<u>Requirements</u>	<u>Comments</u>
Management Plan c) Area-Wide Wastewater Treatment Plan		
2. General Plan		The project's conformance to City of Pacifica General Plan elements is listed in Section
3. Regional Transportation Plan		The proposed project does not conflict with the San Mateo County Regional Transportation Plan, as it will result in the use of recycled water for irrigation of a golf course, parks, schoolyards and ballfields, and Hwy. 1 landscaping. No new temporary or permanent residents will be added in the area which would adversely affect regional transportation facilities in the area. The construction of the proposed project will not affect regional transportation facilities such as Hwy.1.
4. Regional Housing Allocation Plans		See above for a discussion regarding the generation of new residents in the area (none are expected).
5. Air Quality Management Plan		Since the project does not generate new permanent residents, and because the project is relatively small, no new air quality impacts are expected (see the Air Quality discussion in Section III of the Initial Study Checklist) Therefore, the proposed project will not adversely affect the Air Quality Management Plan.
6. Habitat Conservation Plans (HCPs)		There are no HCPs for the subject site.
7. Regional land use plans	The applicable Regional Land Use Plan is for the Coastal Zone.	Coastal Zone issues are discussed in Section III, of the Initial Study Checklist. The project is in conformance with all Local Coastal Plan policies.
<b>B. Topography of the Region</b>		
1. Location of project area with regard to major topographical features		See Section II, Project Description, of the Initial Study Checklist.
2. Elevations and slopes on project site (for grading and excavation activities)		The majority of the site is relatively flat, as shown in Figure II-7. The highest elevation at the water tank site is approximately 360 feet above mean sea level.

<u>Subject</u>	<u>Requirements</u>	<u>Comments</u>
<b>C. Land Use and Zoning</b>		
<ol style="list-style-type: none"> <li>1. At project site</li> <li>2. Adjacent to project site</li> <li>3. Along pipeline alignments</li> <li>4. At reclaimed water reuse sites</li> </ol>		Land Use and Zoning issues are discussed in Section III, of the Initial Study Checklist. The project is in conformance with all City of Pacifica General Plan policies and the City's Zoning Code.
<b>D. Geology of the Region</b>		
<ol style="list-style-type: none"> <li>1. Seismic hazards</li> <li>2. Unstable substrate</li> <li>3. Erosion potentials</li> <li>4. Information directly relating to a water quality problem (e.g., fractured bedrock)</li> </ol>		Geological issues are discussed in Section III, of the Initial Study Checklist. The project contains a discussion of all Geologic issues and contains a mitigation measure that will ensure that no geologic impacts exceeding Standards of Significance occur.
<b>E. Climate</b>		
<ol style="list-style-type: none"> <li>1. Annual precipitation</li> <li>2. Seasonal weather patterns</li> </ol>		Climatic situations are discussed in the Air Quality responses to the Initial Study Checklist (Section III).
<b>F. Air Quality for construction related impacts (also see No. 5 above)</b>		
<ol style="list-style-type: none"> <li>1. Air basin</li> <li>2. State and Federal attainment status for the following pollutants: <ol style="list-style-type: none"> <li>a) Ozone</li> <li>b) Nitrogen dioxide</li> <li>c) Sulfur dioxide</li> <li>d) Particulates</li> <li>e) Carbon monoxide</li> </ol> </li> <li>3. Status of local air quality plan</li> </ol>		Please see No. 5 above.
<b>G. Major Botanical Features (plant communities or associations) and Important Fish and Wildlife</b> (major species and economically or recreationally important species)		Major botanical features are discussed in the Biological subsection of Section III of the Initial Study Checklist. Table 1 of Appendix A contains the plant lists and plant communities that are found along the proposed pipeline corridor and project-affected areas. Table 2 of Appendix A contains the Threatened and Endangered Species that could be found along the proposed pipeline corridor and project-affected areas and lists the status of each.
<b>H. Threatened or Endangered Species (Listed, Proposed or Candidate)</b>		
<ol style="list-style-type: none"> <li>1. U.S. Fish and Wildlife</li> <li>2. National Marine Fisheries Service</li> <li>3. California Department of Fish and Game</li> <li>4. Private Organization Listings (e.g., California Native Plant Society)</li> </ol>		See above.

Subject	Requirements	Comments
<b>I. Critical Habitats listed by the U.S. Fish and Wildlife Service</b>		
1. Plant Community Type 2. Location 3. Size		See above.
<b>J. Wetlands delineated by Army Corps of Engineers</b>		
1. Type 2. Location 3. Size		None are affected by the proposed project.
<b>K. Designated Wild and Scenic Rivers (Include Map if Present)</b>		
1. Name 2. Location 3. Classification		None are affected by the proposed project.
<b>L. Water Resources</b>		
1. Surface water features a) Lakes b) Rivers c) Estuaries d) Ocean e) Lagoons, marshes and other water features 2. Groundwater resources a) Depth b) Water quality c) Basin description 3. Receiving water quality a) Qualitative description b) Quantitative analysis c) Comparison to effluent quality d) Beneficial uses 4. Water supplies for the service area a) List of water purveyors b) Percentage of supply from each source		1. See Project Description in Section II of the document.  2. See the Biology and Hydrology sections in Section III, Initial Study Checklist.  3. See the Biology and Hydrology sections in Section III, Initial Study Checklist.  4. The North Coast County Water District is the sole water supplier in Pacifica.
<b>M. Agricultural Land</b>		
1. Acres by type (e.g. prime, statewide significance, local significance) 2. Zoning 3. Present use		No agricultural lands will be affected by the proposed project.
<b>N. Cultural resources</b>		
1. Archaeological resources 2. Historic architecture, landscapes, features, structures or objects 3. Traditional cultural properties 4. Paleontological resources		See Section III, Initial Study Checklist and also Appendix B of this document.
<b>O. Coastal Zone Jurisdiction</b>		
		Coastal Zone issues are discussed in Section III, of the Initial Study Checklist. The project is in conformance with all Local Coastal Plan policies.
<b>P. Floodplain Delineated by the Federal Emergency Management Agency (FEMA) or Other Agency</b>		
		None of the areas of pipeline alignment or construction are within any floodplain defined by FEMA or any other agency.

Subject	Requirements	Comments
<b>III. Primary And Secondary Impacts</b>		
<b>A. Water Quantity</b>		
<ol style="list-style-type: none"> <li>1. Change in point of discharge</li> <li>2. Increase/ decrease in stream discharge</li> <li>3. Increase in water demands</li> </ol>	<p>These issues are discussed in both Sections II and III of the document.</p>	
<b>B. Water Quality</b>		
<ol style="list-style-type: none"> <li>1. Surface water               <ol style="list-style-type: none"> <li>a) Contamination from construction materials</li> <li>b) Siltation from construction related erosion</li> <li>c) Effluent discharge</li> <li>d) Storm runoff from site</li> <li>e) Reclaimed water runoff</li> </ol> </li> <li>2. Groundwater               <ol style="list-style-type: none"> <li>a) Percolation of effluent</li> <li>b) Construction dewatering</li> </ol> </li> </ol>	<p>1, 2. See the Biology and Hydrology sections in Section III, Initial Study Checklist.</p>	
<b>C. Air Quality</b>		
<ol style="list-style-type: none"> <li>1. Project construction emission estimates for non-attainment or maintenance pollutants</li> <li>2. Air basin emissions inventory for federal non-attainment or maintenance areas</li> <li>3. Construction dust</li> <li>4. Odors</li> </ol>	<p>1-4. These issues are discussed in Section III, Initial Study Checklist. No significant impacts are expected to occur.</p>	
<b>D. Geology</b>		
<ol style="list-style-type: none"> <li>1. Slope stability</li> <li>2. Seismic hazards</li> </ol>	<p>1, 2. These issues are discussed in Section III, Initial Study Checklist. No significant impacts are expected to occur.</p>	
<b>E. Soils</b>		
<ol style="list-style-type: none"> <li>1. Erosion</li> <li>2. Contamination</li> <li>3. Compaction</li> <li>4. Stability</li> </ol>	<p>1-4. These issues are discussed in Section III, Initial Study Checklist. Implementation of mitigation measure GEO-1 will ensure that no significant impacts occur.</p>	
<b>F. Vegetation</b>		
<ol style="list-style-type: none"> <li>1. Grading and excavation impacts</li> <li>2. Trampling</li> <li>3. Effluent impacts on aquatic and riparian vegetation</li> <li>4. Conflict with local policies and ordinances</li> </ol>	<p>1-4. These issues are discussed in Section III, Initial Study Checklist. Implementation of mitigation measures in the Biology subsection will ensure that no significant impacts occur.</p>	
<b>G. Fish and Wildlife</b>		
<ol style="list-style-type: none"> <li>1. Construction noise and interference</li> <li>2. Habitat loss</li> <li>3. Interference with movement/ migration</li> <li>4. Waterfowl attraction to open ponds</li> <li>5. Effluent impact on aquatic biota</li> <li>6. Conflict with local policies</li> </ol>	<p>1-6. These issues are discussed in Section III, Initial Study Checklist. Implementation of mitigation measures in the Biology subsection will ensure that no significant impacts occur.</p>	
<b>H. Aesthetics</b>		
<ol style="list-style-type: none"> <li>1. Temporary impacts from construction</li> <li>2. Visual disruption of new facilities</li> </ol>	<p>1-3. These issues are discussed in Section III. Initial Study Checklist. No</p>	

Subject	Requirements	Comments
3. Creation of a new source of light or glare		significant impacts are expected to occur.
<b>I. Noise</b>		
1. Construction 2. Operation		1, 2. These issues are discussed in Section III, Initial Study Checklist. No significant impacts are expected to occur.
<b>J. Recreation</b>		
1. Disruptions 2. Closures		1, 2. These issues are discussed in Section III, Initial Study Checklist. No significant impacts are expected to occur.
<b>K. Open Space</b>		
1. Loss of 2. Construction or operation related interference 3. Conflict with local policies		1-3. These issues are discussed in Section III, Initial Study Checklist. No significant impacts are expected to occur.
<b>L. Cultural Resources</b>		
1. Facilities construction impacts 2. Pipeline alignment excavation impacts 3. Erosion impacts 4. Inundation from ponds 5. Impacts from land application of effluent		1-5. These issues are discussed in Section III, Initial Study Checklist. Implementation of mitigation measure CUL-1 will ensure that no significant impacts occur.
<b>M. Threatened or Endangered Species</b>		
1. Incidental taking of a species 2. Potential for jeopardizing the viability of the population 3. Loss of habitat 4. Harassment 5. Interference with movement/migration 6. Disruption of reproductive activities		1-6. These issues are discussed in Section III, Initial Study Checklist. Implementation of mitigation measures in the Biology subsection will ensure that no significant impacts occur.
<b>N. Environmentally Sensitive Areas</b>		
1. Loss of environmentally significant agricultural land 2. Incompatible activities within the coastal zone 3. Removal, filling, hydraulic interruption, or other means of affecting wetlands as defined by Section 404 of the Clean Water Act 4. Impacts to sensitive natural communities identified by DFG or FWS 5. Impacts on wild & scenic rivers 6. Construction on floodplains that could impede floodwaters or expose structures to significant losses 7. Loss of critical habitats		1. No loss of any agricultural land will occur. 2. No activities are incompatible with the Local Coastal Plan. 3. No removal, filling, or other means of affecting wetlands pursuant to Section 404 of the Clean Water Act will occur. No Section 404 permit is needed. 4, 7. The Biological mitigation measures listed in Section III of the document will ensure that no significant impacts to sensitive natural communities or critical habitats occur. 5. No wild or scenic rivers will be affected by the proposed project. 6. No floodplains are affected; the project will not impede floodwaters or expose structures to significant losses.

Subject	Requirements	Comments
<b>O. Energy</b>		
<ol style="list-style-type: none"> <li>1. Use during construction</li> <li>2. Use during operation</li> </ol>		<p>Since this is not a large project, a moderate amount of gas and electricity will be used during the construction process. The amount of energy used will not exceed available supplies.</p>
<b>P. Transportation/Circulation</b>		
<ol style="list-style-type: none"> <li>1. Traffic interference during construction</li> <li>2. Traffic increases during construction and operation</li> <li>3. Parking interference during construction and operation</li> </ol>		<ol style="list-style-type: none"> <li>1, 2. All construction operations shall follow applicable City of Pacifica codes to ensure that traffic flow is not significantly impacted.</li> <li>3. Parking of construction vehicles will be at the staging areas at either the Calera Creek Wastewater Recycling Plant or at the staging area in the Sharp Park Archery Range. A minimum number of construction-related vehicles will be allowed at the construction sites. Neighbor parking may be disrupted for a few days; signs will be posted to notify residents so they can park in non-construction areas.</li> </ol>
<b>Q. Public Services</b>		
<ol style="list-style-type: none"> <li>1. Additional public services required for facilities operation</li> <li>2. Additional public services required for service area expansion</li> <li>3. Construction and operation interferences on public utilities</li> </ol>		<ol style="list-style-type: none"> <li>1. No additional public services should be needed for facilities operation, besides the pump station at the Calera Creek Wastewater Recycling Plant.</li> <li>2. No service area expansion is proposed.</li> <li>3. No construction and operation interferences on public utilities are expected to occur.</li> </ol>
<b>R. Public Health and Safety</b>		
<ol style="list-style-type: none"> <li>1. Use of reclaimed water</li> <li>2. Excavation of contaminated soils</li> <li>3. Mosquito attraction to open ponds</li> <li>4. Interference with emergency operations</li> <li>5. Use, storage, and disposal of hazardous materials</li> </ol>		<ol style="list-style-type: none"> <li>1. No significant public health and safety effects are expected; please see Section III, Initial Study Checklist for details.</li> <li>2. No excavation of contaminated soils is expected.</li> <li>3. No new ponds are proposed.</li> <li>4. The project is not expected to interfere with emergency operations—all construction areas along City of Pacifica streets shall have one lane open.</li> <li>5. No use, storage and/or disposal of hazardous materials is expected.</li> </ol>
<b>S. Population and Housing</b>		
<ol style="list-style-type: none"> <li>1. Additional work force for construction and operation</li> <li>2. Growth inducement</li> </ol>		<ol style="list-style-type: none"> <li>1. Additional work force from existing will be needed for construction, but not for operation. No new impacts</li> </ol>

<u>Subject</u>	<u>Requirements</u>	<u>Comments</u>
		are expected. 2. No new growth is expected to occur, as this project will irrigate existing facilities within Pacifica.
<b>T. Land Use and Zoning</b>		
	1. Incompatible use of project site 2. Conflict with surrounding land use or a Williamson Act contract	1, 2. The project site/alignment is not incompatible with surrounding land uses. No Williamson Act contracts exist on either the proposed alignment areas or in adjacent areas.

## V. References, Persons Contacted and Report Preparers

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## APPENDIX A BIOLOGICAL RESOURCES

The following tables are included in this appendix:

Table 1. Vascular Plant List

Table 2. List of Potentially Affected Special-Status Species

**Table 1. Vascular Plant List**

Vascular plants identified along the pipeline corridor in Pacifica, CA for the North Coast County Water District – Water Recycling Project.

<b>Family</b>	<b>Scientific Name</b>	<b>Common Name</b>
<b>Aizoaceae</b>	<i>Carpobrotus edulis</i>	Ice plant
<b>Anacardiaceae</b>	<i>Toxicodendron diversilobum</i>	Poison-oak
<b>Apiaceae (Umbelliferae)</b>	<i>Conium maculatum</i>	Poison hemlock
	<i>Daucus carota</i>	Queen Anne's lace
	<i>Daucus pusillus</i>	Wild carrot
	<i>Foeniculum vulgare</i>	Fennel
	<i>Heracleum lanatum</i>	Cow parsnip
	<i>Oenanthe sarmentosa</i>	Oenanthe
	<i>Osmorhiza chilensis</i>	Sweet-cicely
	<i>Sanicula crassicaulis</i>	Pacific sanicle
	<i>Torilis arvensis</i>	Torilis
<b>Araliaceae</b>	<i>Aralia californica</i>	Spikenard
<b>Asclepiadaceae</b>	<i>Asclepias</i> sp.	Milkweed
<b>Asteraceae (Compositae)</b>	<i>Achillea millefolium</i>	Yarrow
	<i>Anaphalis margaritacea</i>	Pearly everlasting
	<i>Artemisia californica</i>	California sagebrush
	<i>Artemisia douglasiana</i>	Mugwort
	<i>Aster chilensis</i>	Aster
	<i>Baccharis pilularis</i>	Coyote brush
	<i>Cirsium vulgare</i>	Bull thistle
	<i>Cotula coronopifolia</i>	Brass buttons
	<i>Erechtites minima</i>	Fireweed
	<i>Erigeron glauca</i>	Fleabane daisy
	<i>Eriophyllum staechadifolium</i>	Seaside woolly sunflower
	<i>Helenium puberulum</i>	Sneezeweed
	<i>Hieracium albiflorum</i>	Hawkweed
	<i>Hypochaeris glabra</i>	Smooth cat's ear
	<i>Lactuca serriola</i>	Prickly lettuce
	<i>Madia sativa</i>	Tarweed

	<i>Picris echioides</i>	Ox-tongue daisy
	<i>Senecio mikanioides</i>	German ivy
	<i>Senecio vulgaris</i>	Common groundsel
	<i>Sonchus oleraceus</i>	Sow thistle
<b>Betulaceae</b>		
	<i>Alnus rubra</i>	Red alder
	<i>Corylus cornuta</i>	Hazelnut
<b>Blechnaceae</b>		
	<i>Woodwardia fimbriata</i>	Giant chain fern
<b>Boraginaceae</b>		
	<i>Myosotis discolor</i>	Forget-me-not
<b>Brassicaceae (Cruciferae)</b>		
	<i>Brassica nigra</i>	Black mustard
	<i>Cardamine oligosperma</i>	Bittercress
	<i>Raphanus sativus</i>	Wild radish
	<i>Rorippa nasturtium ssp. aquatica</i>	Water cress
<b>Caprifoliaceae</b>		
	<i>Lonicera hispidula</i>	Honeysuckle
	<i>Sambucus racemosa</i>	Black elderberry
<b>Chenopodiaceae</b>		
	<i>Chenopodium sp.</i>	Goosefoot
	<i>Salicornia virginica</i>	Pickleweed
<b>Convolvulaceae</b>		
	<i>Convolvulus arvensis</i>	Bindweed
<b>Cornaceae</b>		
	<i>Cornua sericea ssp. sericea</i>	Dogwood
<b>Cucurbitaceae</b>		
	<i>Marah fabaceus</i>	Wild cucumber
<b>Cupressaceae</b>		
	<i>Cupressus macrocarpa</i>	Monterey cypress
<b>Cyperaceae</b>		
	<i>Cyperus eragrostis</i>	Nutsedge
	<i>Scirpus californicus</i>	California bulrush
	<i>Scirpus microcarpus</i>	Bulrush
	<i>Scirpus pungens</i>	Bulrush
<b>Dennstaedtiaceae</b>		
	<i>Pteridium aquilinum</i>	Bracken fern
<b>Dipsacaceae</b>		
	<i>Dipsacus fullonum</i>	Teasel
<b>Dryopteridaceae</b>		
	<i>Athyrium filix-femina</i>	Lady fern
	<i>Polystichum munitum</i>	Sword fern
<b>Equisetaceae</b>		
	<i>Equisetum arvense</i>	Common horsetail
<b>Fabaceae (Leguminosae)</b>		
	<i>Cytisus scoparius</i>	Scotch broom
	<i>Lathyrus sp.</i>	Sweet pea
	<i>Lotus corniculatus</i>	Bird's foot trefoil
	<i>Melilotus albus</i>	White sweet-clover
	<i>Trifolium sp.</i>	Clover

<b>Gentianaceae</b>		
	<i>Centaureum muehlenbergii</i>	Centauray
<b>Geraniaceae</b>		
	<i>Geranium dissectum</i>	Cut-leaved geranium
	<i>Geranium molle</i>	
<b>Iridaceae</b>		
	<i>Iris douglasiana</i>	Douglas iris
<b>Juncaceae</b>		
	<i>Juncus balticus</i>	Baltic rush
	<i>Juncus bufonius</i>	Toad rush
	<i>Juncus effusus</i>	Common rush
	<i>Juncus patens</i>	Rush
<b>Lamiaceae</b>		
	<i>Marrubium vulgare</i>	Horehound
	<i>Mentha arvensis</i>	Peppermint
	<i>Satureja douglasii</i>	Yerba buena
	<i>Stachys ajugoides</i> var. <i>ajugoides</i>	Hedgenettle
<b>Lauraceae</b>		
	<i>Umbellularia californica</i>	California bay
<b>Liliaceae</b>		
	<i>Disporum smithii</i>	Fairy bells
<b>Malvaceae</b>		
	<i>Malva sylvestris</i>	High mallow
<b>Myrtaceae</b>		
	<i>Eucalyptus globulus</i>	Blue gum
<b>Onagraceae</b>		
	<i>Epilobium brachycarpum</i>	Fireweed
	<i>Epilobium ciliatum</i>	Fireweed
<b>Papaveraceae</b>		
	<i>Eschscholzia californica</i>	California poppy
<b>Pinaceae</b>		
	<i>Pinus radiata</i>	Monterey pine
<b>Plantaginaceae</b>		
	<i>Plantago coronopifolia</i>	Cut-leaved plantain
	<i>Plantago lanceolata</i>	European plantain
<b>Poaceae (Gramineae)</b>		
	<i>Agrostis viridis</i>	Green bent
	<i>Avena barbata</i>	Wild oats
	<i>Briza maxima</i>	Large rattlesnake grass
	<i>Bromus carinatus</i> var. <i>carinatus</i>	California brome
	<i>Bromus diandrus</i>	Ripgut
	<i>Bromus hordeaceus</i>	Soft chess
	<i>Bromus madritensis</i> ssp. <i>madritensis</i>	Foxtail chess
	<i>Calamagrostis nutkaensis</i>	Pacific reedgrass
	<i>Cortaderia jubata</i>	Pampas grass
	<i>Distichlis spicata</i>	Saltgrass
	<i>Elymus glaucus</i>	Blue wildrye
	<i>Holcus lanatus</i>	Velvet grass
	<i>Hordeum jubatum</i>	Foxtail barley

	<i>Hordeum marinum</i> var. <i>gussoneanum</i>	Barley
	<i>Leymus triticoides</i>	Creeping ryegrass
	<i>Lolium multiflorum</i>	Annual ryegrass
	<i>Melica imperfecta</i>	Oniongrass
	<i>Nassella cernua</i>	Nodding needlegrass
	<i>Phalaris aquatica</i>	Harding grass
	<i>Poa annua</i>	Annual bluegrass
	<i>Polypogon monspeliensis</i>	Rabbitsfoot grass
	<i>Vulpia myuros</i>	Annual fescue
<b>Polygonaceae</b>		
	<i>Polygonum persicaria</i>	Lady's thumb
	<i>Rumex acetosella</i>	Sheep sorrel
	<i>Rumex crispus</i>	Curly dock
<b>Primulaceae</b>		
	<i>Anagallis arvensis</i>	Scarlet pimpernel
<b>Pteridaceae</b>		
	<i>Adiantum jordanii</i>	Maidenhair fern
	<i>Pentagramma triangularis</i>	Goldback fern
<b>Rhamnaceae</b>		
	<i>Ceanothus thyrsiflorus</i>	Blue blossom
	<i>Rhamnus californica</i>	California coffeeberry
<b>Rosaceae</b>		
	<i>Fragaria vesca</i>	Woodland strawberry
	<i>Heteromeles arbutifolia</i>	Toyon
	<i>Holodiscus discolor</i>	Oceanspray
	<i>Potentilla anserina</i> ssp. <i>pacifica</i>	Pacific silverweed
	<i>Rosa gymnocarpa</i>	Wood rose
	<i>Rubus discolor</i>	Himalaya berry
	<i>Rubus parviflorus</i>	Thimbleberry
	<i>Rubus ursinus</i>	California blackberry
<b>Salicaceae</b>		
	<i>Salix lasiandra</i>	Shining willow
	<i>Salix lasiolepis</i>	Arroyo willow
	<i>Salix sitchensis</i>	Sitka willow
<b>Scrophulariaceae</b>		
	<i>Mimulus aurantiacus</i>	Sticky golden monkeyflower
	<i>Mimulus guttatus</i>	Common monkeyflower
	<i>Scrophularia californica</i>	California beeplant
<b>Solanaceae</b>		
	<i>Solanum americanum</i>	Nightshade
<b>Typhaceae</b>		
	<i>Typha latifolia</i>	Broadleaf cattail
<b>Urticaceae</b>		
	<i>Urtica dioica</i>	Stinging nettle
<b>Zannichelliaceae</b>		
	<i>Zannichellia palustris</i>	Horned pondweed

Table 2. List Of Potentially Affected Special-Status Species

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
<b>Birds</b>				
<i>Accipiter cooperi</i> Cooper's hawk (nesting)	--/CSC/- -	Nests in trees near riparian forests and woodlands, canyon bottoms. Forages from perches in forests, woodlands and grasslands.	Medium. The project area provides abundant potential nesting and foraging habitat for this species. The species has been observed foraging in the project area (TRA, 1994).	Year round
<i>Agelaius tricolor</i> Tricolored blackbird (nesting colony)	--/SC/--	Freshwater marshes (cattail marshes), riparian vegetation, and open grasslands. Often nests in blackberry brambles or reeds	Low. Suitable nesting and foraging habitat is present within the project area though the species was not observed during the field survey	Year round
<i>Aquila chrysaetos</i> Golden eagle	--/SC/--	Mountainous forests and open grasslands, found in many habitats during migration, nests on ledges or in tall trees.	Low. Abundant foraging habitat exists within the project area and limited nesting habitat. Project will not impact potential foraging or nesting habitat	Year round
<i>Asio flammeus</i> Short-eared owl	--/SC/--	Freshwater and saltwater marshes; open grasslands, prairies, and sand dunes. Nests on the ground in herbaceous cover or under shrubs	Low. Suitable nesting and foraging habitat is present within the project area though the species was not observed during the field survey	Year round
<i>Athene cunicularia</i> Burrowing owl	--/SC/--	Forages in open plains, grasslands and prairies; typically nests in abandoned small mammal burrows.	Low. No suitable nesting (burrows) and limited foraging habitat is present within the project area. The species was not observed during the field survey and is not known from the area.	Year round
<i>Buteo swainsonii</i> Swainson's hawk	--/T/--	Forages in open plains, grasslands and prairies; typically nests in trees or large shrubs	Medium. Site provides foraging habitat in the form of uplands and grasslands. Limited nesting habitat occurs within project area. The species has been observed foraging near Calera Creek (TRA, 1994).	Year round

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
<i>Calypte costae</i> Costa's hummingbird (nesting)	FSC/CS C/--	Breeds in Central California and eastward into Nevada and Utah, winters in Southern California and Mexico; nests in shrubs or small trees. Often found in chaparral and shrub-dominated communities. Feeds on insects and nectar.	Medium. The project area provides abundant potential foraging and nesting habitat for this species. The species was not observed during surveys of the project area.	Spring and Summer
<i>Circus cyaneus</i> Northern harrier	--/CSC/- -	Nests in freshwater and saltwater marshes and grasslands; forages in grasslands, agricultural fields, and marshes.	Medium. The species was observed foraging in grasslands throughout the project area. No nesting sites were located.	Year round
<i>Elanus leucurus</i> White-tailed kite	CP/--	Nests in dense oak, willow, or other tree stands near open grassland meadows, farmlands, and emergent wetlands.	Medium. Suitable foraging and nesting habitat in project area. Species was observed foraging in project area during previous surveys.	Year round
<i>Falco peregrinus anatum</i> Peregrine falcon (nesting)	--/CE/--	Nests in cliffs and rock outcrops adjacent to forests, canyons and grasslands. Hunts other birds from the air.	Low. No nesting habitat at site. The project area provides foraging habitat for the species. The species was observed foraging in the area during previous surveys of the project area.	Year round
<i>Haliaeetus leucocephalus</i> Bald eagle	T/--/--	Nests in large trees with open branches along coastal, and interior lake and river margins, usually within one mile of water.	Low. Though suitable nesting habitat occurs within the project area, no disturbance to any potential nesting habitat is expected from pipeline construction. The construction sites experiences a high level of human disturbance and provides no wintering habitat.	Year round
<i>Lanius ludovicianus</i>	FSC/CS C/--	Nests in dense shrubs and brush near open	Medium. The species has been observed foraging in the	Year round

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
Loggerhead shrike		foraging areas such as grasslands.	project area (TRA, 1994). Temporary affects to foraging habitat may occur as a result of pipeline construction.	
<i>Laterallus jamaicensis coturniculus</i> California black rail	--/T/--	Typically associated with coastal saltmarsh, less often with inland freshwater marsh.	Medium. Abundant foraging and nesting habitat exists within the project area. The species is not known from the project area.	Year round
<i>Melanerpes lewis</i> Lewis' woodpecker	FSC/--/- -	Pine forests, oak woodlands, grasslands. This species feeds on insects, acorns, and nuts and nests in cavities of stumps or trees.	Low, limited suitable habitat within project area. Project is has low potential to affect species.	Year round
<i>Phalacrocorax auritus</i> Double-crested cormorant (breeding)	--/CSC/- -	Found in lakes, rivers, swamps, and coasts; breeds. Nests in colonies on rocky islands or cliffs.	Low. No nesting habitat in project area. Potential foraging and resting habitat for this species occurs in the project area. The species is known from the project area.	Year round
<i>Rallus longirostris obsoletus</i> California clapper rail	FE/CE/- -	Occupies coastal salt and brackish marshes and tidal sloughs of San Francisco Bay and Suisun Bay. Forages for invertebrates and seeds. Nests on the ground in tidal sloughs, typically beneath a canopy of vegetation.	Medium. Though the species is not known from Laguna Salada or Horse Stable Pond, the project area provides abundant potential habitat.	Year round
<i>Riparia riparia</i> Bank swallow (nesting)	--/SCE/- -	Nests in colonies on banks or cliffs adjacent to streams, canals or lakes	Unlikely. No potential habitat for this species occurs in the project area, the species was not located during current and previous surveys.	Year round
<i>Selasphorus sasin</i>	FSC/--/- -	Coastal chaparral, shrubland and forest.	Medium. The area that the project	

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
Allen's hummingbird (nesting)		Breeds along coast from Southern Oregon to Southern California	traverses provides abundant foraging and nesting habitat for the species and the species has been observed at the site during previous surveys (TRA, 1994).	
<i>Sterna antillarum browni</i> California least tern	FE/CE/- -	Migratory species such as the least tern may use project area beaches for nesting during the breeding season. The species inhabits bays, estuaries and coastlines.	Unlikely, no sand dune, beach or other coastline habitat will be affected by the proposed project.	March-June
<b>Mammals</b>				
<i>Reithrodonto mys raviventris</i> Saltmarsh harvest mouse	FE/CE/- -	Found in saline emergent wetlands in the San Francisco Bay and associated tributaries. Also uses adjacent upland habitats.	Medium. Abundant suitable habitat for this species occurs in the project area, at Horse Stable Pond.	Year round
<i>Sorex vagrans halicoetes</i> Saltmarsh wandering shrew	FSC/CS C/--	Found in saline emergent wetlands in the San Francisco Bay Area and associated tributaries. Also uses adjacent upland habitats.	Medium. Abundant suitable habitat for this species occurs in the project area. The species is not known from the project area.	Year round
<b>Reptiles</b>				
<i>Clemmys marmorata</i> Western pond turtle	--/SC/--	Ponds and marshes, streams and banks along irrigation ditches.	High. The project area provides abundant suitable habitat for this species within the riparian corridor, wetlands and ponds. The species was observed in Arrowhead Marsh during field surveys.	Year-round
<i>Clemmys marmorata marmorata</i> Northwestern	--/SC/--	Ponds and marshes, streams and banks along irrigation ditches.	Medium. The project area provides limited suitable habitat within the riparian corridor for this species.	Year-round

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
pond turtle				
<b>Thamnophis sirtalis tetrataenia San Francisco garter snake</b>	<b>FE/CE/- -</b>	<b>Marshes, streams, and sloughs of the San Francisco Bay Area.</b>	<b>High, abundant potential habitat occurs in the perennial drainages, vegetated ponds and marshes within the project area. The species is known to occur in Laguna Salada and is known historically from Calera Creek.</b>	<b>Year -round</b>
<b>Amphibians</b>				
<i>Ambystoma californiense</i> California tiger salamander	PT/CSC /--	Estivates in ground squirrel burrows; breeds in stockponds, pools of streams and vernal pools. The species is rarely observed migrating over upland habitats.	Low, potential foraging and breeding habitat occurs in the project area. However, no estivating habitat (ground squirrel burrows were observed in the project area. The species is not known to occur in or around the project area.	February-May
<i>Rana aurora draytonii</i> California red-legged frog	FT/CSC / --	<b>Winters in woodlands and adjacent riparian corridors near water sources; breeds in pools of perennial and intermittent streams and stockponds ; prefers shorelines with dense vegetation.</b>	<b>High, the species is known to occur in Horse Stable Pond and other wetland habitats within the project area. Abundant high quality potential habitat occurs in the project area.</b>	April-October
<b>Fish</b>				
<i>Eucyclogobius newberryi</i>	FE/CSC /--	Lives in coastal lagoons, streams and estuaries, may occur in brackish and freshwater habitats. Feeds on molluscs, insects and crustaceans. Known locally from Waddell Creek.	Low. Though potential habitat for this species occurs in the project area, construction activities have a low potential to affect the species.	Year round
<i>Oncorhynchus kisutch</i> Coho salmon	FT/CE/--	Spawns in freshwater streams in sand or gravel beds. Young smolts live in streams and estuaries before returning to the ocean.	Low. Though potential habitat for this species occurs in the project area, construction activities have a low potential to affect the species.	Year round
<i>Oncorhynchus</i>	FT/CSC	Spawns in freshwater	Low.	Year round

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
<i>mykiss</i> Central California Steelhead	/--	streams in sand or gravel beds. Young smolts live in streams and estuaries before returning to the ocean.	Though potential habitat for this species occurs in the project area, construction activities have a low potential to affect the species.	
<b>Invertebrates</b>				
<i>Danaus plexippus</i> Monarch butterfly	--/--	Meadows, roadsides and sandy areas wherever milkweed grows.	Unlikely. Though potential breeding habitat in the form of Eucalyptus groves occurs in the upper slopes of the project area adjacent to Arrowhead marsh no impacts are expected to these trees.	April- September
<i>Elaphrus viridis</i> Delta green ground beetle	T/--	This ground beetle inhabits areas of barren soil with sparse vegetation near water in grasslands and wetlands.	Low. The project area provides limited suitable habitat within the riparian corridor for this species.	Year round
<i>Caecidotea tomalensis</i> Tomales isopod	--/--	Inhabits localized fresh-water ponds and streams with still or slow-moving water in several bay area counties.	Low. Limited marginal habitat occurs in the project area.	Year round
<i>Calicina minor</i> Edgewood blind harvestman	FSC/--/- -	Occupies locations under boulders or logs in serpentine areas. Known to occur at Edgewood County park and near a spring on County Road 14 north of Crystal Springs Dam.	Unlikely. No serpentine outcrops occur on the project area. Surveys for this species were not conducted.	Year round
<i>Hydrochara rickseckeri</i> Ricksecker's water scavenger beetle	FSC/--/- -	Aquatic habitats, such as lakes and ponds, in the San Francisco Bay Area. Range is restricted. Known historically from Pulgas Water Temple, Upper Crystal Springs Reservoir. Scattered	Unlikely. Habitat suitable for this species does not occur in the project area.	Year round

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
		occurrences throughout ponds in bay area counties.		
<i>Tryonia imitator mimic tryonia</i> California brackishwater snail	FSC/--/- -	Brackish-water habitats	Unlikely. Habitat suitable for this species occurs in the project area. However no impacts are expected to the saltmarshes of Laguna Salada or Horse Stable Pond.	Year round
<b>Plants</b>				
<i>Acanthomintha duttonii</i> San Mateo thorn-mint	FE/CE/1 B	Mixed evergreen forests, valley and foothill grasslands and chaparral, typically on serpentine. Known from two extant occurrences.	Unlikely. Though suitable habitat for this species occurs in the project area, the species was not located during current and previous surveys. Range is highly restricted.	April-June
<i>Arctostaphylos hookeri</i> ssp. <i>franciscana</i> Franciscan manzanita	--/--/1A	Coastal bluff scrub and chaparral, typically on serpentine. Presumed extinct.	Unlikely. Though suitable habitat for this species occurs in the project area, the species was not located during current surveys. No manzanita species were located during current surveys.	February-April
<i>Arctostaphylos hookeri</i> ssp. <i>ravenii</i> Presidio manzanita	FE/CE/1 B	Chaparral and coastal prairie, typically on serpentine.	Unlikely. Though suitable habitat for this species occurs in the project area, the species was not located during current surveys. No manzanitas were located during current surveys.	February-March
<i>Arctostaphylos imbricata</i> San Bruno Mtn. Manzanita	--/CE/1B	Coastal scrub and chaparral, known from five occurrences on San Bruno Mountain	Unlikely. Though suitable habitat for this species occurs in the project area, the species was not located during current and previous surveys. No manzanitas were located during current or previous surveys.	February-May
<i>Arctostaphylos montaraensis</i>	--/--/1B	Coastal scrub and chaparral, known from	Unlikely. Though suitable habitat for this	January-March

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
Montara manzanita		approximately ten occurrences in San Mateo County near Montara Mountain	species occurs in the project area, the species was not located during current and previous surveys. No manzanitas were located during current or previous surveys.	
<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i> San Francisco spineflower	--/--/1B	Coastal bluff scrub, coastal dunes, coastal prairie and coastal scrub, often on sandy soils. The species is known from coastal terraces adjacent to Laguna Salada.	Unlikely. Though marginal potential habitat for this species occurs in the project area, the species is unlikely to be affected by construction activities.	April-August
<i>Cirsium fontinale</i> var. <i>fontinale</i> Fountain thistle	FE/CE/1 B	Valley and foothill grasslands, typically on serpentine soils.	Unlikely. Though potential habitat for this species occurs in the project area, the species was not located during current and previous surveys.	June-October
<i>Cirsium occidentale</i> var. <i>compactum</i>	--/--/1B	Chaparral, coastal dunes, coastal scrub, coastal prairie. Known from fewer than twenty occurrences.	Low. Though limited potential habitat for this species occurs in the project area, construction activities will occur in roadways and other heavily disturbed habitats dominated by non-native and ruderal species.	April-June
<i>Collinsia multicolor</i> San Francisco collinsia	--/--/1B	Closed-cone coniferous forests and coastal scrub, often on serpentine. Occurs rarely in Monterey, Santa Clara, Santa Cruz, San Francisco and San Mateo Counties.	Low. Though the project area provides limited suitable habitat for the species, the species was not observed during current or previous surveys.	March-May
<i>Cordylanthus maritimus</i> ssp. <i>palustris</i> Pt. Reyes bird's-beak	E/T/1B	Coastal saltwater or brackish marshes and swamps at low elevations (0-3 m).	Unlikely. Though suitable habitat occurs in the project area none of this habitat will receive impacts from construction activities. Species was not observed during	June-October

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
			survey.	
<i>Dirca occidentalis</i> Western leatherwood	--/--/1B	Broadleaved upland forest, chaparral, riparian scrub, oak woodland, typically associated with moist or shady locations	Low. Limited potential habitat occurs for this species within coastal riparian scrub communities near Arrowhead Marsh. The species was not observed during survey.	January-April
<i>Eriophyllum latilobum</i> San Mateo woolly sunflower	FE/CE/1 B	Occurs in cismontane woodland, on serpentine. Known from only one occurrence near Crystal Springs Road.	Low. Though suitable habitat for this species occurs in the project area, the species was not located during current and previous surveys. The species occurs within 1 mile of the project area.	May-June
<i>Fritillaria liliacea</i> Fragrant fritillary	--/--/1B	Cismontane woodland, coastal prairie, coastal scrub and grasslands, often on serpentine. The species occurs nearby on serpentine grasslands southwest of the project area.	Low. Though suitable habitat for this species occurs in the project area, the species was not located during current and previous surveys. The species occurs within 1 mile of the project area.	February-April
<i>Helianthella castanea</i> Diablo helianthella	--/--/1B	Cismontane woodland, coastal prairie, coastal scrub and grasslands. Closest known occurrence is San Bruno Mountain	Unlikely. Though potential habitat for this species occurs in the project area, the species was not located during current surveys.	April-June
<i>Hesperolinon congestum</i> Marin western flax	FT/CT/1 B	Coastal scrub and coastal prairie, often on serpentine.	Unlikely. No habitat for this species occurs in the project area, the species was not located during current surveys.	April-July
<i>Lessingia arachnoidea</i> Crystal Springs lessingia	--/--/1B	Cismontane woodland, coastal prairie, coastal scrub and grasslands, often on serpentine. Known from seven occurrences near Crystal Springs Reservoir.	Unlikely. No habitat for this species occurs will be affected by construction activities, the species was not located during current surveys.	July-October

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
<i>Linanthus rosaceus</i> Rose linanthus	--/--/1B	Coastal bluff scrub. The species occurs on Mori Point.	Unlikely. No habitat for this species occurs will be affected by construction activities; the species was not located during current surveys.	April-June
<i>Microseris paludosa</i> Marsh microseris	--/--/1B	Closed-cone coniferous forests, woodlands, coastal scrub and grasslands.	Low. Though limited potential habitat for this species occurs in the project area, construction activities will occur in roadways and other heavily disturbed habitats dominated by non-native and ruderal species.	April-June
<i>Pedicularis dudleyi</i> Dudley's lousewort	-- /CR/1B	Maritime chaparral, cismontane woodland, valley and foothill grasslands.	Low. Though limited potential habitat for this species occurs in the project area, construction activities will occur in roadways and other heavily disturbed habitats dominated by non-native and ruderal species.	April-June
<i>Pentachaeta bellidiflora</i> White-rayed pentachaeta	FE/CE/1 B	Valley and foothill grassland, on serpentine. Known from one extant occurrence near Woodside south of the project area, historically occurred near Edgewood County Park.	Unlikely. No habitat for this species occurs in the project area, the species was not located during current surveys.	March-May
<i>Silene verecunda</i> ssp. <i>verecunda</i> San Francisco Campion	--/--/1B	Coastal bluff scrub, chaparral, coastal prairie, valley and foothill grassland, often on rock outcrops or sandy sites.	Unlikely. Limited marginal habitat for this species occurs in the project area, the species was not located during current surveys.	March-August
Northern coastal salt marsh	--/--/--	Coastal salt marsh habitats have become increasingly rare due to	High. This community is present within the project area within Laguna Salada and Horse Stable	Year round

Species	Federal/ State/ CNPS Status	General Habitat	Potential for Project to Impact	Period of Identification / Bloom Period
		threats from coastal development, and water diversions.	Pond.	
Northern maritime chaparral	--/--/--	Coastal chaparral stands have become increasingly rare in the modern California landscape.	Low. This community does not occur within the project area.	Year round
Valley needlegrass grassland	--/--/--	Once widespread through the California landscape, native needlegrasslands have become threatened by development, invasion from exotic annual grasses and changes in land management.	Low. This community does not occur within the project area.	Year round

**SOURCES**

CNDDDB 2002. Electronic inventory for the following USGS Quads:

CNPS 2001. Electronic inventory for the following USGS Quads:

USFWS 2002. Species lists for the following USGS Quads:

**STATUS CODES:**

FEDERAL: (U.S. Fish and Wildlife Service and National Marine Fisheries Service)

FE = Listed as Endangered by the Federal Government

FT = Listed as Threatened by the Federal Government

FPT = Proposed for Listing as Threatened

FC = Candidate for Federal Listing

FSC = Federal Species of Special Concern

STATE: (California Department of Fish and Game)

CE = Listed as Endangered by the State of California

CT = Listed as Threatened by the State of California

CR = Listed as Rare by the State of California (plants only)

CSC = California Species of Special Concern

CNPS: (California Native Plant Society)

List 1A = Presumed extinct in California

List 1B = Plants rare, threatened, or endangered in California and elsewhere

List 2 = Plants rare, threatened, or endangered in California but more common elsewhere

List 3 = Plants about which more information is needed

List 4 = Plants of Limited Distribution

## **APPENDIX B**

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CULTURAL RESOURCES LITERATURE REVIEW FOR THE PROPOSED  
RECYCLED WATER PROJECT

CULTURAL RESOURCES LITERATURE REVIEW FOR THE PROPOSED RECYCLED  
WATER PROJECT RUNNING FROM THE CITY OF PACIFICA CALERA CREEK  
RECYCLING PLANT TO THE CITY OF SAN FRANCISCO'S SHARP PARK GOLF  
COURSE, PACIFICA, SAN MATEO COUNTY, CALIFORNIA

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OCTOBER, 2003

EXECUTIVE SUMMARY

The proposed recycled water project calls for the construction of a 12 inch pipeline running from the Calera Creek Recycling Plant north along the western side of Highway 1 to the Sharp Park Golf Course, terminating at the old sewerage treatment plant. Current plans call for the placement of the pipeline in engineered fill from the Calera Creek plant to the Highway 1 right of way where it will be inserted into an existing abandoned 24 inch sewer line which runs from south of the Calera Creek plant northwards into the Sharp Park Golf property to end at the old sewer treatment plant. A branch line will run from the abandoned sewer line east along Fairway Drive to Rifle Range Road to access a new water storage tank to be placed at the end of the road.

The pipeline will pass through the recorded location of one archaeological site (SMA-268) and through the an area of high archaeological sensitivity (Laguna Salada) which may contain additional buried archaeological sites.. If the proposed pipeline is placed entirely in fill material and is jacked through the abandoned sewer pipeline, no impacts will occur to known or suspected sites.

## ARCHIVAL RESEARCH

An archaeological literature review for this project was undertaken by the author at the Northwest Information Center (NWIC) located at Sonoma State University during the last week of September, 2003 (file no. 03-215). The records indicate that there have been numerous archaeological surveys of the pipeline route between the recycling plant and the vicinity of the Sharp Park Golf Course which have resulted in the recording of two prehistoric archaeological sites, Sma-162 and 268, and one historic site, C-302, the historic Vallemar Railroad Station, and one possible prehistoric site in the Sharp Park vicinity.

Additionally, there have been at least two archaeological literature reviews done by Thomas Reid Associates for the Calera Parkway Improvements project which cover most of the proposed route of the pipeline. In 2000 (file 00-137) the Northwest Information Center (NWIC) reported that there had been three archaeological studies which covered portions of the current pipeline project (Melandry 1986:S-8244; O'Connor and Melandry 1988:S-9715; Orlins and Schwaderer 1994:S-15828). The project review concluded that the area should be considered archaeologically sensitive for prehistoric occupation sites and recommended further archival and field research.

An updated review was done in 2003 by Thomas Reid Associates (file no. 02-882) for the Calera Parkway Improvements project which restated the findings of the 2000 literature review concerning archaeological sensitivity based upon the proximity of Sma-162 and 268, recommending further field study.

The most recent literature review conducted by this author in September 2003 (file no. 03-215) concentrated on the actual proposed route of the pipeline from the recycled water plant at its southernmost end up to the Sharp Park rifle range where a new storage tank will be built,

and the portion of the pipeline which will run into the Sharp Park Golf Course to the old sewer treatment plant at its northern end and ultimately to Oceana Highschool and the Sharp Park elementary school along routes which have not been clearly defined to date. One new archaeological survey report by Matthew Clark (2002) was obtained for the proposed Pacifica Village Center project area which was to have been built west of the recycled water plant; because it involved archaeological sites Sma-268 and 162, this report contains the most comprehensive discussion of these sites done to date.

No additional cultural resources have been recorded for the proposed pipeline route other than those currently mapped: Sma-268, 162 and C-302. Of these three resources, only one, Sma-268, is actually located on or near the projected route of the pipeline at its exit from the recycled water plant at Highway 1. The other two sites, Sma-162 and C-302, are not located inside the projected route of the pipeline. Finally, there is the issue of the potential for the discovery of additional prehistoric archaeological site deposits along a portion of the line in the vicinity of the Sharp Park Golf Course and rifle range access road, based upon the observations of a previous archaeological researcher in the area, Cindy Desgrandchamps (1978) and based upon the environmental setting of this general area. These issues will be discussed below.

#### **SMA-268:**

This is an archaeological site first recorded by Melandry and Compton during a Caltrans survey in 1986, although the site had been known about since 1963, when improvements to Route 1 (culvert placement) revealed an extensive archaeological deposit containing as many as 50 bodies (Clark 2002:11). Survey conditions were poor in 1986, but based upon field observations and the newspaper accounts of the discovery in the roadway, Melandry drew the borders of Sma-268 extending out into the Route 1 right of way.

The site was re-recorded by Orlins and Schwaderer in 1993 for the water recycling plant construction and wetlands construction project. Clark describes their work below:

They described it as a “habitation site: dark brown midden with many shell fragments, mammal bone, fire affected rock” (1993:1) entirely north of the creek. On the site record Orlins and Schwaderer also describe the site as partially “covered with up to 70 cm of fill and overburden.” having relocated the site, Orlins and Schwaderer recommended extended subsurface reconnaissance, carried out in September 1993 with a backhoe. Eight backhoe trenches were excavated, delimiting the site and revealing about 60-65 cm of apparently intact shell midden. Although Orlins and Schwaderer state that the “bank of Calera Creek forms the southerly and easterly site boundary” (1994:10), no trenches were excavated east of the creek into the berm of the Caltrans right-of-way....” (2002:10-11)

In short, Orlins and Schwaderer stopped at the right of way probably due to the complexity of obtaining Caltrans permits and never explored the possibility that the archaeological site extended east and north along the right of way north of the entrance to the recycling plant, where the 50 bodies and extensive artifactual material was found in 1963.

## **POTENTIAL IMPACTS:**

In spite of the fact that there may be a large deposit of prehistoric archaeological material extending from the new recycling plant eastwards to Route 1 and then extending northwards for an undetermined distance, the current project design seeks to avoid impacts to it: the proposed 10 inch water line will be placed in existing engineered fill from the existing pumping plant to the exit road at Route 1: project designers claim that the fill used to build the existing roadway is of sufficient depth to allow pipeline placement in the fill layer. From the eastern edge of the roadway it will then be connected to (and sleeved inside) an existing abandoned 24 inch sewer line which runs northwards along the western side of the roadway up to the Sharp Park Golf Course, through the course to connect with the old sewer plant at Clarendon Avenue.

Impacts to SMA-268 could occur at the point that the new trench from the plant accesses the existing buried sewer line if it is necessary to excavate a pit large enough to allow connection at that point: none of the archaeological research done in this area to date has demonstrated that the archaeological site *actually stops at the edge of the Route 1 right-of-way*, or that there is a sufficiently deep layer of imported fill over the prehistoric deposit to insure that it won't be damaged: the abandoned 24 inch sewer line could be located directly in the prehistoric deposit noted at this location in 1963.

## **ARCHAEOLOGICALLY SENSITIVE AREAS:**

North of Calera Creek the proposed pipeline will follow the western side of Route 1 through a cut in the hills to the Sharp Park Golf Course, the former location of the Laguna Salada, a wetland and estuary which was destroyed by the construction of the golf course. While early development of this area prevented formal archaeological surveys, it must be assumed that this area was and is extremely archaeologically sensitive. Archaeological sites could still exist buried under fill and landscaping all along the former edges of the Laguna, which extended east of Route 1 into the existing golf course.

There is some documentation of archaeological resources in the area: in 1978 Cindy Desgrandchamps recorded SMA-162 on a berm directly south of Calera Creek outside of the present project area, noting that it was probably a redeposit of archaeological materials from elsewhere:

Midden material is remains of one or more archaeological sites originally located in the Sharp Park area. Midden removed during construction of Rte.1 through Sharp Park & redeposited at present location as road fill for later highway projects. (1978:3).

Desgrandchamps evidently looked inside the Caltrans right-of-way in the Sharp Park vicinity, but found only scant evidence of midden there.

## **POTENTIAL IMPACTS:**

If the proposed water line is sleeved through the abandoned 24 inch sewer line as it passes through the Sharp Park golf course north to the abandoned sewer plant and requires no additional excavation along the route to facilitate pipe placement, then there should be no new impacts on any possibly buried or obscured archaeological sites inside the golf course.

There is one exception to this however: water will be pumped through the new line up to the edge of the golf course on the west side of Route 1 to a point at Fairway Drive where the line will turn east under Route 1 through a golf cart tunnel, where it will be placed in a trench along Rifle Range Road up to the location of a new storage tank which will be built at the location of an existing storage tank.

Potential impacts to archaeological resources could occur during trenching operations along the stretch of the proposed pipeline which will run from the 24 inch abandoned pipeline to the east of Route 1 up to Rifle Range Road: the lands below the 100 foot contour should be considered an extension of the Laguna Salada and thus extremely archaeologically sensitive. Trenching even inside Rifle Range Road could uncover buried prehistoric archaeological materials.

## **SUMMARY OF FINDING/RECOMMENDATIONS**

Archaeological research done for this report shows that there is only one recorded archaeological site, SMA-268 which may be impacted by the proposed project. Design plans currently available to this author state that the proposed 10 inch pipe will not intrude into native soils at any point west of Route 1, in particular in the vicinity of SMA-268: there is a sufficient level of fill at the pumping plant and along the access road to protect native soils from trenching, and at the point where the new line will proceed north on the west side of the highway it will be contained in an existing abandoned sewer line.

It is the recommendation of this report that an archaeological monitor be retained to observe earthmoving activities from the recycled water plant to the point where it connects with the abandoned line to insure that there is no damage to the recorded archaeological site. If buried archaeological soils associated with SMA-268 are encountered at any point during excavation, work should be stopped within 30 feet of the discovery until a program of evaluative testing is completed in the area of further impacts. If testing demonstrates that the area of impact contains an archaeological resource eligible for listing on the California Register of Historic Resources, a plan for mitigation of impacts to the resource should be submitted to the project sponsor for approval and should be implemented before construction activities are allowed to recommence in the defined impact zone.

Finally there still remains a high potential that buried archaeological materials could be disturbed by the portion of the pipeline which will exit from the abandoned sewer line west of Route 1, passing under the highway and then running in a trench up to the water tank site inside at the end of Rifle Range Road.

Unless it can be demonstrated that proposed trench route from the point of departure

from the abandoned sewer line east to the approximate 100 foot contour line contains sufficient imported fill to protect potentially buried archaeological resources, it is recommended that a program of mechanical subsurface testing be undertaken along the proposed route to search for buried archaeological resources. In the event that any resource areas are discovered, plans for their evaluation should be submitted for approval and executed before any program for the mitigation of impacts to these resources can be undertaken.

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- 1978a                   Archaeological Site Record for SMA-162. On file, NWIC
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1986                   Archaeological Site Record for SMA-268. On file, NWIC.
- Orlins, R.I., and R. Schwaderer  
1993                   Archaeological Site Record for SMA-268 (Supplemental). On file, NWIC.
- 1994                   *The Archaeological Survey and Extended Survey for the City of Pacifica Wastewater Treatment Project, San Mateo County, California.* On file, NWIC file no. S-15828

## **APPENDIX C**

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ADDENDUM TO THE MITIGATED NEGATIVE DECLARATION FOR THE  
REDWOOD CITY RECYCLED WATER PROJECT

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*Addendum to the  
Mitigated Negative Declaration  
for the*

**Redwood City  
Recycled Water Project**

Prepared for

**The City of Redwood City**

Public Works Services Department  
1400 Broadway  
Redwood City, CA 94063

May 12, 2003

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# Section 1 – Introduction

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The City of Redwood City is considering the development and construction of a recycled water project that will provide a highly treated water supply for various uses in Redwood City. The recycled water project consists of infrastructure facilities to deliver recycled water from the South Bayside System Authority (SBSA) wastewater treatment plant to the Redwood Shores, Greater Bayfront, and Central Redwood City areas of the City. SBSA's recycled water meets stringent Title 22 environmental health requirements established by the California Department of Health Services (DHS) for unrestricted use of recycled water.

The Redwood City Recycled Water project represents a continuation of the "First Step Recycled Water Project," a pilot program initiated in spring 2000 by the City and SBSA. SBSA is a joint powers authority that provides wastewater treatment and disposal for the cities of Redwood City, Belmont and San Carlos, and the West Bay Sanitary District (serving Menlo Park, Atherton, Portola Valley, and parts of East Palo Alto). The First Step Project currently delivers recycled water to landscape irrigation customers at the eastern end of the Redwood Shores peninsula.

An Initial Study/Mitigated Negative Declaration (IS/MND) was prepared for the Redwood City Recycled Water Project. Pursuant to the provisions of the California Environmental Quality Act (CEQA), the City distributed the IS/MND for public review and comment from June 20 to July 20, 2002. The City received comment letters from four state agencies and one local business association; none of the comment letters raised significant environmental issues and, in accordance with CEQA, did not require responses. Prior to release of the IS/MND, the City conducted a public information workshop on the project on June 11, 2002. Two members of the public attended the meeting. No public comment letters from these citizens, or any others, were received on the IS/MND.

The Redwood City Planning Commission is responsible for adopting the MND before the City Council can take action on the project. The Planning Commission adopted the MND at its noticed public hearing on August 6, 2002. Two members of the public spoke in support of the project at that hearing. No one spoke in opposition. The Commission made the following findings in accordance with CEQA in its adoption action:

- The Mitigated Negative Declaration was completed in compliance with CEQA;
- Based on the record (including the Initial Study and comments received), there is no substantial evidence that the project will have a significant effect on the environment;
- A Mitigation Monitoring Plan for the project's mitigation measures was also adopted;
- The Mitigated Negative Declaration reflects the City's independent judgment and analysis.

Although the Commission's action on the MND was appealable to the City Council, no appeal was filed within the 10-day appeal period.

Subsequent to adoption of the MND by the Planning Commission on August 6, 2002, a greater interest in the project began to emerge from one of the citizens who attended the

June 11 public information workshop, as well as other members of the public. At its regularly scheduled meeting of August 26, 2002, the City Council reviewed and accepted the *Final Report of the Water Recycling Feasibility Study* for Redwood City, and also heard a presentation by Nelda Matheny (President, HortScience, Inc.) on *Landscapes Suitable for Irrigation with Recycled Water*. Several members of the public spoke on these items. The Council did not take action on the recycled water project at the meeting, but directed City staff to increase its public outreach and education efforts for the project.

Pursuant to City Council direction, a Public Information Forum was held for the recycled water project on September 16, 2002. A summary of the Forum is available at <http://www.redwoodcity.org/water/index.html>. Approximately 100 members of the public attended the meeting. Since then, public interest in the City's recycled water project has continued to remain high. As a result of this interest, the City has gathered research on and prepared several technical reports to address issues raised by the public about the recycled water project. The intent of these reports is to provide the public and the City Council with supplemental technical information about the project as it moves through the decision process.

The City has decided that these technical reports and other materials should be added to the CEQA documentation for the project. As indicated above, the Planning Commission has already adopted the MND for the project; however, the City Council has not yet taken an action on the project that would result in filing of the CEQA Notice of Determination (NOD). Therefore, the City has directed the preparation of this Addendum to the MND for the purpose of including this supplemental documentation into the CEQA record.

## **Purpose of Addendum and CEQA Requirements**

The purpose of this Addendum is to append supplemental technical information addressing issues raised by the public about the recycled water project, subsequent to adoption of the MND but prior to City Council action on the project. This document is prepared in accordance with Sections 15164 and 15162 of the State CEQA Guidelines.

Section 15164(b) of the CEQA Guidelines states:

*An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred.*

Section 15162 (a) of the CEQA Guidelines provides that, for a project covered by a certified EIR or adopted negative declaration, preparation of a subsequent EIR or negative declaration rather than an Addendum is required only if one or more of the following conditions occur:

1. *Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;*
2. *Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration*

*due to the involvement of new significant environmental effects or a substantial increase in the severity of the previously identified significant effects; or*

3. *New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:*
  - a. *The project will have one or more significant effects not discussed in the previous EIR or negative declaration;*
  - b. *Significant effects previously examined will be substantially more severe than shown in the previous EIR or negative declaration;*
  - 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 or negative declaration would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measures or alternative.*

Section 15162(b) of the CEQA Guidelines states:

*If changes to a project or its circumstances occur or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent EIR if required under subsection (a) [above]. Otherwise the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum or no further documentation.*

An Addendum to the MND is the appropriate CEQA document to address issues raised by the public subsequent to adoption of the MND because none of the criteria set forth in Section 15162(a)(1), (2), and (3) of the CEQA Guidelines have been triggered by the inclusion of this technical information. No changes to the recycled water project are being considered, and the information included in this Addendum does not create any new significant environmental effects, nor does it increase the severity of any previously identified significant effects. The changed circumstance under which the project is being undertaken involves the increase in public interest in the project subsequent to adoption of the MND. The City believes it is prudent to address these issues and include technical information about them in the CEQA record prior to making a decision on the project.

### **Circulation and City Council Consideration of Addendum**

Although circulation for public review of an Addendum is not required under CEQA (Guidelines Section 15164(c)), the City has determined that it is beneficial and important to the public discourse and understanding of the project that the material contained in this Addendum be provided to the citizens of Redwood City and the general public. Thus, this Addendum is being circulated for public review for a 28-day period. Written comments on this document may be submitted to the City through June 9, 2003 at the following address:

Public Works Services Department  
1400 Broadway  
Redwood City, CA 94063

It is anticipated that the City Council will take action on the recycled water project in the July-August, 2003 timeframe. In accordance with CEQA Guidelines Section 15164(d), the Council will consider the Addendum with the adopted MND prior to making a decision on the project.

*For additional copies of this Addendum, call Public Works Services at (650) 780-7464, or download files from the City's website: <http://www.redwoodcity.org/water/index.html>*

# Section 2 – Contents of Addendum

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## **Previous Environmental Documentation**

As indicated in Section 1, an IS/MND for the recycled water project was prepared and circulated for public review, and was adopted by the Planning Commission on August 6, 2002. The Planning Commission staff report and minutes from the meeting of August 6, 2002 are included in this Addendum as Appendix A. The IS/MND is not included with this Addendum, but can be obtained at City Hall (office of the City Clerk, 1017 Middlefield Road, Redwood City) or from the City's website: <http://www.redwoodcity.org/water/index.html>.

## **September 16, 2002 Public Information Forum**

Many of the public's issues and concerns about the project were raised and discussed at the September 16, 2002 Public Information Forum conducted by the City Council. A summary of the Forum is available at <http://www.redwoodcity.org/water/index.html>. VHS video tapes of the forum are also available at the Redwood City Main Library, Reference/Information Desk.

## **Issues Responded to in the Addendum**

Based on its review of the IS/MND and issues raised at the September 16, 2002 Public Information Forum and subsequent meetings, the City has determined that technical information about two primary issues should be included in this Addendum: 1) Water quality and public health, and 2) Recycled water quality and intended uses. In addition, a section on the City and SBSA's water quality assurance program is included in this Addendum. These items are addressed in Sections 3, 4, and 5, respectively, of this Addendum.

# Section 3 – Water Quality and Public Health

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## Definitions of Water Sources

For purposes of understanding the different types and qualities of water sources, the following definitions are provided with respect to Redwood City's current water supply setting.

**Potable Water Supply** - Water meeting the minimum requirements of the United States Environmental Protection Agency (U.S. EPA) and additional requirements of the State of California Department of Health Services (DHS) for drinking water. In Redwood City, 100% of the potable water supply is provided by through contract agreement with the City and County of San Francisco via the San Francisco Public Utility Commission (SFPUC), operator of the Hetch Hetchy regional water system. This water supply is widely considered to have very high water quality, probably within the top three water systems in the entire United States.

**Wastewater** - After water is used for municipal or industrial purposes it becomes wastewater. In Redwood City, wastewater is generated primarily by residential, commercial and office land uses, with very small contributions from light manufacturing and hospital uses. This wastewater source is typical of wastewater generated from an urban, residential based community. Wastewater is treated to the requirements of the State of California's Regional Water Quality Control Board (RWQCB) for protection of the environment and drinking water supplies. In Redwood City, SBSA is responsible for treating the City's wastewater and discharging the treated effluent to the San Francisco Bay. Because discharges to the San Francisco Bay are further regulated under the California Toxics Rule, SBSA provides even higher levels of treatment than typically required for wastewater, providing removal of heavy metals and other constituents. SBSA provides primary and secondary treatment followed by disinfection to remove solids, pathogens, viruses and other regulated and non-regulated contaminants before wastewater is discharged to the San Francisco Bay. Primary treatment is a physical process that removes suspended solids and most organic matter. Secondary treatment is a biological process that uses microorganisms to remove residual organic matter and suspended material. Disinfection kills pathogens and viruses.

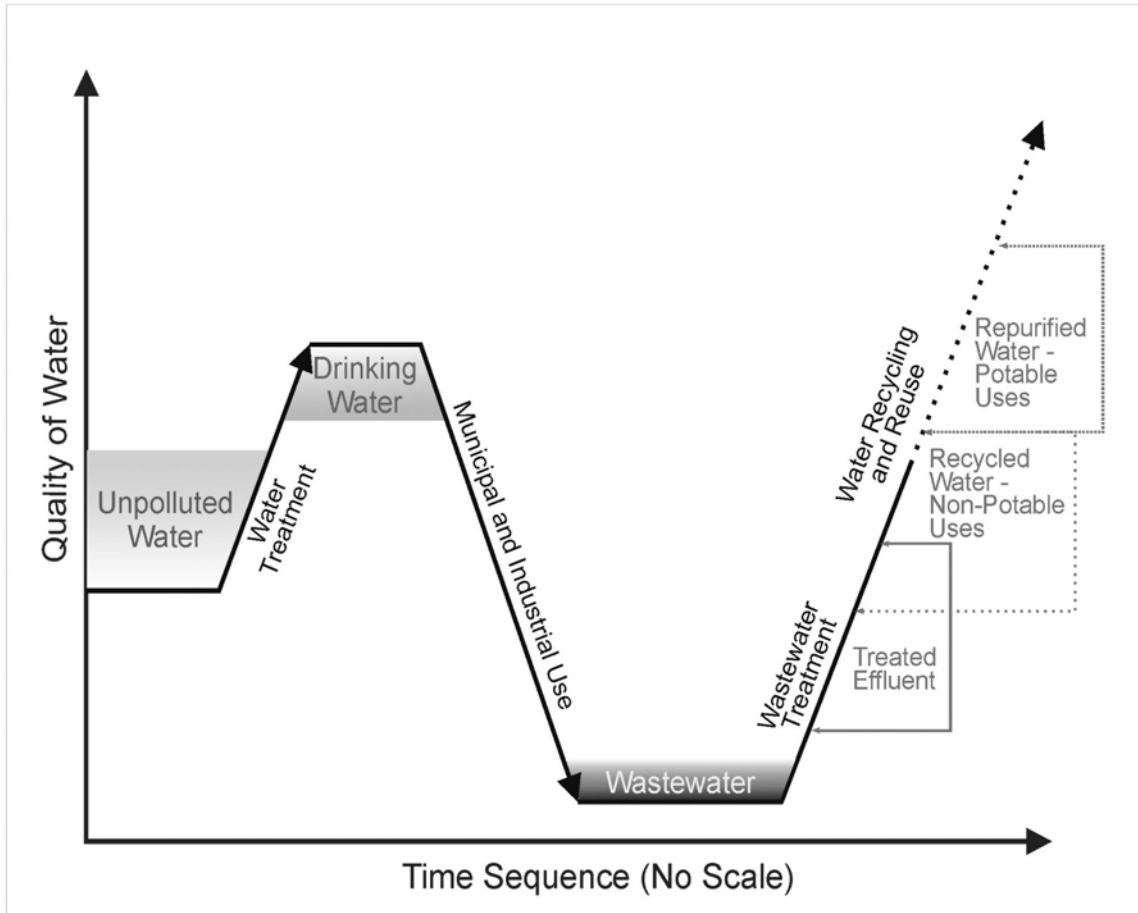
**Treated Effluent** - After wastewater is treated it becomes treated effluent, suitable for discharge to the environment. The SBSA outfall pipe is located approximately 6,000 feet off shore, 3.5 miles south of the San Mateo Bridge, in the deep water ship channel.

**Recycled Water** - Recycled water is produced from treated effluent, after several additional treatment steps are provided. Recycled water is also regulated and must comply with the minimum requirements of Title 22 California Code of Regulations, which is administered through the DHS and the RWQCB, the same entities that are responsible for protection of drinking water supplies and the environment. For purposes of Redwood City's proposed Recycled Water Project, recycled water would be produced at SBSA following additional tertiary treatment and disinfection steps as required to meet specific requirements for

beneficial uses. This additional treatment includes the addition of chemicals and coagulation to effectively remove very fine suspended particles through direct filtration. In addition, a higher level of disinfection is provided using chlorine, the same chemical used for disinfecting drinking water supplies. Recycled water has significantly higher water quality than treated effluent. According to the California Water Code, Section 13050(n): "Recycled water" means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource.

**Graphic Summary** - Figure 1 depicts water quality changes during municipal uses of water relative to levels of treatment.

**Figure 1 – Understanding the Relative Quality of Water Sources**



**Source:**  
 Water quality changes during municipal uses of water in a time sequence and the concept of water recycling (Asano, T., *Water Science & Technology*, Vol. 45, No. 8, p. 29, 2001.)

**Kennedy/Jenks Consultants**

Redwood City  
 Recycled Water Project

**Understanding The Relative Quality  
 Of Water Sources**

020539.09  
 April 2003

**FIGURE 1**

## Regulatory Requirements for Safe Operation of Recycled Water Projects

Recycled water in Redwood City is intended for specific non-potable uses as permitted under Title 22 California Code of Regulations, Division 4, Chapter 3 - Water Recycling Criteria, Article 3 - Uses of Recycled Water (March 20, 2001). These regulations set the requirements for the protection of public health and safety related to recycled water use. Refer to Figure 2 for a summary of these regulations. For each permitted use (i.e., irrigation, impoundments, cooling and other purposes), the specific level of treatment and water quality requirement is defined that must be met to achieve safe use and compliance with DHS and RWQCB regulations. In Title 22, there are four classifications for the level of treatment. Listed in order of lowest water quality to the highest water quality, these classifications include:

- Undisinfected Secondary Recycled Water
- Disinfected Secondary 23 Recycled Water
- Disinfected Secondary 2.2 Recycled Water
- Disinfected Tertiary Recycled Water

Of these classifications, Disinfected Tertiary Recycled Water in the State of California requires the highest level of treatment and establishes the most restrictive water quality requirements for any recycled water source in the United States. SBSA currently produces this level of disinfected tertiary recycled water for the First-Step Recycled Water Project that has been in operation for three years in Redwood Shores. This water is suitable for every use listed in Figure 2, without restriction, including irrigation of edible food crops.

Relevant definitions from the California Department of Health Services for "disinfected tertiary recycled water" are as follows:

### **60301.230. Disinfected tertiary recycled water**

"Disinfected tertiary recycled water" means a filtered and subsequently disinfected wastewater that meets the following criteria:

(a) The filtered wastewater has been disinfected by either:

(1) A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or

(2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

(b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

**60301.320. Filtered wastewater**

"Filtered wastewater" means an oxidized wastewater that meets the criteria in subsection (a) or (b):

(a) Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:

(1) At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in traveling bridge automatic backwash filters; and

(2) So that the turbidity of the filtered wastewater does not exceed any of the following:

(A) An average of 2 NTU within a 24-hour period;

(B) 5 NTU more than 5 percent of the time within a 24-hour period; and  
*California Health Laws Related to Recycled Water June 2001 Edition Title 22*

(C) 10 NTU at any time.

(b) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:

(1) 0.2 NTU more than 5 percent of the time within a 24-hour period; and

(2) 0.5 NTU at any time.

**60301.650. Oxidized wastewater.**

"Oxidized wastewater" means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

The SBSA treatment process utilizes the dual biological "secondary treatment" process of trickling filters and activated sludge to produce the "oxidized wastewater". The oxidized wastewater is then filtered through gravity-fed dual media filters. The filter media is comprised of a 12" layer of supporting gravel, a 12" layer of sand and a 24" layer of anthracite filter coal. In the First Step Recycled Water project, the oxidized filtered water is disinfected with sodium hypochlorite in a dedicated chlorine contact system before being pumped to the distribution system or to storage. It is anticipated that sodium hypochlorite will also be used in the Redwood City Recycled Water Project.

### **Intended Purpose and Use of Recycled Water in Redwood City**

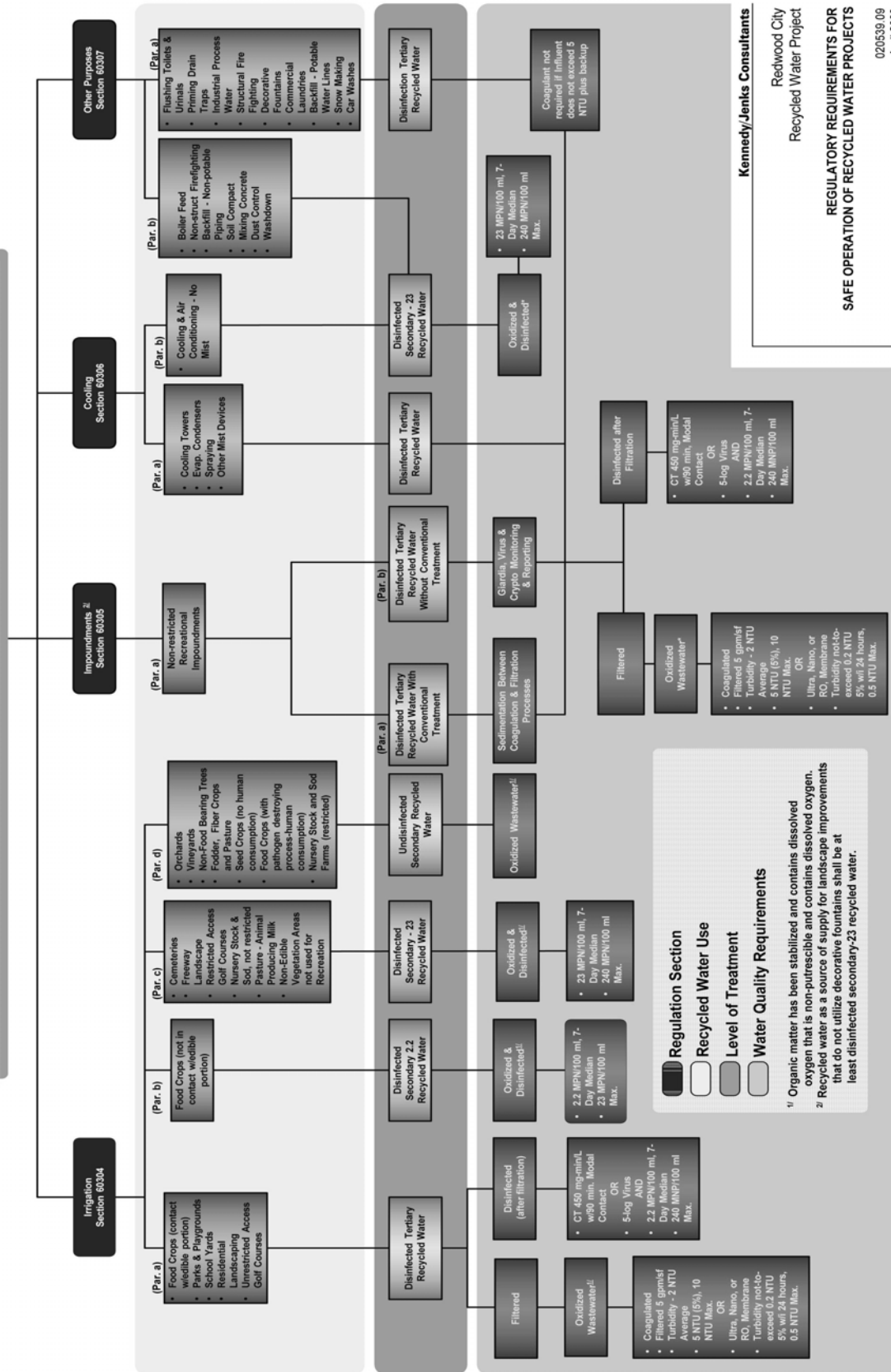
Recycled water is intended to be a source of drought-proof, non-potable water supply in Redwood City. As described in the IS/MND, the *Final Report for the Water Recycling Feasibility Study for Redwood Shores* (Kennedy/Jenks Consultants, January 2002), and the subsequent *Final Report for the Water Recycling Feasibility Study for Redwood City* (Kennedy/Jenks Consultants, August 2002), a recycled water project can be implemented that will supply approximately 1,950 acre feet per year (AF/yr) of water for various non-potable uses. In combination with passive and active water conservation efforts it is anticipated that the City can reduce its current 1,000 AF/yr overdraft on the Hetch Hetchy regional water supply and provide sufficient water supply for the City's planned growth through the year 2020.

The proposed Recycled Water Project would include the following non-potable uses identified previously in Figure 2:

- **Irrigation** – the largest use of recycled water will be for irrigation of parks and playgrounds, schoolyards, residential landscaping, and street/highway landscapes.
- **Impoundments** – some recycled water could be used for landscape impoundments at the SBSA site or other sites in the future. (“An impoundment is defined in Title 22 as “An impoundment in which recycled water is stored or used for aesthetic enjoyment or landscape irrigation, or which otherwise serves a similar function...”)
- **Cooling** – some recycled water could be used for cooling purposes in existing or new commercial/office buildings.
- **Other Purposes** – recycled water could be used for other purposes such as construction water for backfill and soil compaction, street and walkway wash down, dust control, concrete mixing, internal toilet flushing in new commercial/office buildings, and in decorative fountains.

Figure 2 – Regulatory Requirements for Recycled Water Projects

**TITLE 22, CALIFORNIA CODE OF REGULATIONS  
DIVISION 4, CHAPTER 3, WATER RECYCLING CRITERIA  
Article 3 - Uses of Recycled Water (March 20, 2001)**



**Note: SBSA produces Disinfected Tertiary Recycled Water that is suitable for every use listed on this figure, without restriction.**

## **Redwood City / SBSA First Step Recycled Water Project**

As stated on page 3 of the IS/MND, the proposed Redwood City Recycled Water Project represents a continuation of the "First Step Project," a pilot recycled water project initiated in spring 2000 by the City and SBSA. SBSA operates a publicly owned wastewater treatment plant at the eastern end of the Redwood Shores peninsula. These facilities produce a high level of wastewater treatment, as required by regulatory agencies for the discharge of effluent to the San Francisco Bay. The RWQCB encouraged SBSA to take a leadership role in developing a pilot water recycling project concurrent with the Board's approval of SBSA's Stage 2 Wastewater Treatment Facilities Expansion project in 1997.

The First Step Project is currently in operation, and consists of temporary treatment facilities and permanent underground pipelines that deliver recycled water to landscape customers at the eastern end of the Redwood Shores peninsula near the SBSA plant. The eastern end of Redwood Shores has existing dual water piping facilities that were installed in the streets as part of residential and other development since the mid-1980s. The intent of the project has been to demonstrate the feasibility of producing recycled water at SBSA that meets California's Title 22 environmental health requirements for disinfected tertiary recycled water established by the DHS, while using it successfully in the community, primarily for landscape irrigation. The project was designed with the intent of providing recycled water for two years, using the existing temporary facilities with minimal modifications. The First Step Project has been successful in demonstrating use of recycled water, and has been extended two more years. It will operate through the 2003 irrigation season. A Categorical Exemption (CE) for the First Step Project was prepared in accordance with CEQA statutes and guidelines in October 1999, with SBSA as the Lead Agency and the City as Responsible Agency.

## **Safety Record of Recycled Water Projects in California**

According to the *California Municipal Wastewater Reclamation Survey*, May 24, 2000, by the Office of Water Recycling, California State Water Resources Control Board, 402,000 AF/yr of recycled water was being used in California at that time (see Appendix B). The May 2003 final report, *Recommendations of California's Recycled Water Task Force – Water Recycling 2030* is (available on the State website at [www.owue.water.ca.gov/recycle/taskforce/taskforce.cfm](http://www.owue.water.ca.gov/recycle/taskforce/taskforce.cfm)) states "Currently, California is recycling approximately 500,000 acre-feet of water per year for various uses." The report points out that by 1952, 107 California communities were using recycled water for agricultural and landscape irrigation. In its letter of transmittal to the State legislature, the Task Force makes the statement, "The Task Force believes that the recommendations in this report will improve the status of recycled water in the State. We are convinced that it is possible to substantially advance the safe use of recycled water, and we look forward to helping you implement the recommendations."

The 40-member Task Force was created and formed when the Governor signed Assembly Bill 331 into law in October 2001. Over the 12 months that the Task Force was active, it identified and adopted 25 issues with respective recommendations to address obstacles, impediments, and opportunities for California to increase its recycled water usage. Not one of the issues identified was related to the need for changes in protection of public health for

recycled water uses under consideration in Redwood City. However, several of the Task Force recommendations do address the need for more public education and awareness. Only potential indirect potable use in other parts of the State was determined to require a recommendation.

There is no data indicating that the proper use of recycled water for intended purposes has caused any illness or compromised human health in California. As discussed in subsequent pages of this section, there are no data indicating that the use of recycled water from the SBSA wastewater treatment plant for landscape irrigation in urban areas will present a health risk to humans.

### **Representative Recycled Water Projects**

The proposed Redwood City Recycled Water Project is similar to other recycled water projects that have been successfully operated for up to twenty years in the San Francisco Bay area. Several representative projects were reviewed and compared to the proposed Redwood City Project. The representative projects were selected because their location, climate type, land use, wastewater source, level of wastewater treatment, level of tertiary treatment, and recycled water uses are nearly identical to those in Redwood City. The representative project comparison is summarized in Table 1.

**Table 1 – Comparison of Redwood City’s Proposed Recycled Water Project to Representative Bay Area Recycled Water Projects**

<b>Parameters</b>	<b>Marin Municipal Water District</b>	<b>South Bay Water Recycling/ City of Santa Clara<sup>1</sup></b>	<b>City of Sunnyvale</b>	<b>City of Palo Alto</b>	<b>SBSA Redwood City First-Step Project</b>
Years in Operation	20	14	15	15	3
Community Population	175,000	1,060,000	132,000	59,000	80,000
Capacity (AF/yr & MGD)	2 MGD 870 AF/yr	10 MGD 6,000 AF/yr	8 MGD 2,170 AF/yr	4 MGD	0.25 MGD 73 AF/yr (3.7 MGD or 1,946 AF/yr proposed)
No. of Existing Customers	318	390	80	3	12 (120 proposed)
<b><u>Uses:</u></b>					
Schoolyard Irrigation	X	X	X		Proposed
Park/Golf Course Irrigation	X	X	X	X	X
Streetscape Irrigation	X	X	X		X
HOA Irrigation	X	X			Proposed
Landscape Impoundments	X	X	X	X	X
Car Washes/Laundries	X				
Industrial Uses & Cooling	X	X	Proposed		Proposed
Internal Plumbing/Toilets	X	X	X		Proposed

<sup>1</sup> The City of Santa Clara began delivering recycled water in 1989 and is now a partner in South Bay Water Recycling.

<b>Table 1 (cont.) Parameters</b>	<b>Marin Municipal Water District</b>	<b>South Bay Water Recycling/ City of Santa Clara<sup>2</sup></b>	<b>City of Sunnyvale</b>	<b>City of Palo Alto</b>	<b>SBSA Redwood City First- Step Project</b>
<b><u>Performance Criteria:</u></b>					
No. of Permit Violations	none	none	none	none	none
No. of Reported Illnesses	none	none	none	none	none
No. of Successful Claims or Lawsuits	none	none	none	none	none
No. of Disconnects	none	none	none	none	none
No. of Landscape Failures	none	none	none	none	none
Initial Public Concerns / Resistance?	yes	yes	yes	yes	yes

---

<sup>2</sup> The City of Santa Clara began delivering recycled water in 1989 and is now a partner in South Bay Water Recycling.

## **Safety Record for the City of Redwood City, the SFPUC and the SBSA**

Public confidence in the agencies that directly serve water to a community is vital. While it is broadly understood that multiple State and federal agencies have regulatory authority over water and wastewater services, most citizens consider the integrity and performance of their local service providers when seeking the assurances they desire for protection of public health and safety. Therefore, the following summary information is provided in order to establish that Redwood City has a strong record of safety related to water and wastewater.

### **City of Redwood City Water Utility (municipal, retail water distribution system)**

According to the U.S. EPA Safe Drinking Water Information System (SDWIS):

- In the category of Health Based Violations of federal and state regulations; *“No health-based violations found. EPA has no record of any health-based violations reported by the state for this water system (1993 and later violations are included in this report).”*
- In the categories of Monitoring, Reporting and Other Violations, since 1993, a single non-significant monitoring violation occurred (April 2000).

In an annual Water System Inspection letter to the City of Redwood City dated February 22, 2001, California Department of Health Services District Engineer Eric Lacy, P.E. stated, “The water system is in excellent condition and operated in a professional and competent manner. The storage facilities and pump stations are in good physical condition, clean, and well maintained. The City’s written plans for sampling, emergency operation, valve exercising, and flushing are sufficient and current. The City maintains excellent and quickly accessible records on operations and maintenance, and water quality monitoring.”

### **San Francisco Public Utilities Commission (San Francisco Hetch Hetchy Regional Water System - wholesale)**

According to the U.S. EPA Safe Drinking Water Information System (SDWIS):

- In the category of Health Based Violations of federal and state regulations; *“Amount of contaminant exceeded safety standard (MCL) or water was not treated properly. Treatment Technique (Surface Water Treatment Rule) violations occurred in June 1998, August 1995, March 1995 and June 1993.”*
- In the categories of Monitoring, Reporting and Other Violations, since 1993, two non-significant monitoring violations occurred (August 1996 and Sept. 1993).

Because the SFPUC regional water system is an unfiltered surface water source of potable water, it is prone to occasional excessive turbidity events, usually caused by sudden rain storms or snow melt in the Hetch Hetchy watershed. The violations above reflect such events, which compromised water quality for short durations. The effect of these events on water quality in Redwood City was visibly discernable cloudiness in the water, lasting from 12 to 48 hours. No action was required of Redwood City, other than responding to customer inquiries.

## **South Bayside System Authority**

**Regulatory Compliance:** The overriding objective that determines the focus of SBSA's activities is consistent, long term, reliable compliance with all regulatory requirements. In addition to the traditional emphasis of wastewater agencies on National Pollutant Discharge Elimination System (NPDES) permit compliance, SBSA places equal value on compliance with air quality, employee safety and hazardous materials compliance.

SBSA has a long history of consistent NPDES permit compliance. During the past three years there have been no violations of NPDES permit requirements.

Regulatory compliance is a key consideration in many other SBSA activities. The surface runoff from rainfall and spills is 100% contained on the SBSA site and returned to the plant for treatment. Toxic air emissions are kept below the level considered "not significant" by the Bay Area Air Quality Management District regulations. This level was established by a comprehensive air toxics inventory and risk assessment that evaluated the risk from SBSA emissions on the nearest residential zoned property. The odor control program is based on an objective of keeping the frequency of detectable odors in the nearby residential area to less than one each three years.

A Recycled Water Policy was adopted by the SBSA Commission that establishes SBSA as the technical and institutional leader in the SBSA service area on recycled water, and states that SBSA will provide legislative, regulatory and technical expertise coordinating public and private participation in developing recycled water projects. The First Step Recycled Water project was initiated in 2000 to develop and refine inter-agency relationships with the water purveyor and regulatory agencies, and to establish customer confidence and landscape maintenance strategies for individual use sites. The project has successfully completed its third year with 100% compliance with all regulatory requirements.

**Performance Recognition:** SBSA received the Association of Metropolitan Sewerage Agencies (AMSA) "Gold Award" for 100% permit compliance in year 2001 and 2002. SBSA was selected the California Water Environment Federation Plant-of-the-Year in 1996 and 2001. Only two other treatment plants in the state have been repeat winners of this statewide award.

## Discussion of Specific Issues

This section of the Addendum contains responses to specific issues raised during public discussions on the proposed recycled water project. The discussions are organized as follows: a statement of the issue, its public concern, background information on the issue, findings and conclusions, and references used in the discussion. The author of each discussion is also identified.

### Risk from Pathogens (James Crook, Ph.D., P.E.)

**Statement of the Issue:** Will use of recycled water for landscape irrigation project present a public health risk to the community from microbiological contaminants?

**Public Concern:** Recycled water used for landscape irrigation may contain pathogenic microorganisms that are harmful to humans.

**Background:** The infectious agents that may be present in untreated municipal wastewater can be classified into three broad groups: bacteria; parasites (protozoa and helminths); and viruses. There are several pathways (ingestion, inhalation, contact) through which an individual can acquire disease from recycled water – but only if pathogens are present in sufficient numbers to initiate disease in susceptible individuals. In order to insure public health protection where recycled water is used for landscape irrigation in urban areas, it is important to control pathogenic microorganisms by effective treatment and disinfection.

The California Department of Health Services (DHS) has adopted Water Recycling Criteria<sup>1</sup> to ensure that the use of recycled water for irrigation in urban areas does not impose undue risks to health. The criteria prescribe treatment processes, water quality limits, treatment reliability requirements, and use area controls for several types of recycled water applications, including the irrigation of residential landscaping, parks, playgrounds, and schoolyards. The criteria are based on research, demonstration studies<sup>2,3</sup>, experience at operating recycling plants, attainability, and good engineering practice. They prescribe criteria that are intended to result in recycled water that does not contain measurable levels of pathogens. Although incidental, infrequent ingestion of tertiary treated reclaimed water would not present unreasonable health risks from microbial pathogens or chemicals, the DHS criteria also include use area requirements as an added safety measure to reduce potential ingestion of the recycled water. Measures include: confinement of runoff to the approved recycled water use area unless otherwise approved by the regulatory agency; prohibition of reclaimed water spray, mist, or runoff in dwellings, designated outdoor eating areas or food handling facilities; protection of drinking water fountains against contact with recycled water; signs at sites using recycled water that are accessible to the public; prohibition of hose bibs on recycled water piping systems accessible to the public; and conformance to cross connection regulations. In addition, the California Health and Safety Code requires a color-coded labeling or marking system for pipes and appurtenances that clearly distinguishes recycled water from potable water.

The ability to reliably produce recycled water that is safe for the intended use has been demonstrated throughout California at full-scale facilities having the same treatment

processes, water quality limits, and reliability features as those at the SBSA wastewater treatment plant. For example, during a 10-year study<sup>4</sup> of 6 tertiary treatment plants (similar to the SBSA plant) operated by the County Sanitation Districts of Los Angeles County, only 1 of 590 samples of recycled water was found to contain a measurable level of enteric viruses, while a 1997-1999 study<sup>5</sup> at the Salinas Valley Reclamation Project did not detect any *E. coli* 0157:H7, *Cyclospora*, *Salmonella*, helminth ova, viable *Giardia*, or culturable natural (*in situ*) viruses. Only an extremely low number of *Cryptosporidium* (in only two instances) was detected in any of the tertiary treated reclaimed water samples, and it was not determined whether the oocysts were viable or nonviable.

Risk assessment models have been used to estimate human health risk associated with various applications of recycled water. For example, one study<sup>6</sup> directed at golf course irrigation using tertiary effluent (similar to that from the SBSA plant) indicated that the annual risk of contracting at least one infection from exposure to the water was less than that considered acceptable for drinking water. Maximum contaminant levels for drinking water are typically based on a one in ten thousand ( $1 \times 10^{-4}$ ) acceptable risk level. A similar study<sup>7</sup>, which took treatment reliability into account, determined that the annual risk of enteric virus infection of using tertiary recycled water for golf course irrigation ranged from 1.4 in one million to 5.5 in ten million episodes ( $1.4 \times 10^{-6}$  to  $5.5 \times 10^{-7}$ ) assuming a 95% confidence level. The apparent risk level from virus infection is approximately 100 to 1,000 times safer than the California health based standards. Another study<sup>8</sup> conducted at the Irvine Ranch Water District (again, a treatment facility with the same treatment and quality requirements as those at SBSA) using an epidemiologically based risk assessment model, determined that swimming in an impoundment filled recycled water did not increase the predicted incidence levels above those obtained when the impoundment was filled with water of non-sewage origin.

Exposure to recycled water in spray form (aerosols) has often been cited as a public health concern. A review of the scientific literature does not indicate that there have been any reported documented disease outbreaks in the U.S. resulting from spray irrigation with disinfected recycled water, including recycled water that has received considerably less disinfection than that provided at the SBSA facility.

There are urban irrigation projects in several states (e.g., Arizona, Florida, and Texas) that have less restrictive treatment and disinfection criteria than those imposed on projects in California, and the literature reviewed did not reveal any documented instances of illness resulting from recycled water in these or other states. This is particularly significant in Florida's case, since Florida has had large-scale dual water systems providing recycled water for irrigation throughout communities since the mid-1970s. St. Petersburg, for example, has been using recycled water for multiple uses within the city since 1977 and currently has more than 10,000 individual residential customers where recycled water is used for lawn irrigation. The Irvine Ranch Water District (IRWD) is one example of a large dual water system in California. IRWD has been in operation since 1977 and currently uses about 15 million gallons per day of recycled water for several applications, including landscape irrigation of residential lawns, parks, and schoolyards. The County Sanitation Districts of Los Angeles County (which has the same recycled water treatment and quality

requirements as SBSA) also provides large amounts of recycled water for landscape irrigation. The final draft of a report by the California Department of Water Resources Recycled Water Task Force states that, in 2000, approximately 80,000 acre-feet (70 million gallons/day) of recycled water was used for landscape irrigation in the state.

A correlation can be made between EPA's recommended microbial standard of 126 *E. coli*/100 mL for recreational waters<sup>9</sup> (swimming allowed with some ingestion anticipated) and recycled water. EPA's standard is much less restrictive than the total coliform standard of 2.2/100 mL required by DHS for irrigation with recycled water in urban areas and met in the SBSA recycled water (*E. coli* is a subset of the total coliform group). Even though there will be no body contact activities associated with the use of recycled water in Redwood City and only incidental contact with the water, the microbial quality of the recycled water clearly is superior to the quality recommended by EPA for recreational waters.

**Findings:** Pathogens are present in untreated municipal wastewater but can be reduced to immeasurable levels by conventional wastewater treatment processes. There have been no documented cases of illness in California (or elsewhere in the U.S.) resulting from the use of recycled water to irrigate urban areas. The SBSA wastewater treatment plant conforms to all of the regulations contained in the California DHS *Water Recycling Criteria*, which are conservative from a public health standpoint.

**Conclusion:** Existing data indicate that the use of recycled water from the SBSA wastewater treatment plant for landscape irrigation in urban areas will be safe from infection or disease associated with pathogenic microorganisms.

#### References:

1. State of California. 2000. *Water Recycling Criteria*. Title 22, Division 4, Chapter 3, California Code of Regulations. California Department of Health Services, Drinking Water Program, Sacramento, California.
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4. Yanko, W.A. 1993. Analysis of 10 Years of Virus Monitoring Data from Los Angeles County Treatment Plants Meeting California Wastewater Reclamation Criteria. *Water Environ. Research*, 65(3):221-226.
5. Jaques, R.S., G.M. Antonz, R.C. Cooper, and B Sheikh. 1999. Pathogen Removal Effectiveness of a Full-Scale Recycling Plant. In: *Proceedings of WEFTEC '99*, October 9-13, 1999, New Orleans, Louisiana.
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9. U.S. Environmental Protection Agency. 1986. *Ambient Water Quality Criteria for Bacteria - 1986*. EPA A440/584-002, U.S. Environmental Protection Agency, Office of Water Regulations and Standards, Washington, D.C.

## Pharmaceuticals and Endocrine Disruptors (James Crook, PhD, P.E.)

**Statement of the Issue:** Do pharmaceuticals and endocrine disruptors present a health risk if recycled water is used for landscape irrigation?

**Public Concern:** Recycled water used for landscape irrigation may contain pharmaceutically active compounds and endocrine disruptors that could be harmful to humans.

**Background:** There has been a great deal of interest and, in some cases, concern, regarding human health effects associated with pharmaceuticals, hormones, and other organic wastewater contaminants. Chemicals that interfere with endocrine systems of humans and wildlife are termed endocrine disruptors (EDCs). Chemicals and pharmaceuticals in general that elicit a pharmaceutical response in humans are termed pharmaceutical active compounds (PhaCs). It should be noted that EDCs and PhaCs are not mutually exclusive classifications, as some, but not all, EDCs are also PhaCs. Endocrines are chemicals used by organisms to regulate important metabolic activities, such as ion balance, reproduction, basal metabolism and fight or flight responses, through changes in hormones secreted by the thyroid, parathyroid, pituitary, adrenal, sex, and other glands. Research has identified more than 60 pharmaceutically active compounds that impact the endocrine system of animals or humans in nanogram/liter (ng/L), i.e., one part per trillion, or lower concentrations in the ecosystem. In addition, pharmaceuticals and personal care products are sometimes called PPCPs, which comprise a very broad, diverse collection of thousands of chemical substances, including prescription and over-the-counter drugs, fragrances, cosmetics, sun screen agents, diagnostic agents, biopharmaceuticals, and many other compounds.

Most of the research to date has been directed at the presence, concentration, and effects of pharmaceuticals, personal care products, and endocrine disruptors – or their metabolites – on the aquatic environment, where these constituents have been shown to have adverse effects on aquatic animals such as frogs and fish. Less is known about the presence, concentration, and human health effects (including additive/synergistic effects) associated with these compounds resulting from long-term ingestion from potable waters and concerns have been raised.

Much of the current concern is based on the results of a nationwide reconnaissance of the occurrence of organic contaminants conducted by the U.S. Geological Survey in 1999-2000<sup>1</sup>. Samples collected from 139 streams in 30 states for 95 pharmaceuticals, personal care products, and known or potential endocrine disruptors found that 80% of the streams sampled contained at least one of the chemicals. While measured concentrations were generally low and rarely exceeded drinking water guidelines, drinking water advisories, or aquatic life criteria, many of the compounds do not have such guidelines established<sup>1</sup>.

Many commonly used pharmaceuticals in the United States are ubiquitous in wastewater effluents. In conventional wastewater treatment plants, they can be removed, or reduced in concentration, by microbial degradation, adsorption to particulates that are removed during

wastewater treatment, or by biotransformation. Research on wastewater samples collected at several wastewater treatment plants in California indicated that secondary effluent contains estrogenic hormone concentrations comparable to those that cause vitellogenesis (i.e., feminization) in fish and that filtration of secondary effluent (i.e., tertiary treatment) removes approximately 70% of the hormones from secondary effluent<sup>2</sup>. For example, the synthetic oral contraceptive 17 $\alpha$ -ethynyl estradiol occurs generally at concentrations less than 7 ng/L in wastewater effluent. This compound is suspected, in combination with the steroidal estrogens 17 $\beta$ -estradiol and estrone, of causing vitellogenin production (feminization) in male fish. While conventional secondary and tertiary treatment efficiently removes some pharmaceuticals, removal or reduction of others is highly variable<sup>4,5</sup>.

The release of pharmaceuticals and endocrine disruptors through municipal wastewater into the environment is potentially associated with a human health risk where water is subsequently used to augment a drinking water supply. It should be remembered that recycled water used for urban irrigation is not intended to be consumed; thus, the concerns associated with ingestion of water containing these contaminants do not apply to the Redwood City project. A review of the scientific literature does not provide any information indicating that pharmaceuticals and endocrine disruptors become concentrated on vegetation or in soil via irrigation with recycled water. Drugs detected in the environment are generally in the  $\mu\text{g/L}$  -  $\text{ng/L}$  (parts per billion - parts per trillion) range and many have short half-lives (i.e., they do not persist for long periods in the environment) and may not pose much acute risk<sup>3</sup>. Also, most pharmaceuticals and endocrine disruptors have low volatility or are nonvolatile and, thus, would not be expected to present a health concern from inhalation at spray irrigation sites.

**Findings:** Pharmaceuticals and endocrine disruptors in water have been shown to have adverse effects on aquatic animals. Human health effects associated with long term ingestion of these types of compounds – at the low concentrations potentially present in drinking water – have not been documented and are uncertain at this time. Contact with – or infrequent/inadvertent ingestion of – tertiary treated recycled water containing low levels of pharmaceuticals and endocrine disruptors would appear to present substantially less risk than that associated with long term ingestion of drinking water containing similar levels of such substances.

**Conclusion:** There are no data indicating that the use of recycled water from the SBSA wastewater treatment plant for landscape irrigation in urban areas presents a health risk from pharmaceuticals or endocrine disruptors.

#### References:

1. Kolpin, D.W., E.T. Furlong, M.T. Meyer, E.M. Thurman, S.D. Zaugg, L.B. Barber, and H.T. Buxton. 2002. Pharmaceuticals, Hormones, and Other Organic Wastewater Contaminants in U.S. Streams, 1999-2000: A National Reconnaissance. *Environ, Sci. Technol.*: 36(6)1202-1211.
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5. Ternes, T.A. 1998. Occurrence of Drugs in German Sewage Treatment Plants and Rivers. *Water Research*, 32(11):3245-3260.

## **Carcinogenic Compounds (James Crook, Ph.D., P.E.)**

**Statement of the Issue:** Do carcinogenic compounds present a health risk if recycled water is used for landscape irrigation in an urban area?

**Public Concern:** Recycled water used for landscape irrigation may contain carcinogenic compounds that are harmful to humans.

**Background:** Since chlorine is used for disinfection at the SBSA wastewater treatment plant for disinfection, there is the possibility that chlorine will react with organic and inorganic constituents in the water to create disinfection byproducts (DBPs) that are potentially harmful upon ingestion of the water. The DBPs of concern in drinking water include trihalomethanes, haloacetic acids, bromate, and haloacetonitriles. Data from various studies indicate that tertiary treatment of municipal wastewater (similar to that in place at SBSA) removes or reduces many of the compounds that react with chlorine to form DBPs and, thus, reduces the potential for DBP formation. DBP levels – as well as pesticide and heavy metal levels – in tertiary treated wastewater generally are below maximum contaminant levels (MCLs) in drinking water standards<sup>1</sup>. A review of the scientific literature provided no information on accumulation of DBPs on turf or soil, but many DBPs are volatile and would not be expected to accumulate on turf or in soil. While it is true that some DBPs remain unidentified and poorly characterized toxicologically, it should be noted that: (1) risk levels for contaminants in drinking water are based on consumption of 2 liters/day (0.5 gallons/day) of water by a 70-kilogram (150-pound) person for 70 years; and (2) recycled water in Redwood City will be used only for nonpotable applications.

N-Nitrosodimethylamine (NDMA) is an example of a probable carcinogen that has been identified in both recycled water and drinking water. In the past, NDMA was a key ingredient in the production of 1,1-dimethylhydrazine, a component of rocket fuel. It has also been used in battery, rubber, and polymer manufacturing, and as an additive to some lubricants. It is no longer produced commercially. NDMA is semi-volatile and has a high chronic and acute toxicity; levels needed to cause acute toxicity are much higher than those that have found in tertiary treated recycled water. It is classified by EPA as a probable human carcinogen with a one in a million ( $1 \times 10^{-6}$ ) lifetime cancer risk at 0.7 nanograms per liter (ng/L), i.e., 0.7 parts per trillion. This level is based on elicited *in vitro* genotoxicity and carcinogenicity effects in laboratory animals conducted over the past two decades. EPA has not adopted a primary drinking water standard for NDMA. The California DHS has set an action level of 10 ng/L in drinking water. Action Levels are health based advisory levels established by the California Department of Health Services for chemicals that lack maximum contaminant levels.

Several water supply agencies in California have observed the formation of NDMA after chlorine disinfection of source water<sup>2</sup>. While chlorination of surface waters used for drinking typically results in the formation of less than 10 ng/L NDMA, concentrations in tertiary treated wastewater can be much greater. The observation of NDMA is due to improvements in analytical techniques that have enabled detection of concentrations as low as 1 ng/L rather than changes in treatment techniques. In order to put the concentration

and health risk of NDMA in water in perspective, it should be noted that NDMA is common in food products such as fish, cheese, milk, cured meats, and beer. Average concentrations of NDMA measured in food have been shown to range from 90-100 ng/L for whole milk, 2,600-2,700 ng/L for bacon, and 50-7,700 ng/L for various beers<sup>3</sup>. It can also be found in tobacco smoke, cosmetics, and rubber products.

**Findings:** Several disinfection byproducts, such as the trihalomethanes, and other chemical contaminants are known to be carcinogenic upon long-term ingestion; however, a review of the literature provides no indication that they have been implicated as having any adverse effects resulting from nonpotable uses of recycled water, such as landscape irrigation. Most of these contaminants are present in tertiary treated wastewater at levels that are lower than maximum contaminant levels specified in drinking water standards. Fears of chronic health effects (associated with long term ingestion of water containing DBPs or other carcinogens) are unfounded for recycled water projects directed at nonpotable applications of the water, since there will be no long term ingestion of the recycled water.

**Conclusion:** There are no data indicating that the use of recycled water from the SBSA wastewater treatment plant for landscape irrigation in urban areas will present a health risk to humans from DBPs or other carcinogens.

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1. National Research Council. 1998. *Issues in Potable Reuse: The Viability of Augmenting Drinking Water Supplies with Reclaimed Water*. National Academy Press, Washington, D.C.
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3. Metropolitan Water District of Southern California. 2000. *Report on N-Nitrosodimethylamine (NDMA) in Metropolitan's Treated Water*. May 30, 2000, Water Systems Operations, Metropolitan Water District of Southern California, Los Angeles, California.

## **Exposure to Children (James Crook, Ph.D., P.E.)**

**Statement of the Issue:** Does the use of recycled water used for landscape irrigation present risks to children?

**Public Concern:** Recycled water used for landscape irrigation may contain microbial pathogens or chemical contaminants that are harmful to children.

**Background:** The issue discussions above conclude that landscape irrigation in Redwood City using recycled water from the SBSA wastewater treatment plant will not present health risks measurably different than those resulting from the use of potable water. These conclusions apply to all residents that live within or close to the proposed irrigation sites, including children. Recognizing that children may have more intimate contact with grounds irrigated with the recycled water, a further discussion documenting their safety is provided.

Children playing in turf irrigated with recycled water could come in contact with pathogenic organisms (if present in the water) or chemical contaminants by: ingestion of grass or soil; contact with turf, soil, or objects wet with recycled water or containing residue from recycled water; by inhalation of recycled water aerosols during spray irrigation; or by contact or ingestion of the recycled water directly from puddles, hose bibbs or other means. As stated in the preceding issue papers, pharmaceuticals and disinfection byproducts would not be expected to accumulate to levels on turf or in soil to levels that present health risks.

Additional safety measures will be imposed on the recycled water distribution system by Redwood City, including: color-coding all recycled pipes, valves, and appurtenances; prohibition of hose bibbs or above ground distribution piping systems to reduce the chance of misuse; prohibition of ponding and runoff of the recycled water; irrigation during off-hours to limit potential contact with the water; and inspection and surveillance activities.

The authors of the California DHS *Water Recycling Criteria* recognized during development of the criteria that the mechanisms for contact, ingestion, or inhalation described above can occur. They thus adopted criteria requiring a high degree of treatment and reliability to assure that recycled water used for landscape irrigation in urban areas is free of measurable levels of pathogenic microorganisms. California's water recycling criteria are among the most conservative in the U.S., and the SBSA facility is subject to those restrictive criteria. The literature reviewed did not reveal any documented instances of disease resulting from any of the many landscape irrigation projects in California or elsewhere in the U.S., where there are hundreds of sites using recycled water for the irrigation of parks, playgrounds, school yards, and residential lawns.

As stated in the preceding issue papers, the recycled water produced at the SBSA facility will meet most of the drinking water standards. Drinking water standards for most regulated contaminants are based on long-term ingestion, i.e., 2 liters/day (0.5 gallons/day) for 70 years by a 70-kilogram (150-pound) person. Therefore, infrequent incidental ingestion

of contaminants that may be present in the recycled water would not be expected to present acute or long term adverse health consequences at the concentrations likely to be present.

**Findings:** The recycled water from the SBSA wastewater treatment plant is subject to strict criteria to insure that it will not contain measurable levels of pathogenic microorganisms. Data from the SBSA facility indicate that all requirements are consistently met. Children's activities that may result in contact with the recycled water are expected and the water quality criteria to be met take this into account. A review of the scientific literature did not provide any documentation of illness or disease to children (or adults) resulting from any recycled water landscape irrigation project in the U.S.

**Conclusion:** The use of recycled water from the SBSA wastewater treatment plant for landscape irrigation in urban areas will not present health risks to children that are measurably different than any risks associated with irrigation using potable water.

## **Safety of Recycled Water for Irrigation of Landscaping (Bahman Sheikh, Ph.D., P.E.)**

**Statement of the Issue:** Is disinfected tertiary recycled water safe for irrigation of residential landscaping, parks, playgrounds and/or schoolyards?

**Public Concern:** Recycled water used for landscape irrigation could be harmful to humans if skin contact or ingestion occurs.

**Background:** The issue summarized above can be answered using at least four different approaches:

- **Public health approach** based on treatment technology, disinfection capability, and the documentation available to the public on hundreds of similar treatment systems currently in operation.
- **Exemplary approach**, based on the numerous other residential areas in California, Florida and other localities using similar quality recycled water over a long period of time.
- **Environmental contextual approach**, acknowledging the numerous sources of contamination of the landscape (domestic and wild animals, fertilizers, pesticides, herbicides, human activity) in contrast to the thoroughly disinfected recycled water supplied in closed pipes for irrigation.
- **Comparative approach**, reasoning that use of recycled water for landscape irrigation is on a lesser level of human exposure than its use for vegetable crop irrigation, where the vegetables are marketed for use in salads and other produce intended for raw and fresh consumption by humans – irrespective of their age, health, or immunity status.

In this discussion, the latter approach is adopted, focusing specifically on the experience gained over the last five years in Monterey County with use of disinfected tertiary recycled water for irrigation of raw-eaten food crops, such as lettuce, strawberries, celery, cauliflower, broccoli, etc. The recycled water used in Monterey County for irrigation of fresh-eaten vegetable crops is disinfected tertiary reclaimed water, with the same quality characteristics as the recycled water currently produced by SBSA serving the City of Redwood City's First Step pilot project.

Other farming areas using similar quality recycled water for irrigation of fresh vegetables are located in Sonoma County and in Orange County.

### **Motivation, History and Pilot Project**

The Monterey Regional Water Pollution Control Agency (MRWPCA) was formed in the early 1970s as a joint-powers agreement among eight cities<sup>3</sup>, Monterey County, and Fort Ord, to provide wastewater treatment, water reclamation, and effluent disposal for the

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<sup>3</sup> Cities represented in the MRWPCA are: Salinas, Pacific Grove, Monterey, Castroville, Moss Landing, Del Rey Oaks, Seaside, and Marina. Another member, Fort Ord has since been converted from military to civilian use, under the control of the California State University system.

entire Northern Monterey region. The U.S. EPA planning and construction grants that resulted in the regional wastewater management scheme included a strong provision<sup>4</sup> for reclamation and reuse of the effluent for agricultural irrigation. This was motivated by the relatively rapid rate of advance of seawater intrusion into the two confined aquifers supplying fresh water for domestic and agricultural needs in Northern Monterey County.

Seawater intrusion is a coastal phenomenon, caused by overdraft of the aquifers resulting in a hydraulic reversal of low and movement of saline water inland deteriorating water quality in near-shore wells. An eleven-year pilot project was conducted to determine and demonstrate the safety of using disinfected tertiary recycled water for irrigation of such raw-eaten vegetable crops as celery, lettuce, broccoli, cauliflower, and artichokes. The research team that planned and conducted the pilot project included scientists in the fields of agronomy, biology, public health engineering, sanitary engineering, and survey research<sup>5</sup>.

The research plan was discussed at length by local farmers, Monterey County Environmental Health Officer, Monterey County Farm Advisor, and other stakeholders who formed an oversight task force for the duration of the study. The task force reviewed project plans and made a large number of changes and additions to the research plan in order to make the results as credible and useful to the community as possible. The demonstration project was successfully concluded in 1987, conclusively demonstrating the safety of use of recycled water for irrigation of food crops. These results and conclusions were published in a comprehensive final report, in peer reviewed journals, and in numerous technical publications as well as presentations at national and international conferences. Some of these publications are included among the list of references at the end of this paper.

### **Overview - Project Implementation**

The Monterey County Water Recycling Projects comprise a partnership between the Monterey County Water Resources Agency (MCWRA) and the MRWPCA. The partnership was formed in 1992, resulting in a \$75-million project, including tertiary treatment facilities, a 45-mile pressurized distribution system, and 22 supplemental wells. The purpose of the projects is to supply irrigation water to about 12,000 acres of farmland in the northern part of Salinas Valley. The project began full-scale operation in 1998 and currently provides about 13,000 acre-ft per year of recycled water, with a peak production rate of almost 30 million gallons per day. The project is designed for ultimate capacity of 20,000 acre-ft per year with future provisions for storage of a portion of the winter flows for summer use. Crops grown currently include strawberries, lettuce, broccoli, celery, cauliflower, and artichokes.

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<sup>4</sup> These provisions arose from regional planning for long-term wastewater management in the basin, and were a result of recognition of the water shortage conditions in the region and the resultant over-pumping of the local coastal aquifers for domestic and agricultural uses. Reuse of reclaimed water was made a grant condition for the construction of the Regional Treatment Plant by the State Water Resources Control Board—as long as reuse was shown to be viable and economically feasible. Community involvement in the planning process was the key to the ultimate viability and feasibility of the water reuse plans.

<sup>5</sup> Key members of the research team included Dr. Bahman Sheikh (agronomist/soil scientist, project manager, and author of this paper), Professor Robert C. Cooper (public health scientist—now, Emeritus, UC Berkeley), and Dr. Robin Cort (biologist, environmental scientist, with Parsons Engineering Science).

## **Public and Customer Perception**

Initially, the majority of the farming public was skeptical, with a few vocal and active opponents. However, the pilot project, known as Monterey Wastewater Reclamation Study for Agriculture (MWRSA) underwent significant efforts to educate them that recycled water meeting California's strict Title-22 regulations would be safe and wholesome for use in irrigation of food crops and for long-term productivity of their soils. Potential impact of use of recycled water on sale of the crops to the public was a more complicated concern to address. A market analysis, focusing on major wholesale buyers in large metropolitan areas in the United States (New York, Chicago, Los Angeles, San Francisco), discovered that the market was not affected by the type of irrigation water used, as long as the irrigation water met regulatory requirements and as long as no labeling of the produce was required. It was established that both of these conditions were met. Over the past five years, since the project has been fully operational, there have not been any negative impacts on the sale of crops to the wholesale or retail market. Neither has there been a need for labeling the produce as having been irrigated with recycled water<sup>6</sup>. Public health agencies agreed to waive the labeling requirements around the farms using recycled water, as long as access to private property was restricted with appropriate signs. This was deemed necessary to avoid giving the public the incorrect impression that use of the recycled water for irrigation of food crops was in any way unsafe.

The agencies involved have a detailed emergency plan ready for implementation in case there are reports that implicate the recycled water in any crop contamination cases that might arise in the future – either as a rumor, intentional misinformation, or an unrelated actual contamination. The plan has not yet been needed to be implemented – after five years of using recycled water. However, it is continually updated and kept in readiness mode, in large part to ensure the farmers that their investments will be protected.

Professor William Bruvold conducted extensive survey research throughout California in the 1970s to determine the level of public acceptance of various uses of recycled water. He found an inverse correlation between acceptance and the level of intimacy of use of reclaimed water. For example, use for drinking was least acceptable (44 percent) and irrigation of landscapes, including golf courses, most acceptable (98 percent). Irrigation of vegetables was acceptable to 88 percent of the respondents<sup>7</sup>. These early findings have since been confirmed by numerous recent surveys conducted in different parts of the country, including one in the City of San Francisco<sup>8</sup>. The percentage of San Franciscans surveyed who “strongly supported” or “moderately supported” using recycled water for watering yards in residential neighborhoods was 85 %.

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<sup>6</sup> Labeling of a product is required when a potential or actual health or safety hazard is proven; for example, sugar, fat, salt, nicotine, etc, are known to pose significant health risk to humans when consumed in food or tobacco products, hence the regulatory requirement for labeling of those products. No potential or actual public health risks have been proven with use of recycled water for any of its allowed applications; therefore, there has never been a regulatory requirement for labeling any agricultural product irrigated with recycled water.

<sup>7</sup> Bruvold, W. H., “Public Attitudes toward Reuse of Reclaimed Water”, *contrib. Univ. Calif. Water Resource. Cent.* 173, 1972.

<sup>8</sup> Public Affairs Management; and Public Research Institute, San Francisco State University, “Assessing Public Opinion Regarding the Recycling of San Francisco's Treated Wastewater: A Survey of San Francisco Neighborhoods”, August 1995.

The agencies involved in implementing the Monterey County Water Recycling Projects have prepared a number of public information materials and strategies to avert the possibility of rumors and unfounded fears from causing economic harm to the growers. These preparations include:

- Project educational brochures
- Worker safety video and brochure
- Produce seller training
- Updated marketing study
- Briefing State regulatory officials
- Briefing produce trade organizations
- Utilizing world-class experts as advisors on pathogens, soil science.
- User booklet
- Reference book
- Emergency response plan

### **Ensuring and Documenting Food Safety**

From the beginning, food safety has been a primary concern of the MRWPCA and its partners in the water recycling project. In the early planning stages, a five-year pilot project was conducted in which the same crops were grown in rotation in 96 replicated randomized plots, some irrigated with recycled water and some with well water. At each harvest, samples were taken from the crops, soils, irrigation waters, and runoff water and analyzed for microbiological and chemical parameters<sup>9</sup>. Statistical tests were performed on the results to determine if any differences might be attributed to use of recycled water. Over the five year period, no such differences were observed and none of the monthly samplings of recycled water over the five-year period was positive for virus.

Prior to start of large-scale use of recycled water, additional food safety tests were conducted to determine the ability of the treatment process to inactivate pathogenic organisms such as *E. Coli* 0157:H7, *Cyclospora*, *Giardia*, *Cryptosporidium*, *Salmonella*, and *Shigella*. The results clearly indicated that the recycled water was as safe as any other source of irrigation water – if not safer than some<sup>10</sup>.

Over the last five-year period of full-scale irrigation on 12,000 acres of vegetable crops with recycled water, samplings of recycled water for pathogenic microorganisms were continued, even though they were not required by the regulatory agencies – in this case, the Regional Water Quality Control Board and the Monterey County Environmental Health Department. This was done to further verify the continued safety of recycled water, and to give

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<sup>9</sup> Constituents and parameters tested on water, crops, and/or soil samples included the following: coliform (including fecal) bacteria, virus, parasites, pH, electrical conductivity, calcium, magnesium, sodium, potassium, carbonate as CaCO<sub>3</sub>, bicarbonate as CaCO<sub>3</sub>, hardness as CaCO<sub>3</sub>, nitrate as N, ammonia as N, total phosphorus, chloride, sulfate, boron, total dissolved solids, biochemical oxygen demand (BOD), adjusted SAR, MBAS, cadmium, zinc, iron, manganese, copper, nickel, cobalt, chromium, lead, crop yield, shelf life, and a number of crop quality characteristics.

<sup>10</sup> Surface water sources commonly used for irrigation are routinely contaminated with animal droppings and runoff from adjacent areas. Tertiary recycled water, by contrast, is treated, disinfected, and delivered in closed pipes. Safety of recycled water, by now, has been corroborated by intensive studies in other areas, and by the track record of some 250 agencies producing and reusing similar disinfected tertiary recycled water.

additional confidence to the growers that they were receiving a reliably safe source of water. The results continue to corroborate earlier conclusions reached during the pilot study and during the run-up to full-scale irrigation with recycled water.

In addition to these intensive tests for food safety, the Monterey County Environmental Health Department has taken regular samples of recycled water for analysis in their own laboratories. The results of these independent tests have consistently corroborated those performed by the Agency and its contractors.

Over the past five years, thousands of tons of vegetables have been harvested from the 12,000 acres irrigated with disinfected tertiary recycled water and sold on the open market throughout the country. Wholesale buyers and markets are aware of the source of water used for irrigation of these crops, and as long as food safety is assured by the regulatory agencies, they have no qualms about buying and marketing the produce. Some of the produce they buy and market comes from foreign countries where the sources of irrigation water are of far lesser (and far less regulated and monitored) quality.

Even though a mandatory use ordinance is in effect in the service area, it has not been necessary to invoke the mandate. Within the 12,000 acres irrigated with recycled water, 95 percent of the growers voluntarily use recycled water for irrigation.

#### **Water Quality Assurance**

An enhanced water quality assurance program has been initiated with the following components:

- Source Control
- In-Plant Monitoring
- Equipment Redundancy
- Water Storage Monitoring
- Distribution System Monitoring
- Worker Safety Program
- Product Safety Testing
- Water Quality Advisory Committee

**Findings:** Over the five-year operational phase of the Monterey County Water Recycling Projects, there have been no reports of any public health problems connected with the use of recycled water for irrigation of vegetable crops. The state and local public health officials have been involved in monitoring the system. In addition, the Monterey County Environmental Health Department has performed independent tests of water quality for the presence of indicator microorganisms. The results have verified the monitoring results obtained by MRWPCA. Personnel from the Monterey County Environmental Health Department recently participated in a tour of the project with a group of out-of-state visitors and responded to the visitors' questions with positive reports about the safety of recycled water used for irrigation.

**Conclusion:** The following conclusions are based on the operational record of the Monterey Water Recycling Projects, ongoing monitoring studies, and its predecessor five-year field pilot and demonstration project:

1. Disinfected tertiary recycled water is safe. The water is virtually pathogen-free and safe for direct contact with humans, such as in breathing sprinkler aerosols.
2. Use of recycled water for irrigation of raw-eaten food crops is safe for consumers of raw-eaten food crops thus irrigated.
3. Since use of recycled water for food crop irrigation is demonstrably safe, its use for the less-intimate uses, such as landscape irrigation, is by comparison deemed equally safe.
4. Public and consumer acceptance of food grown with recycled water has not been an issue. Food safety has been scientifically documented and therefore labeling has not been required.
5. Posting of sites with warning signs sends a mixed message to the general public. Posting is required by existing regulations to prevent unauthorized use of recycled water for drinking<sup>11</sup>. Flexibility in the design, wording, and color scheme of signs is feasible and can result in greater public acceptance.

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<sup>11</sup> This requirement is intended to add an additional layer of conservatism to the safe use of recycled water, even though a number of accidental and intentional illegal cross-connections (and the resultant unwary consumption of recycled water) have not been traced to any documented negative outcomes.

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8. Sheikh, B., Cort, R. P., Kirkpatrick, W. R., Jaques, R.S., Asano, T. 1990. "Monterey Wastewater Reclamation Study for Agriculture." *Research Journal WPCF*, 26(3): 216-226.
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11. York, David W., "Protozoan Pathogens: A Comparison of Reclaimed Water and Other Irrigation Waters", in Conference Proceedings of Water Reuse '98, Joint AWWA-WEF sponsored conference in Orlando, Florida, February 1-4, 1998.

# Section 4 – Recycled Water Quality and Intended Uses

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## Recycled Water by Uses

This section provides supplemental technical information for each intended use of recycled water being considered in Redwood City. When properly managed and monitored, recycled water will result in a dependable and safe new water supply, and will reconcile the existing imbalance between the City's water supply and demand.

As described in Section 3, Disinfected Tertiary Recycled Water generated at SBSA is intended for use in four general regulatory non-potable categories;

1. primarily for irrigation,
2. to a much lesser extent for use in impoundments,
3. industrial and commercial cooling,
4. and other purposes as permitted under Title 22 (see Figure 2).

Title 22 regulations set forth the requirements for protection of public health for these general categories where recycled water is typically suitable to the end user or customer. In order to determine if the recycled water quality produced at SBSA is suitable for Redwood City's customers, the City performed research and water quality evaluations in connection with SBSA's three-year pilot project.

In 2001 and 2002, landscapes throughout the entire Redwood Shores were screened and reviewed by landscape and irrigation specialists with significant experience in using recycled water for urban landscape irrigation in the Bay Area. Several representative landscapes were selected that reflect the broad spectrum of development style, planting types, irrigation systems and soil variations in Redwood Shores for detailed evaluation as part of the *Water Recycling Feasibility Study for the Redwood Shores Area* (Kennedy/Jenks Consultants, January 2002). A total of three homeowners associations, a school and community center, a park, a sports complex, two street landscapes and two commercial property sites were included. A series of site visits were made to review plant types, irrigation systems and observe landscape management practices. Interviews with current landscape maintenance personnel were conducted along with review of several years of irrigation records and climatological data. This evaluation concluded that all of the representative landscapes were appropriate for irrigation with recycled water, but that current water management practices would need to be improved throughout Redwood Shores to reduce chronic and widespread over watering and site runoff. A number of water management recommendations were provided in the final report, and ongoing reviews of the sites being irrigated since the spring of 2000 confirm that the first three years of irrigation with recycled water has been successful, as noted on page 3 of the IS/MND.

Following receipt of additional public concerns and comments related to water quality after the study was performed, the City requested that a number of additional water quality evaluations be performed. This recent work is summarized in this section including:

- Review of SBSA water quality data against industry standards and other accepted guidelines for specific uses in greater detail;
- Comparison of SBSA's recycled water quality to the water quality in other recycled water projects that have been in operation for relatively long periods of time, and have a very similar project setting as Redwood City;
- Development of concepts for management strategies to assure reliable service is provided to the customer.

As a result of the recent investigations, three proposed uses (irrigation, cooling and concrete mixing) were reviewed in greater detail, as they represent about 90% of the potential use of recycled water in Redwood City and there were either public or City staff comments or concerns expressed relative to these uses. Other uses including construction water, toilet flushing in commercial/office buildings, and dust control were reviewed. Title 22 regulations set forth all of the requirements that are required to achieve high levels of performance and service for these uses.

The following tables summarize the key water quality parameters relative to using recycled water for landscape irrigation, industrial and commercial cooling, and concrete production. For each use, water quality parameters are identified and compared to industry standards and the test results for Redwood City's current Hetch Hetchy potable supply, and the proposed recycled water supply. Remarks are provided relative to whether these parameters might be of concern to Redwood City's customers, and if so, management methods are defined to address potential problems. Parameters are identified for further monitoring as part of the City's long-term commitment to providing safe and reliable service to its customers.

To further demonstrate the suitability of recycled water for many specific uses, the City performed a general benchmarking survey of other recycled water projects in the Bay Area as discussed in Table 1. Table 5 provides a comparison of SBSA's water quality to these same representative projects that have been successfully operated for up to 20 years.

## **Summary**

SBSA's recycled water quality is appropriate for the intended uses identified, and the City can serve customers with a high degree of reliability. Long-term customer acceptance will be augmented with a comprehensive customer information program, a water management guidebook of protocols and methods, and a proactive water quality monitoring program. In addition, the City will continue to offer free large landscape water management consultation services. The evidence for this conclusion includes:

- The First-Step Recycled Water Project has achieved compliance with Title 22 regulations and has been successful for irrigation uses in its first three years of operation.

- The recycled water quality provided by SBSA is within generally accepted standards and guidelines for the proposed uses.
- The City's proposed recycled water project is very similar to several other Bay Area projects that have been successfully operated for extended periods of time. These representative projects serve as examples that recycled water is a beneficial, drought-proof water resource that Redwood City residents can also enjoy. Although there are a few water quality parameters that are close to or slightly exceed generally accepted guidelines in each of these projects, management methods and customer information programs have resulted in high customer satisfaction and acceptance over time.

**Table 2 – Water Quality Matrix for Landscape Irrigation**

**SALINITY, PERMEABILITY, TOXICITY & NITROGEN**

PARAMETER OF POTENTIAL CONCERN		Units	Degree of Restriction of Use <sup>1</sup>			Comments (Reference Next Page)	SBSA RECYCLED WATER	HETCH HETCHY POTABLE WATER	
			None	Slight to Moderate	Severe		RANGE	RANGE	
SALINITY (Total Salt Content)	Electrical Conductivity (E <sub>cw</sub> )	dS/m	<0.7	0.7 - 3.0	>3.0	See Salinity Comments next page	1.5 - 1.6	0.009 - 0.34	
	Total Dissolved Solids (TDS)	mg/l	<450	450 - 2000	>2000		710 - 800	15 - 170	
PERMEABILITY	Sodium Absorption Ratio (SAR) = $\frac{Na}{Ca + Mg}$	6 -- 12 with an E <sub>cw</sub> =	>1.9	1.9 - 0.5	<0.5	See Permeability Comments next page	SAR = 7.2 - 7.3	NA	
							E <sub>cw</sub> = 1.53 - 1.56	NA	
NITROGEN (Total N)		mg-N/l	<5	5 -- 30	>30	See Nitrogen Comments next page	~23 (ammonia + nitrite + nitrate as nitrogen)	<0.4	
TOXICITY	<b>Ion Toxicity</b>					See Ion Toxicity Comments next page			
	Sodium (Na)	Surface Irrigation	SAR	<3	3 -- 9		>9	7.23 - 7.31	NA
		Spray Irrigation	mg/l	<70	>70			203 - 204	<3 - 9
	Chloride (Cl)	Surface Irrigation	mg/l	<140	140 - 350		>350	300	<3 - 10
		Spray Irrigation	mg/l	<100	>100			300	<3 - 10
	Boron (B)	mg/l	<0.7	0.7 - 3.0	>3.0		0.515		
	<b>Trace Metal Toxicity</b>					See Trace Metals Toxicity Comments next page			
	Trace Metals		Recommended Maximum Concentration (mg/l) <sup>1</sup>						
	Aluminum		5.0					0.00012 - 0.00013	<0.050 - 0.088
	Copper		0.20					<0.00002	<0.001 - 0.034
Iron		5.0					0.00009 - 0.0001	<0.1 - 0.28	
Lead		5.0				0.00048 - 0.0024	<0.002 - 0.028		

<sup>1</sup>Adapted from Ayers and Westcott & Irrigation with Reclaimed Municipal Wastewater A Guidance Manual, 1984

University of California Extension Leaflet 2995 Water Quality - Its Effects on Ornamental Plants

Data from the National Urban Agriculture Council on Marin Municipal Water District's Recycled Water Demonstration Garden 1995 - 2002.

## Table 2 – Water Quality Matrix for Landscape Irrigation (Comments)

### Salinity Comments:

**Concerns** - Salinity (salt content) is measured in terms of Ecw and/or TDS. If high levels of salt build up in surface soils, they can retard plant growth due to effects of ion toxicity and also reduced soil permeability which keeps water from percolating to the plant roots.

**Remarks** - The salinity level of SBSA recycled water could have a 'slight' degree of restriction on use. The data from the references, SBSA pilot project, and area demonstration gardens indicates that SBSA recycled water will not present a salinity problem for turf and the vast majority of ornamentals. Additional treatment for salt reduction is not required on a continuous basis; however, standby connection to potable water is available for blending or leeching salt from soils if needed in the future. A water management protocol for avoiding or replacing salt sensitive plants, at the customers' preference, is recommended.

### Permeability Comments:

**Concerns** - Soil permeability is commonly expressed in terms of SAR -- a ratio of the concentrations of sodium, calcium, and magnesium -- in conjunction with a specific salinity (Ecw) value. As SAR increases and Ecw decreases in any water source, soil permeability is impacted, which in turn causes reduction of soil aeration and water infiltration and percolation.

**Remarks** - The SAR and Ecw values indicate that SBSA recycled water could have a 'slight' degree of restriction of use. The use of SBSA recycled water will not present a significant problem associated with soil permeability. There are well-established methods for managing soil permeability that are typically performed for any landscape such as surface cultivation, sod plugging and the use of mulch to prevent soil compaction. Gypsum can also be added to the water or soil to further enhance permeability in the soil. Concepts for managing soil permeability should be included in a water management protocol for customers.

### Nitrogen Comments:

**Concerns** - Nitrogen in recycled water is beneficial in landscape management because it is an essential plant nutrient and reduces the need for fertilizer. However, excessive nitrogen concentration can increase the incidence of heat stress, particularly in hot climates during the summer when temperatures and irrigation volumes are at seasonal highs. Total Nitrogen (N) is composed of nitrate, nitrite and ammonia species. SBSA recycled water averages nitrate at 2.3 mg-N/l and ammonia at 21 mg-N/l.

**Remarks** - SBSA recycled water may have a 'slight' to moderate' degree of restriction of use in terms of its nitrogen content. The temperate climate at Redwood City helps to buffer potential heat stress as compared to the Central Valley of California where recycled water is used successfully for irrigation. It is anticipated that fertilization amounts and frequency will need to be reduced to prevent heat stress in the summer, and this should be provided as a water management protocol for customers.

**Ion Toxicity Comments:**

**Concerns** - Ion toxicity can occur when specific ions accumulate to toxic concentration levels in the leaves during transpiration or from overhead irrigation. Primary constituents of concern are sodium, chloride, and boron. Ion toxicity can cause foliar damage at leaf edges, leaf drop, and in severe cases long-term plant dieback.

**Remarks** - According to the guidelines, SBSA recycled water would have a "slight to moderate" degree of restriction of use for both spray and surface irrigation due to relatively elevated levels of sodium and chloride. Boron appears to be within the ranges where an ion toxicity problem will not occur. If sodium and chloride concentrations can be maintained close to their current levels, and proper water management practices are employed on landscape sites, ion problems can be avoided for the vast majority of plant species. It is recommended that plant lists and plant monitoring be performed for sensitive species, and that water quality monitoring of these ions be performed. Ion toxicity can be addressed by blending with potable water to reduce ion concentrations, if required.

**Trace Metals Toxicity Comments:**

**Concern** - Some heavy metals accumulate in the environment and are toxic to plants and animals. Aluminum can cause nonproductivity in acid soils, but soils at pH 5.5 to 8.0 will precipitate the ion and eliminate toxicity; copper can be toxic to a number of plants at 0.1 mg/L in nutrient solution; iron can contribute to soil acidification and loss of essential phosphorous and molybdenum; and lead can inhibit plant cell growth at very high concentrations.

**Remarks** - SBSA recycled water was tested for aluminum, copper, lead, and iron. The concentrations of these metals were well below the maximum allowable concentrations and no problems related to Trace Metal Toxicity are anticipated.

### Table 3 – Water Quality Matrix for Industrial and Commercial Uses

PARAMETER OF POTENTIAL CONCERN	MAKE-UP for RECIRCULATION (mg/l)	ONCE-THROUGH (mg/L)	COMMENTS	SBSA RECYCLED WATER	HETCH HETCHY POTABLE WATER
				RANGE	RANGE
Silica (SiO <sub>2</sub> )	50	50	Can produce difficult-to-remove scale deposits.	NA	NA
			Pretreatment or sidestream filtration is often required if the silica levels are above 150 mg/l (as SiO <sub>2</sub> ). Need to analyze for silica -- typically expected to be below the limit.		
Aluminum	0.1		Aluminum concentration of SBSA recycled water is well below the allowable limit.	0.00012 - 0.00013	<0.050 - 0.088
Iron (Fe)	0.5		May be a concern if it combines with phosphate to form undesirable foulants. It may also deactivate specialized polymers used to inhibit calcium phosphate scaling.	0.00009 - 0.0001	<0.1 - 0.28
			Iron concentration of SBSA recycled water is well below the allowable limit.		
Calcium (Ca)	50	200	Calcium concentration of SBSA recycled water is below the allowable limit.	28 - 38	4 -- 29
Magnesium (Mg)	0.5		Magnesium is usually not much of a problem unless the silica levels are high. This could result in magnesium silicate scale in the heat exchangers. SBSA silica levels are not anticipated to be high as described above, but should be confirmed. Mg concentration of SBSA recycled water is 30 mg/l (annual average) and this water is being used successfully for many cooling applications.	24	<0.5 - 10
Ammonia (NH <sub>4</sub> as N)	1.0		An macro nutrient for microorganisms, it can promote biofilm development and growth in the heat exchangers and cooling tower fill. It is also extremely corrosive to copper alloys (even those well passivated with chemicals.) There have been documented cases of stress corrosion cracking in copper alloys from ammonia concentrations as low as 2.0 ppm.	21	NA
			Biological growth is typically controlled by the addition of biocides. It should be recommended that a cooling tower system with copper alloys not use SBSA recycled water.		
Sulfate (SO <sub>4</sub> )	200	680	Sulfate concentration of SBSA recycled water is below the allowable limit.	76 - 80	<1 - 23
Chloride (Cl)	500	600	Can be corrosive to most metals, especially mild steel. A chloride limit of 300 ppm is often used for stainless steel, but limits for other metals may go as high as 1,000 ppm.	300	<3 - 10
			Chloride concentration of SBSA recycled water is below the allowable limit.		
Total Dissolved Solids (TDS)	500	1,000	Excessive concentrations can cause scaling on the cooling surfaces, reducing the efficiency of heat exchange units. Varying the blowdown rate controls the degree of concentration of dissolved constituents in the cooling tower.	710 - 880	15 - 170
Zinc (Zn)	0.5 - 3.0		Can assist phosphates and nitrates in reducing mild steel corrosion rates and pitting tendencies. Levels in cooling water above 0.5 mg/l are beneficial, but levels above 3.0 mg/l can contribute to deposits.	NA	NA
			Need to analyze for Zn. Expected to be well below the limit. The annual average of Zn for South Bay recycled water is 0.0055 mg/l.		
Hardness	650	850	Calcium is particularly troublesome because certain calcium salts exhibit an inverse solubility in water with regards to temperature. Unlike most salts in solution, which become more soluble with increasing temperature, calcium carbonate becomes less soluble with increasing temperature.	NA	NA
			Need to analyze for hardness. Expected to be below the limit. The annual average hardness for South Bay recycled water is 238 mg/l.		
Alkalinity	350	500.0	Bicarbonates normally represent the major portion of the measured alkalinity, although under certain conditions, appreciable amounts of carbonate and hydroxide alkalinity may also be present. Alkalinity is an important means of predicting calcium carbonate scale potential.	NA	14 - 110
			Bicarbonate of SBSA recycled water is 268 - 303 mg/l, and can be assumed that this constitutes the vast majority of alkalinity. Therefore, alkalinity appears to be below limit; and coupled with low calcium concentration, should not present any problem.		
pH	6.9 - 9.0	5.0 - 8.3	pH of SBSA recycled water is within the acceptable range.	8.1 - 8.2	8.6 - 9.6
BOD	25		Reflects the organic content for biological organisms and the associated demand for oxidizing biocide in addition to the amount used for bio fouling control.	10	NA
			Will not be an issue for SBSA recycled water which is well below 25 mg/l BOD.		
TSS	100	1000	Unlike dissolved solids, not all suspended solids enter the cooling system with the makeup water. Some might be generated as corrosion and scale byproducts or from air/water contact. Suspended solids can adhere to biofilms and cause under-deposit corrosion.	NA	NA
			TSS can be controlled through pretreatment, sidestream filtration or through use of deposit control agents. Need to analyze for TSS, but should be below the limit. TSS of South Bay recycled water is 2.0 mg/l.		

**Sources:**  
 Adapted from National Academy of Science, National Academy of Engineering: Water Quality Criteria (1972)  
 Adapted from Water Pollution Control Foundation and Goldstein et al  
**NA = Not Analyzed**  
 Shaded area indicates no applicable data/information is provided.

### Table 4 – Water Quality Matrix for Concrete Mixing Water

PARAMETER OF POTENTIAL CONCERN	SUMMARY	HETCH HETCHY POTABLE WATER	SBSA RECYCLED WATER*		AMERICAN CONCRETE INSTITUTE (ASTM C94)**	CALTRANS STANDARD SPECIFICATIONS (JULY 1995)	BS 3148 (BRITISH STANDARDS)	PORTLAND CEMENT ASSOCIATION (1, 13, 17)	TOLERABLE LIMIT FOR CONCRETE STRENGTH (9, 18)
		RANGE	RANGE	AVERAGE	LIMITS	LIMITS	LIMITS	LIMITS	LIMITS
Chloride	Reduction in strength, using sodium chloride solutions. Surface efflorescence and persistent dampness. Possible adverse effect of chloride ions on the corrosion of reinforcing steel or prestressing strands; calcium chloride admixtures should be avoided in steel-reinforced concrete.	<3 - 19	300	300	500	1000 (conventionally reinforced)	500		500
	Chloride concentration of SBSA recycled water is below various limits.				1000	2000 (non-reinforced)			
Sulfate	Delayed reduction of compressive strength; may increase early strength but reduce later strength. Possible expansive reactions and deterioration.	<0.5 - 30	76 - 80	78	3000	1300 (reinforced & prestressed)	1000		1000
	Sulfate concentration of SBSA recycled water is below various limits.					1500 (non-reinforced)			
Alkalies as (Na <sub>2</sub> O + 0.658 K <sub>2</sub> O)	Alkali-Aggregate Reaction with Silica -- cracking and disruptive expansion. Should be analyzed prior to final evaluation for use.				600	300			
Magnesium	Alkali-Aggregate Reaction (Silica) and Alkali-Carbonate Reaction -- cracking and disruptive expansion. Magnesium sulfate should be less than 25,000 ppm. All below various limits.	<0.5 - 9	24	24			Combined total <2000		
Calcium		4 -- 27	28 - 38	33					
Potassium		<0.5 - 1	14	14					
Sodium		3 -- 22	203 - 204	203.5					
Total Alkalinity (as CaCO <sub>3</sub> )	Up to 2000 mg/l of sodium carbonate or bicarbonate or the sum is tolerable -- causing reduction in mortar strengths in excessive amount.	11 - 122	NT	NT					1000
Carbonate	Performance tests recommended for water with no service record contains alkali carbonate or bicarbonate in excess of 1000 mg/L.								1000
Bicarbonate	Below the limits.	NA	268 - 303	285.5					400
pH	Acidic waters cause corrosion; alkaline waters (sodium or potassium hydroxide) can cause quick setting and low strengths.	7.4 - 9.8		8.1 - 8.2	8.15				3.0
	Within the acceptable range.								
Total Dissolved Solids (TDS)	Performance tests are recommended when water for which no service record is available contains TDS more than 2000 mg/l.	21 - 170	700 - 800	740			2000		4000
	Below the limits								
Suspended Solids	May increase water demand, increase drying shrinkage, or cause efflorescence; retard the setting and hardening of concrete.						2000	1000	2000
(Inorganic + organic + algae)	Algae or other suspended organic materials may retard setting and strength development by interfering with cement hydration; entrain excessive amounts of air, thereby reducing strength.								
Turbidity	Below the limits.	0.18 - 0.64							
Miscellaneous Inorganic Salts	Iodates, Phosphates, Arsenates, Borates							500 each	
	Boron	NA	0.5 - 0.53	0.515				500	
	Copper	<2 - 130	<0.02	<0.02				500	500
	Lead	<2 - 17	NT	NT				500	500
	Manganese							500	
	Tin	Below the limits.						500	
Zinc							500	500	

NA Not available  
 NT Not tested  
 NR Not reported  
 NS Not sampled

\*SBSA recycled water meets or exceeds all Title 22 requirements for tertiary treated recycled

\*\*Applicable when wash water from mixer washout

**Table 5 – Recycled Water Quality Comparison of Bay Area Projects**

<b>WATER QUALITY PARAMETERS</b>	<b>UNIT</b>	<b>SBSA Recycled Water</b>	<b>South Bay Water Recycling<sup>1</sup></b>	<b>Marin Municipal Water District<sup>2</sup></b>	<b>City of Sunnyvale<sup>3</sup></b>	<b>City of Palo Alto<sup>4</sup></b>
<b>GENERAL</b>						
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	NS	183	90.3	139	NA
Bicarbonate (HCO <sub>3</sub> )	mg/L	268 - 303	183	90.3	139	NA
BOD (Biological Oxygen Demand)	mg/L	6.0 <sup>5</sup>	<3.4	NA	NA	1.6
Conductivity (E <sub>cm</sub> )	dS/m	1.5 - 1.6	1.2	0.95	1.28	NA
Hardness (Total as CaCO <sub>3</sub> )	mg/L	NS	238	187.5	294	NA
pH	pH unit	8.1 - 8.2	6.9	7.4	7.1	NA
TDS	mg/L	710 - 800	724	571	778	NA
TSS	mg/L	NA	2	NA	NA	1.9
Turbidity	NTU	0.2 - 1.9	0.8	1.3	NA	1
SAR (not adjusted)	calculated	NA	4.3	NA	3.29 - 4.15	NA
SAR (adjusted)	calculated	7.2 - 7.3	NA	3.1 - 4.2	3.25 - 4.19	NA
<b>INORGANIC CHEMICALS</b>						
Aluminum	ug/L	0.12 - 0.13	NA	0.33	NA	NA
Ammonia	mg/L	25 - 26	<0.4	NA	1.3	0.5
Arsenic	ug/L	NS	1.1	ND	NA	0.9
Boron	mg/L	0.5 - 0.53	0.52	0.3	0.47	NA
Cadmium	ug/L	NS	<0.5	<1.0	NA	0.2
Calcium	mg/L	28 - 38	50.6	28.7	51	NA
Chloride	mg/L	300	190	124.2	244	NA
Chromium	ug/L	NS	<0.6	ND	NA	0.7
Copper	ug/L	<0.02	3	NA	NA	7
Cyanide	ug/L	NS	NA	0.2	NA	3.9
Iron	ug/L	0.09 - 0.1	NA	0.09	NA	NA
Lead	ug/L	0.48 - 2.4	<1.0	<5.0	NA	0.4
Magnesium	mg/L	24	29.9	21.9	41	NA
Manganese	ug/L	NS	NA	40	NA	NA
Mercury	ug/L	NS	<0.0022	NA	NA	0.007
Nickel	ug/L	NS	5.7	<10.0	NA	3.9
Nitrate	mg/L-N	2.0 - 2.5	9.8	20.9	15	18.8
Nitrite	mg/L-N	NS	<0.3	0.17	NA	0.044
Phosphate	mg/L	NS	2.8	1.4	4	11.1
Potassium	mg/L	14	16.3	NA	NA	NA
Selenium	ug/L	NS	NA	<0.005	NA	0.5
Silica	mg/L	NS	12	NA	NA	NA
Silver	ug/L	NS	<0.2	<5	NA	0.2
Sodium	mg/L	203 - 204	156	120.6	151	NA
Sulfate	mg/L	76 - 80	103	90.4	94	NA
Zinc	ug/L	NS	55	1660	NA	3.9

NS = Not Sampled  
 NA = Not Available  
 ND = Not Detected

Notes:

1. 2002 yearly average data from San Jose/Santa Clara Water Pollution Control Plant
2. 1998 yearly average data from Marin Municipal Water District - Las Gallinas Valley Reclamation Plant
3. 2002 yearly average data from the Sunnyvale Water Pollution Control Plant.
4. 2002 yearly average data from the Palo Alto Regional Water Quality Control Plant.
5. Value is for Carbonaceous Biochemical Oxygen Demand (CBOD) as reported to the RWQCB in SBSA's 2002 Annual Report.

# Section 5 – Integrated Water Quality Assurance Program

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## Purpose

This section provides supplemental technical information on the regulatory requirements that will become a part of the proposed project if it is approved. If the City Council does approval the project, Redwood City will assume responsibility for the development of full and complete technical information required to obtain a permit for construction and operation of a recycled water system from the State.

Currently, the City and SBSA hold a permit for operation of the First Step Project, as reflected in the *First Step Recycled Water Project Conformed Engineer's Report Update, July 2002*, prepared for the City of Redwood City Public Works Services Department and the South Bayside System Authority, by Whitley Burchett & Associates.

## SBSA Wastewater Source Control

SBSA regulations governing discharge to sanitary sewers were developed according to federal guidelines in order to protect the sewer system and the treatment facility, and to assure compliance with SBSA's permit to discharge to San Francisco Bay. The regulations prohibit the discharge of many types of wastes to the sanitary sewers. Among discharges specifically prohibited are "toxic substances" and "hazardous waste".

The U.S. EPA requires that publicly owned treatment works such as SBSA implement a "pretreatment program" for regulating industries (refer to the Code of Federal Regulations Chapter 40 Parts 400-471). In addition to general regulations for establishing a "pretreatment program" to regulate industries, these regulations address specific categories of industries. In the SBSA service area these include: electroplating, circuit board manufacturing, metal finishing, electrical and electronic components, and pharmaceutical manufacturing. There are a total of 20 companies in the SBSA service area which fall into these categories. Results of pretreatment compliance monitoring are summarized in the Annual Pretreatment Report that is submitted to various regulatory agencies. A copy of the pretreatment annual report can be obtained from SBSA upon request.

The SBSA treatment process utilizes several biological processes that could be effected by improper discharge of wastes. The SBSA NPDES discharge permit contains many prohibitions and limitations to protect the sensitive aquatic habitat of San Francisco Bay. Through the combination of the highly effective Pretreatment Program and consistent careful treatment process operation and control SBSA has achieved an exemplary record of regulatory compliance.

## **Redwood City Permit Compliance**

According to the State of California Title 22 Code of Regulations, Division 4 – Environmental Health, Chapter 3, Water Recycling Criteria, Article 1: The California Regional Water Quality Control Board has jurisdiction over water recycling plants and use areas.

The California Water Code, Article 4 – Regulation, assigns the responsibility for setting water recycling criteria to the State Department of Health Services, and sets forth the protocols for DHS recommendations requirements to RWQCB. Article 4 also delineates the State Legislature’s water recycling goal, the procedure for identifying potential uses, and the application process for recycled water supply at the wholesale, retail and customer levels. Prior to commencement of construction of a recycled water project, Redwood City shall submit to DHS an Engineering Report for review and approval, such that DHS may recommend to the RWQCB that a permit be issued for the project. The report shall address all Water Code requirements including report submittal, design requirements and operation requirements. Redwood City shall ensure that design and construction documents minimally meet the State’s requirements, as well as any unique features and conditions imposed by the City Council at the time of project approval. At that juncture, SBSA (as producer/wholesaler) and Redwood City (as distributor/retailer) will be accountable for full compliance with all regulations outlined in the *California Health Laws Related to Recycled Water – The Purple Book*; excerpts from the Health and Safety Code, Water Code, and Titles 22 and 17 of the California Code of Regulations, June 2001 Edition.

All requirements for protection from cross-connections is delineated in the State of California Title 17 Code of Requirements, Division 1, Chapter 5, Article 2 – Protection of Water System, and in the California Health and Safety Code, Division 104, Part 12, Chapter 5, Article 2. Redwood City shall be responsible for continuous compliance with these regulatory requirements.

## **Redwood City Program Activities and Customer Support Services**

Redwood City will develop a comprehensive set of rules, regulations and guidelines for use by existing and potential recycled water customers, which in turn will be supported by City Council policy actions reflected in resolutions and/or ordinances. The guidelines will be augmented by a staffed customer information program, with the goal of ensuring that customers are able to meet all applicable regulations and use recycled water with a high degree of long-term safety and success. Fundamental elements of the guidelines will include guidance for the design and operation of customer (“on-site”) recycled water facilities – both for existing and new sites. The guidelines will include:

1. Planning for recycled water use
  - Determination to use recycled water
  - Protection of public health
  - Approved uses of recycled water
  - Recycled water use permit (required for each site)

- Local authority (responsibilities and authorities vested in the City Council)
  - Procedure for obtaining service
  - City-sponsored plant material replacement and irrigation equipment rebate programs
2. Design, installation and inspection of on-site recycled water irrigation systems
- Design requirements at service connection
  - Design requirements for on-site facilities
  - Information required on plans
  - Installation and construction inspections
3. Operation and maintenance
- General customer responsibilities
  - System operations
    - System responsibilities
      - Wholesaler (SBSA)
      - Retailer (Redwood City)
      - Customer (site owners / managers)
  - Cross connection protection

### **Water Quality Monitoring Program**

Based on the review of water quality parameters for various uses presented in Section 4, a number of non-regulatory parameters are identified as being important relative to maintaining good service to customers in Redwood City and in assisting them with effective water management. These parameters are identified in Table 6 for each use of recycled water relative to the recommended limits for each parameter. The current levels of these parameters in SBSA's recycled water are also indicated.

It is anticipated that this water quality monitoring program will evolve over time, and be responsive to new regulations and protocols. Parameters may be added or deleted, based on the City's experience and customer satisfaction. The intent is to be proactive in monitoring the parameters that might become problematic, with water management practices or protocols developed for the customer's use.

**Table 6 – Water Quality Objectives and Monitoring Program Matrix**

WATER QUALITY PARAMETERS	UNIT	RECOMMENDED LIMITS FOR RECYCLED WATER APPLICATIONS			SBSA RECYCLED WATER
		LANDSCAPE IRRIGATION	COOLING WATER (Make-up / Once-through)	CONCRETE MIXING WATER	
<b>GENERAL</b>					
Alkalinity (Total as CaCO <sub>3</sub> )	mg/l		350 / --	1000	NS
Bicarbonate (HCO <sub>3</sub> )	mg/l	500	24 / 600	400	268 - 303
BOD <sub>5</sub> (Biochemical Oxygen Demand)	mg/l		25 / --		6.0 <sup>1</sup>
Conductivity (E <sub>cw</sub> )	dS/m	3			1.5 - 1.6
Hardness (Total as CaCO <sub>3</sub> )	mg/l		650 / 850		NS
pH	pH unit	6.5 - 8.4	6.9 - 9.0/5.0 - 8.3	3<	8.1 - 8.2
TDS	mg/l	1000	500 / 1000	2000	710 - 800
TSS	mg/l		100 / 1000	1000	NA
Turbidity	NTU				0.2 - 1.9
SAR (Adjusted)	calculated	6 - 12			7.23 - 7.31
<b>INORGANIC CHEMICALS</b>					
Alkali (as Na <sub>2</sub> O + 0.658K <sub>2</sub> O)	mg/l			300	NS
Aluminum	ug/L	5000		100	0.12 - 0.13
Ammonia	mg-N/l			1.0	21
Arsenic	ug/L	100			NS
Boron	mg/L	3		500	0.5 - 0.53
Cadmium	ug/L	10			NS
Calcium	mg/l		50 / 200	500	28 - 38
Chloride	mg/l	350	500 / 600	500	300
Copper	ug/L	200		500,000	<0.02
Iron	ug/L	5000	500 / --	500,000	0.09 - 0.1
Lead	ug/L	5000		500,000	0.48 - 2.4
Magnesium	mg/ l		0.5 / --	500	24
Manganese	ug/L	200		500,000	NS
Nitrate	mg-N/l	30 (total Nitrogen)		500	2.3
Phosphate	mg/l			500	NS
Potassium	mg/l			500	14
Silica	mg/l		50 / 50		NS
Sodium	mg/l	>70 for SAR = 3 - 9		500	203 - 204
Sulfate	mg/l		200 / 680	1000	76 - 80
Zinc	ug/L	2000	500 - 3000 / --	500,000	NS

NS = Not Sampled

NA = Not Available

Shaded area denotes no numerical limit is set.

Note 1: Value is for Carbonaceous Biochemical Oxygen Demand (CBOD) as reported to the RWQCB in SBSA's 2002 Annual Report.

## **Contingency Plan**

Section 3.3 of the *First Step Recycled Water Project Conformed Engineer's Report Update, July 2002* (prepared for the City of Redwood City Public Works Services Department and the South Bayside System Authority, by Whitley Burchett & Associates) delineates the DHS-approved contingency plan in place at SBSA. The purpose of the contingency plan is to assure that water not meeting Title 22 requirements for disinfected tertiary treated recycled water is not distributed to customers. The contingency plan describes the steps that must be taken in the event that a diversion of the recycled water is necessary, the capacity of contingency storage and conditions for use, and the emergency notification procedure.

The *Final Report for the Water Recycling Feasibility Study for Redwood City* (Kennedy/Jenks Consultants, August 2002) delineates design concepts for the proposed recycled water project, including a stand-by potable connection with an air gap at the storage tanks. Should SBSA determine that a diversion of recycled water is necessary, potable water may be used in the interim to ensure that all recycled water customer needs are met until recycled water service is restored.

## Section 6 – Documents Incorporated by Reference

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1. *Initial Study/Mitigated Negative Declaration (IS/MND) for the Redwood City Recycled Water Project*, prepared for the City of Redwood City Public Works Services Department, by CH2MHILL, June 2002.
2. *First Step Recycled Water Project Conformed Engineer's Report Update, July 2002*. Prepared for the City of Redwood City Public Works Services Department and the South Bayside System Authority, by Whitley Burchett & Associates.
3. *California Health Laws Related to Recycled Water – The Purple Book*. Excerpts from the Health and Safety Code, Water Code, and Titles 22 and 17 of the California Code of Regulations. June 2001 Edition. Available at [www.dhs.ca.gov](http://www.dhs.ca.gov).

# Section 7 – List of Preparers and Contributors

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## **Lead Agency**

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# Appendices

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**Appendix A** - Staff Report and Minutes of August 6, 2002 Planning Commission Meeting

**Appendix B** - California Municipal Wastewater Reclamation Survey, May 24, 2000, by Office of Water Recycling, California State Water Resources Control Board.

**Appendix C** - "Water Recycling in California", A summary of the California Municipal Wastewater Reclamation Survey, May 24, 2000 (Appendix B), prepared by the Redwood City Public Works Services Department, revised April 2003.

## **APPENDIX D**

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MEMO FROM JEFF STONE/CALIFORNIA DEPT. OF HEALTH SERVICES TO  
TOBY ROY AND BRIAN BERNADOS

DEPARTMENT OF HEALTH SERVICES  
DIVISION OF DRINKING WATER  
TECHNICAL PROGRAMS SECTION  
SANTA BARBARA

**MEMORANDUM**

DATE: June 24, 1999

TO: Toby Roy / Brian Bernados  
San Diego District

FROM: Jeff Stone   
Recycled Water Unit

SUBJECT: San Diego Unified School District  
Unrestricted Landscape Irrigation

This memo is intended to address the issues raised under Concern Nos. 2 and 3 by the San Diego Unified School District (letter dated May 18, 1999) concerning the use of recycled water on local school grounds.

**CONCERN No. 2;**

First, let me provide some general comments concerning incidental contact and then I'll address the six bullet items listed. From the 'tone' of their letter, it would appear that safety concerns with respect to the use of tertiary - 2.2 recycled water for irrigation may have been misunderstood at the meeting held on May 5, 1999. The use-sites in question fall under the "unrestricted use" category for which tertiary-2.2 recycled water is required.

Currently allowed uses of recycled water under the unrestricted use category include (but are not limited to) body contact recreation, irrigation of food crops and irrigation of parks, playgrounds and schoolyards. The Department considers a properly filtered and disinfected water meeting the tertiary-2.2 requirements to be essentially pathogen free. As noted by Asano et al.<sup>(1)</sup>, "To achieve efficient virus removal or inactivation in tertiary treatment, two major criteria must be met: 1) the effluent must be low in suspended solids and turbidity prior to disinfection to prevent shielding of viruses and chlorine demand, and 2) sufficient disinfectant must be applied to the wastewater". Treatment requirements determined necessary to meet the tertiary - 2.2 criteria outlined in Title

22 include effective filtration to reduce turbidity to less than a daily average of 2 NTU and disinfection to ensure a minimum CT of 450 milligram-minutes per liter at all times. This treatment scheme is intended to remove solids and properly prepare the water for effective disinfection and achieve an approximately five-log reduction of virus.

To provide a scientific basis upon which to evaluate the Title-22 Criteria, a virus risk analysis was conducted by Asano et al. (2). Based on monitoring data from 424 secondary effluent samples and 814 tertiary effluent samples in California, risks associated with using recycled water were analyzed for golf courses, food crops, recreational impoundments, and groundwater recharge. Virus concentrations in recycled water after tertiary filtration and disinfection were less than 111 vu/100L and 99% of the time were less than the limit of detection of 1 vu/100L. At an enteric virus concentration of 1 vu/100L, the annual risk of polio- and echo-virus infection from exposure to tertiary - 2.2 water is estimated to be in the range of  $10^{-2}$  to  $10^{-4}$  for unrestricted recreational impoundments where swimming may take place. The probability of infection per year for a golfer who plays on a golf course irrigated with tertiary - 2.2 water is estimated to be in the range of  $10^{-4}$  to  $10^{-6}$ .

It is noted that the  $10^{-6}$  risk level is less than the limit recommended for potable water supplies of  $10^{-4}$  (1 infection per 10,000 persons per year). Additionally, the Monterey Wastewater Reclamation Study for Agriculture (MWRSA) was a six year (1980-1986), \$7.2 million field scale project designed to evaluate the safety and feasibility of irrigating food crops (many for eating raw) with tertiary - 2.2 recycled water. During this study, no enteric viruses were detected in the chlorinated effluent in either full treatment or alternative treatment processes. These studies are not necessarily definitive however, because the analytical technologies are not capable of detecting or enumerating all pathogens.

It is noted that the risk of infection is further reduced by:

- environmental barriers (die-off due to natural exposure to air, sunlight, etc.),
- treatment reliability requirements (multiple treatment units, alarms, automatic turnout capability, auxillary power, etc.),
- real time and routine monitoring requirements (contiuous turbidity and chlorine residual), and
- the numerous process and use-site controls (having the express intent of minimizing contact) typically required of any unrestricted landscape irrigation facility.

Current and proposed regulations which allow for unrestricted landscape irrigation incorporate stringent treatment and water quality requirements which are designed to be protective of public health. The turbidity and disinfection CT requirements outlined in our pending criteria are intended to achieve these objectives. In addition, it is noted that (as with any reuse project) use-site controls are incorporated into each project to further enhance the overall safety of the reuse application.

Comments Concerning Bulleted Items:

1. "Are damp areas (particularly in the morning) a health risk to children or the general public?" The treatment requirements for unrestricted access landscape irrigation (tertiary - 2.2) are intended to provide necessary public health protection for the intended reuse as noted above. Through the required filtration and disinfection processes, virus concentrations in the treated recycled water should be at a non-detectable level (less than one virus unit per 100 liters). It should be noted however that risk values addressed above do not necessarily take into account subgroups of the general population (i.e. children, elderly, immuno-compromised, etc.) that are at increased risk due to immune system development/status.

It is recognized that incidental contact with the irrigated landscape may occur. However recognizing the level and reliability of treatment required (which renders an essentially pathogen free water), coupled with use-site controls which should ensure against direct ingestion, the Department considers the re-use criteria to be adequately protective of public health. From a comparative standpoint, the use of tertiary treated - 2.2 recycled water for impoundments within which body contact recreation (swimming) is allowed, the application of such water on turf having unrestricted access poses a very low level of public health risk.

2. "If so, how damp is damp?" Use site control measures should ensure that recycled water applications do not exceed the percolative capacity of the turf. Requirements should be in place which prevent ponding and runoff, and provide for maximizing the time period between application and site use. A reasonable interpretation of the intent behind such controls would be that the use site is not soggy, although recognizing that the grass blades may quite likely be moist.

3. "If the area is damp, how is it determined whether it is caused by atmospheric conditions or irrigation?" If the area is irrigated with recycled water, it is safest to assume the moisture is attributable to this water and that all applicable use site precautionary measures are employed at all times.

4. "If for an example, reclaimed water was applied during the day to the field at the high school (for any reason) that the football team needed to practice on, how much time would it take before they were allowed to practice on the field?" The

minimum time period would be that which ensures that post irrigation turf conditions are not soggy (which can result in ponding during heavy use).

5. "A practice of all high school baseball coaches is to water down the infield for safety reasons. How will that practice be identified so it may continue?" It is assumed this is referring to the baselines, which are generally comprised of a clay/soil material. Sufficient time should have passed at which no puddling/ponding conditions remain. If this is not possible, use of a potable supply for this purpose is recommended. Also, I don't think we want to condone the idea of having hoses which convey recycled water laying around a ball field during active use. This is just one more of these use site control measures which should be addressed in use-site plan.

6. NA

CONCERN No. 3;

Bulleted Items:

1. "At what age has it been determined that contact with reclaimed water is not a risk?" The document entitled "Review of Health Risks Relating to Ingestion and Inhalation of Constituents of Reclaimed Water" (DHS 1992) states that children under eight years of age may not have acquired immunities to all illnesses that can be caused by the array of enteric viruses that might occur in municipal wastewater. However, it must be stressed that the level and reliability of treatment required for unrestricted landscape irrigation using recycled water is intended to result in an essentially pathogen free water delivered to the use site. Given this understanding, age should not be of significance, although further assessment work in this regard may very well be warranted. Restrictions imposed on lower order use sites where a lesser level of treatment is provided (e.g. Secondary 2.2 or 23) are necessary because it is recognized that the recycled water may not be pathogen free.

2. "If it's not acceptable, as an example, for a third grade student to be exposed to reclaimed water but, is determined that the risk is acceptable to a sixth grade student, how will this opinion be shared with the parents of the sixth grade student?" (See above).

3. "Within this context, please state the position of the meeting participants, in particular DEH and CSDWD of specific irrigation parameters?" I don't understand this question!!!!

4. "If daytime watering is not permitted, please state the position of the meeting participants on the operation of an irrigation seeding program or watering-in of fertilizer, which

may take place during daytime hours?" Use site controls would need to be developed which effectively exclude the public during the period(s) in question similar to any other application period. If this entails 'normal use periods', special measures may be needed such as lock-out and site supervision to exclude the public until the seeding or watering-in period ends.

Attachment (references)

SDUSD\699mem.doc

## REFERENCES

1. Asano, T, Tchobanoglous, G, Cooper, R.C., "Significance of Coagulation-Flocculation and Filtration Operations in Wastewater Reclamation and reuse", in Symposium Proceedings, The Future of Water Reuse, Water Reuse Symposium III, San Diego, California, August 26-31, 1984. American Waterworks Association Research Foundation.
2. Asano T., Leong L. Y. C., Rigby, M. G., Sakaji, R. H., (1992) "Evaluation of the California Wastewater Reclamation Criteria Using Enteric Virus Monitoring Data", Water Sci. Technol., 26, 1513.

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The following is a listing of reference materials which may provide more in-depth information concerning the health risks associated with the use of tertiary - 2.2 recycled water on parks, playgrounds and schoolyards:

1. Draft Statement of Reasons Relating to Risk of Exposure to Reclaimed Water, SDHS 12/10/92
2. Review of Health Risks Relating to Ingestion and Inhalation of Constituents of reclaimed water, SDHS 1992
3. Estimating the safety of Wastewater Reclamation and Reuse using Enteric Virus Monitoring Data, H. Tanaka, et al., 1998
4. Guidelines For Water Reuse, Chapter 2 Section 2.4, USEPA 1992
5. Microbial Risk Assessment For Reclaimed Water prepared for Irvine Ranch WD, EOA, Inc. 1995
6. Evolution of Tertiary Treatment Requirements in California, T. Asano, et al., Water Environment & Technology, Vol. 4, No. 2, February 1992.
7. Letter from SDHS (Gaston) to SWRCB, 9/27/79