6.0 Brackish Agricultural Drainage from Oso Flaco Watershed

Introduction

This section considers the constraints associated with treating shallow ground water or agricultural runoff from Oso Flaco Lake and delivering the treated water to the Nipomo Community Services District (NCSD) distribution system. This alternative may include returning a portion of the treated flow to the watershed. A schematic map of the Project is shown in Figure 6-1.

Setting

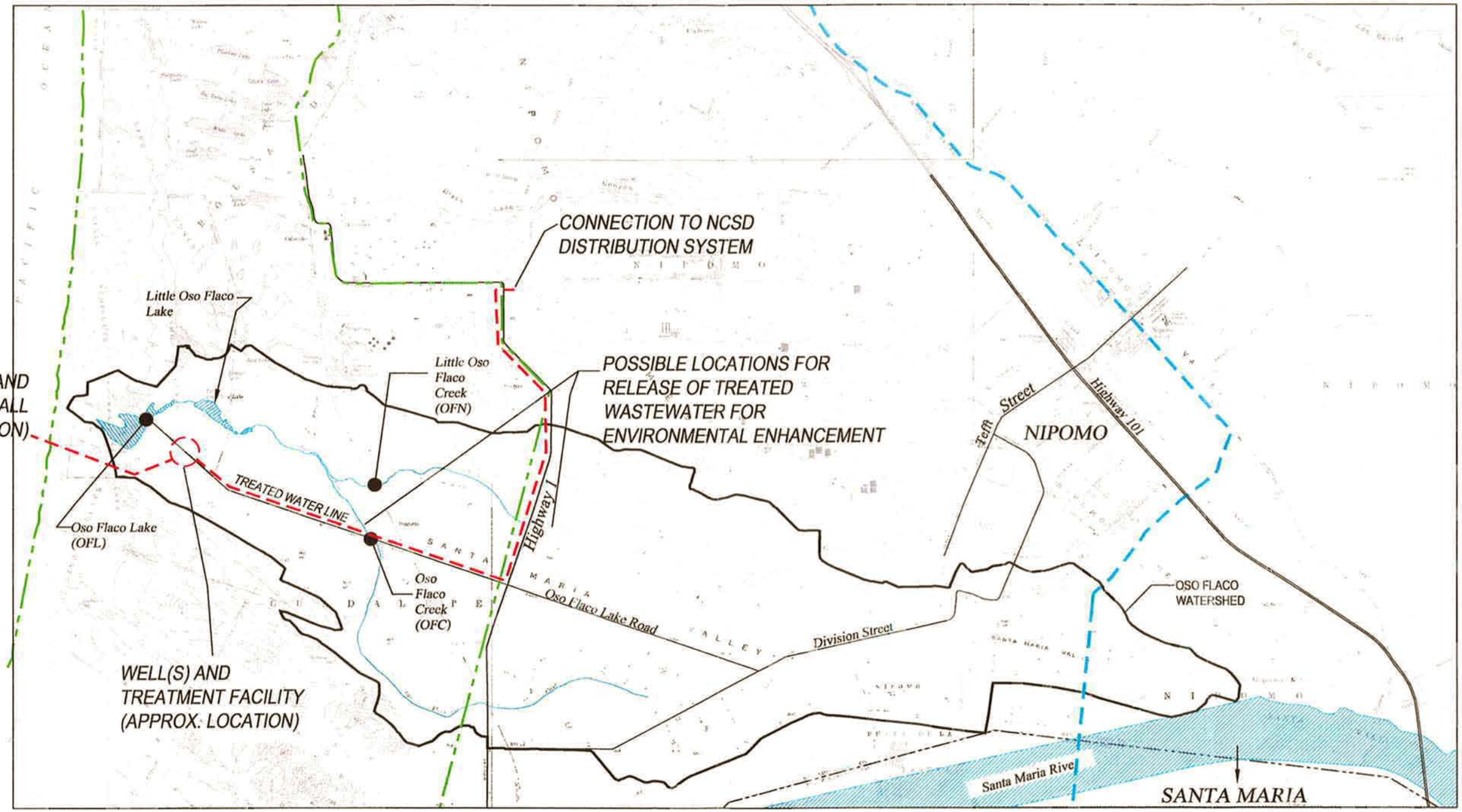
The Oso Flaco Creek Watershed covers approximately 10,370 acres. It is located north of the Santa Maria Estuary in the western portion of the Santa Maria Valley in San Luis Obispo County, California. Land use in the Oso Flaco Watershed is primarily irrigated vegetable row crops. Oso Flaco Creek has become degraded and functions primarily as a drainage channel to receive irrigation tail-water run-off.

The western terminus for the watershed is Oso Flaco Lake, owned by California State Parks. Oso Flaco Creek flows out of the lake and meanders ¼ mile to the Pacific Ocean through active sand dunes. Oso Flaco Lake is the largest of four small freshwater lakes located in the Guadalupe Nipomo Dunes Complex. The freshwater lake occupies a surface area of 82 acres and is classified by the U.S. Fish and Wildlife Service as palustrine emergent wetlands, a valuable habitat for wildlife, and subsequently a resource for many recreational and educational activities. (CRCD, 2004)

Recent Studies

Water quality and associated biological resources in Osos Flaco Lake and its watershed have been recently studied. Pertinent report include:

- Cachuma Resource Conservation District and the Dunes Center. *Draft Nitrate and Sediment Assessment, Oso Flaco Watershed, San Luis Obispo County, California, August 2004.* Report prepared for California Regional Water Quality Control Board, Central Coast Region.
- Central Coast Ambient Monitoring Program (CCAMP). *312 Santa Maria River Hydrologic Unit Draft Report for Sampling Year 2000*



LEGEND:

- Coastal Zone Boundary
- Proposed Treated Water Line
- Existing C.C.W.A. Waterline
- Oso Flaco Watershed
- CCAMP Monitoring Site (Site Code)

0 5000

SCALE IN FEET

BOYLE ENGINEERING CORPORATION
1194 Pacific St., Suite 204 San Luis Obispo, CA. 93401
Tel. 805-542-9840 Fax 805-542-9990
WWW.BOYLEENGINEERING.COM

NIPOMO CSD EVALUATION OF SUPPLEMENTAL WATER ALTERNATIVES

OSO FLACO WATERSHED

BEC PROJECT NO. 19996.32

FIGURE 6-1

DWG: M:\Nipomo CSD (19996)\19996.32 (Alternative Water Supply)\CAD\Design\Revised Figures and Pictures\Figure 6-1_Oso Flaco Watershed.dwg
DATE: Jan 11, 2007 9:11am
XREFS: BASE MAP IMAGES: OSO FLACO WATERSHED.tif PAGE: 7.tif Map1.tif Map2.tif Map3.tif USER: cromero Map5.tif Map6.tif Map7.tif Map9.tif Map_10.tif Map_11.tif Map_12.tif Map_13.tif

Supply

Average rainfall in the watershed is approximately 12 inches per year, occurring primarily between November and April. Storm runoff to Oso Flaco Lake has been estimated to average 1,512 acre-feet per year (AFY) (Lockhart, pers. comm..)

Older wells in the watershed are pumping from depths of 50 to 150 feet. Wells currently being drilled are drawing from 200 to 400 feet of depth. There is also a perched water table west of Highway 1. Oso Flaco and Little Oso Flaco Lakes are surface water bodies hydraulically connected to perched groundwater. (DWR, 2002) Sea water intrusion is apparently not occurring in this watershed, due to the steep gradient of fresh groundwater coming down the valley. (CRCD, 2004)

Oso Flaco Lake and Little Oso Flaco Lake are usually at maximum pool due to the steady flow of agricultural runoff. It has been estimated that 6,371 acres in the watershed are irrigated, primarily with pumped groundwater, and that 17,564 af/yr of water are applied, resulting in 968 AFY of agricultural runoff. Efforts are currently underway to improve irrigation efficiency to both reduce the quantity of water applied and the volume of agricultural runoff. It has been estimated that if 100% of the irrigated area were to adopt sprinkler/drip systems, the annual runoff volume would decrease to 440 AFY. (CRCD, 2004)

According to the estimates noted above, the total amount of water flowing to Oso Flaco Lake is approximately 1,120 acre-feet per year. It appears reasonable to conclude that extracting either 3,000 AFY or 6,300 AFY from the lake or hydraulically-connected shallow aquifer would significantly lower the existing level of the lake. It is reasonable to assume that such extractions would be opposed by the various regulatory agencies that have jurisdiction, and that this may represent a "Fatal Flaw" with this alternative

Quality and Restoration Efforts

The Central Coast Ambient Monitoring Program (CCAMP) is conducted by the Central Coast Regional Water Quality Control Board's to provide a screening level assessment of water quality, based on a variety of chemical, physical and biological indicators. CCAMP monitoring in the Oso Flaco Creek watershed between 2000 and 2002 included conventional water quality, and sediment chemistry and toxicity. California Department of Fish and Game's Toxic Substances Monitoring Program also collected resident fish at Oso Flaco Lake in August 2001.

CCAMP collected data at three locations in the Oso Flaco Creek watershed, and determined that the 3 sites monitored did not support the beneficial uses of contact recreation, municipal water supply, aquatic

life, fish consumption, agricultural use and non-contact recreation. These CCAMP assessments are summarized in Table 6-1. Additional CCAMP data is summarized in Appendix B.

Table 6-1 CCAMP Findings and Beneficial Uses in the Oso Flaco Creek watershed.

Monitoring site	Unsafe to Swim?	Unsafe to drink?	Are aquatic life uses impaired?	Unsafe to eat fish?	Are agriculture uses impaired?	Are non-contact recreation activities impaired?
Little Oso Flaco Creek at railroad crossing	Yes	Yes	S	-	Yes	Yes
Oso Flaco Creek at Oso Flaco Lake Road	Yes	Yes	Yes	-	Yes	Yes
Oso Flaco Lake at culvert	Yes	Yes	S	Yes	Yes	Yes

(Excerpted from Table 5.1.1b, CCAMP, 2002)
Yes - evidence that a problem exists, No - no evidence that a problem exists, S – some evidence that a problem may exist.

The inability to support these beneficial uses was based on:

- elevated fecal coliform concentrations,
- observed pH > 8.4,
- elevated nitrate concentrations,
- elevated un-ionized ammonia concentrations,
- low dissolved oxygen levels,
- toxicity,
- pesticide residue in fish tissue,
- chlorophyll concentrations,
- algal cover,
- turbidity, and
- measures of biotic integrity.

Oso Flaco Creek and Oso Flaco Lake were listed on the CWA section 303(d) list of impaired waterbodies (CCRWQCB 2002). Oso Flaco Creek was listed for impairment due to fecal coliform and nitrate, and Oso Flaco Lake was listed for impairment due to nitrate.

Oso Flaco Lake was the only water body in the 2000 assessment area specifically identified in the Basin Plan as not supporting the Municipal Supply beneficial use.

The Regional Board is now in the process of developing total maximum daily loads (TMDLs) for nitrates, fecal coliform, and pesticides. Once approved, these TMDLs will establish 1) an allowable amount of a pollutant to each waterbody, 2) proportional responsibility for controlling the pollutant, 3) numeric indicators of water quality, and 4) implementation to achieve the allowable amount of pollutant loading.

Local growers are working with the Cachuma Resource Conservation District to develop and implement practices to reduce agricultural runoff, nitrate loadings, and sediment loads, and to improve habitat.

Reliability

As part of this alternatives study, Oso Flaco surface water and perched water are being compared to other potential sources. For purposes of comparison, each alternative is evaluated under two design flows: 3,000 acre-feet per year (AFY) and 6,300 AFY.

The surface water in Oso Flaco Lake and its associated perched aquifer receive water from precipitation, agricultural underflow, and agricultural runoff. As noted above, efforts are underway to decrease the amount of applied irrigation and agricultural runoff. As also noted above, a more detailed hydrogeological study of the lake, watershed, and perched aquifer would be needed in order to form an opinion of the reliability of this potential source.

Required Facilities

Water quality in Oso Flaco Lake, Oso Flaco Creek, or shallow groundwater associated with either of these sources dictate that a treatment facility must be built to reduce or remove the following constituents:

- Microorganisms
- Nitrate
- Dissolved solids
- Turbidity
- Sulfate

In addition, elevated levels of the following constituents were found in fish tissue or sediment, or through toxicity identification analyses, and therefore may result in additional treatment requirements:

- Chlorpyrifos
- DDT

- Endrin
- Toxaphene

DHS requirements that this "extremely impaired source" be treated with the "best available technology" limit the options for treatment, as shown below:

Table 6-2 Probable Treatment requirements for Oso Flaco Water Source

Treatment Technology	Coagulation, Filtration & Disinfection [1]	Ion Exchange	Reverse Osmosis	Electrodialysis	Granulated Activated Carbon	Packed Tower Aeration
Microorganisms	x		x			
Nitrate		BAT	BAT	BAT		
Dissolved solids			x			
Turbidity	x		x			
Sulfate			x			
Chlorpyrifos						
DDT						
Endrin					BAT	
Toxaphene					BAT	BAT

BAT = best available technology per USEPA, x = effective treatment, probable requirement
(1) or approved alternative filtration technology

Treatment Option:

One treatment option was investigated as part of this constraints analysis:

1. coagulation, filtration and disinfection, followed by
2. reverse osmosis, and
3. granular activated carbon.

Project Components:

Based on this constraints analysis, the following facilities will be required to obtain water from the Oso Flaco Lake perched aquifer, treat it, dispose of the waste, and transport the treated water to the NCSD distribution system:

- Well Site (purchase land);
- Treatment Plant;

- Subdivide and purchase a site for the wells and the treatment plant;
- Improvements to electrical grid for required power;

- 2 miles of 18-inch effluent pipeline;
- Ocean outfall; and
- 6 miles of 18-inch pipeline to connect to NCSD distribution system at Eureka well site.

Implementation Schedule

Given the time needed for interagency cooperation, extensive environmental review, design, construction, and startup, it is expected that implementation of any of these alternatives would take between 7 and 10 years. Steps would be similar to the desalination options in the previous section.

Constraints

Institutional

Institutional constraints for the proposed project are identified as follows:

The vast majority of Oso Flaco and Little Oso Flaco Lakes is on land owned by California State Parks. It is expected that State Parks would only support the project if it could be demonstrated to be environmentally beneficial and compatible with current and planned uses of the parkland.

Legal

Oso Flaco drainage is considered a component of the Santa Maria Valley Groundwater Basin, and use of this supply would require approval by all signatory parties to the litigation and subsequent management agreements. This water may be available for development if it drains through Oso Flaco Lake to the ocean and does not recharge the NMMA subbasin. No data or historical documents reviewed define or describe the hydro-geological connectivity of the surface or perched groundwater to the principal production aquifer underlying the NMMA. Additional field investigations would be required to determine the character of hydrological connectivity of the Oso Flaco watershed to the NMMA.

Regulatory

Department of Health Services: For municipal drinking water uses, the California Department of Heath Services (DHS) would probably consider surface water or shallow groundwater from the Oso Flaco watershed an "extremely impaired source" (IES). It would be classified an IES because nitrate and nitrogen concentrations exceed 3 times their MCLs, and because the waters contain a mixture of contaminants of health concern.

The use of this "extremely impaired source" would probably not be approved unless the additional health risk, relative to the use of other available drinking water sources, are known, minimized, and considered acceptable by DHS. DHS policy dictates that an extremely impaired source should not be considered for direct human consumption where alternatives are available. In addition, DHS policy requires that drinking water quality and public health shall be given greater consideration than costs or cost savings when evaluating alternative drinking water sources or treatment processes.

In other words: DHS would approve of this alternative only if it was the best alternative possible, regardless of price.

Before an extremely impaired source can be used for municipal supply the following process must be implemented:

- Determine the extent to which the aquifer or surface water is vulnerable to contaminating activities. (This step has been partially completed through monitoring associated with the CCAMP program.)
- Full characterization of raw water quality. (Additional monitoring would be required.)
- There must be a program in place to control the level of contamination. (At a minimum, best management practices for waste handling and waste reduction would be required.)
- The treatment process must be commensurate with the degree of risk associated with the contaminants present. (As a minimum, treatment would require use of the *best available treatment technology* defined by the EPA. See discussion under Required Facilities.)

California Environmental Quality Act (CEQA). Environmental review under CEQA must be completed for the project. Given the scope of the project, and the potential to impact numerous sensitive resources, it is expected that a full Environmental Impact report (EIR) would be required.

Other Resource Agencies. The construction of a treatment system, ocean outfall, pipelines (including multiple stream crossings), and pumping facilities will require permits from numerous local, state, and federal agencies.

Cost

The estimated annual costs, including debt service on capital costs and O&M, assuming the two delivery rates investigated can be achieved, are $2,700/af with a 3,000 afy facility, and $2,300/af with a 6,300 afy facility.

The cost of this project may be partially offset if suitable grants or loans can be arranged. Examples of funding programs that may be applicable include:

- California Department of Water Resources (DWR) Local Groundwater Assistance Program: Local public agencies with authority to manage groundwater resources can apply for up to

$250,000 for projects providing groundwater data collection, modeling, monitoring and management studies; monitoring programs and installation of equipment; basin management; and development of information systems

- DWR's Water Desalination Program: Local agencies can apply for grants to support development of local water supplies through brackish water and sea water desalination. Up to $25 million is available statewide during the current funding cycle.
- DWR's Agriculture & Urban Water Use Efficiency Program: Local agencies, public agencies, incorporated mutual water companies, and tribes can apply for grants to support agricultural and urban water use efficiency implementation projects or studies that carry out the goals of the California Bay Delta Program's Water Use Efficiency Program. Total Program Funds: $120 million, pending California Department of Finance exemption. Up to $35 million is available statewide during the 2006/2007 funding cycle.

Capacity

The capacity of this alternative is dependent on the amount of water available from the lake and associated shallow aquifer. Any water removed from this watershed would likely lower water levels in the lakes, with the exception of storm waters that otherwise discharge to the ocean. However, in order to utilize storm water, a retention facility would be required to capture short-term storm events and make these waters available over the following months. If withdrawals are limited to agricultural return flows, production would be less than 968 AFY, possibly decreasing to less that 440 AFY if irrigation conservation measures are universally adopted in the watershed.

7.0 Nacimiento Water Project Extension

Introduction

The NWP is a transmission facility that will convey raw water from Lake Nacimiento to communities in San Luis Obispo County. The San Luis Obispo County Flood Control & Water Conservation District (SLOCFCWCD) is managing the design and construction of this facility. The initial contracted participants are the City of El Paso de Robles, Atascadero Mutual Water Company, Templeton Community Services District, Cayucos County Service Area (CSA 10A), and the City of San Luis Obispo.

The NWP consists of 45 miles of transmission pipeline ranging in size from 30 to 12 inches in diameter; storage reservoirs; and booster pump stations. The pipeline ends at the City of San Luis Obispo Water Treatment Plant (SLO WTP) turnout.

This section considers the constraints associated with extending the Nacimiento Water Project (NWP) pipeline from the City of SLO Turnout to the Nipomo Community Services District (NCSD) distribution system. A schematic map of the Project is shown in Figure 7-1.

Previous Studies

The following list summarizes the studies and documents referenced in this evaluation:

- Nacimiento Reservoir: Reliability As a Water Source for San Luis Obispo County (Boyle Engineering, October 2002)
- Nacimiento Water Project: Technical Memorandum (TM) 8 Water Quality Investigations for San Luis Obispo County Flood Control & Water Conservation District (SLOCFCWCD) (Black & Veatch, January 2006)
- Supplemental Water Supply Study: Nacimiento Pipeline Extension for City of Arroyo Grande, City of Grover Beach, and Oceano CSD (Wallace Group, January 2006)
- Nacimiento Water Project: Preliminary Design Report (PDR) for SLOCFCWCD (Black & Veatch, in Association with Boyle Engineering, July 2006 FINAL)
- AIWRP Water Supply Evaluation: Nacimiento Treatment Evaluation for City of El Paso de Robles (Boyle Engineering, September 2006)
- Agendas from NWP Commission and Board of Supervisors of the SLOCFCWCD

LOPEZ LAKE

NCSD QUAD TANKS

HWY 101

NIPOMO

LOPEZ TREATMENT PLANT

REACH 1 (19.5 MILES)

REACH 2 (12.6 MILES)

ALIGNMENT "A" PER 2006 WALLACE STUDY

ORCUTT ROAD

CITY OF ARROYO GRANDE

HWY 101

CITY OF GROVER BEACH

NOTE:
PUMPING, STORAGE, AND TREATMENT FACILITIES NOT SHOWN

HWY 101

NWP TURNOUT (SAN LUIS OBISPO WATER TREATMENT PLANT)

CITY OF SAN LUIS OBISPO

SLO AIRPORT

CITY OF PISMO BEACH

8000 0 8000 16000

SCALE IN FEET

LEGEND:

REACH 1: PROPOSED NACIMIENTO WATER PROJECT EXTENSION

REACH 2: PROPOSED NACIMIENTO WATER PROJECT EXTENSION

EXISTING S.W.P. COASTAL BRANCH PIPELINE (C.C.W.A.)

HWY-1

CONNECT TO FUTURE NWP

HWY 101

SHELL BEACH

BOYLE ENGINEERING CORPORATION

NIPOMO CSD EVALUATION OF SUPPLEMENTAL WATER ALTERNATIVES

NACIMIENTO WATER PROJECT EXTENSION

BEC PROJECT NO. 19996.32

FIGURE 7-1

DWG: W:\Nipomo CSD (19996)\19996.32 (Alternative Water Supply)\CAD\Design\Revised Figures and Plates\Figure 7-1_Nacimiento Extension.dwg USER: cromero
DATE: Jun 11, 2007 8:49am XREFS: CCWA PIPELINE IMAGES: Large Map-grayscale.tif

Supply

The SLOCFCWCD has an annual entitlement of 17,500 acre-feet (AF) within Lake Nacimiento through a 1959 Agreement with Monterey County Water Resources Agency (MCWRA) and is owner of the NWP.

The NWP is designed to convey 15,750 acre-feet per year (AFY) with the remainder of the entitlement set aside for lakeside use. The total delivered entitlement currently under contract is 9,655 AFY. The "Reserved Capacity" (or unsubscribed entitlement) is 6,095 AFY.

Initially the SLOCFCWCD intended to deliver the full Reserved Capacity to the end of the project. In an effort to reduce the construction cost of the NWP, the SLOCFCWCD reduced pipeline size and capacity between Santa Margarita and the City of San Luis Obispo's Turnout. As indicated on the Design Plans for the NWP, the last reach ending at the SLOWTP will be 12-inches in diameter with a current deliverable Reserved Capacity of 2,148 AFY. However, Mr. Hollenbeck indicated the last reach of the NWP could be upgraded to provide up to 3,000 AFY if an interested agency paid for design revisions and were able to sign an agreement with SLO County.

Quality

The NWP will convey raw surface water. Participants will need to treat the water or utilize aquifer storage and recovery. The City of El Paso de Robles plans to construct a surface water treatment plant for NWP water. As discussed in the Water Source Evaluation for the City of Paso Robles (Boyle 2006), the City will treat the raw water, blend it with groundwater, and pump it directly into their distribution system. The City of San Luis Obispo plans to treat its NWP water at its existing water treatment plant located on Stenner Creek Road. TCSD and AMWC plan to use their NWP deliveries for aquifer recharge via spreading ponds.

Nacimiento Water Project PDR identified the following water quality issues that could potentially affect NWP participants:

- Algae;
- Iron and manganese;
- PH, alkalinity, and hardness (corrosion potential);
- Odor;
- Turbidity and color; and
- Disinfection byproduct formation

In order to utilize this water supply, the NCSD will need to filter and disinfect the raw surface water, or develop an aquifer storage and recovery (ASR) system. In addition, the District must ensure compliance with the drinking water standards for disinfection by products (DBPs), ensure maintenance of a disinfectant residual, and address potential corrosion impacts due to the water.

Reliability

The current NWP Delivery Entitlement Contracts provide the initial participants with an annual allocation in Acre-feet (AF) of NWP water, including specified maximum instantaneous flow rates in cubic feet per second (cfs) and maximum allocations for any given month of service. Additionally, the maximum period of delivery for any participant is 11 months in order to allow for routine maintenance of the NWP.

It is understood the City of San Luis Obispo's allocation of 3,380 AFY of NWP water will be delivered at a constant rate for 11 months per year. Similarly, it is understood the current deliverable Reserved Capacity at the SLOWTP pipeline terminus could be delivered at a constant rate for the same 11-month duration. However, as discussed previously in this report, only 2148 AFY will be available for the District.

As indicated in the NWP Preliminary Design Report, backup systems for critical project components (e.g. backup pumps, backup communications) are incorporated into the NWP design to enhance system reliability.

Required Facilities

Two options were evaluated in this Constraints Analysis:

- Participation in a regional project to extend the NWP pipeline to other South County purveyors; and
- Transmission of Nacimiento Water to Nipomo CSD, with no additional partners or South County participants.

Regional NWP Participation

A NWP extension to the NCSD service area will likely require participation from other agencies to help offset the expected high capital and NWP "buy-in" costs. The Cities of Arroyo Grande and Grover Beach and Oceano Community Services District jointly evaluated the feasibility of extending the NWP from its terminus at the SLOWTP to the Lopez Water Treatment Plant for distribution as supplemental water to South County Purveyors (2006 Supplemental Water Supply Study, Wallace Group). The 2006 study conducted by the purveyors considered two alternative alignments for the pipeline extension.

Both alternatives utilized the NWP EIR alignment from the SLOWTP to the SLO Airport area[6] (approximately 9.5 miles). Descriptions of both alternative alignments evaluated by Wallace Group are as follows:

- Alignment A: From SLOWTP to Lopez WTP along Orcutt Road, parallel to the existing State Water Pipeline (17.5 miles total)
- Alignment B: From SLOWTP to Lopez WTP along Orcutt Road, utilizing the planned Plains Oilfield pipeline from Price Canyon, along Highway 227 (18.1 miles total)

Based on a review of this study, the primary assumptions used in Wallace Group's analysis were as follows:

- NWP reserve capacity available for new participants in southern SLO County is 2,100 AFY
- NWP pipe size at SLOWTP is 20-inches inner diameter (I.D.)
- NWP delivered Hydraulic Grade Line (HGL) at SLOWTP turnout is 1295 feet
- Ground Elevation at SLOWTP is 400 feet; Nominal water surface elevation at Lopez Reservoir is 383 feet
- Raw water conveyed by NWP extension will be treated (filtered and disinfected) at the Lopez WTP and conveyed to South County area water purveyors via the Lopez distribution system

Since NWP design had not been completed at the time of the 2006 Wallace Study, the study addressed a range of hydraulic conditions at SLOWTP. The study concluded a 12-inch diameter pipeline would be sufficient to convey approximately 2300 AFY of water along Alignment A given a minimum calculated HGL of approximately 1260-ft at the SLOWTP. A 16-inch diameter pipeline would be required if the available HGL was reduced to 575-ft at the SLOWTP. A booster station would be required for any further reductions in NWP delivered HGL at the SLOWTP turnout. To accommodate this additional flow, the Lopez WTP would need to be expanded and the Lopez Distribution system may need to be upgraded.

Raw water allotted for NCSD could be treated at the Lopez WTP, or conveyed further south to the NCSD service area for treatment and distribution. As shown on Figure 7-1, it may be possible to align the remainder of the pipeline extension from the Lopez WTP to NCSD (approximately 12 miles) parallel to the existing Central Coast Water Authority (CCWA) pipeline and possibly within its easement.

It is anticipated a connection to NCSD's distribution system can be made near the vicinity of Tefft St. and Thompson Rd.; however, the pipeline could be extended to the Quad Tank Site near Foothill Rd. and Tefft St. If treatment is not provided at Lopez Lake, a water treatment facility will be required to filter and disinfect the raw water prior to introduction into the municipal water supply.

[6] This sub-alternative was previously evaluated as part of the December 2003 Final EIR for the NWP

Sole Ownership of Nacimiento WP Extension from SLO WTP to NCSD Service Area

If this option is pursued, the project alignments and facilities discussed above (except treatment at the Lopez WTP) would still be appropriate. However, the District would bear the full cost for all facilities.

Project Components:

Based on this constraints analysis, the following facilities will be required to extend the NWP pipeline from the SLO WTP to the NCSD distribution system. It is assumed project alignments and components would be similar for either alternative mentioned above:

- Reach 1 (SLOWTP to Lopez WTP): Extension of approximately 92,400 linear feet (17.5 miles) of pipe (Alignment A as identified in 2006 Wallace Study);
- Reach 2 (Lopez WTP to NCSD);
    - Pipeline extension: 65,000 linear feet (12.3 miles) of pipe;
    - Connection to existing municipal water system w/possible required upgrades
- Booster pump station(s) and Storage facilities at SLO WTP Turnout, Lopez WTP, and/or Nipomo CSD tie-in; and
- Water treatment plant to filter and disinfect raw NWP water

Implementation Schedule

As of the date this section was written (January 2007), the NWP was nearing 100% design completion and the final bid packages were being prepared for submittal to SLOCFCWCD. The plans and specifications were bid in May 2007 for award sometime later in the year. Additionally, as currently designed, the final reach of the NWP has a deliverable capacity of approximately 2,148 AFY for new South County participants.

As these dates indicate, the project window is rapidly closing for any additional participants. During our January 25, 2007, meeting with Mr. Hollenbeck, he indicated any interested South County participants would need to quickly commit and be able to enter an Agreement with San Luis Obispo County for an entitlement to available NWP water. He also indicated the interested agencies would need to satisfy the CEQA process prior to the County entering an Agreement with them. It is our understanding a Supplemental EIR would need to be initiated and/or Draft completed prior to said Agreement being executed.

With regards to project implementation schedule, the Wallace Study estimated a project timeline of approximately 5 years for Reach 1, from the beginning of agency agreements to completion of construction.

It is estimated approximately five (5) to seven (7) years will be required to fully implement Reach 1 and 2 of this project.

Constraints

Institutional

Institutional constraints for the proposed project are identified as follows:

- NCSD must decide if it wants to further pursue the feasibility of extending the NWP.
- To share costs, the NCSD must quickly mobilize and secure sufficient participation from interested South County communities.
- NCSD must determine its minimum acceptable water volume entitlement for negotiating with SLOCFCWCD and tentative South County Participants. NCSD will not be able to secure the full 3,000 AFY from the NWP extension.
- NCSD must notify SLOCFCWCD of its intentions and receive approval from the existing project participants. They would be unlikely to support any actions that would delay their project, so it is unlikely they would allow the District to contribute toward design and construction of a larger capacity pipeline between Cuesta Tunnel and San Luis Obispo.

Legal

Legal constraints are summarized as follows:

- NCSD and interested South County participants must enter into agreements with SLOCFCWCD to secure NWP deliveries. As a condition for executing this agreement, it is understood environmental review under CEQA must be initiated and/or completed along the pipeline extension corridor by way of a Supplemental EIR.
- As identified in the 2006 Wallace Study, NWP deliveries to South County participants will likely require alteration of the Zone 3 Entitlement Contracts. The existing Lopez Distribution system downstream of the Lopez WTP would probably be utilized for delivery of NWP water. This may delay participation by NCSD's potential project partners.

Regulatory

As indicated above, environmental review under CEQA must be initiated and/or completed along the pipeline extension corridor by way of a Supplemental EIR prior to SLOCFCWCD entering into an agreement with any additional prospective participants.

The construction of a treatment system, storage tanks, pipelines (including multiple stream crossings), and pumping facilities will require permits from local, state, and federal agencies.

The water would also require filtration and disinfection to meet federal and state surface water treatment regulations.

Cost

From the December 14, 2006, Nacimiento Project Commission Agenda Item V.a (Total Project Cost Update-90% Progress Point), the total capital cost for the City of San Luis Obispo is approximately $80.4M ($23,800 per AFY capacity). The estimated annual cost, including annual debt and O&M, is approximately $6.4M to $7.1M. This results in an overall cost of approximately $1900-$2100 per AF, for delivery of 2100 AFY (maximum reserve capacity in pipeline) raw water to the SLO City Turnout.

In addition, the project would require storage, pumping, water treatment, and transmission facilities between the SLO City Turnout and the NCSD distribution system. The project cost for the transmission main (approximately 30 miles) would be over $1 million per mile, assuming 12-in PVC pipe was installed, for a total of $30M. At 6% interest, over a 20-year payback period, the pipeline alone would cost over $1100 per AF for 2100 AFY delivery.

Therefore, the cost of delivery at the SLO City turnout and transmission to the NCSD system would cost $3000-$3200 per AF. With supporting facilities (storage, pumping, and filtration), a planning-level cost of over $4000 per AF may be expected.

WIP would be considerably less expensive at approximately $2100 per AF (including debt service at 6% over 20 years, operations & maintenance, and purchase price from Santa Maria per the MOU). This is based on the $26M budget described in the draft WIP Preliminary Engineering Memorandum (Boyle, 2006).

Capacity

In considering the desired water quantity for NCSD of 3,000 AFY, the desired water quantity in the 2006 Supplemental Water Study for 2,300 AFY, and the Reserved Capacity of 2,148 AFY at the NWP terminus, there is currently not enough deliverable capacity at the end of the NWP pipeline to satisfy all needs. However, as described above, Mr. Hollenbeck indicated it might be possible to marginally increase NWP deliverable capacity to new South County participants. It is doubtful the NWP deliverable capacity can be increased to satisfy the total desired water quantity of 5,300 AFY. If the NCSD pursues this alternative water supply, all potential South County participants (including the NCSD) will likely need to compromise and accept smaller water allocations as the available water is proportioned along the various new participants. If NCSD pursues the NWP extension without any additional partners, only 2,148 AFY (of desired 3000 AFY) would be available.

8.0 Recharge of Groundwater with Recycled Water from Southland WWTF

Introduction

Background

The Nipomo Community Services District (NCSD) owns and operates the Southland Wastewater Treatment Facility (WWTF), located just west of Highway 101 in the southern portion of San Luis Obispo County, California. The WWTF provides secondary treatment for a mixture of domestic and industrial wastewater from part of the Nipomo community under Waste Discharge Requirements (WDR) Order No. 95-75. Existing facility components include four aeration ponds, two sludge-drying beds, and eight infiltration basins. The WWTF has a permitted capacity of 900,000 gallons per day based on the maximum monthly demand.

This analysis considers constraints associated with developing a groundwater recharge program within the Nipomo Mesa Management Area (NMMA) involving recharge of the groundwater basin with recycled water from Southland WWTF.

Objective

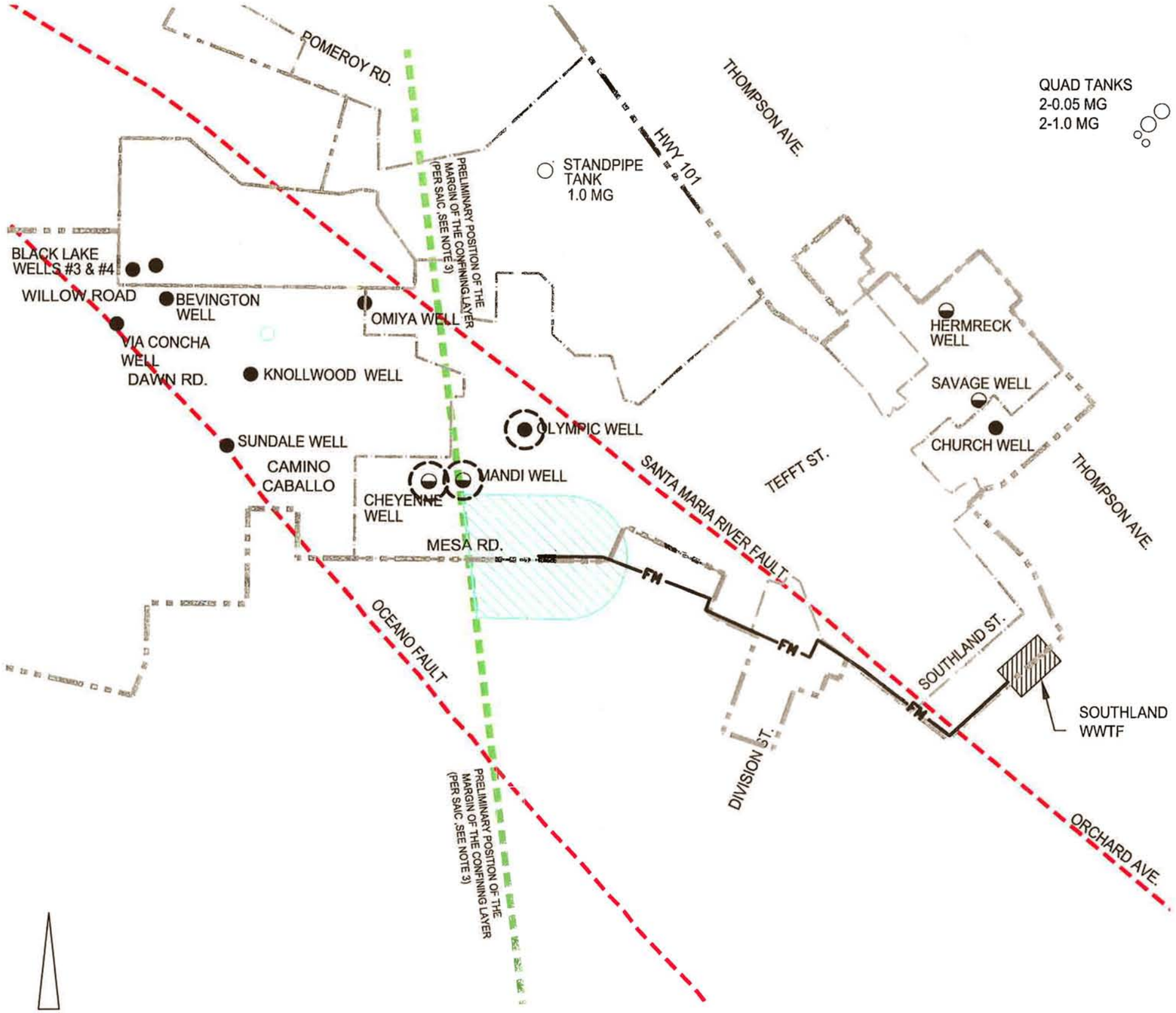
Groundwater recharge is proposed to provide a means to manage and help stabilize the groundwater basin within the subject area, and is not a true supplemental water supply alternative. The objectives of this alternative include:

- Stabilize and elevate existing groundwater pumping depressions; and
- Prolong useful life of existing NCSD wells.

Previous Studies/Documents

The following list summarizes the studies and documents referenced for this evaluation:

- Technical Memorandum, Yield of Aquifer Storage and Recovery (SAIC, June 2007)
- Southland Wastewater Treatment Facility Master Plan (Boyle Engineering, Draft February 2007)
- Task 25 – Screening Evaluation of Potential Recharge Locations of Treated Effluent (Garing Taylor & Associates, January 16, 2007)
- Groundwater in Storage Underneath the Nipomo Mesa Management Area As of April 2006, Draft Technical Memorandum (SAIC, October 11, 2006)
- Urban Water Management Plan 2005 Update (SAIC, January 2006)
- Phase V Stipulation of the Santa Maria Groundwater Litigation (June 30, 2005)
- Nipomo Mesa Groundwater Resource Capacity Study (SS Papadopulos, March 2004)
- Water Resources of the Arroyo Grande - Nipomo Mesa Area (DWR Southern District, 2002)
- Final Report: Evaluation of Water Supply Alternatives (Kennedy/Jenks, October 2001)



NOTES:

1. POTENTIAL GROUNDWATER RECHARGE LOCATIONS AND PIPELINE ALIGNMENTS ARE DERIVED FROM THE 2007 GTA EVALUATION OF POTENTIAL RECHARGE LOCATIONS.
2. PER SECTION 60320.010 OF CDHS GROUNDWATER RECHARGE REUSE DRAFT REGULATIONS (JAN. 4, 2007), RECYCLED WATER SHALL NOT BE EXTRACTED WITHIN 500 FEET OF ANY GRRP SURFACE SPREADING AREA.
3. POSSIBLE LOCATION OF EASTERN MARGIN OF POSSIBLE CONFINING LAYER.

LEGEND

- POTENTIAL GROUNDWATER RECHARGE LOCATION (SEE NOTE 1)
- NIPOMO CSD WELLS
- NIPOMO CSD WELLS (STANDBY)
- NIPOMO CSD TANKS
- FUTURE WATER SYSTEM SERVICE AREA BOUNDARY
- EXISTING WATER SYSTEM SERVICE AREA BOUNDARY
- APPROXIMATE FAULT LINE
- FM — RECYCLED WATER FORCE MAIN

DWG: W:\Nipomo CSD (19996)\19996.32 (Alternative Water Supply)\CAD\Design\Revised Figures and Plates\Figure 8-1_Groundwater Recharge.dwg USER: cromero
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BOYLE ENGINEERING CORPORATION

NIPOMO CSD EVALUATION OF SUPPLEMENTAL WATER ALTERNATIVES	BEC PROJECT NO.	FIGURE
GROUNDWATER RECHARGE OF RECYCLED WATER FROM SOUTHLAND WWTF	19996.32	8-1

- Evaluation of Alternative Water Supplies (Bookman-Edmonston, July 1994)

Supply

No Increase in "Supply":

The proposed groundwater recharge alternative is intended to function as a groundwater management program within the subject area of the NMMA. No increase in supply to the District would result because Southland WWTP discharge is assumed to be included in the groundwater budget that has been presented during litigation involving the Santa Maria and Nipomo aquifers. (i.e., WWTP groundwater recharge is already considered as "return flows" to the NMMA.)

As no new supplemental water will be imported from outside the NMMA, there will be no effect on the overall water balance within the NMMA. However, there may be some benefit to the specific study area, previously described as the depressed groundwater basin within the NMMA bounded by the Oceano and Santa Maria River Faults.

Quantity Available from Southland WWTF:

Average annual flow rates to the Southland WWTP are currently 0.59 MGD, equivalent to approximately 662 acre-feet per year (AFY). These flows are projected to increase to 1,460 AFY (1.3 MGD) in the year 2030. For the purpose of this analysis, it is assumed effluent flows, and therefore flows discharged to the infiltration basins, are equivalent to the existing and projected influent flows.

Hydrogeology:

Review of available data tends to indicate the presence of a low-permeability layer overlying the production aquifer in the western portion of the District. This evidence includes observations of three artesian wells located near the ocean (11N36W12C), anecdotal evidence that Santa Maria River surface flows beyond the Bonita School Road Crossing do not contribute to the underlying principal production aquifer, the existence of and morphology of Black Lake Canyon, and driller reports from District production wells. If additional data and subsequent investigations confirm the presence and extent of this confining layer, then suitable locations for percolation ponds would be limited to an area bounded by the confining layer to the west, Black Lake Canyon to the north, the bluffs to the south, and the Santa Maria River Fault to the east (SAIC, 2007). See Figure 8-1.

Quality

Implementation of this recharge alternative will need to consider and mitigate impacts to groundwater quality. Constituents of concern include salts and nitrogen.

Salt accumulation in the groundwater basin resulting from high dissolved solids in recharged effluent may pose a challenge for this alternative. Total Dissolved Solids (TDS) concentrations in the effluent vary between 980 and 1180 mg/l while TDS in NCSD drinking water is approximately 650 to 675 mg/l. Secondary Maximum Contaminant Levels for TDS are 500 mg/l.

Nitrogen in effluent is also a concern. Nitrate concentrations in District drinking water has averaged between 5.1 and 6.8 mg/l as nitrate during 2005 and 2006, while the Primary MCL for nitrate is 45 mg/l as nitrate, or 10 mg/l as nitrogen. Total Nitrogen in the effluent typically measures at 28-46 mg/l.

Treatment Requirements for Recycled Water from Southland WWTF:

The 2007 Draft Groundwater Recharge Reuse Regulations prepared by CDHS indicate recycled water used for groundwater recharge reuse projects (GRRP) must meet the definition of filtered, disinfected tertiary wastewater. Additionally, the median and maximum total coliform limits are the same as for disinfected tertiary wastewater for unrestricted urban use. The Draft regulations also set forth guidelines for maximum percentage of recycled water and maximum contaminant levels (MCLs) as well as other physical parameters.

It is assumed the requirements and criteria in the draft regulations would be implemented in this reuse project. Because the Southland WWTF currently only provides secondary treatment, treatment plant improvements will be required.

Reliability

Recycled water is considered a reliable water supply. However, its reliability as it pertains to groundwater recharge is contingent on the NCSD's ability to provide and maintain recycled water quality meeting the Draft Groundwater Recharge Reuse Regulations as well as taking additional necessary measures to mitigate salt accumulation in the groundwater basin.

The recharged groundwater will be extracted by existing or new NCSD wells. Therefore, the reliability of the return flows will be approximately the same as the existing groundwater supply. Therefore, its reliability may be hindered by drought conditions within the NMMA and any further development/expansion of the pumping depressions.

Required Facilities

The Southland WWTF Master Plan (Boyle 2007) identified 2 methods for recharge: (1) direct injection with groundwater wells and (2) surface spreading and percolation. The Master Plan indicated the latter option may be preferred because it would allow natural filtration of the percolated wastewater, allowing further biological and filtration treatment. Direct injection is often energy intensive, requiring high capital costs due to the requirement for RO treatment, may present public perception concerns, and may require an additional level of treatment to assure the public that contamination is not a significant risk. For the purposes of this analysis, it is assumed recharge will occur by surface spreading and percolation.

In order to utilize its treated wastewater discharge for groundwater recharge, it is expected the NCSD will upgrade its treatment to provide "Tertiary Recycled Water". This level of treatment will require oxidation, coagulation, filtration and disinfection (Boyle, 2007). The District will also need to provide a potable water source for diluting the recycled water, as required by the Draft CDHS Regulations. In order to convey the recycled water to the recharge facilities/ponds, the NCSD will also need to construct pumping and transmission pipeline facilities.

NCSD selection of recharge sites will need to satisfy the following minimum criteria:

(1) Soil conductivity must be such that percolation capacity is suitable for desired recharge rate
(2) Percolation ponds should be located where recharge will increase available water in aquifer (see Hydrogeology discussion above)
(3) Source of potable diluent water must be available
(4) Extraction shall not be within 500 feet of recharge facility

Based on a preliminary screening of undeveloped properties within the areas noted (GTA, 2007) the general location of the proposed facilities were selected, and are shown in Figure 8-1. As noted above, additional geological investigations will be required in order to determine the feasibility of recharge with recycled water, and to evaluate the suitability of any particular site for infiltration.

Project Components:

The following facilities will be required to implement this groundwater recharge alternative:

- Upgrades to Southland WWTF to provide disinfected tertiary recycled water, including filtration and disinfection;
- Transmission pipeline and/or connection(s) to existing potable water system to provide diluent water;
- Pumping and transmission pipeline facilities to convey recycled water to recharge facilities;
- Percolation ponds (15 acres would be sufficient to percolate 1,460 AFY, the flow rate projected for the Southland WWTP in 2030); and
- Upgrades to existing water pumping, treatment, and transmission facilities.

Implementation Schedule

It is estimated approximately 2 to 4 years will be required to fully implement this project.

Constraints

Institutional

Institutional constraints for the proposed project are identified as follows:

- Public perception with the *use* of recycled water for groundwater recharge may be a problem.
- Public perception may be a problem with regards to *locating* a percolation basin or combination percolation/stormwater detention adjacent to or within a residential development.

Legal

The Court would not consider the proposed groundwater recharge as newly "developed" or "salvaged" water because it is assumed to have been included in the groundwater budget presented during litigation, and thereby already counted as "return flows" to the NMMA.

Regulatory – Water Resources

In order to utilize its wastewater discharge for a groundwater recharge reuse project, the NCSD will need to upgrade its treatment facility. NCSD will also need to revise the Waste Discharge Requirements for Southland WWTF to allow reuse of plant effluent for groundwater recharge.

NCSD should conform to the 1994 CDHS Groundwater Recharge Reuse Draft Regulations for its Groundwater recharge reuse project (GRRP). In doing so, NCSD will be required to prepare and submit an engineering report for approval to CDHS and the RWQCB containing a comprehensive investigation and evaluation of the proposed GRRP and other required information and action plans. Following submission of this report, NCSD will be required to administer an industrial pretreatment and pollutant source control program. It is understood CDHS will conduct public hearings for the proposed GRRP prior to making recommendations to the RWQCB regarding permitting.

The construction of an expanded treatment system, pipelines, percolation basins, and pumping facilities will require permits from local and state agencies.

Cost

The probable cost of improvements is approximately $15 million and includes treatment, conveyance, and percolation facilities. These costs do not include land acquisition.. Amortizing this cost over 20 years and including approximately $30,000 to $40,000 in annual operational costs brings the total annual cost to between $1.4 million and $1.5 million. This alternative recycles between 596 and 1,683 AFY of treated wastewater, but may not produce any "new" return flows. The cost per acre-foot of treated and percolated water is $870 to $2,320, depending on the flow rate, plus the cost of land acquisition, if any.

Capacity

The implementation of this alternative will be constrained by the volume of water treated at Southland WWTP, currently equal to approximately 662 acre-feet per year (AFY), projected to increase to 1,460 AFY in the year 2030. Assuming 10% of the influent flow is lost to evaporation, the resulting recycle flows are 596 AFY rising to 1,341 AFY in the year 2030.