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Potential Water Sources for the Ormond Beach Restoration Feasibility Plan

22 July 2005

Prepared for

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K/J Project No. 0489033

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Section 1: Introduction

The Ormond Beach Wetlands Restoration Feasibility Plan is being developed for the State Coastal Conservancy by Aspen Environmental Group (Aspen). Kennedy/Jenks Consultants is assisting Aspen in providing the environmental and engineering services. Figure 1-1 shows the wetland location. The restoration and enhancement of the Ormond Beach wetlands would encompass a range of activities that support habitats associated with a wetland environment (i.e., the continuous or ephemeral presence of soil water and shallow surface water). Supplemental water supplies are necessary for several potential restoration activities. Accordingly, the purpose of this report is to (1) identify the various water sources that may be available for use in the restoration of the Ormond Beach wetlands, and (2) determine the characteristics of these potential sources.

1.1 Overview of Potential Water Sources

Table 1-1 below outlines the potential water sources identified and the sections in which their characteristics are discussed in this document. The following characteristics are included in the potential water source discussions:

- Anticipated schedule for availability.
- Water quality.
- Volume.
- Seasonal flow variations.

Discussions are limited by the level of information currently available for each potential water source. Where information was not readily available for review, notation is made in the discussion.

TABLE 1-1
POTENTIAL WATER SOURCES

Potential Water Source[(a)]	Section in which Discussed
Calleguas Municipal Water District (CMWD) Brine Line	2.0
City of Oxnard (Oxnard) Brine Line	3.0
Seawater Effluent from Reliant Energy's Ormond Beach Generating Station	4.0
Agricultural Water from United Water Conservation District (UWCD)	5.0
Perched Groundwater	6.0
Recycled Water from Oxnard	7.0

Note: (a) Potable water from the Ocean View Pipeline, although initially under consideration for use in the wetland restoration efforts, is intentionally not included in this list. The pipeline is being converted to convey recycled water. See Section 7.0 for corresponding discussion.

Source: City of Oxnard website http://www.ci.oxnard.ca.us/index.html

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Site Location Map

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Figure 1-1

1.2 Regulatory Standards

The regulatory standards for which the potential water sources should be compared to will either be California Ocean Plan (State Water Resources Control Board 2001) or the Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Los Angeles Regional Water Quality Control Board [RWQCB] 1994), hereinafter referred to as the Basin Plan; which one of the standards will be based upon the Los Angeles RWQCB's determination at the time an application is reviewed for discharge to the Ormond Beach wetlands. The data in the tables provided throughout this report summarize the most current water quality data available for each potential water source; the data is compared to the above-referenced standards and typical method detection limits (MDLs).

The Basin Plan outlines numerous water quality objectives, depending on the type of water body (e.g., groundwater versus inland surface water) and the beneficial uses specified for the water body. The water quality objectives included in the above-referenced tables are for inland surface waters per the beneficial uses specified for the Ormond Beach wetlands, (i.e., Water Contact Recreation; Non-contact Water Recreation; Estuarine Habitat; Wildlife Habitat; Rare, Threatened, or Endangered Species; and Wetland Habitat). (Los Angeles RWQCB 1994.)

1.3 Organization of this Report

This report is organized, as follows:

- Introduction. The introduction provides background information, introduces the evaluation, and identifies the report structure.
- Potential water sources. Each potential water source is described and quantified in a separate section, as described in the chart above. The water quality data for most potential water sources are voluminous; as such, this information is presented in the Appendix. This information is provided in a table format and is compared to the regulatory standards indicated in Section 1.2 above.
- Summary of potential water sources. The results of the findings in this report are summarized in this section.
- References. Sources for the citations contained in the report are presented in this section.
- Appendix. Water quality data for potential water sources is presented in separate tables in the appendix, as indicated below:
  - CMWD Brine Line - Appendix Table 1.
  - Seawater Effluent from Reliant Energy's Ormond Beach Generating Station – Appendix Table 2.

- Recycled Water from Oxnard – Appendix Table 3.

  The reason tables are not included in the Appendix for the other potential water sources (i.e., Oxnard brine line, agricultural water from UWCD, and perched groundwater) is because available data is not comparable with the constituents of concern for the California Ocean Plan or the Basin Plan.

Section 2: Calleguas Municipal Water District Brine Line

CMWD is a wholesale water supplier to cities and unincorporated areas located south and east of the Santa Clara River in Ventura County. CMWD is constructing a pipeline for collecting, conveying, and distributing highly-treated wastewater and brine concentrates from groundwater desalting operations (i.e., reverse osmosis [RO], to an ocean outfall and/or downstream beneficial uses) including the proposed Ormond Beach wetlands restoration efforts. This brine line is part of the Calleguas Creek Watershed Management Plan (CCWMP) and will be used for managing salinity in the Calleguas Creek watershed. As a principal water agency in the area, CMWD is a stakeholder in the CCWMP.

2.1 CCWMP

The stakeholder group preparing the CCWMP was formed in 1996 and consists of a broad coalition of property owners; water and wastewater agencies; environmental, agricultural, and governmental entities; and other private interests. CCWMP is intended to improve and manage water, habitat, and land resources in the watershed. Many surface waters and groundwater basins in the watershed contain high levels of mineral salts, which limit their use as a water supply. In addition, some groundwater basins have been over pumped, resulting in seawater intrusion along the coast. Many of the reaches of the watershed are listed by the Los Angeles RWQCB as impaired for certain salts under the Clean Water Act (CWA) Section 303(d) list of impaired waters. The Los Angeles RWQCB has scheduled the development of total maximum daily loads (TMDLs) for these reaches. Constituents of concern include total dissolved solids (TDS), sulfate, sodium, chloride, and boron. In an effort to analyze the water quality within Calleguas Creek watershed, the stakeholders conducted a detailed study of Calleguas Creek and its tributaries.

In cooperation with CCWMP efforts, CMWD prepared a Regional Salinity Management Program and endorsed the development of a regional salinity management conveyance system to minimize any further accumulation of salts within the surface and groundwater resources of the Calleguas Creek watershed. The key element of this system is a pipeline (hereinafter referred to as a "brine line"). The brine line would receive treated effluent from three, publicly-owned treatment works (POTWs) and brine from the RO treatment of potable water from drinking water supply wells. The brine line would then transport the saline waters and brine concentrate downstream. Saline waters and brine would be discharged into the ocean. Recycled water would be conveyed to potential areas of demand.

The benefits of the Regional Salinity Management Program and the associated brine line include:

- Reducing mass loadings of saline wastewaters that are discharged into the Calleguas Creek watershed.
- Assisting in the attainment of Basin Plan Water Quality Objectives for various reaches within the Calleguas Creek watershed.

- Removing Calleguas Creek watershed reaches from the CWA Section 303 (d) listings.
- Helping the Los Angeles RWQCB achieve compliance with TMDL objectives for the reaches.
- Assisting in the preservation of the beneficial uses of these reaches, as well as preserving the beneficial uses of the underlying groundwater.
- Transferring salt and TDS loadings from freshwaters to an ocean outfall without negatively affecting water quality or marine life.
- Providing a source of recycled water to downstream uses, including agricultural zones, greenbelt areas, and coastal wetland habitats.

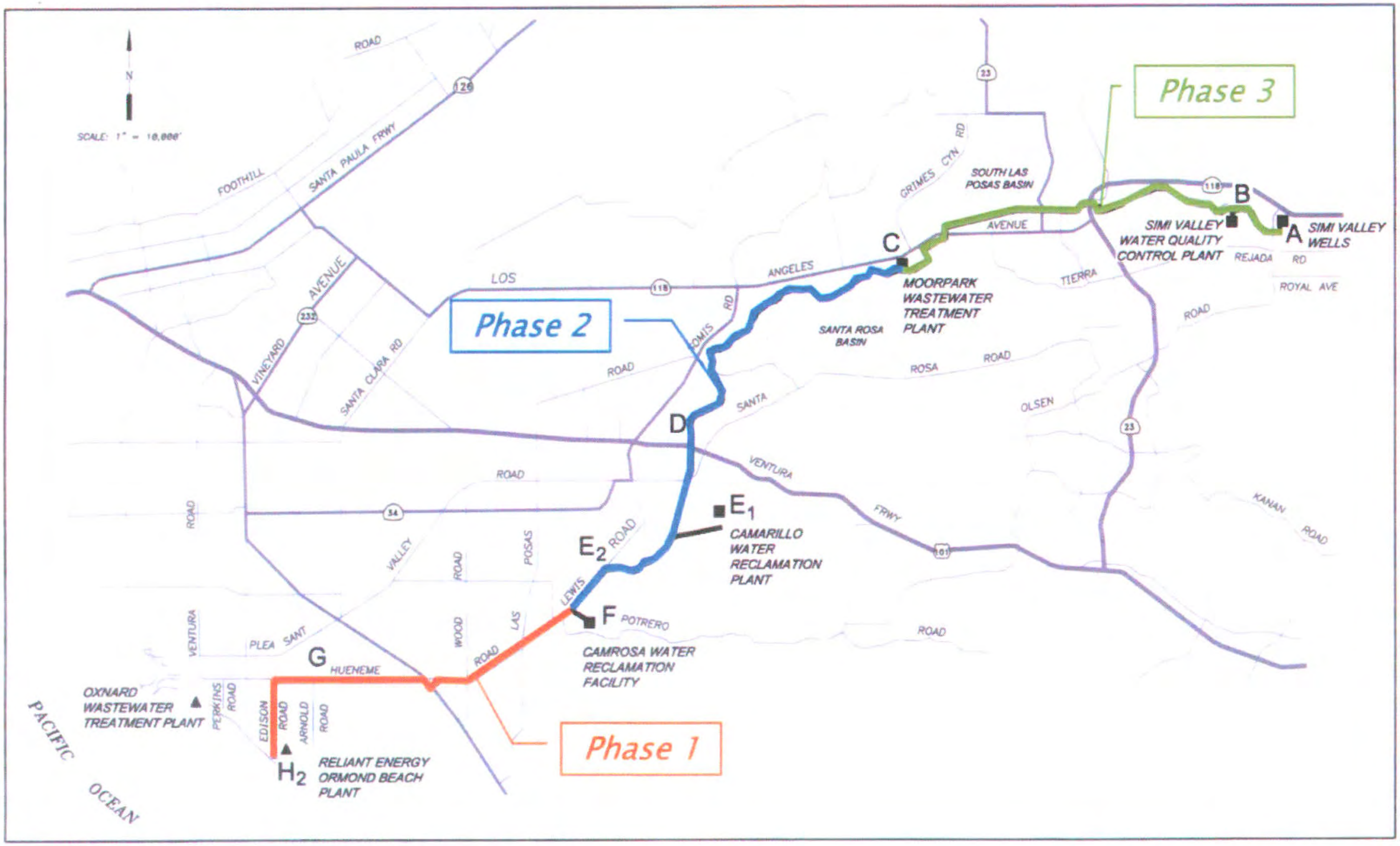
2.2 Description of the CMWD Brine Line

The brine line is expected to be implemented in 3 phases and would, ultimately, extend from Simi Valley at the most easterly point, through City of Moorpark, City of Camarillo (Camarillo), unincorporated areas of Ventura County, and would then terminate at the westerly endpoint in Oxnard where the pipeline would connect with an existing ocean outfall at Ormond Beach. The schedule for completion of the phases is outlined in Table 2-1. Each phase of the brine line alignment is shown on Figure 2-1.

TABLE 2-1
BRINE LINE PHASE COMPLETION

Phase	Location	Anticipated Completion Date
1	Ormond to Camrosa Reach	2006
2	Camrosa to Moorpark Reach	2008
3	Moorpark to Simi Valley Reach	2009

Source: CMWD undated.



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CMWD Brine Line Phases

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Figure 2-1

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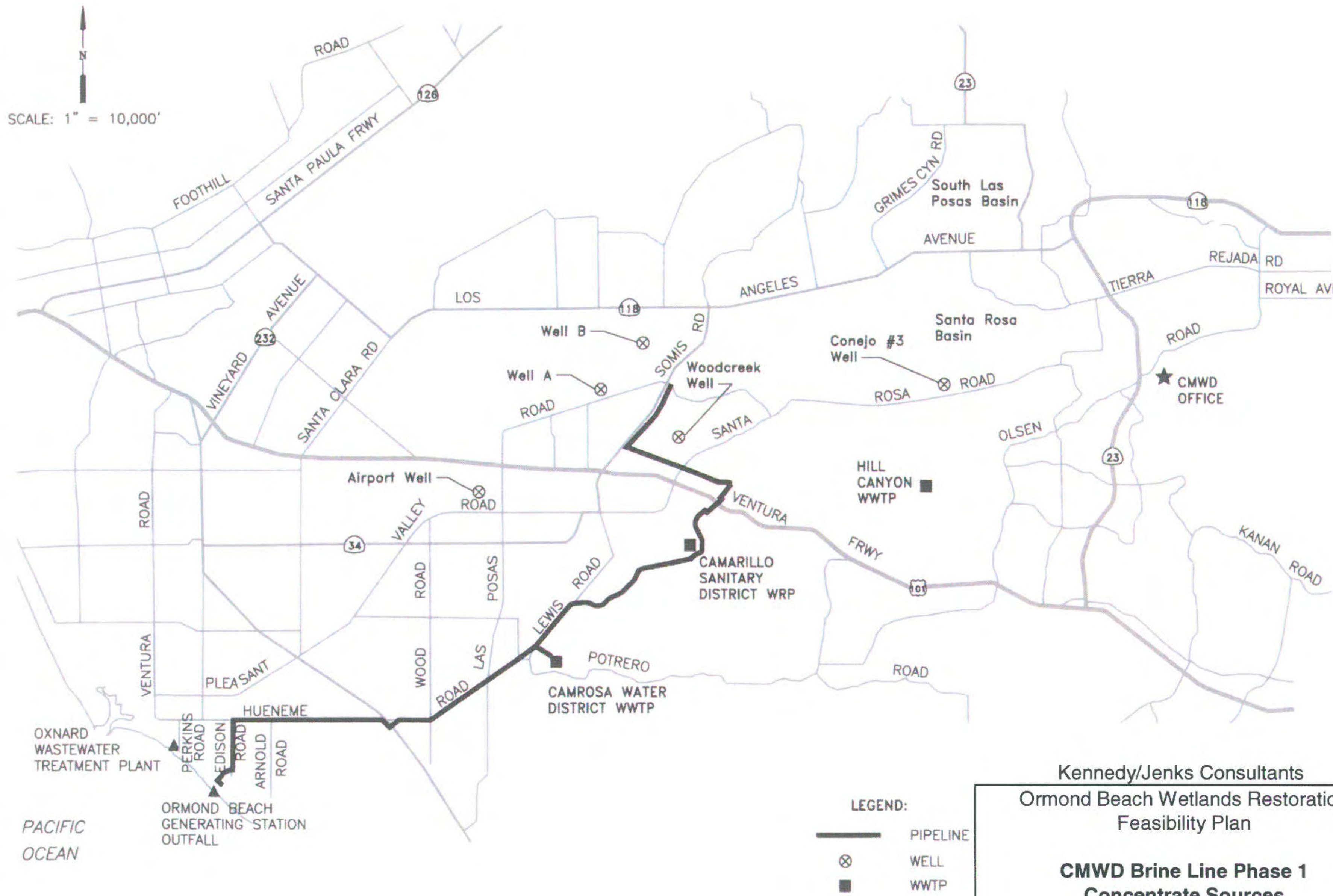
The first phase of the brine line alignment, including concentrate sources, is shown on Figure 2-2 and is described as follows:

- The upper reaches of the pipeline would collect water from five sources.
  - Thousand Oaks Hill Canyon WWTP.
  - RO brines from Camrosa Water District's Woodcreek and Conejo #3 drinking water supply wells.
  - Brine from Ventura County Waterworks District (VCWWD) Airport Well.
  - Brines from the Camarillo Wells A and B.
- The pipeline would then follow a generally southwest direction to collect wastewaters from the Camarillo Sanitary District Water Reclamation Plant (WRP) and the Camrosa Water District WWTP.
- The brine line would then follow a westerly direction along Hueneme Road.
- A flow control facility would be constructed near the Ormond Beach outfall location to route discharge from the brine line through to the ocean outfall. The outfall is owned and operated by Reliant Energy per a lease from the State Lands Commission. CMWD would use the outfall under a license agreement from Reliant Energy, subject to approval by the State Lands Commission. This discharge requires the authorization of a National Pollutant Discharge Elimination System (NPDES) permit and associated Waste Discharge Requirements (WDRs) from the RWQCB.

The pipeline diameter would vary along the length of the pipeline, but is not expected to exceed 54 inches near the downstream end. Pipeline material would also vary along the alignment and would depend on performance characteristics, availability, and cost. The 54-inch diameter pipe sections would be constructed of high-density polyethylene (HDPE). Potential materials considered for future pipeline reaches are reinforced concrete cylinder pipe, welded steel pipe, reinforced concrete pipe, polyvinyl chloride, vitrified clay pipe, as well as HDPE.



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CMWD Brine Line Phase 1 Concentrate Sources

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Figure 2-2

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2.3 Volume

The statistics primarily consist of calculated means and 90th percentile flow values. The mean and 90th percentile flow values for each water source during periods of high concentration discharge were then used to determine projected brine line flow after wastewaters from the various sources were combined. Selection for the use of the 90th percentile values is subjective; however, because there are seven potential source waters, and 90th percentile flows are being used simultaneously from each source, this should be a conservative estimate of high loading periods into the brine line. For the drinking water supply wells, these wells only operate in an on- or off-mode and are not equipped with variable frequency drive motors. Therefore, drinking water supply wells do not have 90th percentile flows applied to them, as the mean flow is based on the projected capacity of the well pump.

The combined flow from the seven sources of wastewater for the brine line is estimated to be 17.529 MGD. Source flows are outlined in Table 2-2 below. Since CMWD would otherwise be discharging the effluent to the ocean, it could be assumed the entire flow would be available as a water source for the proposed wetlands restoration efforts. However, CMWD stated although no other potential uses have been identified for the brine line effluent other than that by the Ormond Beach restoration efforts, the Ormond Beach use would be “at the end of the line” in terms of flow sequence. As such, if there were competing uses for the brine line effluent, Ormond Beach would only be allotted any remaining flow after other uses (e.g., Duck Club) were allotted their share (K. McCaffrey, pers. comm., July 12, 2005).

TABLE 2-2
BRINE LINE SOURCE WATERS AND FLOWS

Source	Expected Mean Flow (MGD)
Camrosa Water District WWTP Effluent	1.441
Camarillo Sanitary District WRP Effluent	3.690
Hill Canyon WWTP Effluent	10.587
Camrosa Woodcreek Well Brine	0.245
Camrosa Conejo #3 Well Brine	0.161
Camarillo Wells A & B Brines	0.685
Ventura County Water Works District Airport Well Brine	0.720
Total	17.529

Source: Kennedy/Jenks Consultants 2002.

2.3.1 Camrosa Water District WWTP

The Camrosa WWTP is located in Camarillo. In 2002, Camrosa treated a mean flow rate of 1.441 MGD, with a 90th percentile flow of 1.662 MGD. The plant is designed to treat 1.5 MGD, with an ultimate planned capacity of 3 MGD. The treatment capabilities include extended aeration, nitrogen removal, secondary clarification, tertiary filtration, and disinfection with chlorine. Approximately 60 percent of the wastewater is recycled for irrigation use.

Normally, wastewater that is not recycled for irrigation is discharged into storage ponds, where the wastewater is treated in subsurface soils and infiltrates into underlying aquifers. On infrequent occasions, when the volume of wastewater exceeds the demand and storage pond capacity for recycled water, the NPDES permit allows discharge into Calleguas Creek. Typically, discharges into Calleguas Creek occur for only 1 to 2 weeks in the spring; however, these discharges may not occur at all in some years.

2.3.2 Camarillo Sanitary District Water Reclamation Plant

The Camarillo Sanitary District WRP treated a mean flow rate of 3.690 MGD in 2002, with a 90^{th} percentile flow rate of 3.940 MGD. The plant has a treatment capacity of 6.75 MGD.

Wastewater treatment consists of typical primary treatment, activated sludge treatment, secondary clarification, chlorination, and dechlorination. Approximately 50 percent of the wastewater effluent is recycled for landscape and agricultural use. Effluent flow in excess of the seasonal, recycled water demand is discharged into the Conejo Creek under a NPDES permit; the effluent flow varies.

In the Final Program Environmental Impact Report prepared for the GREAT Program (CH2M Hill 2004), it was assumed that the WRP might add RO treatment for a portion of its effluent to generate additional recycled water. However, the brine line project is considering discharging the excess WRP wastewater into the brine line instead.

2.3.3 Thousand Oaks Hill Canyon WWTP

The City of Thousand Oaks (Thousand Oaks) Hill Canyon WWTP processed a mean flow rate of 10.587 MGD in 2002, with a 90^{th} percentile flow rate of 11.308 MGD. Under the Regional Salinity Management Project, excess effluent from the Hill Canyon WWTP would be collected into the brine line for conveyance to downstream users or for ultimate discharge through the ocean outfall. This would be the largest source contribution to the brine line.

Wastewater is currently discharged into Arroyo Conejo, which flows into Conejo Creek, and eventually into Calleguas Creek. The City of Thousand Oaks and other local agencies, including CMWD and Camrosa, have coordinated with the SWRCB on the Conejo Creek Diversion Project, which enables downstream water districts to divert reclaimed water discharged from the Hill Canyon WWTP for agricultural reuse on farmlands in the Santa Rosa Valley and the Oxnard Plain. This would allow downstream water purveyors to decrease groundwater pumping, reduce overdraft, and lessen problems with seawater intrusion in the Oxnard Plain; as such, the diversion would provide for a regional benefit.

2.3.4 Camrosa Water District Water Supply Wells

Camrosa owns and operates the Woodcreek and Conejo #3 wells in the Santa Rosa Basin. These wells contain nitrates and elevated TDS, requiring treatment by RO or electrodialysis reversal (EDR). The brine produced as a byproduct of the treatment would be discharged to the proposed brine line. The Woodcreek Well operates at 1.224 MGD and the Conejo Well operates at 0.806 MGD. Formal design has not yet been prepared for either of the wells' treatment system, so general assumptions have been made to determine reject flows and constituent concentrations resulting from RO treatment on these wells:

- RO and EDR treatments would each generate a 20 percent reject rate.
- Removal efficiencies are conservatively estimated at 90 to 99 percent for most constituents.

2.3.5 Camarillo Water Supply Wells A and B

Both wells are located in the Las Posas Basin in Camarillo. Well A is located at 3901 Las Posas Road and is equipped to produce 2,000 gpm of water. Well A is currently a standby well; it is not currently in use due to excess sand production and high TDS levels. Well B is located near Well A and has produced at an average rate of 1,110 gpm. Well B has been affected by rising manganese concentrations; the water is currently blended with imported CMWD water to achieve drinking water quality standards.

Camarillo is considering the construction of a joint facility to treat flows from both Wells A and B at a common location. As with the Camrosa Water District wells and VCWWD airport wells, there has been no formal design of a treatment system for the wells; the same general assumptions have been used to determine flows and constituent concentrations for the treatment system brine.

2.3.6 Ventura County Airport Water Supply Well

VCWWD owns the Airport well, which is located in the Pleasant Valley Basin and is near the Camarillo Airport. Due to water quality issues, primarily nitrate levels, the well is not currently in operation. As with the Camrosa wells, there has been no formal design of a treatment system for the well; the same general assumptions have been used to determine flows and constituent concentrations for the treatment system brine.

2.4 Seasonality of Flows

In general, the flows from each of the brine line sources are expected to be fairly constant. However, recycled water demand is greatest during the summer months and tends to decrease during the winter months. If WWTPs recycle directly from the treatment facility, then their wastewater flows into the brine line would likely be lower during the summer months. Sufficient information is not available at this time to quantify the expected range of flows.

CMWD is examining potential water reuse options for the brine line wastewater. Ventura County Game Preserve (Preserve) has been identified as a potential user. Water use would likely not exceed 1.0 MGD. The Preserve's peak demand period would be from August to October; this timing complements the time of year when other irrigation uses for recycled water is declining.

2.5 Quality

The brine line wastewater would consist of slightly brackish water, which is a characteristic of disinfected, tertiary-treated, domestic wastewater. The level of treatment at each facility is outlined below:

- Camarillo WRP.
  - This is a secondary treatment facility.
  - A tertiary treatment facility will be constructed in the next few years for nutrient removal.
- Camrosa WWTP.
  - This is a tertiary treatment facility.
  - Uses RO and EDR to treat nitrate and elevated TDS concentrations for the drinking water wells.
- Thousand Oaks Hill Canyon WWTP.
  - This is a tertiary treatment facility.
  - A facility upgrade project is being constructed to allow for efficient removal of nitrogen and phosphorus; the upgrade is expected to be completed by the summer of 2005.

An extensive water quality testing program was conducted in 2002 to analyze effluent from the treatment facilities listed above and the brine and drinking water from the five wells previously described. California Toxic Rule (CTR) parameters were analyzed. The results of these analyses are summarized in Table 1 in the Appendix; these summaries are based on a regional salinity management report prepared for CMWD (Kennedy/Jenks Consultants 2003) and are compared to regulatory standards.

As with volume calculations, the statistics primarily consist of calculated means and 90th percentile concentration values. The mean and 90th percentile concentration values for each water source during periods of high concentration discharge were then used to determine projected brine line concentrations after wastewaters form the various sources were combined. Selection for the use of the 90th percentile values is subjective; however, because there are seven potential source waters, and 90th percentile concentrations are being used simultaneously from each source, this should be a conservative estimate of high loading periods into the brine line. Because the Camrosa Water District drinking water supply wells only operate in an on- or off-mode and are not equipped with variable frequency drive motors, these source waters do not have 90th percentile flows applied to them, as the mean flow is based on the projected capacity of the well pump.

RO wellhead treatment systems currently do not exist on any of the five drinking water wells. In order to calculate the brine concentrations, it was assumed that the RO would produce a reject stream equal to 20 percent of the pumping capacity. In addition, typical removal efficiencies for contaminants or groups of contaminants were used to develop a mass balance and calculate constituent concentrations in the brine.

Based on the data available, as presented in Appendix Table 1, there would be several constituents of potential concern, as concentrations exceeded regulatory standards. These constituents are highlighted in the table and are listed below:

- Basin Plan.
- California Ocean Plan:
  - Ammonia as nitrogen possibly ammonia as nitrogens (temperature indicators were not provided)
  - PAHs
  - Tributyltin
  - Seven metals
  - All of the pesticides except HCH
  - Acrylonitrile
  - Seven semi-volatile organic compounds.

Values for a number of Basin Plan constituents were not available; therefore, it is unknown how the brine line would compare with the following:

- Turbidity
- Temperature alteration
- Color
- Taste and Odor
- Fecal coliform REC-1 and REC-2.

Section 3: Oxnard Brine Line

The City of Oxnard Water Division developed the Groundwater Recovery Enhancement and Treatment (GREAT) Program to ensure a future reliable and affordable supply of high quality water. The GREAT Program Advanced Planning Study (Kennedy/Jenks Consultants 2002) provides detailed information on the recycled water and groundwater resources. The GREAT Program Final Program Environmental Impact Report (CH2M Hill 2004) was adopted by the City of Oxnard; specifications outlined in the GREAT Program are currently being implemented.

One component of the GREAT Program includes the construction and operation of a brine concentrate collection system. This system would collect concentrate from RO facilities and convey the combined brine sources to the Oxnard WWTP ocean outfall. Alternatively, or in addition to the ocean outfall, the brine could be conveyed to the Ormond Beach area for use as a coastal wetlands water supply. Conveyance of the brine to the coastal wetlands would serve a dual purpose, (1) it will enable the City of Oxnard to reduce the hydraulic and mineral loading of its wastewater treatment plant, and (2) it could provide a water supply for the restoration of the Ormond Beach wetlands.

3.1 Sources

There are four known sources that either currently contribute, or are slated to contribute, brine concentrate to the Oxnard WWTP:

- Point sources:
  - PHWA Brackish Water Reclamation Demonstration Facility (BWRDF)
  - Industrial/manufacturing facilities
  - Groundwater desalting facilities
- Non-point sources - self-regenerating water softeners.

Available water quality data for the above-referenced potential water sources does not compare with the water quality parameters for the California Ocean Plan or the Basin Plan; therefore, no determination can be made to equate the quality of these potential sources to these regulatory standards at this time.

3.1.1 PHWA BWRDF

As currently configured, the PHWA BWRDF discharges brine generated by RO, nanofiltration, and EDR treatment processes to the Oxnard WWTP influent sewer. Table 3-1 presents estimated concentrate flow and quality from each of the treatment processes.

TABLE 3-1
2001 BWRDF CONCENTRATE FLOWS AND QUALITY

Discharger	Flow GPD	TDS Mg/l	TDS lbs/day	Chloride mg/l	Chloride lbs/day	Boron mg/l	Boron lbs/day
Reverse Osmosis	259,200	4,936	10,677	267	578	1.2	2.7
Nanofiltration	262,080	4,904	10,726	227	496	1.2	2.5
Electrodialysis Reversal	201,600	4,105	6,906	183	308	1.1	1.8
Total/Average[(a)]	722,880	4,696	28,309	229	1,382	1.2	7.0

Source: Kennedy/Jenks Consultants 2002.
Note: (a) Total is used for flow and mass loading (lbs/day) columns. Average is used for concentration (mg/l) columns.

3.1.2 Existing Industrial Concentrate Sources

There are several industrial sites within the City of Oxnard that produce concentrate. The City of Oxnard's 1993 Water Reclamation Master Plan identified six sites that discharged substantial TDS, chloride, and boron loads to the City's sewers. Table 3-2 presents the loading information for these six dischargers based on 1992 data.

TABLE 3-2
1992 CONCENTRATE DISCHARGE QUANTITIES AND QUALITY

Discharger	Flow GPD	TDS mg/l	TDS lbs/day	Chloride mg/l	Chloride lbs/day	Boron mg/l	Boron lbs/day
Bush Oil	34,183	23,038	6,541	11,575	3,282	16.1	4.6
Energy Factor	471,463	1,390	4,839	178	609	3.7	12.9
Liquid Waste Transfer Facility	54,428	4,718	2,140	3,095	1,404	7.4	3.4
Santa Clara Wastewater	222,288	17,610	32,645	11,750	21,784	18.6	34.5
Procter and Gamble	710,334	4,174	24,716	3,141	18,600	2.4	14.2
Willamette	419,925	5,590	19,575	498	1,743	2.4	8.4
Total	1,858,621	5,835	90,456	284	47,422	5.0	78
Influent wastewater (1992)	16,000,000	1,760	234,854	516	68,855	2.0	267
Influent wastewater w/o concentrate	14,141,379	1,224	144,398	182	21,433	1.6	189

Source : Malcolm-Pirnie/James M. Montgomery 1993.

More recent sampling has indicated a different set of dischargers and a different quality of concentrates. Table 3-3 indicates the more recent dischargers and the corresponding concentrate quality.

TABLE 3-3
2001 CONCENTRATE QUANTITIES AND QUALITY

Discharger	Flow	TDS		Chloride		Boron	
	GPD	mg/l	lbs/day	mg/l	lbs/day	mg/l	lbs/day
Agrilink Foods	180,000	1,180	1,771	146	219	0.6	0.9
Arcturus Manufacturing	25,000	11,600	2419	6,200	1,293	1.0	0.2
Kaiser Aluminum	10,000	4,290	358	240	20	2.1	0.2
Mission Linen Supply	39,000	2,600	846	280	91	0.5	0.2
Pacific Linen Service	80,000	1,150	767	76	51	0.6	0.4
Procter and Gamble	1,200,000	1,630	16,313	390	3,903	0.3	3.0
Sithe Energy	70,000	266	155	14	8	0.7	0.4
Willamette Industries	235,000	3,580	7,016	610	1,196	13.6	26.7
Subtotal	1,839,000	1,933	29,645	442	6,781	2.1	32
Influent wastewater (2001)	21,500,000	1,673	299,986	404	72,441	0.9	161.4
Wastewater without concentrate[(a)]	19,661,000	1,649	270,341	400	65,660	0.8	129
Santa Clara Wastewater Company	130,000	22,500	24,395	2,700	2,927	9.7	10.5
Ventura Regional Sanitation District	90,000	1,620	12,160	8,900	6,680	1.6	1.2
Wastewater without concentrate	19,441,000	1,442	233,786	346	56,053	0.7	118

Source: Kennedy/Jenks Consultants 2002.
Note: (a) Concentrates from the Santa Clara Wastewater and Ventura Regional Sanitation District are excluded in this line as both sources are questionable from either a quality or cost-effectiveness standpoint.

The differences between the 1992 and 2001 concentrate qualities are substantial. Two potential factors have been identified:

- TDS, chloride, and boron concentrations are based on a single sample and may not totally be representative of the average constituent concentrations.
- The blend ratio of the water distributed in 1992 is not the same as the 2001 ratio. In 1992, the blend ratio was closer to 2 parts CMWD imported surface water to 1 part groundwater. Currently, the City of Oxnard is closer to operating on a basis of 1 part CMWD imported surface water to 1 part groundwater. This would indicate that the TDS of the potable water and the wastewater would be lower in 1992 than are currently observed, assuming incremental increases in TDS through normal use.

Wastewater flows from the Santa Clara Wastewater Company is by contract because the facility is located outside of the City of Oxnard's city limits. Santa Clara Wastewater Company discharge flows are currently and expected to stay below the contractual limit:

- Current flows: approximately 130,000 GPD.
- Expected future flow: up to 250,000 GPD.
- Contractual maximum flow: 600,000 GPD.

Santa Clara Wastewater Company flow consists primarily of oil field production water, concentrates, septage, and a small amount of industrial process water. The original agreement for services expired on September 30, 1997; the agreement was extended and it is anticipated that it will be extended on an on-going basis. This source was excluded in the GREAT Program as a recycled water production option because of the presence of hydrocarbons in the wastewater makes this source unsuitable for both agricultural irrigation and direct groundwater injection. Although, as indicated previously, wetlands restoration was not an option considered in the GREAT Program because the preliminary wetland studies were not complete, this source can now also be considered unsuitable for the proposed wetlands restoration efforts.

Wastewater flows from the Ventura Regional Sanitation District are also by contract because, like the Santa Clara Wastewater Company, the facility is located outside of the City of Oxnard's city limits. Wastewater flows from Ventura Regional Sanitation District consist of septage, concentrates, and a small amount of industrial process water. Flow rates are approximately at the contract limit of 90,000 GPD. Per the terms of the agreement, discharge can only occur between 10:00 p.m. and 5:00 a.m. The original agreement for services expired on September 30, 1997; as with the Santa Clara Wastewater Company, this agreement was also extended and it is anticipated that it will be extended on an on-going basis. Concentrate from this source was not identified as a recycled water option in the GREAT Program because it is relatively isolated and, as such, accessing this source would not be cost-effective.

3.1.3 Groundwater Desalting Facilities

The GREAT Program desalter is expected to produce concentrates that would impact the recycled water quality if they were allowed to enter the Oxnard WWTP influent sewer. Table 3-4 presents the estimated concentrate that would be derived from both of the facilities.

TABLE 3-4
GREAT PROGRAM DESALTER CONCENTRATE QUANTITY AND QUALITY

Discharger	Flow GPD	TDS mg/l	TDS lbs/day	Chloride mg/l	Chloride lbs/day	Boron mg/l	Boron lbs/day
GREAT Program Desalter	259,200	4,936	10,677	267	578	1.2	2.7
CMWD Desalter	259,200	4,936	10,677	267	578	1.2	2.7
Total	518,400	4,936	21,354	267	1,156	1.2	5.4

Source: Kennedy/Jenks Consultants 2002.

3.1.4 Self-Regenerating Water Softeners

A salinity management study for the Metropolitan Water District of Southern California included a discussion regarding water softeners (Bookman-Edmonston Engineering, Inc. 1998). Water softeners use an ion exchange process to reduce the hardness of water. Self-regenerating softeners typically discharge their waste brine to the sewer system. Salt loading from water softeners increases the salinity of raw wastewater and may limit the end-use for traditionally-produced recycled water (i.e., oxidation, coagulation, filtration, and disinfection treatment processes). The amount of salt loading to the sanitary sewer would vary based on the frequency of regeneration, the efficiency of regeneration, and the TDS of the source water. TDS contributions were calculated for four southern California locations, based on projections, laboratory testing, effluent sampling, and bulk salt sales surveys; these figures are presented in Table 3-5. The results from this study should provide an estimated range for that of the Oxnard brine line.

TABLE 3-5
WATER SOFTENER IMPACTS ON RECYCLED WATER TDS

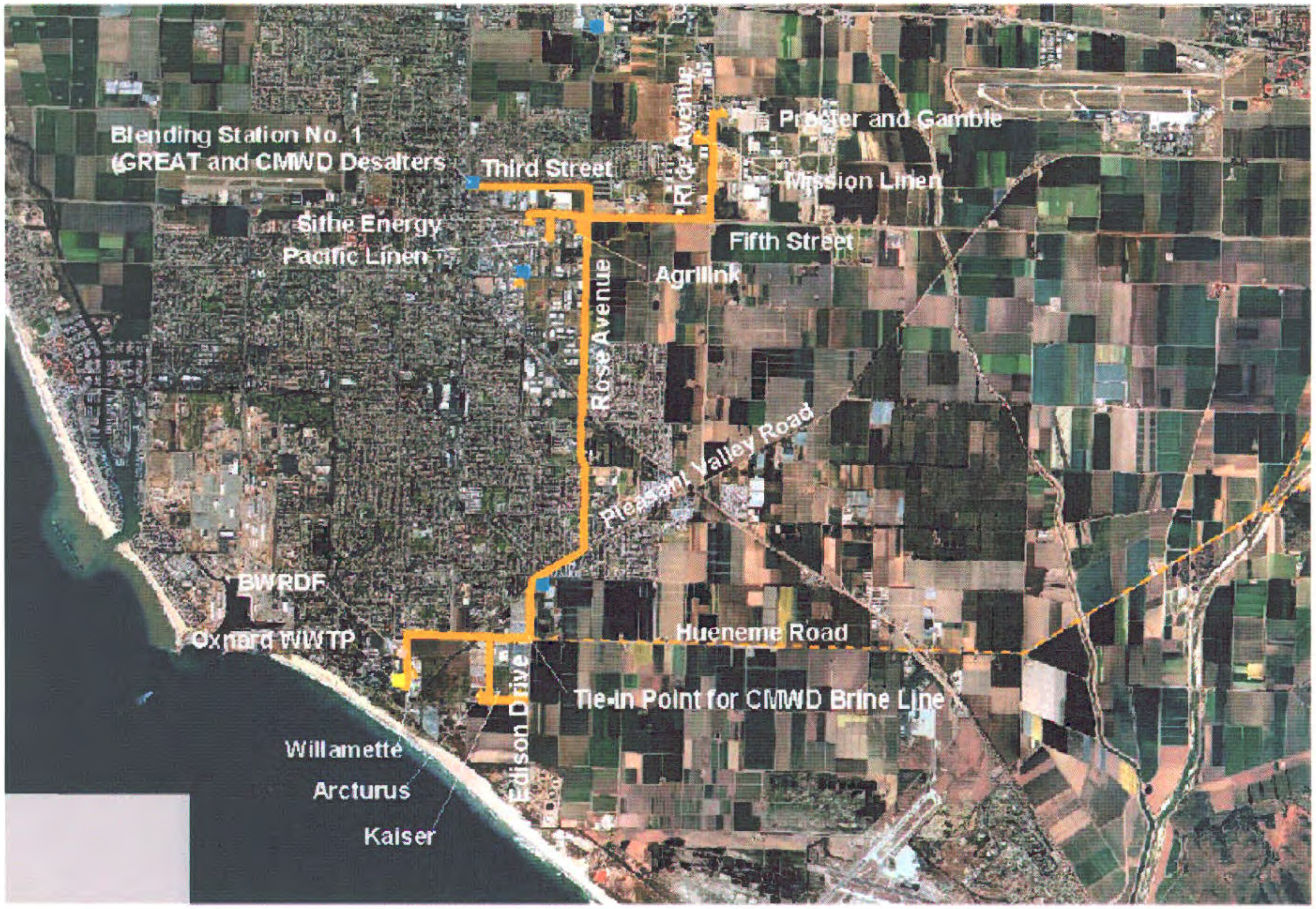
Location	Year	Residential Water Softener TDS Contribution, mg/l	Wastewater TDS, mg/l	Basis of Information
San Diego North City Water Reclamation Plant	1997	120	1,200	Technical projection
Tillman/Los Angeles Glendale Reclamation Plants	1991	23	350	Technical projection and laboratory results
Rancho Bernardo	1989	108	1,100	Effluent sampling
City of Escondido	1992	45	1,037	Technical projection and survey of bulk salt sold

Source: Bookman-Edmonston Engineering, Inc. 1998.

3.2 Alignments

The sources that would be served by the Oxnard brine line were considered in the development of the City of Oxnard concentrate conveyance facilities alignments. The GREAT Program determined that, at a minimum, the Oxnard brine line should be routed to serve the BWRDF, the GREAT Program desalter, and the Procter and Gamble facility. These facilities generate large quantities of concentrate and are expected to be operated on a fairly continuous basis. Removal of their brines from the wastewater collection system would provide the largest benefit to the demineralization processes at the BWRDF. Many of the other concentrate dischargers identified in the GREAT Program, including City of Oxnard Blending Station No. 1, are located in the general vicinity of the Procter and Gamble and the desalter facilities.

The recommended alignment for the GREAT Program concentrate collection system is shown on Figure 3-1. The GREAT Program assumes that the current discharge point is the Oxnard WWTP ocean outfall because the wetlands restoration concept was not fully



Legend

- BWRDF
- WWTPs
- Blending Stations
- CMWD Brine Line
- Proposed Concentrate Line
- Brine Dischargers

N

2 0 2 4 Miles

Source: Kennedy/Jenks Consultants
2002

Kennedy/Jenks Consultants

Ormond Beach Wetlands Feasibility Plan

GREAT-Recommended Brine Concentrate Collection System for City of Oxnard

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Figure 3-1

developed at that time. However, since that time, the wetlands have been studied and consideration will now be given to routing the brines to the Ormond Beach wetlands.

The backbone alignment for the brine line is expected to be as follows:

- Along Rose Avenue starting at Fifth Street and continuing south to Pleasant Valley Road.
- Along Pleasant Valley Road and continuing southwest to Hueneme Road.
- Along Hueneme Road and continuing east to Perkins Road.
- Along Perkins Road and continuing south to the outfall.

Backbone laterals would enable the collection of concentrate from the following dischargers:

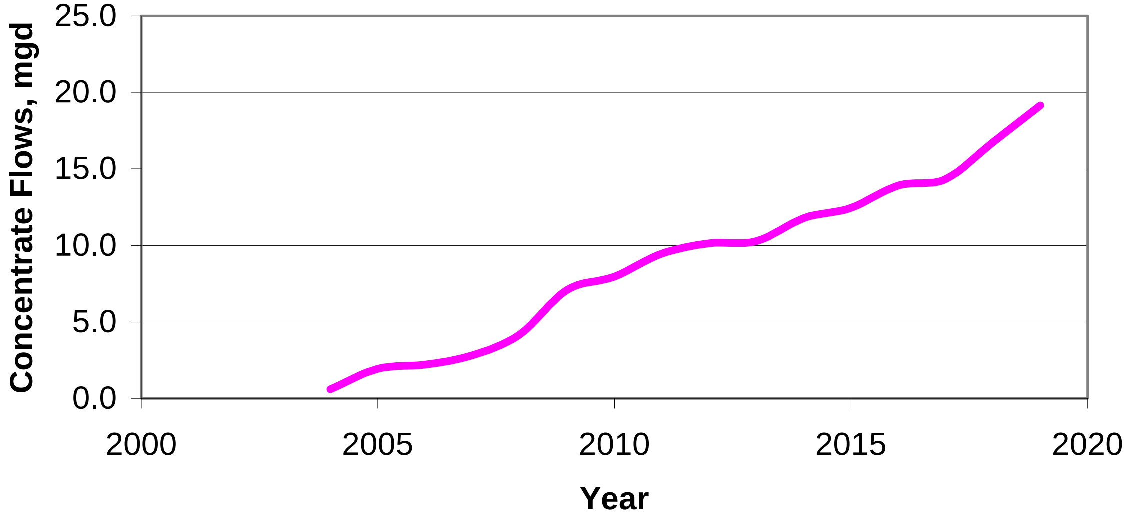
- Agrilink Foods
- Arcturus Manufacturing
- Blending Station No. 1 (i.e., both the GREAT and CMWD desalters)
- BWRDF
- CMWD brine line
- Kaiser Aluminum
- Mission Linen
- Pacific Linen
- Procter and Gamble
- Sithe Energy
- Willamette Industries.

If Phase 2B Project Scenario is selected for the GREAT Program, then only concentrate from Arcturus Manufacturing, Blending Station No. 1, BWRDF, CMWD Brine Line, Kaiser Aluminum, and Willamette Industries would be collected. Concentrate from the other facilities would be eliminated through the provision of RO permeate from the GREAT Program desalter.

3.3 Volume

CMWD's Brine Line would be built in stages over several years. Figure 3-2 shows the projected increase in flows for the CMWD Brine Line system over time.

FIGURE 3-2
CMWD CONCENTRATE LINE FLOWS



Source: Kennedy/Jenks Consultants 2002.

Table 3-6 presents the outfall capacities based on the GREAT Program and the associated assumption that water recycling is implemented as projected, and that brine discharges from the BWRDF, the GREAT Program desalter, CMWD's desalter, and the industrial dischargers are rerouted to the outfall.

TABLE 3-6
POTENTIAL OUTFALL CAPACITY

Parameter	2005	2010	2020
Existing outfall capacity, mgd [a]	25.0	25.0	25.0
Wastewater flows, mgd [b]	21.5	24.0	28.9
Recycled water flows, mgd	10.7	18.8	32.6
BWRDF concentrate, mgd	(1.3)	(2.2)	(3.8)
GREAT Program Desalter concentrate, mgd	(0.7)	(1.1)	(1.9)
CMWD desalter concentrate, mgd	(2.1)	(2.1)	(2.1)
Industrial concentrate, mgd	(1.8)	(1.8)	(1.8)
Firm spare capacity, mgd [c]	4.8	11.6	23.0

Source: Kennedy/Jenks Consultants 2002.
Notes:
(a) The existing permitted capacity of the Oxnard WWTP is 25.0 mgd, but the City has requested from the RWQCB, an increase to 31.7 mgd.
(b) 2020 wastewater flow rates were taken from the Wastewater Collection System Master Plan (Brown and Caldwell, 2000). The 2010 flow rate was prorated between the 2005 and 2020 flows.
(c) Firm spare capacity assumes that all of the municipal and industrial concentrates are directed to the outfall for disposal. Additional capacity could be gained if these flows were directed to the wetlands.

3.4 Seasonality of Flows

Data regarding seasonality of flows are unavailable.

Section 4: Seawater Effluent from the Reliant Energy Ormond Beach Generating Station

The Ormond Beach Generating Station, owned by Reliant Energy, Inc., is a 1,500-megawatt plant located in along the coast in Oxnard at 6635 South Edison Drive. The facility consists of two steam-electric, gas-fueled generating units that are rated at 750 megawatts each.

This wastewater consists of:

- Once-through cooling water from two steam-electric generating units.
- Metal cleaning wastes - wastewaters resulting from chemical cleaning of metal process equipment including, but not limited to, boiler tube, boiler fireside, and air preheaters.
- Low-volume wastes - softener regeneration wastes, fireside and air preheater washes, floor drains, and boiler blowdown wastes.

The facility discharges wastewater into the ocean near Ormond Beach where the wastes are jetted vertically from an outfall coffer located at about 1,790 feet offshore at a depth of 20 feet Mean Lower Low Water (MLLW). The cooling water intake structure is located about 1,900 feet offshore at a depth of 34 feet MLLW and draws water from a depth of 25 feet below MLLW.

4.1 Quality and Volume of Effluent

Data was available for 2001 and 2004, as described below.

4.1.1 2001 Data

A NPDES permit regulates the discharge of the once-through cooling water, treated metal cleaning wastes, and low-volume wastes into the ocean. From January 1, 2001 through June 27, 2001, Ormond Beach Generating Station operated in accordance with Los Angeles RWQCB Order No. 94-132 and NPDES No. CA0001198. On June 28, 2001, the Los Angeles RWQCB approved the renewal of the NPDES permit and issued the new WDR Order No. 01-092 and NPDES No. CA0001198.

The characteristics of the effluent discharged from the Reliant Generating Station, as reported in the above-referenced NPDES permit application, are listed in Appendix Table 2; the daily maximum reported flow was 688.2 MGD. Additional wastewater characteristics are outlined in the Effluent Monitoring Analysis Data from the Reliant Energy 2001 Annual Summary Report; this data is also presented in Appendix Table 2. The total flow values reported included:

- Monthly range of 460 to 686.7 MGD

- Discharge limit of 688.2 MGD

It is unknown how much of this effluent would be available to the Ormond Beach wetland restoration efforts. Reliant Energy has pre-existing agreements for this effluent. Discussions between the Project Proponent - i.e., the Coastal Conservancy - and Reliant Energy would need to ensue in order to make availability determinations.

4.1.2 2004 Data

Reliant Energy provided an annual summary for constituents they monitored in 2004. The results of these analyses are presented in Appendix Table 2.

4.1.3 Constituent Exceedances

Wastewater discharged from the Reliant Energy generating station exceeded the following NPDES constituent limits during the 5-year period between December 1994 and January 2001 (Reliant Energy 2002):

- The 30-day average for copper, 9.5 µg/l, was exceeded in May 1996 with a 16 µg/l reading in May 1996.
- A chronic toxicity limit of 7.5 TU_c was exceeded in September and October of 1996 with values of 16 and 8 TU_c, respectively. Exceedances may have been due to an error in laboratory procedures.
- The chronic toxicity limit was exceeded again on 26 June 2001. This was due to the station’s installation of a sampling pump that had brass components.
- In September 2000, total suspended solids were detected at 140 mg/l. This level exceeds the 100 mg/l limit. As such, Reliant Energy was issued an Administrative Civil Liability in December 2000.

Results for the above-referenced data set, as compared to the California Ocean Plan and Basin Plan parameters, are as follows:

- California Ocean Plan. Only five of the numerous California Ocean Plan parameters were reported in the above-referenced data set. Of those five parameters, pH was exceeded.
- Basin Plan. The values for chlorine (residual) and pH were exceeded. Results were not provided for settable solids, turbidity, color, or taste and odor.

Results for the 2004 data set, as compared to the California Ocean Plan and Basin Plan parameters, are as follows:

- California Ocean Plan. Only chlorine (residual), pH, and all of the metal parameters were reported; none of these constituents exceeded the California Ocean Plan limits.

- Basin Plan. Only four of the Basin Plan parameters were reported – i.e., chlorine (residual), temperature, pH, and toxicity; only the toxicity analysis exceeded the Basin Plan limit.

4.1.4 Impact of Pipeline Maintenance on Effluent

The marine fouling of the intake and discharge conduits for the cooling water is controlled through heat treatment. The heat treatment procedure consists of temporarily recirculating and reversing the flow of the once-through cooling water. The process alternates between using the intake conduit and the discharge conduit (i.e., the discharge point becomes the intake point and visa versa). This procedure is typically conducted every 5 weeks and lasts for approximately 2 hours per conduit. During the heat treatment, the temperature of waste discharged does not exceed 125°F except during adjustment of the recirculation gate, at which time the temperature of the wastes discharged does not exceed 135°F. During gate adjustments, temperatures above 125°F do not last longer than 30 minutes.

Biological growth on the condenser tubes is controlled by intermittently injecting chlorine, in the form of sodium hypochlorite, into the cooling water system. There are two chlorination cycles per day, with each cycle lasting 100 minutes.

4.2 Seasonality of Flows from Reliant

Data regarding seasonality of flows are unavailable.

Section 5: Agricultural Water from United Water Conservation District

UWCD is a public agency that encompasses about 214,000 acres of central Ventura County. UWCD covers the downstream portion of the Santa Clara River and the Oxnard Plain. UWCD serves as the steward for managing the surface water and groundwater resources in order to provide water to its municipal and agricultural customers. Figure 5-1 depicts the groundwater basins within UWCD boundaries.

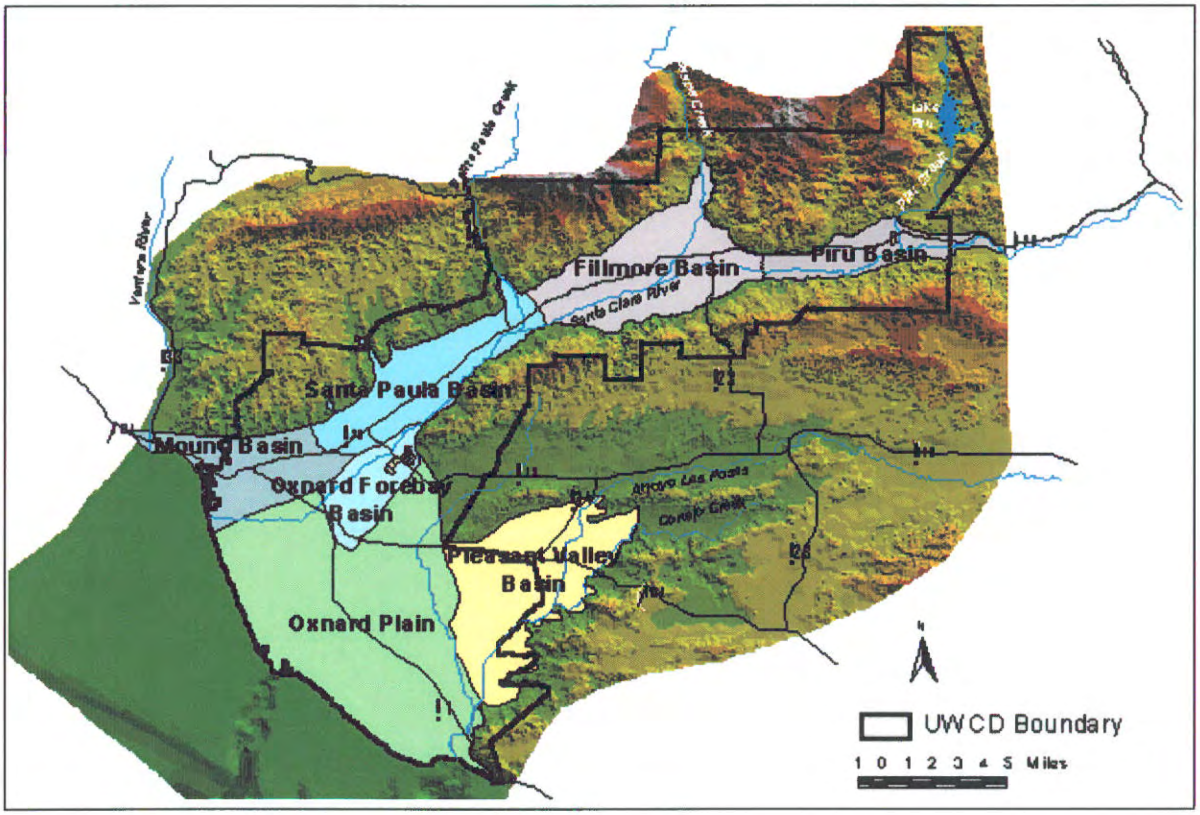
As shown on Figure 5-2, water releases from Lake Piru and natural runoff from the Santa Clara River watershed are diverted by the Freeman Diversion located near Saticoy. Water diverted from the river is conveyed to a desilting basin. At this point, water velocity slows and this allows for sediment to settle out from the water column. From the desilting basin, water is conveyed to the Saticoy Spreading Grounds. From the main canal at the Saticoy Spreading Grounds, water is directed, as follows:

- To percolation ponds at the Saticoy Spreading Grounds for Upper Aquifer System (UAS) recharge.

- To the Main Supply Pipeline. From here, water is directed as described below.
  - To the Pumping Trough Pipeline (PTP) for agricultural use and for groundwater recharge. Lower Aquifer System (LAS) groundwater is extracted from five wells near the PTP to augment the diverted Santa Clara River water. Augmentation with groundwater is necessary because demands periodically exceed diverted river water supplies (UWCD 2000). The PTP then conveys the water, as follows:
    - To UWCD's agricultural users and the PTP Reservoir.
    - To the Pleasant Valley Pipeline (PVP), which then conveys water to PVMWD's agricultural users and the Pleasant Valley Reservoir.
    - To the El Rio Spreading Grounds for UAS recharge.
  - To the El Rio Spreading Grounds for UAS recharge. Groundwater is extracted from a well field near the El Rio Spreading Grounds. This groundwater is fed into the Oxnard-Hueneme (O-H) Pipeline for conveyance to municipal and industrial (M+I) users. Because O-H Pipeline-conveyed water is not used for agricultural purposes, it is not an option for the proposed wetlands restoration efforts. As such, the El Rio Spreading Grounds and the O-H Pipeline are not discussed further in this document.

Other sources of agricultural water for the Oxnard Plain and Pleasant Valley basins include:

- Groundwater from other water purveyors (i.e., Ocean View Municipal Water District [OVMWD] and Pleasant Valley County Water District [PVCWD]). OVMWD is discussed in Section 7.0 regarding a potential water source for the proposed wetlands restoration efforts. PVCWD is not considered an option for the wetlands restoration efforts because it does not have excess water.



Source: UWCD 2001

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Ormond Beach Wetlands Restoration Feasibility Plan

Groundwater Basins within UWCD Boundaries

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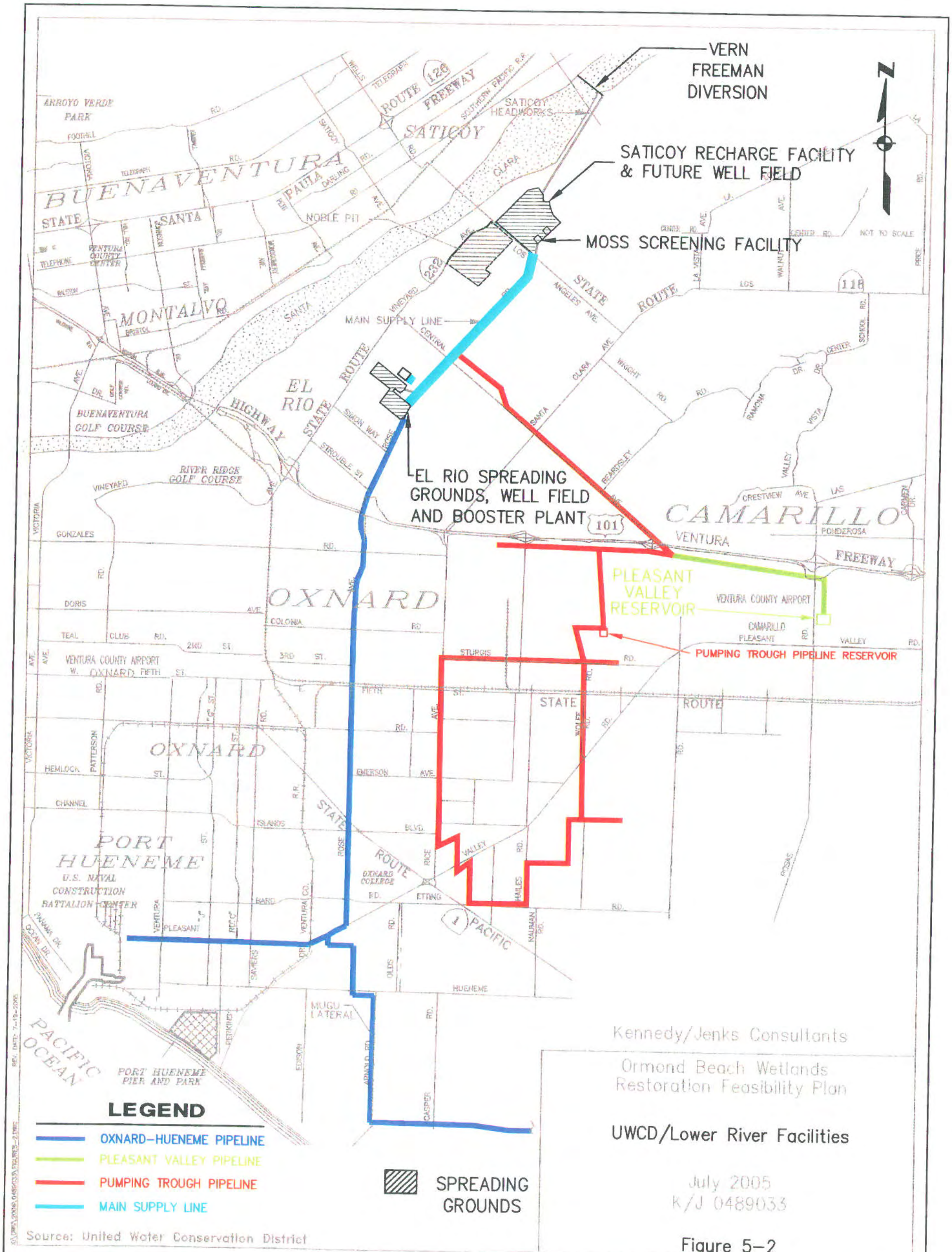
Figure 5-1



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UWCD/Lower River Facilities

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Figure 5-2

- Groundwater from private wells operated by farmers. These private groundwater sources are not an option for the proposed wetlands restoration efforts and, as such, are not discussed further in this document.

The sections that follow describe UWCD's agricultural water supplies. Prior to these discussions, though, brief overviews are provided regarding the topics listed below, as they are inherent components of the agricultural water supplies being considered for the proposed wetlands restoration efforts.

- Key regional water management programs
- Surface water characteristics
- Groundwater characteristics.

5.1 Regional Water Management Programs

The GREAT Program and FCGMA are important elements for managing the region's water supplies.

5.1.1 GREAT Program

As indicated previously, the City of Oxnard Water Division developed the GREAT Program to ensure a future reliable and affordable supply of high quality water. The GREAT Program Advanced Planning Study (Kennedy/Jenks Consultants 2002) provides detailed information on the recycled water and groundwater resources. The GREAT Program Final Program Environmental Impact Report (CH2M Hill 2004) was adopted by the City of Oxnard; specifications outlined in the GREAT Program are currently being implemented.

5.1.2 Fox Canyon Groundwater Management Agency

Fox Canyon Groundwater Management Agency (FCGMA) is an independent special district, separate from the County of Ventura or any city government. It was created by the California Legislature in 1983 to oversee Ventura County's vital groundwater resources by addressing ongoing overdraft and seawater intrusion into the Oxnard Plain Basin. The purpose of FCGMA is to manage the region's groundwater supply by protecting the quantity and quality of local groundwater resources and by balancing the supply and demand for groundwater resources. Ventura FCGMA is not a water purveyor, but does have management jurisdiction over almost 1,000 water wells in the southern half of County.

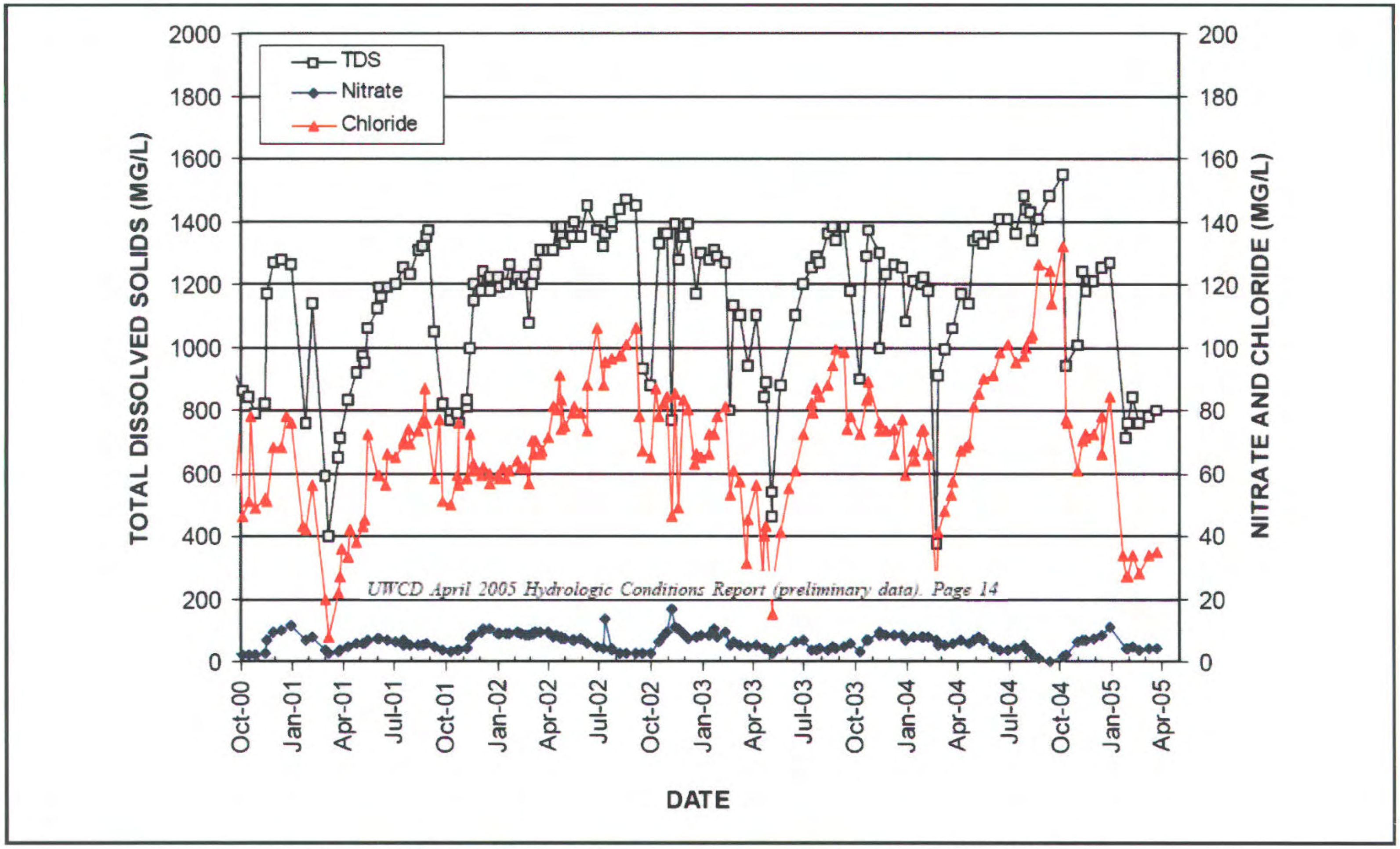
In order to eliminate groundwater overdraft and bring extractions within safe yield by 2010, the FCGMA adopted Ordinance No. 5. This ordinance established (1) historical allocations for each pumper in the Oxnard Plain Basin, and (2) a schedule of pumping allocation reductions. The historical pumping allocation is credited to the pumper and was based on actual extractions during the 5-year base period from 1985 to 1989. A series of 5 percent reductions to historical pumping allocations have been scheduled at approximately 5-year intervals until a 25 percent reduction is achieved in the year 2010. According to FCGMA, three, 5 percent reductions have been implemented to date; the two remaining 5 percent reductions are scheduled for 2005 and 2010 (Panaro, D. 2005, pers. comm., March 14).

5.2 Surface Water Characteristics

The quality of surface waters within UWCD varies by location and season. Water becomes more mineralized as it travels through the complex flow system of the Santa Clara River watershed. Mineralization is the result of both natural processes and land use activities. Impacts to surface and groundwater quality from human activities may result from the presence of water reclamation plants, urban areas, solid waste disposal sites, agricultural practices, mining, grazing, toxic spills, and other land uses. A number of chemical constituents are known to fluctuate with streamflow, with lower concentrations of dissolved constituents showing strong correlation with higher flows.

Water quality records at the Freeman Diversion for the 2000 water year through April 2005 are displayed on Figure 5-3. These data do not lend themselves to comparison with regulatory standards, as the three measured constituents - TDS, nitrate, and chloride - are not quantified by the California Ocean Plan or the Basin Plan.

The volume of water historically diverted from the Freeman Diversion is outlined on Figure 5-4 below. Although the graph depicts historical average data (maroon-colored bars) along with data that is atypical (i.e., the period of 1999 to 2000 [blue-colored bars]) the historical average data is the portion of the graph which represents the information needed for the subject analysis. The period for which the historical averages are based was not available to include in this Ormond Beach report.



Santa Clara River water quality at Freeman Diversion

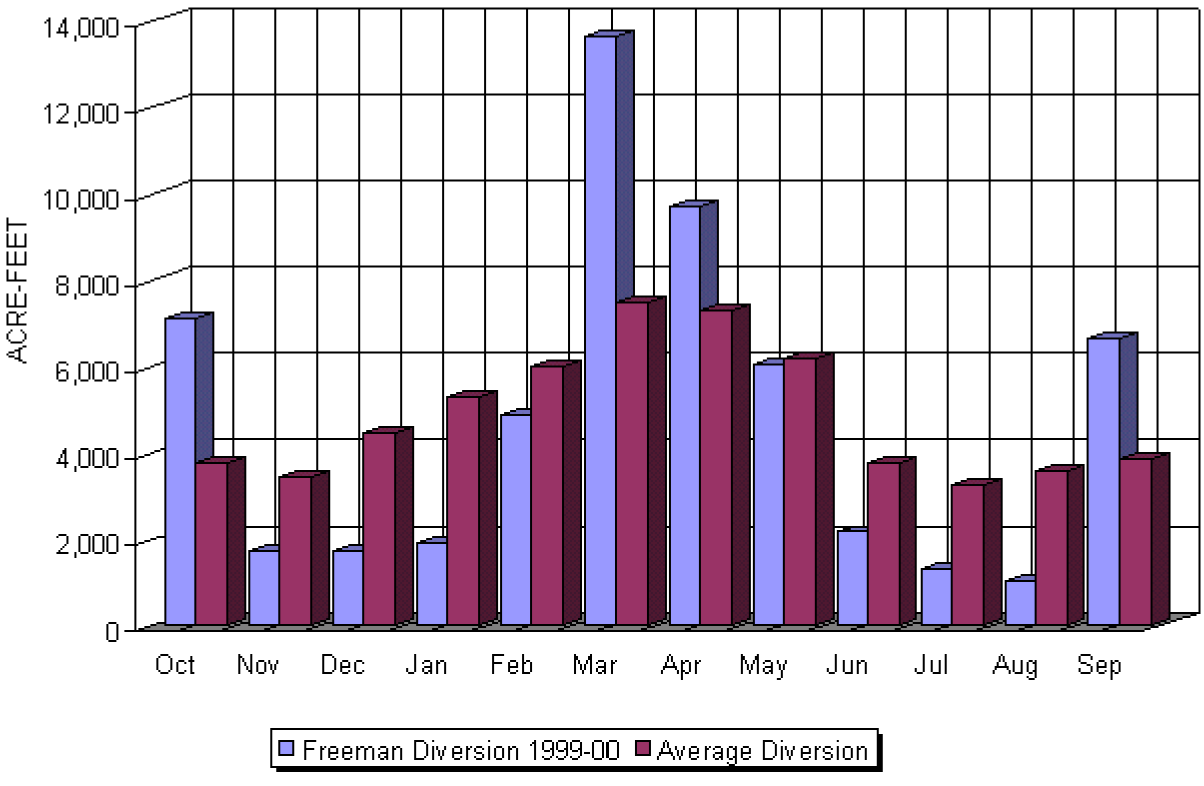
Kennedy/Jenks Consultants

Ormond Beach Wetlands Restoration Feasibility Plan
Santa Clara River Water Quality
at Freeman Diversion
July 2005
K/J 0489033

Figure 5-3

Source: UWCD 2005.

FIGURE 5-4
1999-2000 FREEMAN DIVERSION MONTHLY WATER DIVERSIONS AND HISTORICAL AVERAGES

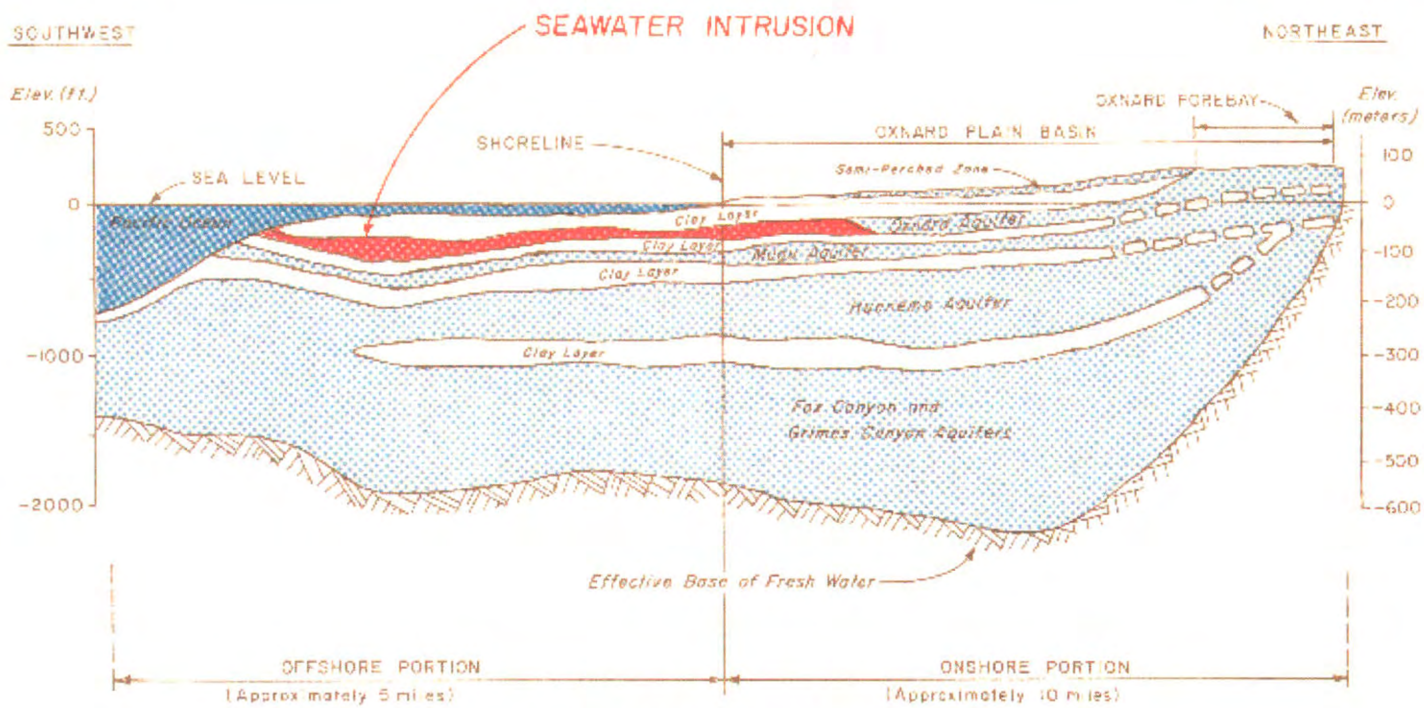


Source: UWCD 2001.

5.3 Groundwater Characteristics

Groundwater used for the PTP and PVP deliveries, as outlined below in Section 5.4, is extracted from the Oxnard Plain basin. A simplified cross-section of the basin's UAS and LAS is illustrated on Figure 5-5. The Oxnard Plain basin extends several miles offshore beneath the marine shelf, where UAS groundwater is in direct contact with seawater. In areas near Port Hueneme and Pt. Mugu, where submarine canyons extend nearly to the coastline, the fresh-water aquifers may be in direct contact with seawater a short distance offshore.

UWCD's major issues of concern regarding the Oxnard Plain are groundwater overdraft and the intrusion of saline water. Salt water intrusion in the UAS of the Oxnard Plain basin has been reversed in most areas. However, saline intrusion in the LAS north of Mugu Lagoon continues over a broad area. The intrusion is the result of chronically-depressed water levels in over-drafted areas of the southern Oxnard Plain and portions of the Pleasant Valley basin.



From DWR Bulletin No. 104-8 (1976)

Source: UWCD 2001

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Ormond Beach Wetlands Restoration
Feasibility Plan

Simplified Cross-Section of Oxnard Plain Aquifers*

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Figure 5-5

*Although not illustrated in this schematic, saltwater intrusion also exists in the Mugu, Hueneme, and Fox Canyon aquifers.

When groundwater levels are below sea level along the coastline, there may also be significant recharge from seawater flowing into the aquifers. When LAS water levels are substantially lower than UAS water levels, there may be substantial leakage of UAS water into the LAS through the confining clays that separate Oxnard Plain basin aquifers. In some areas of the Oxnard Plain basin, a semi-perched aquifer sits above the confining clay; the semi-perched aquifer is discussed in Section 6.0. Because the Oxnard Plain basin is overlain by confining clays, aquifer recharge is not due to deep percolation of surface water sources, but rather from underflow from the Oxnard Forebay basin. Water quality is the major issue of concern regarding the Oxnard Forebay basin. Because this basin is the primary source of recharge for the Oxnard Plain basin, this water quality issue impacts the Oxnard Plain basin, as well. UWCD is evaluating and planning a number of specific projects to increase delivery of water to overdrafted areas, reduce pumping, and lessen the threat of land subsidence and water quality degradation in coastal areas by the intrusion of saline waters.

It is difficult to determine whether UWCD would consider the subject Ormond Beach wetlands restoration area a key prospect for water delivery as part of their overall plan that is being formed. Aside from UWCD's prospective restorative deliveries, the agricultural demands still exist, as outlined in the following section, and must be considered in the evaluation and plans for restoration of the groundwater basins and, possibly, the Ormond Beach wetlands.

5.4 Agricultural Water Delivery

As discussed above, UWCD agricultural water is supplied by the PTP and PVP. The demands for these sources are outlined below.

5.4.1 PTP Deliveries

PTP water demand varies over three, distinct cycles:

- Climactic cycles. Climatic cycles encompass changes in the weather, primarily associated with the amount of annual rainfall. During dry years, groundwater pumping tends to dominate supply as there is little-to-no surface water available for delivery. During a wet year, surface water deliveries tend to dominate and groundwater pumping is reduced. Dry weather years tend to have higher total demands. Based on recent data, the dry year (1990) pumping rates were 226 percent higher than wet year (1998) pumping rates. However, surface water deliveries in dry years were only about 3 percent of their counterparts during wet years.

- Seasonal cycles. Seasonal changes are the most dramatic in agricultural areas. The average demand for PTP users varies from approximately 320 acre-feet per month in January to approximately 970 acre-feet per month in August.

- Diurnal cycles. Diurnal variations in agricultural irrigation demand exist, but at the current time, the PTP is not equipped to provide an accounting of this. It is generally noted that demands are higher in the daytime when field workers are present. Current UWCD operations are based on a constant rate of delivery with excess water delivered to the PTP reservoir, primarily at night when demands are low. Significant demand reductions are experienced over the weekends. UWCD staff has noted that once the PTP reservoir is filled over the weekend, there are almost no additional deliveries to the PTP.

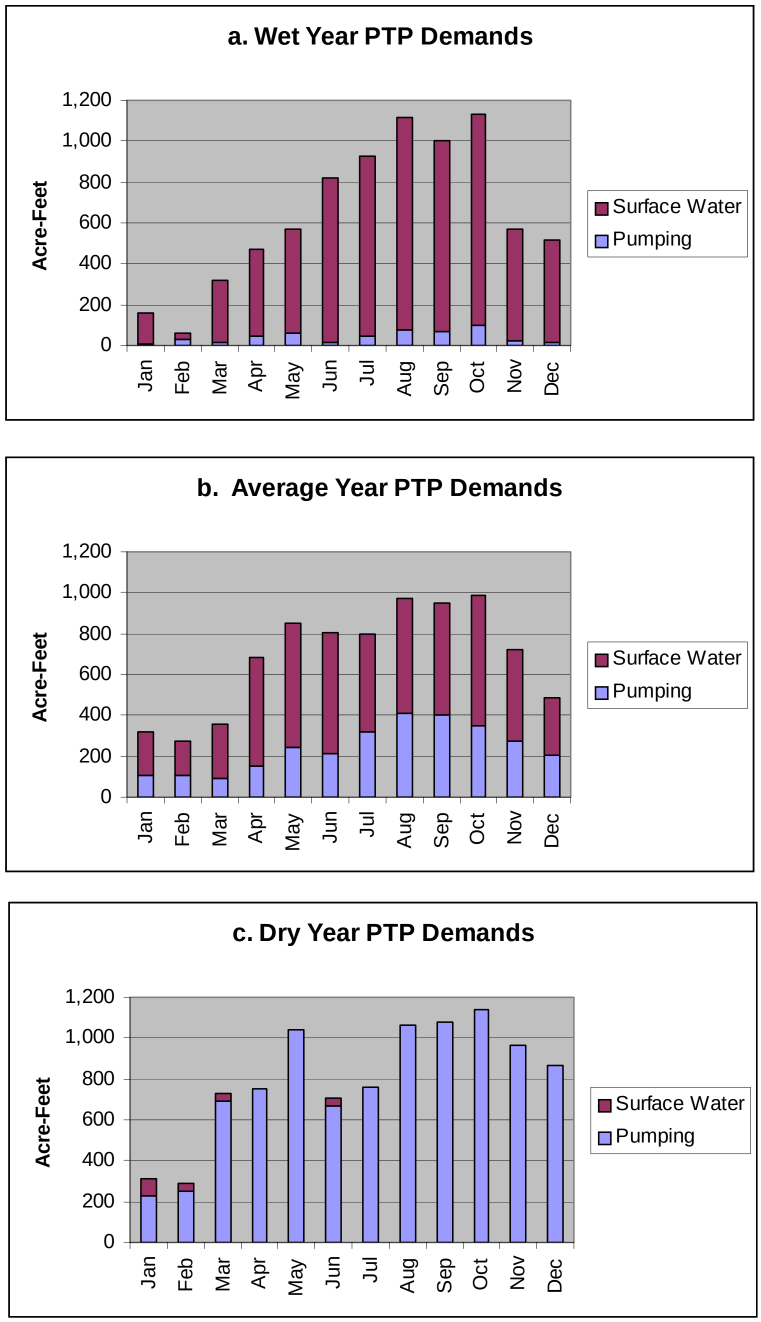
Table 5-1 summarizes historical demands on the PTP system based on data from UWCD. The data are also presented graphically on Figure 5-6.

TABLE 5-1
PTP DEMANDS

	PTP Pumping			PTP Surface Water Deliveries			Total PTP Deliveries		
Month	**Wet Year[(a)]**	**Ave Year[(b)]**	**Dry Year[(c)]**	**Wet Year[(a)]**	**Ave Year[(b)]**	**Dry Year[(c)]**	**Wet Year[(a)]**	**Ave Year[(b)]**	**Dry Year[(c)]**
Jan	5	109	231	155	211	79	160	320	310
Feb	30	105	249	33	165	43	63	270	292
Mar	17	89	690	300	271	37	317	360	727
Apr	49	149	752	424	532	0	473	681	752
May	59	244	1,037	507	603	0	566	847	1,037
Jun	16	209	665	803	594	42	819	803	707
Jul	47	320	760	882	474	0	929	794	760
Aug	77	408	1,065	1,041	562	0	1,118	970	1,065
Sep	71	399	1,082	930	550	0	1,001	949	1,082
Oct	101	349	1,139	1,030	640	0	1,131	989	1,139
Nov	25	274	967	547	447	0	572	721	967
Dec	12	207	868	508	276	0	520	483	868
Total	509	2,862	9,505	7,160	5,325	201	7,669	8,187	9,706

Source: Kennedy/Jenks Consultants 2002.
Notes:
(a) Wet year data is for calendar year 1998.
(b) Average year data is the average for calendar years 1989 – 2000.
(c) Dry year data is for calendar year 1990.

FIGURE 5-6
PTP DEMANDS



Source: Kennedy/Jenks Consultants 2002.

Comparison of the PTP's historical groundwater and surface water delivery volumes are indicated below (UWCD 2001):

- Averaged approximately 2,214 AFY groundwater deliveries for the period of 1991 to 2000.
- Approximately 2,099 AFY groundwater deliveries for the period of 1999 to 2000.
- Averaged approximately 6,454 AFY surface water deliveries for the period of 1991 to 2000.
- Approximately 7,009 AFY surface water deliveries for the period of 1999 to 2000.

Future demands are not expected to change significantly in the PTP service area. The Save Open-Space and Agricultural Resources (SOAR) initiative would likely limit any urbanization in the area until at least 2015. The SOAR initiative requires a majority vote by the public to implement a land use change in the local General Plan. In Ventura County, open space, agriculture, and rural land, are specifically protected by the SOAR initiative.

5.4.2 PVP Deliveries

Comparison of the PVP's historical surface water delivery volumes are indicated below (UWCD 2001):

- Averaged approximately 10,968 AFY surface water deliveries from for the period of 1991 to 2000.
- Approximately 10,538 AFY surface water deliveries for the period of 1999 to 2000.

Table 5-2 presents the demands of the PVCWD for average, wet, and dry year conditions. The demands are depicted graphically on Figure 5-7.

5.4.3 Ormond Beach Wetlands Deliveries

Based on the data sets above for the years 1991 to 2000, UWCD delivers approximately 17.6 MGD to its customers. Because of these pre-existing commitments, it is difficult to predict the volume of water that could be made available to the Ormond Beach wetlands restoration efforts. The Project Proponent – i.e., the Coastal Conservancy – would need to enter into discussions with UWCD to determine the likelihood of this availability.

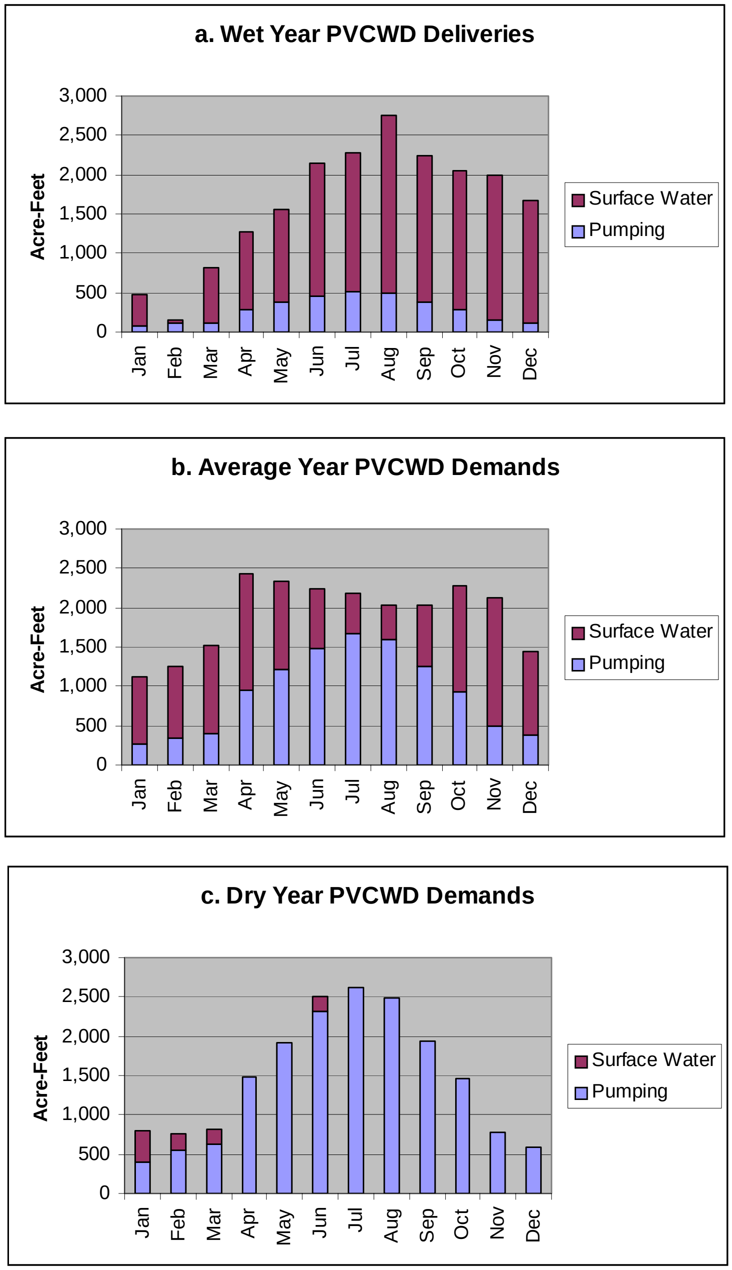
TABLE 5-2
HISTORICAL PVCWD DEMANDS

	Pumping[a]			Surface Water Deliveries			Total Deliveries		
Month	Wet Year[b]	Ave Year[c]	Dry Year[d]	Wet Year[b]	Ave Year[c]	Dry Year[d]	Wet Year[b]	Ave Year[c]	Dry Year[d]
Jan	79	259	404	391	868	388	470	1,127	792
Feb	107	351	548	47	910	212	154	1,261	760
Mar	123	403	628	699	1,123	182	822	1,526	810
Apr	289	946	1,475	983	1,479	0	1,272	2,425	1,475
May	374	1,224	1,910	1,180	1,114	0	1,554	2,338	1,910
Jun	452	1,479	2,308	1,690	766	207	2,142	2,245	2,515
Jul	511	1,673	2,611	1,769	516	0	2,280	2,189	2,611
Aug	486	1,591	2,482	2,275	445	0	2,761	2,036	2,482
Sep	380	1,244	1,942	1,854	779	0	2,234	2,023	1,942
Oct	285	934	1,458	1,770	1,353	0	2,055	2,287	1,458
Nov	153	502	783	1,846	1,628	0	1,999	2,130	783
Dec	116	379	592	1,561	1,061	0	1,677	1,440	592
Total	3,355	10,985	17,141	16,065	12,042	989	19,420	23,027	18,130

Source: Kennedy/Jenks Consultants 2002.

Notes:
(a) Annual pumping demands have been proportioned on a monthly basis based on measured crop demands.
(b) Wet year data is for calendar year 1998.
(c) Average year data represents the average of 1985 – 2000 calendar year data for pumping and 1991 – 2001 calendar year data for surface water deliveries.
(d) Dry year data is for calendar year 1990. Only annual delivery records were available for 1990 data. Monthly distribution of surface water deliveries are in proportion to PTP deliveries during the same year.

FIGURE 5-7
PVP DEMANDS



<u>Source</u>: Kennedy/Jenks Consultants 2002.

Section 6: Perched Groundwater

Aside from geological characteristics, data are limited to nonexistent regarding the perched aquifer that resides in the Oxnard Plain. A summary the available data is described below.

The Oxnard Plain is underlain by a complex system of aquifers and reached more than 1,400 feet deep. These aquifers can be divided into an upper and a lower aquifer system. The Oxnard aquifer comprises the upper-most portion of the upper aquifer system, with the exception of an unconfined, perched aquifer. A thick, arealy-extensive, clay deposit separates the perched and Oxnard aquifers. The perched aquifer crops out immediately offshore all along the coastal area of the Oxnard Plain.

Limited data suggest that perched water levels fluctuate little in the Oxnard Plain and commonly occur within 5 to 10 feet of the ground surface and extend down to no more than 100 feet. Deep percolation of rainfall and irrigation return flows are the major components of recharge to the perched zone.

Although water quality data for this perched aquifer are limited, it has been determined that:

- The water quality can vary widely with time and location - ranging from fresh to brackish.
- The water quality is classified as hazardous or unsuitable for almost all uses due to contamination from fertilizers, septic tanks, pesticides, herbicides, leaking underground petroleum and chemical storage tanks, surface spills, and a high dissolved mineral salts content (County of Ventura [1] undated).
- TDS levels typically exceed 2,000 mg/l (Jones & Stokes Associates, Inc. 1995). Several wells show TDS levels in the 4,000 to 5,000 mg/l range or higher due to seawater intrusion (County of Ventura [2] undated).
- The maximum nitrate concentration has been measured at 40 mg/l (County of Ventura [2] undated).
- The main cations consist of sodium and calcium. The main anions are bicarbonate, sulfate, and iron (County of Ventura [2] undated).

This above data does not lend itself to comparison with regulatory standards, as the two measured constituents, TDS and nitrate, are not quantified by the California Ocean Plan or the Basin Plan.

Section 7: Recycled Water from the City of Oxnard

At the present time, the City does not operate any water recycling programs. However, the City's recently approved GREAT Program outlines water recycling, groundwater injection, and groundwater desalination projects to more efficiently utilize existing local water resources. Although the City of Oxnard recycled water component of the GREAT Program was developed to provide water to agricultural irrigation users, this water could also be considered for the proposed wetlands restoration effort. The recycled water facilities outlined by the GREAT Program are summarized below.

7.1 New Tertiary Treatment Facility

The Oxnard WWTP currently produces secondary effluent that is discharged to the ocean outfall. Filtration and improved disinfection facilities would be constructed to produce a tertiary effluent that would allow for direct use of the recycled water, per California Department of Health Services standards, in the irrigation of landscaping and specific agricultural crops. This tertiary treatment would occur at a facility that would be constructed at an 8-acre vacant parcel along Perkins Road, which is north and east of the existing WWTP. As outlined below in Section 7.2 below, a portion of Phase 2's tertiary effluent would be further treated to advanced standards in order to be meet criteria for (1) groundwater recharge, and (2) non-potable, agricultural and industrial uses.

7.2 New AWTF

The tertiary effluent described in Section 7.1 above is not suitable for all crop irrigation uses because of its high concentrations of TDS, chlorides, and boron. To address this concern, an AWTF is being planned. This facility would treat a portion of the tertiary-treated effluent and then blend the AWTF effluent back with tertiary-only treated effluent to yield a recycled water product that is meets criteria for all crop irrigation uses in the area. This recycled water product would also meet water quality criteria for groundwater recharge efforts (i.e., injection of the over-drafted aquifers underlying the Oxnard Plain and Pleasant Valley basins).

7.3 Converted Ocean View Pipeline

The City provides potable water to municipal and agricultural customers in the OVMWD service area. This potable water supply comes from groundwater pumped from UWCD's El Rio Spreading Grounds, which is then conveyed via the O-H Pipeline to the Ocean View Pipeline. The Ocean View Pipeline, also known as the Hueneme Road Line, is 16-inch diameter asphalt concrete pavement pipe that extends along Hueneme Road from the intersection of Edison Drive to a location approximately 1,600 feet east of the intersection of Hueneme Road and the Pacific Coast Highway.

As a component of the GREAT Program, the Ocean View Pipeline would be converted to recycled water use because agricultural customers comprise approximately 99 percent of the pipeline's demand (Malcolm-Pirnie/James M. Montgomery 1993.) This conversion would involve approximately 2,500 lf of 24-inch diameter pipeline to connect the AWTF to the Ocean View pipeline and another 5,400 lf of 16-inch diameter pipeline to connect the Ocean View pipeline to the existing PTP, which serves agricultural (non potable) users, as discussed in Section 5.0.

7.4 Water Quality

The quality of recycled water, for both agricultural and non-agricultural uses, is strictly dictated by standards established by the Los Angeles RWQCB, the Comprehensive Water Quality Control Plan Report for the Santa Clara River Basin, and by the California Administrative Code, Title 22, Division 4.

Appendix Table 3 presents a summary for the following water quality parameters, in addition to the California Ocean Plan and Basin Plan standards:

- 2004 Oxnard WWTP secondary effluent.
- Desired recycled water quality standards.
  - The Irrigation Water Quality Criteria would correspond to the planned tertiary treatment from Oxnard WWTP.
  - The Groundwater Recharge Water Quality Requirements would correspond to the new AWTF and the converted Ocean View Pipeline.

7.4.1 2004 Data

Based upon the data presented in Appendix Table 3, exceedances have been identified for the following California Ocean Plan constituents:

- Ammonia as nitrogen
- Total and fecal coliform
- Four metals, although some of the concentrations were reported as "<" values, so it is difficult to determine whether these values actually exceeded limits.
- Six pesticides, although the concentrations reported were all <0.001, so it is difficult to determine whether these values actually exceeded limits.

Values for a number of the California Ocean Plan constituents were not reported, including:

- Numerous miscellaneous compounds (see Appendix Table 3 categorization)
- Some metals
- All volatile organic compounds
- All semi-volatile organic compounds.

Regarding Basin Plan constituents, only one of the reported constituents – i.e., ammonia as nitrogen – was exceeded. Values for several of the Basin Plan constituents were not reported, including:

- Fecal coliform
- Dissolved oxygen
- Turbidity
- Increase in temperature
- Color
- Taste and odor.

7.4.2 Expected Data for New Tertiary Treatment Facility

Appendix Table 3 also provides data for potential effluent values for the upgraded treatment facilities and converted pipeline being considered by Oxnard, as indicated above. A comparison of the California Ocean Plan and the Basin Plan to the planned tertiary treatment facility's effluent is summarized below:

- California Ocean Plan. The only reported constituents that are comparable to the California Ocean Plan are pH, turbidity, total coliform and metals.
  - The pH, turbidity, and total coliform values were all were within the regulatory limits.
  - The values for the metal values all exceeded the regulatory limits. Values for four metals were not reported.

- Basin Plan. The only reported constituent that is comparable to the Basin Plan is pH, which is within the regulatory limit.

7.4.3 Expected Data for New AWTF and Converted Ocean View Pipeline

A comparison of the California Ocean Plan and the Basin Plan to the planned AWTF and Ocean View pipeline effluents are summarized below:

- California Ocean Plan. The only reported constituents that are comparable to the California Ocean Plan are ammonia as nitrogen, total suspended solids, turbidity, total coliform, and most of the metals. Exceedances were indicated for ammonia as nitrogen and all of the metals reported except antimony.

- Basin Plan. No constituents were reported that are comparable to the Basin Plan.

7.5 Quantity and Availability

The volume of effluents from the tertiary treatment system and AWTF are outlined below:

- New tertiary treatment facility. The new tertiary treatment facility would be constructed with an initial effluent capacity of 5 MGD; in Phase 2 of the GREAT Program, the effluent capacity would increase to 32.6 MGD.

- New AWTF. The GREAT Program identified the effluent capacity to be 3.8 MGD in Phase 1 of construction and 15.3 MGD in Phase 2.

- Converted Ocean View Pipeline. The current agricultural demand from the Ocean View Pipeline totals approximately 3,400 AFY (Malcolm-Pirnie/James M. Montgomery 1993). However, the pipeline is capable of delivering much more, approximately 3,800 GPM or 6,100 AFY, assuming a velocity of 6 feet per second and 365 days per year. However, assuming no other irrigation sources are developed within the City, the Ocean View Pipeline would need to be paralleled with a 30-inch diameter pipeline in order to meet the recycled water demand projected in Phase 2 of the GREAT Program, which does not include wetland restoration efforts.

The GREAT Program indicates that under average year conditions and full implementation of the recycled water facilities, the demand for the recycled water will equal supply; wetland restoration is not included in the demand forecasts. However, recycled water may be available during wet years and during wet winter months when irrigation demands drop; further refinement regarding availability of this potential water source for the Ormond Beach wetlands restoration efforts is not available at this time.

7.6 Anticipated Schedule for Availability

The GREAT Program is expected to be fully operational by the year 2007 (CH2M Hill 2004). Although it is not necessary for all three of the recycled water facilities to be completed in order to use one of them, a timeframe for the completion of the individual facilities is not currently available.

Section 8: Summary of Potential Water Sources

The water sources described in the preceding sections have limited data available to determine the (1) extent of the various flows that could be made available to the Ormond Beach restoration efforts, and (2) quality of the water. The estimated capacities of the six potential water sources are summarized below.

TABLE 8-1
CAPACITIES OF THE POTENTIAL WATER SOURCES

Water Source	Estimated Capacity (MGD)	Seasonality
CMWD Brine Line	17.5	Recycled water demand is greatest during summer months, so WWTP wastewater flows into the brine line could be lower during the summer if WWTPs recycle directly from the treatment facility.
Oxnard Brine Line	25.0	Unavailable.
Seawater Effluent from Reliant Energy Ormond Beach Generating Station	688.2	Unavailable.
Agricultural Water from UWCD	17.6 (delivery)	Demand is greatest during summer months.
Perched Groundwater	Unavailable.	Unavailable.
Recycled Water from Oxnard		
New Tertiary Treatment Facility	5.0 Phase 1 32.6 Phase 2	Unavailable.
New AWTF	3.8 Phase 1 15.3 Phase 2	Unavailable.
Converted Ocean View Pipeline	3.0	Unavailable.

The producers and/or purveyors of these water sources, outside of the perched groundwater, may have previous commitments or, for facilities that are currently being planned, they may not have entered into any formal agreements yet for external uses of the effluents. However, should the Project Proponent – i.e., the Coastal Conservancy - initiate discussions with these sponsors regarding the information presented in this report and their needs for a water supply, then specific availabilities could be determined.

Regarding water quality, data for many constituents specified by the California Ocean Plan and Basin Plan are not currently available for the potential water sources. Depending on whether it is the California Ocean Plan or the Basin Plan which would regulate the potential water source discharges to the Ormond Beach wetlands, a suite of constituents would need to be analyzed that have not yet been "pre-screened" by the analyses described in the previous sections. The exceedances and omissions in the water quality parameters is not summarized in this section, as (1) the tables in the Appendix directly indicate regulatory exceedances and omissions per highlighted entries, and (2) for water sources wherein tables were not provided due to limited data availability, the text neatly summarizes the voids – i.e., no comparable constituents.

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Appendix

Water Quality of the Potential Water Sources

Table 1 – Calleguas Municipal Water District Brine Line Evaluation

Table 2 – Seawater Effluent from the Reliant Energy Ormond Beach Generating Station

Table 3 – Evaluation of Recycled Water from the City of Oxnard

Table 1
Calleguas Municipal Water District Brine Line Evaluation

Constituent	Units	Typical MDL µg/L	California Ocean Plan(a)			Basin Plan(b)			Calleguas Brine Line Mean Concentrations(c)								
			30-Day Average or 6-Month Median	Daily Max	Instaneous Max	30-Day Average or 6-Month Median	Daily Max/Min	Instaneous Max/Min	Combined	Camrosa WWTP	Camarillo WRP	Hill Canyon WWTP	Woodcreek Well(d)	Conejo #3 Well(d)	Camarillo Well A(d)	Camarillo Well B(d)	Ventura County Airport Well(d)
General Constituents																	
Ammonia as nitrogen	mg/l	1.70E-01	6.00E-01	2.4	6	(g)			3.52								
Boron	mg/l	4.70E-03							6.30E-01	3.50E-01	6.40E-01	6.20E-01	2.20E-01	3.00E-01	5.60E-01	3.80E-01	2.50E-01
BOD	mg/l					no increase(h)			6								
COD	mg/l								11								
Chloride	mg/l	3.20E-01							192	199	178	150	122	160	134	74	60
Chlorine, residual	µg/L	17	2	8	60	100(h)			0								
Oil & grease	mg/l	1.5	25	40	75	no visible film/objects(h)			3.12								
Settleable solids	mg/l	1.00E-01	1	1.5	3	none(h)			6.00E-02								
Sodium	mg/l	8.50E-01							141	129	129	90	94	201	109	81	77
Sulfate	mg/l	4.10E-02							258	150	203	113	151	221	425	263	226
TDS	mg/l	3.8							1,153	802	899	639	702	1,080	2,040	739	690
TSS	mg/l	6.2	60			none(h)			5								
DO	mg/l					greater than 7.0 (i)		5.0 minimum									
Turbidity	NTU	4.80E-02	75	100	225				2.5								
natural turbidity 0 to 50 NTU	NTU					increase < 20%											
natural turbidity greater than 50 NTU	NTU					increase < 10%											
Temperature alteration (above natural)	°F					5(j)											
Color	---					color-free(k)											
Taste and odor						no causal substances(l)											
pH	---	1.00E-02			6 to 9	6.5 to 8.5 (k)			7.05								
Bacterial Characteristics																	
Total Coliform	MPN/100ml	2.00E+00			1000				2								
Fecal Coliform	MPN/100ml	2			200				2								
REC-1	MPN/100ml					200(l)		400(o)									
REC-2	MPN/100ml					2000(l)		4000(o)									
General Basin Plan Constituents																	
Bioaccummulation						no toxic pollutants(m)											
Biostimulatory substances						none(h)											
Toxicity						no toxic substances(m)(n)											
Radioactive substances						no radionuclides(m)											
Miscellaneus compounds																	
Chlorinated phenolics	µg/L	2.24	1	4	10				1.00								
Halomethanes	µg/L	1.40E-01	130						6.20E-01								
PAHs	µg/L	2.92E-02	8.80E-03						7.7E-02								
Phenolic compounds	µg/L	3.6	30	120	300				2.00								
TCDD equivalents	µg/L	1.4E-12	3.90E-09						5.64E-13								
Tributyltin	µg/L	2E-09	1.40E-03						2.68E-03								
Metals																	
Antimony	µg/L	8.20E-03	1200						1.20								
Arsenic	µg/L	8.10E-01	8	32	80				2.62								
Beryllium	µg/L	3.60E-02	3.3E-02						6.0E-02								

Table 1
Calleguas Municipal Water District Brine Line Evaluation

Constituent	Units	Typical MDL µg/L	California Ocean Plan[a]			Basin Plan[b]			Calleguas Brine Line Mean Concentrations[c]								
			30-Day Average or 6-Month Median	Daily Max	Instaneous Max	30-Day Average or 6-Month Median	Daily Max/Min	Instaneous Max/Min	Combined	Camrosa WWTP	Camarillo WRP	Hill Canyon WWTP	Woodcreek Well[d]	Conejo #3 Well[d]	Camarillo Well A[d]	Camarillo Well B[d]	Ventura County Airport Well[d]
Cadmium	µg/L	7.10E-02	1	4	10				2.60E-01								
Chromium(III)	µg/L	9.50E-02	190000						3.22								
Chromium(VI)	µg/L	9.70E-01	2	8	20				1.94								
Copper	µg/L	6.90E-02	3	12	30				10.02								
Cyanide	µg/L	1	1	4	10				1.80								
Lead	µg/L	1.70E-02	2	8	20				2.14								
Mercury	µg/L	1.30E-03	4.0E-02	1.60E-01	4.0E-01				1.70E-01								
Nickel	µg/L	4.80E-02	5	20	50				5.50								
Selenium	µg/L	7.50E-01	15	60	150				2.19								
Silver	µg/L	7.30E-02	7.0E-01	2.8	7				8.0E-02								
Thallium	µg/L	1.30E-02	2						6.80E-01								
Zinc	µg/L	1.6	20	80	200				48.22								
Pesticides																	
Aldrin	µg/l	8.40E-04	2.20E-05						4.03E-03								
Chlordane	µg/L	1.00E-03	2.30E-05						2.82E-03								
DDT	µg/L	7.80E-04	1.70E-04						2.44E-02								
Dieldrin	µg/L	1.00E-03	4.00E-05						2.29E-03								
Endosulfan (alpha +beta+sulfate)	µg/L	1.00E-03	9.00E-03	1.80E-02	2.70E-02				1.31E-02								
Endrin	µg/L	8.80E-04	2.00E-03	4.00E-03	6.00E-03				2.11E-03								
Heptachlor	µg/L	7.60E-04	5.00E-05						3.70E-03								
Heptachlor epoxide	µg/L	7.80E-04	2.00E-05						3.49E-03								
Hexachlorocyclohexane (HCH)[e]	µg/L	4.20E-03	4.00E-03	8.00E-03	1.20E-02				3.86E-03								
PCBs[f]	ng/L	50	1.90E-02			7.00E-02	14		3.88								
Toxaphene	µg/L	4.00E-02	2.10E-04						1.50E-01								
Volatile Organic Compounds																	
1,1,1-trichloroethane	µg/L	1.50E-01	540000						2.30E-01								
1,1,2,2-tetrachloroethane	µg/L	2.50E-01	2.3						2.30E-01								
1,1,2-trichloroethane	µg/L	2.10E-01	9.4						2.40E-01								
1,1-dichloroethylene	µg/L	2.50E-01	9.0E-01						2.20E-01								
1,2-dichloroethane	µg/L	2.40E-01	28						2.10E-01								
1,3-dichloropropene	µg/L	2.00E-01	8.9						1.90E-01								
1,4-dichlorobenzene	µg/L	7.30E-02	18						1.70E-01								
Acrolein	µg/L	1.9	220						2.02								
Acrylonitrile	µg/L	5.00E-01	1.00E-01						7.40E-01								
Benzene	µg/L	1.10E-01	5.9						2.20E-01								
Carbon terachloride	µg/L	1.40E-01	9.00E-01						3.30E-01								
Chlorobenzene	µg/L	1.70E-01	570						2.12E-01								
Chlorodibromomethane	µg/L	1.50E-01	8.6						4.43								
Chloroform	µg/L	1.40E-01	130						5.56								
Dichloromethane	µg/L	1.10E-01	450						1.55E-01								
Dichlorobromomethane	µg/L	1.50E-01	6.2						6.05								
Ethylbenzene	µg/L	7.60E-02	4100						2.10E-01								
Tetrachloroethylene	µg/L	1.80E-01	2						5.90E-01								

Table 1
Calleguas Municipal Water District Brine Line Evaluation

Constituent	Units	Typical MDL µg/L	California Ocean Plan[a] 30-Day Average or 6-Month Median	California Ocean Plan[a] Daily Max	California Ocean Plan[a] Instaneous Max	Basin Plan[b] 30-Day Average or 6-Month Median	Basin Plan[b] Daily Max/Min	Basin Plan[b] Instaneous Max/Min	Calleguas Brine Line Mean Concentrations[c] Combined	Camrosa WWTP	Camarillo WRP	Hill Canyon WWTP	Woodcreek Well[d]	Conejo #3 Well[d]	Camarillo Well A[d]	Camarillo Well B[d]	Ventura County Airport Well[d]
Toluene	µg/L	1.90E-01	85000						6.60E-01								
Trichloroethylene (TCE)	µg/L	2.20E-01	27						2.40E-01								
Vinyl chloride	µg/L	2.00E-01	36						2.40E-01								
Semi-Volatile Organic Compounds																	
1,2-diphenylhydrazine	µg/L	1.2	1.60E-01						5.50E-01								
2,4,6-trichlorophenol	µg/L	2.4	2.90E-01						9.70E-01								
2,4-dinitrophenol	µg/L	6.8	4						2.39								
2,4-dinitrotoluene	µg/L	1.9	2.6						7.80E-01								
3,3-dichlorobenzidine	µg/L	1.5	8.10E-03						7.30E-01								
4,6-dinitro-2-methylphenol	µg/L	4.1	220						2.1								
Benzidine	µg/L	24	6.90E-05						9.869								
Bis(2-chloroethoxy) methane	µg/L	1.2	4.4						5.40E-01								
Bis(2-chloroethyl) ether	µg/L	9.40E-01	4.50E-02						4.30E-01								
Bis(2-chloroisopropyl) ether	µg/L	1.3	1200						6.20E-01								
Bis(2-ethylhexyl) phthalate	µg/L	3.1	3.5						1.42								
Dichlorobenzenes	µg/L	7.73E-01	5100						3.80E-01								
Diethyl phthalate	µg/L	4.20E-01	33000						3.40E-01								
Dimethyl phthalate	µg/L	1.6	820000						6.80E-01								
Di-n-butyl phthalate	µg/L	1.5	3500						6.80E-01								
Fluoranthene	µg/L	1.8	15						7.00E-01								
Hexachlorobenzene	µg/L	1	2.10E-04						4.52E-01								
Hexachlorobutadiene	µg/L	9.80E-01	14						4.40E-01								
Hexachlorocyclopentadiene	µg/L	5.90E-01	58						2.90E-01								
Hexachloroethane	µg/L	8.00E-01	2.5						3.80E-01								
Isophorone	µg/L	1.1	730						4.90E-01								
Nitrobenzene	µg/L	1.6	4.9						6.70E-01								
N-nitrosodimethylamine	µg/L	1.6	7.3						8.60E-01								
N-nitrosodi-N-propylamine	µg/L	1.3	3.80E-01						5.70E-01								
N-nitrosodiphenylamine	µg/L	1.3	2.5						5.90E-01								

Highlighted cells indicate values exceeds standards in the California Ocean Plan and/or the Basin Plan

Highlighted cells indicate not analyzed per the California Ocean Plan and/or Basin Plan Standards

(a) State Water Resources Control Board, Water Quality Control Plan, Ocean Waters of California, California Ocean Plan, 2001.

(b) Los Angeles Regional Water Quality Control Board (RWQCB), Water Quality Control Plan, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 13, 1994.

(c) Calleguas Municipal Water District Regional Salinity Management Report, October 2003.

(d) Raw water.

(e) Sum of alpha, beta, gamma (Lindane), and delta isomers of hexachlorocyclohexane.

(f) PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Arolclor-1254, and Aroclor-1260.

(g) Refer to 1-hour and 4-day Avg. Concentration for Ammonia tables on next page of these footnotes.

(h) And/or not in concentrations (levels) that cause a nuisance or impairments of beneficial uses.

(i) Waste discharges shall not depress dissolved oxygen levels below: 5mg/l for surface waters designated WARM, 6 mg/l for COLD surface waters, and 7 mg/l for water designated both COLD and SPWN.

(j) For waters designated WARM and COLD. WARM waters shall not be raised above 80 ^{o}F at any time.

(k) And waste discharge shall not be change ambient pH levels more than 0.5 units.

(l) Based on a minimum of four samples for any 30-day period.

(m) In levels that are deleterious to human, plant, animal, or aquatic life or that result in accumulation in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

(n) Compliance will be determined by appropriate methods, as specified by the State Water Resources Control Board or Los Angeles RWQCB.

(o) No more than 10 percent of total samples during any 30-day period should exceed value given.

Table 1
Calleguas Municipal Water District Brine Line Evaluation

(p) Regarding ammonia:

- The brine line's primary source would be from the Hill Canyon WWTP. This facility recently completed construction of a biological nitrification/denitrification system to reduce the ammonia concentrations. Although these systems are capable of reducing ammonia to non-detect levels, the Hill Canyon WWTP system may be adjusted to maintain an ammonia concentration of near 2.0 mg/l in order to facilitate the formation of chloramines during the post chlorination treatment step. Plant operations will control the chlorine to ammonia ratio in order to minimize the formation of carcinogenic trihalomethanes.
- The Camarillo WRP is developing plans to implement biological nitrification/denitrification along with their tertiary treatment. This would further reduce the ammonia concentrations in the brine line.

Regarding copper:

- Corrosion of copper piping in home plumbing systems contributes to this concentration.
- The Hill Canyon WWTP would be the largest source of copper on a mass basis due to its high flow rate relative to the other sources. The Hill Canyon WWTP mean effluent concentration is 8.9 µg/l and the 90th percentile concentration is 14.3 µg/l. The mass flows are 0.788 pounds per day (lbs/day) and 1.35 lbs/day for the mean and 90th percentile concentrations, respectively.
- By comparison, the mean copper concentrations from RO brines at the Woodcreek and Conejo wells are higher (i.e., 53 µg/l and 36 µg/l) respectively. These high concentrations result from the concentration effects of RO treatment, creating brines that are saturated with 3 to 4 times the concentrations of copper contained in the raw water sources. However, due to the low flow rates of the RO effluent, the mass flow rates of these brines are low in comparison to the Hill Canyon WWTP effluent flow rate.

Regarding polynuclear aromatic hydrocarbons (PAHs):

- The typical laboratory method detection limits (MDLs) for PAHs are higher than the CTR water quality objectives. Use of one-half of the MDL for non-detect values to calculate projected effluent concentrations can artificially indicate that concentrations of a particular constituent, such as PAHs, exceed CTR water quality objectives.
- The situation for PAHs was complicated by the detection of one PAH compound (phenanthrene) from one sampling event on 22 April 2003 from the Camrosa WWRP effluent. To verify this result, additional analyses were performed; results indicated all PAH compounds, including the phenanthrene, were non-detect. It is believed that the one detectable result was a sampling or laboratory analysis anomaly.
- There are no known PAH sources in any of the brine line source waters. Any potential concerns about PAHs are solely due to the lack of sensitivity in the analytical detection methods. PAHs are not expected to be a problematic constituent for the brine line, even if analytical techniques improve and substantially lower the MDLs.

Regarding DDT and PCB compounds:

- Special monitoring was performed at the Hill Canyon WWTP from April 2002 through December 2002 for constituents listed in the CTR; analyses included three of the six DDT compounds and all seven PCB compounds because of detection earlier that year.
- All subsequent analyses have not detected the presence of any DDT or PCB compounds. As such, the earlier test results from 2002 are considered short-term anomalies. Since the above-referenced monitoring period in 2002, the NPDES permit has been revised for the Hill Canyon WWTP and monitoring for these compounds has been incorporated into the WDRs.

One-hour Avg. Concentration for Ammonia for Waters					
Total Ammonia as Nitrogen (mg/L)					
	Temperature (Celsius)				
pH	0	5	10	15	20
6.50	28.8	27.1	25.5	24.7	23.8
6.75	26.3	24.7	23.0	22.2	22.2
7.00	23.0	21.4	20.6	19.7	18.9
7.25	18.9	18.1	16.4	16.2	15.8
7.50	14.3	13.4	12.7	12.2	12.0
7.75	10.0	9.4	9.0	8.6	8.5
8.00	6.6	6.2	5.8	5.7	5.6
8.25	3.7	3.5	3.4	3.3	3.2
8.50	2.1	2.0	1.9	1.9	1.9
8.75	1.2	1.2	1.2	1.2	1.2
9.00	0.7	0.7	0.7	0.7	0.7

4-Day Avg. Concentration for Ammonia for Waters Designated as WARM							
Total Ammonia as Nitrogen (mg/L)							
	Temperature (Celsius)						
pH	0	5	10	15	20	25	30
6.50	2.47	2.30	2.22	2.06	2.06	1.42	1.01
6.75	2.47	2.30	2.22	2.14	2.06	1.43	1.01
7.00	2.47	2.30	2.22	2.14	2.06	1.43	1.01
7.25	2.47	2.30	2.22	2.14	2.06	1.44	1.02
7.50	2.47	2.30	2.22	2.14	2.06	1.45	1.03
7.75	2.30	2.14	2.06	1.97	1.89	1.36	0.97
8.00	1.50	1.40	1.33	1.29	1.27	0.90	0.65
8.25	0.85	0.80	0.76	0.74	0.74	0.53	0.39
8.50	0.48	0.45	0.44	0.44	0.44	0.32	0.24
8.75	0.28	0.26	0.25	0.25	0.26	0.20	0.16
9.00	0.16	0.16	0.16	0.16	0.17	0.13	0.11

Potential Water Sources		Ammonia as Nitrogen (mg/l)	pH	Temperature (°C)
Combined Calleguas Brine Line Average[(b)]		3.52	7.05	
Reliant Energy Ormond Beach Generating Station 30-day Average[(c)]		0.10	8.28	36.11/39.44[(e)]
Oxnard Recycled Water[(d)]	2004 Effluent Water Quality	21.67	7.23	23.5
	2004 Effluent Water Monthly Range	20 - 24	7.2 - 7.3	21 - 26

Notes:

(a) Los Angeles RWQCB, Water Quality Control Plan, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 13, 1994.

(b) Calleguas Municipal Water District Regional Salinity Management Report, October 2003.

(c) Los Angeles RWQCB, Order No. 01 092, NPDES No. CA0001198, 28 June 2001.

(d) GREAT Program Advanced Planning Study, City of Oxnard, May 2002.

(e) Winter (October-April)/Summer (May-September) actual temperature.

Table 2
Seawater Effluent from the Reliant Energy Ormond Beach Generating Station

Constituent	Units	Typical MDL µg/L	California Ocean Plan[a]			Basin Plan for Coastal Watersheds of LA and Ventura Counties[b]			2001 NPDES Permit Report[c]		2001 Reliant Energy Annual Report[d]		2004 Annual Summary[e]	
			30-Day Average or 6-Month Median	Daily Max	Instaneous Max	30-Day Average or 6-Month Median	Daily Max/Min	Instaneous Max/Min	30-Day Average	Daily Max	Max Value Range per month	Discharge Limit	Year Average	Max Value Range per month
General Constituents														
Ammonia as nitrogen	mg/l	1.70E-01	6.00E-01	2.4	6	(h)			1.00E-01					
Nitrate-nitrite, as nitrogen	mg/l								<0.5					
Nitrogen, total organic	mg/l													
Boron	mg/l	4.70E-03								3.73				
BOD	mg/l					no increase[i]				1				
COD	mg/l									36				
Chloride	mg/l	3.20E-01												
Chlorine, residual	µg/L	17	2	8	60	100[i]				230	50-320	399	2.00E-01	0.10 - 0.62
Chlorine, free available	mg/l												2.00E-01	0.08 - 0.55
Bromide	mg/l									54				
Oil & grease	mg/l	1.5	25	40	75	no visible film/objects[i]				7.7				
Settleable solids	mg/l	1.00E-01	1	1.5	3	none[i]								
Sodium	mg/l	8.50E-01												
Sulfite, as SO_3	mg/l									2				
Sulfate	mg/l	4.10E-02								2,300				
TDS	mg/l	3.8												
TSS	mg/l	6.2	60			none[i]				16				
DO	mg/l					greater than 7.0 [j]		5.0 minimum						
Turbidity	mg/l	4.80E-02	75	100	225									
natural turbidity 0 to 50 NTU	mg/l					increase < 20%								
natural turbidity > 50 NTU	mg/l					increase < 10%								
Temperature	°F					+ 5[k]			97/103[q]	113/121[q]	83-105	105.0	90.3	57.0 - 131.4
Color	mg/l					color-free[i]								
Taste and odor						no causal substances[i]								
pH	---	1.00E-02			6 to 9	6.5 to 8.5 [l]			8.28	10.21	7.60-8.00(min) 8.00-8.90 (max)	6.00 (min) 9.00 (max)	7.8 (min) 8.2 (max)	7.6 - 8.1 (min) 8.1 - 8.2 (max)
Bacterial Characteristics														
Total coliform	MPN/100ml	2			1000									
Fecal coliform	MPN/100ml	2			200					5				
REC-1	MPN/100ml					200[m]		400[p]						
REC-2	MPN/100ml					2000[m]		4000[p]						
General Basin Plan Constituents														
Bioaccumulation						no toxic pollutants[n]								
Biostimulatory substances						none[i]								
Toxicity	TU_c					no toxic substances[n][o]					1.0-8.0	7.5	2.1	1.0 - 4.0
Radioactive substances						no radionuclides[n]							(r)	

Table 2
Seawater Effluent from the Reliant Energy Ormond Beach Generating Station

Constituent	Units	Typical MDL µg/L	California Ocean Plan[a] 30-Day Average or 6-Month Median	California Ocean Plan[a] Daily Max	California Ocean Plan[a] Instaneous Max	Basin Plan for Coastal Watersheds of LA and Ventura Counties[b] 30-Day Average or 6-Month Median	Basin Plan[b] Daily Max/Min	Basin Plan[b] Instaneous Max/Min	2001 NPDES Permit Report[c] 30-Day Average	2001 NPDES Permit Report[c] Daily Max	2001 Reliant Energy Annual Report[d] Max Value Range per month	2001 Reliant Energy Annual Report[d] Discharge Limit	2004 Annual Summary[e] Year Average	2004 Annual Summary[e] Max Value Range per month
Miscellaneus compounds														
Aluminum	mg/l									1.44E-01				
Fluoride	mg/l									4.00E-01				
Magnesium	mg/l									931				
Molybdenum	mg/l									6.00E-03				
Radium, total	pCi/l									8.10E-01				
Beta, total	pCi/l									101.60				
Alpha, total	pCi/l									3.92				
Chlorinated phenolics	µg/L	2.24	1	4	10									
Halomethanes	µg/L	1.40E-01	130											
PAHs	µg/L	2.92E-02	8.80E-03											
Phenolic compounds	µg/L	3.6	30	120	300									
TCDD equivalents	µg/L	1.4E-12	3.9E-09											
Tributyltin	µg/L	2E-09	1.40E-03											
Metals														
Antimony	µg/L	8.20E-03	1200										ND (1.50E-02)[s]	
Arsenic	µg/L	8.10E-01	8	32	80								ND (1.50E-02)[s]	
Beryllium	µg/L	3.60E-02	3.30E-02										ND (1.0E-03)[s]	
Cadmium	µg/L	7.10E-02	1	4	10								ND (5.0E-03)[s]	
Chromium(III)	µg/L	9.50E-02	190000										6.33E-03[s]	
Chromium(VI)	µg/L	9.70E-01	2	8	20									
Copper	µg/L	6.90E-02	3	12	30					7			ND (5.0E-03)[s]	
Cyanide	µg/L	1	1	4	10									
Lead	µg/L	1.70E-02	2	8	20								ND (1.0E-02)[s]	
Mercury	µg/L	1.30E-03	4.00E-02	1.60E-01	4.00E-01								ND (5.0E-04)[s]	
Nickel	µg/L	4.80E-02	5	20	50								ND (5.0E-03)[s]	
Selenium	µg/L	7.50E-01	15	60	150								ND (1.50E-02)[s]	
Silver	µg/L	7.30E-02	7.00E-01	2.8	7								ND (5.0E-03)[s]	
Thallium	µg/L	1.30E-02	2										ND (1.50E-02)[s]	
Zinc	µg/L	1.6	20	80	200								ND (1.0E-02)[s]	
Pesticides														
Aldrin	µg/l	8.40E-04	2.20E-05											
Chlordane	µg/L	1.00E-03	2.30E-05											
DDT	µg/L	7.80E-04	1.70E-04											
Dieldrin	µg/L	1.00E-03	4.00E-05											
Endosulfan (alpha +beta+sulfate)	µg/L	1.00E-03	9.00E-03	1.80E-02	2.70E-02									
Endrin	µg/L	8.80E-04	2.00E-03	4.00E-03	6.00E-03									

Table 2
Seawater Effluent from the Reliant Energy Ormond Beach Generating Station

Constituent	Units	Typical MDL µg/L	California Ocean Plan[(a)] 30-Day Average or 6-Month Median	California Ocean Plan[(a)] Daily Max	California Ocean Plan[(a)] Instaneous Max	Basin Plan for Coastal Watersheds of LA and Ventura Counties[(b)] 30-Day Average or 6-Month Median	Basin Plan Daily Max/Min	Basin Plan Instaneous Max/Min	2001 NPDES Permit Report[(c)] 30-Day Average	2001 NPDES Permit Report[(c)] Daily Max	2001 Reliant Energy Annual Report[(d)] Max Value Range per month	2001 Reliant Energy Annual Report[(d)] Discharge Limit	2004 Annual Summary[(e)] Year Average	2004 Annual Summary[(e)] Max Value Range per month
Heptachlor	µg/L	7.60E-04	5.00E-05											
Heptachlor epoxide	µg/L	7.80E-04	2.00E-05											
Hexachlorocyclohexane (HCH)[(f)]	µg/L	4.20E-03	4.00E-03	8.00E-03	1.20E-02									
PCBs[(g)]	ng/L	50	1.90E-02			7.00E-02	14							
Toxaphene	µg/L	4.00E-02	2.10E-04											
Volatile Organic Compounds														
1,1,1-trichloroethane	µg/L	1.50E-01	540000											
1,1,2,2-tetrachloroethane	µg/L	2.50E-01	2.3											
1,1,2-trichloroethane	µg/L	2.10E-01	9.4											
1,1-dichloroethylene	µg/L	2.50E-01	9.00E-01											
1,2-dichloroethane	µg/L	2.40E-01	28											
1,3-dichloropropene	µg/L	2.00E-01	8.9											
1,4-dichlorobenzene	µg/L	7.30E-02	18											
Acrolein	µg/L	1.9	220											
Acrylonitrile	µg/L	5.00E-01	1.00E-01											
Benzene	µg/L	1.10E-01	5.9											
Carbon terachloride	µg/L	1.40E-01	9.00E-01											
Chlorobenzene	µg/L	1.70E-01	570											
Chlorodibromomethane	µg/L	1.50E-01	8.6											
Chloroform	µg/L	1.40E-01	130											
Dichloromethane	µg/L	1.10E-01	450											
Dichlorobromomethane	µg/L	1.50E-01	6.2											
Ethylbenzene	µg/L	7.60E-02	4100											
Tetrachloroethylene	µg/L	1.80E-01	2											
Toluene	µg/L	1.90E-01	85000											
Trichloroethylene (TCE)	µg/L	2.20E-01	27											
Vinyl chloride	µg/L	2.00E-01	36											
Semi-Volatile Organic Compounds														
1,2-diphenylhydrazine	µg/L	1.2	1.60E-01											
2,4,6-trichlorophenol	µg/L	2.4	2.90E-01											
2,4-dinitrophenol	µg/L	6.8	4											
2,4-dinitrotoluene	µg/L	1.9	2.6											
3,3-dichlorobenzidine	µg/L	1.5	8.10E-03											
4,6-dinitro-2-methylphenol	µg/L	4.1	220											
Benzidine	µg/L	24	6.90E-05											
Bis(2-chloroethoxy) methane	µg/L	1.2	4.4											
Bis(2-chloroethyl) ether	µg/L	9.40E-01	4.50E-02											
Bis(2-chloroisopropyl) ether	µg/L	1.3	1200											

Table 2
Seawater Effluent from the Reliant Energy Ormond Beach Generating Station

Constituent	Units	Typical MDL µg/L	California Ocean Plan[a] 30-Day Average or 6-Month Median	California Ocean Plan[a] Daily Max	California Ocean Plan[a] Instaneous Max	Basin Plan for Coastal Watersheds of LA and Ventura Counties[b] 30-Day Average or 6-Month Median	Basin Plan Daily Max/Min	Basin Plan Instaneous Max/Min	2001 NPDES Permit Report[c] 30-Day Average	2001 NPDES Permit Report[c] Daily Max	2001 Reliant Energy Annual Report[d] Max Value Range per month	2001 Reliant Energy Annual Report[d] Discharge Limit	2004 Annual Summary[e] Year Average	2004 Annual Summary[e] Max Value Range per month
Bis(2-ethylhexyl) phthalate	µg/L	3.1	3.5											
Dichlorobenzenes	µg/L	7.73E-01	5100											
Diethyl phthalate	µg/L	4.20E-01	33000											
Dimethyl phthalate	µg/L	1.6	820000											
Di-n-butyl phthalate	µg/L	1.5	3500											
Fluoranthene	µg/L	1.8	15											
Hexachlorobenzene	µg/L	1	2.10E-04											
Hexachlorobutadiene	µg/L	9.80E-01	14											
Hexachlorocyclopentadiene	µg/L	5.90E-01	58											
Hexachloroethane	µg/L	8.00E-01	2.5											
Isophorone	µg/L	1.1	730											
Nitrobenzene	µg/L	1.6	4.9											
N-nitrosodimethylamine	µg/L	1.6	7.3											
N-nitrosodi-N-propylamine	µg/L	1.3	3.80E-01											
N-nitrosodiphenylamine	µg/L	1.3	2.5											

Highlighted cells indicate, values exceeds standards in the California Ocean Plan and/or the Basin Plan

Highlighted cells indicate not analyzed per the California Ocean Plan and/or Basin Plan Standards

(a) State Water Resources Control Board, Water Quality Control Plan, Ocean Waters of California, California Ocean Plan, 2001.

(b) Los Angeles Regional Water Quality Control Board (RWQCB), Water Quality Control Plan, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 13, 1994.

(c) Los Angeles RWQCB, Order No. 01 092, NPDES No. CA0001198, 28 June 2001.

(d) Reliant Energy, Attachment 1 in letter from G.K. Malik, Station Manager, Ormond Beach Generating Station, to Dennis Dickerson, LARWQCB, dated 14 February 2002.

(e) Reliant Energy, email from Robert Lawhn on July 8, 2005 containing Reliant Energy's 2004 Summary Water Quality Report for Ormond Beach Generating Station. 2004 average values were calculated from the maximum monthly values given. Range values are those values from the month with the lowest maximum value and the month with the highest maximum value (respectively) for each parameter.

(f) Sum of alpha, beta, gamma (Lindane), and delta isomers of hexachlorocyclohexane.

(g) PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical charateristics resemble those of Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Arolclor-1254, and Aroclor-1260.

(h) Refer to 1-hour and 4-day Avg. Concentration for Ammonia tables on next page of these footnotes.

(i) And/or not in concentrations (levels) that cause a nuisance or impairments of beneficial uses.

(j) Waste discharges shall not depress dissolved oxygen levels below: 5mg/l for surface waters designated WARM, 6 mg/l for COLD surface waters, and 7 mg/l for water designated both COLD and SPWN.

(k) For waters designated WARM and COLD. WARM waters shall not be raised above 80 ^{o}F at any time.

(l) And waste discharge shall not be change ambient pH levels more than 0.5 units.

(m) Based on a minimum of four samples for any 30-day period.

(n) In levels that are deleterious to human, plant, animal, or aquatic life or that result in accumulation in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

(o) Compliance will be determined by appropriate methods, as specified by the State Water Resources Control Board or Los Angeles RWQCB.

(p) No more than 10 percent of total samples during any 30-day period should exceed value given.

(q) Winter (October-April)/Summer (May-September) actual temperature. Max Daily values taken during heat treatment.

(r) Source certifies that radioactive pollutants were not added into the waste streams.

(s) Average value of two samples taken November 2, 2004. ND = not detected (concentration below indicated limit of detection).

Table 2
Seawater Effluent from the Reliant Energy Ormond Beach Generating Station

One-hour Avg. Concentration for Ammonia for Waters Desginated as WARM (Salmonids and other sensitive coldwater species absent) [a]					
Total Ammonia as Nitrogen (mg/L)					
	Temperature (Celsius)				
pH	0	5	10	15	20
6.50	28.8	27.1	25.5	24.7	23.8
6.75	26.3	24.7	23.0	22.2	22.2
7.00	23.0	21.4	20.6	19.7	18.9
7.25	18.9	18.1	16.4	16.2	15.8
7.50	14.3	13.4	12.7	12.2	12.0
7.75	10.0	9.4	9.0	8.6	8.5
8.00	6.6	6.2	5.8	5.7	5.6
8.25	3.7	3.5	3.4	3.3	3.2
8.50	2.1	2.0	1.9	1.9	1.9
8.75	1.2	1.2	1.2	1.2	1.2
9.00	0.7	0.7	0.7	0.7	0.7

4-Day Avg. Concentration for Ammonia for Waters Designated as WARM (Salmonids and other sensitive species absent) [a]							
Total Ammonia as Nitrogen (mg/L)							
	Temperature (Celsius)						
pH	0	5	10	15	20	25	30
6.50	2.47	2.30	2.22	2.06	2.06	1.42	1.01
6.75	2.47	2.30	2.22	2.14	2.06	1.43	1.01
7.00	2.47	2.30	2.22	2.14	2.06	1.43	1.01
7.25	2.47	2.30	2.22	2.14	2.06	1.44	1.02
7.50	2.47	2.30	2.22	2.14	2.06	1.45	1.03
7.75	2.30	2.14	2.06	1.97	1.89	1.36	0.97
8.00	1.50	1.40	1.33	1.29	1.27	0.90	0.65
8.25	0.85	0.80	0.76	0.74	0.74	0.53	0.39
8.50	0.48	0.45	0.44	0.44	0.44	0.32	0.24
8.75	0.28	0.26	0.25	0.25	0.26	0.20	0.16
9.00	0.16	0.16	0.16	0.16	0.17	0.13	0.11

Potential Water Sources		Ammonia as Nitrogen (mg/l)	pH	Temperature (^oC)
Combined Calleguas Brine Line Average[b]		3.52	7.05	
Reliant Energy Ormond Beach Generating Station 30-day Average[c]		0.10	8.28	36.11/39.44[e]
Oxnard Recycled Water[d]	2004 Effluent Water Quality	21.67	7.23	23.5
	2004 Effluent Water Monthly Range	20 - 24	7.2 - 7.3	21 - 26

Notes:
(a) Los Angeles RWQCB, Water Quality Control Plan, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 13, 1994.
(b) Calleguas Municipal Water District Regional Salinity Management Report, October 2003.
(c) Los Angeles Regional Water Quality Control Board, Order No. 01 092, NPDES No. CA0001198, 28 June 2001.
(d) GREAT Program Advanced Planning Study, City of Oxnard, May 2002.
(e) Winter (October-April)/Summer (May-September) actual temperature.

Table 3
Evaluation of Recycled Water from the City of Oxnard

Constituent	Units	Typical MDL µg/L	California Ocean Plan[a] 30-Day Average or 6-Month Median	California Ocean Plan[a] Daily Max	California Ocean Plan[a] Instaneous Max	Basin Plan[b] 30-Day Average or 6-Month Median	Basin Plan[b] Daily Max/Min	Basin Plan[b] Instaneous Max/Min	2004 Secondary Effluent Water Quality Average[c]	2004 Secondary Effluent Water Quality Monthly Range[c]	Tertiary Effluent[d]	AWTF and OV Pipeline[e]
General Constituents												
Ammonia as nitrogen	mg/l	1.70E-01	6.00E-01	2.4	6	(h)			21.67	20 - 24	N/A	10
Nitrate (as N)	mg/l									<0.01 - 1.92	N/A	10
Nitrite (as N)	mg/l								0.9248	0.09 - 1.68	N/A	1
Organic nitrogen	mg/l								3.59	2.60 - 5.10		
Total nitorgen	µg/L										N/A	10,000
Boron	mg/l	4.70E-03									0.50	1 [v]
BOD	mg/l					no increase[i]			14.17	12 - 18	N/A	30 [w]
COD	mg/l											
Chloride	mg/l	3.20E-01									140	150 [v]
Chlorine, residual	µg/L	17	2	8	60	100[i]			0.0542	0.03 - 0.08		
Fluoride											1.8	2
Oil & grease	mg/l	1.5	25	40	75	no visible film/objects[i]				<5 - 6		
Settleable solids	mg/l	1.00E-01	1	1.5	3	none[i]			<0.1	N/A		
Total hardness											N/A	N/A
Calcium											100	N/A
Magnesium											40	N/A
Sodium	mg/l	8.50E-01									160	N/A
Total alkalinity											N/A	N/A
Carbonate											50	N/A
Bicarbonate											90	N/A
Sulfate	mg/l	4.10E-02									200	300 [v]
TDS	mg/l	3.8									800	700 [v]
TSS	mg/l	6.2	60			none[i]			6.33	5 - 9	N/A	30 [w]
DO	mg/l					greater than 7.0 [j]		5.0 minimum				
Dissolved organic carbon (DOC)											N/A	N/A
SDI											N/A	N/A
Total organic carbon (TOC)											N/A	2[x]
Turbidity	NTU	4.80E-02	75	100	225				3.58	2.9 - 4.8	0.2 [u]	0.2 [u]
natural turbidity 0 to 50 NTU	NTU					increase < 20%						
natural turbidity greater than 50 NTU	NTU					increase < 10%						
Temperature						+ 5 °F [k]			23.5°C	21 - 26 °C		
Color	---					color-free[i]						
Taste and odor						no causal substances[i]						
pH	---	1.00E-02			6 to 9	6.5 to 8.5 [i]			7.23	7.2 - 7.3	6.5 - 8.4	N/A
Bacterial Characteristics												
Total coliform	MPN/100ml	2			1000				23,247.25	11,768 - 78,039	2.2	2.2
Fecal coliform	MPN/100ml	2			200				7471.17	196 - 43,480	N/A	N/A
REC-1	MPN/100ml					200[m]		400[p]				
REC-2	MPN/100ml					2000[m]		4000[p]				
Enterococcus	MPN/100ml								1777.25	83 - 6,104		

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General Basin Plan Constituents												
Bioaccummulation						no toxic pollutants[h]						
Biostimulatory substances						none[i]						
Toxicity	TU_c					no toxic substances[n][o]			17.86	N/A		
Radioactive substances						no radionuclides[n]						
Miscellaneus compounds												
Silica											N/A	N/A
Gross Beta	pCi/l										N/A	50
Gross Alpha	pCi/l										N/A	15
Synthetic organic compunds	µg/l										N/A	(s)
Phenolic compounds	µg/L	3.6	30	120	300				7.38	5.0 - 10.0		
Chlorinated phenolics	µg/L	2.24	1	4	10							
Halomethanes	µg/L	1.40E-01	130									
PAHs	µg/L	2.92E-02	8.80E-03									
TCDD equivalents	µg/L	1.40E-12	3.90E-09									
Tributyltin	µg/L	2.00E-09	1.40E-03									
Metals												
Aluminum											10	1
Antimony	µg/L	8.20E-03	1200								N/A	6
Arsenic	µg/L	8.10E-01	8	32	80					<1.0 - 2.6	100	50
Beryllium	µg/L	3.60E-02	3.30E-02								100	4
Cadmium	µg/L	7.10E-02	1	4	10				<0.2	N/A	10	5
Chromium(III)	µg/L	9.50E-02	190000							<1.0 - 3.0	500	50
Chromium(VI)	µg/L	9.70E-01	2	8	20							
Copper	µg/L	6.90E-02	3	12	30					<20 - 21	200	N/A
Cyanide	µg/L	1	1	4	10				<5.0	N/A	N/A	200
Lead	µg/L	1.70E-02	2	8	20					<0.2 - 0.7	5,000	
Mercury	µg/L	1.30E-03	4.00E-02	1.60E-01	4.00E-01				<0.2	N/A	N/A	2
Nickel	µg/L	4.80E-02	5	20	50				6.00	3 - 12	200	100
Selenium	µg/L	7.50E-01	15	60	150						20	50
Silver	µg/L	7.30E-02	7.00E-01	2.8	7				<1.0	N/A	4,000	0.1[y]
Thallium	µg/L	1.30E-02	2								N/A	2
Zinc	µg/L	1.60	20	80	200				<20	N/A	2,000	5.0 [y]
Pesticides	µg/l											
Aldrin	µg/l	8.40E-04	2.20E-05						<0.001	N/A		
Chlordane	µg/L	1.00E-03	2.30E-05						<0.001	N/A		
DDT	µg/L	7.80E-04	1.70E-04						<0.001	N/A		
Dieldrin	µg/L	1.00E-03	4.00E-05						<0.001	N/A		
Endosulfan (alpha +beta+sulfate)	µg/L	1.00E-03	9.00E-03	1.80E-02	2.70E-02				<0.001	N/A		
Endrin	µg/L	8.80E-04	2.00E-03	4.00E-03	6.00E-03				<0.001	N/A		
Heptachlor	µg/L	7.60E-04	5.00E-05						<0.001	N/A		
Heptachlor epoxide	µg/L	7.80E-04	2.00E-05									

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Hexachlorocyclohexane (HCH)[(f)]	µg/L	4.20E-03	4.00E-03	8.00E-03	1.20E-02				<0.001	N/A		
PCBs[(g)]	ng/L	50	1.90E-02			7.00E-02	14		<0.01	N/A		
Toxaphene	µg/L	4.00E-02	2.10E-04						<0.01	N/A		
Volatile Organic Compounds	µg/L											
1,1,1-trichloroethane	µg/L	1.50E-01	540000									
1,1,2,2-tetrachloroethane	µg/L	2.50E-01	2.3									
1,1,2-trichloroethane	µg/L	2.10E-01	9.4									
1,1-dichloroethylene	µg/L	2.50E-01	9.00E-01									
1,2-dichloroethane	µg/L	2.40E-01	28									
1,3-dichloropropene	µg/L	2.00E-01	8.9									
1,4-dichlorobenzene	µg/L	7.30E-02	18									
Acrolein	µg/L	1.9	220									
Acrylonitrile	µg/L	5.00E-01	1.00E-01									
Benzene	µg/L	1.10E-01	5.9									
Carbon terachloride	µg/L	1.40E-01	9.00E-01									
Chlorobenzene	µg/L	1.70E-01	570									
Chlorodibromomethane	µg/L	1.50E-01	8.6									
Chloroform	µg/L	1.40E-01	130									
Dichloromethane	µg/L	1.10E-01	450									
Dichlorobromomethane	µg/L	1.50E-01	6.2									
Ethylbenzene	µg/L	7.60E-02	4100									
Tetrachloroethylene	µg/L	1.80E-01	2									
Toluene	µg/L	1.90E-01	85000									
Trichloroethylene (TCE)	µg/L	2.20E-01	27									
Vinyl Chloride	µg/L	2.00E-01	36									
Semi-Volatile Organic Compounds												
1,2-diphenylhydrazine	µg/L	1.2	1.60E-01									
2,4,6-trichlorophenol	µg/L	2.4	2.90E-01									
2,4-dinitrophenol	µg/L	6.8	4									
2,4-dinitrotoluene	µg/L	1.9	2.6									
3,3-dichlorobenzidine	µg/L	1.5	8.10E-03									
4,6-dinitro-2-methylphenol	µg/L	4.1	220									
Benzidine	µg/L	24	6.90E-05									
Bis(2-chloroethoxy) methane	µg/L	1.2	4.4									
Bis(2-chloroethyl) ether	µg/L	9.40E-01	4.50E-02									
Bis(2-chloroisopropyl) ether	µg/L	1.3	1200									
Bis(2-ethylhexyl) phthalate	µg/L	3.1	3.5									
Dichlorobenzenes	µg/L	7.73E-01	5100									
Diethyl phthalate	µg/L	4.20E-01	33000									
Dimethyl phthalate	µg/L	1.6	820000									
Di-n-butyl phthalate	µg/L	1.5	3500									
Fluoranthene	µg/L	1.8	15									

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Hexachlorobenzene	µg/L	1	2.10E-04									
Hexachlorobutadiene	µg/L	9.80E-01	14									
Hexachlorocyclopentadiene	µg/L	5.90E-01	58									
Hexachloroethane	µg/L	8.00E-01	2.5									
Isophorone	µg/L	1.1	730									
Nitrobenzene	µg/L	1.6	4.9									
N-nitrosodimethylamine	µg/L	1.6	7.3									
pre-chlorination	ng/L										N/A	2
post-chlorination	ng/L										N/A	2
N-nitrosodi-N-propylamine	µg/L	1.3	3.80E-01									
N-nitrosodiphenylamine	µg/L	1.3	2.5									

Highlighted cells indicate values exceeds standards in the California Ocean Plan and/or the Basin Plan

Highlighted cells indicate not analyzed per the California Ocean Plan and/or Basin Plan Standards

(a) State Water Resources Control Board, Water Quality Control Plan, Ocean Waters of California, California Ocean Plan, 2001.

(b) Los Angeles Regional Water Quality Control Board (RWQCB), Water Quality Control Plan, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 13, 1994.

(c) City of Oxnard, email from Mark Moise on July 12, 2005 containing City of Oxnard's 2004 WWTP effluent quality lab data for each month. 2004 average values were calculated from the monthly values given. Range values are those values from the month with the lowest value and the month with the highest value (respectively) for each parameter.

(d) Based on Title 22 Irrigation requirements and irrigation water quality criteria from local agricultural users.

(e) Based on Title 22 subsurface injection regulations, which require the discharge to meet Title 22 drinking water MCLs and Basin Plan requirements.

(f) Sum of alpha, beta, gamma (Lindane), and delta isomers of hexachlorocyclohexane.

(g) PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical charateristics resemble those of Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Arolclor-1254, and Aroclor-1260.

(h) Refer to 1-hour and 4-day Avg. Concentration for Ammonia tables on next page of these footnotes.

(i) And/or not in concentrations (levels) that cause a nuisance or impairments of beneficial uses.

(j) Waste discharges shall not depress dissolved oxygen levels below: 5mg/l for surface waters designated WARM, 6 mg/l for COLD surface waters, and 7 mg/l for water designated both COLD and SPWN.

(k) Alteration above natural temperature for waters designated WARM and COLD. WARM waters shall not be raised above 80^{o}F at any time.

(l) And waste discharge shall not be change ambient pH levels more than 0.5 units.

(m) Based on a minimum of four samples for any 30-day period.

(n) In levels that are deleterious to human, plant, animal, or aquatic life or that result in accumulation in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

(o) Compliance will be determined by appropriate methods as specified by the State Water Resources Control Board or Los Angeles RWQCB.

(p) No more than 10 percent of total samples during any 30-day period should exceed value given.

(q) Assumed based on typical values for secondary effluent.

(r) All SOCs were below detection limits.

(s) Detectable concentrations of lindane, beta BHC, delta BHC, and heptachlor epoxide. Lindane, beta BHC and delta BHC do not have MCLs. Heptachlor epoxide exceeded its MCL once.

(t) Detectable concentrations of chloroform, 1,4-dichlorobenzene and toluene less than their respective MCLs. All other VOCs were less than the detection limits.

(u) 0.2 NTU is required for membrane filtration.

(v) Based on Pleasant Valley Basin confined aquifer quality.

(w) Required secondary effluent quality.

(x) Based on an RWC of 50 percent.

(y) Based on Title 22 secondary MCLs.

Table 3
Evaluation of Recycled Water from the City of Oxnard

One-hour Avg. Concentration for Ammonia for Waters Desginated as WARM (Salmonids and other sensitive coldwater species absent) (a)					
Total Ammonia as Nitrogen (mg/L)					
	Temperature (Celsius)				
pH	0	5	10	15	20
6.50	28.8	27.1	25.5	24.7	23.8
6.75	26.3	24.7	23.0	22.2	22.2
7.00	23.0	21.4	20.6	19.7	18.9
7.25	18.9	18.1	16.4	16.2	15.8
7.50	14.3	13.4	12.7	12.2	12.0
7.75	10.0	9.4	9.0	8.6	8.5
8.00	6.6	6.2	5.8	5.7	5.6
8.25	3.7	3.5	3.4	3.3	3.2
8.50	2.1	2.0	1.9	1.9	1.9
8.75	1.2	1.2	1.2	1.2	1.2
9.00	0.7	0.7	0.7	0.7	0.7

4-Day Avg. Concentration for Ammonia for Waters Designated as WARM (Salmonids and other sensitive species absent) (a)							
Total Ammonia as Nitrogen (mg/L)							
	Temperature (Celsius)						
pH	0	5	10	15	20	25	30
6.50	2.47	2.30	2.22	2.06	2.06	1.42	1.01
6.75	2.47	2.30	2.22	2.14	2.06	1.43	1.01
7.00	2.47	2.30	2.22	2.14	2.06	1.43	1.01
7.25	2.47	2.30	2.22	2.14	2.06	1.44	1.02
7.50	2.47	2.30	2.22	2.14	2.06	1.45	1.03
7.75	2.30	2.14	2.06	1.97	1.89	1.36	0.97
8.00	1.50	1.40	1.33	1.29	1.27	0.90	0.65
8.25	0.85	0.80	0.76	0.74	0.74	0.53	0.39
8.50	0.48	0.45	0.44	0.44	0.44	0.32	0.24
8.75	0.28	0.26	0.25	0.25	0.26	0.20	0.16
9.00	0.16	0.16	0.16	0.16	0.17	0.13	0.11

Potential Water Sources		Ammonia as Nitrogen (mg/l)	pH	Temperature (°C)
Combined Calleguas Brine Line Average(b)		3.52	7.05	
Reliant Energy Ormond Beach Generating Station 30-day Average(c)		0.10	8.28	36.11/39.44(e)
Oxnard Recycled Water(d)	2004 Secondary Effluent Water Quality Average	21.67	7.23	23.5
	2004 Secondary Effluent Water Quality Monthly Range	20 - 24	7.2 - 7.3	21 - 26

Notes:
(a) Los Angeles Regional Water Quality Control Board (RWQCB), Water Quality Control Plan, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 13, 1994.
(b) Calleguas Municipal Water District Regional Salinity Management Report, October 2003.
(c) Los Angeles RWQCB, Order No. 01 092, NPDES No. CA0001198, 28 June 2001.
(d) GREAT Program Advanced Planning Study, City of Oxnard, May 2002.
(e) Winter (October-April)/Summer (May-September) actual temperature.