LAS VIRGENES - TRIUNFO
JOINT POWERS AUTHORITY
AGENDA
4232 Las Virgenes Road, Calabasas, CA 91302

CLOSING TIME FOR AGENDA IS 8:30 A.M. ON THE TUESDAY PRECEDING THE MEETING. GOVERNMENT CODE SECTION 54954.2 PROHIBITS TAKING ACTION ON ITEMS NOT ON POSTED AGENDA UNLESS AN EMERGENCY, AS DEFINED IN GOVERNMENT CODE SECTION 54956.5 EXISTS OR UNLESS OTHER REQUIREMENTS OF GOVERNMENT CODE SECTION 54954.2(B) ARE MET.

5:00 PM October 5, 2015

PLEDGE OF ALLEGIANCE

1. CALL TO ORDER AND ROLL CALL

2. APPROVAL OF AGENDA

3. PUBLIC COMMENTS

Members of the public may now address the Board of Directors **ON MATTERS NOT APPEARING ON THE AGENDA**, but within the jurisdiction of the Board. No action shall be taken on any matter not appearing on the agenda unless authorized by Subdivision (b) of Government Code Section 54954.2

4. CONSENT CALENDAR

A Minutes: Special JPA Meeting of September 1, 2015 Approve - **Pg. 3**

5. ILLUSTRATIVE AND/OR VERBAL PRESENTATION AGENDA ITEMS

A Recycled Water Seasonal Storage Plan of Action: Conveyance to Tillman Water Reclamation Plant and Possible Groundwater Replenishment - Pg. 9

6. ACTION ITEMS

A Tapia NPDES Permit Renewal: Proposal for Technical Assistance and Pilot Watershed Management Project - Pg. 50

Accept a proposal from and authorize the General Manager to execute a professional services agreement with Larry Walker Associates, in the amount of $97,489, to provide expert technical assistance for the renewal of the Tapia NPDES Permit utilizing a watershed-based nutrient management planning approach; and budget and appropriate $107,237 to fund the work.

B Time and Location of Regular JPA Board Meetings - Pg. 64

Pass, approve, and adopt Resolution No. 4, establishing the time and location for regular meetings.

RESOLUTION NO. 4

A RESOLUTION OF THE GOVERNING BODY OF THE LAS VIRGENES - TRIUNFO JOINT POWERS AUTHORITY ESTABLISHING THE TIME AND LOCATION FOR REGULAR MEETINGS

(Reference is hereby made to Resolution No. 4 on file in the JPA's Resolution Book and by this reference the same is incorporated herein.)

C Purchase of Dewatering Container and Ramp for Disposal of Grit and Rags - Pg. 66

Approve the purchase of a dewatering container and ramp from Wastequip, LLC in the amount of $27,956.26

D Consideration of a Board of Directors' Code of Conduct - Pg. 74

Review, comment and consider approval of the draft Board of Directors' Code of Conduct.

7. BOARD COMMENTS

8. ADMINISTERING AGENT/GENERAL MANAGER REPORT

9. FUTURE AGENDA ITEMS

10. INFORMATION ITEMS

A Wastewater Influent Flow Volume and Strength Trends: 2012 to 2015 - Pg. 77

B Annual Supply and Delivery of Polymer: Award - Pg. 82

11. PUBLIC COMMENTS

Members of the public may now address the Board of Directors **ON MATTERS NOT APPEARING ON THE AGENDA**, but within the jurisdiction of the Board. No action shall be taken on any matter not appearing on the agenda unless authorized by Subdivision (b) of Government Code Section 54954.2

12. CLOSED SESSION

A Conference with District Counsel – Existing Litigation (Government Code Section 54956.9(a)):

Las Virgenes - Triunfo Joint Powers Authority v. United States Environmental Protection Agency and Heal the Bay, Inc. v. Lisa P. Jackson

13. ADJOURNMENT

Pursuant to Section 202 of the Americans with Disabilities Act of 1990 (42 U.S.C. Sec. 12132), and applicable federal rules and regulations, requests for a disability-related modification or accommodation, including auxiliary aids or services, in order to attend or participate in a meeting, should be made to the Executive Assistant/Clerk of the Board in advance of the meeting to ensure availability of the requested service or accommodation. Notices, agendas, and public documents related to the Board meetings can be made available in appropriate alternative format upon request.

LAS VIRGENES – TRIUNFO
JOINT POWERS AUTHORITY
MINUTES

5:00 PM September 1, 2015

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance to the Flag was led by Chair James Wall.

1. CALL TO ORDER AND ROLL CALL

A Call to order and roll call

The meeting was called to order at **5:00 p.m.** by Chair James Wall in the Conference Room at the Oak Park Library at 899 N. Kanan Road, in Oak Park, California. Josie Guzman, Clerk of the Board, conducted the roll call.

Present: Director(s): Caspary, Lewitt, McReynolds, Orkney, Paule, Peterson, Polan, Renger and Wall

Absent: Director(s): Iceland (arrived at **5:28 p.m.**)

2. APPROVAL OF AGENDA

Administering Agent/General Manager David Pedersen stated that the Closed Session Item was not needed, and he asked that it be removed from the agenda.

Director Caspary moved to approve the agenda as amended. Motion seconded by Director Paule. Motion carried by the following vote:

AYES: Director(s): Caspary, Lewitt, McReynolds, Orkney, Paule, Peterson, Polan, Renger, Wall
NOES: Director(s): None
ABSENT: Director(s): Iceland

3. PUBLIC COMMENTS

None.

4. CONSENT CALENDAR

A Minutes: Regular JPA Meeting of August 3, 2015 Approve

Director Lewitt moved to approve the Minutes of the Regular JPA Meeting of August 3, 2015 as presented. Motion seconded by Director Polan. Motion carried by the following vote:

AYES: Director(s): Caspary, Lewitt, McReynolds, Paule, Peterson, Polan, Renger, Wall
NOES: Director(s): None
ABSTAIN: Director(s): Orkney
ABSENT: Director(s): Iceland

5. ILLUSTRATIVE AND/OR VERBAL PRESENTATION AGENDA ITEMS

None.

6. ACTION ITEMS

A Recycled Water Seasonal Storage: Basis of Design Report

Accept the proposal from MWH Global to prepare a Recycled Water Seasonal Storage Basis of Design Report and authorize the Administering Agent/General Manager to execute a professional services agreement with MWH Global, in the amount of $462,825, for the work; authorize the Administering Agenda/General Manager to execute Amendment No. 1 with RMC Water and Environment for the Woodland Hills Country Club Preliminary Design Report, in the amount of $52,820, to add a conceptual evaluation of seasonal storage at Encino Reservoir; and approve an additional budget and appropriation of $406,480 for CIP No. 10587 to fund the proposed studies.

Administering Agent/General Manager David Pedersen presented the report.

A discussion ensued regarding the NPDES permitting process and compliance with the Total Maximum Daily Load (TMDL) for Malibu Creek; exploring the possibility of obtaining Proposition 1 grant funds; receiving a presentation on the option for the Tillman Water Reclamation Plant; the goal to eliminate discharging to Malibu Creek; the possibility of bifurcating the planning studies; and whether the process would move more quickly if the planning studies were separated.

James Borchardt, representing MWH Global, stated that the two planning studies could proceed in parallel and his staff would move them along as quickly as possible. He also stated there would be no advantage in terms of the schedule by bifurcating the work. He noted that his staff would identify any fatal flaws with either of the alternatives, and they would not proceed with the full scope of work should a fatal flaw be identified.

The Board discussed concerns with indirect potable reuse without storage, and with building a large treatment facility that would be potentially idle for the majority of the year.

Director Iceland arrived at **5:28 p.m.**

A discussion ensued regarding the possibility of repurposing the Encino Reservoir for seasonal storage; proceeding initially with Scenario 5 to determine whether it contains any fatal flaws; and the possibility of moving forward with Scenarios 4 and 5 simultaneously to facilitate the NPDES permitting.

Director McReynolds moved to approve Item 6A. Motion seconded by Director Iceland.

Director Peterson suggested exploring the Tillman Water Reclamation Plant option and speaking with the City of Los Angeles regarding indirect potable reuse and storage opportunities.

Director McReynolds amended the motion to approve Item 6A, with the addition of having staff bring back a presentation for the Board to consider the Tillman Water Reclamation Plant as an option. Motion seconded by Director Renger. Motion carried unanimously.

B Purchase Dewatering Container and Ramp for Disposal of Grit and Rags

Approve the purchase of a dewatering container and ramp from Wastequip, LLC in the amount of $27,956.26.

Administering Agent/General Manager David Pedersen presented the report.

A discussion ensued regarding concerns with grit and rags becoming trapped in the mesh inside the dewatering container; exploring whether other agencies have used this type of dewatering container; considering alternatives such as a hydraulic lift; and the current process for the disposal of these materials.

It was the consensus of the Board to table this item to a future meeting to allow staff to explore whether other agencies use similar dewatering containers and ramps.

C Financial Review: Fourth Quarter of Fiscal year 2014-15

Receive and file the financial review for the fourth quarter of Fiscal Year 2014-15.

Director of Finance and Administration Don Patterson presented the report and responded to questions posed by the Board.

Director Peterson moved to receive and file Item 6C. Motion seconded by Director McReynolds. Motion carried unanimously.

7. BOARD COMMENTS

Director Orkney reported she attended the Recycled Water Fill Station training. She expressed concern with the training presentation because it could discourage customers' use, specifically the State's requirement for safe handling and permitted uses of recycled water. She inquired regarding the number of customers who have used the Recycled Water Fill Station. Administering Agent/General Manager David Pedersen responded that the Recycled Water Fill Station had been open for two weekends and approximately 10 customers picked up 280 gallons of recycled water. He noted that customers' enthusiasm is very high and staff would increase publicity. He also noted that the training presentation was reviewed and approved by several State agencies.

Director Paule reported he attended the California Association of Sanitation Agencies (CASA) Conference in San Diego. He noted that he serves on the CASA Program Committee and he asked the Board members to provide input for future conferences. Directors Peterson and Polan reported they also attended the CASA Conference.

8. ADMINISTERING AGENT/GENERAL MANAGER REPORT

Administering Agenda/General Manager David Pedersen reported he attended the CASA Conference. He commented that the session by The Freshwater Trust regarding water quality trading was a very interesting idea for regulatory compliance.

9. FUTURE AGENDA ITEMS

Director Peterson requested a future agenda item for consideration of adopting a Board of Directors' Code of Conduct.

10. INFORMATION ITEMS

A Tapia Channel Mixing Improvements Project: Change Order Nos. 1 and 2

B Flow Augmentation to Malibu Creek: Cost and Economic Impact

Director Polan acknowledged staff for providing the cost and economic impact for flow augmentation.

11. PUBLIC COMMENTS

None.

12. CLOSED SESSION (Item 12A was removed from agenda)

A Conference with District Counsel – Existing Litigation (Government Code Section 54956.9(a)):

Las Virgenes - Triunfo Joint Powers Authority v. United States Environmental Protection Agency and Heal the Bay, Inc. v. Lisa P. Jackson

13. ADJOURNMENT

Seeing no further business to come before the Board, the meeting was duly adjourned at **6:22 p.m**.

James Wall, Chair

ATTEST:

Glen Peterson, Vice Chair

INFORMATION ONLY

October 5, 2015 JPA Board Meeting

TO: JPA Board of Directors

FROM: Facilities & Operations

Subject: Recycled Water Seasonal Storage Plan of Action: Conveyance to Tillman Water Reclamation Plant and Possible Groundwater Replenishment

SUMMARY:

On September 1, 2015, the Board approved proposals from MWH Global and RMC Water and Environment to further investigate two scenarios for the Recycled Water Seasonal Storage Plan of Action: Scenario No. 4, use of the Las Virgenes Reservoir for indirect potable reuse, and Scenario No. 5, re-purposing of the Encino Reservoir for seasonal storage.

Staff met with Los Angeles Department of Water and Power (LADWP) executives to discuss Scenario No. 5. At the meeting, LADWP officials suggested exploring the possibility of conveying recycled water to the City's Donald C. Tillman Water Reclamation Plant (Tillman) for subsequent use as replenishment water for the San Fernando Basin. As a result, the scope of work for RMC Water and Environment includes an investigation of the key elements of this concept. The cost of the work will shared equally between the JPA and LADWP.

The Board expressed an interest in additional information on this opportunity and requested a follow-up discussion. This item is intended to facilitate the discussion, while recognizing that substantial additional work is required to evaluate the technical, institutional and financial details.

FISCAL IMPACT:

No

ITEM BUDGETED:

No

DISCUSSION:

Background:

LADWP is implementing its multi-faceted 2010 Urban Water Management Plan, including a near-term goal to develop 59,000 acre-feet per year (AF/Y) of recycled water by 2035 as a sustainable source of local water. The proposed uses include traditional non-potable reuse and up to 30,000 AF/Y of groundwater replenishment in the San Fernando Basin. The groundwater replenishment process would begin with treating recycled water at Tillman through both conventional and advanced water purification processes to produce water of near distilled quality, conveying it to regional spreading grounds for groundwater replenishment. It would take at least two years for the highly-treated water from the spreading grounds to reach LADWP's well fields for extraction, treatment and distribution.

The San Fernando Basin encompasses an area of 112,000 acres, and the City has an adjudicated right to pump approximately 87,000 AF/Y. However, contamination of the groundwater with chlorinated solvents has increasingly limited LADWP's ability to fully utilize the valuable resource. Given reductions in water deliveries from the Los Angeles Aqueduct, groundwater resources have become increasingly important to LADWP's water supply portfolio. As a result, LADWP is moving forward with a fast-tracked project to build a centralized groundwater treatment complex at a cost of $600 to $900 million to allow it to fully utilize its groundwater resources in the San Fernando Basin and enhance local supplies through groundwater recharge and stormwater capture.

Opportunity for JPA-LADWP Collaboration:

With excess recycled water available during certain times of the year, the JPA is well-positioned to collaborate with LADWP on its initiative to fully utilize its groundwater resources. In concept, the JPA would discharge excess recycled water into a City-owned sanitary sewer[1], or into a conveyance system from Encino Reservoir[2], to supplement the influent to Tillman. The additional supply of water to Tillman would then be treated via an advanced purification process and conveyed to regional spreading grounds for future extraction, treatment and distribution as potable water.

Potential Mutual Benefits to JPA and LADWP:

LADWP could benefit from such an arrangement by receiving additional source water for groundwater replenishment purposes. With plans in place to treat contaminated groundwater extracted from the San Fernando Basin, LADWP and LA Sanitation are increasingly focused on opportunities to divert more water to Tillman for treatment and subsequent groundwater recharge. Conveying excess JPA recycled water to Tillman would support this objective. The JPA and its customers could benefit through an unbalanced exchange agreement with LADWP. With such an agreement, the JPA would provide recycled water to LADWP and receive a fraction of the water back through an existing potable water interconnection during times of water shortage.

Unbalanced Exchange Concept:

An unbalanced exchange involves an agreement where water is exchanged, but less water is returned than was provided. For example and illustrative purposes only, a 2:1 unbalanced exchange would provide the JPA with one acre-foot of potable water for every two acre-feet of recycled water provided. The exchange is "unbalanced" to recognize that the benefits conferred to the two agencies are not necessarily equal.

Below is a table summarizing the maximum amount of water potentially available for conveyance to Tillman and the benefits that could be received under a theoretical 2:1 unbalanced exchange.

Available Tapia recycled water at build-out	13,600 AF/Y
Existing JPA recycled water demand	6,000 AF/Y
Future add'l JPA recycled water demand[3]	1,000 AF/Y
Water potentially available for replenishment	6,600 AF/Y

Considering a 2:1 unbalanced exchange and a maximum of 6,600 AF/Y of recycled water conveyed to Tillman for subsequent groundwater replenishment, up to 3,300 AF/Y of water could theoretically be stored in the San Fernando Basin on behalf of the JPA to be called upon during times of shortage[4]. LVMWD and LADWP have an existing interconnection (Kittridge), as does LVMWD and Oak Park Water Service (Kanan), which would allow for potable water to be returned. After one year of storage, approximately 2,330 AF would be available to LVMWD and 970 AF to Triunfo Sanitation District.

Conclusion:

The proposal to convey excess JPA recycled water to Tillman for subsequent groundwater recharge merits further investigation and appears to offer mutual benefits to the JPA and LADWP. However, many unknowns remain and the concept requires substantial additional investigation and discussion with the key partners. Also, it is likely that this approach, if successful, would compliment rather than eliminate the need for Scenario Nos. 4 or 5 as described in the Recycled Water Seasonal Storage Plan of Action.

At this time, only very preliminary high-level discussions have occurred with LADWP officials. However, LADWP has agreed to jointly fund the initial investigation to be performed by RMC Water and Environment. LA Sanitation would need to be engaged in the process and support the approach. Also, staff would need to discuss the proposal with Calleguas Municipal Water District to determine its role, as the regional water supplier for eastern Ventura County, in a possible unbalanced exchange.

Staff will continue to explore this opportunity and report back to the Board with additional information as it

become available. Attached for reference is a fact sheet on groundwater in the LADWP's service area and the executive summary of City's Groundwater Replenishment Master Planning Report.

---

[1] The nearest large diameter City-owned sewer is a 48-inch pipeline at Topanga Canyon Boulevard and Vanoween Street.

[2] The use of Encino Reservoir will allow recycled water to be pumped back to the JPA's service area, eliminating the need for potable supplement.

[3] Assumes 900 AF/Y for three golf courses in LADWP's service area and 100 AF/Y of growth in the JPA's service area.

[4] Depending on the terms of an unbalanced exchange agreement, more or less water maybe available based on banking.

Prepared By: David R. Lippman, P.E., Director of Facilities and Operations

ATTACHMENTS:

Groundwater Fact Sheet: Groundwater - A Vital Water Resource for Los Angeles

City's Groundwater Replenishment Master Planning Report

GROUNDWATER: A VITAL WATER RESOURCE FOR LOS ANGELES

June 2012

Background

The City of Los Angeles (City) encompasses an area of 465 square miles with a population of over four million residents and an annual average water consumption of approximately 660,000 acre-feet (AF), or 215 billion gallons. Local groundwater provides approximately 11% of the total water supply for Los Angeles, and has provided up to 30% of the total supply in drought years.

The City owns water rights in three Upper Los Angeles River Area (ULARA) groundwater basins -- San Fernando, Sylmar, and Eagle Rock -- and in the Central and West Coast Basins. On average, about 86% of the City's groundwater supply is extracted from the ULARA groundwater basins, while the Central Basin provides 14%.

San Fernando Basin

The San Fernando Basin (SFB) is the largest of the three basins and encompasses an area of 112,000 acres. The City has an adjudicated right to pump approximately 87,000 AF per year. Unfortunately, contamination has increasingly limited LADWP's ability to fully utilize this valuable resource.

History of SFB Groundwater Contamination

Chlorinated solvents, including trichloroethylene (TCE) and tetrachloroethylene (PCE), were widely used in the United States starting in the 1940s for dry cleaning and for degreasing machinery. Disposal was not well regulated at that time. In the 1980s, TCE was consistently detected in SFB production wells at concentrations greater than the maximum contaminant level (MCL) for drinking water (See Figure 1). The development of the interim groundwater treatment facility known as the North Hollywood Operable Unit (NHOU) began in 1984. In 1986, the U.S. Environmental Protection Agency (USEPA) established four National Priority List sites in the San Fernando Valley under the federal Superfund Program. The USEPA identified several potentially responsible parties (PRPs) that have contributed to the NHOU funding through Consent Decrees. More investigation is necessary to determine the full extent of the contamination and the responsible parties. The USEPA, along with several local regulatory agencies and in cooperation with LADWP, has been pursuing a clean-up remedy of the soils and groundwater in the vicinity of the most severely contaminated part of the SFB. This remedy would contain the worst part of the contaminant plume, but would not address lower-level contamination impacting several water supply production wells.

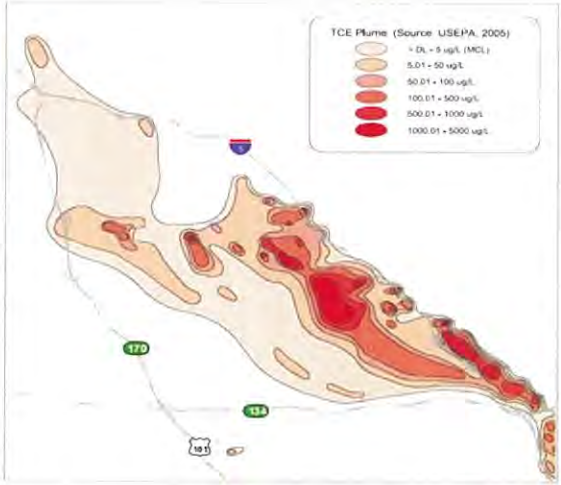


Figure 1: TCE Plume in the SFB

LADWP Wellfield

LADWP has eight major wellfields within the SFB. These are: Tujunga, Rinaldi-Toluca, NHOU, North Hollywood, Erwin, Whitnall, Verdugo, and Pollock. These wells were installed over a period spanning from 1924 to 1991, with the most recent installations being the Rinaldi-Toluca Wellfield in 1988, and the Tujunga Wellfield in 1991. Collectively, these eight wellfields have the ability to pump and serve approximately 650 AF of water per day, with the Rinaldi-Toluca and Tujunga wells providing about 65% of this total, or 420 AF per day.

To date, 50% of LADWP's wells have been inactivated due to contamination. Additionally, the remaining active wells are not operated at their full capabilities due to the regional contamination issues that affect all of LADWP's wells. This constraint significantly reduces LADWP's flexibility in managing its groundwater resources within the SFB.

Well Contamination Summary

Of the 115 wells LADWP has in the SFB, 57 of them have been removed from service due to contamination, resulting in a loss of approximately 500 AF per day or 45% of LADWP's total pumping capacity. The remaining 58 active wells have a pumping capacity of approximately 600 AF per day, but 45 of these wells have recorded contaminant concentrations above the corresponding MCLs. Most notable among these contaminants of concern are the volatile organic compounds (VOCs) TCE, PCE, and carbon tetrachloride; chromium; nitrate; and perchlorate. The remaining 13 wells have recorded marginal levels of contamination, mostly VOCs.

LADWP Strategy and Goals

The main goal of LADWP is to restore its pumping capacity to historical levels, and alleviate the need to depend on costly, potentially unreliable, and, in some cases, dwindling imported water supplies. LADWP is looking for a long-term, regional, comprehensive solution to addressing the SFB contamination in order to maintain operational flexibility, reliability, and re-establish the

ability to store and pump its full adjudicated water rights from the SFB, along with any stored water credits.

In order to accomplish these goals on a regional basis, there is the need to investigate and characterize the contamination for a significant portion of the SFB areas in a timely and expedited fashion, and a need to investigate and identify PRPs in cleanup orders. LADWP is currently leading a list of projects to cleanup the SFB and to allow the City to fully utilize this valuable water supply resource.

Existing and Ongoing Projects

NHOU: Constructed in 1989, the 2,000 gallons per minute (gpm) plant was designed to achieve VOC plume containment and reduction of VOC contaminant mass using groundwater extraction wells, air stripping, vapor-phase granular activated carbon (GAC) treatment and chlorination station. NHOU's inability to fully contain the groundwater plume, and the discovery of new contaminants, such as chromium and 1,4-dioxane, necessitates the design and implementation of a new remedy- referred to as NHOU Second Interim Remedy (NHOU IR2). In September 2009, USEPA issued its Record of Decision for the NHOU IR2. To increase the effectiveness of plume containment and contaminant removal, the plan is to deepen several of the existing NHOU extraction wells, construct new wells and a treatment facility that will treat VOCs, chromium, 1,4-dioxane and other contaminants of concern.

Tujunga Demonstration Project: LADWP developed a joint project with the Metropolitan Water District of Southern California to constructing a liquid-phase GAC treatment plant at each of two wells (Tujunga Well #6 and #7) with the highest VOC concentrations, primarily TCE, PCE, CTC, and 1,1-DEC. The treatment of these two wells also allowed increased pumping of other production wells within the Tujunga Wellfield. The Plants have been in operation since May 2010 and has a designed capacity of 8,000 gpm (See Figure 2).

Figure 2: GAC Vessels at Tujunga Wellfield

The Pollock Wells Treatment Plant: This plant was developed by LADWP to restore the two Pollock wells and to contain and remove contamination, primarily TCE and PCE, from SFB groundwater. The plant consists of liquid-phase GAC treatment, chlorination stations, and booster pumping station to provide up to 3,000 gpm of high-quality water (See Figure 3).

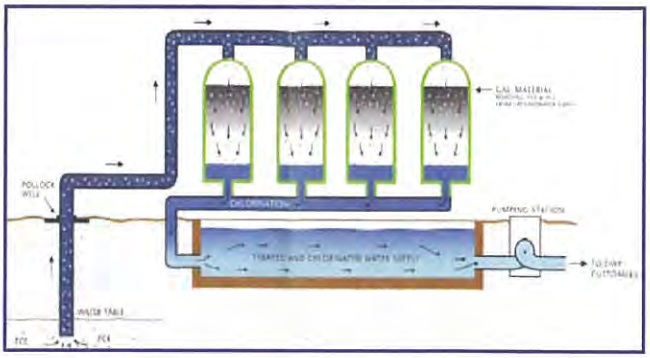


Figure 3: Treatment Process at Pollock Wellfield

Groundwater System Improvement Study (GSIS): In 2009, LADWP initiated a 6-year, $24 million comprehensive analysis by independent experts that will provide recommendations and assistance in developing short- and long-term projects, including the design and construction of a groundwater treatment complex (described below), to maximize the use of the groundwater supply in the SFB, which is of growing importance to Los Angeles as imported water supplies become increasingly contended and limited. As a part of the GSIS, the LADWP will be drilling approximately 26 new groundwater monitoring wells, and perform short-term monitoring of the existing and new groundwater wells, in order to obtain supplemental water quality data necessary for planning the groundwater treatment projects in the SFB. The drilling of the new monitoring wells was initiated in April 2012.

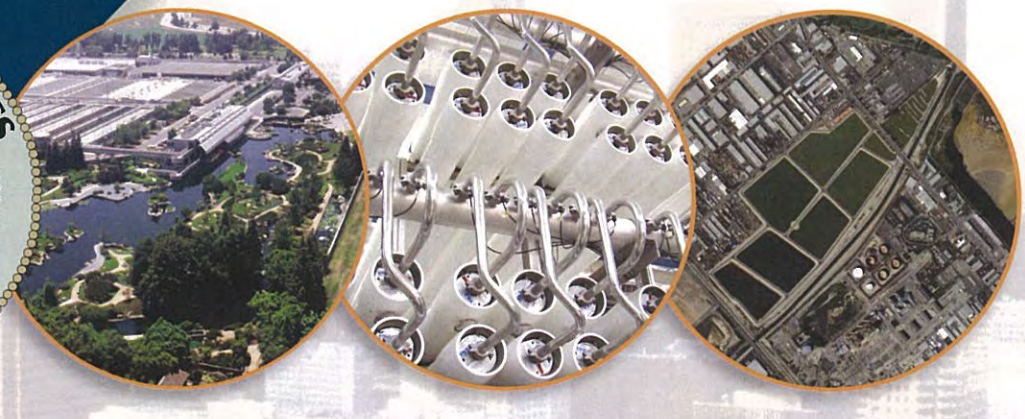
Future Projects

Groundwater Treatment Complex: In response to the critical water supply picture in the region, LADWP is initiating a fast-tracked and ambitious undertaking to restore its lost groundwater production. This undertaking will enable LADWP to safely manage and extract water from existing wellfields and future groundwater recharge efforts. The future groundwater treatment complex in the SFB will include centralized and localized treatment facilities in the vicinity of LADWP's North Hollywood, Rinaldi-Toluca and Tujunga Wellfield. The $600 to $900 million groundwater treatment complex will greatly reduce LADWP's reliance on costly and diminishing imported water supplies, and will compliment LADWP's strategies for securing the City's future water supply through sustainable means. The groundwater treatment complex will also enable LADWP to fully utilize its activities to enhance local supplies through groundwater recharge and stormwater projects.

City of Los Angeles

Recycled Water Master Planning

Los Angeles Department of Water and Power
and
Department of Public Works



Groundwater Replenishment Master Planning Report

Prepared by:

RMC in association with CDM Smith

Volume 1 of 3: Report
March 2012

City of Los Angeles
Recycled Water Master Planning

Groundwater Replenishment Master Planning Report

Prepared by:

RMC in association with CDM Smith

March 2012

REGISTERED PROFESSIONAL ENGINEER
JENNIFER KRISTINE THOMPSON
No. C64820
Exp. 6/30/13
CIVIL
STATE OF CALIFORNIA

LA DWP

CITY OF LOS ANGELES
SANITATION
DEPARTMENT OF
PUBLIC WORKS

Title:	Groundwater Replenishment Master Planning Report
Prepared For:	John Hinds, Project Manager, LADWP Doug Walters, Project Manager, BOS Eloy Perez, Task 1 Co-Lead, LADWP Hiddo Netto, Task 1 Co-Lead, BOS
Prepared by:	Jennifer Thompson, Task 1 Lead, CDM Smith Evelyn You, Task 1 Project Engineer, CDM Smith Heather Boyle VanMeter, Deputy Project Manager, CDM Smith Chuen-Shiow Chen, CDM Smith Arthur Goh, CDM Smith Brian Heywood, CDM Smith Meha Patel, CDM Smith Arlene Post, CDM Smith Dan Rodrigo, CDM Smith Don Schroeder, CDM Smith Jorge Toscano, CDM Smith Greg Wetterau, CDM Smith Jeff Woon, CDM Smith Rob Morrow, RMC Danilo Bautista, Dean Ryan Consultants & Designers, Inc. Chris Harris, Harris & Company Margie Nellor, Nellor Environmental Associates, Inc.
Reviewed by:	Tom Richardson, Project Manager, RMC R. Bruce Chalmers, CDM Smith Don Vandertulip, CDM Smith Greg Bradshaw, RMC
Contributors:	James Yannotta, LADWP Paul Liu, LADWP John Hinds, LADWP Evelyn Cortez-Davis, LADWP Eloy Perez, LADWP Todd Rother, LADWP Serge Haddad, LADWP Mark Adrian, LADWP Hadi Jonny, LADWP Ken Redd, BOE Michael Sarullo, BOE Al Bazzi, BOE Ali Poosti, BOS Doug Walters, BOS Hiddo Netto, BOS Michael Bell, BOS
Date:	March 2012
Reference:	Task 1b Groundwater Replenishment Master Planning Report Subtask 1.10 GWR Master Planning Report Development (Project Scope of Work Document)

Executive Summary

The Los Angeles Department of Water and Power (LADWP), in partnership with the Los Angeles Department of Public Works (LADPW) Bureau of Sanitation (BOS) and Bureau of Engineering (BOE), developed the Recycled Water Master Planning (RWMP) documents. Specifically, the RWMP process identified projects that will significantly increase the City's recycled water use locally. Recycling more water within the Los Angeles metropolitan area provides a number of benefits. For each acre-foot of recycled water used, an equal amount of imported water is saved. As a local source of water, recycled water is more reliable than imported water and is drought-resistant.

Since the early 1900s, Los Angeles has tapped into a variety of water sources. Today, the City's water comes from Northern California (California Aqueduct); Owens Valley and Mono Lake Basin (Los Angeles Aqueduct); Colorado River (Colorado River Aqueduct); and several local water sources including groundwater aquifers, stormwater capture, and recycled water. But securing water from distant sources has become more restricted and unreliable. LADWP's 2010 Urban Water Management Plan (UWMP) outlines a goal of increasing recycled water to 59,000 acre feet per year (AFY) by 2035 to reduce dependence on imported water.

The RWMP documents include an evaluation of alternatives – strategies that take into account forward-looking groundwater replenishment (GWR) options as well as the more familiar from of recycling water for non-potable reuse (NPR) purposes, such as for irrigation and industry. This GWR Master Planning Report is one element of the RWMP documents. It is a thorough examination of the facilities that are needed to purify recycled water from the Donald C. Tillman Water Reclamation Plant (DCTWRP) and replenish groundwater in the San Fernando Groundwater Basin (SFB).

The results of this analysis will be combined with findings and recommendations of several other technical studies being completed for the RWMP effort. When implemented, the RWMP will provide project alternatives to deliver 59,000 AFY of recycled water in the near-term to offset imported water and potential implementation strategies for long-term concept projects.

ES.1 Introduction

LADWP is implementing its multi-faceted 2010 UWMP to ensure a safe and reliable water supply for future generations of Angelenos. This is a blueprint for the City's water future, and many elements go into such an important plan, such as the RWMP effort.

Figure ES-1 summarizes the City of Los Angeles' RWMP Initiative, which is guiding the development of recycled water planning for the near-term and long-term. The 2010 UWMP includes a near-term goal to develop 59,000 AFY of recycled water by 2035 as a sustainable source of local water. Of this amount, approximately 8,000 AFY is currently used for NPR and for barrier supplement in the Dominguez Gap Barrier. An additional 11,350 AFY of NPR projects are in development. The focus for the near-term is to develop the remaining 39,650 AFY (30,000 AFY from GWR and 9,650 AFY from NPR) of recycled water in Los Angeles to offset 59,000 AFY of imported water. The focus of the long-term is to offset imported water to the extent possible (up to 168,000 AFY) by 2085, fifty years after 2035.

Figure ES-1: Overview of RWMP Components

[1]*Goals are cumulative.*

[2]*Additional Barrier Supplement does not offset imported water in the City of Los Angeles and, moving forward, does not count toward the goal of 59,000 AFY.*

Purpose of this GWR Master Planning Report

GWR is a practical, proven way to increase the amount of water Los Angeles can get from a safe, reliable, locally-controlled water supply. The RWMP planning team has developed options and analyzed the science, technology, and regulatory arena to support the pursuit of using purified recycled water to replenish Los Angeles' groundwater basins – one significant, local source of the city's drinking water supply. The purpose of this study is to develop the GWR project components (e.g., treatment, conveyance, etc.) to a facilities planning level. Facilities planning is completed prior to starting the technical design, environmental assessment, and permitting processes.

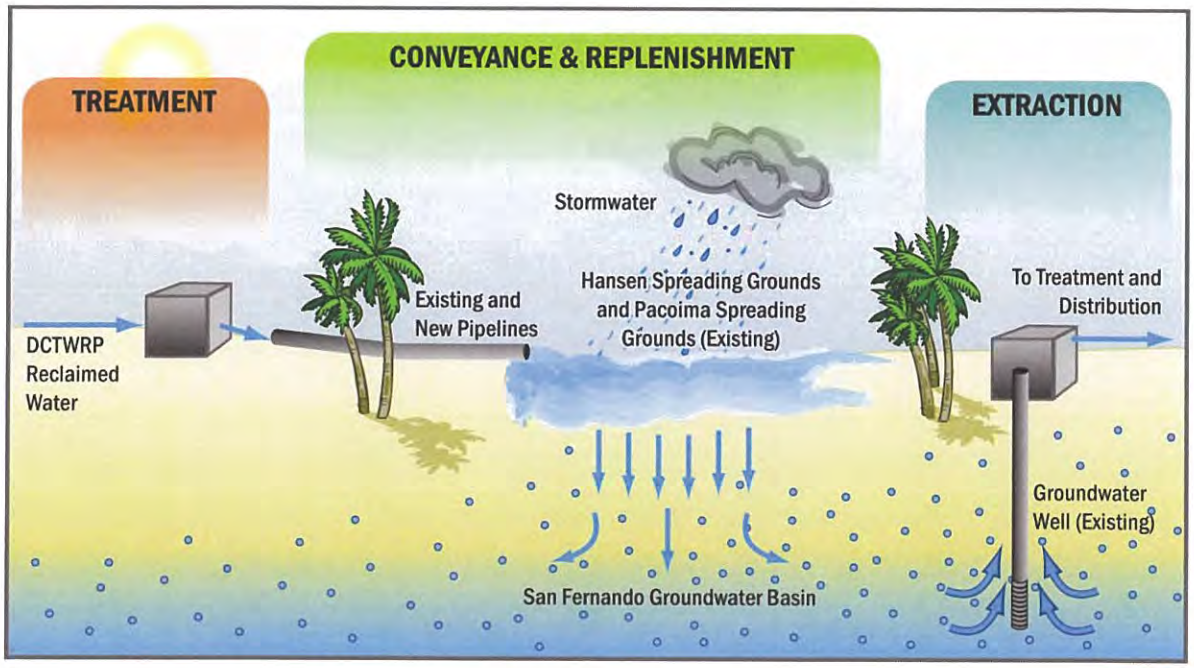
This study builds the GWR strategy around two City assets:

1. Water rights and existing facilities to add and extract water from the SFB in the San Fernando Valley.
2. Ownership and operation of the nearby DCTWRP.

Figure ES-2 below illustrates established GWR processes that begin with treating recycled water using advanced water purification (AWP) processes to near-distilled quality, conveying the water to spreading grounds, and allowing that water to percolate into natural underground aquifers to replenish the groundwater basin. It will take at least two years for water released into spreading basins to reach the well field for extraction.

The RWMP process relied on the August 2008 draft California Department of Public Health (CDPH) groundwater regulations. In late 2011, after the initial drafting of this report, CDPH released a new draft of its groundwater recharge regulations, which are currently being revised and are anticipated to be finalized by the end of 2013. The City will continue to evaluate the GWR project design with the evolving groundwater recharge regulations.

Figure ES-2: GWR Concept



Recycled Water Master Planning Approach

The RWMP multi-year planning process has focused on four major steps:

- Perform basic research and develop planning objectives;
- Formulate alternatives, based upon the research and objectives;
- Evaluate alternatives; and,
- Develop viable projects and opportunities.

Through the Recycled Water Advisory Group (RWAG), stakeholders have been involved in discussions with the recycled water planning team since late 2009. Their input has been folded into each of these major steps, resulting in viable projects and opportunities that include insights and interests of a very diverse cross-section of the Los Angeles community. **Figure ES-3** illustrates the main master planning steps and timeline.

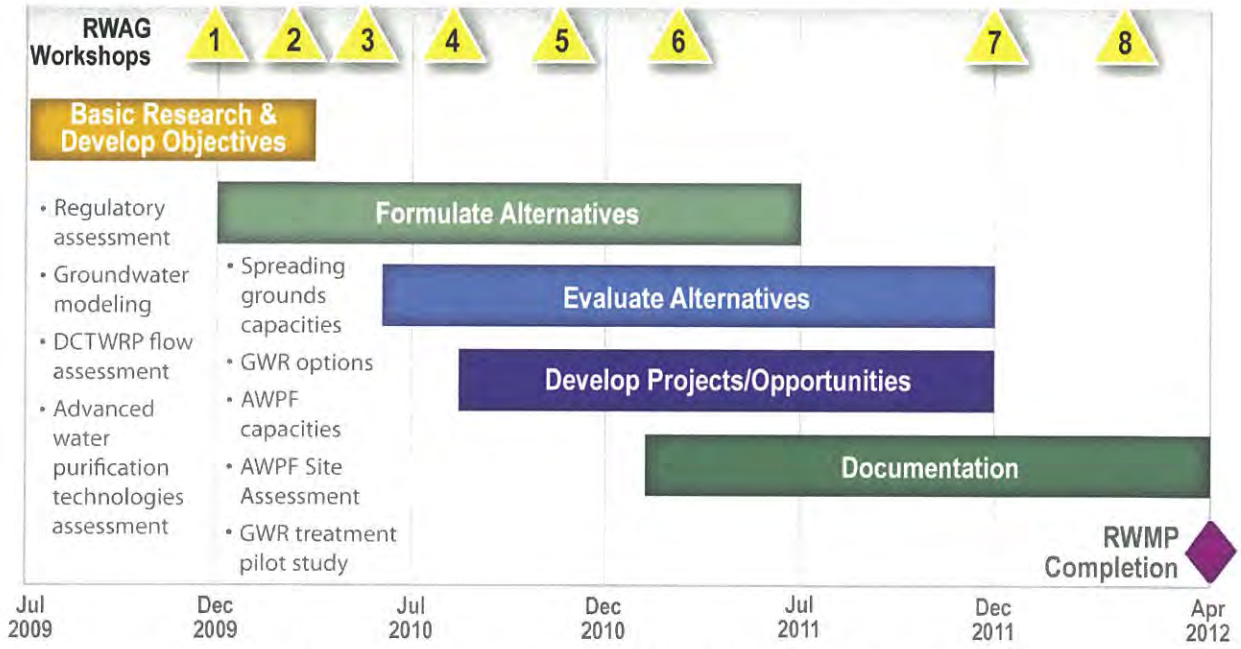


Figure ES-3: Recycled Water Master Planning Approach

Organization of the GWR Master Planning Report

The organization of the **GWR Master Planning Report** is as follows:

- Section 1 – Introduction
- Section 2 – Public Outreach
- Section 3 – Planning Parameters
- Section 4 – GWR Treatment Pilot Study
- Section 5 – Advanced Water Purification Facility
- Section 6 – Site Improvements at DCTWRP
- Section 7 – Conveyance and Replenishment Facilities
- Section 8 – Design Standards and Criteria
- Section 9 – Regulatory Requirements and Considerations
- Section 10 – Implementation Strategy
- Section 11 – Opinion of Probable Costs and Financial Analysis
- Appendices, including an evaluation of post-treatment options, additional information on the opinion of probable costs, and technical memoranda (TMs) that were completed as part of the GWR master planning effort.

ES.2 Public Outreach

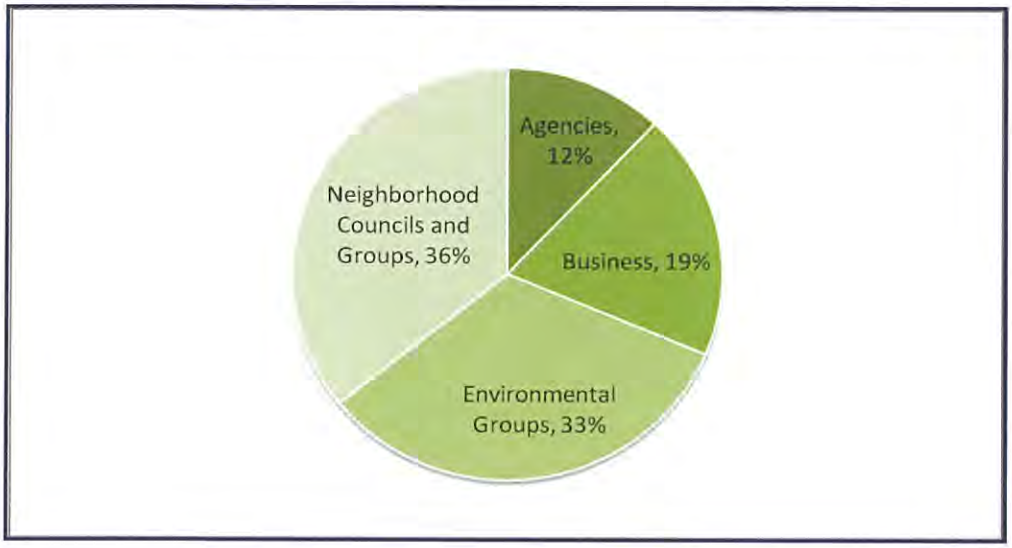
The City has been conducting an ambitious outreach program that is closely linked with RWMP activities, milestones, and decision points.

The objectives of that public outreach are:

- Build trust and confidence in the City and its departments as a provider of high-quality, safe, and reliable water;
- Achieve public understanding of recycled water and GWR as safe, beneficial sources of water;
- Receive knowledge and open stakeholder input to the RWMP documents;
- Be transparent in information sharing and inclusion; and,
- Support the media with responsive, accurate, and timely information.

The GWR master planning process has included presenting to and receiving feedback from the Recycled Water Advisory Group (RWAG). This group of highly interested stakeholders was formed to provide input and ideas related to increasing the amount of recycled water beneficially used in Los Angeles. The group has attended a series of half-day workshops, facility tours, and update sessions; listened to concepts and studies that are part of the RWMP process; and provided insightful feedback. RWAG members reflect a wide diversity of interests and are extremely well informed about recycled water and related issues. **Figure ES-4** shows participation in RWAG by category of interests. The City has reached out to many groups citywide. Additional outreach activities include briefings for City Council and other elected officials; one-on-one briefings with key stakeholders; presentations to Neighborhood Councils; presentations to Community Organizations, NGOs, Businesses, Recycled Water Forums throughout the city, and Urban Water Management Plan Workshops; informing LADWP/BOS employees; formation of an Independent Advisory Panel (IAP); gathering letters of support; and maintaining a stakeholder database.

Figure ES-4: RWAG Participants Represent Diverse Interests



ES.3 Planning Parameters

Planning parameters are essential for comparing concepts and alternatives. Planning parameters are often distinguishing characteristics or functions. Planning parameters include objectives, GWR goals, implementation phases, spreading grounds, and advanced water purification facility (AWPF) site selection, sizing, and influent water quality.

Planning Principles and Objectives

At the onset of the RWMP process in 2008, a number of guiding principles were established that shaped the alternatives considered for the GWR project. These principles included protection of public health and water quality, attainment of recycled water goals, compliance with regulatory frameworks, cost-effectiveness of the project, and engagement of stakeholders. Some very specific principles were identified in the City's May 2008 Water Supply Action Plan. The Plan called for the use of advanced treatment for recycled water used to replenish groundwater and a groundwater replenishment benchmark of 15,000 AFY. Subsequent to initiating the recycled water master planning process, the LADWP adopted the 2010 UWMP, which incorporated recycled water as a key water supply strategy for Los Angeles and superseded the 2008 Water Supply Action Plan. The 2010 UWMP now serves as the City's guiding document for expanding the recycled water program, including groundwater replenishment. The UWMP reflects realities of funding limitations that were not addressed in the 2008 Water Supply Action Plan document. Water rate increases are required to achieve even the revised projections in the UWMP.

In November 2011, as the planning process was nearing completion, the CDPH released a new draft of its groundwater recharge regulations. Although the groundwater recharge regulations will not be final until at least the end of 2013, the revised draft appears to provide flexibility for GWR projects that may allow the City to consider other alternatives that could reduce project costs, primarily through recognition of the proven role that natural systems play in the water purification process. These potential regulatory changes and the potential for other alternatives appear to be consistent with input provided to the City by the IAP. As the CDPH regulatory process evolves, the City will continue to evaluate opportunities to reduce project costs while developing the GWR project design within its guiding principles. Any new alternatives will also take into consideration the scope, timing, and implementation of the San Fernando Basin Groundwater Treatment Complex, a project that will focus on the treatment of legacy groundwater contamination in the San Fernando Groundwater Basin (SFB). At this time, it is anticipated that the construction of the GWR Project will proceed when the implementation of the San Fernando Basin Groundwater Treatment Complex moves forward.

In addition to these planning principles, planning objectives were also developed. Two threshold objectives were established, which had to be met regardless of the alternative:

- **Threshold Objective 1** – Meet all water quality regulations and health and safety requirements, and use proven technologies.
- **Threshold Objective 2** – Provide effective communication and education about the recycled water program.

In addition to the threshold objectives, six additional recycled water planning objectives were established, which include:

- **Objective 1 –** Promote Cost Efficiency
- **Objective 2 –** Achieve Supply and Operational Goals
- **Objective 3 –** Protect Environment
- **Objective 4 –** Maximize Implementation
- **Objective 5 –** Promote Economic and Social Benefits
- **Objective 6 –** Maximize Adaptability and Reliability

Planning Year and GWR Goals

An integrated alternatives analysis was completed to determine the balance between GWR and NPR to meet the City's recycled water goal of 59,000 AFY by 2035. The analysis compared alternatives that comprised different combinations of GWR and NPR, as shown in **Figure ES-5**. The planning objectives listed above were used to evaluate the alternatives.

Figure ES-5: Integrated Alternatives to Reach 50,000 AFY and 59,000 AFY[1]

Note:

1) The original recycled water goal for the RWMP was 50,000 AFY by 2019, which was established before the completion of the 2010 UWMP. The recycled water goal was revised to 59,000 AFY by 2035 with the issuance of the 2010 UWMP. The UWMP reflects realities of funding limitations that were not addressed in the 2008 Water Supply Action Plan. Water rate increases are required to achieve even the revised projections in the UWMP. The integrated alternatives analysis was originally focused on determining the balance of GWR and NPR to achieve 30,650 AFY so that when combined with the

19,350 AFY of existing and planned NPR demands would achieve an overall recycled water goal of 50,000 AFY.

The integrated alternatives analysis concluded that more GWR (Alternative 3) is most beneficial, since this alternative performs better than alternatives with less GWR in terms of capital costs and project implementation. Therefore, this GWR Master Planning Report is based on achieving a GWR goal of 30,000 AFY – the maximum amount of GWR that can be served by DCTWRP and the most conservative project size from a planning perspective. As shown in **Figure ES-5**, when combined with 30,000 GWR, 9,650 AFY of NPR projects are needed so that when added to the 19,350 AFY of existing and planned NPR demands the City will achieve the overall goal of 59,000 AFY by 2035.

To allow for the most flexibility for implementation, the NPR Master Planning Report identifies over 18,000 AFY of potential NPR projects. NPR projects that are most feasible considering cost and other important criteria will be the ones pursued.

The City relies on a mix of GWR and NPR projects to meet its goals, and has the flexibility to adjust the amount of GWR eventually implemented. As the recycled water program develops, the City can revisit the multi-criteria comparison of GWR and NPR to determine whether the GWR project should be expanded by an additional 15,000 AFY or less. If Phase 2 is less than 15,000 AFY, then more NPR projects would be implemented to achieve the goal of 59,000 AFY by 2035.

GWR Project Implementation Phases

The GWR project will be implemented in two phases. The implementation phases are shown in **Table ES-1** below.

Table ES-1: GWR Projects Implementation Schedule

GWR Project Phases	Imported Water Offset	Target Year
GWR Project – Phase 1	15,000 AFY	FY 2022 (In service by July 2022)
GWR Project – Phase 2	Up to 30,000 AFY [1]	FY 2035 (In service by July 2035)

Notes:
1) Due to limited flow from the DCTWRP and spreading grounds availability, 30,000 AFY of GWR may not be achievable unless groundwater injection wells are considered.

AWPF Site Selection

Another key planning parameter was selecting a preferred potential location for the AWPF. A separate study was done by the RWMP planning team to identify and evaluate several potential sites. From that process, five viable candidate sites were identified. These sites are located at the City's DCTWRP and Valley Generating Station (VGS). These sites were evaluated in more detail and based on this analysis; the City selected Site 2, DCTWRP Southwest, as the staff-preferred location for the GWR master planning and environmental documentation. The other four viable sites will be carried forward into environmental documentation. **Figures ES-6 and ES-7** are aerial photos of the City's DCTWRP and VGS with

the five most viable candidate sites overlaid. **Table ES-2** shows some of the critical criteria used to evaluate the five sites.

Figure ES-6: AWPF Candidate Sites at or Near DCTWRP

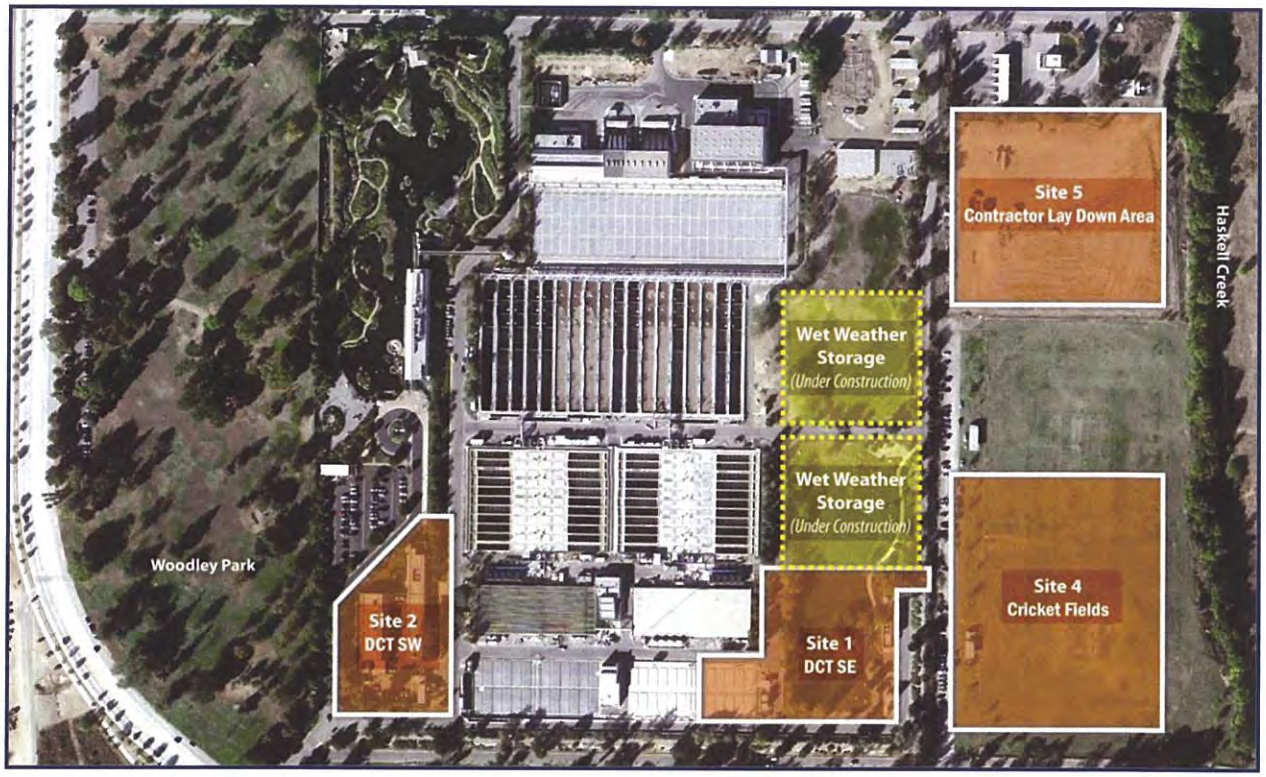


Figure ES-7: AWPF Candidate Site at VGS

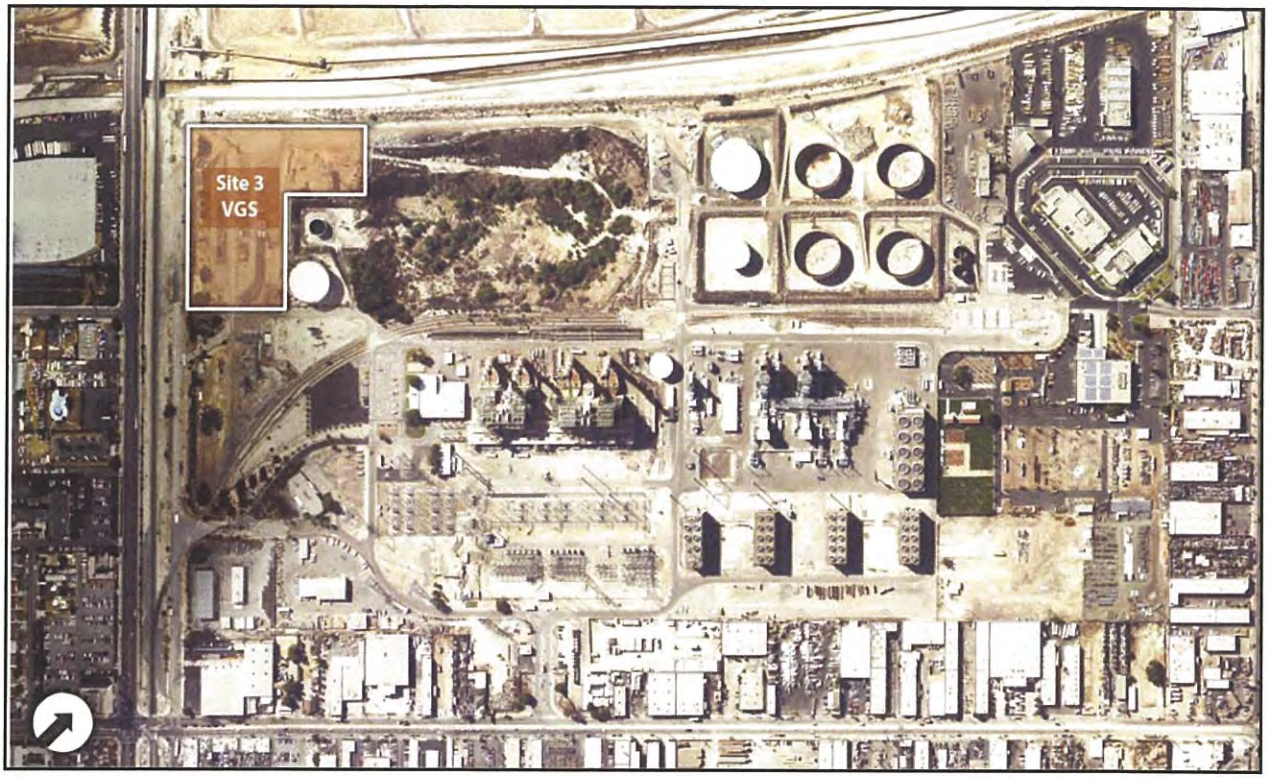


Table ES-2: Critical Criteria for Evaluation of Five Candidate Sites

Critical Criteria	Site 1 DCTWRP SE	Site 2 DCTWRP SW	Site 3 VGS	Site 4 Cricket Fields	Site 5 Contractor Lay Down Area
Bureau of Sanitation (BOS) already has related facilities and staffing at the site to support the operation of the AWPF for GWR. Although new facilities will be built for GWR, there are benefits and economies of operation having new facilities alongside existing operational facilities and staff.	√	√		√	√
Site is within the boundaries of the existing berm or outside of the Sepulveda Flood Control Basin.	√	√	√		
Site is not in an area of potential future expansion to the existing treatment processes for producing tertiary treated effluent at DCTWRP.		√	√		

✓ = Site meets criterion.

DCTWRP Flows, Other Demands for Recycled Water and AWPF Capacity

Another key planning parameter was the amount of water that could be treated in the AWPF considering the influent to DCTWRP and other demands for recycled water. DCTWRP has capacity to treat up to 80 million gallons per day (mgd), of which approximately 29 mgd is for in-plant reuse, Lake Balboa, Wildlife Lake, Japanese Gardens, and the Los Angeles River. **Table ES-3** summarizes the DCTWRP flows and **Table ES-4** shows the AWPF capacity planning parameters. Data in Tables ES-3 and ES-4 are based upon the assumption that all recycled water from DCTWRP for both GWR and NPR is treated at the AWPF. However, through development of the GWR project, based on viability and cost, some of the NPR demands in the Sepulveda Basin area may be served with tertiary Title 22 recycled water and purified recycled water from the AWPF.

Table ES-3: DCTWRP Flows

Parameter	Phase 1 FY 2022	Phase 2 FY 2035
DCTWRP Title 22 Treatment Capacity	80 mgd	80 mgd
DCTWRP Influent	66 mgd [1,2,5]	80 mgd [1,3]
DCTWRP Effluent (Title 22 Recycled Water)	61 mgd [1,2]	73 mgd [1,3]
In-Plant Reuse	2 mgd	2 mgd
Flows to Lakes and LA River [4]	27 mgd	27 mgd
Influent to AWPF	32 mgd	44 mgd

Notes:

1) As noted in *Draft DCTWRP Maximum Flow Assessment TM* (Appendix G), Table 4-2, the DCTWRP tertiary effluent production capacity is estimated to be approximately 87% of the influent flow rate, based on plant flow data from January 2005 through December 2008. The new cloth media filters, which have fewer losses than the old granular media filters, came on-line in December 2009 so data from December 2009 through August 2011 were analyzed as part of this GWR Master Planning Report. The DCTWRP tertiary effluent production capacity is estimated to be approximately 92% of the influent flow rate. If DCTWRP secondary effluent is used for AWPF influent, slightly more flow will be available since losses from cloth media filters will be eliminated.
2) Approximate daily total influent and effluent flows, accounting for weekend diurnal curves and existing primary flow equalization capacity.
3) Maximum daily total influent and effluent flows, accounting for weekend diurnal curves and installation of additional primary flow equalization capacity. See Section 5 for more information.
4) Assumed flow to Lakes and LA River, based on 2006 Integrated Resources Plan Draft Environmental Impact Report.
5) For Phase 1 the influent flow rate will be managed to meet the recycled water demands (i.e., in-plant reuse, flows to Lakes and LA River, and influent to AWPF).

Table ES-4: AWPF Capacity

Parameter	Phase 1 (FY 2022)		Phase 2 (FY 2035)	
	Wet Year[2]	Dry Year[3]	Wet Year[2]	Dry Year[3]
AWPF Influent Flow	32 mgd	32 mgd	44 mgd	44 mgd
AWPF Product Water Capacity [1]	25 mgd [(5)]	25 mgd	35 mgd	35 mgd
AWPF Production, Potential	20,000 AFY	23,000 AFY	31,000 AFY	35,000 AFY
NPR [4]	5,000 AFY	5,000 AFY	5,000 AFY	5,000 AFY
GWR	15,000 AFY	18,000 AFY	26,000 AFY	30,000 AFY

Notes:

1) Assumes overall 79% AWPF recovery (93% MF recovery and 85% RO recovery).
2) Accounts for 92% AWPF online factor, and the maximum number of days HSG (70 days/year) and PSG (30 days/year) are unavailable to receive purified recycled water.
3) Accounts for 92% AWPF online factor, and the assumed minimum number of days HSG (10 days/year) and PSG (5 days/year) are unavailable to receive purified recycled water.
4) Includes existing and planned NPR users only. During wet years, NPR demands would be lower since demands for irrigation water would be lower.
5) While the required AWPF capacity to achieve 15,000 AFY of GWR in Phase 1 during wet years is 23.4 mgd, the AWPF equipment described in Section 5 are sized for 25.0 mgd capacity in Phase 1, since RO trains are sized in 5.0 mgd capacity units. The AWPF will have 5.0 mgd treatment capacity with one RO train online,

25.0 mgd capacity with five RO trains online (Phase 1), and 35.0 mgd capacity with seven RO trains online (Phase 2).

ES.4 GWR Treatment Pilot Study

A pilot study was conducted to evaluate the effectiveness of AWP processes on the DCTWRP recycled water, support public outreach, and test alternative advanced oxidation processes. The pilot study tested the following AWP technologies that are proposed for the AWPF:

- Microfiltration (MF);
- Reverse osmosis (RO);
- Advanced oxidation process (AOP) using ultraviolet (UV) light and hydrogen peroxide (H_2O_2); and,
- An alternative AOP using ozone and H_2O_2.

MF, RO, and AOP with UV/H_2O_2 have been successfully permitted by the California Department of Public Health (CDPH) for other GWR programs run by nearby water agencies, such as the Orange County Water District's (OCWD) GWR System.

The primary function of the MF system is to provide pretreatment for sustainable operation of the RO process. The MF also provides the first barrier against protozoa and bacteria, which should be undetectable in the MF product. The primary function of the RO process is to provide removal of dissolved salts and organic contaminants. The primary function of the AOP system is to destroy trace organic compounds not completely removed by the RO membranes.

A critically important part of the GWR master planning process was to conduct a pilot project consisting of these purification technologies using effluent (treated wastewater) from DCTWRP. Pilot testing was conducted over 16 months in three phases:

- Phase 1 validated the proposed processes used at existing advanced water purification facilities in California, including MF, RO, and UV/H_2O_2 – considered the baseline treatment process.
- Phase 2 evaluated ozone/H_2O_2 as an alternative to UV/H_2O_2, with both AOPs tested side-by-side and with target contaminants spiked into the AOP supply.
- Phase 3 confirmed the recommended operating conditions from Phases 1 and 2 and also evaluated two alternative RO membranes.

Source Water Evaluation: Design for Flexibility

Pilot testing results demonstrated that there were no significant differences in MF, RO, or AOP performance when secondary or tertiary effluents were used as feed water to the AWPF. With no difference in operating efficiency or water quality, it was recommended that the full-scale facility be designed to allow flexibility to use either secondary or tertiary effluent as source water, taken before chlorine addition.

Highlights of MF Pilot Testing Results

Two disinfection methods were pilot tested. The first, traditional chloramination – which was recommended for use in the full-scale facility – involved adding sodium hypochlorite and ammonium hydroxide at the same process location, immediately upstream of the MF feed tank. This method performed significantly better than the second method tested; sequential chlorination.

Highlights of RO Pilot Testing Results

Testing results demonstrated that the RO system effectively met the water quality goals, while removing constituents of emerging concern (CECs) to non-detectable levels for all but 11 compounds. Removal of these compounds was greater than 98 percent for all but NDMA, which was removed to non-detectable levels by the downstream UV/ H_2O_2 process. The testing demonstrated that RO provides an exceptional water quality for GWR.

Highlights of AOP Pilot Testing Results

Testing results support the conclusion that UV/ H_2O_2 is an effective method for removing trace organic compounds, which are only partially removed by the RO membranes. It also demonstrated that ozone/ H_2O_2 is promising for the removal of 1,4-dioxane and TCEP, two compounds that are more difficult to oxidize than most other CECs. Higher NDMA removal was achieved with UV/H_2O_2 as result of direct photolysis from the UV light. Based on the positive pilot results for ozone/H_2O_2, both UV/H_2O_2 and ozone/H_2O_2 are included as potential AOPs in the GWR Master Planning Report. Additional study and testing is required for ozone/ H_2O_2 to determine if it would be viable for the AWPF and to further refine the design criteria.

Water Quality

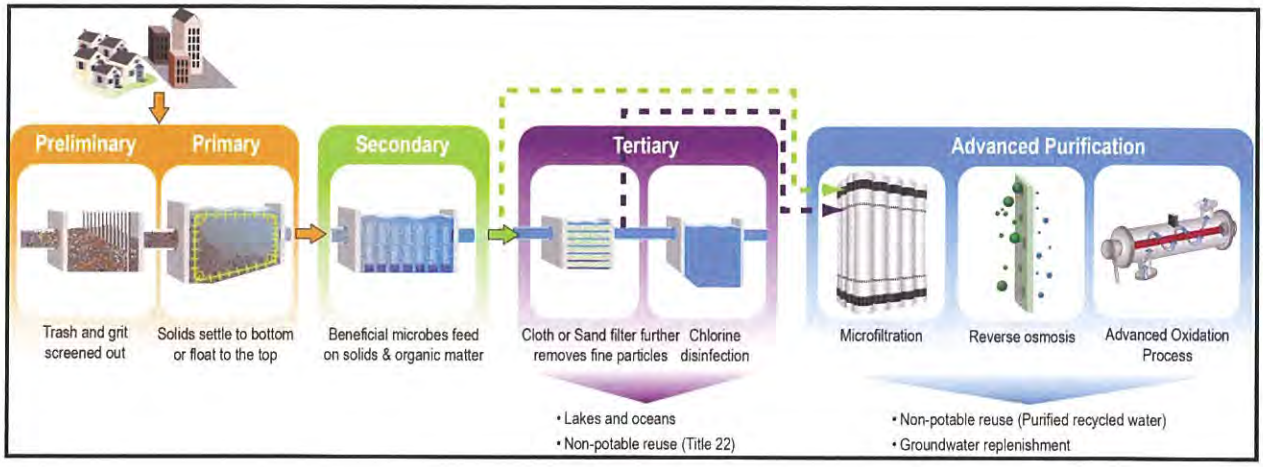
Water quality results from the pilot testing confirmed that all existing and draft drinking water and recycled water regulations can be met using the proposed treatment processes. All of the regulated compounds in the product water measured below their regulatory limits.

All but ten non-regulated pharmaceuticals and personal care products were removed to concentrations below detection levels by the RO process. All but three of these were removed to below detection levels by the UV/H_2O_2 process, and all but two by the ozone/H_2O_2. Overall, the removal of these three remaining compounds was greater than 98 percent, with their concentrations in the final product water averaging less than 10 nanograms per liter (ng/L), which is often considered to be a non-detectable level.

ES.5 Advanced Water Purification Facility at DCTWRP

The GWR Master Planning Report sizes and lays out the treatment processes for the AWPF. As discussed in Section ES.3, the City selected the DCTWRP Southwest location for the AWPF for the proposed site, which is the basis for this master planning report. **Figure ES-8** shows the major treatment processes that exist for DCTWRP and that are proposed for the AWPF.

Figure ES-8: Major Treatment Processes in at DCTWRP and Proposed for the AWPF



Each of the treatment processes shown in **Figure ES-8** have multiple components. Each of those components requires design criteria to enable the planning team to evalute how well that component of the AWPF will meet treatment goals. The design criteria, highly detailed and technical in nature, established standards for performance (e.g., that the product water would meet regulations), safety, and operational needs. As discussed in Section ES.3, the initial capacity of the AWPF for Phase 1 is 25 mgd, which would be expanded to 35 mgd for Phase 2. **Table ES-5** lists the design criteria categories addressed in the GWR Master Planning Report.

Table ES-5: AWPF Design Criteria Categories

AWPF Design Criteria Included in GWR Master Planning Report
• MF Feed Pumps • MF Pre-Filters • Pall MF System • MF/RO Break Tank • RO Transfer Pumps • RO Cartridge Filters, • RO Feed Pumps • RO Systems, including a comparison of 8-inch and 16-inch RO Systems • UV/H_2O_2 Systems (Calgon and Trojan) • Ozone/H_2O_2 System as Alternative AOP, based on pilot testing • Post-Treatment • Product Water Pump Station • Chemical Storage and Feed Systems, including Ammonium Hydroxide, Sodium Hypochlorite, Antiscalant, Sulfuric Acid, Hydrogen Peroxide, Carbon Dioxide, Calcium Chloride, Caustic Soda, Citric Acid, and Sodium Bisulfite • Backwash/Concentrate Pipe • Phase IV Primary Clarifiers/Equalization Basins

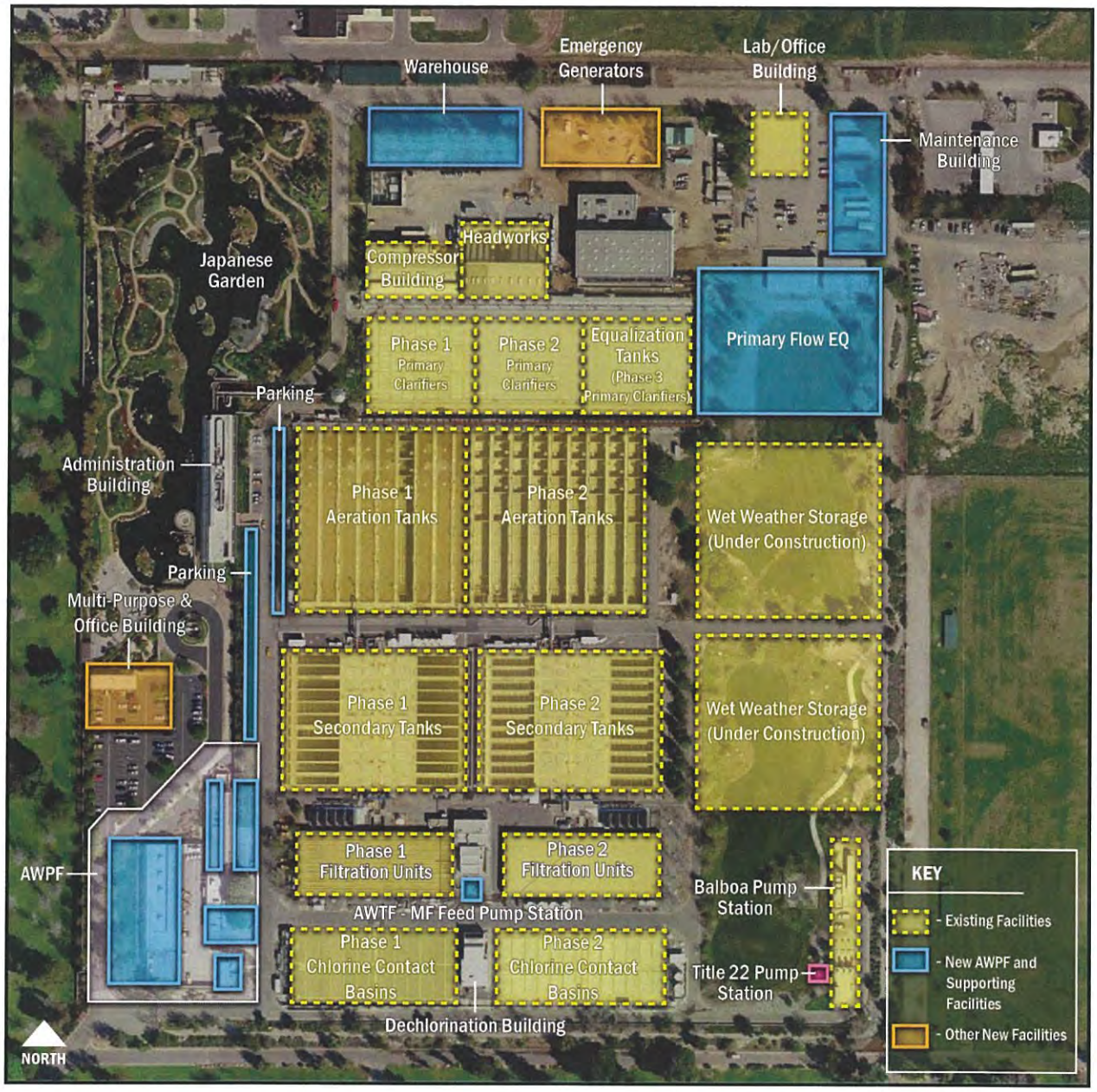
ES.6 Site Improvements at DCTWRP

The staff preferred site for the AWPF is located at the southwest corner of the DCTWRP. Currently, service buildings occupy the space where the main purification facilities will be constructed. Work at DCTWRP associated with the AWPF includes the following:

- Construction of the new maintenance and warehouse buildings on the north side of DCTWRP before construction of the AWPF;
- Demolition of the existing service buildings, parking lot, pavement, planters, and a buffer of vegetation;
- Construction of additional Phase IV clarifiers for flow equalization (before expansion to Phase 2);
- Construction of new Title 22 Pump Station (see Non-Potable Reuse Master Planning Report);
- Construction of the new AWPF structures; and,
- Installation of various piping.

Figure ES-9 shows an aerial view of the DCTWRP with proposed AWPF improvements.

Figure ES-9: Aerial View of DCTWRP Preliminary Site Plan



ES.7 Conveyance and Replenishment Facilities

After the water is treated in the AWPF, it will be conveyed to spreading grounds to replenish the groundwater basin. Ultimately it will be extracted as a safe, reliable, local supply of water.

The GWR Master Planning Report evaluated the different processes that will be capable of providing water in two phases: 15,000 AFY and 30,000 AFY.

- **Phase 1:** 15,000 AFY of GWR will be achieved by surface spreading at the HSG

- **Phase 2 Option A:** Up to 30,000 AFY of GWR will be achieved by surface spreading at the HSG and PSG
- **Phase 2 Option B:** Up to 30,000 AFY of GWR will be achieved by surface spreading at the HSG and PSG, as well as direct injection using injection wells, and/or Strathern Wetlands Project

The HSG and PSG are shown in **Figures ES-10 and ES-11**, respectively.

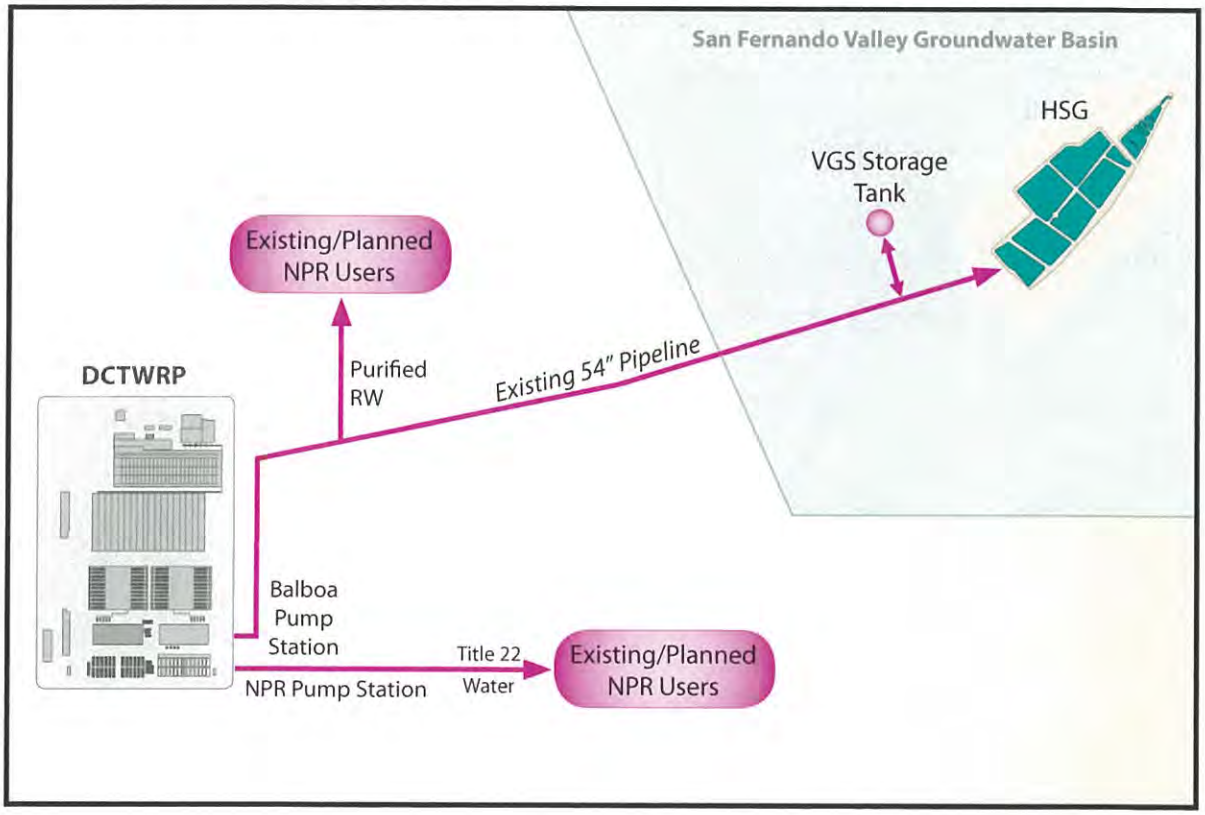
Figure ES-10: HSG Aerial Photograph

Figure ES-11: PSG Aerial Photograph

Phase 1: 15,000 AFY to Hansen Spreading Grounds

The goal of Phase 1 is to recharge the groundwater basin with an annual average of 15,000 AFY of purified recycled water at HSG. As shown in **Figure ES-12**, purified recycled water will be conveyed from DCTWRP to HSG through the existing 54-inch pipeline.

Figure ES-12: Schematic of Conveyance Facilities to Deliver 15,000 AFY from DCTWRP to HSG



Purified recycled water will be delivered at a relatively steady rate throughout the year, but stormwater is seasonal. Theoretically, there is more than adequate capacity at the HSG to achieve the 15,000 AFY target, however, there are two major reasons that the basin(s) at the HSG may be unavailable for recharge of the purified recycled water: (1) due to extreme wet weather conditions when stormwater takes precedence over purified recycled water; and (2) maintenance. These conditions require a careful plan of operations and close cooperation with Los Angeles County Department of Public Works (LACDPW) to be developed and followed.

The output capacity of the AWPF will be large enough to compensate for the downtime of the HSG and still meet the GWR goal of 15,000 AFY for the Phase 1.

For extraction, the two main quantitative considerations to demonstrate compliance with the CDPH 2008 draft groundwater recharge regulations are: (1) retention time and (2) recycled water contribution.

Under the 2008 draft regulations, retention time is six months from when purified recycled water is delivered to the spreading grounds until it reaches the nearest drinking water supply well. This must be verified by means of a tracer study. Prior to this, for planning purposes in siting a project, the project proponent may use numerical modeling to show that a minimum retention time of 12 months is met. LADWP applied its San Fernando Basin Groundwater Model (SFBGM) to assess the time for AWPF water to travel from HSG to the Tujunga Well Field (three years) and the Rinaldi-Toluca Well Field (six years). Compliance with the 12-month minimum retention time can easily be demonstrated.

The 2008 draft regulations also require that, initially, at least 50 percent of the water that replenishes the groundwater basin will come from non-recycled water sources, which can include stormwater. (This is referred to as "diluent" water. The recycled water divided by the sum of the recycled water and diluents water is referred to as the recycled water contribution, or RWC.) The planning team looked at historic hydrology and a wide range of potential conditions and determined that, with certain facility improvements to HSG, there a high probability that Phase 1 will meet the initial RWC requirement. Furthermore, the probability of meeting the initial RWC would even be higher assuming CDPH accepted an alternative approach that considered blending in the aquifer from multiple non-recycled water sources upgradient of potable supply wells such as several spreading grounds.

A Memorandum of Understanding (MOU) between LADWP and LACDPW is being developed with respect to recharging purified recycled water at the HSG.

Phase 2 Options A and B: 30,000 AFY to Hansen and Pacoima Spreading Grounds

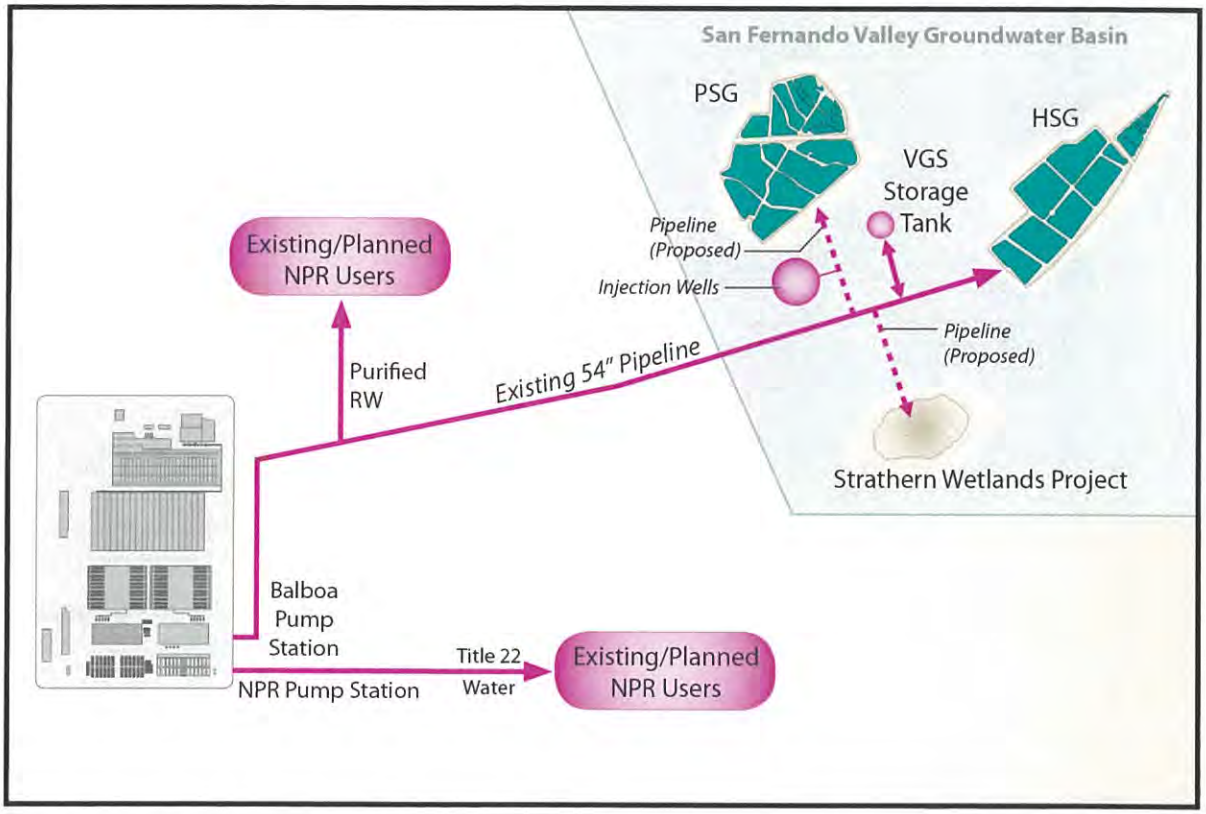
The goal of Phase 2 is to recharge an annual average volume of up to 30,000 AFY of purified recycled water. Use of HSG alone is not sufficient to allow GWR of 30,000 AFY for Phase 2. The use of stormwater for replenishment at the LACDPW spreading grounds is the first priority and based on historic volumes and recent improvements, it is assumed LACDPW will spread an average of 16,800 AFY of stormwater at HSG. Phase 1 of the GWR project will add another 15,000 AFY for a total of 31,800 AFY to be spread at HSG. Groundwater model results indicate that, while HSG has the percolation capacity to accept more than 15,000 AFY of recycled water, the underlying aquifer system may not have the capacity to transmit flows much in excess of 31,800 AFY without excessive groundwater mounding because of a fault downgradient of HSG (approximately at San Fernando Road). Mounding could bring groundwater levels very close to the surface and greatly reduce percolation capacity, as well as the potential to adversely impact operations at the nearby Bradley Landfill. Therefore, recharge of recycled water greater than 15,000 AFY is not proposed for the HSG and the use of both the HSG and the PSG is necessary to increase GWR in Phase 2.

Under Phase 2 Option A, the recharge will occur at both HSG and PSG. Distribution of the purified recycled water to each spreading ground will be approximately equal. Under Phase 2 Option B, injection wells may also be incorporated into the project to allow for additional groundwater recharge under certain conditions in the winter months when the spreading basins are unavailable for recycled water recharge. Injection wells are similar to groundwater production wells and have screens below the water table. The pressure in the existing delivery

system would move the water down the injection wells where it exits into the groundwater basin through the screened zones. Another potential option is spreading at the Strathern Wetlands Project.

As shown in **Figure ES-13**, purified recycled water will be conveyed from DCTWRP to HSG through the existing 54-inch pipeline for both Options A and B. A new pipeline will be constructed to connect the 54-inch pipeline with PSG. For Option B, the injection wells will be located along this new pipeline route, as shown schematically in **Figure ES-13**.

Figure ES-13: Schematic of Conveyance Facilities to Deliver 30,000 AFY from AWTF to HSG and PSG (Phase 2 Option A), and Injection Wells and/or Strathern Wetlands Project (Phase 2 Option B)



As with Phase 1, there will be periods when the spreading grounds may be unavailable for the recharge of recycled water. In addition to HSG being unavailable for up to 70 days per year, LACDPW has indicated that PSG could be unavailable for 30 days per year. Based on this information, there may be times of year that the City cannot recharge purified recycled water at both HSG and PSG. Under Option B, injection wells and/or spreading at the Strathern Wetlands Project are being considered to allow recharge of water year-round regardless of the spreading basin availability.

The same two main quantitative considerations to demonstrate compliance with the 2008 draft regulations described earlier also apply to Phase 2 Option A. They are: (1) retention time and (2) recycled water contribution.

LADWP applied its SFBGM to assess the time for AWPF water to travel from HSG and PSG to the Tujunga Well Field and the Rinaldi-Toluca Well Field. Results are show in **Table ES-6** below. Compliance with the 12-month minimum retention time can easily be demonstrated.

Table ES-6: Simulated Retention Time for Phase 2 Option A

Source of Recycled Water	Simulated Retention Time (years)	
	Tujunga Well Field	Rinaldi-Toluca Well Field
Phase 2 Option A		
HSG	3	5.5
PSG	4.5	11

With the expansion from 15,000 AFY for Phase 1 to 30,000 AFY for Phase 2, the City will be expanding to a 100 percent recharge project where the RWC will be increased from 50 percent (50 percent purified recycled water and 50 percent stormwater) to as much as 75 percent purified recycled water. The 2008 draft groundwater recharge regulations permit an increase in the RWC up to 100 percent subject to demonstration of successful compliance with regulatory criteria including: 1) the 20-week total organic carbon (TOC) average in recycled water for a one year period must equal 0.5 mg/L divided by the proposed maximum RWC; 2) demonstration that monitoring wells have received specified percentages of recycled water for at least six months and twelve months; and 3) review by an expert panel.. Since the County will always be recharging stormwater at HSG, PSG, and Tujunga Spreading Grounds (TSG), all of which provide stormwater to effectively blend with purified recycled water, the RWC will never approach 100%. Therefore, the project is expected to be able to demonstrate the ability to operate and be allowed to expand to at least 75 percent RWC and be in compliance.

For Phase 2 Option B, the concept of adding injection wells to the operational strategy is to allow the City to continue replenishing the groundwater basin during wet periods when LACDPW would restrict spreading of purified recycled water. LACDPW could require LADWP to stop sending purified recycled water during storm event to either or both HSG and PSG for periods of time ranging from a few days to several weeks or longer. Therefore, the injection wells will be designed for the full capacity of the AWPF (35.0 mgd) so that for any day or extended periods that the basins are not available, the maximum amount of purified recycled water could still be injected by the wells to maximize groundwater replenishment. This is summarized in **Table ES-7**.

Table ES-7: Injection Well Flows and Operating Conditions

Injection Wells	Estimated Quantities
Total Injection Capacity	35.0 mgd
Operational Capacity per Well	2.7 mgd; 4.2 cfs
No. of Wells	13
Operating Conditions	Standby under normal conditions. To be used when HSG/PSG are not available for recycled water spreading.

An important consideration with respect to introducing injection wells is the question of meeting blend requirements under the 2008 draft regulations. Projects using AWPF purified recycled water, initially, are required to blend a maximum of 50% of recycled water with a minimum of 50% potable water from other sources. Under these requirements, it would be possible to inject 100% recycled water into the wells whenever the spreading basins are not available, and inject an equivalent amount of treated potable water into the wells to achieve a 50/50 blend on a seasonal or annual basis.

Groundwater Extraction

Groundwater will be ultimately extracted, treated and delivered to LADWP customers using existing wells. Of the 115 wells owned by LADWP in the SFB, over 50 have been shut down due to contamination, resulting in a loss of approximately 40 percent of LADWP's total pumping capacity. Of the remaining active wells, 45 wells have recorded contaminant concentrations above the corresponding maximum contaminant levels (MCLs). Most notable among these contaminants of concern are the volatile organic compounds (VOCs) TCE, PCE, and carbon tetrachloride; chromium; nitrate; and perchlorate. Thirteen wells have recorded marginal levels of contamination, mostly VOCs.

As part of a separate project to clean up groundwater contamination in the SFB, the future Groundwater Treatment Complex, which includes centralized treatment facilities and wellhead treatment, are being considered to allow LADWP to again have the ability to fully utilize the SFB groundwater supplies, including groundwater that has been replenished with purified recycled water. Locations of the centralized treatment are being considered in the vicinity of the LADWP North Hollywood Pump Station and Tujunga Well Field.

ES.8 Design Standards and Criteria

The GWR Master Planning Report addresses standards for the buildings and structures that will house the AWPF and related facilities. These standards included architectural, civil, geotechnical, structural, and electrical elements, which are required for any major public facility design. These criteria will need to be updated during pre-design to reflect code changes. The architectural and electrical design approaches are summarized below.

Architectural Considerations

The DCTWRP is well known for its Japanese Garden. BOS will be constructing a Multi-Purpose and Office Building immediately south of the Japanese Garden to facilitate public tours for the garden. A complementary architectural theme is recommended for the MF/RO Building, the primary building to be constructed as part of the AWPF. As with many recently designed City buildings, the MF/RO facility will be a model for stewardship and innovative design, without sacrificing functionality or ease of maintenance. Sustainable design strategies will be included to minimize energy consumption, greenhouse gas emissions, water consumption and solid waste generation.

The overall building footprint will be approximately 130 feet by 225 feet to be able to house all of the necessary equipment. The height of the MF/RO equipment requires the building to be two stories.

Electrical Considerations

The electrical system for the AWPF will be investigated further during the design phase of the project, which will include an evaluation of the costs and benefits of using renewable energy sources for powering the facilities.

The AWPF will require a new industrial substation. There are three options for providing power to the AWPF:

Combine with and Expand Existing DCTWRP Substation IS-2250: There may be enough capacity in the existing 20 million volt-amperes (MVA) substation to provide enough power for Phase 1. DCTWRP is currently operating with one treatment phase with a total power draw of 7 MVA; doubling this power draw to estimate the total DCTWRP power draw with both phases operating will be 14 MVA. Therefore, there may be enough power to supply the AWPF from the existing substation for Phase 1. The substation will need to be expanded to provide enough power for Phase 2. This will require distributing the 5 kilovolt (kV) medium voltage power from the north end of DCTWRP to the AWPF in SWRP Way, which is congested with existing utilities.

New AWPF Substation in Location of Existing IS-2250 Satellite Substation for Balboa Lake Feed Pumps: A new substation for the AWPF could be located within the AWPF site in the existing location of the IS-2250 satellite substation. This will require dual 35 kV lines to feed the proposed two (2) 10 MVA, 34.5 kV/4.16 kV transformers. The actual routing of the 35 kV lines will need to be determined by LADWP, but would likely need to be routed on Woodley Avenue. Overhead lines using power poles, underground ductbanks, or a combination of both, may be routed to the new substation. Because Woodley Avenue is on USACE-owned land, this approach would need to be discussed with USACE. This option would avoid running the 5 kV medium voltage power in SWRP Way.

New AWPF Substation Co-located with Existing IS-2626 Substation for the PWPS: The new AWPF substation could be located in the southeast corner of DCTWRP near the PWPS. As with the option of locating the new AWPF substation in the location of the existing IS-2250 satellite substation, this option requires dual 35 kV lines to feed the proposed two (2) 10 MVA, 34.5 kV/4.16kV transformers. The actual routing of the 35kV lines will need to be determined by

LADWP, but would likely come from Victory Boulevard and routed south along the eastern DCTWRP border. Overhead lines using power poles, underground ductbanks, or a combination of both, may be routed to the new substation. This would require approval to go through the property north of the DCTWRP and would also need to be discussed with USACE since DCTWRP is on USACE-owned land. This option would avoid running power lines down Woodley Avenue.

The power source needs to be investigated further and determined during pre-design.

ES.9 Regulatory Requirements and Considerations

The RWMP planning team conducted a thorough assessment of all applicable regulatory requirements and considerations for groundwater replenishment with highly purified AWPF water, including the 2008 draft CDPH groundwater recharge regulations. The following are highlights of the regulatory requirements and considerations:

Overview of the Regulators and Regulations that Apply to GWR Projects

The CDPH and the Los Angeles Regional Water Quality Control Boards (RWQCB) have regulatory oversight of groundwater recharge projects in the Los Angeles basin.

- CDPH regulates GWR projects under the State Water Recycling Criteria (Title 22) and makes recommendations for projects based on the draft groundwater recharge regulations.
- The Los Angeles RWQCB regulates groundwater recharge projects under numerous state laws and regulations, including the Los Angeles Water Quality Control Plan (Basin Plan) and the State Water Resources Control Board's Recycled Water Policy.

In addition, the project must comply with the California Environmental Quality Act (CEQA). Since the project is located on federally-owned land and because federal money will likely sought for funding, it must also comply with the National Environmental Policy Act (NEPA).

Overview of Permitting Process

The City has been deliberate in selecting a treatment train that is very similar to GWR projects that have been successfully permitted and are in operation, such as OCWD's GWR System in Fountain Valley and the West Basin Municipal Water District's facility in El Segundo. The following is a brief summary of the extensive, extremely detailed permitting process.

Engineering Report: The City will initiate the permitting process by preparing an Engineering Report and submitting it to CDPH and the Los Angeles RWQCB for approval.

The 2008 draft regulations do not have specific requirements for the Engineering Report, and this lack of specificity must be addressed with CDPH and the Los Angeles RWQCB to ensure that the report meets each agency's needs. The Engineering Report must include an anti-degradation analysis, confirming that the addition of GWR to the existing groundwater basin would not degrade the quality of the groundwater. Currently, there is no set process for conducting an anti-degradation analysis; this lack of specificity must be addressed with the Los Angeles RWQCB.

CDPH Findings of Fact and Conditions: CDPH will hold a public hearing and then issue its Findings and Conditions. This document serves as CDPH's recommendation to the Los Angeles RWQCB for the project's permit.

Environmental Documentation and Report of Waste Discharge: The City will prepare the project's draft environmental documents, receive public comments, and prepare a final environmental document(s). Once the Environmental Impact Report is certified, the City will then prepare and submit a Report of Waste Discharge to the Los Angeles RWQCB.

GWR Permit: The Los Angeles RWQCB will release a tentative GWR permit and hold a public hearing. Assuming no significant opposition, the RWQCB will issue the GWR permit.

California Water Code Section (CWC) 1211: Because the project will divert some treated wastewater from DCTWRP from flowing into the Los Angeles River, it must comply with the CWC 1211 process, which protects in-stream beneficial uses such as wildlife and recreation. The City will file a petition for change to be approved by the State Water Resources Control Board.

Other Requirements: Other agencies will be involved in the permitting process, including the United States Army Corps of Engineers (USACE).

Independent Advisory Panel: Initially, LADWP will develop a project that would blend a maximum of 50% of recycled water with a minimum of 50% diluent water from other sources, in accordance with the 2008 CDPH draft regulations. Projects that are allowed to increase the percentage of recycled water above 50% are subject to additional permit requirements including review by an Independent Advisory Panel (IAP).

In 2010, the City worked with the National Water Research Institute (NWRI) to establish an IAP to provide a panel of experts to provide input and advice for the project, and specifically to support the regulatory approval process. By establishing the IAP early in the process, the City will have additional flexibility with the project implementation and facility planning.

Monitoring GWR at all Stages

The recycled water, groundwater from monitoring wells, groundwater from production wells, and diluent water will be monitored for regulated constituents such as maximum contaminant levels (MCLs) and constituents with Basin Plan water quality objectives; notification levels (NLs); Priority Pollutants; microorganisms; constituents of emerging concern (CECs); and various performance parameters. See Section 9 for a more detailed and annotated list of monitoring requirements. See Section 9 for a more detailed and annotated list of monitoring requirements.

Environmental Documentation

The City has selected Site 2 DCTWRP Southwest as the proposed project location. In addition to the proposed location, the four other locations for the AWPF are considered.

Both CEQA and NEPA environmental assessments will be performed for the project. NEPA is required since the proposed project is located on federal land (DCTWRP is located on land

owned by the USACE). NEPA will also be required if the City pursues federal funding for the project.

The CEQA and NEPA environmental reports are expected to be one joint document prepared by LADWP (CEQA lead agency) and the USACE (NEPA lead agency). The step for the environmental documentation process is to issue the Initial Study and Notice of Preparation (NOP), which is anticipated in 2013.

ES.10 Implementation Strategy

The GWR project implementation strategy is driven by the goal to achieve 59,000 AFY recycled water by 2035. Implementation will be done in two phases: Phase 1 - 15,000 AFY by July 2022 and Phase 2 – an additional 15,000 AFY to achieve a total of 30,000 AFY by July 2035. The remaining 29,000 AFY will be achieved by implementing NPR projects.

Planning and Permitting Activities

Planning and permitting activities include public outreach; coordination with the IAP; regulatory coordination with CDPH, Los Angeles RWQCB, and the State Water Resources Control Board, and others; and environmental documentation.

GWR Phase 1 Activities

During this phase, the GWR facilities to deliver 15,000 AFY will be designed and built, and placed into operation. Major steps include:

- Pre-design report
- Equipment pre-selection and vendor pilot testing required for prequalification
- Final design, including plans and specifications
- Bidding and contract award
- Construction
- Startup and final approvals

Before the construction of the AWPF can be started to implement GWR Phase 1, the new warehouse and maintenance buildings need to be designed and constructed to make room for the AWPF facilities.

GWR Phase 2 Activities

During this phase, the GWR facilities will be expanded to provide an additional 15,000 AFY. The major steps include all of the above for Phase 1 except for equipment pre-selection and vendor pilot testing. Before implementing GWR Phase 2, the City can revisit the multi-criteria comparison of GWR and NPR to determine if it is prudent to still implement a 15,000 AFY Phase 2 GWR project or to pursue a lesser amount of GWR that, when combined with additional NPR projects, achieves the 59,000 AFY recycled water goal.

By the time that Phase 2 is to be implemented by 2035, it is possible that the State of California may allow direct potable reuse (DPR) as an alternative to indirect potable reuse with GWR.

(The processes described in this document are indirect potable reuse.) If this happens, the City should reassess the project to determine if DPR would be a better option than GWR.

ES.11 Opinion of Probable Costs and Financial Analyses

Opinion of Probable Costs

GWR project costs were evaluated for all options for capital costs (cost to design and build) and operations and maintenance (O&M). The following tables summarize the opinion of probable costs: Table ES-8: Conceptual Level Capital Costs for AWPF, Table ES-9: Conceptual Level Capital Costs for Conveyance Pipelines and Improvements to Spreading Grounds, Table ES-10: Conceptual Level Capital Costs for Injection Wells, Table ES-11: Conceptual Level Capital Costs for all GWR Components, Table ES-12: Conceptual Level Annual O&M Costs for AWPF, and Table ES-13: Conceptual Level Annual O&M costs for all GWR Components.

Table ES-8: Conceptual-Level Capital Cost for AWPF

	Capital Cost[1]	
	Phase 1	Phases 1 and 2
AWPF	**25.0 mgd capacity**	**35.0 mgd capacity**
MF System [2]	$32,657,000	$42,212,000
MF/RO Equalization Basins [3]	$1,604,000	$1,604,000
RO System [4]	$36,337,000	$47,753,000
Two-Story MF/RO Building [5]	$42,727,000	$42,727,000
UV System [6]	$8,192,000	$10,188,000
Chemical Systems [7]	$3,170,000	$3,308,000
Balboa Pump Station Modification [8]	$0	$1,206,000
Primary Flow Equalization Basins [9]	$0	$16,538,000
Yard Piping [10]	$3,236,000	$3,236,000
Site Improvements [11]	$1,468,000	$1,468,000
Protection of Existing Satellite Substation (IS-2250) In Place	$337,000	$337,000
Relocation of Existing Electrical Ductbanks [12]	$1,687,000	$1,687,000
Demolition of Existing Service Buildings	$5,764,000	$5,764,000
Construction of New Service Buildings [13]	$30,000,000	$30,000,000
Construction Subtotal	***$167,179,000***	***$208,028,000***
30% Contingency	$50,154,000	$62,408,000
Construction Total	***$217,333,000***	***$270,436,000***
30% Implementation Cost [14]	$65,200,000	$81,131,000
Total Capital Cost (AWPF)	**$283,000,000**	**$352,000,000**

Notes:
1) All costs are in September 2011 dollars.
2) Includes MF Feed Pump Station. See Sections 5.3.2 and 5.3.4.
3) See Section 5.3.5.

4) Includes RO Transfer Pumps, RO Cartridge Filters, and RO Feed Pumps. See Sections 5.3.6 through 5.3.9.
5) Includes additional costs for architectural features and cost to depress the building below grade to meet building height limitations.
6) See Section 5.3.10. Hydrogen peroxide system is included with chemical systems.
7) Includes all chemical systems included in Section 5.3.13.
8) See Section 5.3.12.
9) See Section 5.3.16.
10) Includes gravity pipeline connections to secondary and tertiary effluent channels, pressure MF feed pipeline, pressure AOP product water pipeline, gravity AWPF backwash and concentrate pipeline and chemical feed pipelines.
11) Includes site grading, retaining wall at DCTWRP entrance, site security improvements, converting grass areas to parking spaces, and landscaping.
12) See Section 8.5.3.
13) Costs provided by BOE.
14) Includes Planning, Environmental Documentation, and Permits; Engineering Services (pre-construction and during construction); Construction Management and Inspection; Legal and Administrative Services; and Field Detail Allowance. See the *Cost Estimating Basis for Recycled Water Master Planning TM* (Appendix C) for more information.

Table ES-9: Conceptual-Level Capital Cost for Conveyance Pipeline and Spreading Grounds Improvements

	Capital Cost[1]	
	Phase 1	**Phases 1 and 2**
Conveyance and Replenishment – Spreading	**15,000 AFY**	**30,000 AFY**
HSG Improvements [2]	$1,217,000	$1,217,000
PSG Improvements and 54" Pipeline Connection to PSG [3]	$0	$14,734,000
Construction Subtotal	***$1,217,000***	***$15,951,000***
30% Contingency	$365,000	$4,785,000
Construction Total	***$1,582,000***	***$20,736,000***
30% Implementation Cost	$475,000	$6,221,000
Total Capital Cost (Spreading Grounds Improvements)	**$2,060,000**	**$27,000,000**

Notes:
1) All costs are in September 2011 dollars.
2) See Section 7.1.4.
3) See Section 7.2.4.

Table ES-10: Conceptual-Level Capital Cost for Injection Wells

	Capital Cost[1]	
	Phase 1	Phases 1 and 2
Conveyance and Replenishment - Injection	**0 AFY**	**600 AFY (dry) to 4,000 AFY (wet)**
Injection Wells [2]	$0	$21,067,000
Construction Subtotal	***$0***	***$21,067,000***
30% Contingency	$0	$6,320,000
Construction Total	***$0***	***$27,387,000***
30% Implementation Cost	$0	$8,216,000
Total Capital Cost (Injection Wells)	**$0**	**$35,600,000**

Notes:
1) All costs are in September 2011 dollars.
2) See Section 7.3.4.

Table ES-11: Conceptual-Level Capital Cost for All GWR Project Components

		Capital Cost[1]	
	Injection Wells	Phase 1	Phases 1 and 2
AWPF using UV/H_2O_2 with Trojan UV	**Not Included**	**$285M**	**$379M**
AWPF using UV/H_2O_2 with Trojan UV	**Included**	**$285M**	**$415M**

Note:
1) All costs are in September 2011 dollars.

Table ES-12: Conceptual-Level Annual O&M Cost

	Annual O&M Cost[2]	
	Phase 1	Phases 1 and 2
AWPF	**25.0 mgd capacity**	**35.0 mgd capacity**
Power Costs		
MF System	$360,000	$447,000
RO System	$2,053,000	$2,874,000
UV System – Trojan UV	$233,000	$434,000
PWPS [2]	$1,461,000	$2,045,000
Miscellaneous Equipment	$50,000	$53,000
MF/RO Building	$543,000	$543,000
Power Costs – Subtotal	***$4,700,000***	***$6,396,000***
Chemical Costs		
MF Pre-treatment	$343,000	$480,000
RO Pre-treatment	$378,000	$529,000
H_2O_2 for AOP	$352,000	$493,000
Post-treatment	$701,000	$981,000
Chemical Costs – Subtotal	***$1,773,000***	***$2,483,000***
Replacement of Consumables		
MF Membranes	$705,000	$987,000
RO Cartridge Filters and RO Membranes	$520,000	$728,000
UV Lamps and Ballasts – Calgon UV	$275,000	$367,000
Replacement of Consumables – Subtotal	***$1,500,000***	***$2,082,000***
Maintenance Costs [3]	***$1,847,000***	***$2,299,000***
Labor Costs [4]	***$3,219,000***	***$3,695,000***
Total Annual O&M Cost	**$13,039,000**	**$16,955,000**

Notes:
1) All costs are in September 2011 dollars.
2) Pumping from AWPF to spreading grounds.
3) Assumed to be 1.7% of the equipment construction cost.
4) Estimated staffing for Phase 1 = 19 personnel and for Phase 2 = 22 personnel. Estimates provided by BOS.

Table ES-13: Conceptual-Level Annual O&M Cost for All GWR Project Components

	Injection Wells	Annual O&M Cost	
		Phase 1	Phases 1 and 2
AWPF using UV/H_2O_2 with Trojan UV	Not Included	$13.0M	$17.0M
AWPF using UV/H_2O_2 with Trojan UV	Included	$13.0M	$17.9M

Notes:
1) All costs are in September 2011 dollars.
2) The O&M costs do not include labor costs.
3) The O&M costs for spreading grounds, excluding labor costs, are assumed to be negligible.
4) The estimated annual O&M cost for injection wells is $0.9M.
5) Groundwater extraction pumping is estimated to be an additional $68/AF, which is not included in annual O&M costs above. Estimate provided by LADWP.

Financial Analyses

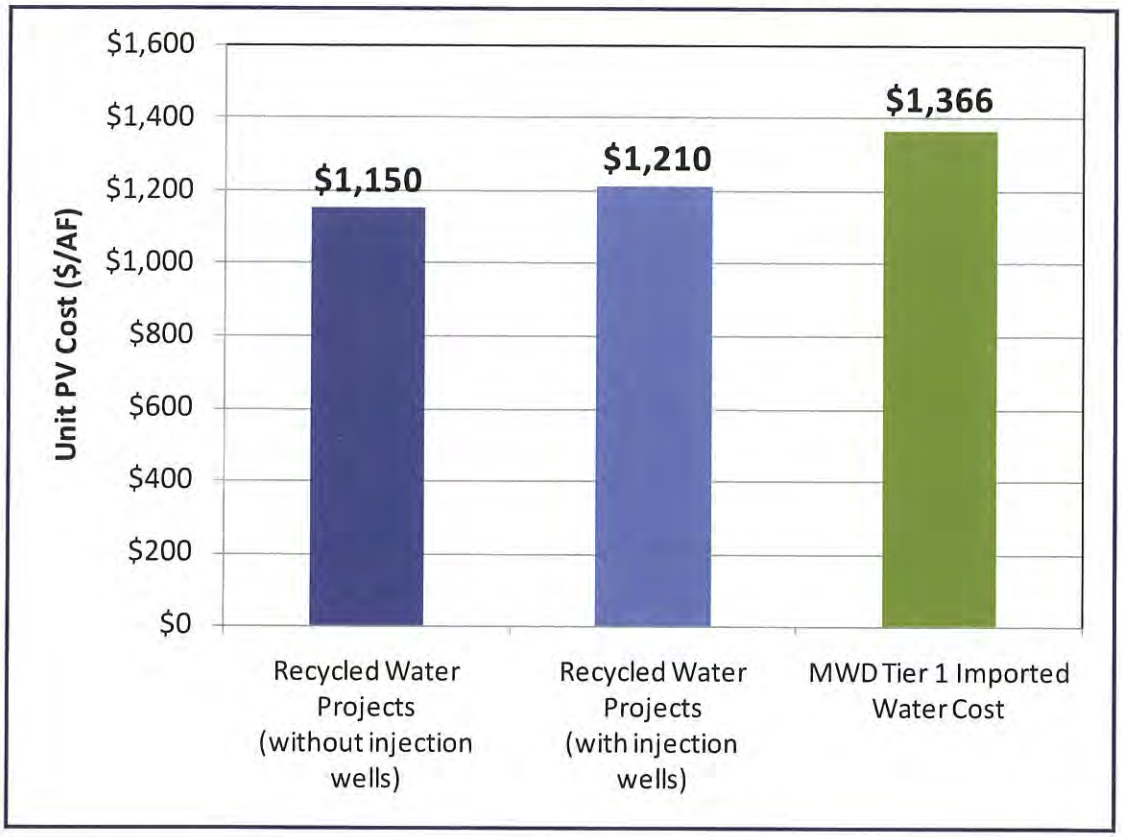
This section presents financial analyses of the GWR project costs. There are many different ways that the GWR program could be financed, which impacts the total cost of producing the purified recycled water. In this section two potential methods are presented, "pay-as-you-go" (no financing) and financing using borrowed funds, with the resulting cumulative cost over a 50-year period. For both evaluations, the projected cumulative cost is compared with projected Tier 1 Metropolitan Water District of Southern California (MWD) imported water cumulative costs. Historically, LADWP has funded its recycled water projects entirely through its Water Rates Ordinance Water Procurement Adjustment Surcharge (Surcharge) without borrowing money. This is called the "pay-as-you-go" method that provides funding during each of the project's planning, design, and construction phases, and also for ongoing O&M costs.

To evaluate and compare future recycled projects for the RWMP documents, a standard economic method called the present value (PV) approach was used. This approach first estimates future capital and O&M costs for the lifecycle of each project, accounting for inflation. Then all future year O&M and capital costs are brought back to PV terms using a discount rate. To determine the cost-effectiveness of the recycled water projects under pay-as-you-go financing, a PV unit cost in dollars per acre-foot ($/AF) for the GWR project was estimated by taking the sum of the PV costs divided by the sum of water yield over the 50-year life of the program. This PV unit cost was then compared to the PV unit cost of MWD Tier 1 water purchases.

The PV unit cost for the GWR project is estimated to be $1,150/AF without injection wells and $1,210/AF with injection wells, which includes potential capital and O&M costs for the AWPF (summarized in Section 11.1) over the 50-year life of the recycled water projects. The PV also includes groundwater extraction pumping costs of $68/AF starting the year after Phase 1 and 2 are implemented (i.e., groundwater extraction pumping increased by 15,000 AFY in 2023 and by an additional 15,000 AFY in 2036). The PV unit cost for MWD Tier 1 water purchases over the same 50-year period is estimated to be $1,366/AF, which is about 13% greater than the estimated PV for the GWR project with injection wells and 19% greater than the estimate PV for the GWR project without injection wells. The MWD Tier 1 water rates were forecasted based on current MWD rate projections through 2018 (averages 5% per year), historical rate

increases (through 2012), and an assumed 5% annual growth from 2019 on. **Figure ES-14** shows the PV unit costs for the imported water rate projections along with the present value unit costs for the GWR project with and without injection wells. As shown in the figure, both GWR options cost less than purchasing Tier 1 water from MWD.

Figure ES-14: Unit PV Cost for GWR Project Compared with Projected MWD Tier 1 Imported Water Costs



An alternative funding approach is to borrow money through long-term financing to fund capital expenditures. Borrowing to fund these costs reduces the near-term impact on customer's water rates, but the costs will have to be repaid with interest over a long-term period. The same future MWD Tier 1 imported water rates were estimated for the long-term financing option as with the pay-as-you-go analysis, which is based on a 5% annual growth from 2012 to 2061.

To determine the annual expenditures of the recycled water projects using this alternative funding approach, the following assumptions were made:

1. Sixty percent of capital expenditures are financed over 30 years at 5% interest, resulting in an annual amortized payment.
2. The remaining forty percent of capital expenditures plus O&M costs are paid using the "pay-as-you-go" method in each future year.
3. All costs include the effects of inflation.

October 5, 2015 JPA Board Meeting

TO: JPA Board of Directors

FROM: Facilities & Operations

Subject: Tapia NPDES Permit Renewal: Proposal for Technical Assistance and Pilot Watershed Management Project

SUMMARY:

As negotiations proceed with the Los Angeles Regional Water Quality Control Board (RWQCB) for renewal of the NPDES permit for the Tapia Water Reclamation Facility, staff recommends engaging the services of a firm with expertise and regional experience in handling such technical negotiations. Larry Walker Associates (LWA) is uniquely qualified to perform the work, which would include utilizing elements of a watershed-based nutrient management approach. Staff recommends that the Board accept a proposal from LWA in the amount of $97,489 for the work.

RECOMMENDATION(S):

Accept a proposal from and authorize the General Manager to execute a professional services agreement with Larry Walker Associates, in the amount of $97,489, to provide expert technical assistance for the renewal of the Tapia NPDES Permit utilizing a watershed-based nutrient management planning approach; and budget and appropriate $107,237 to fund the work.

FISCAL IMPACT:

Yes

ITEM BUDGETED:

No

FINANCIAL IMPACT:

A budget and appropriation of $107,237, including a 10% contingency, is recommended to fund the work. The cost of the work would allocated 70.6% to LVMWD and 29.4% to Triunfo Sanitation District.

DISCUSSION:

Background:

On March 29, 2013, the Board adopted a strategy to address proposed, increasingly stringent regulatory standards for Malibu Creek. The strategy included engaging in the regulatory process, determining the full cost of compliance, communicating effectively with the JPA's customers, advocating for balanced regulations with elected and appointed officials, and developing a better scientific understanding of the basis of the proposed regulations.

The Board and staff have already taken a number of actions to implement the strategy, such as approving a cooperative study to better understand the effect of invasive species on benthic macroinvertebrate communities and initiating work to prepare a Basis of Design Report for implementation of the Recycled Water Seasonal Storage Plan of Action. At this time and to further implementation of the strategy, staff believes it would be prudent to engage a firm with technical expertise and regional experience to assist with negotiations for Tapia's NPDES permit renewal.

About Larry Walker Associates:

Larry Walker Associates (LWA) is an environmental engineering and consulting firm providing innovative

water quality solutions to agencies throughout California. The firm and its staff have extensive experience in NPDES permit negotiations, most recently helping Ojai Valley Sanitation District to obtain a permit renewal that incorporated a comprehensive long-term implementation plan to comply with stringent nutrient standards.

State Nutrient Management Policy:

LWA and its president, Mr. Tom Grovhoug, are currently part of an important CASA-led effort to engage with the State Water Resources Control Board (SWRCB) on development of a statewide nutrient management policy. Mr. Grovhoug along with Bobbi Larson of CASA have been instrumental in promoting the benefits of a watershed-based nutrient management planning approach in lieu of strict end-of-pipe limits for nutrients.

As part of the effort, CASA and LWA have partnered with The Freshwater Trust, an Oregon-based not-for-profit organization that actively works to preserve and restore freshwater ecosystems. The Freshwater Trust has been a strong advocate of watershed-based nutrient management and assisted to CASA to garner support from the SWRCB Members to explore a pilot effort aimed to prove the validity of the concept. The Malibu Creek Watershed is an ideal candidate for such a pilot.

NPDES Permit Renewal Assistance:

LWA and The Freshwater Trust, working as a sub-consultant to LWA, propose the following general tasks in assisting the JPA with Tapia's NPDES permit renewal. The effort for each task may be adjusted slightly, depending on the timing and content of the draft NPDES permit.

- Development of a well-articulated strategy for the JPA to follow in the NPDES permit renewal negotiations. The strategy will allow the JPA to systematically address issues raised during the negotiations and draw from LWA's past experience negotiating other permits.
- Review of the JPA's existing NPDES permit to develop a list of desired changes.
- Review and comment on a draft NPDES permit, when issued, including references to "lessons learned" from recently adopted permits. The review will result in suggested changes to the draft permit.
- Preparation of meeting materials, and meeting with regulatory agencies during the permit renewal process.

Watershed-Based Nutrient Management:

Watershed-wide management or "water quality trading" as a compliance measure in lieu of strict end-of-pipe limits have been supported by the SWRCB and USEPA Region 9. The concept is not new and is being implemented in variety of watersheds including some in California. The USEPA issued a Water Quality Trading Policy in 2003, and the Water Environment Federation developed guidelines for water quality trading in 2006.

The concept involves developing watershed-wide nutrient reduction programs and projects that, combined with some level of point source treatment improvements, achieve water quality compliance, improve beneficial uses of receiving waters and provide a more economical solution for all parties. LWA, CASA and The Freshwater Trust have been active in promoting the concept as an alternative to strict "brick and mortar" solutions for TMDL and permit compliance. The SWRCB has indicated its support of the approach and interest in a pilot project proving the validity of the concept in meeting water quality goals.

LWA and The Freshwater Trust have proposed the following tasks to develop a work plan and budget for a potential pilot project in the Malibu Creek Watershed.

- Evaluation of current and future nutrient loading and near-field impacts.
- Review of service area and policies to ascertain any potential constraints for implementation of the concept.
- Evaluation of restoration potential and in-stream response analysis.
- Nitrogen and phosphorus credit analysis.
- Preparation of meeting materials and attendance at meetings with regulatory agencies (EPA Region

9, SWRCB, and RWQCB) to discuss the concept and linkage to TMDL compliance.
- Final report preparation and Board presentation.

Conclusion:

The JPA has completed a Recycled Water Seasonal Storage Plan of Action and embarked on preparation of a Basis of Design Report for two scenarios selected by the Board to significantly reduce discharges to Malibu Creek. This long-term plan to reduce discharges from Tapia, and thus nutrient loading to Malibu Creek, will be a key element for negotiation of an NPDES permit renewal.

However, implementing either scenario will take a decade or more, and the RWQCB will be seeking additional nutrient management actions in the meantime given the establishment of the *2013 Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to Address Benthic Community Impairments*. Treatment process optimization and modest improvements at Tapia, together with a possible pilot project to demonstrate the value of watershed-wide nutrient management, may bridge the gap and enable the JPA to achieve long-term regulatory compliance.

Prepared By: David R. Lippman, P.E., Director, Facilities and Operations

ATTACHMENTS:

Larry Walker Associates Proposal

The Freshwater Trust Scope of Work

Budget Summary

707 4th Street, Suite 200
Davis, CA 95616

530.753.6400
530.753.7030 fax

www.lwa.com

September 22, 2015

Mr. David Pederson
General Manager
Las Virgenes Municipal Water District
4232 Las Virgenes Road
Calabasas, CA 91302

LARRY WALKER ASSOCIATES

Proposal for NPDES Assistance and Pilot Watershed Services

Dave:

Thank you for the opportunity to talk on Wednesday, September 2 regarding the District's upcoming NPDES permit renewal and the issues facing the District as a result of the July 2013 Malibu Creek and Lagoon TMDL for Sedimentation and Nutrients to Address Benthic Community Impairments (Malibu Creek TMDL). As you noted in our conversation, the District's NPDES permit expired on August 10, 2015 and has been administratively extended. Your conversations with Regional Water Board staff have indicated that the permit renewal will likely occur in mid-2016.

As you have requested, we have prepared this scope of services and budget estimate to provide support to the District in the NPDES permit renewal effort.

As we discussed, our goal is to assist you and the District in working with Regional Board staff to implement provisions into the NPDES permit which provide an effective means of addressing the Malibu Creek TMDL through a three-pronged approach: (1) a long range District plan to increase recycling of treated effluent and to minimize treated wastewater discharges to Malibu Creek; (2) a District commitment to explore operational optimization at the Tapia Water Reclamation Facility in the short term to reduce nutrient levels in effluent and (3) participation in a pilot study of the Malibu Creek watershed to establish an effective nutrient management plan based on a holistic assessment of management capabilities and attainable biological outcomes. Under this approach, the renewed permit would provide adequate time for performance of the pilot study prior to establishment of effluent limits in the NPDES permit that would drive the need for major capital expenditures.

As you know, Larry Walker Associates (LWA) has been actively involved in the CASA-led effort over the past two years to inform SWRCB Board members and SWRCB staff regarding the benefits of a watershed-based nutrient management planning approach to nutrient regulatory policy. Working with CASA and representatives from the Freshwater Trust in the past several months, we have garnered strong support from all five State Board members for the concept of pilot watershed-scale efforts to prove the validity of this policy concept. We are encouraged to believe that such a pilot in the Malibu Creek watershed would be supported by State and federal regulatory agencies.

The Freshwater Trust is a non-profit organization from Portland Oregon with strong watershed restoration and Clean Water Act credentials. In the performance of this work, we would propose to include the Freshwater Trust as a subcontractor on our team to provide support in the performance of specific tasks.

We have developed the following scope of services and task descriptions for your review.

SCOPE OF SERVICES

Task 1 – Strategic Assistance

The purpose of this work will be to develop a well-articulated strategy for the District to follow in its NPDES permit negotiations to address TMDL implementation issues. This work will include development of the strategy and preparation of documentation supporting the strategy. This work will also include meetings with District staff to refine the approach that the District chooses to pursue in its NPDES permit negotiations to achieve its strategic goals and long range planning objectives.

Task 2 – NPDES permit Assistance

This work will include review of the District's existing NPDES permit (Order No. R4-2010-0165, NPDES No. CA0056014) with District staff to assist in the development of a listing of desired changes to the existing permit and proposed text for the renewed permit to support implementation of the strategy identified in Task 1. The task will also include review of the proposed Tentative Order, preparation of comments on the TMDL implementation provisions, and up to 20 hours of other assistance as requested by District staff.

Task 3 – Development of Pilot watershed study

As we discussed, an element of the District's strategy going forward may include participation in a pilot watershed study which will be the vehicle for addressing numerous issues pertaining to the existing TMDL, TMDL targets and nutrient wasteload allocations. This study will need to be adequately described and budgeted to allow the District and others to consider such work as part of an overall package in the NPDES permit negotiations. The work under this task will include development of a workplan and budget for the proposed watershed pilot study and performance of services to provide preliminary work on the pilot effort. The workplan will be tailored to the specific needs of the District, its watershed, its NPDES permit and Malibu Creek TMDL provisions. The workplan will include a description of pilot study goals and objectives, overall structure, and major tasks, including data analysis, monitoring and modeling elements, and reporting. The pilot study services will follow the task breakdown described in the attached scope of services provided by The Freshwater Trust.

Task 4– Meetings with Regulatory Agencies

This task includes meetings with District, Regional Water Board, State Water Board, and USEPA Region IX representatives to discuss the pilot watershed study concept, content, and linkages between the NPDES permit provisions and TMDL implementation requirements. The task includes assistance to the

District with meeting preparation, development of meeting agendas and handout materials, and meeting follow-up. It is anticipated that four meetings with Regional Water Board staff and one meeting each with State Board and USEPA Region IX representatives will occur under this task.

Task 5 – Other Services as Requested by District

If, during the course of the work, other desired services are identified by the District, those services would be performed under this task. Prior to the performance of any work under this task, an authorization from the District and a scope and budget for those services shall be approved by the District.

ESTIMATED FEES

The estimated fees for performance of the above work is described in Table 1 (attached). The total estimated fees for this work are $97,489.

SCHEDULE

We propose to work closely with the District in the performance of the above described tasks. Following notice to proceed, we estimate the work described above will be completed in five months. We will work with District staff to adjust the schedule to meet the needs of the NPDES permit renewal schedule.

Again, we thank you for the opportunity to assist the District in the NPDES permit renewal effort and in the development of a strategy and plan for dealing with the Malibu Creek TMDL. Let us know if you have any questions.

Sincerely,

Thomas R Grovhoug

Thomas R. Grovhoug
President, Larry Walker Associates

Cc: Alex Johnson, The Freshwater Trust

Attachments

The Freshwater Trust®
Changing the course of conservation.

The Freshwater Trust is a 501(c)(3) Oregon-based not-for-profit organization that actively works to preserve and restore our freshwater ecosystems.

Watershed Pilot Program Feasibility Study

Draft Scope of Work for Larry Walker Associates

September 22, 2015

Introduction: The Las Virgenes Municipal Water District (LVMWD) faces strict new nitrogen and phosphorus limits at the point of discharge of its Tapia Wastewater Treatment Facility. These limits stem from a recent Total Maximum Daily Load (TMDL) for Malibu Creek. As a result, the LVMWD would like to explore the potential for a watershed pilot program as a compliance option to be incorporated into its upcoming National Pollutant Discharge Elimination System (NPDES) permit. The Freshwater Trust (the Trust), an environmental nonprofit organization committed to increasing the pace and scale of river restoration and with a history of developing such programs, proposes to assist in the development of a watershed pilot program for the LVMWD and its lead permitting consultant, Larry Walker Associates (LWA).

Analysis Needed: The California State Water Resources Control Board (SWRCB) and EPA Region 9 have supported watershed management and water quality trading as a compliance solution to achieve TMDL objectives and meet NPDES load limits in water quality limited waterbodies. This compliance option is consistent with those used in other municipal sewer districts and permitted treatment facilities across the United States, including Pennsylvania, Virginia, Oregon, Montana, North Carolina, and Wisconsin, which are similarly evaluating and/or implementing watershed management and water quality trading programs. The LVMWD's current goal is to examine options to cost-effectively achieve NPDES and TMDL compliance by evaluating attainable management goals and assessing the benefits of reducing overall nitrogen and phosphorus loading to the Malibu Creek system in comparison to other watershed management alternatives. Desired benefits include improving functional conditions instream to effect a positive response by benthic biota in

the area downstream of the Tapia discharge as per the overarching goals of the recent TMDL. The Trust will assist in the development of a watershed management pilot program as an element of a long term compliance solution for the LVMWD. The pilot program will seek to define how further coordinated action throughout a watershed can achieve desired water quality and habitat improvements. The Trust proposes a Scope of Work comprised of the following tasks:

Task 1) Potential Future Loading and Near Field Impacts Evaluation

4 weeks from project kick-off

- → The Trust will review the LVMWD's discharge monitoring reports to establish current nitrogen and phosphorus loadings and make future projections based on population growth and known facility or process changes.
- → Potential future nutrient limits will be estimated for the LVMWD (or confirmed with the LVMWD and LWA) using the recent Malibu Creek TMDL. A range of potential wasteload allocations will be defined through consultation with the LVMWD and LWA in order to evaluate the potential for water quality trading in conjunction with technological solutions.
- → The Trust will review the available effluent data and water quality information to confirm that the facility's discharge is not resulting in a localized impact.

Deliverable:

1. The Trust will provide a report containing an evaluation of the LVMWD's current and future pollutant loading scenarios for both phosphorus and nitrogen in its wastewater discharge. This document will clearly reference relevant equations, assumptions and methodology used so results can be easily evaluated by LVMWD staff and LWA. The results of this analysis will better inform the necessary elements of a watershed management and water quality trading program for compliance, and frame both the likely schedule of credit need and the number of credits likely required for purchase.

Estimated Cost: $10,305

Task 2) Service Area Identification & Policy Review

14 weeks from project kick-off

→ Service area identification: The "service area" is the watershed area within which compliance options will be evaluated. This area is typically inclusive of all land upstream of the 'point of maximum impact' as identified in a TMDL; the regulating agency can also determine/confirm the service area for a given facility. The Trust will review the Malibu Creek TMDL, the Regional Water Board's Basin Plan, and other watershed documents in depth to determine likely service area for credit generation, and review service area conclusion(s) with the LVMWD, LWA, and regulatory stakeholders as directed.

→ Policy review to support watershed management and trading: Focusing on LVMWD's discharge and local watershed ecology, The Trust will review applicable materials pertinent to water quality trading and water quality standards in the State of California and the Los Angeles Regional Water Quality Control Board's area. Those materials, which include federal, state, and local statutes, regulations, and policy documents, will provide a complete understanding of the framework for potential watershed management and trading.

Following this review, The Trust will have the ability to determine the specific characteristics of potential management and trading scenarios in the area. Moreover, this analysis will result in the preliminary identification of any potential barriers to implementation of a watershed management or trading program in the Malibu Watershed. Using this information, The Trust will ascertain how these policy and legal constraints may impact the actions likely required of LVMWD in order to anticipate the scope of a potential program.

Deliverable:

1. The Trust will develop a technical memo documenting:
    - The potential service area with ecologically appropriate areas for expansion identified
    - A description of the baseline obligations within the potential service area and the expected impacts on outcomes
    - A synopsis of important points and considerations of a potential pilot program

that would achieve nutrient compliance for LVMWD

Estimated Cost: $7,200

Task 3) Evaluation of Restoration Potential & Instream Response Analysis

10 weeks following Task 1

- Evaluation of restoration potential: In addition to direct reductions in nutrient loads, improved stream and riparian vegetation conditions will be evaluated to assess potential improvements in aquatic habitat for benthic biota. The Trust will review available watershed data and information, including remote sensing data and results of other local restoration efforts, to identify potential restoration actions that will improve instream conditions in Malibu Creek and its tributaries. The Trust will focus on restoration actions that will improve habitat conditions for benthic macroinvertebrates and reduce nuisance algal growth. This information will be used to identify attainable goals for benthic conditions in Lower Malibu Creek downstream of the Tapia Wastewater discharge.
- **Instream response analysis:** The Malibu Creek TMDL points to the need for riparian shade to decrease nuisance algal growth, increase river function and improve benthic communities. The Trust will leverage a concurrent research effort and assemble the state of scientific understanding of the benefits associated with improved instream and riparian conditions. Where possible, The Trust will identify where improved ecological conditions have been found to lead to improvements in benthic communities. The Trust will work with LWA to explore use of the Biological Condition Gradient approach as a tool to link nutrient concentrations and improved ecological condition to attainment of benthic community condition goals in Lower Malibu Creek.

Deliverables:

1. The Trust will develop a technical memo documenting:
   - The ecologically appropriate restoration actions for Malibu Creek and its tributaries, and the potential for restoration actions in the watershed. These actions will be described in detail and displayed on a draft restoration

opportunities map of Malibu Creek.

- A description of functional river and water quality benefits possible through identified restoration actions.

Estimated Cost: $16,425

Task 4) Nitrogen and Phosphorus Credit Cost Analysis & Final Report

6 weeks (overlapping with Tasks 2 and 3)

→ Cost analysis: If the Instream Response Analysis demonstrates a high likelihood of a reasonable supply of nitrogen and phosphorus credits, then the cost range of programmatic implementation will be coarsely estimated to aid in decision making and implementation planning. The Trust will conduct an analysis to estimate the costs of the potential nitrogen and phosphorus credit-generating actions within the LVMWD's service area to bracket the potential total program implementation cost.

→ Final report development: The Trust will package all findings in a comprehensive final report for LVMWD and LWA review.

Deliverables:

1. The Trust will develop an additional section of the Technical Memo describing the potential range of costs to implement a nitrogen and phosphorus water quality trading program as an option for the LVMWD's compliance with upcoming NPDES permits.
2. The Trust will finish this Scope of Work with a Final Report after receiving comments.

Estimated Cost: $12,050 (including travel to Los Angeles/Malibu for 2 people for 1 in-person meeting)

Assumptions:

- The LVMWD and LWA will review and provide comment on draft deliverables; and
- The LVMWD will be notified in advance and will participate in meetings between its

consultant engineers (LWA) and The Trust.

Suggested Meetings:

- The exact meeting schedule will be determined after contracting, but The Trust proposes participation in a kick-off meeting with the LVWMD and LWA at the beginning of this Scope of Work.
- The Trust will participate in scheduled conference calls with the LVWMD and LWA as needed.
- The Trust proposes an in-person concluding presentation of the deliverables developed through this Scope of Work in February or March of 2016. This meeting will conclude by answering any questions and developing next steps.

Timeline:

Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Task 1																		
Task 2																		
Task 3																		
Task 4																		

Total Estimated Cost: $45,980

The Freshwater Trust®
65 SW Yamhill Street
Suite 200
Portland, OR 97204
www.thefreshwatertrust.org
Phone: 503.222.9091
Fax: 503.222.9187

Conclusion:

The Trust has proposed this Scope of Work based on deep experience and understanding of water quality trading program development. The Trust will help the LVWMD and LWA develop a solid understanding of watershed management and water quality trading options for NPDES compliance in Malibu Creek in order to better compare and/or integrate with other compliance alternatives.

Who to contact for next steps:

The Freshwater Trust appreciates Larry Walker Associates and the Las Virgenes Municipal Water District's interest and review. Please direct questions, comments and additions to:

Alex Johnson
Senior Freshwater Solutions Director
503-222-9091 x18
alex@thefreshwatertrust.org

Table 1

Las Virgenes Municipal Water District

NPDES Permit Assistance and Pilot Watershed Studies

9/22/2015

Larry Walker Associates
In association with
The Freshwater Trust

Task No.	Task Description	LWA Labor TG	AD	Proj Eng	LWA ODCs	LWA Cost	Freshwater Trust
1	Strategic Assistance	12	16		100	7,820	5,000
2	NPDES Permit Assistance	12	20	24	100	13,440	12,505
3	Development of Pilot Watershed Study	20	20		50	11,150	23,475
4	Meetings with Regulatory Agencies	24	36		300	16,800	5,000
5	Other Services	TBD	TBD	TBD	TBD	TBD	TBD
	SUBTOTALS					49,210	45,980
	TOTAL (includes 5% subcontract markup)						97,489

October 5, 2015 JPA Board Meeting

TO: JPA Board of Directors

FROM: General Manager

Subject: Time and Location of Regular JPA Board Meetings

SUMMARY:

On February 2, 2015, the JPA Board took action to hold all future JPA Board meetings at the Las Virgenes Municipal Water District headquarters, with the exception of the March and September meetings of each year, which would be held at the Oak Park Library. Adoption of Resolution No. 4 is necessary to supersede Resolution No. 05-10-0002 that previously established the location would alternate every month.

RECOMMENDATION(S):

Pass, approve, and adopt Resolution No. 4, establishing the time and location for regular meetings.

RESOLUTION NO. 4

A RESOLUTION OF THE GOVERNING BODY OF THE LAS VIRGENES - TRIUNFO JOINT POWERS AUTHORITY ESTABLISHING THE TIME AND LOCATION FOR REGULAR MEETINGS

(Reference is hereby made to Resolution No. 4 on file in the JPA's Resolution Book and by this reference the same is incorporated herein.)

FISCAL IMPACT:

No

ITEM BUDGETED:

No

FINANCIAL IMPACT:

There is no financial impact associated with this action.

DISCUSSION:

The JPA executed a Joint Exercise of Powers Agreement on January 26, 2009. Article One states that meetings of the JPA shall be held at times and places as determined by the Board. On May 17, 2010, the JPA Board adopted Resolution No. 05-10-0002, establishing the time and location for regular meetings and specifying that the meeting location would alternate monthly between Las Virgenes Municipal Water District headquarters and the Oak Park Library.

Resolution No. 4 establishes that all future JPA Board meetings are to be held at the Las Virgenes Municipal Water District headquarters, with the exception of the March and September meetings of each year, which are to be held at the Oak Park Library.

Prepared By: Josie Guzman, Executive Assistant/Clerk of the Board

ATTACHMENTS:

Resolution No. 4, Establishing Time and Location for Regular Meetings

RESOLUTION NO. 4

RESOLUTION OF THE GOVERNING BOARD OF THE LAS VIRGENES-TRIUNFO JOINT POWERS AUTHORITY ESTABLISHING THE TIME AND LOCATION FOR REGULAR MEETINGS

BE IT RESOLVED BY THE GOVERNING BOARD OF THE LAS VIRGENES-TRIUNFO JOINT POWERS AUTHORITY as follows:

1. Purpose.

This resolution sets the time and location for regular meetings.

2. Regular Meetings.

(a) Regular meetings shall be held on the first Monday of each month.

(b) Regular meetings shall be held at 4232 Las Virgenes Road, Calabasas, California 91302, with the exception of the regular meetings occurring in the months of March and September, which will be held at the Oak Park Library, 899 North Kanan Road, Oak Park, California 91377.

(c) In all respects, meetings of the governing board shall be conducted in accordance with the Brown Act.

PASSED, APPROVED AND ADOPTED on the _____ day of _____, 2015.

_____
Chair

ATTEST:

_____
Vice Chair

[Seal]

APPROVED AS TO FORM:

_____
Legal Counsel

October 5, 2015 JPA Board Meeting

TO: JPA Board of Directors

FROM: Facilities & Operations

Subject: Purchase of Dewatering Container and Ramp for Disposal of Grit and Rags

SUMMARY:

On September 1, 2015, staff recommended approval to purchase a container and ramp to be used for dewatering and disposal of grit and rags removed from the JPA's trunk sewer system and sludge wet wells at the Rancho Las Virgenes Composting Facility. The Board deferred action on the item to allow for staff to provide additional information in response to questions that arose at the meeting. This item provides answers to the questions and recommends approval of the purchase.

RECOMMENDATION(S):

Approve the purchase of a dewatering container and ramp from Wastequip, LLC in the amount of $27,956.26

FISCAL IMPACT:

Yes

ITEM BUDGETED:

Yes

FINANCIAL IMPACT:

The adopted Fiscal Year 2015-16 JPA Budget includes $50,000 for this equipment, which would be allocated 70.6% to LVMWD and 29.4% to Triunfo Sanitation District.

DISCUSSION:

Background:

The JPA outsources the removal of grit and rags from the trunk sewer system and sludge wet wells at Rancho via vacuum truck as part of routine maintenance. The service does not include transport and disposal of the grit and rags, primarily due to the high cost of multiple trips to transport the material. As a result, the purchase of a dewatering container and ramp would allow for the vacuum truck contractor to dispose of materials at the Tapia Water Reclamation Facility for subsequent haul off by Waste Management, Inc. Waste Management has existing routes to the Tapia Water Reclamation Facility and incorporating a pickup for this dewatering container would be an efficient means to dispose of the material without impacting plant operations or building additional facilities.

Bid Process:

On June 23, 2015, quotes for the container and ramp were solicited from Wastequip, Con-Fab, and Bucks Fabrication. Con-Fab failed to submit a formal quote, and Bucks Fabrication provided a quote but subsequently withdrew its bid. Neither Con-Fab nor Bucks Fabrication make or sell the ramp, and the shipping cost for the container, if formally quoted, would have been thousands of dollars. For comparison, Wastequip quoted the equipment with a minimal shipping cost because it would originate from a west coast manufacturing facility.

Additional Information in Response to Questions:

The 20-yard container is a water-tight, roll-off unit with a perforated metal basket permanently attached to the inside that acts like a strainer. A disposable liner is placed inside the perforated metal basket and allows liquid to pass through, while retaining grit, rags, and sludge. The metal basket has 3/8-inch perforations that provide support for the disposable liner and allow liquids to pass through it. The unit includes a side-to-side roll tarp for hauling, which can also be used to contain odors when in place.

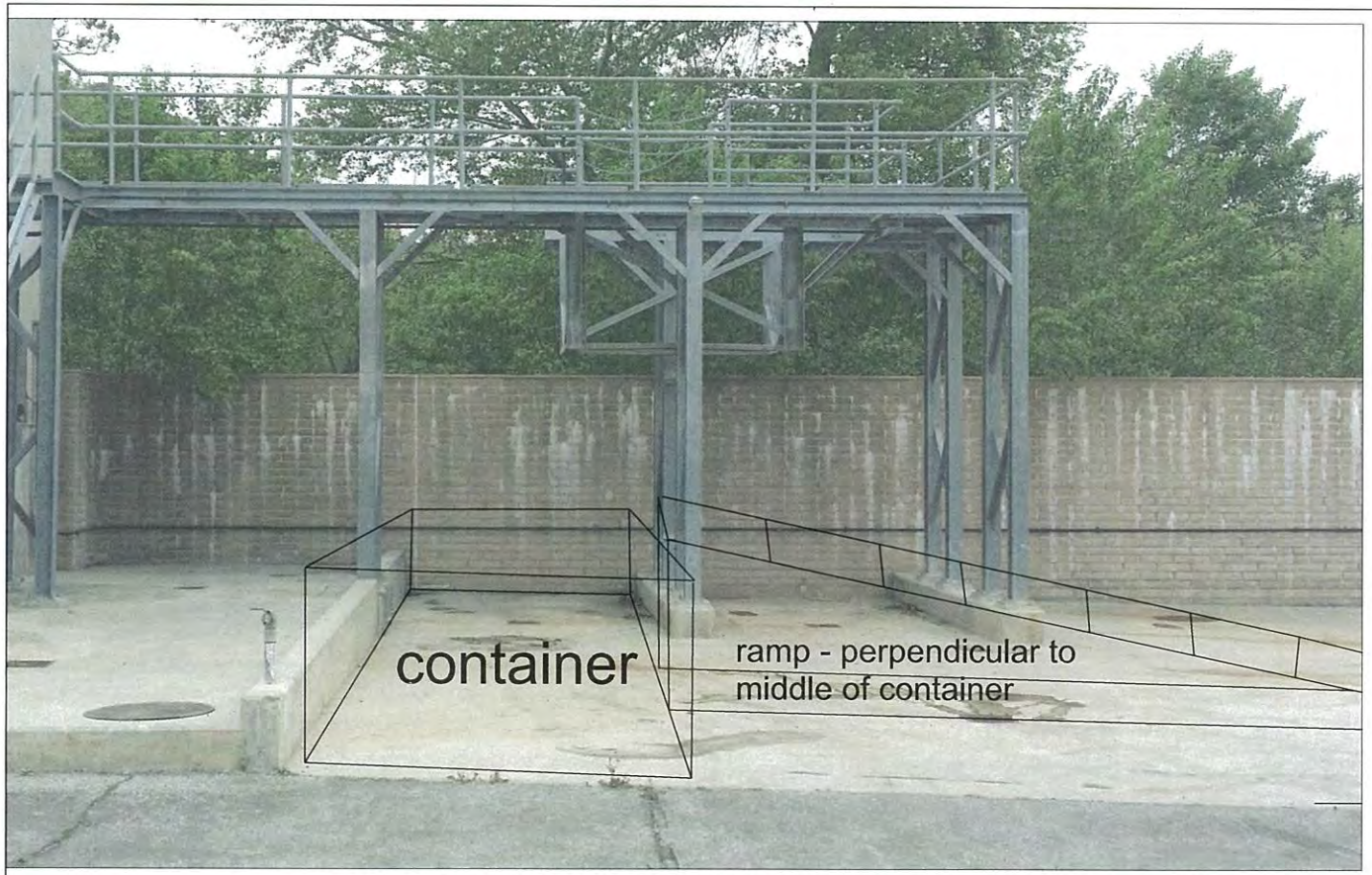
When in operation, the disposable liner would be placed in the perforated basket. Vacuum trucks would back up the ramp and dump their loads, consisting primarily of liquid but also containing grit and rags, into the unit. The liquid would pass through the disposable liner and perforated metal basket, collecting at the bottom of the container, while the grit and rags would be captured by the disposable liner. Once sufficiently decanted, the liquid would be drained through a 4-inch capped port on the container into existing collection drains that conveying it to Tapia's headworks.

Once every few months, Waste Management would hauls off the container to dump the contents. A gasketed rear door can be opened to allow the disposable liner holding the grit and rags to slide out, leaving the container and metal basket empty. Waste Management would then return the container, and staff would install a new disposable liner. It is estimated to cost from $450 to $850 per load to empty the container, depending on the weight and including the cost of pick-up, dumping and replacement of the disposable liner.

Prepared By: Eric Maple, P.E., Associate Engineer

ATTACHMENTS:

Ramp, Container and Liner Information



RAMP AND CONTAINER TO BE PLACED IN EXISTING UNUSED BELT PRESS AREA AT TAPIA

REV.	DATE	DESCRIPTION	APPR.	REV.	DATE	DESCRIPTION	APPR.

MUNICIPAL ENGINEERING

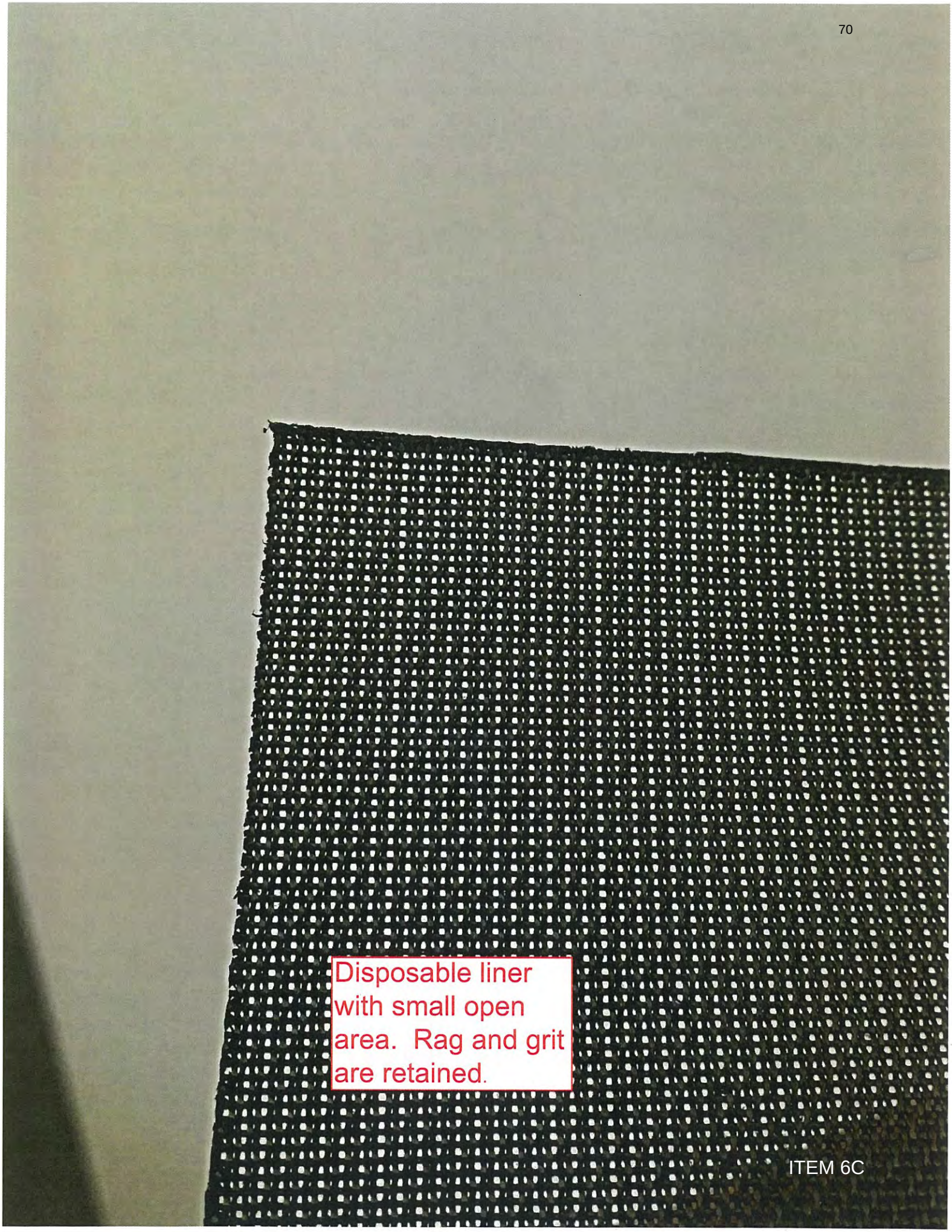
DESCRIPTION

SEWER GRIT HANDLING PROJECT
PLAN

ITEM 6C


Perforated basket with large perforations. Liner placed on top.

ITEM 6C

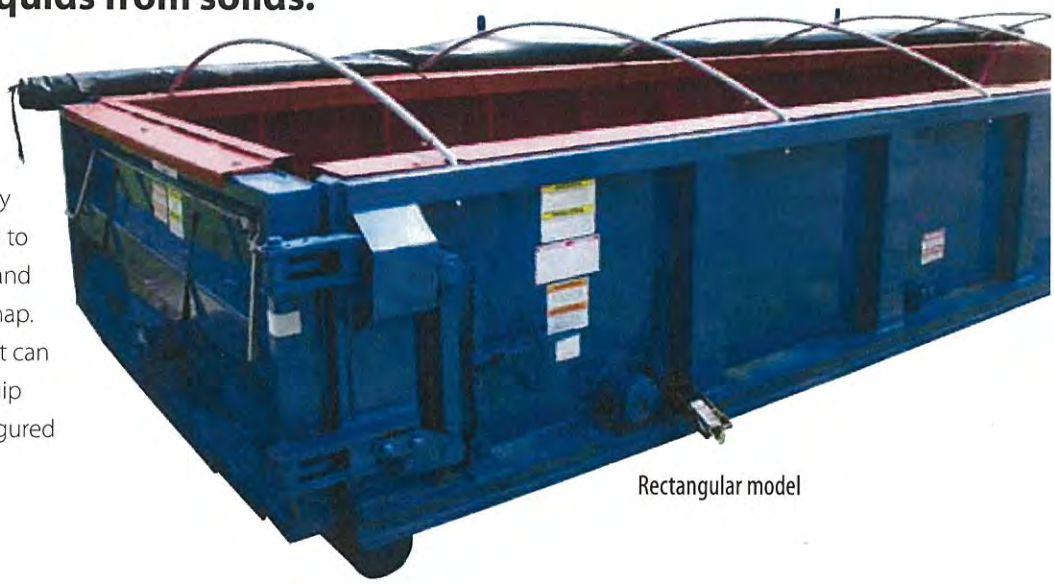

Disposable liner with small open area. Rag and grit are retained.

ITEM 6C

ROLL-OFF SLUDGE CONTAINER
with Dewatering Shell

Dewatering containers reduce the cost of waste disposal by separating liquids from solids.

Wastequip dewatering containers are ideal for wastewater treatment facilities, manufacturing facilities, spill sites, construction sites, refineries and mines. They feature gasketed doors and are hydro tested to ensure they will not leak. Disposable liners and the easy-to-remove shell make clean up a snap. Since the shell is easily removed with bolts, it can also be used as a sludge container. Wastequip dewatering containers can be custom configured for specific applications.



Rectangular model

Specifications

Container	• 1/4" floor, 7 gauge sides • All continuous welds inside • Solid steel nose cone • Outside rail understructure • 3 1/2" x 6" side stakes on 36" centers • 5" x 3" x 3/16" rectangular tubing top cap • 6" x 2" x 1/4" rectangular tubing long sills • 3" (3.5#) structural channel cross sills • Front and rear rollers standard
Dewatering shell	• 1/2" flat #13 expanded metal sides with "J" hooks (sides, front and door) • 7 gauge perforated floor, 52% open
Door	• Full rear door bracing • Rear door gasketed with neoprene rubber or T gasket
Clean out	• (1) 4" drain located on rear door; additional models available with (2) 6" clean-outs • Removeable dewatering shell • Liners available
Sizes/ configurations	• 20 or 25 cu. yd. • Round-bottom or rectangular container • Custom sizes available

Bolt-in liners are easily removed.

Round bottom model

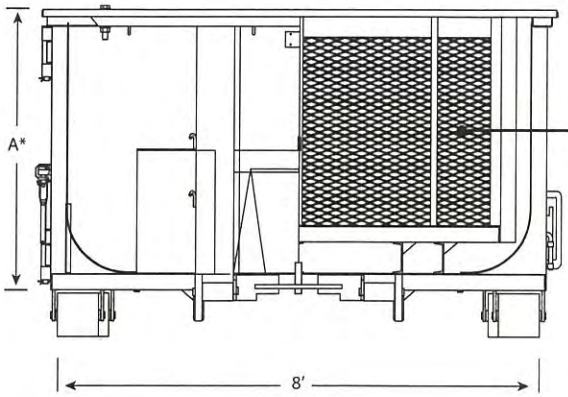
WASTEQUIP

Tel: 877.468.9278
envirosales@wastequip.com
www.wastequip.com

WASTEQUIP Toter Galbreath CUSCO PIONEER Mountain Tarp PARTS PLACE

ROLL-OFF SLUDGE CONTAINER
with Dewatering Shell

Dewatering shell in round bottom sludge container



Removeable dewatering shell

Removeable dewatering shells and disposable liners make clean up easy.

* Dimension "A" is 3 ft. 5 in. for 20 yard containers and 4 ft. 3 in. for 25 yard containers.

Available options

Side to side roll tarp with bows and bow pockets or single piece, side-to-side plastic or aluminum lids.

Drains and valves can be custom configured.

Container weights (lbs.) with lid options

Size	Open top	Steel lid	Aluminum lid	Plastic lid
20 yard	5,655	8,055	6,444	6,285
25 yard	6,125	8,525	6,914	6,755

PIONEER — Tarps available through Wastequip's Pioneer brand

PARTS PLACE — Replacement parts available online at www.partsplace-inc.com

Standard Color Choices

Black, Dark Gray, Light Gray, Teal, Cadet Blue, Green, Tan, Gold, Orange, Red, Blue Gray, Indigo, Royal Blue, Brown, Charcoal

WASTEQUIP

Wastequip is the leading North American manufacturer of waste and recycling equipment for collecting, processing and transporting recyclables and solid or liquid waste.

WQP013-72010

ROLL-OFF TRUCK RAMP

WASTEQUIP
Tel: 877-468-9278 | sales@wastequip.com
www.wastequip.com

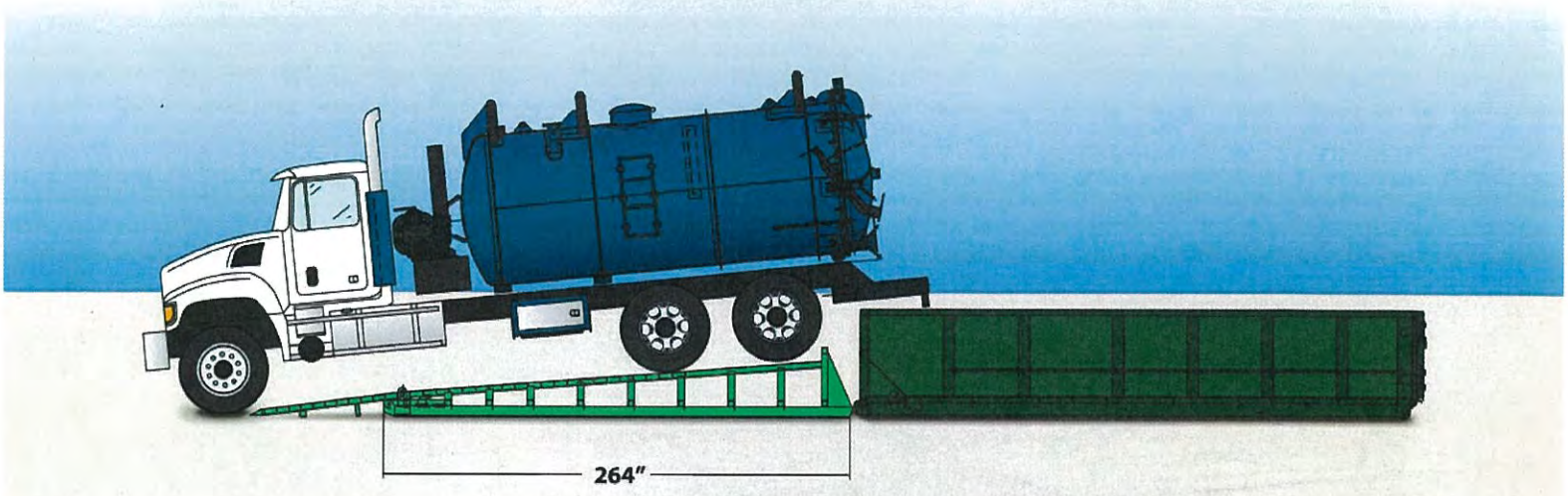
Wastequip truck ramps make it easy for trucks to empty into sludge and dewatering containers.

Features & Benefits:

- Outside rail understructure
- Spring-assisted fold-up ramps
- 43" grade lift
- Rated at 100,000 lbs. maximum capacity
- Outer rails 5 x 3 x 1/4" tubing
- Rear wheel bumper
- All standard Wastequip paint colors available (see reverse)
- 20' of cat walk standard
- Tire guides
- Long sills 5 x 2 x 1/4" tubing
- Gussets on long sills and outer rails

Options:

- Side-mounted fold-down catwalks (over 20')
- Pinned rear outriggers for stability on uneven surfaces



Drawing is for illustration purposes only and is not to scale.

October 5, 2015 JPA Board Meeting

TO: JPA Board of Directors

FROM: General Manager

Subject: Consideration of a Board of Directors' Code of Conduct

SUMMARY:

On September 1, 2015, JPA Board Vice-Chair Glen Peterson requested a future agenda item for the Board to consider establishing norms of behavior and protocol for conducting the JPA's business. Staff assembled the attached draft Board of Directors' Code of Conduct, drawing content from a similar document recently adopted by the LVMWD Board, to facilitate the Board's discussion.

RECOMMENDATION(S):

Review, comment and consider approval of the draft Board of Directors' Code of Conduct.

FISCAL IMPACT:

No

ITEM BUDGETED:

No

FINANCIAL IMPACT:

There is no financial impact associated with this item.

DISCUSSION:

On August 25, 2015, the LVMWD Board adopted a Board of Directors' Code of Conduct, establishing norms of behavior and protocol for conducting LVMWD's business. JPA Board Vice-Chair Glen Peterson suggested that the JPA consider adopting a similar code of conduct and, therefore, requested a future agenda item for the JPA Board to discuss the issue.

Background:

Many elected bodies adopt "norms" or a "code of conduct" to reflect accepted behaviors of public officials and to document expectations for interactions with the agency's staff and the public. In developing the draft, staff researched and reviewed sample norms and codes of conduct, including those adopted by the West Basin Municipal Water District and the cities of Agoura Hills, Calabasas, Thousand Oaks and Santa Clarita. Although each agency adopted a slightly different approach, a number of common items appeared in the documents. Drawing from those items, staff assembled the attached draft Board of Directors' Code of Conduct to facilitate the Board's discussion on the topic.

Prepared By: David W. Pedersen, Administering Agent/General Manager

ATTACHMENTS:

Draft Board of Directors Code of Conduct

LAS VIRGENES-TRIUNFO JOINT POWERS AUTHORITY

BOARD OF DIRECTORS' CODE OF CONDUCT

The Board of Directors of the Las Virgenes-Triunfo Joint Powers Authority (JPA) adopted the following norms of behavior and protocol (Code of Conduct) for conducting the JPA's business in an ethical and professional manner. The norms are intended to serve as guidelines for Directors to maintain the credibility of the JPA and foster public trust.

General

- Treat other Directors, staff and the public with courtesy and respect.
- Avoid criticizing individuals in public by focusing on the issues or work products.
- Avoid misrepresenting facts or making assertions that are inaccurate or untrue.
- Avoid promulgating inaccuracies or falsehoods.
- Stay abreast of issues affecting the JPA and other local agencies.
- Refrain from communications that may constitute a violation of the Ralph M. Brown Act such as discussions among a quorum of Directors, at one time or serially, face-to-face or otherwise.
- Maintain the confidentiality of non-public information.
- Ensure public statements, op-eds or letters to the editor that do not reflect the policy of the majority of the Board are cited as personal opinion.

Public Meetings

- Inform other Directors and the Administering Agent General Manager (General Manager) of unexpected issues that may arise at a public meeting.
- Be prepared for Board meetings by reviewing the agenda and supporting materials in advance.
- Respect the Board Chair's responsibility to run meetings.
- Seek recognition by the Board Chair before speaking and avoid interrupting other Directors.
- Listen carefully to public speakers, avoid interrupting and do not engage in debate; limit questions to those aimed to understand the speaker's point of view.
- Make remarks succinct and to the point in an effort to avoid tiring the public or engaging in tedious or repetitious discussion.

- Refrain from private communications with other Directors or the public via electronic communication devices while at the dais.

Decision-Making

- Make decisions based on public input.
- Attempt to persuade other Directors through reasoned debate and accept the majority's decision graciously and as policy of the Board.
- Articulate the reasoning for decisions for the benefit of the public, particularly when the Board is divided on an issue.

Business Operations

- Provide policy direction to the General Manager, and support the General Manager to implement policy through staff.
- Avoid unnecessary individual requests for the General Manager's time or attention to matters that may not be of interest to the majority of the Board.
- Obtain recommendations from the General Manager on JPA issues.
- Inform the Clerk of the Board in advance when unavailable for JPA business.
- Ensure direction to staff is supported by a majority of the Board and voice concerns timely with the direction provided.
- Initiate action to resolve problems cooperatively with other Directors or the General Manager as soon as possible.
- Demonstrate flexibility and cooperation to fill in for another Director at important meetings or functions.
- Direct concerns or complaints about staff to the General Manager.
- Avoid unduly influencing the content of staff reports.
- Forward copies of complaints from the public to the General Manager and allow staff to seek resolution and respond accordingly.
- Share copies of correspondence related to the JPA's business promptly with other Directors and the General Manager.
- Direct inquiries, questions or requests of staff, and concerns or complaints about staff, to the General Manager, recognizing that employees report to the General Manager.

INFORMATION ONLY

October 5, 2015 JPA Board Meeting

TO: JPA Board of Directors

FROM: Facilities & Operations

Subject: Wastewater Influent Flow Volume and Strength Trends: 2012 to 2015

SUMMARY:

This report summarizes wastewater influent flow volume and strength trends at the Tapia Water Reclamation Facility from January 2012 to August 2015. Overall, influent flow volume to Tapia has decreased by 34%, from 8.9 to 5.8 MGD, during the 3.5-year period. Meanwhile, the strength of wastewater influent, as measured by 5-day Biochemical Oxygen Demand (BOD), trended upward. Together, these trends appear to be driven by the extremely dry conditions and water conservation measures.

FISCAL IMPACT:

No

ITEM BUDGETED:

No

DISCUSSION:

Influent Flow Volume:

For the period of January 2012 through August 2015, the influent to Tapia has decreased by 34%, from 8.9 to 5.8 MGD. The relative contribution from LVMWD's service area decreased by 45%, from 6.0 to 3.4 MGD; whereas, the contribution from Triunfo Sanitation District's service area decreased by 9%, from 2.7 to 2.4 MGD [1]. Staff spoke with other treatment plant managers and found that they are experiencing similar downward trends but more frequently in the range of 20%. Chart 1 is attached and shows the combined LVMWD and Triunfo Sanitation District flows along with rainfall for the same period.

Influent Strength:

During the same period, influent strength as measured by the 5-day Biochemical Oxygen Demand (BOD) trended upward [2]. The increase in BOD indicates lower interior water consumption because the same amount of waste is being conveyed to Tapia with less overall water. Interestingly, the measured total suspended solids (TSS) decreased over the same period, which is somewhat surprising. However, the trend may be driven by the lack of scouring flows in the sanitary sewers and low infiltration rates. Chart 2 is attached and shows the BOD and TSS trends as well as rainfall for the same period.

Potential Causes of Trends:

Water years 2012 through 2014 stand as California's driest three consecutive years in terms of statewide precipitation [3]. Regionally, eight of the last ten years' rainfall measured at the Los Angeles Civic Center have been below average. The very dry conditions are mirrored in the JPA's service area where the seasonal average rainfall at Tapia from January 2012 to May 2015 has been 1.0 inch[4].

The very dry conditions have lowered the local groundwater tables given there is little or no storm water recharge. The lower groundwater levels have significantly reduced infiltration rates into the local collection systems and trunk sewers. During the rare storm event, surface water flows are less and of shorter duration because the flows infiltrate into dry ground surfaces rather than create sustained flows to local stream

and creeks. Many of the JPA's trunk sewers follow the creeks, exposing them to inflow during sustained creek flows. The dramatically reduced infiltration and inflow (I&I) rates contribute to the decrease in Tapia's influent.

On April 1, 2015, Governor Jerry Brown issued an Executive Order calling for a mandatory 25% statewide reduction in statewide urban water use. In July, the State Water Resources Control Board issued emergency regulations that grouped water agencies into different tiers to meet the overall 25% goal. LVMWD was required to reduce its demands by 36%; Oak Park Water Service was required to reduce by 32%. Other water purveyors in Triunfo Sanitation District's service area were required to reduce by amounts ranging from 28% to 36%.

The significant water use reductions are being meet by both indoor and outdoor device-based conservation and behavioral changes. Indoor device-based use reductions are achieved through installation of ultra-low flow toilets, low flow showerheads and high efficiency washing machines. Indoor behavioral changes are achieved through fewer flushes per day, reduced showering times and fewer daily loads in the dishwater and clothes washer.

At this time, it is very difficult to determine the actual amount of reduced flow volume attributed to changes in I&I versus conservation. However, the significant difference in flow volume reduction between LVMWD and Triunfo Sanitation District points to the greater influence of reduced I&I. All the larger diameter trunk sewers and longer reaches of the collection system are within LVMWD's service, leading to greater potential for I&I. If the El Nino conditions continue to build and bring heavy rains to the region this winter, staff may be able to better assess the influence of I&I on flow volumes because recent influent treads can be used for comparisons.

---

[1] The flows from Triunfo Sanitation District are metered at three locations. The contribution from LVMWD is calculated as shown on the attachment entitled "Net Influent Calculation."

[2] 5-day Biochemical Oxygen Demand (BOD) is the measurement of the dissolved oxygen used by microorganisms in the biochemical oxidation of organic matter.

[3] The water year extends from October 1st through September 30th.

[4] The seasonal (July 1st through June 30th) average rainfall from 1877 through 2015 is 14.81 inches at the Los Angeles Civic Center.

Prepared By: David R. Lippman, P.E., Director of Facilities and Operations

ATTACHMENTS:

Chart 1 - Tapia Influent

Chart 2 - BOD5 and TSS Trends

Net Influent Calculation

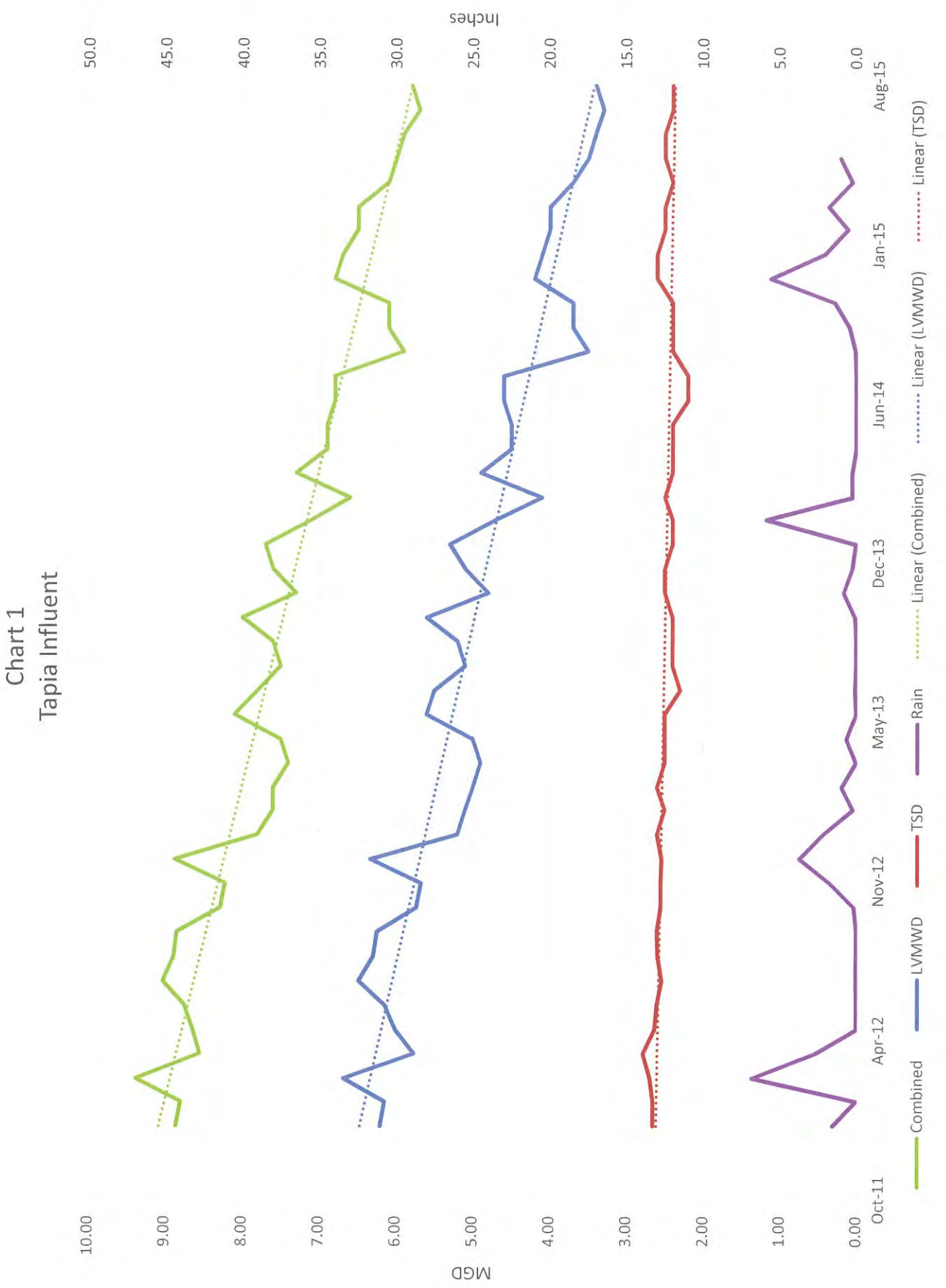


Chart 1
Tapia Influent
MGD
Inches
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-11
Apr-12
Nov-12
May-13
Dec-13
Jun-14
Jan-15
Aug-15
Combined
LVMWD
TSD
Rain
Linear (Combined)
Linear (LVMWD)
Linear (TSD)

ITEM 10A

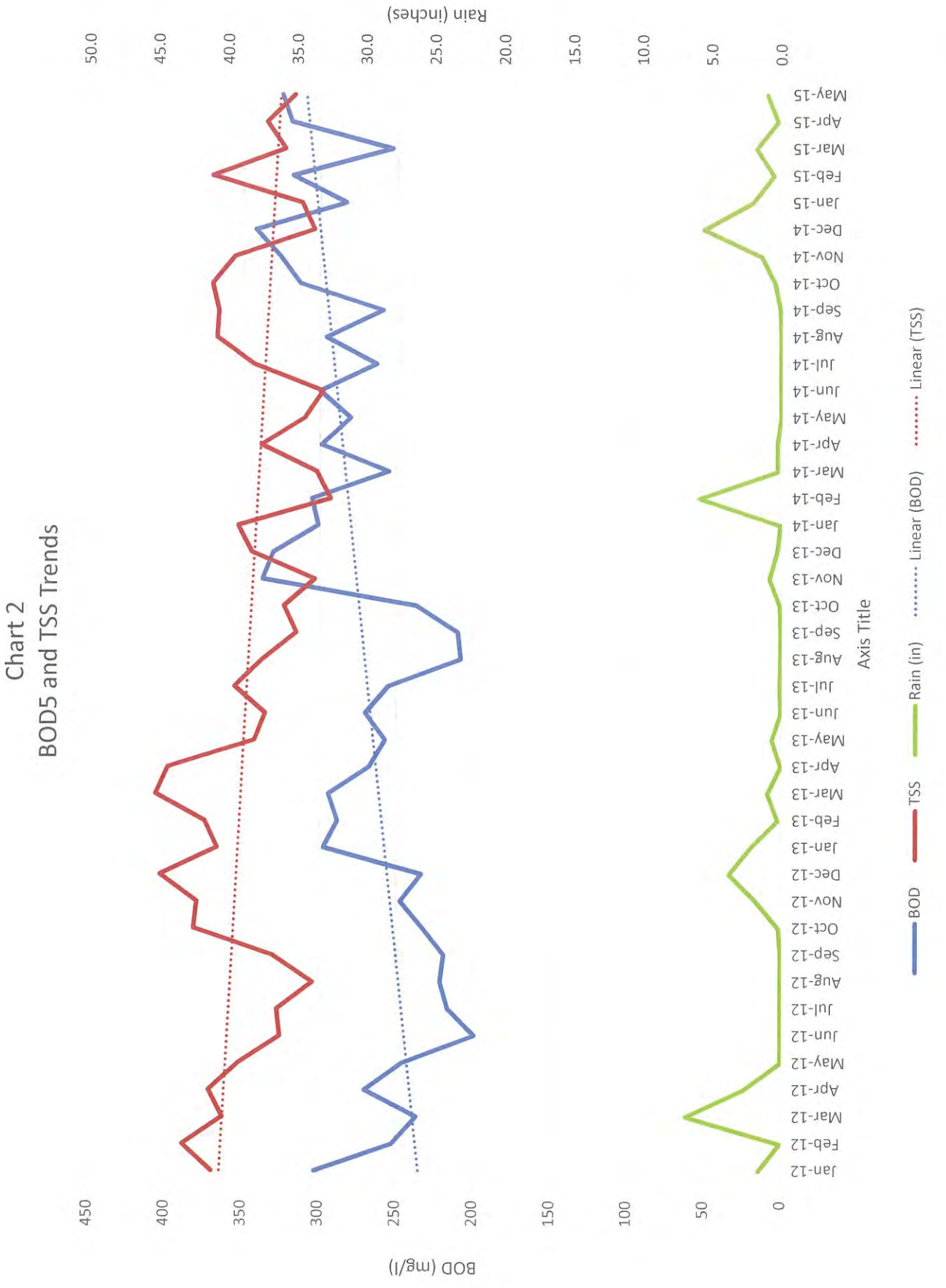
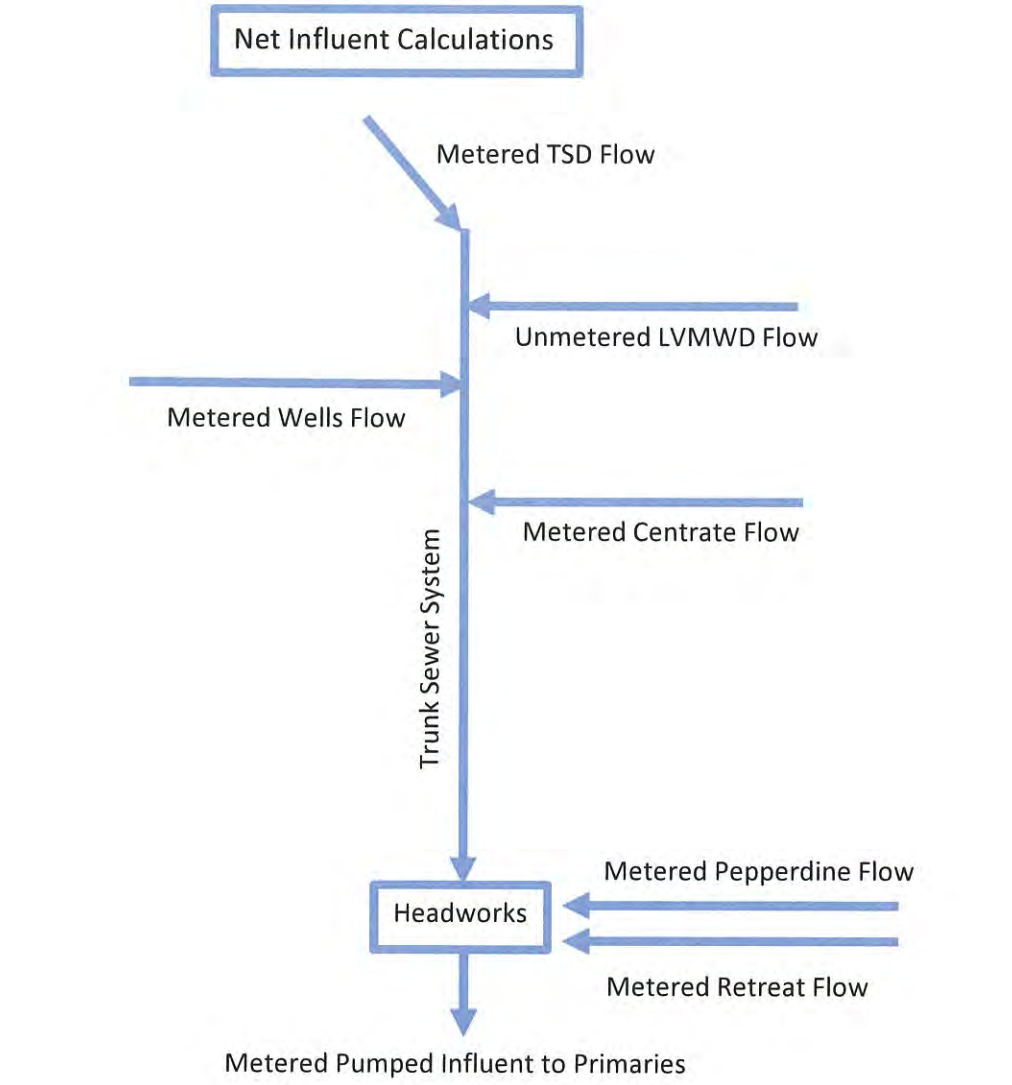


Chart 2
BOD5 and TSS Trends
BOD (mg/l)
Rain (inches)
BOD
TSS
Rain (in)
Linear (BOD)
Linear (TSS)
Axis Title
Jan-12
Feb-12
Mar-12
Apr-12
May-12
Jun-12
Jul-12
Aug-12
Sep-12
Oct-12
Nov-12
Dec-12
Jan-13
Feb-13
Mar-13
Apr-13
May-13
Jun-13
Jul-13
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15

ITEM 10A


Net Influent Calculations
Metered TSD Flow
Unmetered LVMWD Flow
Metered Wells Flow
Metered Centrate Flow
Trunk Sewer System
Metered Pepperdine Flow
Headworks
Metered Retreat Flow
Metered Pumped Influent to Primaries
Net Influent = Pumped Influent + Pepperdine - Wells - Centrate - Retreat
LVMWD Flow = Net Influent - TSD Flow

INFORMATION ONLY

October 5, 2015 JPA Board Meeting

TO: JPA Board of Directors

FROM: Finance & Administration

Subject: Annual Supply and Delivery of Polymer: Award

On September 8, 2015, the LVMWD Board, acting as Administering Agent of the Las Virgenes-Triunfo Joint Powers Authority (JPA), authorized the General Manager to accept a bid and approve a purchase order to Polydyne, Inc., for the annual supply and delivery of polymer.

SUMMARY:

The LVMWD Board authorized the General Manger to approve a purchase order to Polydyne, Inc. in the amount of $121,398.75 for the annual supply and delivery of Polymer. Polymer is use to enhance the separation of liquids and solids during the dewatering process at the Rancho Las Virgenes Composting Facility. The unit price resulted in an overall 28% cost savings to the JPA.

FISCAL IMPACT:

Yes

ITEM BUDGETED:

Yes

FINANCIAL IMPACT:

The total estimated annual cost for polymer is $121,398.75, which constitutes an annual cost-savings of $47,824 as compared to current pricing. Sufficient funds are available for polymer in the adopted Fiscal Year 2015-16 JPA Budget and will be proposed in future year budgets.

DISCUSSION:

Polymer is used to enhance the separation of liquids and solids during the dewatering process at the Rancho Las Virgenes Composting Facility. To ensure the JPA receives the best pricing, the purchase of polymer is bid at least once every five years. The competitive bid process resulted in a 28% reduction in the current pricing for polymer, from $1.15 per pound to $0.825 per pound.

The Request for Bids was posted on LVMWD's website, advertised in the *Daily News*, and sent to six vendors that previously expressed interest in chemical bids. Five responses were received with bids submitted by three of the five.

Bid Summary:

Following is a summary of the bids received.

Bidder Name	Unit Price ($/pound)	Bid Total
Polydyne, Inc.	**$ 0.825**	**$121,398.75**
BASF	$0.947	$139,351.05
Solenis	$1.040	$152,550.00
Kemira	No Bid	
Univar	No Bid	

Prepared By: Gretchen Bullock, Purchasing Supervisor

ITEM 10B