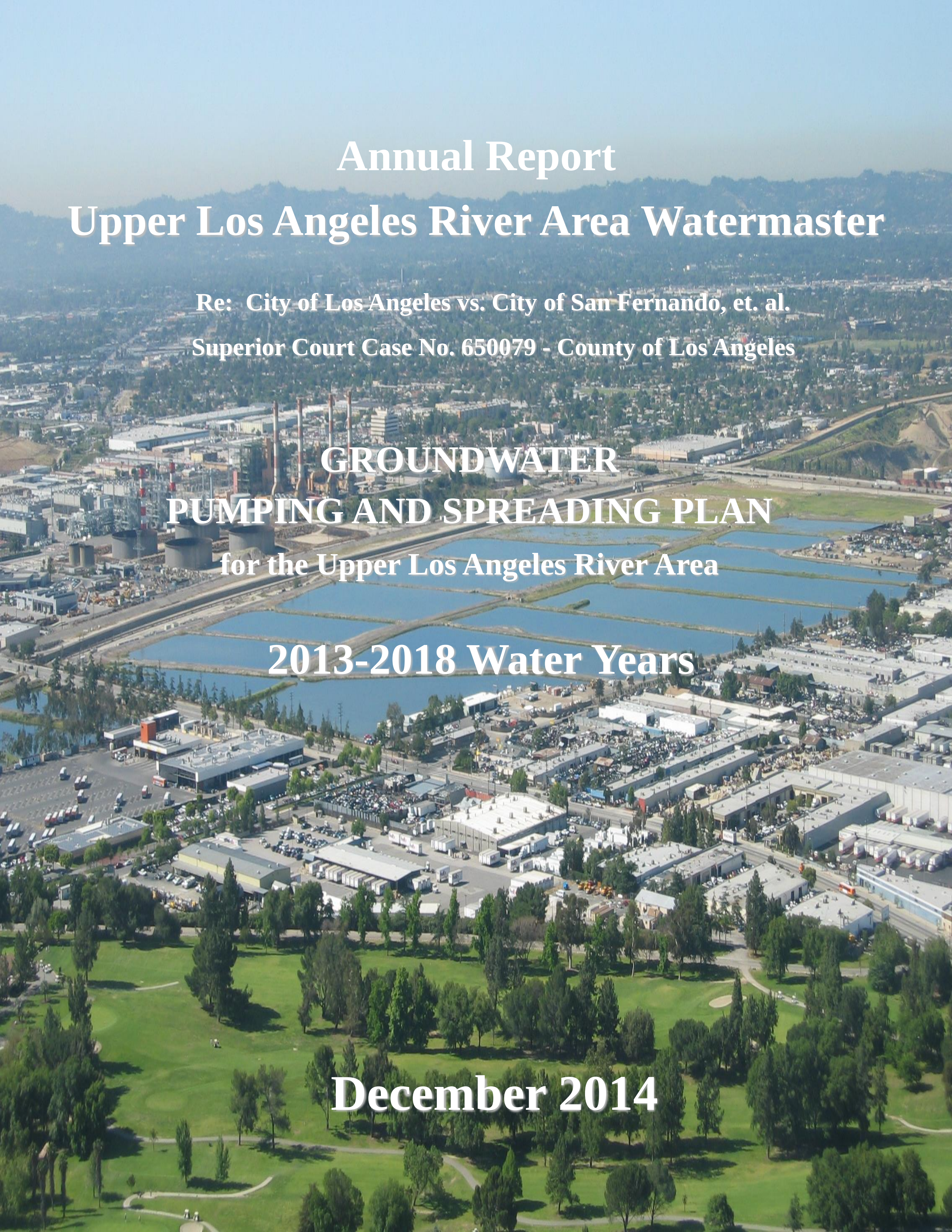


Annual Report

Upper Los Angeles River Area Watermaster

Re: City of Los Angeles vs. City of San Fernando, et. al.

Superior Court Case No. 650079 - County of Los Angeles

GROUNDWATER PUMPING AND SPREADING PLAN

for the Upper Los Angeles River Area

2013-2018 Water Years

December 2014

ANNUAL REPORT
UPPER LOS ANGELES RIVER AREA WATERMASTER

Re: City Of Los Angeles vs. City Of San Fernando, et. al.
Superior Court Case No. 650079 - County Of Los Angeles

GROUNDWATER PUMPING AND SPREADING PLAN FOR THE UPPER LOS ANGELES RIVER AREA (ULARA) LOS ANGELES COUNTY, CALIFORNIA

2013-2018 WATER YEARS
October 2013 – September 2018

ULARA WATERMASTER
Richard C. Slade, P.G., C.E.G.

GROUNDWATER HYDROLOGY/MODELING CONSULTANT
Hadi Jonny, P.E.

WATERMASTER SUPPORT STAFF

Anthony Hicke, CHG	Assistant Watermaster
Gregory Reed, P.E.	Civil Engineering Associate
Fatema Akhter	Civil Engineering Associate

Copies of this report may be downloaded from the
ULARA Watermaster Website (http://ularawatermaster.com).

December 2014

TABLE OF CONTENTS

IX. TABLES

X. FIGURE

XI. PLATES

XII. APPENDICES

A. City of Los Angeles - Plan 2013-2014

B. City of Burbank - Plan 2013-2014

C. City of Glendale - Plan 2013-2014

D. City of San Fernando - Plan 2013-2014

E. Crescenta Valley Water District - Plan 2013-2014

F. Annual Municipal Extractions in ULARA 1979-2013

I. EXECUTIVE SUMMARY

As the Watermaster for the Court-adjudicated Upper Los Angeles River Area (ULARA), I am pleased to submit this Annual Report for the Groundwater Pumping and Spreading Plan for Water Years 2013-14 through 2017-18. Note that this Groundwater Pumping and Spreading Plan is being submitted to the Court later than its anticipated July 2014 filing date. Due to various technical and personnel issues at the Watermaster's office, the report is being provided to the Court in March 2016. However, to avoid confusion with the submittal to the Court of the next Annual Pumping and Spreading Plan for Water Years 2014-15 through 2018-19, this current report has been purposely dated December 2014.

Preparation of this Annual Report is in compliance with Section 5.4 of the Policies and Procedures document (as developed by the original ULARA Watermaster), which established the Watermaster's responsibility for management of the four groundwater basins in ULARA (the San Fernando, Verdugo, Sylmar and Eagle Rock basins). Also provided in this Groundwater Pumping and Spreading Plan, as appendices, are the individual pumping and spreading plans submitted by each of the five major pumping Parties (the cities of Burbank, Glendale, Los Angeles and San Fernando, and the Crescenta Valley Water District) for their proposed operations during Water Years 2013-14 through 2017-18. Further, this report discusses the possible changes in recharge, spreading, pumping rates and pumping patterns, especially in relation to the available plans for cleanup of the contaminated groundwater in the eastern portion of the San Fernando Groundwater Basin.

In this current Water Year which ended September 30, 2014, unprecedented low rainfall conditions have resulted in a historically-low allocation of State Water Project (SWP) supplies by the California Department of Water Resources and a statewide drought state of emergency, as declared by Governor Brown. The cities of Los Angeles and San Fernando both continued to experience pumping difficulties in the Sylmar Basin and expect to pump less than their annual entitlements from the San Fernando Groundwater Basin (SFB). Overall pumping in the SFB will also be less than its long-term average. Further, the cities of Burbank and Glendale are on track to produce more than their adjudicated water rights from SFB, whereas the City of Los Angeles continues to experience considerable challenges with groundwater contamination in this basin and thus will pump less groundwater than its annual entitlement. However, the City of Los Angeles has implemented changes to their system (such as wellhead treatment facilities) that will allow them to extract more groundwater in the SFB than they have in recent years to offset reduction in SWP deliveries. In addition, work by the City of Los Angeles to construct replacement supply wells in the Sylmar Basin has been accelerated to further increase the supply of local groundwater. In the Verdugo Basin, both the Crescenta Valley Water District, due to local problems with groundwater contamination, and Glendale, due to its limited local pumping capacity, expect to produce less than their adjudicated water rights during Water Year 2013-2014. There are no municipal-supply wells in the Eagle Rock Basin, the smallest of the four separate groundwater basins in ULARA.

Currently, there are five major groundwater cleanup facilities (each with its own water wells and treatment plant) in operation in ULARA. These include: the North Hollywood Operable Unit (NHOU) and the Pollock Wells Treatment Plant, both of which are located in the City of Los Angeles; the Burbank OU (BOU) in Burbank; the Glendale OU (GOU), which contains a North Operable Unit (GNOU) in Glendale and a South Operable Unit (GSOU) in Los Angeles; and the CVWD Glenwood Nitrate Removal Plant in La Crescenta. Glendale operates its grant-funded Weak Base Anion Exchange (WBA) Chromium (VI) Removal facility to remove hexavalent chromium from a portion of the groundwater produced by its OU wells. In addition to the WBA treatment, an existing 100-gpm demonstration facility uses reduction, coagulation and filtration (RCF) technology to remove hexavalent chromium from the groundwater. The City of Los Angeles continues to operate wellhead treatment facilities on a few of its twelve wells at its Tujunga Wellfield in the SFB.

The groundwater model, which is updated each year by the Watermaster support group at the Los Angeles Department of Water and Power (LADWP), continues to be used to simulate the combined effects of the projected pumping and spreading operations on groundwater elevations in the SFB for the five-year period ending September 30, 2018. The most significant effects shown by their recent modeling effort include the rebound of simulated water levels in the basin resulting from increased recharge activity in the spreading basins that has occurred over time. This rebound is likely to continue into the future, in part because of the expected continued reduction in groundwater pumping by Los Angeles from the SFB. As simulated by the model, water levels may increase by as much as 8 to 42 feet in some areas. However, Los Angeles has had to reduce its pumping in some of its wellfields in response to ongoing water quality concerns regarding the existence of certain contaminants at concentrations that exceed their respective regulatory limits in the groundwater. As a result, LADWP is taking steps to site, design and eventually construct water treatment facilities to treat the contaminated groundwater in an effort to regain the operational capacity of its wellfields over the next several years. Also noteworthy are the simulated groundwater elevation contours in the areas near the BOU wells which appear to show some possible effects of plume containment by those wells. In summary, the estimated cumulative amounts of recharge have been projected to exceed the cumulative amounts of extractions by approximately 155,998 AF over the next five years, as simulated by the LADWP model.

In closing, I would like to thank each Party for taking the time and making the effort to provide its individual Spreading and Pumping Plan for the next five Water Years, and express my appreciation to each of those Parties for providing information and data that were essential to the preparation of this Annual Pumping and Spreading Plan document for Water Years 2013-14 through 2017-18. Also much appreciated has been the continued assistance of the Watermaster support group at LADWP (including Mr. Hadi Jonny, Ms. Fatema Akhter, and Mr. Greg Reed) in helping with data analyses, modeling and preparation of the figures for this report.

RICHARD C. SLADE
ULARA Watermaster

II. INTRODUCTION

As a result of the groundwater contamination that was detected in certain municipal-supply water wells in the eastern portion of the San Fernando Basin in the late-1970s, the original ULARA Watermaster and Administrative Committee, together with the Los Angeles Regional Water Quality Control Board (LARWQCB), revised (in late-1993) the ULARA Watermaster's Policies and Procedures document to help prevent further degradation of groundwater quality and to help limit the spread of contamination in all four ULARA groundwater basins. The Policies and Procedures document was revised again by that Watermaster in February 1998 to organize the material into a more comprehensive document.

Section 5.4 of the Policies and Procedures requires each of the five municipal-supply purveyors (Parties) in ULARA to prepare its own annual Groundwater Pumping and Spreading Plan for each successive five-year period. These five Parties include the cities of Burbank, Glendale, Los Angeles and San Fernando, and the Crescenta Valley Water District (CVWD). Thus, each of these municipal-supply pumpers is required to annually submit (on or before May 1 of each Water Year) its own Groundwater Pumping and Spreading Plan to the ULARA Watermaster. Each plan is to include the projected groundwater pumping and spreading volumes, recent water quality data for each active water well, and possible modifications planned for key facilities owned/operated by that Party (e.g., constructing or destroying wells, building or modifying treatment plants, etc) for the next five-year period.

The ULARA Watermaster is required to: evaluate the five individual plans in regard to the potential impacts of the combined pumping and spreading activities by all Parties regarding the implementation of the San Fernando Judgment of January 26, 1979; and provide, if needed, recommendations for improving groundwater management and/or for helping to protect groundwater quality in the ULARA groundwater basins. The Watermaster's evaluation and recommendations are to be included in each Annual Groundwater Pumping and Spreading Plan, and the Administrative Committee is to review and approve the plan so that it may be provided to the Court in July of each Water Year.

This Annual Report represents the Groundwater Pumping and Spreading Plan for the five Water Year period of 2013-14 through 2017-18 for ULARA, and it has been prepared pursuant to Section 5.4 of the Policies and Procedures document. This Groundwater Pumping and Spreading Plan provides basic information to the Administrative Committee for use in possibly improving basin management, providing protection of the water rights of each Party, and protecting water quality within ULARA.

III. PLANS FOR THE 2013-14 THROUGH 2017-18 WATER YEARS

A. Projected Groundwater Pumping for 2013-14 Water Year

The estimated pumping capacities of the various municipal-supply water wells owned by each of the five Parties within the San Fernando, Sylmar and Verdugo basins are listed on Table 3-1. Because there are no municipal-supply wells in the Eagle Rock Basin, this small basin is not listed on Table 3-1 and is not discussed further herein. Also shown on Table 3-1 are the number of active wells owned by each Party in each basin, the total number of municipal-supply wells owned by all Parties in each basin, and the estimated pumping capacity of each well (as reported by each Party). Clearly, the SFB has the most Parties (3) and the total largest number of currently active municipal-supply water wells (76); the Sylmar Basin has the fewest number of active wells (4). The number of active wells in each basin is subject to change each year due to various problems, such as water level declines, mechanical problems, and impacts from groundwater contamination.

Table 3-1A has been prepared to show the actual and projected volumes of groundwater pumped by the five Parties for Water Year 2013-14 in the San Fernando, Sylmar and Verdugo groundwater basins. Actual values listed on Table 3-1A represent the specific volumes of groundwater pumped by each Party for the period October 2013 through at least March 2014, as reported to the Watermaster by the respective Party. Projected values shown on Table 3-1A are the groundwater extractions estimated (or projected) by each Party for the remainder of Water Year 2013-14 through September 2014 for each of the three ULARA groundwater basins. As seen on Table 3-1A, the five Parties expect to pump a total of approximately 105,049 acre feet (AF) of groundwater during Water Year 2013-14 from the three groundwater basins. These total groundwater extractions for Water Year 2013-14 by the five Parties are expected to include 97,326 AF from San Fernando Basin, 3,948 AF from Sylmar Basin and 3,775 AF from Verdugo Basin.

The total volume of groundwater expected to be pumped by all Parties during the current Water Year (105,049 AF) is 10,804 AF less than the 34-year historical average extractions from the three basins for the 34-year period of 1979-2013. The estimated volume of pumping for the next Water Year (2014-15) is shown on Table 3-1A to be 87,408 AF, which is also less than the historical long-term (1979-2013) average of 94,245 AF.

As shown on Table 3-1B, the City of Burbank plans to pump 10,583 AF of groundwater from the SFB in the 2013-2014 Water Year; this volume exceeds its annual pumping entitlement from this basin (including extractions by Valhalla Mortuary). Including approximately 435 AF of pumping by Valhalla Mortuary, extractions by Burbank will be 1,098 AF more than its five-year average of 10,724 AF, and 5,797 AF higher than its long-term average of 6,025 AF for the period of 1979-2013. Burbank's annual entitlement for the 2013-14 Water Year is 4,096 AF, based on its 20 percent import return credit (as reported in the 2013-14 Annual Watermaster Report). Existing and planned extractions by Burbank are required by its EPA-mandated groundwater clean-up operations by its BOU facilities; the BOU has a total pumping capacity of 9,000 gallons per minute (gpm) or about 14,000 acre-feet per year (AF/Y). Burbank can account for its pumping in excess of its annual import return credit by electing to purchase as much as 4,200 AF of Physical Solution water from Los Angeles. Also, since the completion of the Foothill Feeder connection, Burbank can spread Metropolitan Water District of Southern California (MWD) water in the Pacoima spreading grounds, and accumulate credit for the spread water. As of April 2014, Burbank has spread 6,703 AF of MWD water in the Pacoima Spreading Grounds during Water Year 2013-2014. Burbank may also purchase and import water from the MWD and store it in the SFB, or obtain stored water credits from the cities of Los Angeles and/or Glendale. Burbank can also use a portion of its *available* groundwater storage credits, which were 3,660 AF as of October 1, 2013 (Burbank also has an additional 7,530 AF of stored water credits *on reserve*).

CVWD plans to pump 2,340 AF in Water Year 2013-14 from Verdugo Basin; this volume is less than its full right of 3,294 AF/Y from this basin. This planned pumping by CVWD from Verdugo Basin is 515 AF less than its long-term average pumping of 2,855 AF for the period 1979-2013 and 567 AF less than its five-year average of 2,907 AF (2008-2013).

The City of Glendale resumed significant pumping from the SFB when its Glendale Operable Unit (GOU) began operating in September 2000. In the 2013-14 Water Year, Glendale plans to pump 7,933 AF from the SFB; this volume is 63 AF more than its five-year average of 7,870 AF (2008-2013). In the SFB, Glendale's annual water right is 5,074 AF from SFB, based on its 20 percent import return credit for water delivered to its service area within this basin during the 2012-13 Water Year. Glendale has the right to purchase up to 5,500 AF/Y of Physical Solution water from Los Angeles to cover the excess pumping. Glendale can also use a portion of its *available* stored water credits, which totaled 14,160 AF as of October 1, 2013 (Glendale also has an additional 29,129 AF of stored water credits *on reserve*).

In the Verdugo Basin, Glendale plans to pump 1,435 AF in Water Year 2013-14; this volume is 809 AF less than its 34-year (1979-2013) historical average extractions of 2,244 AF from this basin, and represents a decrease of 505 AF relative to its average pumping during the recent five-year period of 2008-2012 (see Table 3-1B). Glendale has recently been taking steps to increase its pumping capacity from the Verdugo Basin. In 2010-11, Glendale rehabilitated an old, unused well on Foothill Boulevard and connected it to the City's water supply system in mid-2011. Additionally, a new well at the Rockhaven Sanitarium was constructed in mid-2011, but, due to elevated concentrations of nitrate, the City has had to begin evaluating various nitrate treatment options. This new well will remain off-line until a final treatment method has been determined and a treatment facility has been constructed. Glendale also completed the rehabilitation of the Glorietta Wells 3 & 4 in 2013.

The City of Los Angeles expects to pump 78,810 AF this Water Year from the SFB, a volume that is 5,582 AF more than its long-term (1979-2013) annual average of 73,228 AF from this basin, and 27,044 AF more than its average pumping over the past five years (2008-2013). Los Angeles expects to pump 673 AF of groundwater from the Sylmar Basin; this volume is 2,014 AF less than its 1979-2013 average of 2,687 AF from this basin. As of October 1, 2013, Los Angeles' *available* stored water credits were 175,806 AF in the SFB (Los Angeles also has an additional 361,647 AF of stored water credits *on reserve* in the SFB). In the Sylmar Basin, Los Angeles has 9,014 AF of "frozen" water credits, or 10,213 AF of credits using the 5-year calculation method.

For 2013-14, the City of San Fernando plans to pump 3,275 AF from the Sylmar Basin. This volume is 38 AF more than its average pumping for the past five years and 166 AF more than its 34-year long-term average (for 1979 to 2013). San Fernando has 404 AF of "frozen" water credits, or 920 AF of credits using the 5-year calculation method.

Estimated pumping capacities of the ULARA wellfields are provided in Table 3-1A. Actual and projected amounts of pumping and spreading by the major parties during 2013-2014 are shown in Tables 3-1A, 3-1B, and 5-1A.

B. Constraints on Pumping as of 2013-14

CONSTRAINTS ON PUMPING IN THE SAN FERNANDO BASIN

City of Burbank – The United States Environmental Protection Agency (USEPA) Consent Decree project implemented the BOU treatment facility which became fully operational on January 3, 1996.

As part of the requirement to close the first consent decree, USEPA required Burbank to demonstrate that the BOU would operate at its design capacity. In the summer of 2010, Burbank successfully completed a 60-day performance test at the BOU operating at 9,000 gpm. To ensure the effectiveness of the remedy EPA monitored drawdown and the extent of the cone of depression by conducting a multi-well pumping test for 30 days during the demonstration time frame. EPA used water levels and pumping ratio data monitored during this pumping test to update BOU hydraulic conductivity, transmissivity, and storativity values in the Basin-wide groundwater model.

Groundwater extracted by the City of Burbank also contains chromium, which cannot be removed by the BOU or by Burbank's other groundwater treatment facility (the Lake Street GAC Treatment Plant). In January 2002, USEPA approved an operational mode for the BOU that allows the BOU wells to be pumped and also permits the blending of this pumped groundwater with imported MWD water to keep total chromium at concentrations at or below 5 micrograms per liter (µg/L); 1 µg/L is equivalent to one part per billion (ppb). Effective July 1, 2014, the Maximum Contaminant Level (MCL) for Chromium VI (Cr-VI) in the State of California is 10 µg/L, as recommended by the California Department of Public Health (now under the jurisdiction of the Division of Drinking Water). A limit of 5 µg/L for Total Chromium is still the goal established by the Burbank City Council for delivered water within the City during Water Year 2013-2014.

Currently, the BOU operations are limited by fluctuations in City-wide water demands and blending requirements to manage chromium concentrations. However, Burbank plans to continue the voluntary shut down of the Lake Street GAC Treatment Plant and nearby wells due to the inability to blend the extracted groundwater to lower chromium concentrations to 5 µg/L or less. Lockheed-Martin had arranged to utilize the capacity of the GAC Treatment Plant, when available, to augment the production of the BOU to reach the 9,000 gpm capacity of the BOU plant. The plant will not be operated in the future except for water quality testing and for emergency water supply.

The City of Burbank currently contracts with APT Water Services, LLC, for the day-to-day operation of the BOU.

City of Glendale – The Glendale Operable Unit (GOU) began operating in September 2000 but hexavalent chromium was encountered shortly thereafter in the pumped groundwater. However, because the Glendale OU was not designed to treat for chromium, Glendale has had to blend the treated water with imported supplies from MWD to achieve the target concentration of 5 µg/L (still used by the Glendale City Council) for this contaminant during Water Year 2013-14.

Glendale has continued to pursue an aggressive research program to identify viable treatment technologies for the removal of hexavalent chromium from its pumped groundwater. Glendale has received grants from federal and state appropriations, and the

Water Research Foundation (WaterRF), and others, to investigate technology capable of large-scale treatment of hexavalent chromium. As a result, Glendale constructed the Weak Base Anion (WBA) Chromium Removal facility to remove hexavalent chromium from groundwater produced by GSOU Well GS-3 using WBA exchange technology. They also constructed a 100-gpm demonstration scale facility next to its Glendale Water Treatment Plant; this plant uses reduction, coagulation and filtration (RCF) technology. The treatment facilities using the two technologies identified in a prior study by Malcolm Prinie were constructed and placed into service by April 2010; these facilities have been generally effective in removing chromium in the groundwater to concentrations below 5 µg/L.

City of Los Angeles - All wellfields operated by Los Angeles within the SFB have been impacted by groundwater contamination, primarily from volatile organic compounds (VOCs), such as trichloroethylene (TCE) and perchloroethylene (PCE). Further, increasing concentrations of Cr-VI have been detected in water supply wells, as well as detection of other emerging chemicals in water supply wells. This contamination has greatly impacted the ability of Los Angeles to pump groundwater from the SFB. Contaminant concentrations have exceeded the respective Primary MCLs for the VOCs in a large percentage of the active wells operated by Los Angeles. Whereas Los Angeles' five-year pumping plans reflect continued reductions in its groundwater pumping, this City is responding to the challenges of groundwater contamination by pursuing plans to build new facilities for contaminant removal; when completed, these facilities will help restore Los Angeles' ability to pump and serve potable groundwater to its customers.

Hexavalent chromium contamination also resulted in the discontinued operation of one of Los Angeles' extraction wells, Aeration Well No. 2, at the North Hollywood Operable Unit (NHOU) facility. Under a March 2007 Amendment to an existing Clean-up and Abatement Order (CAO) issued by the LARWQCB, Honeywell International Inc. (Honeywell) was ordered to, among other things, provide or pay LADWP for uninterrupted replacement water and provide wellhead treatment for this extraction well. Honeywell continues to discharge groundwater from Aeration Well No. 2 to the sanitary sewer for plume containment while continuing to develop the treatment process that will return the use of this well for potable water supply.

CONSTRAINTS ON PUMPING IN THE SYLMAR BASIN

City of San Fernando - All of the groundwater pumped by the City of San Fernando is extracted from the Sylmar Basin. To date, VOC contamination has not been detected in any of its municipal-supply wells in this basin. However, two of its wells have pumped groundwater with nitrate concentrations that have exceeded the Primary MCL for nitrate (as NO_3) of 45 mg/L. One of these wells (Well 7A) was placed on inactive status whereas the other well (Well 3) has been on stand-by status while awaiting implementation of a nitrate mitigation plan. Old septic systems and past agricultural practices in the region are the likely causes of these elevated nitrate concentrations in the local groundwater. The City of San Fernando selected a consultant to design a nitrate removal system and a new transmission line. Current projections include the installation of a new Envirogen ion exchange nitrate removal unit. That treatment system is expected to come on-line in 2015.

City of Los Angeles - Los Angeles has been unable to pump its full adjudicated water right from the Sylmar Basin due to elevated concentrations of TCE in at least two wells in its Mission Wellfield and also to the physical deterioration of the infrastructure at this facility. A project to rehabilitate this wellfield is underway by LADWP. Phase 1 of the project provided for the replacement of a water storage tank and related control systems. LADWP is now planning Phase 2, which will include the construction of three new water-supply wells, the destruction of two deteriorated/older water wells, and the construction of additionally-required infrastructure.

A feasibility study of installing wellhead treatment units for the two existing water wells is also underway. Once the project is complete, Los Angeles will be more capable of pumping its annual water right and utilizing its stored water credits from this basin under the 5-year calculation method for Sylmar Basin.

CONSTRAINTS ON PUMPING IN THE VERDUGO BASIN

Crescenta Valley Water District - All of the groundwater rights of CVWD occur in the Verdugo Basin. Groundwater contamination from VOCs has been negligible to date; however, nitrate contamination is widespread and methyl tertiary butyl ether (MTBE), a component of gasoline, has also been detected in a few CVWD-owned wells. Elevated nitrate concentrations are mitigated in the water supply by treating a portion of the pumped groundwater using anion exchange at the existing Glenwood Nitrate Removal

Plant, and by blending untreated groundwater with treated groundwater and/or with imported MWD supplies in order to meet drinking water standards.

From its initial detection in 2005, groundwater pumped by the 12 wells in CVWD's service area has encountered MTBE concentrations ranging up to approximately 50 µg/L. In August 2006, concentrations of MTBE increased to values above its Primary MCL of 13 µg/L in Well 7, whereupon this well was immediately taken out of service. The prior Watermaster responded by establishing the Verdugo Basin MTBE Task Force in November 2006; task force members included the CDPH, the LARWQCB, the ULARA Watermaster, Glendale Water and Power, CVWD, and various oil companies and independent gas station owners in Verdugo Basin. The Task Force had historically been meeting at the CVWD office on a bi-monthly basis to coordinate site-remediation activities among the various responsible parties.

In the Water Year 2009-10, CVWD received a grant from CDPH under the Drinking Water Treatment and Research Fund for funding the installation of a granulated activated carbon (GAC) water treatment system for removal of MTBE at the Well 5 site. In February 2011, CVWD performed a pumping test at Well 5 to determine if the MTBE levels would increase after pumping activity. The results of the pumping test were that the MTBE level remained steady at 0.20 µg/L. CVWD was given permission by CDPH to place Well 5 back into service in March 2011 and, in addition, CDPH suspended CVWD's grant for funding the installation of the GAC at Well 5. Since the MTBE levels in Well 5 were below the secondary and primary MCL levels, grant funding was put on hold until such time that the MTBE might increase once again. In 2011-12, the grant funding was eliminated by the State. If MTBE levels do rise again, CVWD will have to find a new funding source for the treatment. In WY 2012/13, the Task Force did not meet and was suspended until MTBE levels are higher than 1.0 ug/L.

City of Glendale - The City of Glendale has made only limited use of its maximum adjudicated rights of 3,856 AF/Y from the Verdugo Basin, due to water quality problems, groundwater level declines, and limited extraction capacity in this basin.

In order to increase the use of its water rights, the City completed construction of the Verdugo Park Water Treatment Plant ("VPWTP") in 1996. This facility treats water from the two low-capacity wells, and from a subsurface horizontal infiltration system along Verdugo Canyon.

In 2010-11, the City completed the rehabilitation of its Foothill Well and constructed its new Rockhaven Well in the Montrose area in a further attempt to increase its extraction capacity from the Verdugo Basin. The Foothill Well was connected to the City's water supply system in mid-2011. However, as a result of excess nitrate concentrations in the new Rockhaven well, the well is currently inactive. This well will remain off-line until a final treatment alternative for nitrate has been selected. In 2013, the City completed the rehabilitation of Glorietta Wells 3 & 4.

TABLE 3-1: ESTIMATED CAPACITY OF EXISTING WELLFIELDS

Party/Well Field	Number of Active Wells	Number of Standby Wells	Estimated Capacity (All Wells) (cfs)	Estimated Capacity (All Wells) (gpm)
SAN FERNANDO BASIN				
City of Los Angeles				
Aeration (NHOU)	7	---	2.4	1,077
Erwin	2	---	6.1	2,738
North Hollywood	14	3	69.6	31,237
Pollock	2	---	5.9	2,648
Rinaldi-Toluca	15	---	113.0	50,714
Tujunga	12	---	98.2	44,072
Verdugo	2	---	7.4	3,321
Whitnall	4	---	14.8	6,642
City of Burbank	8	2	24.5	11,000
City of Glendale	10	---	17.0	7,650
TOTAL	76	5	359.0	161,099
SYLMAR BASIN				
City of Los Angeles	2	---	5.0	2,244
City of San Fernando	2	1	8.5	3,800
TOTAL	4	1	13.5	6,044
VERDUGO BASIN				
CVWD	12	---	5.3	2,400
City of Glendale	6	---	5.0	2,240
TOTAL	18	---	10.3	4,640

TABLE 3-1A: HISTORIC AND PROJECTED GROUNDWATER EXTRACTIONS 2013-14

(Acre-feet)

Party/Well Field	2013			2014									Total
	Oct.	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
						SAN FERNANDO BASIN							
City of Los Angeles													
Aeration (NHOU)	0	0	0	0	84	126	112	114	125	126	126	122	935
Erwin	0	1	0	0	1	0	0	0	0	0	0	0	2
North Hollywood	1,457	383	3	350	735	591	839	1,315	2,018	2,460	2,460	2,678	15,289
Pollock	0	218	293	397	316	0	0	99	347	369	369	0	2,408
Rinaldi-Toluca	879	201	94	521	1,243	1,229	1,804	2,372	2,804	3,752	3,752	3,631	22,282
Tujunga	6,403	2,259	1,305	1,575	2,668	2,768	2,142	1,905	2,314	4,428	4,428	4,428	36,623
Verdugo	153	53	0	149	201	115	176	0	0	0	0	0	847
Whitnall	419	1	1	1	1	1	0	0	0	0	0	0	424
SUB TOTAL City of Los Angeles:	9,311	3,116	1,696	2,993	5,249	4,830	5,073	5,805	7,608	11,135	11,135	10,859	78,810
City of Burbank[A]	1,010	820	773	807	677	705	965	965	965	965	965	965	10,583
City of Glendale[B]	715	648	675	685	581	597	672	672	672	672	672	672	7,933
TOTAL San Fernando Basin:	**11,036**	**4,584**	**3,144**	**4,485**	**6,507**	**6,132**	**6,710**	**7,442**	**9,245**	**12,772**	**12,772**	**12,496**	**97,326**
						SYLMAR BASIN							
City of Los Angeles	0	0	115	166	146	49	171	26	0	0	0	0	673
City of San Fernando		255	244	258	211	242	344	344	344	344	344	344	3,275
TOTAL Sylmar Basin:	**0**	**255**	**359**	**424**	**357**	**291**	**515**	**370**	**344**	**344**	**344**	**344**	**3,948**
						VERDUGO BASIN							
Crescenta Valley Water Dist.	206	178	203	202	164	193	199	199	199	199	199	199	2,340
City of Glendale	129	143	129	114	120	122	113	113	113	113	113	113	1,435
TOTAL Verdugo Basin:	**335**	**321**	**332**	**316**	**284**	**314**	**312**	**312**	**312**	**312**	**312**	**312**	**3,775**
ULARA TOTAL:	**11,371**	**5,160**	**3,834**	**5,224**	**7,148**	**6,737**	**7,538**	**8,125**	**9,902**	**13,429**	**13,429**	**13,153**	**105,049**

TABLE 3-1B: HISTORIC AVERAGE AND PROJECTED GROUNDWATER EXTRACTIONS

(Acre-feet)

Party/Wellfield	Historic Average Pumping (AF)		Projected Groundwater Pumping (AF)				
SAN FERNANDO BASIN							
City of Los Angeles	1979-2013[A]	2008-2013[B]	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Aeration (NHOU)	-	916	935	1,377	4,923	4,923	4,923
Erwin	-	1,264	2	0	0	0	0
North Hollywood	-	10,307	15,289	13,064	0	0	0
Pollock	-	2,247	2,408	2,559	2,178	2,178	2,178
Rinaldi-Toluca	-	12,052	22,282	19,204	0	0	0
Tujunga	-	20,033	36,623	23,667	15,674	15,674	15,674
Verdugo	-	1,730	847	0	0	0	0
Whitnall	-	3,217	424	0	0	0	0
SUBTOTAL City of Los Angeles	73,228	51,766	78,810	59,871	22,775	22,775	22,775
City of Burbank[C]	6,025	10,724	10,583	11,634	11,634	11,634	11,634
City of Glendale[D]	4,098	7,870	7,933	7,736	7,736	7,736	7,736
TOTAL San Fernando Basin:	**83,351**	**70,360**	**97,326**	**79,241**	**42,145**	**42,145**	**42,145**
SYLMAR BASIN							
City of Los Angeles	2,687	1,093	673	0	0	2,000	4,170
City of San Fernando	3,109	3,237	3,275	3,300	3,300	3,300	3,300
TOTAL Sylmar Basin:	**5,795**	**4,330**	**3,948**	**3,300**	**3,300**	**5,300**	**7,470**
VERDUGO BASIN							
Crescenta Valley Water District	2,855	2,907	2,340	2,670	2,810	2,950	3,010
City of Glendale	2,244	1,940	1,435	2,197	3,178	3,178	3,178
TOTAL Verdugo Basin:	**5,099**	**4,847**	**3,775**	**4,867**	**5,988**	**6,128**	**6,188**
TOTAL ULARA:	94,245	79,537	105,049	87,408	51,433	53,573	55,803

Notes:

A. In prior reports, the longterm-average included only muncipal well field pumping. Herein, the averages include physical solution pumping for burbank, Glendale and CVWD (but not Los Angeles). Historic pumping averages include wells that are no longer in service.

B. 5-year average. Please note that in the historic report dated July 2011, this 5-year average did not include physical solution pumping.

C. Includes BOU, City pumping, and Valhalla. Valhalla pumping not included in projections after 2013-14. Vallhalla is expected to be using recycled water in lieu of puming beginning sometime during the 2013-14 WY.

D. Includes Forest Lawn, GOU, and Grayson Power Plant pumping.

E. There are no municipal-supply water wells in the Eagle Rock Basin.

IV. GROUNDWATER PUMPING AND TREATMENT FACILITIES

A. Wellfields

As shown on Table 3-1, there are ten municipal-supply wellfields located in the SFB, two in the Sylmar Basin, and two in the Verdugo Basin; there are no municipal-supply wells in the Eagle Rock Basin. Table 3-1, as mentioned previously, also lists the current number of active wells in each basin and the estimated pumping capacity of each wellfield (as reported by each Party). The general locations of wellfields within the SFB are shown on Plate 3.

Table 4-1 has been prepared to summarize the volumes (in AF) of groundwater that have reportedly been pumped and treated in the San Fernando, Sylmar and Verdugo basins by each of the various treatment facilities owned and/or operated by the five Parties. The volumes of treated groundwater are listed for the years 1985-86 through 2012-13. As seen on Table 4-1, an approximate total of 440,843 AF of groundwater has been treated during that time period within the eight listed treatment facilities. Table 4-2 lists the volumes (in AF) of groundwater that are projected to be treated at the seven listed treatment facilities for the period 2013-14 through 2017-18. As shown on Table 4-2, the Parties report that an approximate total of 231,232 AF are projected to be treated at their existing treatment facilities between Water Years 2013-14 through 2017-18.

TABLE 4-1 HISTORIC AND CURRENT GROUNDWATER TREATMENT

(Acre-feet)

Water Year	Burbank GAC	Lockheed Aqua Detox	Burbank OU	Glendale North/South OU	CVWD Glenwood Nitrate Removal Plant	Los Angeles North Hollywood OU	Los Angeles Pollock Wells Treatment Plant	Los Angeles Tujunga Wells Treatment Plant	Annual Total
1985-86		1							1
1986-87		1							1
1987-88		1							1
1988-89		924							924
1989-90		1,108				1,148			2,256
1990-91		747				1,438			2,185
1991-92		917			847	786			2,550
1992-93	1,205	692			337	1,279			3,513
1993-94	2,395	425	378		1,550	726			5,474
1994-95	2,590		462		1,626	1,626			6,304
1995-96	2,295		5,772		1,419	1,182			10,668
1996-97	1,620		9,280		1,562	1,448			13,910
1997-98	1,384		2,580		1,391	2,166			7,521
1998-99	1,555		9,184		1,281	1,515	1,513		15,048
1999-00	1,096		11,451	979	1,137	1,213	1,851		17,727
2000-01	995		9,133	6,345	989	1,092	1,256		19,810
2001-02	0		10,540	6,567	515	998	1,643		20,263
2002-03	0		9,170	7,508	216	1,838	1,720		20,452
2003-04	0		9,660	6,941	164	1,150	1,137		19,052
2004-05	0		6,399	7,541	782	1,042	1,752		17,517
2005-06	0		10,108	6,777	997	1,766	2,442		22,090
2006-07	0		9,780	7,562	644	1,307	2,231		21,524
2007-08	0		6,817	7,347	660	1,038	2,573		18,435
2008-09	148		9,818	7,148	459	662	1,698		19,932
2009-10	5		10,043	7,300	410	935	2,377	36,623	57,693
2010-11	4		10,394	7,473	592	5,824	3,127	12,200	39,614
2011-12	4		9,993	7,830	447	7,774	2,957	20,648	49,654
2012-13	0		11,364	6,518	488	1,006	1,629	5,718	26,724
Total AF	**15,296**	**4,815**	**162,327**	**93,837**	**18,513**	**40,960**	**29,907**	**75,189**	**440,843**

TABLE 4-2 PROJECTED GROUNDWATER TREATMENT

(Acre-feet)

	Burbank GAC	Burbank OU	Glendale North/South OUs [1]	CVWD Glenwood Nitrate Removal Plant	Los Angeles North Hollywood OU	Los Angeles Pollock Wells Treatment Plant	Los Angeles Tujunga Wells Treatment Plant [2]	Annual Total
2013-14	0	10,583	7,300	150	935	2,377	36,623	57,968
2014-15	0	11,634	7,300	250	1,377	2,559	23,667	46,787
2015-16	0	11,634	7,300	350	4,923	2,178	15,674	42,059
2016-17	0	11,634	7,300	450	4,923	2,178	15,674	42,159
2017-18	0	11,634	7,300	550	4,923	2,178	15,674	42,259
TOTAL	**0**	**57,119**	**36,500**	**1,750**	**17,081**	**11,470**	**107,312**	**231,232**

1. Groundwater treatment includes chromium via theWBA Chromium Removal facility and the RCF demonstration project.
2. Treatment plant utilizing GAC wellhead treatment only on Wells #6 and #7 of the twelve extraction wells at Tujunga Wellfield

B. Active Groundwater Pumping and Treatment Facilities

Glendale OU (GOU) – City of Glendale

The GOU in the eastern portion of the SFB has been producing and treating local groundwater for VOCs since September 2000. On April 23, 2001, the City of Glendale assumed operation of the GOU. Prior to that time, the Glendale Respondents Group had operated the treatment plant through a contract with Camp Dresser & McKee, a consulting engineering firm.

The GOU is comprised of a treatment plant, eight extraction wells (4 in the Glendale North area and 4 in the Glendale South area), a pumping plant, a disinfection facility, and associated piping. The facility is designed to treat groundwater contaminated by TCE and PCE at a combined rate of approximately 5,000 gpm using aeration and granulated activated carbon (GAC). The treated water is then blended with imported supplies to control nitrate concentrations. Currently, the eight extraction wells are being pumped and blended in a manner to limit hexavalent chromium concentrations to achieve the City's target of 5 μg/L. Glendale has continued to pursue an aggressive research program to identify viable treatment technologies for the removal of hexavalent chromium from its pumped groundwater. These technologies consist of the Weak Base Anion Exchange (WBA) Chromium (VI) Removal facility, and a 100-gpm demonstration scale facility that uses reduction, coagulation and filtration (RCF) technology. The treatment facilities using the two technologies identified in a study by Malcolm Prinie were constructed and placed into service by April 2010; these facilities have been relatively effective in removing chromium in the groundwater to concentrations below 5 µg/L.

Burbank OU (BOU) – City of Burbank

The remediation of groundwater contamination in the eastern portion of the SFB was also significantly enhanced by the startup of the BOU on January 3, 1996. The BOU, which consists of eight water wells and air-stripping towers followed by liquid- and vapor-phase GAC, has a total design capacity of 9,000 gpm (14,000 AF/yr). Under the terms of USEPA's Second Consent Decree, Burbank assumed operation of the BOU on March 12, 2001 and will be the long-term primary operator of this facility. Burbank, in cooperation with the USEPA and Lockheed-Martin, continued with design improvements and operational changes to make the facility mechanically more reliable. During the 2012-13 Water Year, a total of 11,387 AF of groundwater was treated at the BOU, an increase of 1,394 AF from the volume treated in the prior water year. As a requirement of the Second Consent Decree, Burbank also reduces the concentrations of nitrate in the groundwater by blending the treated effluent with imported supplies from MWD at its blending facility before delivery to customers in the City of Burbank.

The City of Burbank currently contracts with APT Water Services, LLC for the day-to-day operation and maintenance of the BOU.

GAC Treatment Plant - City of Burbank

This facility, which includes the two Lake Street wells, was operated by the City of Burbank from 1992-2001. These two wells were able to pump water at a combined rate of 2,000 gpm to the liquid-phase GAC plant for removal of certain VOCs. When the plant was in use, the treated water supplements production from the BOU and can be delivered to the Burbank distribution system. The GAC Treatment Plant would normally operate during the summer season. However, current plans are to keep the plant shut down, except for emergencies or to permit the groundwater to be sampled and tested for its water quality, because of the prior detections of hexavalent chromium (Chromium VI) in the groundwater. As a result, in the 2012-13 Water Year, no pumped groundwater was treated at the GAC. The existing GAC treatment process does not remove chromium, and blending facilities are not available. Total chromium in the plant effluent would exceed the limit of 5 µg/L set by the Burbank City Council as a policy for water to be delivered to its distribution system.

North Hollywood OU (NHOU) - City of Los Angeles

The North Hollywood Operable Unit (NHOU) was placed into service in December 1989 and is being operated and maintained under the direction of the USEPA in accordance with the Cooperative Agreement between these two agencies. USEPA provides 90 percent of the funding for the operations and maintenance of the North Hollywood Groundwater Treatment Facility.

The NHOU was designed to achieve a groundwater treatment capacity of up to 2,000 gpm utilizing eight extraction wells and an aeration tower to remove certain VOCs from the pumped groundwater. Vapor-phase granular activated carbon (GAC) vessels are then utilized to remove VOCs from the aeration tower's air emissions.

Pollock Wells Treatment Plant - City of Los Angeles

The Pollock Wells Treatment Plant was placed into service March 1999 to remove certain VOCs from the groundwater at a combined pumping rate of up to 3,000 gpm; this facility was specifically designed to absorb trichloroethylene (TCE) and perchloroethylene (PCE). Liquid-phase GAC is used to restore the use of the Pollock wells. Pumping at these wells also helps to reduce the amount of rising groundwater that leaves the San Fernando Basin via the Los Angeles River.

Tujunga Wellfield Demonstration Project – City of Los Angeles

The Tujunga Wells Treatment Plant was placed into service May 2010. New liquid-phase GAC groundwater treatment vessels were installed on two production wells at this wellfield, and have restored the use of 12,000 acre feet per year (AFY) of pumping capacity that had been unavailable due to water quality constraints. The wellhead treatment facilities were placed into service in May 2010.

Glenwood Nitrate Removal Plant – Crescenta Valley Water District

Groundwater pumped from wells operated by CVWD in the Verdugo Basin often contains elevated to excessive concentrations of nitrate. A portion of the pumped groundwater is treated by ion exchange and then blended with untreated water from MWD and/or imported water to reduce nitrate concentrations to values that are below the Primary MCL for nitrate (as NO_3) of 45 mg/L. In the past few years, the ion-exchange plant has been in operation for the majority of each year to help maximize the use of local groundwater. For the 2012-13 Water Year, the ion-exchange plant was in operation for twelve (12) months, but only very minor flows were available for four (4) of those months.

C. Other Issues

1. Future Groundwater Pumping and Treatment Facilities

Verdugo Basin Wells – City of Glendale

Glendale completed the rehabilitation of its Foothill Well and connected this well to the City's water supply system in mid-2011. In 2013, the City completed the rehabilitation of its Glorietta Well Nos. 3 and 4A. The basic purpose of this well rehabilitation work was to increase the local pumping capacity in an effort to help Glendale obtain its full adjudicated water right from this basin.

The Rockhaven Well was constructed in 2010-11 in Verdugo Basin for the City, but the new well has been off-line and has been inactive since its construction due to elevated nitrate concentrations. Glendale has been working with CVWD on a project to activate the well. The project will use CVWD's existing Nitrate Treatment Removal Facility to treat the local groundwater to Federal and State water standards. When completed, the project will reduce the dependence of these two Parties on imported MWD water, and provide the additional benefit of reducing the amount of nitrate within the Verdugo Basin. The project is estimated to produce about 480 AF/yr of additional local water. CVWD and Glendale have submitted a 2014 Drought Grant application as part of Proposition 84 for funding for the design and construction of the Rockhaven Well project. Grant funding was approved, and the Rockhaven Well project is planned to be completed by November 2015.

Groundwater System Improvement Study – City of Los Angeles

Since 2009, LADWP has continued to make progress on its $34 million Groundwater System Improvement Study (GSIS) to fully characterize the groundwater basin and develop strategies for remediation, containment, clean-up and removal of the contaminated groundwater. As a part of GSIS, LADWP was planning on drilling and constructing an additional 25 monitoring wells necessary to complete the raw water quality characterization, along with one additional monitoring well to be drilled by the EPA. Drilling and construction of the LADWP monitoring wells were completed in March 2014. Phase 1 of the water quality sampling was completed, while Phase 2 is in progress. A high-level concept plan and cost estimate was developed for the remediation facilities necessary to remediate 122,000 AF of contaminated groundwater per year. The conceptual cost estimate is approximately between $600-$900 million dollars. LADWP will be refining this estimate as data from the GSIS become finalized, and as the final planning and design phases for the remediation facility continue over time. The environmental documentation process is proposed to begin in 2015.

2. Other Groundwater Remediation Projects

Many privately-owned, industrial-type properties in the ULARA groundwater basins have been found to have contaminated the soils and/or the groundwater beneath their facilities. Many of these facilities are under Cleanup and Abatement Orders from the LARWQCB; some sites are under the regulatory authority of the State Department of Toxic Substance Control (DTSC). Each known contaminated site typically has soil vapor holes and/or groundwater monitoring wells, and some have extraction wells, treatment facilities, and/or injection wells to help mitigate the spread of contamination.

The USEPA has been including hexavalent chromium in the quarterly sampling from its monitoring wells in SFB as a step in the eventual containment and cleanup of this contaminant. The RWQCB-Los Angeles has also been evaluating properties and/or facilities in the eastern portion of the SFB for their possible onsite use, storage and/or release of hexavalent chromium to the environment over time.

3. Dewatering Operations

Temporary Construction Dewatering

Temporary construction excavations, such as for subterranean parking structures and pipelines, sometimes require dewatering in areas that have a high (shallow) water table. Groundwater that is discharged from such temporary dewatering operations may, depending on volume, be required to be accounted for by the Watermaster, and the annual groundwater withdrawals by these dewatering activities would be deducted from the local water right holder.

Permanent Dewatering Operations

A few facilities along the southern and western portions of the SFB have deep foundations and subterranean parking structures that have been excavated and constructed into areas of shallow (high) groundwater; these facilities require permanent dewatering. The amount of groundwater pumped at each such facility is required to be reported to the Watermaster. These activities are subject to approval by the affected municipal-supply Party, and the dewaterer is required to pay for the replacement cost of the extracted groundwater. The pumped groundwater is subtracted from the affected Party's water right by the Watermaster.

4. Unauthorized Pumping in the County

There are numerous individuals, primarily within the unincorporated hill and mountain area of ULARA, who are or may be pumping groundwater without reporting the annual volume of production to the Watermaster, as is required by the Judgment. This groundwater was adjudicated and, in the opinion of prior Watermasters, is owned by the City of Los Angeles; the volume produced by each pumper is probably small. Working in cooperation with the Los Angeles County Department of Public Health and Los Angeles County Planning, the former Watermaster and LADWP initiated a process to help begin to identify and monitor the water usage of these private pumpers through a water license agreement.

V. GROUNDWATER RECHARGE FACILITIES AND PROGRAMS

A. Agency-Owned Spreading Facilities

There are five active spreading facilities located in the SFB (see Plate 1). The Los Angeles County Department of Public Works (LACDPW) operates the Branford, Hansen, Lopez, and Pacoima spreading grounds, whereas the LACDPW (in cooperation with the City of Los Angeles) operates the Tujunga Spreading Grounds. These spreading facilities are used for spreading native and imported water, when available. Projects are underway to deepen and improve the capacity of these spreading basins and the LACDPW and the LADWP are also working to identify ways to maximize spreading, including possible changes to the operations at each spreading basin. The City of Burbank completed construction of MWD's new Foothill Feeder connection in 2010, which is capable of delivering 50 cfs to the Pacoima Spreading Grounds, in order to enable Burbank to spread imported water when it is available. These facilities also allow Burbank to direct water to the Lopez Spreading Grounds. Burbank spread 6,703 AF of water in the Pacoima spreading grounds in the 2012-13 Water Year and, through April 2014 in this 2013-14 Water Year, Burbank has spread nearly 7,000 AF in these spreading grounds.

B. Proposed Spreading Facilities

Rory M. Shaw Wetlands Park

The Rory M. Shaw Wetlands Park, Strathern Wetlands Park Project consists of stormwater capture and treatment facilities within this 46-acre site, which had formerly been used as a gravel borrow pit. The project includes the construction of detention ponds and wetlands to store and treat stormwater runoff that will then be pumped to Sun Valley Park for infiltration. The project has the potential to recharge an average of approximately 590 AF of runoff per year. The project is being designed, and construction is estimated to start in 2017 and be completed by 2020.

C. Actual and Projected Spreading Operations

Table 5-1A shows the recent and projected volumes of native and imported water spread in the San Fernando Basin for the current 2013-14 Water Year. An estimated 10,971AF of native runoff and imported water are projected to be spread in Water Year 2013-14. This represents a decrease when compared to both the long-term (1968-2013) average of 26,671 AF and the past five-year (2008-2013) average of 30,621 AF.

TABLE 5-1A RECENT AND PROJECTED SPREADING OPERATIONS, WY2013-14

(Acre-feet)

Month	Basin Operator					Total
	LACDPW				LACDPW and LADWP	
	Branford	Hansen	Lopez	Pacoima[A,B]	Tujunga[A]	
Actual						
Oct-13	41	0	151	2,599	0	2,791
Nov-13	62	40	220	2,229	0	2,551
Dec-13	61	143	287	1,991	0	2,482
Jan-14	20	132	0	181	0	333
Feb-14	88	290	0	527	131	1,036
Mar-14	14	676	0	159	64	913
Apr-14	44	220	1	357	0	622
May-14	31	102	0	0	0	133
Jun-14	28	36	0	0	0	64
Projected						
Jul-14	7	10	0	0	0	17
Aug-14	7	10	0	0	0	17
Sep-14	4	8	0	0	0	12
TOTAL	407	1,667	659	8,043	195	10,971
2008-2013 Average	606	9,388	960	9,148	10,517	30,621
1968-2013 Average	552	13,647	587	6,851	5,034	26,671

Precipitation on the valley fill area in the SFB is projected to be about 6.23 inches for 2013-14 compared to the long-term average of 17.70 inches per year; the previous five-year average was 14.74 inches per year.

TABLE 5-1B HISTORICAL PRECIPITATION ON THE VALLEY FILL

(Inches per year)

1968-13	2008-13	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14**
17.70	14.74	11.64	19.08	24.44	10.81	7.71	6.23

** Projected

The estimated capacities (in AF/yr) of the five spreading grounds in the northeastern portion of the SFB are shown on Table 5-2. Also listed for each spreading grounds are: the site operator; the type of facility; the approximate total wetted area; and the capacity. As shown, the total maximum capacity of these five spreading grounds is currently on the order of 105,100 AF/yr.

TABLE 5-2 ESTIMATED CAPACITIES OF EXISTING SPREADING GROUNDS

Spreading Ground	Type	Total wetted area [ac]	Capacity [ac-ft/yr.]
Operated by LACDPW			
Branford	Deep basin	7	2,100
Hansen	Med. Depth basins	107	35,000
Lopez	Shallow basins	12	2,000
Pacoima	Med. Depth basins	107	23,000
Operated by LACDPW and LADWP			
Tujunga	Shallow basins	83	43,000
		TOTAL:	105,100

D. <u>Stormwater Recharge Capacity Enhancements</u>

Background Information

During the 1997-98 Water Year, weighted-average precipitation in the valley-fill and hill-and-mountain areas in ULARA was approximately 225% of normal. This amount of rainfall provided a well above-average volume of stormwater runoff that became available for capture in upstream reservoirs and diversion into existing spreading grounds. In April 1998, a former Watermaster received notice from the LACDPW that spreading at both the Hansen and Tujunga spreading grounds would be temporarily suspended. The reasons for curtailing spreading were that: the water table had risen to a level that threatened to inundate the base of the Bradley-East Landfill near the Hansen Spreading Grounds; and methane gas generated from the refuse was migrating from the Sheldon-Arleta Landfill and into the surrounding neighborhood due to the recharge operations at the nearby Tujunga Spreading Grounds. At that time, reservoirs in Los Angeles County were full, and thus thousands of acre-feet of surface water runoff had to otherwise be spilled and lost to the ocean. The spreading activities were suspended for at least one month at that time.

In response to this undesirable condition, in May 1998, that former Watermaster formed the Tujunga and Hansen Spreading Grounds Task Force which later became the San Fernando Basin Recharge Task Force. The task force included representatives from the LACDPW, LADWP, Los Angeles Bureau of Sanitation, and the Watermaster. After a series of meetings, the task force developed preliminary mitigation measures to help improve the utilization of both spreading grounds, particularly during years of above-normal runoff and recharge.

The task force met as the Stormwater Recharge Committee for a period of time, and has since become a collaborative effort between LACDPW and LADWP to focus on projects to enhance the recharge capacity of spreading basins. As a result, watershed management groups have been formed within both the LACDPW and LADWP to address the entire cycle of pumping and recharge as an interrelated discipline, and these groups are working in partnership to study and develop solutions to enhance the groundwater supply in the SFB.

Projects

- Hansen Spreading Grounds

Hansen Spreading Grounds is a 156-acre parcel, located adjacent to the channel of Tujunga Wash and downstream of Hansen Dam. The total wetted area of the spreading grounds is 107 AF with a maximum intake of 600 cfs. These spreading grounds are owned and operated by LACFCD. Improvements to deepen and combine the basins as well as to retrofit and automate the intake structure were completed in January 2013. No additional modifications to the spreading basin are currently proposed. LADWP and LACFCD shared the $8.4 million cost for construction of this project, and it is expected that the project will increase average stormwater recharge by 2,100 AFY.

- Sheldon-Arleta Project – Cesar Chavez Recreational Complex Project (Phase I)

Located adjacent to the Tujunga Spreading Grounds is the Sheldon-Arleta Landfill, which has caused an environmental concern due to the methane gas that is produced (as a byproduct of landfill operations) and released into the subsurface.

During the spreading of surface water at the adjoining Tujunga Spreading Grounds, recharge water moving downward through the underlying soil displaces the air from voids within the unsaturated soil matrix. The resulting lateral migration of the air mass has the potential to displace methane gas out of the adjacent landfill. In recent years, the methane has occasionally migrated offsite, and elevated concentrations of this gas have been reported at a nearby school. To avoid such occurrences, temporary limitations have been placed on the amount of stormwater that can be spread at the Tujunga Spreading Grounds.

To mitigate the displacement of methane gas, LADWP, the Los Angeles Bureau of Sanitation, and the Los Angeles Bureau of Engineering completed the replacement of the existing methane gas collection system at the Sheldon-Arleta Landfill with a new gas collection system. This new system enhances the containment of the methane gas within the landfill, restores the historic spreading flow capacity of 250 cfs at the Tujunga Spreading Grounds, and restores operations at some of the basins closest to the landfill. Construction was completed in 2009 and the three agencies will eventually conduct an evaluation during the next (substantial) storm season to determine the maximum recharge capacity of the improved facility. It is expected that the project could increase average annual stormwater capture by 3,000 AF, to a total of 5,000 AF, at this spreading grounds.

- Tujunga Spreading Grounds

Tujunga Spreading Grounds is a 188-acre parcel located along the channel of Tujunga Wash at its confluence with the Pacoima Wash Channel. These spreading grounds are owned by LADWP, operated by LACFCD, and has a total wetted area of 83 AF and a maximum intake capacity of 250 cfs. Plans are underway to enhance this spreading facility by relocating and automating the current intake structure on Tujunga Wash, installing a second automated intake to receive flows from the Pacoima Wash, and reconfiguring the existing spreading basins. Other enhancements include constructing and/or improving recreational walking trails, native habitat, and educational facilities on the property not currently utilized for the primary function of stormwater capture. It is expected that this project will increase annual stormwater recharge by 8,000 AFY, and increase its intake capacity to 450 cfs. Design of this project was completed Spring 2014, whereas construction is to occur from 2015 through 2017; LADWP will provide $27.2 million for its construction.

- Pacoima Spreading Grounds

These 169-acre spreading grounds are located along both sides of the old Pacoima Wash Channel, downstream of Pacoima Dam. Designs are being prepared for improvements to the spreading basins and upgrades to the intake facility, with construction scheduled to begin in 2016. It is estimated that these improvements will increase average annual stormwater capture by approximately 5,500 AF.

- Lopez Spreading Grounds

The Lopez Spreading Grounds Enhancement Project will upgrade the facility and increase its capacity by upgrading the intake system and removing accumulated silts. This project will increase recharge by approximately 480 AF/Y. Designs and specifications for the project are being finalized.

- Branford Spreading Grounds

Most of the water tributary to this spreading basin is urban runoff from the Branford Street Channel. Located across the Tujunga Wash channel from the Tujunga Spreading Grounds, the project will include the installation of pumps and pipelines to transport stormwater across the channel and into the spreading grounds for infiltration. The Branford Basin is owned and operated by the LACFCD. It is expected that the project will increase average stormwater recharge from 552 to 1,149 AF/Y. A project to revitalize the use of these spreading basins for stormwater capture and recharge is currently being designed and will be constructed from 2017 to 2019.

- Big Tujunga Dam Seismic Retrofit

Big Tujunga Dam was constructed by LACDPW in the 1930s primarily as a flood control facility. In the 1970s, a seismic analysis indicated the dam was susceptible to damage from a large earthquake. Since then, the dam has been operated at a reduced capacity for safety reasons.

LACDPW completed a major seismic retrofit of this dam in January 2012 and this effort has also restored its storage capacity for flood control and water conservation. Specifically, the structural improvements to Big Tujunga Dam increased its storage capacity from 1,500 AF to 6,000 AF. This project, which was partially funded by the City of Los Angeles, greatly enhances LACDPW’s ability to retain and manage stormwater for flood protection, water conservation, and environmental restoration.

- Additional Recharge Projects

LADWP is exploring partnerships, projects, and programs that promote infiltration of rainfall runoff close to its point of origin. Several partnerships that LADWP continues to develop are with LACDPW, the LACFCD, MWD, Tree People, and the Los Angeles and San Gabriel Rivers Watershed Council. Some of the projects and programs being developed include facility retrofits, neighborhood retrofits, and local stormwater recharge projects along medians, power line easements, and parkways.

VI. GROUNDWATER INVESTIGATION PROGRAMS

Pacoima Area Groundwater Investigation

A significant VOC contaminant plume exists in the groundwater near the intersection of San Fernando Road and the Simi Valley Freeway (118 Freeway) in the Pacoima area of the SFB. This area lies approximately 2.5 miles north of and upgradient from the LADWP Tujunga wellfield; groundwater pumped at this wellfield has experienced increasing concentrations of VOCs over time.

To help characterize the extent and potential migration of contamination in the Pacoima area, LADWP constructed two groundwater monitoring wells in 1997, including: PA-01, approximately 0.5 miles downgradient; and PA-02, approximately 1.25 miles downgradient from the suspected source areas.

The reportedly suspected sources include the Chase chemical (formerly Holchem) and the Black & Decker (formerly Price-Pfister) sites, which are under the jurisdiction of DTSC and LARWQCB, respectively.

Chromium Investigations

The LARWQCB, funded in part with a grant from the USEPA, reviewed a large number of sites for potential hexavalent chromium contamination in the SFB and published its original findings in December 2002. Based on this LARWQCB review, 255 suspected hexavalent chromium sites were identified and inspected. As a result of those inspections, the LARWQCB recommended closure (i.e., no further action) for 150 of those sites and the further assessment of the remaining 105 sites. In addition, the LARWQCB issued Cleanup and Abatement Orders to several sites, including, among others, B.F. Goodrich (formerly Menasco Aerospace Division), PRC-Desoto (formerly Courtauld), Drilube, Honeywell (formerly Allied Signal), Lockheed (2), ITT, and Excello Plating; it may eventually issue additional orders to several other sites. The Cleanup and Abatement Orders require a responsible party to assess, clean up, and remediate the effects of contamination encountered in the soil and groundwater. Increasing concentrations of hexavalent chromium in the groundwater have caused the shutdown or reduced pumping of several municipal-supply water wells associated with groundwater treatment plants, because those plants were not designed to remove this contaminant (or any other newly-emerging contaminants). Shutdowns of those municipal-supply wells may possibly allow the continued vertical and lateral migration of the VOCs and chromium to other production wells, and also continue to complicate the extraction, management, and delivery of potable water by the Parties within the SFB.

On August 20, 2009 the California Office of Environmental Health Hazard Assessment (OEHHA) announced its draft Public Health Goal (PHG) for hexavalent chromium to be 0.06 µg/L (or 0.06 ppb) and invited public comments through October 19, 2009. A final PHG for hexavalent chromium of 0.02 ppb was adopted in July 2011. In August 2013 CDPH proposed a Primary MCL for hexavalent chromium of 10 ppb, and this MCL was adopted on May 28, 2014.

Tujunga Discovery Project

In 2008, the LADWP, in conjunction with USEPA and DTSC, formed a task force to conduct an inter-agency investigation into groundwater contamination at the Tujunga wellfield. The investigation began with LADWP's comprehensive sampling of eight existing groundwater monitoring wells in the vicinity of this wellfield. Two additional monitoring wells were sampled in December 2009. The lack of VOCs detected in groundwater samples collected from monitoring well TJ-MW-01 suggests that the Sheldon-Arleta landfill, adjacent to the Tujunga wellfield, may not be the source of this contamination.

USEPA's contractor performed soil vapor sampling and limited soil sampling along several miles of transects upgradient of LADWP's Tujunga wellfield. The site-specific soil vapor results indicate low levels of PCE at most of the investigated sites. In early-2010, sediment sampling was conducted in the adjacent Branford spreading grounds to determine whether sediments in this basin might be a source of VOC contamination. Numerous borings were drilled and a large number of soil samples were analyzed for various analytes, including VOCs; however, TCE was not detected in any of these soils samples. Further, sample results showed the presence of acetone and 2-butanone in certain samples, but these may be related to laboratory contamination.

The next stage of the investigation will involve the construction of several new groundwater monitoring wells in the capture zone of the Tujunga wellfield. The locations of these new monitoring wells were prioritized based on data gaps in the existing wellfield. LADWP completed the construction of four new monitoring wells near the Tujunga wellfield between April 2012 and June 2013, and two other monitoring wells will be constructed by September 2013. USEPA also began the construction of a monitoring well (TJ-MW-09) in April 2013. Construction of these monitoring wells was completed in 2014.

VII. ULARA WATERMASTER MODELING ACTIVITIES

A. Introduction

LADWP continues to support the ULARA Watermaster by performing groundwater modeling of the San Fernando Basin. The basic purpose of this groundwater modeling is to evaluate the combined effects of the proposed groundwater pumping and estimated groundwater recharge in the basin projected over a five-year period. The projected pumping volumes used in the model were obtained from the "Water Year 2013-14 through 2017-18 Pumping and Spreading Plans" submitted by each Party pursuant to the provisions established in the revised February 1998 Policies and Procedures report. The pumping and spreading plan of each Party is included in the appendices of this report.

The groundwater flow model used is a comprehensive three-dimensional computer model that was developed originally for the USEPA during the Remedial Investigation Study of the San Fernando Valley (December 1992). The model is a tool and it has been used herein by LADWP to estimate the future response to pumping and spreading in the SFB for the five-year period ending September 30, 2018.

The model code, "Modular Three-Dimensional Finite-Difference Groundwater Flow Model," commonly called MODFLOW, was originally developed by the U.S. Geological Survey (McDonald-Harbaugh); this model is currently used to develop the San Fernando Basin Groundwater Flow Model. This model consists of 64 rows, 86 columns, and up to four layers to reflect the varying geologic and hydrogeologic characteristics of the SFB in three dimensions. In the deepest portion of the San Fernando Basin, the model is subdivided into four layers, each layer characterizing a specific depth zone. The model has a variable horizontal grid that ranges from 1,000 by 1,000 feet in size in the southeastern portion of the SFB, to 3,000 by 3,000 feet in size in the northwestern portion of this basin (Figure 7-1) or where less data are available; LADWP regularly updates this model.

B. Model Inputs

The input data for this model are illustrated in Table 7-1A, which provides the various elements of recharge into the San Fernando Basin; recharge occurs from precipitation, delivered water, hill and mountain runoff, spreading, and subsurface inflow. Table 7-1B provides the volumes of groundwater extracted from SFB by each major producer, including the cities of Burbank, Glendale, Los Angeles, and other individual pumpers. Both tables show projected values for the five-year study, from Fall 2013 to Fall 2018, as well as any actual values that have been reported for the first half of the 2013-14 Water Year.

In Table 7-1A, the projected values for percolation and spreading activities were estimated using the long-term average rainfall and recharge amounts, and the resulting estimates were then used as inputs to the model. The projections for 2013 to 2018 include the actual amounts reported for the first half of the 2013-2014 Water Year. The spreading estimates reflect temporary shutdowns during construction of the Tujunga Spreading Grounds (TSG). Construction to enhance the spreading capacity at the TSG is planned to occur from 2015 through 2017. The anticipated spreading of imported water at the Pacoima Spreading Grounds (PSG) by the City of Burbank is also included in these projections. Subsurface inflows to the SFB occur from the Sylmar Basin (through the Sylmar Notch and Pacoima Notch) were estimated by the current ULARA Watermaster to be approximately 250 AF/yr. The amounts of subsurface inflows from the Verdugo Basin were determined in the 1962 Report of Referee. These values were used as constants in the model throughout the five-year study.

The volumes for all groundwater extractions shown on Table 7-1B and used as model inputs were obtained from the "Groundwater Pumping and Spreading Plans" submitted by the five municipal–supply producers; a copy of each of these plans is included in the appendices of this report. The total extraction by each wellfield was initially allocated among the individual wells comprising each wellfield, and then a percentage of the pumping allocated to each well was assigned to each model layer based on the percentage of casing perforations considered to be contained within each layer.

The initial head values (groundwater elevations) were derived from the actual data from Water Year of 2012-13, and these values set the initial conditions for model analysis for the next five-year period. These initial conditions reflect the increased in simulated groundwater elevations observed in most areas of the SFB resulting from decreased pumping in the City of Los Angeles wellfields.

At the close of every Water Year, the Watermaster staff at LADWP updates the model input files with the actual basin recharge and extraction data; this activity is performed each year by LADWP and incorporates actual data from as early as 1981.

Table 7-1
MODEL INPUT
San Fernando Basin Recharge & Extractions
2013-2018

Table 7-1A

Projected San Fernando Basin Recharge 2013-18

	RAINFALL (IN/Y)		SAN FERNANDO BASIN RECHARGE (AF/Y)																
			PERCOLATION			H&M (A)	SPREADING GROUNDS			PACOIMA					SUBSURFACE INFLOW				
WATER YEAR	VALLEY	HILL & MTN	VALLEY FILL	RETURN WATER	SUB TOTAL	HILL & MTN	BRANFORD	HANSEN (B) (NATIVE)	LOPEZ	PACOIMA (NATIVE)	PACOIMA (C) (MWD)	PACOIMA (TOTAL)	TUJUNGA (D)	SUB - TOTAL	PACOIMA NOTCH (E)	SYLMAR NOTCH (E)	VERDUGO BASIN	SUB - TOTAL	TOTAL RECHARGE
2013-14	6.23	9.03	4,328	48,691	53,019	1,542	407	1,667	659	1,041	7,000	8,041	195	10,969	117	133	70	320	65,850
2014-15	17.70	21.81	12,296	51,586	63,882	3,725	540	13,900	540	6,564	7,725	14,289	5,100	34,369	117	133	70	320	102,296
2015-16	17.70	21.81	12,296	51,586	63,882	3,725	540	13,900	540	6,564	7,525	14,089	0	29,069	117	133	70	320	96,996
2016-17	17.70	21.81	12,296	51,586	63,882	3,725	540	13,900	540	6,564	7,425	13,989	0	28,969	117	133	70	320	96,896
2017-18	17.70	21.81	12,296	51,586	63,882	3,725	540	13,900	540	6,564	7,425	13,989	5,100	34,069	117	133	70	320	101,996

Table 7-1B

Projected San Fernando Basin Extraction 2013-18

	SAN FERNANDO BASIN EXTRACTIONS (AF/Y)																		
	LADWP										BURBANK			GLENDALE			OTHERS		
WATER YEAR	AE	ER	HW	NH (WEST)	NH (EAST)	PL	RT	TJ	VD	WH	TOTAL LADWP (F)	BURBANK PSD	LOCKHEED	NON-BURBANK (VMP)	CITY OF GLENDALE	GU-NORTH	GU-SOUTH	TOTAL NON-LADWP	TOTAL NON-GLENDALE (F. LAWN)	TOTAL EXTRACTION
2013-14	-935	-3	0	-15,289	0	-2,377	-22,282	-36,623	-846	-424	-78,779	0	-10,583	-400	-24	-4,939	-2,660	-915	-400	-98,700
2014-15	-1,377	0	0	-13,064	0	-2,559	-19,204	-23,667	0	0	-59,871	0	-11,634	0	-36	-4,745	-2,555	-915	-400	-80,156
2015-16	-4,923	0	0	0	0	-2,178	0	-15,674	0	0	-22,775	0	-11,634	0	-36	-4,745	-2,555	-915	-400	-43,060
2016-17	-4,923	0	0	0	0	-2,178	0	-15,674	0	0	-22,775	0	-11,634	0	-36	-4,745	-2,555	-915	-400	-43,060
2017-18	-4,923	0	0	0	0	-2,178	0	-15,674	0	0	-22,775	0	-11,634	0	-36	-4,745	-2,555	-915	-400	-43,060

NOTES:

(A) Hill & Mountain runoff

(B) Hansen Spreading Grounds activated in the water year of 2009-10 after completing the modification work

(C) Burbank projected to spread between 7,000 to 7,725 AF of imported water (MWD) at Pacoima Spreading Grounds on a yearly basis.

(D) Tujunga Spreading Grounds will be taken out of service during the water years of 2015-17 for modifications to increase storage capacity

(E) The values were estimated on the updated Safe Yield for the Sylmar Basin by Mr. Richard Slade, the Watermaster of Upper Los Angeles River Area.

(F) The values shown for Los Angeles on this extraction plan are estimates only. The estimated groundwtaer pumping amounts for the above-mentioned wellfields may be increased as treatment faculities are installed or as the blending with external source of water will continue to be allowable.

C. Simulated Groundwater Elevations and Flow Directions

After running the model for five separate but successive stress periods (Water Years 2013-2018), each lasting 365 days, MODFLOW generated various numerical data, including the heads (groundwater elevations), the drawdown (change in groundwater elevations), and the cell-by-cell flow (vector or flow direction data). These numerical data were used to create the following figures and plates:

- The simulated groundwater (water table) contour results for Model Layer 1 for Fall 2018 are shown on Plate 1; the simulated contours for Model Layer 2 are shown on Plate 2 for the same period.

- The changes in the simulated groundwater elevation contours were generated from the drawdown data from the Fall 2013 to Fall 2018 stress period and the results are shown on Plate 3 for Layer 1 and on Plate 4 for Layer 2.

- The simulated horizontal groundwater flow directions for Fall 2018 are shown on Plate 5 for Model Layer 1 and on Plate 6 for Layer 2 for the same period.

- Plates 7 through 10 depict the most recently generated contaminant plumes for TCE, PCE, nitrate as NO_3, and total dissolved chromium (as adapted from 2010-dated work published by the USEPA), superimposed onto the Layer 1 simulated horizontal groundwater flow direction for the year 2018.

D. Evaluation of Model Results

Plate 1: Simulated Groundwater Contour Model Layer 1 – Fall 2018

- The most noticeable feature of the simulated groundwater contours shown on Plate 1 is the cone of depression (pumping cone) that has developed around the Burbank OU. The extractions by the water wells at this facility occur primarily from Layer 1, although Layer 2 does provide some recharge to Layer 1. Burbank has projected pumping of about 11,634 AF/Y from its BOU for the period from Fall 2013 to Fall 2018. The radius of influence extends as far as 2,030 feet in the downgradient (southeasterly) direction. The upgradient radius of influence is usually larger than the down-gradient radius of influence.

Plate 1 illustrates the more subtle pumping influences of the Glendale OU wells and the Pollock Treatment Plant Wells.

Plate 2: Simulated Groundwater Contour Model Layer 2 – Fall 2018

- The most significant features of the simulated groundwater contours shown on Plate 2 are the simulated cones of depression near the Tujunga wellfield and the Burbank OU. Over 75 percent of the groundwater pumped from the Tujunga wellfield is from Model Layers 2, 3 and 4.

Plate 3: Change in Groundwater Elevation Model Layer 1 – Fall 2013 to Fall 2018

In general, the model simulation showed an increase in groundwater elevations in most areas of the basin, particularly in areas near the wellfields and the spreading grounds. This rebound in simulated water levels would result from the substantial reductions in groundwater pumping expected by the City of Los Angeles; their five-year plan indicates pumping would be reduced each year to values as low as 22,775 AF during Water Year 2017-18 (See Table 7-1B). While Los Angeles's pumping would likely be reduced in response to water quality concerns such as detection of elevated concentrations of contamination in its groundwater, steps are being taken by Los Angeles to construct treatment systems to treat and serve the groundwater, and therefore not lose the operation of its wellfields over these next several years.

In summary, the estimated total recharge volumes expected over the next five years substantially exceeds total groundwater extractions over the same period by about 257,059 AF, cumulatively. The items below provide a more detailed review of Plate 3.

- The area in the vicinity of Tujunga Spreading Grounds shows an increase in simulated water elevations of about 42 feet, as a result of resumed spreading activities at TSG in 2018 and reduced pumping at the nearby Tujunga wellfield.

- The area in the vicinity of Hansen Spreading Grounds shows an increase in simulated water elevation of about 42 feet.

- The increase in simulated groundwater levels from 2013 to 2018 in the vicinity of Pacoima Spreading Grounds is due to the proposed spreading of imported water by Burbank (7,425

AF/Y) in addition to the normal recharge of native surface water by Los Angeles County Department of Public Works (LACDPW).

- The simulated groundwater elevations within the cone of depressions created by the Rinaldi-Toluca and North Hollywood West wellfields were shown by the model to rebound with increases in the simulated groundwater elevations by about 28 and 32 ft, respectively. This simulated rebound in water levels in areas near these wellfields would result from the proposed reduced pumping anticipated by the City of Los Angeles.

- Groundwater elevations near the Erwin, Whitnall and Verdugo wellfields were simulated to increase by 8 to 20 ft, due to the reduction in projected pumping from these wellfields between 2013 and 2018.

- The simulated groundwater level near the Burbank OU showed an expected increase by about 12 ft and the groundwater level near the Glendale North OU was projected to increase by 2 ft from 2013 to 2018.

Plate 4: Change in Groundwater Elevation Model Layer 2 – Fall 2013 to Fall 2018

- Similar to Model Layer 1, Plate 4 illustrates much of the same substantial increases in simulated groundwater elevations in Model Layer 2 which would also result from the reduced pumping anticipated by Los Angeles as well as the increased recharge activity at the spreading basins.

- The model simulated an increase in the groundwater elevations by 32 to 38 ft in the area near the Rinaldi-Toluca and North Hollywood-West wellfields. Simulated groundwater elevations in the area near the Erwin, Whitnall and Verdugo wellfields were projected by the model to increase by 8 to 22 ft. The model also simulated a rebound in the groundwater elevations by about 32 ft in the area upgradient of the Tujunga Wellfield.

Plate 5: Simulated Groundwater Flow Direction Model Layer 1 – Fall 2018

- Plate 5 consists of groundwater flow direction arrows superimposed on the simulated groundwater elevation contours to illustrate the general (or regional) direction of groundwater flow within Layer 1 of the model.

- Groundwater pumped at the Rinaldi-Toluca, Tujunga, North Hollywood, GOU, and BOU wellfields and water spread at the Hansen, Pacoima and Tujunga spreading grounds caused the most pronounced effect on the direction of groundwater flow in the SFB. In particular, the BOU may create such a significant cone of pumping depression that groundwater appears to flow inward toward the wellfield from all directions (radial flow*)*.

- A groundwater divide apparently develops south of the Burbank OU wells. This appears to be primarily due to the 'pumping trough" formed by the pumping at the BOU.

Plate 6: Simulated Groundwater Flow Direction Model Layer 2 – Fall 2018

- Plate 6 consists of groundwater flow direction arrows superimposed on the simulated groundwater elevation contours to illustrate the general or regional direction of groundwater flow within Layer 2 of the model.

Plates 7 – 10: Simulated Groundwater Flow Direction and TCE, PCE, NO_3, and Chromium (Cr) Contamination in Model Layer 1 – Fall 2018

- Plates 7 through 10 depict the most recent TCE, PCE, nitrate as NO_3, and Cr contaminant plumes available from the work of USEPA (as of 2010), and these plumes have been superimposed onto the horizontal direction of groundwater movement in Layer 1 for Fall 2017. The BOU appears to contain most of the 1,000 to 5,000 μg/L TCE and PCE plumes and a large portion of the 0-5, 5-50, 100-500, and 500-1,000 μg/L TCE and PCE plumes. The uncaptured portions of these plumes are likely to continue migrating southeasterly in the direction of the Glendale OU and the Los Angeles River Narrows area.

- Pumping by the Burbank OU (11,634 AF/Y) tends to flatten the horizontal gradient in a southeasterly direction, thereby slowing the natural movement of groundwater southeasterly of the plume in the area of the Burbank OU.

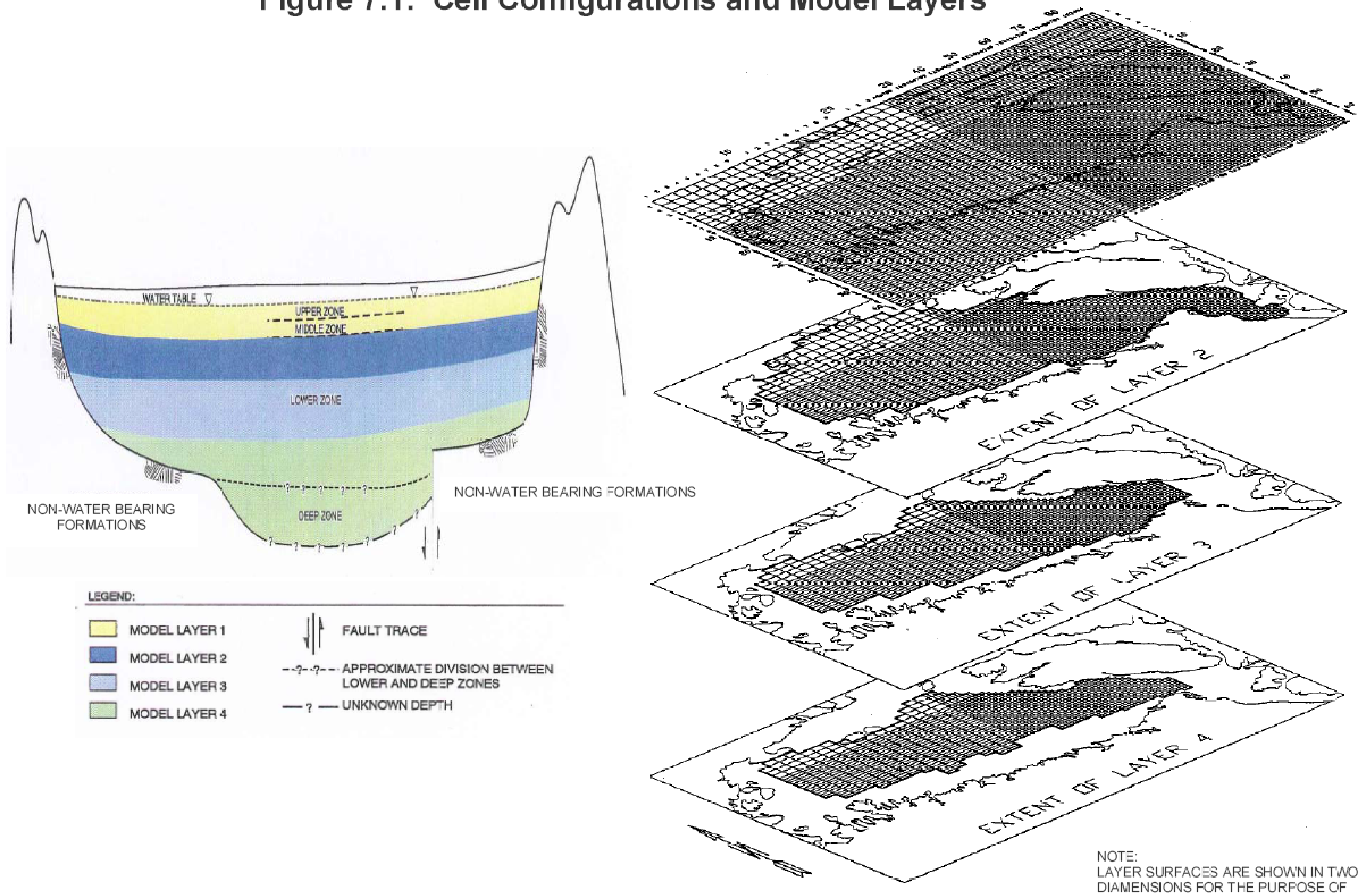
- Wells in the Glendale NOU and SOU capture a portion of the plume(s) that is (are) not captured by the Burbank OU wells. Wells in the entire Glendale OU also capture the plume upgradient and within the radius of influence of these wells.

- Pumping by the Pollock wells (2,178 AF/Y) appears to have little effect on Model Layer 1 because approximately 75 percent of the pumping by this facility extracts groundwater from the zones within Layer 2.

- Plate 9 (Nitrate as NO_3 Contamination) indicates that Layer 1 extractions by the NHOU, BOU and GOU wells may be impacted by nitrate as NO_3.

- Plate 10 (Total Dissolved Chromium) indicates that Layer 1 extractions by wells in the NHOU, the BOU, the North and South GOUs, and the Pollock Wells may be impacted by the chromium plume(s).

Figure 7.1: Cell Configurations and Model Layers



NOTE:
LAYER SURFACES ARE SHOWN IN TWO DIAMENSIONS FOR THE PURPOSE OF THIS ILLUSTRATION ONLY. ACTUAL MODEL LAYER THICKNESS VARIES BY NODE.

Source: *Remedial Investigation Report of Groundwater Contamination in the San Fernando Valley, December 1992*

VIII. WATERMASTER EVALUATION AND RECOMMENDATIONS

Declining groundwater levels in some wells combined with continually increasing Stored Water Credits for the three municipal-supply Parties in the SFB continue to represent serious problems that require ongoing analysis and review with respect to the hydrogeology and management of this basin. The 2007-dated Stipulated Agreement between these Parties (Burbank, Glendale and Los Angeles) will help to limit the future pumping of Stored Water Credits in the SFB. Importantly, this Watermaster has opined that groundwater pumping by the municipal-supply purveyors will need to be reduced until basin recharge and their groundwater extraction volumes become more in equilibrium over time. Further, in an effort to increase stormwater recharge in SFB, the City and County of Los Angeles performed and funded an ambitious and very important program to increase the recharge capacity in several of the local spreading grounds, and the City of Los Angeles continues to investigate additional alternatives to increase water conservation. This Watermaster commends the City and County of Los Angeles for these vital efforts.

VOC contamination continues to be the most serious challenge to water quality and to the ability of the Parties to pump their water rights (without treatment) from the SFB. The various contaminant plumes are large and continue to migrate, despite years of groundwater remediation and treatment. For example, the VOC plumes in North Hollywood have not been completely controlled by the extraction wells in the NHOU, due in large part to declining groundwater levels which have resulted in the reduced pumping capacity of those extraction wells. It is encouraging to see USEPA's proposed Second Interim Remedy for the NHOU which entails facility improvements to increase its peak pumping capacity to as much as 4,000 gpm (3,050 gpm on average). Although the planned implementation of these improvements is several years away, this Remedy should eventually help remove additional contaminant mass and control contaminant migration in the nearby plume(s). The BOU has undergone several capital improvements and that facility now operates with much greater reliability to pump and treat VOC-contaminated groundwater near its 9,000 gpm design capacity on a consistent basis.

The Watermaster is also aware of the rising trends in and/or recent detections of hexavalent chromium in several production wells in the eastern portion of the SFB. Currently, none of the existing water treatment plants are capable of removing this contaminant. As Watermaster, I continue to support an aggressive approach by regulatory agencies including USEPA, LARWQCB, and DTSC in identifying the various sources of this contaminant and in requiring effective, efficient and timely cleanup by the responsible parties. The Watermaster appreciates

Glendale's lead in the development of chromium treatment technology in the area and in the construction of its Chromium (VI) Removal Demonstration Facilities.

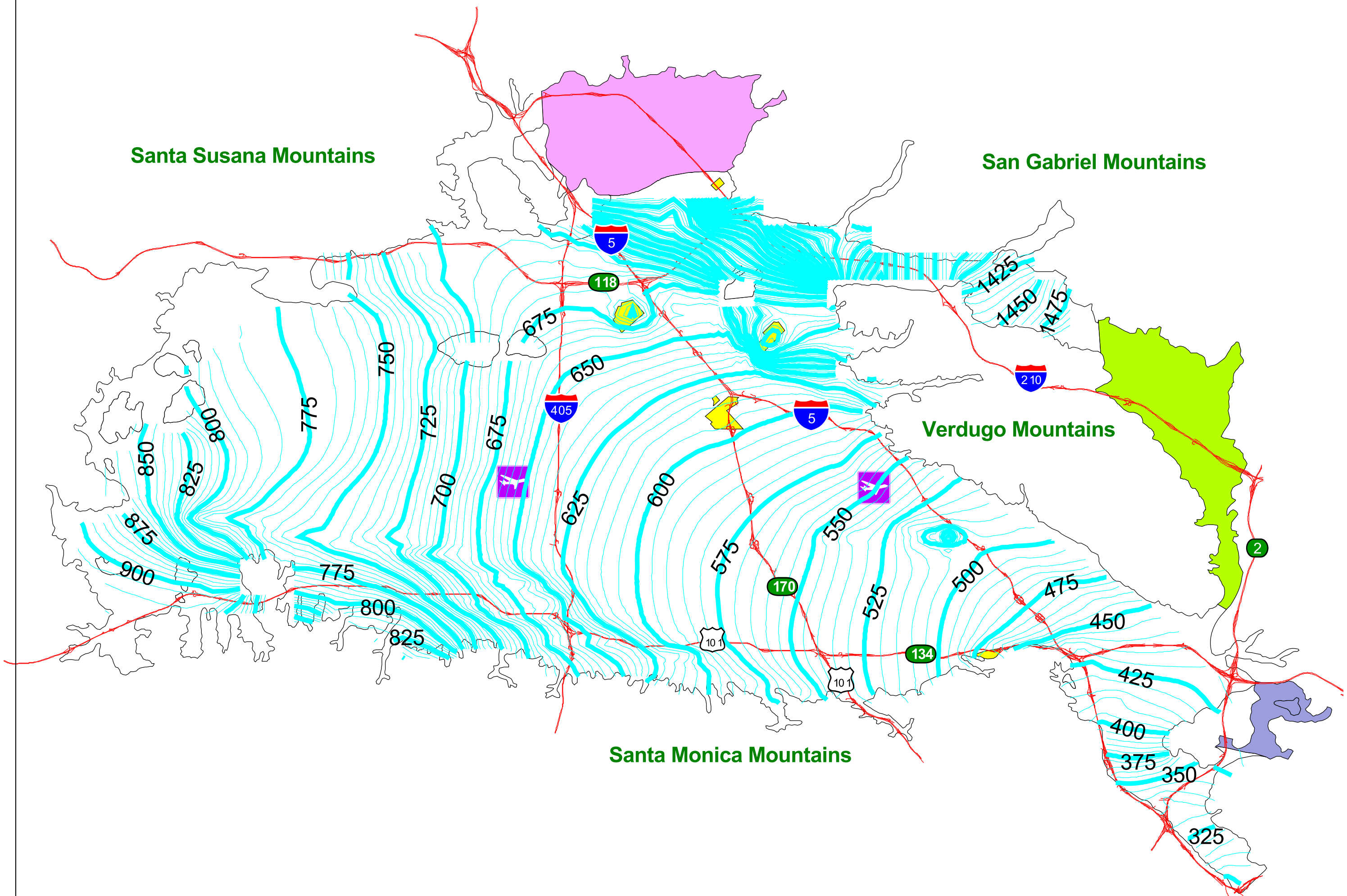
Due to the geologic conditions in Verdugo Basin and the presence of local bedrock constrictions, groundwater tends to rise to ground surface near the Verdugo Wash Narrows and eventually leaves this basin as surface outflow. Glendale is currently unable to pump its full right from the Verdugo Basin, but by rehabilitating one of its previously-abandoned wells and constructing a new municipal-supply well, Glendale has taken steps to increase its extractions from the Verdugo Basin and help reduce the continued groundwater outflow from this basin. The Watermaster commends the ongoing efforts of Glendale to increase its pumping capacity and also the efforts of CVWD to begin an evaluation of potential stormwater recharge projects in Verdugo Basin.

The Parties should continue to expect to face significant challenges to both the availability and quality of the groundwater in the ULARA groundwater basins during the next five water years. It is the opinion of this Watermaster that, over the forthcoming years, it will be essential for the continuing safe yield operation of the ULARA groundwater basins to continue to: provide more recharge at existing spreading basins; define and implement new locations and/or other methods (such as the use of injection wells) for recharging these groundwater basins; actively pursue the possible spreading of recycled water in existing spreading basins in the northeastern side of the SFB in order to augment groundwater recharge that occurs naturally during the rainy season each year in those existing spreading basins; and to begin working with DDW and the LARWQCB to define the possibility of the direct recharge of highly-treated, recycled water into injection wells that could be located near or east of the 405 Freeway in the SFB.

PLATES

PLATE 1

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013- 2018 Water Years



LEGEND

Groundwater Contour (FT)

Spreading Grounds

Airport

Groundwater Basins

San Fernando

Sylmar

Verdugo

Eagle Rock

N

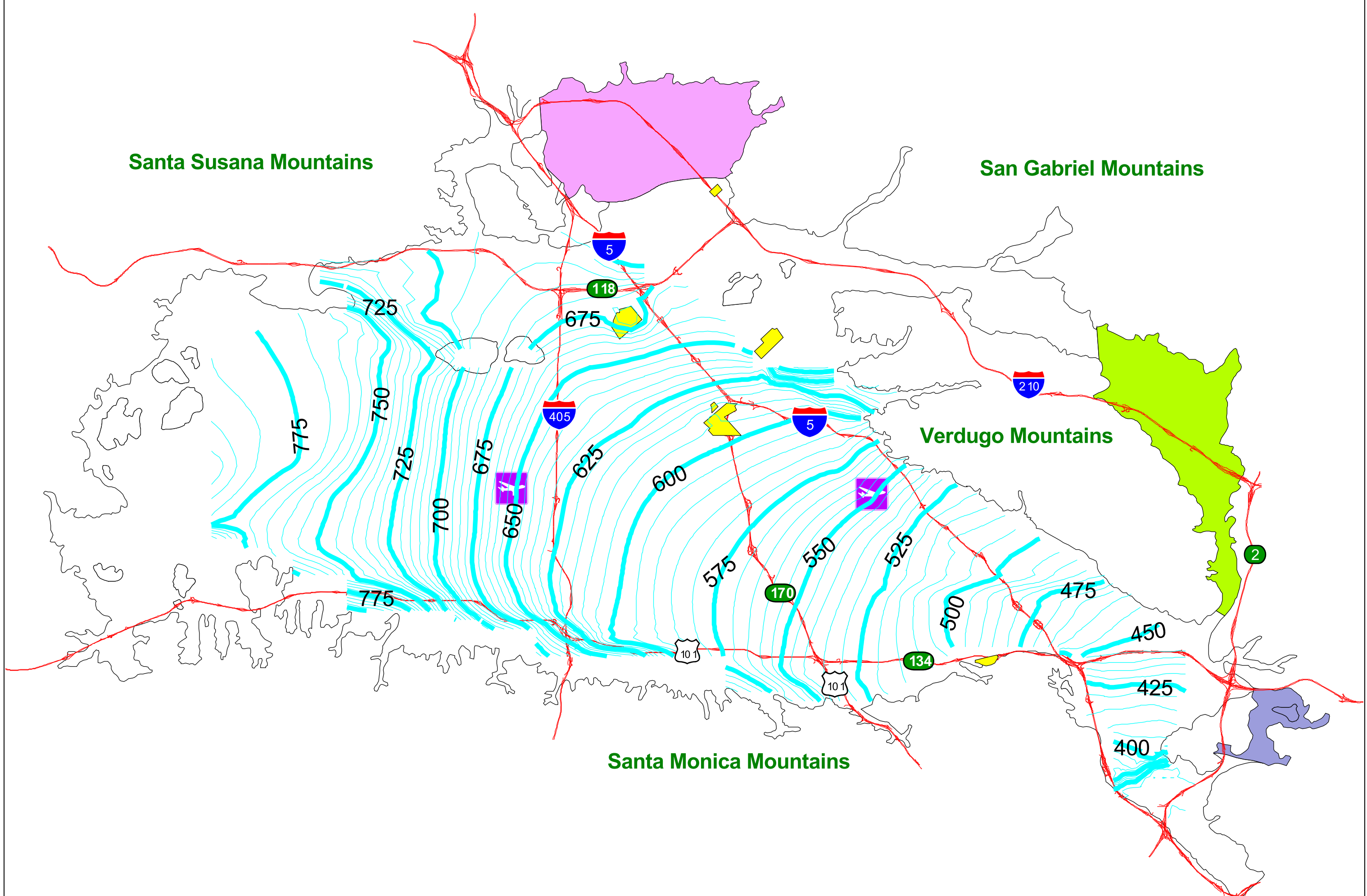
2 0 2 Miles

Note:
Contour units: FT MSL

Simulated Groundwater Contours - Model Layer 1
FALL 2018

PLATE 2

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013 - 2018 Water Years



Note:
Contour units: FT MSL

LEGEND

Groundwater Contour (FT)
Spreading Grounds
Airport

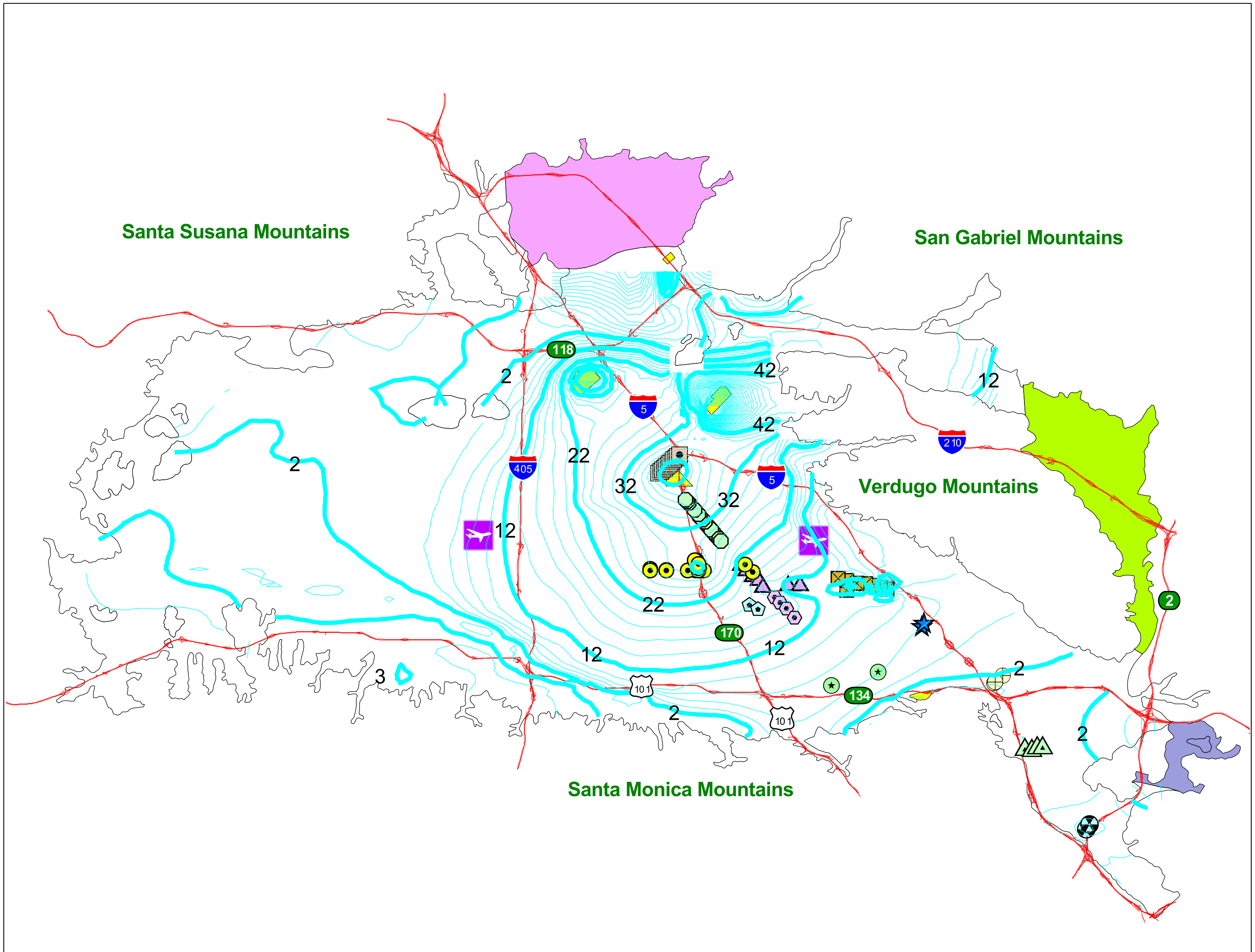
Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

N

2 0 2 Miles

Simulated Groundwater Contours - Model Layer 2
FALL 2018



Note:
Contour units: FT MSL
Possitive numbers = water level increase

PLATE 3

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013 - 2018 Water Years

LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

Change in GW Elev. (FT)
Spreading Grounds
Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

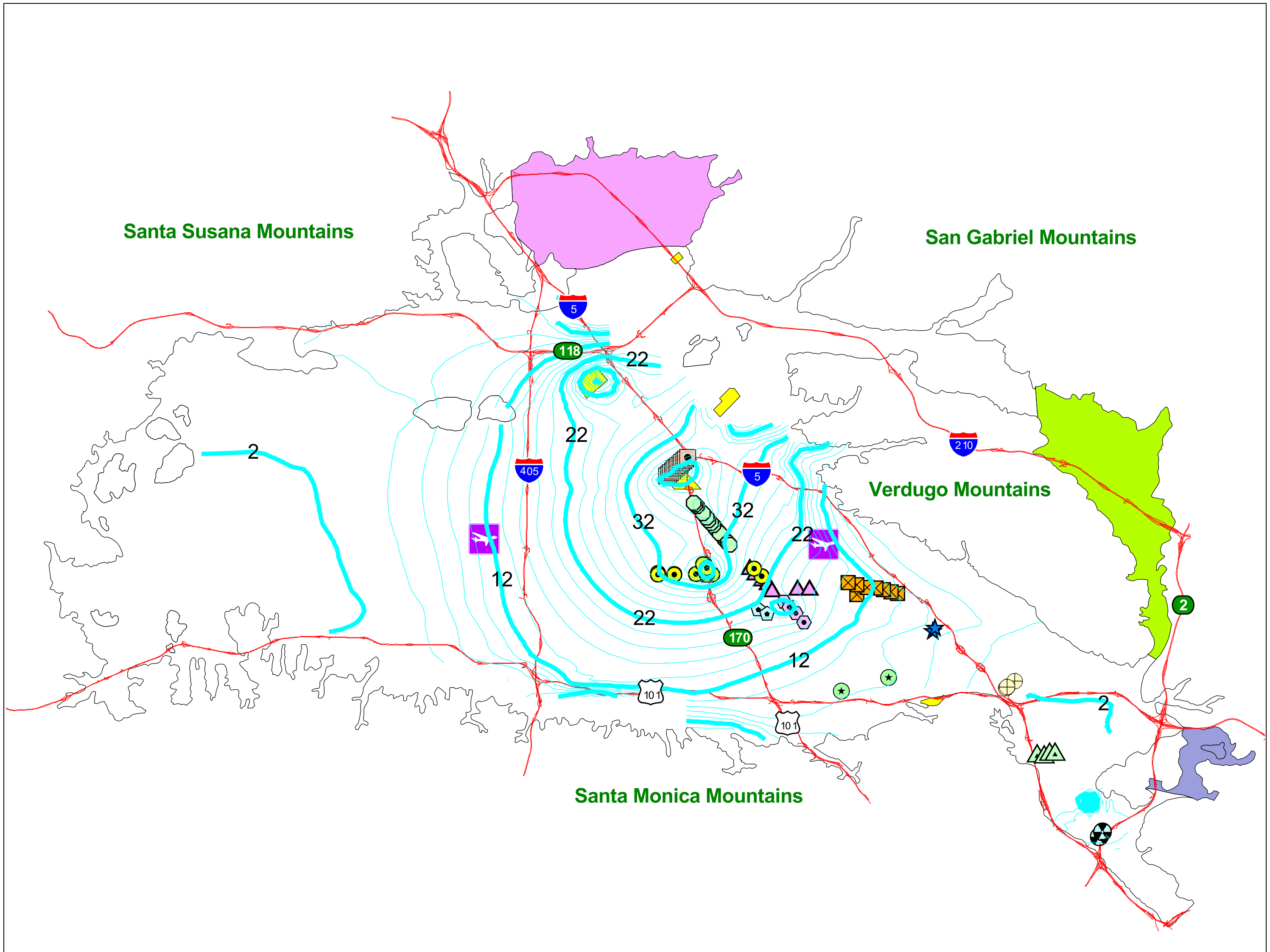
N

2 0 2 Miles

Simulated Change in Groundwater Elevation - Model Layer 1
Fall 2013 - Fall 2018

PLATE 4

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013 - 2018 Water Years



Note:
Contour units: FT MSL
Possitive numbers = water level increase

LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

Change in GW Elev. (FT)

Spreading Grounds

Airport

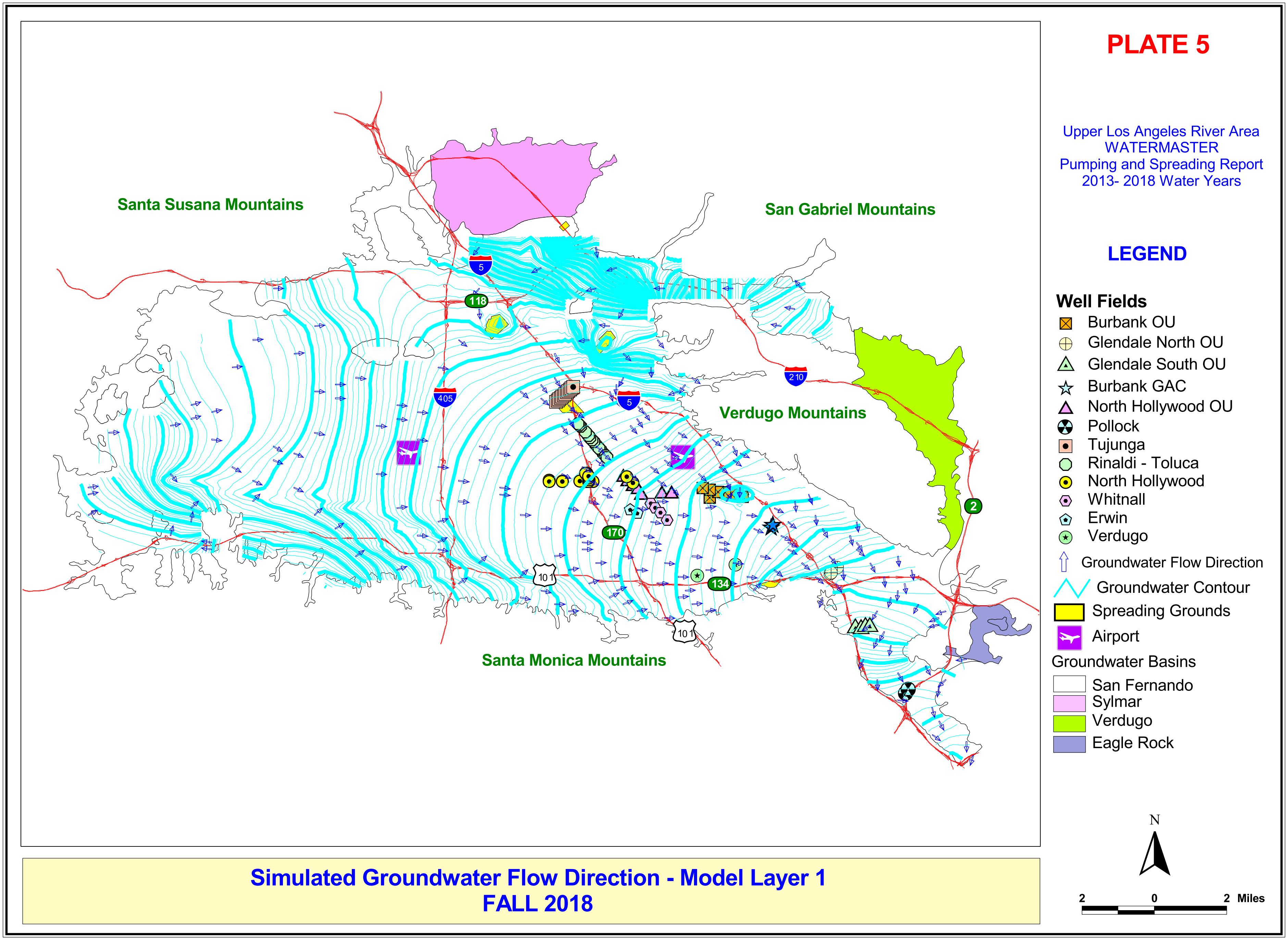
Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

N

2 0 2 Miles

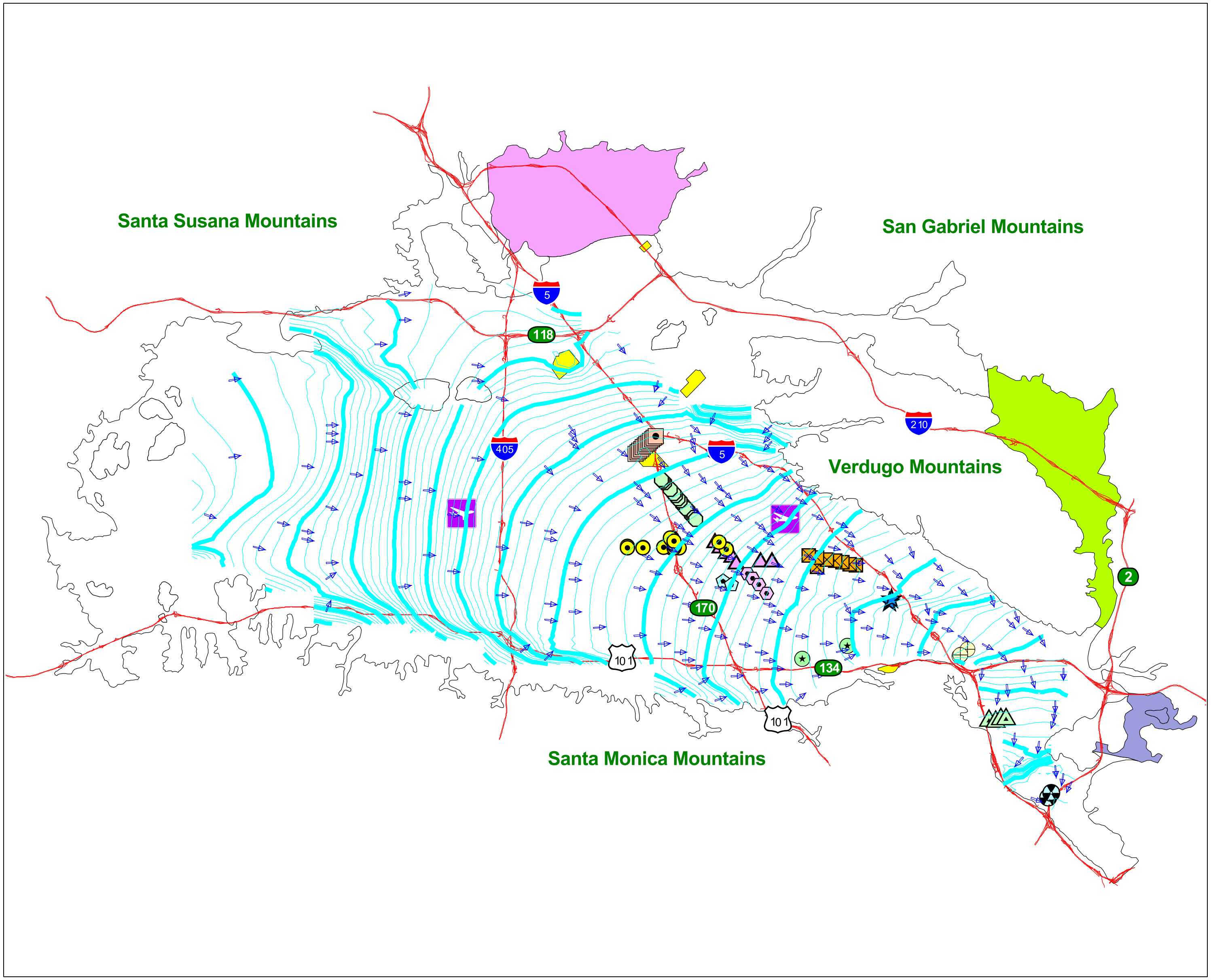
Simulated Change in Groundwater Elevation - Model Layer 2
Fall 2013 - Fall 2018



Simulated Groundwater Flow Direction - Model Layer 1
FALL 2018

PLATE 6

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013 - 2018 Water Years



LEGEND

Well Fields
- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

Groundwater Flow Direction
Groundwater Contour
Spreading Grounds
Airport

Groundwater Basins
- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

N

2 0 2 Miles

Simulated Groundwater Flow Direction - Model Layer 2
FALL 2018

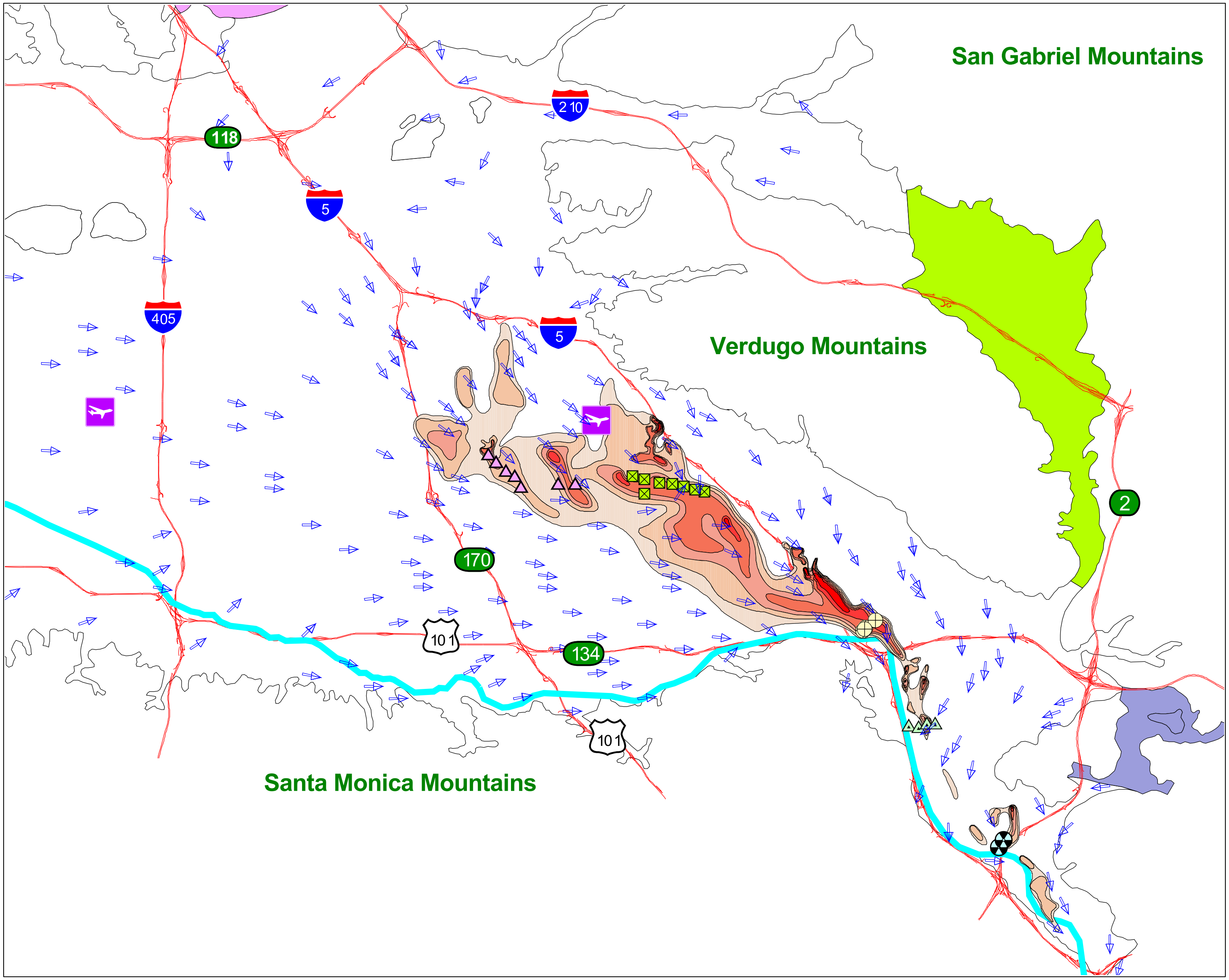


PLATE 7

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013 - 2018 Water Years

LEGEND

- Burbank OU
- Glendale North OU
- Glendale South OU
- North Hollywood OU
- Pollock Wells

TCE Plume (Source: USEPA)

- > DL - 5 ug/L (MCL)
- 5.01 - 50 ug/L
- 50.01 - 100 ug/L
- 100.01 - 500 ug/L
- 500.01 - 1000 ug/L
- 1000.01 - 5000 ug/L
- Groundwater Flow Direction
- Los Angeles River
- Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

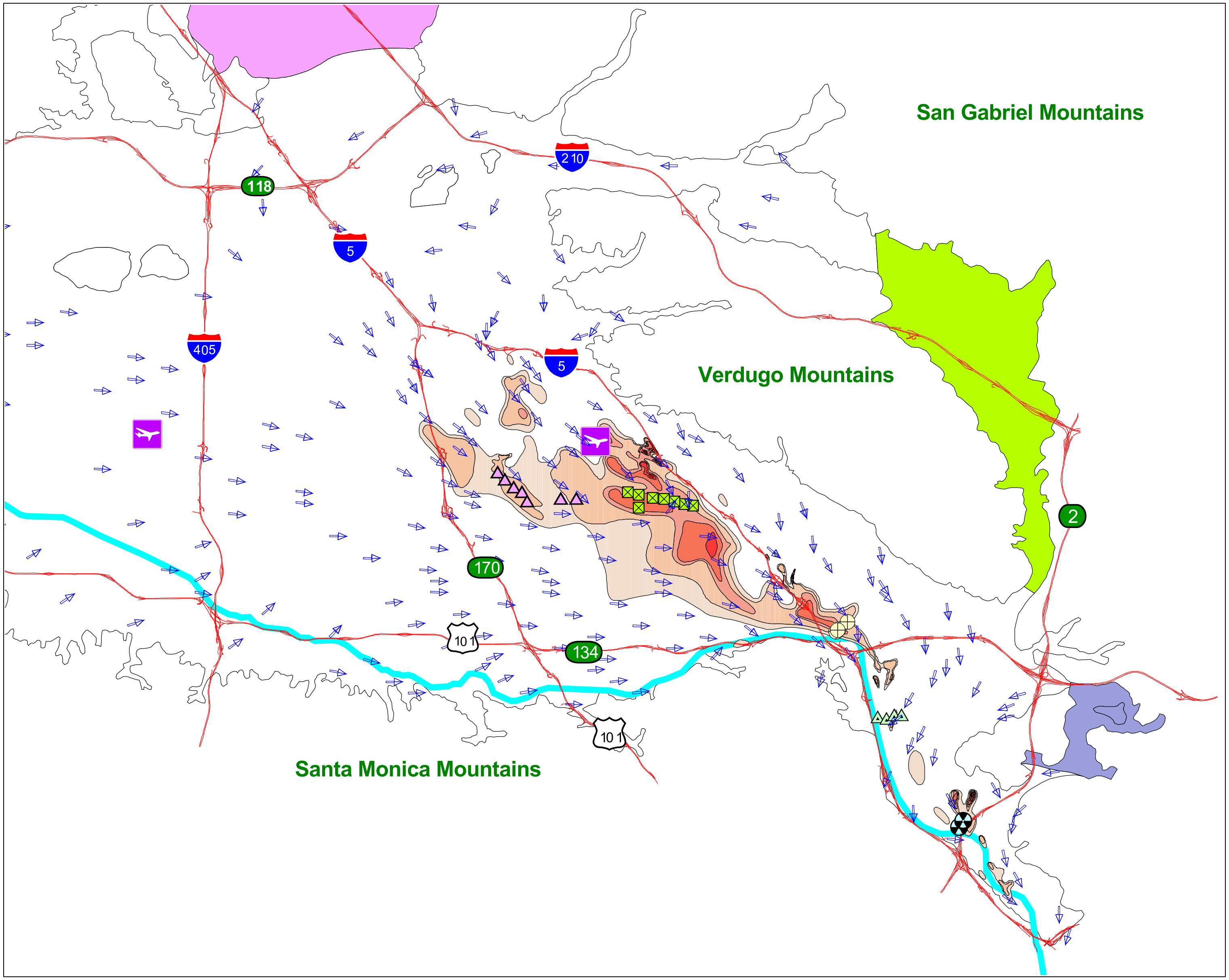
N

1 0 1 2 Miles

2010 TCE Contamination and 2018 Simulated Groundwater Flow Direction
Model Layer 1

PLATE 8

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013 - 2018 Water Years



LEGEND

- Burbank OU
- Glendale North OU
- Glendale South OU
- North Hollywood OU
- Pollock Wells

PCE Plume (Source: USEPA)

- > DL - 5 ug/L (MCL)
- 5.01 - 50 ug/L
- 50.01 - 100 ug/L
- 100.01 - 500 ug/L
- 500.01 - 1000 ug/L
- 1000.01 - 5000 ug/L
- Groundwater Flow Direction
- Los Angeles River
- Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

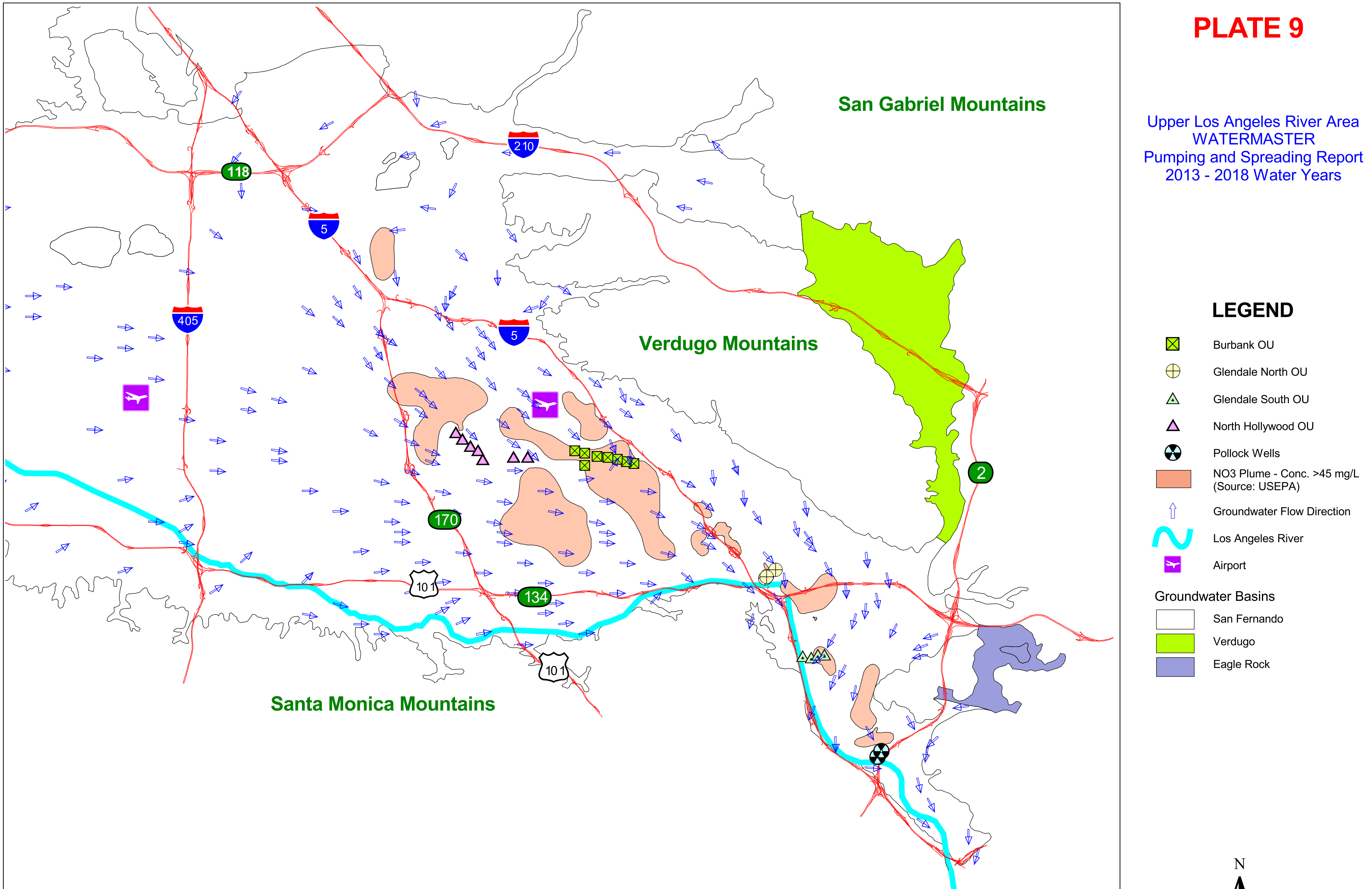
N

1 0 1 2 Miles

2010 PCE Contamination and 2018 Simulated Groundwater Flow Direction
Model Layer 1

PLATE 9

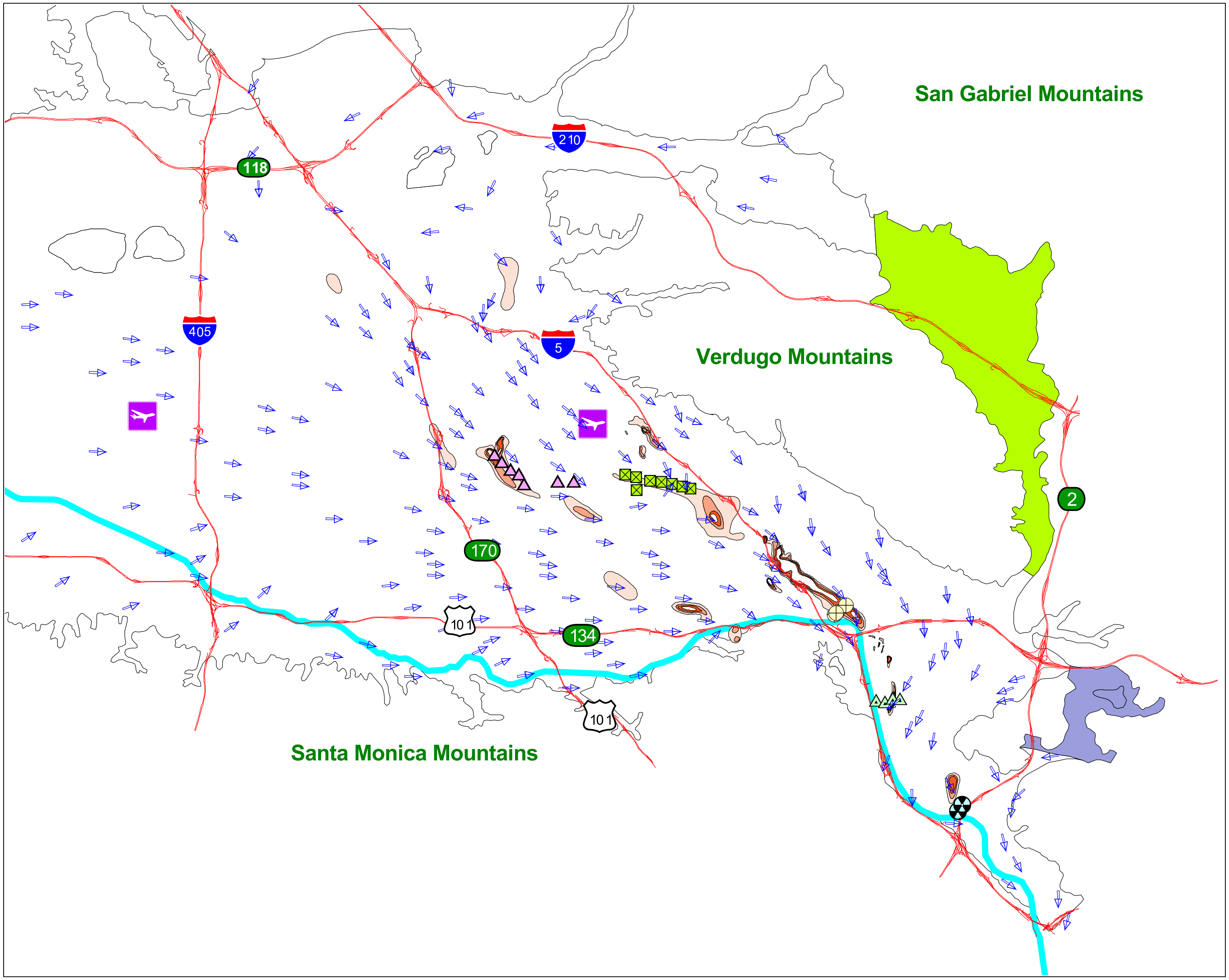
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013 - 2018 Water Years



2010 Nitrate (as NO3) Contamination and 2018 Simulated Groundwater Flow Direction
Model Layer 1

PLATE 10

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2013- 2018 Water Years



LEGEND

- Burbank OU
- Glendale North OU
- Glendale South OU
- North Hollywood OU
- Pollock Wells

Total Chromium Plume (Source: USEPA)

- 5 - 25 ug/L
- 25.01 - 50 ug/L
- > 50 ug/L
- Groundwater Flow Direction
- Los Angeles River
- Airport

Groundwater Basins

- San Fernando
- Verdugo
- Eagle Rock

N

1 0 1 2 Miles

2010 Total Dissolved Chromium Contamination and 2018 Simulated Groundwater Flow Direction Model Layer 1

APPENDIX A

CITY OF LOS ANGELES

PUMPING AND SPREADING PLAN

2013-2018 Water Years

CITY OF LOS ANGELES
GROUNDWATER PUMPING AND SPREADING PLAN
IN THE UPPER LOS ANGELES RIVER AREA
FOR WATER YEARS 2013-2018

JULY 2014

Prepared by:
Water Rights & Groundwater Management Group
WATER RESOURCES DIVISION
Los Angeles Department of Water and Power

TABLE OF CONTENTS

Introduction

The water rights in the Upper Los Angeles River Area (ULARA) were set forth in a Final Judgment, entered on January 26, 1979, ending litigation that lasted over 20 years. The ULARA Watermaster's Policies and Procedures give a summary of the decreed extraction rights within ULARA, together with a detailed statement describing the ULARA Administrative Committee operations, reports to and by the Watermaster and necessary measuring tests and inspection programs. The ULARA Policies and Procedures have been revised several times since the original issuance, to reflect current groundwater management thinking.

In Section 5.4 of the ULARA Policies and Procedures as amended in February 1998, it is stated that:

"...all parties or non-parties who pump groundwater are required to submit annual reports by May 1 to the Watermaster that include the following:

- *A 5-year projection of annual groundwater pumping rates and volumes.*
- *A 5-year projection of annual spreading rates and volumes.*
- *The most recent water quality data for each well."*

This 2014 report presents the five-year Groundwater Pumping and Spreading Plan for the Water Years 2013–2018 for the City of Los Angeles.

Section 1: Facilities Description

Groundwater conditions in ULARA are influenced by facilities owned or operated by the Los Angeles Department of Water and Power (LADWP).

a.) Spreading Grounds: There are five spreading ground facilities that can be used for groundwater recharge of native water in ULARA. The Los Angeles County Flood Control District (LACFCD) operates the Tujunga, Branford, Hansen, Lopez, and Pacoima spreading grounds. LACFCD and LADWP maintain the Tujunga Spreading Grounds cooperatively. LADWP owns Tujunga Spreading Grounds, and LACFCD owns the Branford, Hansen, Lopez and Pacoima spreading grounds. Estimated capacities for these are shown in Table 1-1 and their locations are shown in Figure 1-1.

TABLE 1-1

ESTIMATED CAPACITIES EXPERIENCED AT SPREADING GROUNDS

Spreading Ground	Type	Total wetted area [acre]	Max Recharge Capacity Experienced [acre-feet]
Operated by LACFCD			
Branford	Deep basin	7	2,100
Hansen	Med. Depth basin	107	35,100
Lopez	Shallow basin	12	3,900
Pacoima	Med. Depth basin	107	24,100
(Jointly Maintained by LADWP & LACFCD)			
Tujunga	Shallow basin	83	42,800
		TOTAL:	108,000

b.) Extraction Wells: LADWP has nine well fields in the San Fernando Basin, and one in the Sylmar Basin. The rated capacities of the nine well fields are shown in Table 1-2. The rated capacities are approximate, as operating capacities vary depending on the water levels. Actual groundwater pumping will vary due to maintenance schedules and water quality for each well.

TABLE 1-2
RATED CAPACITIES OF LADWP WELL FIELDS IN ULARA

Well Field	Number of Wells			Rated Capacity	
San Fernando Basin	Active	Stand-by	Total	cfs	gpm
Aeration	7	---	7	2.4	1,077
Crystal Springs (A)	---	---	---	---	---
Erwin	2	0	2	6.1	2,738
Headworks	---	---	---	---	---
North Hollywood	14	3	17	69.6	31,237
Pollock	2	0	2	5.9	2,648
Rinaldi-Toluca	15	---	15	113	50,714
Tujunga	12	---	12	98.2	44,072
Verdugo	2	---	2	7.4	3,321
Whitnall	4	---	4	14.8	6,642
Sylmar Basin					
Mission	2	---	2	5	2,244
TOTAL	60	3	63	322	144,693

(A) Well field has been abandoned pursuant to sale of property to DreamWorks, Inc.

c.) Groundwater Treatment Facilities: LADWP operates three groundwater treatment facilities. Water treated by these facilities is conveyed to the water distribution system and delivered to LADWP customers for potable supply as a beneficial end use.

North Hollywood Groundwater Treatment Facility: The North Hollywood Operable Unit (NHOU) was placed into service December 1989 and is being operated and maintained under the direction of the United States Environmental Protection Agency (USEPA) in accordance with the Cooperative Agreement between these two agencies. USEPA provides 90 percent of the funding for the operations and maintenance of the North Hollywood Groundwater Treatment Facility.

The NHOU was designed to achieve a groundwater treatment capacity of up to 2,000 gallons per minute (gpm) utilizing eight shallow extraction wells and an aeration tower to remove volatile organic compounds (VOC) from the extracted groundwater. Vapor-phase granular activated carbon (GAC) vessels are then utilized to remove VOCs from the aeration tower's air emissions.

Pollock Wells Treatment Plant: The Pollock Wells Treatment Plant was placed into service March 1999 to remove VOCs from the groundwater at a rate of up to 3,000 gpm. This facility was designed to absorb trichloroethylene (TCE) and perchloroethylene (PCE). The facility features the use of liquid-phase GAC to restore the use of Pollock Wells, which also reduces the potential of rising groundwater discharge from the San Fernando Basin into the Los Angeles River.

Tujunga Wells Treatment Plant: The Tujunga Wells Treatment Plant was placed into service May 2010. New liquid-phase GAC groundwater treatment vessels were installed on two production wells at the Tujunga Well Field, and have restored the use of 12,000 acre feet per year (AFY) of pumping capacity that was unavailable due to water quality constraints. The wellhead treatment facilities were placed into service in May 2010.

Section 2: Annual Pumping and Spreading Projections

a.) Pumping Projections for the Water Years 2013-2018: The City of Los Angeles has the following six sources of water supply:

1) Los Angeles Aqueduct supply imported from the Owens Valley/Mono Basin areas,
2) Local groundwater supply from the Central, San Fernando, and Sylmar Basins,
3) Metropolitan Water District of Southern California (MWD) supply imported from the Sacramento Bay Delta via the State Water Project (SWP) and the Colorado River Aqueduct,
4) Recycled water,
5) Stormwater, and
6) Conservation.

LADWP's use of groundwater from the San Fernando Basin fluctuates from year to year depending on the availability of the imported water sources, which can vary as a result of climatic and operational constraints. Use of the San Fernando Basin groundwater supply is largely constrained by the impacts of groundwater contamination, including increasing concentrations of hexavalent chromium (Cr-VI) detected in water supply wells, the detection of other emerging chemicals, and the significant impact of volatile organic compounds, including VOCs which have escaped the containment area of the NHOU thereby affecting nearby groundwater supply wells.

The San Fernando, Sylmar, and Central Basins provide most of the City's local groundwater supply. The City of Los Angeles has the following average annual water rights, in acre feet (AF), which comprise approximately 11% of the City's supply:

San Fernando Basin:	87,000 AF
Sylmar Basin:	3,570 AF
Central Basin:	15,000 AF

Table 2-1 shows the amount of groundwater extractions that are expected during the 2013-14 Water Year from the San Fernando and Sylmar Basins. Table 2-2 provides groundwater extraction projections from 2013 to 2018. These projections are based upon assumed demand and Los Angeles Aqueduct flows, and are subject to yearly adjustments.

TABLE 2-1
ACTUAL AND PROJECTED PUMPING
BY THE CITY OF LOS ANGELES FOR WY 2013-2014
(in acre-feet)

San Fernando Basin		Actual Extraction									Projected Extraction*		
	TOTAL	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
AERATION	935	0	0	0	0	84	126	112	114	125	126	126	122
ERWIN	3	0	1	0	0	1	0	0	0	0	0	0	0
HEADWORKS	0	0	0	0	0	0	0	0	0	0	0	0	0
NORTH HOLLYWOOD	15,289	1,457	383	3	350	735	591	839	1,315	2,018	2,460	2,460	2,678
POLLOCK	2,377	0	218	293	367	316	0	0	99	347	369	369	0
RINALDI-TOLUCA	22,282	879	201	94	521	1,243	1,229	1,804	2,372	2,804	3,752	3,752	3,631
TUJUNGA	36,623	6,403	2,259	1,305	1,575	2,668	2,768	2,142	1,905	2,314	4,428	4,428	4,428
VERDUGO	846	153	53	0	149	201	115	176	0	0	0	0	0
WHITNALL	424	419	1	1	1	1	1	0	0	0	0	0	0
SAN FERNANDO BASIN TOTAL:	78,779	9,311	3,115	1,696	2,963	5,248	4,831	5,073	5,805	7,607	11,135	11,135	10,859
Sylmar Basin													
MISSION	673	0	0	115	166	146	49	171	26	0	0	0	0
ULARA TOTAL:	80,001	9,311	3,115	1,811	3,129	5,394	4,880	5,243	5,831	7,607	11,320	11,320	11,038

*Increased production in the San Fernando Basin due to low allocation from the State Water Project may increase the risk of experiencing high concentrations of contaminates at wellheads, which may curtail pumping.

Unprecedented current dry year conditions have resulted in a historic low allocation of SWP supplies by the California Department of Water Resources, and a statewide drought state of emergency declaration by Governor Brown. To address this situation, water agencies within the Metropolitan Water District of Southern California's SWP service territory have been encouraged to reduce their reliance on imported water supplies from the SWP. In response, LADWP has significantly reduced its deliveries from the SWP by adjusting its groundwater pumping forecast to increase the use of local groundwater from the San Fernando Basin. Additionally, construction of replacement supply wells in the Sylmar Basin has been accelerated to further increase the supply of local groundwater. LADWP recognizes that levels of pumping will likely be constrained due to increasing concentrations of contaminants at each operating wellhead. Water quality conditions will be closely monitored and pumping will be curtailed as necessary to ensure that all regulatory standards continue to be met.

TABLE 2-2

PROJECTED PUMPING IN THE SAN FERNANDO BASIN
BY THE CITY OF LOS ANGELES FOR 2013-2018
(in acre-feet)

WELLFIELD	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
AERATION	935	1,377	4,923	4,923	4,923
ERWIN	3	0	0	0	0
HEADWORKS	0	0	0	0	0
NO HOLLYWOOD	15,289	13,064	0	0	0
POLLOCK	2,377	2,559	2,178	2,178	2,178
RINALDI-TOLUCA	22,282	19,204	0	0	0
TUJUNGA	36,623	23,667	15,674	15,674	15,674
VERDUGO	846	0	0	0	0
WHITNAL	424	0	0	0	0
TOTAL ACRE-FEET	78,779	59,871	22,775	22,775	22,775

Note: Increased production in the San Fernando Basin due to low allocation from the State Water Project may increase the risk of experiencing high concentrations of contaminates at wellheads, which may curtail pumping

Sylmar Basin	1,222	0	0	2,000	4,170

b.) Spreading Projections for the 2013-14 Water Year: Native groundwater recharge from captured storm runoff occurs primarily as a result of the use of man-made spreading grounds. Spreading ground operations are primarily operated by LACFCD. Table 2-3 represents the anticipated spreading volumes for Water Year 2013-14.

TABLE 2-3
ACTUAL AND PROJECTED SPREADING
IN ULARA SPREADING GROUNDS FOR WY 2013-14
(in acre-feet)

TABLE 2-3
Actual and Projected Spreading in ULARA Spreading Grounds in 2013-14 (acre-feet)

	Operated by:						
Month	**LACFCD**					**LADWP**	**Monthly Total**
	Branford	**Hansen**	**Lopez**	**Pacoima (B)**	**Tujunga**	**Headworks (A)**	
Actual							
Oct-13	41	0	151	2,599	0	0	2,791
Nov-13	62	40	220	2,228	0	0	2,550
Dec-13	61	143	287	1,991	0	0	2,482
Jan-14	20	132	0	180	0	0	332
Feb-14	88	290	0	527	131	0	1,036
Mar-14	14	676	0	159	64	0	913
Apr-14	44	220	1	357	0	0	622
May-14	31	102	0	0	0	0	133
Jun-14	28	36	0	0	0	0	64
Projected							
Jul-14	7	10	0	0	0	0	17
Aug-14	7	10	0	0	0	0	17
Sep-14	4	8	0	0	0	0	12
Total	**407**	**1,667**	**659**	**8,041**	**195**	**0**	**10,969**

(A) 1992-93 Water Year was the last year of spreading.

(B) Burbank Purchased 7,000 AF from MWD for spreading.

Section 3: Water Quality Monitoring Program Description

All of LADWP’s 60 active wells in ULARA are monitored in conformance with the requirements set forth in Title 22, California Code of Regulations (CCR). For all active wells, monitoring is required whether the well is in production or not. State regulations require the following types of monitoring regimens:

1. Inorganic compounds
2. Organic compounds
3. Phase II and V initial monitoring
4. Radiological compounds
5. Quarterly organic compounds

Each well, whether on active or standby status, is monitored every three years for all types of inorganic and organic compounds. Phase II and V initial monitoring involves analysis for newly regulated organic compounds at all wells. Each well must be sampled for four consecutive quarters within a three-year period. Quarterly monitoring of organic compounds is performed for each well where such compounds have been detected. A complete list of the parameters that must be tested for is contained in Title 22 of the CCR.

Appendix A provides the concentrations of various compounds detected in LADWP’s groundwater wells in the San Fernando and Sylmar Basins during the period of April 2013 through March 2014. This report includes concentrations detected for nitrate, TCE, PCE, perchlorate, total chromium, iron, manganese, 1,2-dichloroethene-cis, carbon tetrachloride, total coliform, 1,1-DCA, 1,1-DCE, 1,4-dioxane, bromide, and MTBE.

Section 4: Groundwater Treatment Facilities Operations Summary

North Hollywood Operable Unit (NHOU): The NHOU is owned and operated by LADWP. Despite efforts to maintain the facility and equipment, the age and deterioration of this facility have resulted in numerous plant shutdowns. Over the past two years in particular, plant outages have totaled 80 days in 2011 and 171 days in 2012.

Leaks in the aeration tower effluent line caused a considerable impact to facility operations with three plant outages occurring over a one-year period (March 2012, September 2012, and January 2013). A new 16-inch, 1,800-foot long, PVC effluent line was installed to replace the existing steel riveted pipe.

Other plant shutdowns were caused by various equipment failures, repairs to the aeration tower blower, equipment malfunctions, and outages resulting from power bumps and spikes in the power distribution system.

Emerging contaminants have also impacted operational reliability of the NHOU. North Hollywood Extraction Well Nos. 2 and 3 (NHE-2, NHE-3) have been shut down due to elevated concentrations of Cr-VI, which the NHOU was not designed to remove. In 2007, NHE-2 was shut down in response to Cr-VI concentrations exceeding 400 micrograms per liter (ug/L). In order to contain the plume, the responsible party, Honeywell International, Inc. began operating NHE-2 in 2009 and discharging the untreated effluent into the sanitary sewer. The concentrations of Cr-VI in NHE-3 exceeded the maximum contaminant level of 50 ug/L in October 2012 (52 ug/L) and March 2013 (163 ug/L). In response, NHE-3 was removed from operation.

The USEPA is working with the responsible parties to develop plans to replace the NHOU with a new facility, the NHOU Second Interim Remedy (NHOU2IR). This new facility will provide expanded treatment technology designed to remove emerging contaminants such as Cr-VI, 1, 4 dioxane, VOCs and other contaminants that are currently being removed by the aeration tower.

Table 4-1 provides the volume of groundwater extracted by each North Hollywood extraction well and treated through the aeration tower for VOC removal. This table also provides the concentrations of TCE and PCE detected in the raw groundwater from each wellhead before treatment. Water quality measurements from the treated effluent show that VOCs were effectively removed by the treatment process.

TABLE 4-1
GROUNDWATER TREATMENT FROM THE NORTH HOLLYWOOD OPERABLE UNIT (AERATION) WELLS
(in acre-feet)

Mon-Yr	Groundwater Treatment (AF) from Aeration Wells								TCE/PCE (μg/L)	
	No. 2*	No. 3**	No. 4	No. 5	No. 6	No. 7	No. 8	Total	Influent	Effluent
Apr-13	--	0	0	0	0	0	0	**0**	ns	ns
May-13	--	0	0	0	0	0	0	**0**	ns	ns
Jun-13	--	0	8.33	0	0	21.90	23.39	**53.63**	30.3/6.22	ND/ND
Jul-13	--	0.02	3.58	0	8.59	28.76	30.10	**71.05**	29.70/6.12	ND/ND
Aug-13	--	0	0	0	0	0	0	**0**	ns	ns
Sep-13	--	0	0	0	0	0	0	**0**	ns	ns
Oct-13	--	0	0	0	0	0	0	**0**	ns	ns
Nov-13	--	0	0	0	0	0	0	**0**	ns	ns
Dec-13	--	0	0	0	0	0	0	**0**	ns	ns
Jan-14	--	0	0	0	0	0	0	**0**	ns	ns
Feb-14	--	1.29	1.79	0	23.32	27.30	29.84	**83.54**	41.5/5.13	ND/ND
Mar-14	--	0	11.16	0	32.07	40.29	42.49	**126.03**	26.60/5.54	ND/ND
Total								**334.25**		

Note:
* Honeywell Inc. has been operating Aeration Well No. 2 (NHE-2) since 9/16/08, per Los Angeles Regional Water Quality Control Board clean-up and abatement order R4-2003-0037. Effluent from NHE-2 is currently being diverted to the sanitary sewer, and therefore does not enter the NHOU and extraction volumes cannot be verified.
** Well No.3 was shut down in March 2013 due to elevated CR-VI concentrations.
ND: Not Detected
ns: Not Sampled

Pollock Wells Treatment Plant (PWTP): The Pollock Wells Treatment Plant was shut down from March to May 2012 to replace the spent granular activated carbon (GAC). PWTP has been operating reliably since November 2013 when the facility was upgraded and GAC was changed out.

Table 4-2 provides the volume of groundwater extracted by each well and treated through the liquid-phase GAC vessels for VOC removal. This table also provides the concentrations of TCE and PCE detected in the raw groundwater from the influent line before treatment. Water quality measurements from the treated effluent show that VOCs were effectively removed by the treatment process.

TABLE 4-2

GROUNDWATER TREATMENT FROM POLLOCK WELLS

(in acre-feet)

	Treatment (AF) from Pollock Wells			TCE/PCE (µg/L)	
Mon-Yr	**No. 4**	**No. 6**	**Total**	**Influent**	**Effluent**
Apr-13	0	0	**0.00**	ns	ns
May-13	0.04	0	**0.04**	ns	ns
Jun-13	0	0	**0.00**	ns	ns
Jul-13	0	0	**0.00**	ns	ns
Aug-13	0	0	**0.00**	ns	ns
Sep-13	0	0	**0.00**	ns	ns
Oct-13	0.12	0	**0.12**	ns	ns
Nov-13	148.19	70.10	**218.29**	3.32/2.43	ND/ND
Dec-13	201.40	91.22	**292.62**	2.49/1.90	ND/ND
Jan-14	187.06	179.58	**366.64**	4.46/4.22	ND/ND
Feb-14	158.67	156.92	**315.59**	4.55/5.07	ND/ND
Mar-14	0	0	**0.00**	ns	ns
Total			**1193.30**		

Note:
ND: Not Detected
ns: Not Sampled

Tujunga Wells Treatment Plant (TWTP): The Tujunga Wells Treatment Plant has been operating reliably since October 2012 when the GAC was changed out and other maintenance activities performed. A total of approximately 11,000 AF of groundwater was treated by TWTP during the recent water year.

Table 4-3 provides the volume of groundwater extracted by each well and treated through the liquid-phase GAC vessels for VOC removal. This table also provides the concentrations of TCE and PCE detected in the raw groundwater from each wellhead before treatment. Water quality measurements from the treated effluent show that VOCs were effectively removed by the treatment process.

TABLE 4-3
GROUNDWATER TREATMENT FROM TUJUNGA WELLS
(in acre-feet)

	Tujunga Well No. 6			Tujunga Well No. 7			
	Treatment (AF)	TCE / PCE (µg/L)		Treatment (AF)	TCE / PCE (µg/L)		
Mon-Yr		Influent	Effluent		Influent	Effluent	Treatment Totals
Apr-13	550.64	15.50/17.00	ND/ND	505.21	19.40/16.10	ND/ND	**1055.85**
May-13	619.56	13.30/15.00	ND/ND	560.51	17.10/14.20	ND/ND	**1180.07**
Jun-13	596.07	11.80/14.60	ND/ND	532.60	15.60/14.10	ND/ND	**1128.67**
Jul-13	678.44	13.30/15.30	ND/ND	596.99	17.30/14.90	ND/ND	**1275.43**
Aug-13	384.71	11.70/14.20	ND/ND	335.65	19.80/19.50	ND/ND	**720.36**
Sep-13	619.26	16.50/19.70	ND/ND	532.07	19.60/18.20	ND/ND	**1151.33**
Oct-13	647.27	15.30/21.00	ND/ND	551.70	19.80/19.50	ND/ND	**1198.97**
Nov-13	509.76	10.40/10.90	ND/ND	429.36	20.80/20.50	ND/ND	**939.12**
Dec-13	465.01	8.62/9.00	ND/ND	381.82	23.50/27.60	ND/ND	**846.83**
Jan-14	503.26	5.77/5.38	ND/ND	416.32	24.40/29.20	ND/ND	**919.58**
Feb-14	545.87	10.80/11.30	ND/ND	464.26	27.10/32.00	ND/ND	**1010.13**
Mar-14	645.27	12.30/11.90	ND/ND	540.61	21.90/21.70	ND/ND	**1185.88**
Total							**12612.22**

Note:
ND: Not Detected
ns: Not Sampled

Section 5: Proposed Facility Modifications

LADWP and LACFCD, in cooperation with the City of Los Angeles Bureau of Engineering, Bureau of Sanitation and Bureau of Street Services, continue to partner on, jointly fund, and collaborate on several projects that will enhance the capacity for recharge of native water into the groundwater basin via existing spreading grounds in the eastern portion of the San Fernando Basin. This section describes plans for modifying existing spreading facilities and construction of new facilities to provide expanded opportunities for enhancing the recharge capacity of the San Fernando Groundwater Basin.

a.) Spreading Grounds:

Branford Spreading Basin: Branford Spreading Basin is located immediately adjacent to Tujunga Spreading Grounds, along Pacoima Diversion Channel. Most of the water tributary to the Branford Spreading Basin is urban runoff from Branford Street Channel. The total wetted area of the spreading ground is 7 acres with a maximum intake of 1,540 cfs and storage capacity of 137 AF. This spreading basin is owned and operated by LACFCD. Average annual recharge for the facility is approximately 550 AF based on LACFCD historical record. A project to revitalize the use of this basin for stormwater capture and recharge is currently in progress and is scheduled to be completed by 2019. These improvements are expected to yield an additional 590 AFY of recharge.

Hansen Spreading Grounds: Hansen Spreading Grounds is a 156-acre parcel, located adjacent to the Tujunga Wash Channel downstream of Hansen Dam. The total wetted area of the spreading ground is 107 AF with a maximum intake of 600 cfs and storage capacity of 1,557 AF. This spreading ground is owned and operated by LACFCD. Improvements to deepen and combine the basins as well as retrofit and automate the intake structure were completed in January 2013. No additional modifications to the spreading basin are currently proposed. LADWP and LACFCD shared the $8.4 million cost for construction of this project, and it is expected that the project will increase average stormwater recharge by 2,100 AFY.

Lopez Spreading Grounds: Lopez Spreading Grounds is located downstream of Pacoima Dam. This spreading ground has a total wetted area of 12 AF with a maximum intake of 25 cfs and storage capacity of 24 AF. The spreading ground is owned and operated by the LACFCD. The Lopez Spreading Grounds Enhancement Project consolidates the six existing spreading basins into four deeper basins that will increase storage capacity from 24 AF to 73 AF. Flow will be diverted from Pacoima Wash to the reconfigured basins using a new rubber dam diversion structure, increasing recharge by approximately 500 AFY. Final designs are scheduled to be completed by Summer 2015, and are to be followed by construction in 2016 through 2018. LADWP will provide up to $2 million for the design and construction of the $4 million project.

Pacoima Spreading Grounds: The 169-acre Pacoima Spreading Grounds is located on both sides of the old Pacoima Wash Channel downstream of Pacoima Dam and Reservoir. This spreading ground is owned and operated by LACFCD and has a total wetted area of 107 AF with a maximum intake capacity of 600 cfs and storage capacity of 530 AF. LADWP and LACFCD are currently working cooperatively to improve stormwater capture at this facility by upgrading and automating the intake structure and revitalizing the recharge basins. This project is expected to increase average annual stormwater recharge by 10,500 AFY and storage capacity to 1,197 AF. Final designs are scheduled to be completed by early 2015, and are to be followed by construction in 2016 through 2019. LADWP will provide up to $15 million for design and construction of the $30 million project.

Tujunga Spreading Grounds: Tujunga Spreading Grounds is an 188-acre parcel located along the Tujunga Wash Channel at its confluence with the Pacoima Wash Channel. This spreading ground is owned by LADWP and operated by LACFCD and has a total wetted area of 83 AF with a maximum intake capacity of 250 cfs and a storage capacity of 100 AF. Plans are underway to enhance the facility by relocating and automating the current intake structure on Tujunga Wash, installing a second automated intake to receive flows from the Pacoima Wash, and reconfiguring the existing spreading basins. Other enhancements include constructing and/or improving recreational walking trails, native habitat, and educational facilities on property not utilized for the primary function of stormwater capture. It is expected that this project will increase annual stormwater recharge by 8,000 AFY, storage capacity to 790 AF, and intake capacity to 450 cfs. Design of this project was completed Spring 2014, whereas construction is to occur from 2015 through 2017. LADWP will provide $27.2 million for construction of the project.

b.) Groundwater Treatment Facilities:

North Hollywood Operable Unit (NHOU): Since the discovery of VOCs in the San Fernando Basin groundwater supply in 1980, LADWP has worked with state and federal agencies to contain and remediate the high-concentration plumes in the North Hollywood area. With 90 percent funding provided by the USEPA and 10 percent of the funding formerly provided by the state, the NHOU was designed and implemented to contain and remove the VOC contamination at a total groundwater pumping rate of 2,000 gpm. This system consisted of seven extraction wells and an air-stripping tower with vapor-phase GAC for control of air emissions. An eighth extraction well has been dry, and therefore never operated as part of the remedy. Unfortunately, this NHOU remedy has failed to fully contain the plumes, resulting in contaminants escaping the containment areas and forcing the closure of other nearby LADWP water supply wells.

Newly emerging constituents have been detected in the operable unit extraction wells, such as Cr-VI and 1, 4-dioxane, for which the remedy was not designed to treat. Concentrations of Cr-VI in excess of 400 ug/L since 2009 have forced remediation of extraction well NHE-2 to cease and the effluent to be diverted to the sanitary sewer. On June 28, 2013 concentrations of Cr-VI spiked to 171 ug/L in NHE-3 and now exceed the maximum contaminant level (MCL) of 50 ug/L set by the California regulatory agencies for total chromium.

NHE-3 has been taken out of operation as a result of Cr-VI, pending additional direction from USEPA and the Regional Water Quality Control Board (RWQCB). The remedy has also become increasingly unreliable due to equipment failures and deteriorating infrastructure, resulting in numerous plant shutdowns. These problems have clearly shown the urgent need for a new remedy that is able to address the emerging contaminants, adequately contain the plumes, and prevent contaminants from migrating to other areas outside the containment zones. USEPA's 15-year Consent Decree expired on December 31, 2004 and LADWP is working with the agency on a new remedy. The Record of Decision (ROD) for the NHOU2IR was issued September 2009. It is expected that this new remedy will include the deepening of several extraction wells, the addition of more extraction wells, and a new treatment facility designed to remove VOCs, Cr-VI, 1, 4 dioxane and other contaminants of concern. This remedy will continue to focus on the containment and remediation of the highest concentration areas of the plume. Lower concentration areas will still need to be addressed.

To address the increasing levels of Cr-VI, the Los Angeles Regional Water Quality Control Board (LARWQCB) issued a Cleanup and Abatement Order (CAO) to the responsible party, Honeywell, Inc. Under this CAO, Honeywell assumed responsibility for operating NHE-2 to contain the plume by treating the water and discharging the effluent to the local sewer system while evaluating remedial alternatives. Since the water year 2007-08, 649 AF of groundwater have been discharged to the sanitary sewer. Improvements to the well field and operation must be made to discontinue this waste of water. Hexavalent chromium levels are decreasing at NHE-2, but the levels are increasing at the down gradient extraction well, NHE-3, and now exceed the state MCL of 50 ug/L.

LADWP continues to operate and maintain the facility under the direction of USEPA pursuant to a Cooperative Agreement between the two parties (USEPA and Honeywell). Current operations include the use of five of the seven extraction wells.

Groundwater System Improvement Study (GSIS): Since 2009, LADWP has continued to make progress on the $34 million Groundwater System Improvement Study (GSIS) to fully characterize the groundwater basin and develop strategies for remediation, containment, clean-up and removal of the contaminated groundwater. As a part of GSIS, LADWP has drilled an additional 25 monitoring wells necessary to complete the raw water quality characterization, along with 1 additional monitoring well drilled by the EPA. The drilling of the monitoring wells was completed in March 2014. Phase 1 of the water quality sampling was completed, while Phase 2 is in progress. A high-level concept plan and cost estimate was developed for the remediation facilities necessary to remediate 122,000 acre-feet of contaminated groundwater per year. The conceptual estimate is approximately between $600-$900 million dollars. LADWP will be refining this estimate as data from GSIS is finalized, and as the remediation facility projects progress through the final planning and design phases. The environmental documentation process is proposed to begin in 2015.

c.) Recycled Water Projects:

Water Recycling Projects in the San Fernando Valley:

LADWP's Recycled Water Master Planning (RWMP) documents are a series of reports that identify opportunities to offset potable demands in the City of Los Angeles through non-potable reuse projects and the groundwater replenishment (GWR) project. The RWMP is comprised of the following reports:

- Groundwater Replenishment Master Planning Report
- Groundwater Replenishment Treatment Pilot Study
- Non-Potable Reuse Master Planning Report
- Terminal Island Water Reclamation Plant Supplement, and Non-Potable
- Terminal Reuse Concepts Report
- Long-Term Concepts Report

LADWP's most recent Urban Water Management Plan (UWMP 2010) established a goal of increasing recycled water use within the City of Los Angeles to 59,000 AFY by the year 2035. Of this 59,000 AFY, LADWP expects to deliver as much as 29,000 AF of recycled water annually for non-potable reuse within the City of Los Angeles, which includes 5,212 AFY to customers within the San Fernando Basin originating from the Donald C. Tillman (DCT) and Los Angeles-Glendale (LAG) water reclamation plants. A total of 3,788 AFY of recycled water is provided for irrigation and 1,424 AFY for industrial cooling.

The GWR Project will provide up to 30,000 AFY of purified recycled water to replenish the San Fernando Groundwater Basin to maintain the reliability of the City's water supply and reduce the need for imported water. The water utilized for GWR will consist of tertiary-treated recycled water from DCT that will go through additional stages of microfiltration, reverse osmosis, and advanced oxidation resulting in purity close to distilled water before being spread for replenishment.

For the period of October 1, 2012 to September 30, 2013, LADWP delivered 6,360 AF of recycled water to customers in ULARA. No new recycled water customers were added in the San Fernando Valley during that period.

Distribution facilities are also being designed to deliver approximately 200 AFY and 500 AFY of recycled water to Woodley Park and to the Hansen Dam Golf Course, respectively. Woodley Park began irrigating with recycled water in 2012, and the facilities for Hansen Golf Course will be constructed and in service by June 2014.

LADWP signed a Memorandum of Understanding with the City of Los Angeles Department of Recreation and Parks to provide capital funds and design assistance to retrofit Elysian Park with recycled water.

The recycled water line originating from the City of Burbank is anticipated to be extended through Los Angeles to serve Woodbury University, with the conversion expected to be completed in the next ULARA reporting period. This project has an expected yield of 32 AF.

The City of Glendale’s recycled water mainline has been tapped and LADWP expects to have Chevy Chase Park, The Bond Park, and Los Feliz Golf Course utilizing recycled water during the next ULARA reporting period.

LADWP also expects to connect the following customers to recycled water during the next ULARA reporting period: Hansen Golf Course, Delano Park, Woodley Park Phase II, and Branford Park. It is expected that deliveries of 615 AFY of recycled water to these customers will initiate by fiscal year 2014-2015.

APPENDIX A:
Water Quality Sampling Results,
April 2013 through March 2014

SAN FERNANDO AND SYLMAR BASINS WELL FIELDS
1,1-DCA, 1,1-DCE, 1,2-DICHLOROETHENE-CIS, 1,4-DIOXANE, BROMIDE,
CARBON TETRACHLORIDE, TOTAL CHROMIUM, IRON, MANGANESE, MTBE, NITRATE (AS NO3),
PCE, PERCHLORATE, TCE, AND TOTAL COLIFORM CONCENTRATION
SAMPLES TAKEN BETWEEN 4/1/2013 AND 3/31/2014

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
AT002	1,1-Dichloroethane (1,1-DCA)	5/30/2013	0.553	µg/L
AT002	1,1-Dichloroethane (1,1-DCA)	9/24/2013	0.556	µg/L
AT002	1,1-Dichloroethane (1,1-DCA)	4/25/2013	0.557	µg/L
AT002	1,1-Dichloroethane (1,1-DCA)	7/18/2013	0.603	µg/L
AT002	1,1-Dichloroethane (1,1-DCA)	2/18/2014	0.612	µg/L
AT002	1,1-Dichloroethane (1,1-DCA)	6/28/2013	0.614	µg/L
AT002	1,1-Dichloroethane (1,1-DCA)	3/6/2014	0.644	µg/L
AT002	1,1-Dichloroethane (1,1-DCA)	12/16/2013	0.645	µg/L
AT002	1,1-Dichloroethane (1,1-DCA)	1/30/2014	0.712	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	5/30/2013	9.33	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	4/25/2013	10.3	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	6/28/2013	10.5	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	7/18/2013	11	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	3/6/2014	11.5	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	2/18/2014	13.2	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	12/16/2013	13.4	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	9/24/2013	13.6	µg/L
AT002	1,1-Dichloroethene (1,1-DCE)	1/30/2014	14.4	µg/L
AT002	1,2-Dichloroethene-cis	5/30/2013	2.75	µg/L
AT002	1,2-Dichloroethene-cis	6/28/2013	2.94	µg/L
AT002	1,2-Dichloroethene-cis	9/24/2013	3.02	µg/L
AT002	1,2-Dichloroethene-cis	2/18/2014	3.07	µg/L
AT002	1,2-Dichloroethene-cis	4/25/2013	3.09	µg/L
AT002	1,2-Dichloroethene-cis	7/18/2013	3.13	µg/L
AT002	1,2-Dichloroethene-cis	3/6/2014	3.18	µg/L
AT002	1,2-Dichloroethene-cis	12/16/2013	3.29	µg/L
AT002	1,2-Dichloroethene-cis	1/30/2014	3.66	µg/L
AT002	1,4-Dioxane	2/18/2014	2.58	ug/L
AT002	1,4-Dioxane	12/16/2013	2.61	ug/L
AT002	1,4-Dioxane	9/24/2013	2.72	ug/L
AT002	1,4-Dioxane	1/30/2014	2.84	ug/L
AT002	1,4-Dioxane	6/28/2013	3.01	ug/L
AT002	1,4-Dioxane	4/25/2013	3.23	ug/L
AT002	1,4-Dioxane	3/6/2014	3.29	ug/L
AT002	1,4-Dioxane	6/5/2013	3.36	ug/L
AT002	1,4-Dioxane	7/18/2013	3.38	ug/L
AT002	Bromide ,Ion-Chromatography	9/24/2013	0.221	mg/L
AT002	Carbon tetrachloride	4/25/2013	0.794	µg/L
AT002	Carbon tetrachloride	6/28/2013	0.861	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
AT002	Carbon tetrachloride	5/30/2013	0.88	µg/L
AT002	Carbon tetrachloride	3/6/2014	0.959	µg/L
AT002	Carbon tetrachloride	7/18/2013	0.972	µg/L
AT002	Carbon tetrachloride	2/18/2014	1.03	µg/L
AT002	Carbon tetrachloride	12/16/2013	1.05	µg/L
AT002	Carbon tetrachloride	1/30/2014	1.05	µg/L
AT002	Carbon tetrachloride	9/24/2013	1.13	µg/L
AT002	Chromium (Cr) Total, ICP/MS	6/28/2013	40.2	ug/L
AT002	Chromium (Cr) Total, ICP/MS	4/25/2013	40.4	ug/L
AT002	Chromium (Cr) Total, ICP/MS	7/18/2013	41.8	ug/L
AT002	Chromium (Cr) Total, ICP/MS	5/30/2013	43.9	ug/L
AT002	Chromium (Cr) Total, ICP/MS	1/31/2014	54.7	ug/L
AT002	Chromium (Cr) Total, ICP/MS	1/30/2014	55.8	ug/L
AT002	Chromium (Cr) Total, ICP/MS	2/18/2014	59.4	ug/L
AT002	Chromium (Cr) Total, ICP/MS	12/16/2013	59.8	ug/L
AT002	Chromium (Cr) Total, ICP/MS	3/6/2014	62.1	ug/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	4/25/2013	40.8	µg/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	5/30/2013	42.3	µg/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	6/28/2013	42.7	µg/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	7/18/2013	44.6	µg/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	9/24/2013	50.4	µg/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	2/18/2014	61.1	µg/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	1/31/2014	63.8	µg/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	12/16/2013	64.3	µg/L
AT002	Chromium (Cr+6) ,Diphenylcarbazide col	3/6/2014	66.2	µg/L
AT002	Nitrate (as NO3) ,calculated IC value	4/25/2013	41.4	mg/L
AT002	Nitrate (as NO3) ,calculated IC value	3/6/2014	41.9	mg/L
AT002	Nitrate (as NO3) ,calculated IC value	2/18/2014	42.3	mg/L
AT002	Nitrate (as NO3) ,calculated IC value	12/16/2013	42.5	mg/L
AT002	Nitrate (as NO3) ,calculated IC value	7/18/2013	42.7	mg/L
AT002	Nitrate (as NO3) ,calculated IC value	1/30/2014	42.7	mg/L
AT002	Nitrate (as NO3) ,calculated IC value	5/30/2013	43.1	mg/L
AT002	Nitrate (as NO3) ,calculated IC value	6/28/2013	43.3	mg/L
AT002	Nitrate (as NO3) ,calculated IC value	9/24/2013	44	mg/L
AT002	Tetrachloroethylene (PCE)	3/6/2014	30.7	µg/L
AT002	Tetrachloroethylene (PCE)	4/25/2013	32.8	µg/L
AT002	Tetrachloroethylene (PCE)	7/18/2013	33	µg/L
AT002	Tetrachloroethylene (PCE)	6/28/2013	33.1	µg/L
AT002	Tetrachloroethylene (PCE)	5/30/2013	38.2	µg/L
AT002	Tetrachloroethylene (PCE)	9/24/2013	40.6	µg/L
AT002	Tetrachloroethylene (PCE)	12/16/2013	41.7	µg/L
AT002	Tetrachloroethylene (PCE)	2/18/2014	41.8	µg/L
AT002	Tetrachloroethylene (PCE)	1/30/2014	46.1	µg/L
AT002	Trichloroethene (TCE)	4/25/2013	165	µg/L
AT002	Trichloroethene (TCE)	7/18/2013	196	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
AT002	Trichloroethene (TCE)	5/30/2013	197	µg/L
AT002	Trichloroethene (TCE)	3/6/2014	197	µg/L
AT002	Trichloroethene (TCE)	6/28/2013	200	µg/L
AT002	Trichloroethene (TCE)	2/18/2014	204	µg/L
AT002	Trichloroethene (TCE)	12/16/2013	213	µg/L
AT002	Trichloroethene (TCE)	1/30/2014	222	µg/L
AT002	Trichloroethene (TCE)	9/24/2013	225	µg/L
AT003	1,1-Dichloroethane (1,1-DCA)	3/27/2014	2.39	µg/L
AT003	1,1-Dichloroethane (1,1-DCA)	2/18/2014	2.44	µg/L
AT003	1,1-Dichloroethane (1,1-DCA)	6/28/2013	2.76	µg/L
AT003	1,1-Dichloroethene (1,1-DCE)	6/28/2013	7.67	µg/L
AT003	1,1-Dichloroethene (1,1-DCE)	2/18/2014	12.2	µg/L
AT003	1,1-Dichloroethene (1,1-DCE)	3/27/2014	13.2	µg/L
AT003	1,2-Dichloroethene-cis	2/18/2014	5.5	µg/L
AT003	1,2-Dichloroethene-cis	3/27/2014	5.53	µg/L
AT003	1,2-Dichloroethene-cis	6/28/2013	7.46	µg/L
AT003	1,4-Dioxane	2/18/2014	3.28	ug/L
AT003	1,4-Dioxane	3/27/2014	3.78	ug/L
AT003	1,4-Dioxane	6/28/2013	4.87	ug/L
AT003	Bromide ,Ion-Chromatography	2/18/2014	0.219	mg/L
AT003	Carbon tetrachloride	3/27/2014	0.576	µg/L
AT003	Carbon tetrachloride	6/28/2013	0.592	µg/L
AT003	Carbon tetrachloride	2/18/2014	0.607	µg/L
AT003	Chromium (Cr) Total, ICP/MS	3/27/2014	144	ug/L
AT003	Chromium (Cr) Total, ICP/MS	6/28/2013	173	ug/L
AT003	Chromium (Cr+6) ,Diphenylcarbazide col	3/27/2014	132	µg/L
AT003	Chromium (Cr+6) ,Diphenylcarbazide col	2/18/2014	151	µg/L
AT003	Chromium (Cr+6) ,Diphenylcarbazide col	6/28/2013	171	µg/L
AT003	Nitrate (as NO3) ,calculated IC value	3/27/2014	37.6	mg/L
AT003	Nitrate (as NO3) ,calculated IC value	6/28/2013	38.2	mg/L
AT003	Nitrate (as NO3) ,calculated IC value	2/18/2014	38.3	mg/L
AT003	Tetrachloroethylene (PCE)	6/28/2013	12.4	µg/L
AT003	Tetrachloroethylene (PCE)	3/27/2014	16.7	µg/L
AT003	Tetrachloroethylene (PCE)	2/18/2014	18.3	µg/L
AT003	Trichloroethene (TCE)	2/18/2014	121	µg/L
AT003	Trichloroethene (TCE)	3/27/2014	123	µg/L
AT003	Trichloroethene (TCE)	6/28/2013	183	µg/L
AT004	1,2-Dichloroethene-cis	2/18/2014	1.27	µg/L
AT004	1,2-Dichloroethene-cis	6/28/2013	1.32	µg/L
AT004	1,2-Dichloroethene-cis	7/18/2013	1.59	µg/L
AT004	Bromide ,Ion-Chromatography	6/28/2013	0.098	mg/L
AT004	Bromide ,Ion-Chromatography	7/18/2013	0.11	mg/L
AT004	Chromium (Cr) Total, ICP/MS	6/28/2013	4.2	ug/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
AT004	Chromium (Cr) Total, ICP/MS	2/18/2014	4.8	ug/L
AT004	Chromium (Cr) Total, ICP/MS	7/18/2013	5	ug/L
AT004	Chromium (Cr+6) ,Diphenylcarbazide col	6/28/2013	4.42	µg/L
AT004	Chromium (Cr+6) ,Diphenylcarbazide col	2/18/2014	4.84	µg/L
AT004	Chromium (Cr+6) ,Diphenylcarbazide col	7/18/2013	5.06	µg/L
AT004	Nitrate (as NO3) ,calculated IC value	6/28/2013	16.3	mg/L
AT004	Nitrate (as NO3) ,calculated IC value	2/18/2014	17	mg/L
AT004	Nitrate (as NO3) ,calculated IC value	7/18/2013	19	mg/L
AT004	Tetrachloroethylene (PCE)	6/28/2013	1.67	µg/L
AT004	Tetrachloroethylene (PCE)	2/18/2014	2.04	µg/L
AT004	Tetrachloroethylene (PCE)	7/18/2013	2.25	µg/L
AT004	Trichloroethene (TCE)	6/28/2013	8.61	µg/L
AT004	Trichloroethene (TCE)	2/18/2014	10.5	µg/L
AT004	Trichloroethene (TCE)	7/18/2013	10.8	µg/L
AT006	Bromide ,Ion-Chromatography	2/18/2014	0.077	mg/L
AT006	Chromium (Cr+6) ,Diphenylcarbazide col	2/18/2014	3.16	µg/L
AT006	Nitrate (as NO3) ,calculated IC value	2/18/2014	10.5	mg/L
AT006	Tetrachloroethylene (PCE)	2/18/2014	1.98	µg/L
AT006	Trichloroethene (TCE)	2/18/2014	4.17	µg/L
AT007	1,1-Dichloroethane (1,1-DCA)	6/28/2013	0.569	µg/L
AT007	1,1-Dichloroethane (1,1-DCA)	7/18/2013	0.902	µg/L
AT007	1,1-Dichloroethane (1,1-DCA)	2/18/2014	0.951	µg/L
AT007	1,1-Dichloroethene (1,1-DCE)	2/18/2014	0.602	µg/L
AT007	1,1-Dichloroethene (1,1-DCE)	6/28/2013	0.74	µg/L
AT007	1,1-Dichloroethene (1,1-DCE)	7/18/2013	0.841	µg/L
AT007	1,2-Dichloroethene-cis	6/28/2013	0.508	µg/L
AT007	1,2-Dichloroethene-cis	2/18/2014	0.581	µg/L
AT007	1,2-Dichloroethene-cis	7/18/2013	0.697	µg/L
AT007	1,4-Dioxane	7/18/2013	1.18	ug/L
AT007	Bromide ,Ion-Chromatography	2/18/2014	0.169	mg/L
AT007	Chromium (Cr) Total, ICP/MS	6/28/2013	1	ug/L
AT007	Chromium (Cr) Total, ICP/MS	7/18/2013	1.1	ug/L
AT007	Chromium (Cr+6) ,Diphenylcarbazide col	2/18/2014	0.99	µg/L
AT007	Chromium (Cr+6) ,Diphenylcarbazide col	6/28/2013	1.02	µg/L
AT007	Chromium (Cr+6) ,Diphenylcarbazide col	7/18/2013	1.02	µg/L
AT007	Nitrate (as NO3) ,calculated IC value	2/18/2014	28.9	mg/L
AT007	Nitrate (as NO3) ,calculated IC value	7/18/2013	29.8	mg/L
AT007	Nitrate (as NO3) ,calculated IC value	7/2/2013	31.1	mg/L
AT007	Tetrachloroethylene (PCE)	6/28/2013	6.66	µg/L
AT007	Tetrachloroethylene (PCE)	2/18/2014	7.13	µg/L
AT007	Tetrachloroethylene (PCE)	7/18/2013	7.56	µg/L
AT007	Trichloroethene (TCE)	2/18/2014	4.1	µg/L
AT007	Trichloroethene (TCE)	6/28/2013	5.03	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
AT007	Trichloroethene (TCE)	7/18/2013	5.71	µg/L
AT008	1,1-Dichloroethene (1,1-DCE)	6/28/2013	0.879	µg/L
AT008	1,1-Dichloroethene (1,1-DCE)	7/18/2013	1.78	µg/L
AT008	1,1-Dichloroethene (1,1-DCE)	2/18/2014	2.02	µg/L
AT008	1,4-Dioxane	2/18/2014	1.37	ug/L
AT008	1,4-Dioxane	6/28/2013	1.53	ug/L
AT008	1,4-Dioxane	7/18/2013	1.71	ug/L
AT008	Bromide ,Ion-Chromatography	2/18/2014	0.205	mg/L
AT008	Carbon tetrachloride	6/28/2013	1.03	µg/L
AT008	Carbon tetrachloride	2/18/2014	1.61	µg/L
AT008	Carbon tetrachloride	7/18/2013	2.15	µg/L
AT008	Chromium (Cr) Total, ICP/MS	7/18/2013	1	ug/L
AT008	Chromium (Cr+6) ,Diphenylcarbazide col	6/28/2013	0.87	µg/L
AT008	Chromium (Cr+6) ,Diphenylcarbazide col	2/18/2014	0.91	µg/L
AT008	Chromium (Cr+6) ,Diphenylcarbazide col	7/18/2013	0.94	µg/L
AT008	Nitrate (as NO3) ,calculated IC value	7/18/2013	28.4	mg/L
AT008	Nitrate (as NO3) ,calculated IC value	6/28/2013	29.6	mg/L
AT008	Nitrate (as NO3) ,calculated IC value	2/18/2014	31.5	mg/L
AT008	Tetrachloroethylene (PCE)	6/28/2013	3.87	µg/L
AT008	Tetrachloroethylene (PCE)	7/18/2013	5.59	µg/L
AT008	Tetrachloroethylene (PCE)	2/18/2014	7.13	µg/L
AT008	Trichloroethene (TCE)	6/28/2013	42.4	µg/L
AT008	Trichloroethene (TCE)	7/18/2013	67.5	µg/L
AT008	Trichloroethene (TCE)	2/18/2014	76.3	µg/L
ER006	Nitrate (as NO3) ,calculated IC value	12/30/2013	29.5	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	1/28/2014	31.8	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	11/27/2013	34.2	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	6/27/2013	34.5	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	10/31/2013	36.1	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	7/16/2013	36.3	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	3/27/2014	36.9	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	2/25/2014	37.3	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	9/17/2013	39.5	mg/L
ER006	Nitrate (as NO3) ,calculated IC value	8/27/2013	40.1	mg/L
ER006	Tetrachloroethylene (PCE)	2/25/2014	0.884	µg/L
ER006	Tetrachloroethylene (PCE)	6/27/2013	1.03	µg/L
ER006	Tetrachloroethylene (PCE)	3/27/2014	1.05	µg/L
ER006	Tetrachloroethylene (PCE)	10/31/2013	1.06	µg/L
ER006	Tetrachloroethylene (PCE)	7/16/2013	1.07	µg/L
ER006	Tetrachloroethylene (PCE)	8/27/2013	1.19	µg/L
ER006	Tetrachloroethylene (PCE)	11/27/2013	1.25	µg/L
ER006	Tetrachloroethylene (PCE)	1/28/2014	1.36	µg/L
ER006	Tetrachloroethylene (PCE)	12/30/2013	1.38	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
ER006	Tetrachloroethylene (PCE)	9/17/2013	1.58	µg/L
ER006	Trichloroethene (TCE)	2/25/2014	14.6	µg/L
ER006	Trichloroethene (TCE)	3/27/2014	15.2	µg/L
ER006	Trichloroethene (TCE)	8/27/2013	16.2	µg/L
ER006	Trichloroethene (TCE)	9/17/2013	18.1	µg/L
ER006	Trichloroethene (TCE)	10/31/2013	18.3	µg/L
ER006	Trichloroethene (TCE)	7/16/2013	18.7	µg/L
ER006	Trichloroethene (TCE)	6/27/2013	19.3	µg/L
ER006	Trichloroethene (TCE)	11/27/2013	23.5	µg/L
ER006	Trichloroethene (TCE)	1/28/2014	27.7	µg/L
ER006	Trichloroethene (TCE)	12/30/2013	28.6	µg/L
ER010	Bromide ,Ion-Chromatography	2/18/2014	0.171	mg/L
ER010	Coliform Total (CL,QT2000) ,MM0-MUG	2/18/2014	4.1	NUM/100ml
ER010	Nitrate (as NO3) ,calculated IC value	3/27/2014	10.3	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	2/18/2014	12	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	1/28/2014	12.7	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	12/30/2013	21.3	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	6/27/2013	24.7	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	7/16/2013	36.8	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	12/4/2013	39.6	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	8/27/2013	45.2	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	9/17/2013	54	mg/L
ER010	Nitrate (as NO3) ,calculated IC value	10/31/2013	58	mg/L
ER010	Tetrachloroethylene (PCE)	6/27/2013	0.661	µg/L
ER010	Tetrachloroethylene (PCE)	12/30/2013	0.686	µg/L
ER010	Tetrachloroethylene (PCE)	7/16/2013	1.03	µg/L
ER010	Tetrachloroethylene (PCE)	11/27/2013	1.43	µg/L
ER010	Tetrachloroethylene (PCE)	8/27/2013	1.53	µg/L
ER010	Tetrachloroethylene (PCE)	10/31/2013	1.64	µg/L
ER010	Tetrachloroethylene (PCE)	9/17/2013	1.96	µg/L
ER010	Trichloroethene (TCE)	12/30/2013	0.51	µg/L
ER010	Trichloroethene (TCE)	9/17/2013	0.64	µg/L
ER010	Trichloroethene (TCE)	10/31/2013	0.66	µg/L
ER010	Trichloroethene (TCE)	11/27/2013	0.695	µg/L
ER010	Trichloroethene (TCE)	2/18/2014	0.745	µg/L
ER010	Trichloroethene (TCE)	8/27/2013	0.758	µg/L
ER010	Trichloroethene (TCE)	6/27/2013	0.914	µg/L
ER010	Trichloroethene (TCE)	7/16/2013	0.916	µg/L
MH003A	Bromide ,Ion-Chromatography	10/10/2013	0.222	mg/L
MH003A	Nitrate (as NO3) ,calculated IC value	10/10/2013	30.2	mg/L
MH005	Nitrate (as NO3) ,calculated IC value	12/8/2013	8.15	mg/L
MH005	Nitrate (as NO3) ,calculated IC value	11/22/2013	8.28	mg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
MH005	Nitrate (as NO3) ,calculated IC value	4/15/2013	9.52	mg/L
MH006A	Nitrate (as NO3) ,calculated IC value	3/14/2014	13.9	mg/L
MH006A	Nitrate (as NO3) ,calculated IC value	12/8/2013	15	mg/L
MH006A	Nitrate (as NO3) ,calculated IC value	11/22/2013	15.2	mg/L
MH006A	Nitrate (as NO3) ,calculated IC value	4/15/2013	16.1	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	4/29/2013	16.4	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	7/29/2013	16.4	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	4/10/2013	16.7	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	4/17/2013	16.7	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	5/8/2013	16.7	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	6/11/2013	16.7	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	4/3/2013	16.8	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	1/29/2014	16.8	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	4/24/2013	16.9	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	5/22/2013	16.9	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	5/29/2013	16.9	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	6/5/2013	16.9	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	5/15/2013	17	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	2/27/2014	17	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	1/9/2014	17.1	mg/L
MI006	Nitrate (as NO3) ,calculated IC value	3/25/2014	19.6	mg/L
MI007	Nitrate (as NO3) ,calculated IC value	2/27/2014	26.2	mg/L
MI007	Nitrate (as NO3) ,calculated IC value	1/29/2014	26.8	mg/L
MI007	Nitrate (as NO3) ,calculated IC value	4/29/2013	27.4	mg/L
MI007	Nitrate (as NO3) ,calculated IC value	6/11/2013	27.5	mg/L
MI007	Nitrate (as NO3) ,calculated IC value	5/23/2013	27.6	mg/L
MI007	Nitrate (as NO3) ,calculated IC value	7/29/2013	27.6	mg/L
MI007	Nitrate (as NO3) ,calculated IC value	3/25/2014	29.3	mg/L
NH004	Nitrate (as NO3) ,calculated IC value	5/28/2013	10.5	mg/L
NH004	Nitrate (as NO3) ,calculated IC value	6/6/2013	11.1	mg/L
NH004	Nitrate (as NO3) ,calculated IC value	7/11/2013	11.4	mg/L
NH004	Nitrate (as NO3) ,calculated IC value	8/8/2013	11.6	mg/L
NH004	Nitrate (as NO3) ,calculated IC value	9/10/2013	11.8	mg/L
NH004	Nitrate (as NO3) ,calculated IC value	8/28/2013	12.2	mg/L
NH004	Tetrachloroethylene (PCE)	6/6/2013	0.522	µg/L
NH004	Tetrachloroethylene (PCE)	8/8/2013	0.58	µg/L
NH004	Tetrachloroethylene (PCE)	8/28/2013	0.596	µg/L
NH004	Tetrachloroethylene (PCE)	5/28/2013	0.665	µg/L
NH004	Tetrachloroethylene (PCE)	9/10/2013	0.677	µg/L
NH022	1,1-Dichloroethene (1,1-DCE)	2/20/2014	0.519	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
NH022	1,1-Dichloroethene (1,1-DCE)	9/17/2013	1.37	µg/L
NH022	1,1-Dichloroethene (1,1-DCE)	8/28/2013	1.38	µg/L
NH022	1,1-Dichloroethene (1,1-DCE)	7/11/2013	1.46	µg/L
NH022	1,1-Dichloroethene (1,1-DCE)	6/6/2013	1.72	µg/L
NH022	1,1-Dichloroethene (1,1-DCE)	5/23/2013	2.02	µg/L
NH022	Coliform Total (CL,QT2000) ,MM0-MUG	7/11/2013	2	NUM/100ml
NH022	Nitrate (as NO3) ,calculated IC value	2/20/2014	20.2	mg/L
NH022	Nitrate (as NO3) ,calculated IC value	3/25/2014	20.8	mg/L
NH022	Nitrate (as NO3) ,calculated IC value	7/11/2013	23.7	mg/L
NH022	Nitrate (as NO3) ,calculated IC value	5/23/2013	23.8	mg/L
NH022	Nitrate (as NO3) ,calculated IC value	6/6/2013	24.4	mg/L
NH022	Nitrate (as NO3) ,calculated IC value	8/28/2013	24.5	mg/L
NH022	Nitrate (as NO3) ,calculated IC value	9/17/2013	25	mg/L
NH022	Trichloroethene (TCE)	8/28/2013	1.53	µg/L
NH022	Trichloroethene (TCE)	9/17/2013	1.66	µg/L
NH022	Trichloroethene (TCE)	7/11/2013	1.88	µg/L
NH022	Trichloroethene (TCE)	6/6/2013	2.36	µg/L
NH022	Trichloroethene (TCE)	5/23/2013	2.99	µg/L
NH023	1,1-Dichloroethene (1,1-DCE)	2/20/2014	0.529	µg/L
NH023	1,1-Dichloroethene (1,1-DCE)	6/11/2013	0.536	µg/L
NH023	1,1-Dichloroethene (1,1-DCE)	8/27/2013	0.55	µg/L
NH023	1,1-Dichloroethene (1,1-DCE)	9/17/2013	0.564	µg/L
NH023	1,1-Dichloroethene (1,1-DCE)	7/25/2013	0.637	µg/L
NH023	1,2-Dichloroethene-cis	6/11/2013	0.525	µg/L
NH023	1,2-Dichloroethene-cis	2/20/2014	0.558	µg/L
NH023	1,2-Dichloroethene-cis	8/27/2013	0.69	µg/L
NH023	1,2-Dichloroethene-cis	7/25/2013	0.7	µg/L
NH023	1,2-Dichloroethene-cis	9/17/2013	0.725	µg/L
NH023	1,4-Dioxane	2/20/2014	3.67	ug/L
NH023	1,4-Dioxane	7/25/2013	7.26	ug/L
NH023	Nitrate (as NO3) ,calculated IC value	3/25/2014	21	mg/L
NH023	Nitrate (as NO3) ,calculated IC value	5/23/2013	26.5	mg/L
NH023	Nitrate (as NO3) ,calculated IC value	2/20/2014	28.7	mg/L
NH023	Nitrate (as NO3) ,calculated IC value	7/25/2013	33.4	mg/L
NH023	Nitrate (as NO3) ,calculated IC value	6/11/2013	35	mg/L
NH023	Nitrate (as NO3) ,calculated IC value	8/27/2013	35.1	mg/L
NH023	Nitrate (as NO3) ,calculated IC value	9/17/2013	36.5	mg/L
NH023	Tetrachloroethylene (PCE)	3/25/2014	1.76	µg/L
NH023	Tetrachloroethylene (PCE)	2/20/2014	5.52	µg/L
NH023	Tetrachloroethylene (PCE)	5/23/2013	5.98	µg/L
NH023	Tetrachloroethylene (PCE)	7/25/2013	6.24	µg/L
NH023	Tetrachloroethylene (PCE)	8/27/2013	6.36	µg/L
NH023	Tetrachloroethylene (PCE)	9/17/2013	7.36	µg/L
NH023	Tetrachloroethylene (PCE)	6/11/2013	8.76	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
NH023	Trichloroethene (TCE)	5/23/2013	12.8	µg/L
NH023	Trichloroethene (TCE)	3/25/2014	13	µg/L
NH023	Trichloroethene (TCE)	6/11/2013	17.3	µg/L
NH023	Trichloroethene (TCE)	7/25/2013	20.2	µg/L
NH023	Trichloroethene (TCE)	8/27/2013	23	µg/L
NH023	Trichloroethene (TCE)	2/20/2014	24.8	µg/L
NH023	Trichloroethene (TCE)	9/17/2013	26.5	µg/L
NH025	1,1-Dichloroethene (1,1-DCE)	3/25/2014	0.609	µg/L
NH025	1,1-Dichloroethene (1,1-DCE)	2/20/2014	0.621	µg/L
NH025	Nitrate (as NO3) ,calculated IC value	2/20/2014	19	mg/L
NH025	Nitrate (as NO3) ,calculated IC value	3/25/2014	19.5	mg/L
NH033	Bromide ,Ion-Chromatography	6/18/2013	0.345	mg/L
NH033	Coliform Total (CL,QT2000) ,MM0-MUG	8/28/2013	1	NUM/100ml
NH033	Nitrate (as NO3) ,calculated IC value	2/20/2014	4.04	mg/L
NH033	Nitrate (as NO3) ,calculated IC value	3/25/2014	4.08	mg/L
NH033	Nitrate (as NO3) ,calculated IC value	7/11/2013	4.4	mg/L
NH033	Nitrate (as NO3) ,calculated IC value	5/28/2013	4.47	mg/L
NH033	Nitrate (as NO3) ,calculated IC value	6/18/2013	4.56	mg/L
NH033	Nitrate (as NO3) ,calculated IC value	8/8/2013	4.7	mg/L
NH033	Nitrate (as NO3) ,calculated IC value	9/10/2013	4.7	mg/L
NH033	Nitrate (as NO3) ,calculated IC value	8/28/2013	4.96	mg/L
NH034	1,1-Dichloroethene (1,1-DCE)	2/20/2014	0.82	µg/L
NH034	1,1-Dichloroethene (1,1-DCE)	3/25/2014	1.32	µg/L
NH034	Bromide ,Ion-Chromatography	1/21/2014	0.215	mg/L
NH034	Coliform Total (CL,QT2000) ,MM0-MUG	12/11/2013	2	NUM/100ml
NH034	Nitrate (as NO3) ,calculated IC value	12/11/2013	6.87	mg/L
NH034	Nitrate (as NO3) ,calculated IC value	1/21/2014	13.7	mg/L
NH034	Nitrate (as NO3) ,calculated IC value	2/20/2014	23.5	mg/L
NH034	Nitrate (as NO3) ,calculated IC value	3/25/2014	23.5	mg/L
NH034	Tetrachloroethylene (PCE)	3/25/2014	0.896	µg/L
NH034	Tetrachloroethylene (PCE)	2/20/2014	1.07	µg/L
NH034	Trichloroethene (TCE)	1/21/2014	0.975	µg/L
NH034	Trichloroethene (TCE)	2/20/2014	2.12	µg/L
NH034	Trichloroethene (TCE)	3/25/2014	2.7	µg/L
NH036	1,1-Dichloroethene (1,1-DCE)	6/11/2013	1.21	µg/L
NH036	1,1-Dichloroethene (1,1-DCE)	7/11/2013	1.29	µg/L
NH036	1,1-Dichloroethene (1,1-DCE)	9/10/2013	1.39	µg/L
NH036	1,1-Dichloroethene (1,1-DCE)	8/27/2013	1.65	µg/L
NH036	1,1-Dichloroethene (1,1-DCE)	10/10/2013	2.17	µg/L
NH036	1,1-Dichloroethene (1,1-DCE)	2/20/2014	2.33	µg/L
NH036	Bromide ,Ion-Chromatography	9/24/2013	0.226	mg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
NH036	Nitrate (as NO3) ,calculated IC value	5/23/2013	16.5	mg/L
NH036	Nitrate (as NO3) ,calculated IC value	2/20/2014	23	mg/L
NH036	Nitrate (as NO3) ,calculated IC value	6/11/2013	23.6	mg/L
NH036	Nitrate (as NO3) ,calculated IC value	7/11/2013	24.6	mg/L
NH036	Nitrate (as NO3) ,calculated IC value	9/10/2013	25.6	mg/L
NH036	Nitrate (as NO3) ,calculated IC value	10/10/2013	25.6	mg/L
NH036	Nitrate (as NO3) ,calculated IC value	8/27/2013	26.2	mg/L
NH036	Nitrate (as NO3) ,calculated IC value	9/24/2013	26.2	mg/L
NH036	Tetrachloroethylene (PCE)	7/11/2013	0.513	µg/L
NH036	Tetrachloroethylene (PCE)	8/27/2013	0.745	µg/L
NH036	Tetrachloroethylene (PCE)	10/10/2013	0.762	µg/L
NH036	Tetrachloroethylene (PCE)	9/10/2013	0.823	µg/L
NH036	Tetrachloroethylene (PCE)	2/20/2014	1.09	µg/L
NH036	Trichloroethene (TCE)	5/23/2013	0.846	µg/L
NH036	Trichloroethene (TCE)	6/11/2013	2.49	µg/L
NH036	Trichloroethene (TCE)	7/11/2013	2.57	µg/L
NH036	Trichloroethene (TCE)	9/10/2013	3.11	µg/L
NH036	Trichloroethene (TCE)	8/27/2013	3.13	µg/L
NH036	Trichloroethene (TCE)	10/10/2013	3.63	µg/L
NH036	Trichloroethene (TCE)	2/20/2014	4.04	µg/L
NH037	1,1-Dichloroethene (1,1-DCE)	9/10/2013	0.518	µg/L
NH037	1,1-Dichloroethene (1,1-DCE)	7/11/2013	0.606	µg/L
NH037	1,1-Dichloroethene (1,1-DCE)	6/6/2013	0.624	µg/L
NH037	1,1-Dichloroethene (1,1-DCE)	8/27/2013	0.707	µg/L
NH037	1,1-Dichloroethene (1,1-DCE)	10/10/2013	0.789	µg/L
NH037	1,1-Dichloroethene (1,1-DCE)	3/25/2014	0.993	µg/L
NH037	1,2-Dichloroethene-cis	3/25/2014	0.543	µg/L
NH037	1,2-Dichloroethene-cis	8/27/2013	0.577	µg/L
NH037	1,2-Dichloroethene-cis	10/10/2013	0.609	µg/L
NH037	1,2-Dichloroethene-cis	9/10/2013	0.633	µg/L
NH037	Bromide ,Ion-Chromatography	12/11/2013	0.202	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	2/25/2014	6.33	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	12/11/2013	7.71	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	5/23/2013	8.99	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	3/25/2014	22.2	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	6/6/2013	22.8	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	7/11/2013	23.3	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	9/10/2013	23.5	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	8/27/2013	24	mg/L
NH037	Nitrate (as NO3) ,calculated IC value	10/10/2013	24.4	mg/L
NH037	Tetrachloroethylene (PCE)	6/6/2013	1.48	µg/L
NH037	Tetrachloroethylene (PCE)	7/11/2013	2.04	µg/L
NH037	Tetrachloroethylene (PCE)	8/27/2013	3.03	µg/L
NH037	Tetrachloroethylene (PCE)	9/10/2013	3.2	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
NH037	Tetrachloroethylene (PCE)	3/25/2014	3.39	µg/L
NH037	Tetrachloroethylene (PCE)	10/10/2013	3.56	µg/L
NH037	Trichloroethene (TCE)	6/6/2013	1.84	µg/L
NH037	Trichloroethene (TCE)	7/11/2013	2.16	µg/L
NH037	Trichloroethene (TCE)	8/27/2013	2.79	µg/L
NH037	Trichloroethene (TCE)	9/10/2013	3.01	µg/L
NH037	Trichloroethene (TCE)	10/10/2013	3.65	µg/L
NH037	Trichloroethene (TCE)	3/25/2014	4.2	µg/L
NH043A	1,1-Dichloroethene (1,1-DCE)	9/10/2013	0.581	µg/L
NH043A	1,1-Dichloroethene (1,1-DCE)	10/10/2013	0.796	µg/L
NH043A	1,1-Dichloroethene (1,1-DCE)	6/11/2013	0.811	µg/L
NH043A	1,1-Dichloroethene (1,1-DCE)	8/27/2013	0.89	µg/L
NH043A	Nitrate (as NO3) ,calculated IC value	3/25/2014	13.4	mg/L
NH043A	Nitrate (as NO3) ,calculated IC value	5/23/2013	15.8	mg/L
NH043A	Nitrate (as NO3) ,calculated IC value	2/25/2014	17.9	mg/L
NH043A	Nitrate (as NO3) ,calculated IC value	12/11/2013	19.2	mg/L
NH043A	Nitrate (as NO3) ,calculated IC value	6/11/2013	26.8	mg/L
NH043A	Nitrate (as NO3) ,calculated IC value	9/10/2013	29.6	mg/L
NH043A	Nitrate (as NO3) ,calculated IC value	8/27/2013	31.9	mg/L
NH043A	Nitrate (as NO3) ,calculated IC value	10/10/2013	33.4	mg/L
NH043A	Tetrachloroethylene (PCE)	12/11/2013	0.527	µg/L
NH043A	Tetrachloroethylene (PCE)	5/23/2013	0.652	µg/L
NH043A	Tetrachloroethylene (PCE)	6/11/2013	2.46	µg/L
NH043A	Tetrachloroethylene (PCE)	9/10/2013	3.83	µg/L
NH043A	Tetrachloroethylene (PCE)	10/10/2013	4.12	µg/L
NH043A	Tetrachloroethylene (PCE)	8/27/2013	5.38	µg/L
NH043A	Trichloroethene (TCE)	2/25/2014	0.58	µg/L
NH043A	Trichloroethene (TCE)	12/11/2013	1.14	µg/L
NH043A	Trichloroethene (TCE)	5/23/2013	1.32	µg/L
NH043A	Trichloroethene (TCE)	6/11/2013	5.34	µg/L
NH043A	Trichloroethene (TCE)	10/10/2013	11.2	µg/L
NH043A	Trichloroethene (TCE)	9/10/2013	11.7	µg/L
NH043A	Trichloroethene (TCE)	8/27/2013	14.1	µg/L
NH044	Coliform Total (CL,QT2000) ,MM0-MUG	2/25/2014	4.1	NUM/100ml
NH044	Nitrate (as NO3) ,calculated IC value	2/25/2014	4.83	mg/L
NH044	Nitrate (as NO3) ,calculated IC value	12/11/2013	8.51	mg/L
NH044	Nitrate (as NO3) ,calculated IC value	5/23/2013	9.04	mg/L
NH044	Nitrate (as NO3) ,calculated IC value	6/6/2013	12.9	mg/L
NH044	Nitrate (as NO3) ,calculated IC value	7/11/2013	13.6	mg/L
NH044	Nitrate (as NO3) ,calculated IC value	10/10/2013	13.7	mg/L
NH044	Nitrate (as NO3) ,calculated IC value	8/28/2013	13.8	mg/L
NH044	Tetrachloroethylene (PCE)	5/23/2013	0.506	µg/L
NH044	Tetrachloroethylene (PCE)	6/6/2013	0.705	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
NH044	Tetrachloroethylene (PCE)	7/11/2013	1.12	µg/L
NH044	Tetrachloroethylene (PCE)	8/28/2013	1.13	µg/L
NH044	Tetrachloroethylene (PCE)	10/10/2013	1.18	µg/L
NH044	Trichloroethene (TCE)	12/11/2013	0.94	µg/L
NH044	Trichloroethene (TCE)	5/23/2013	1	µg/L
NH044	Trichloroethene (TCE)	6/6/2013	2.25	µg/L
NH044	Trichloroethene (TCE)	7/11/2013	3.37	µg/L
NH044	Trichloroethene (TCE)	8/28/2013	4.3	µg/L
NH044	Trichloroethene (TCE)	10/10/2013	4.83	µg/L
NH045	Bromide ,Ion-Chromatography	9/10/2013	0.248	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	2/25/2014	5.67	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	3/25/2014	7.66	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	12/11/2013	7.84	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	5/23/2013	8.15	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	9/10/2013	13	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	7/25/2013	13.3	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	10/10/2013	13.4	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	6/6/2013	13.5	mg/L
NH045	Nitrate (as NO3) ,calculated IC value	8/28/2013	13.6	mg/L
NH045	Tetrachloroethylene (PCE)	6/6/2013	0.535	µg/L
NH045	Tetrachloroethylene (PCE)	7/25/2013	0.94	µg/L
NH045	Tetrachloroethylene (PCE)	8/28/2013	1.21	µg/L
NH045	Tetrachloroethylene (PCE)	10/10/2013	1.43	µg/L
NH045	Tetrachloroethylene (PCE)	9/10/2013	1.48	µg/L
NH045	Trichloroethene (TCE)	6/6/2013	1.08	µg/L
NH045	Trichloroethene (TCE)	7/25/2013	1.69	µg/L
NH045	Trichloroethene (TCE)	8/28/2013	2.32	µg/L
NH045	Trichloroethene (TCE)	9/10/2013	3.01	µg/L
NH045	Trichloroethene (TCE)	10/10/2013	3.06	µg/L
PL004	Chromium (Cr) Total, ICP/MS	2/24/2014	1.9	ug/L
PL004	Chromium (Cr) Total, ICP/MS	12/31/2013	2	ug/L
PL004	Chromium (Cr) Total, ICP/MS	1/17/2014	2	ug/L
PL004	Chromium (Cr+6) ,Diphenylcarbazide col	2/24/2014	1.94	µg/L
PL004	Chromium (Cr+6) ,Diphenylcarbazide col	12/31/2013	1.97	µg/L
PL004	Chromium (Cr+6) ,Diphenylcarbazide col	1/17/2014	1.97	µg/L
PL004	Nitrate (as NO3) ,calculated IC value	2/24/2014	34.9	mg/L
PL004	Nitrate (as NO3) ,calculated IC value	1/17/2014	35.4	mg/L
PL004	Nitrate (as NO3) ,calculated IC value	12/31/2013	35.8	mg/L
PL004	Nitrate (as NO3) ,calculated IC value	11/25/2013	36.7	mg/L
PL004	Perchlorate	1/17/2014	2.25	µg/L
PL004	Perchlorate	12/31/2013	2.35	µg/L
PL004	Perchlorate	11/22/2013	2.49	µg/L
PL004	Perchlorate	2/24/2014	2.86	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
PL004	Tetrachloroethylene (PCE)	11/22/2013	1.66	µg/L
PL004	Tetrachloroethylene (PCE)	2/24/2014	1.88	µg/L
PL004	Tetrachloroethylene (PCE)	12/31/2013	1.92	µg/L
PL004	Tetrachloroethylene (PCE)	1/17/2014	2.03	µg/L
PL004	Trichloroethene (TCE)	11/22/2013	2.21	µg/L
PL004	Trichloroethene (TCE)	2/24/2014	2.4	µg/L
PL004	Trichloroethene (TCE)	1/17/2014	2.67	µg/L
PL004	Trichloroethene (TCE)	12/31/2013	2.69	µg/L
PL006	1,1-Dichloroethene (1,1-DCE)	1/17/2014	0.793	µg/L
PL006	1,1-Dichloroethene (1,1-DCE)	2/24/2014	1.8	µg/L
PL006	Bromide ,Ion-Chromatography	11/19/2013	0.342	mg/L
PL006	Chromium (Cr) Total, ICP/MS	1/17/2014	2.1	ug/L
PL006	Chromium (Cr) Total, ICP/MS	2/24/2014	2.1	ug/L
PL006	Chromium (Cr) Total, ICP/MS	2/27/2014	2.2	ug/L
PL006	Chromium (Cr) Total, ICP/MS	12/31/2013	2.3	ug/L
PL006	Chromium (Cr+6) ,Diphenylcarbazide col	2/27/2014	2.08	µg/L
PL006	Chromium (Cr+6) ,Diphenylcarbazide col	1/17/2014	2.2	µg/L
PL006	Chromium (Cr+6) ,Diphenylcarbazide col	12/31/2013	2.37	µg/L
PL006	Chromium (Cr+6) ,Diphenylcarbazide col	11/19/2013	2.39	µg/L
PL006	Nitrate (as NO3) ,calculated IC value	2/24/2014	37.7	mg/L
PL006	Nitrate (as NO3) ,calculated IC value	1/17/2014	38	mg/L
PL006	Nitrate (as NO3) ,calculated IC value	12/31/2013	38.8	mg/L
PL006	Nitrate (as NO3) ,calculated IC value	11/19/2013	41.7	mg/L
PL006	Perchlorate	1/17/2014	2.32	µg/L
PL006	Perchlorate	12/31/2013	2.38	µg/L
PL006	Perchlorate	2/24/2014	2.68	µg/L
PL006	Perchlorate	11/19/2013	3.03	µg/L
PL006	Tetrachloroethylene (PCE)	11/19/2013	3.88	µg/L
PL006	Tetrachloroethylene (PCE)	12/31/2013	5.18	µg/L
PL006	Tetrachloroethylene (PCE)	1/17/2014	7.02	µg/L
PL006	Tetrachloroethylene (PCE)	2/24/2014	7.78	µg/L
PL006	Trichloroethene (TCE)	11/19/2013	5.63	µg/L
PL006	Trichloroethene (TCE)	12/31/2013	5.81	µg/L
PL006	Trichloroethene (TCE)	2/24/2014	6.2	µg/L
PL006	Trichloroethene (TCE)	1/17/2014	6.28	µg/L
RT001	Nitrate (as NO3) ,calculated IC value	5/28/2013	10.1	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	2/12/2014	13.6	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	1/14/2014	13.9	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	3/18/2014	16.2	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	6/25/2013	16.3	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	7/23/2013	17	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	8/22/2013	17.6	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	10/17/2013	17.6	mg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT001	Nitrate (as NO3) ,calculated IC value	9/19/2013	17.7	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	12/10/2013	19.5	mg/L
RT001	Nitrate (as NO3) ,calculated IC value	11/21/2013	22.4	mg/L
RT001	Tetrachloroethylene (PCE)	2/12/2014	1.07	µg/L
RT001	Tetrachloroethylene (PCE)	6/25/2013	1.11	µg/L
RT001	Tetrachloroethylene (PCE)	7/23/2013	1.16	µg/L
RT001	Tetrachloroethylene (PCE)	1/14/2014	1.3	µg/L
RT001	Tetrachloroethylene (PCE)	8/22/2013	1.38	µg/L
RT001	Tetrachloroethylene (PCE)	3/18/2014	1.44	µg/L
RT001	Tetrachloroethylene (PCE)	9/19/2013	1.47	µg/L
RT001	Tetrachloroethylene (PCE)	10/17/2013	1.63	µg/L
RT001	Tetrachloroethylene (PCE)	12/10/2013	2.22	µg/L
RT001	Tetrachloroethylene (PCE)	11/21/2013	2.56	µg/L
RT001	Trichloroethene (TCE)	5/28/2013	4.56	µg/L
RT001	Trichloroethene (TCE)	2/12/2014	11	µg/L
RT001	Trichloroethene (TCE)	1/14/2014	13	µg/L
RT001	Trichloroethene (TCE)	3/18/2014	14.1	µg/L
RT001	Trichloroethene (TCE)	6/25/2013	19.2	µg/L
RT001	Trichloroethene (TCE)	9/19/2013	20.7	µg/L
RT001	Trichloroethene (TCE)	7/23/2013	21.1	µg/L
RT001	Trichloroethene (TCE)	12/10/2013	21.3	µg/L
RT001	Trichloroethene (TCE)	8/22/2013	21.9	µg/L
RT001	Trichloroethene (TCE)	10/17/2013	23.6	µg/L
RT001	Trichloroethene (TCE)	11/21/2013	24.5	µg/L
RT002	Nitrate (as NO3) ,calculated IC value	5/30/2013	14.8	mg/L
RT002	Nitrate (as NO3) ,calculated IC value	2/12/2014	17.5	mg/L
RT002	Nitrate (as NO3) ,calculated IC value	3/18/2014	17.7	mg/L
RT002	Nitrate (as NO3) ,calculated IC value	6/25/2013	19.3	mg/L
RT002	Nitrate (as NO3) ,calculated IC value	7/23/2013	21.8	mg/L
RT002	Nitrate (as NO3) ,calculated IC value	11/25/2013	22.6	mg/L
RT002	Nitrate (as NO3) ,calculated IC value	8/26/2013	25	mg/L
RT002	Nitrate (as NO3) ,calculated IC value	9/19/2013	28.9	mg/L
RT002	Nitrate (as NO3) ,calculated IC value	10/24/2013	31.4	mg/L
RT002	Perchlorate	7/23/2013	2.14	µg/L
RT002	Perchlorate	5/30/2013	4.45	µg/L
RT002	Perchlorate	2/12/2014	4.73	µg/L
RT002	Trichloroethene (TCE)	5/30/2013	0.646	µg/L
RT002	Trichloroethene (TCE)	6/25/2013	0.813	µg/L
RT002	Trichloroethene (TCE)	7/23/2013	0.941	µg/L
RT002	Trichloroethene (TCE)	9/19/2013	0.992	µg/L
RT002	Trichloroethene (TCE)	3/18/2014	1	µg/L
RT002	Trichloroethene (TCE)	2/12/2014	1.04	µg/L
RT002	Trichloroethene (TCE)	8/26/2013	1.15	µg/L
RT002	Trichloroethene (TCE)	11/25/2013	1.23	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT002	Trichloroethene (TCE)	10/24/2013	1.38	µg/L
RT003	Nitrate (as NO3) ,calculated IC value	5/30/2013	14.8	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	2/13/2014	15.6	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	12/12/2013	16.2	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	6/27/2013	17.1	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	11/25/2013	17.1	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	3/20/2014	17.4	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	7/25/2013	19.1	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	10/28/2013	20.4	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	8/26/2013	21.5	mg/L
RT003	Nitrate (as NO3) ,calculated IC value	9/20/2013	22.2	mg/L
RT003	Perchlorate	8/26/2013	2.34	µg/L
RT003	Perchlorate	7/25/2013	3.58	µg/L
RT003	Perchlorate	3/20/2014	4.85	µg/L
RT003	Perchlorate	6/27/2013	5.6	µg/L
RT003	Perchlorate	10/28/2013	6.53	µg/L
RT003	Perchlorate	5/30/2013	7.02	µg/L
RT003	Perchlorate	2/13/2014	7.15	µg/L
RT003	Perchlorate	11/25/2013	7.34	µg/L
RT003	Perchlorate	12/12/2013	7.76	µg/L
RT003	Trichloroethene (TCE)	9/20/2013	0.665	µg/L
RT003	Trichloroethene (TCE)	6/27/2013	0.781	µg/L
RT003	Trichloroethene (TCE)	8/26/2013	0.797	µg/L
RT003	Trichloroethene (TCE)	7/25/2013	0.802	µg/L
RT003	Trichloroethene (TCE)	5/30/2013	0.862	µg/L
RT003	Trichloroethene (TCE)	3/20/2014	1.09	µg/L
RT003	Trichloroethene (TCE)	10/28/2013	1.13	µg/L
RT003	Trichloroethene (TCE)	2/13/2014	1.14	µg/L
RT003	Trichloroethene (TCE)	11/25/2013	1.15	µg/L
RT003	Trichloroethene (TCE)	12/12/2013	1.23	µg/L
RT004	Nitrate (as NO3) ,calculated IC value	5/30/2013	14.9	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	12/12/2013	16.5	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	11/25/2013	16.8	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	6/27/2013	17.7	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	10/28/2013	17.8	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	2/13/2014	17.9	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	3/20/2014	18.9	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	7/25/2013	19.4	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	9/20/2013	20.7	mg/L
RT004	Nitrate (as NO3) ,calculated IC value	8/26/2013	21.2	mg/L
RT004	Perchlorate	3/20/2014	3.35	µg/L
RT004	Perchlorate	6/27/2013	4.34	µg/L
RT004	Perchlorate	2/13/2014	4.49	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT004	Perchlorate	5/30/2013	6.08	µg/L
RT004	Perchlorate	12/12/2013	7.02	µg/L
RT004	Perchlorate	11/25/2013	7.16	µg/L
RT004	Perchlorate	10/28/2013	8.11	µg/L
RT004	Trichloroethene (TCE)	6/27/2013	0.554	µg/L
RT004	Trichloroethene (TCE)	2/13/2014	0.646	µg/L
RT004	Trichloroethene (TCE)	3/20/2014	0.689	µg/L
RT004	Trichloroethene (TCE)	5/30/2013	0.731	µg/L
RT004	Trichloroethene (TCE)	11/25/2013	0.928	µg/L
RT004	Trichloroethene (TCE)	12/12/2013	1.12	µg/L
RT004	Trichloroethene (TCE)	10/28/2013	1.27	µg/L
RT005	1,2-Dichloroethene-cis	8/26/2013	0.503	µg/L
RT005	Coliform Total (CL,QT2000) ,MM0-MUG	6/27/2013	2	NUM/100ml
RT005	Nitrate (as NO3) ,calculated IC value	11/25/2013	15.3	mg/L
RT005	Nitrate (as NO3) ,calculated IC value	10/28/2013	16.7	mg/L
RT005	Nitrate (as NO3) ,calculated IC value	12/12/2013	18.3	mg/L
RT005	Nitrate (as NO3) ,calculated IC value	2/13/2014	19.8	mg/L
RT005	Nitrate (as NO3) ,calculated IC value	3/20/2014	21.5	mg/L
RT005	Nitrate (as NO3) ,calculated IC value	6/27/2013	26.6	mg/L
RT005	Nitrate (as NO3) ,calculated IC value	9/20/2013	27.9	mg/L
RT005	Nitrate (as NO3) ,calculated IC value	7/25/2013	28.6	mg/L
RT005	Nitrate (as NO3) ,calculated IC value	8/26/2013	29.1	mg/L
RT005	Perchlorate	6/27/2013	2.41	µg/L
RT005	Tetrachloroethylene (PCE)	12/12/2013	0.746	µg/L
RT005	Tetrachloroethylene (PCE)	2/13/2014	0.81	µg/L
RT005	Tetrachloroethylene (PCE)	3/20/2014	0.846	µg/L
RT005	Tetrachloroethylene (PCE)	6/27/2013	0.992	µg/L
RT005	Tetrachloroethylene (PCE)	9/20/2013	1.14	µg/L
RT005	Tetrachloroethylene (PCE)	7/25/2013	1.28	µg/L
RT005	Tetrachloroethylene (PCE)	8/26/2013	1.52	µg/L
RT005	Trichloroethene (TCE)	12/12/2013	0.508	µg/L
RT005	Trichloroethene (TCE)	9/20/2013	0.512	µg/L
RT005	Trichloroethene (TCE)	11/25/2013	0.98	µg/L
RT005	Trichloroethene (TCE)	10/28/2013	1.36	µg/L
RT006	Nitrate (as NO3) ,calculated IC value	5/30/2013	13.9	mg/L
RT006	Nitrate (as NO3) ,calculated IC value	11/25/2013	14.6	mg/L
RT006	Nitrate (as NO3) ,calculated IC value	6/27/2013	14.7	mg/L
RT006	Nitrate (as NO3) ,calculated IC value	7/25/2013	14.9	mg/L
RT006	Nitrate (as NO3) ,calculated IC value	12/12/2013	15.4	mg/L
RT006	Nitrate (as NO3) ,calculated IC value	8/20/2013	15.5	mg/L
RT006	Nitrate (as NO3) ,calculated IC value	10/28/2013	15.9	mg/L
RT006	Nitrate (as NO3) ,calculated IC value	3/20/2014	16.2	mg/L
RT006	Nitrate (as NO3) ,calculated IC value	2/13/2014	16.3	mg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT006	Nitrate (as NO3) ,calculated IC value	9/20/2013	23.8	mg/L
RT006	Perchlorate	11/25/2013	2.08	µg/L
RT007	Nitrate (as NO3) ,calculated IC value	12/12/2013	15.1	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	11/26/2013	15.2	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	5/30/2013	15.5	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	10/28/2013	15.6	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	2/13/2014	16	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	7/25/2013	16.7	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	3/20/2014	17.4	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	6/27/2013	18	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	9/20/2013	18.5	mg/L
RT007	Nitrate (as NO3) ,calculated IC value	8/26/2013	18.8	mg/L
RT007	Perchlorate	6/27/2013	2.01	µg/L
RT007	Perchlorate	7/25/2013	2.41	µg/L
RT007	Perchlorate	2/13/2014	3	µg/L
RT007	Perchlorate	12/12/2013	3.2	µg/L
RT007	Perchlorate	11/26/2013	3.51	µg/L
RT007	Perchlorate	10/28/2013	3.58	µg/L
RT007	Perchlorate	5/30/2013	3.84	µg/L
RT007	Trichloroethene (TCE)	7/25/2013	0.518	µg/L
RT007	Trichloroethene (TCE)	6/27/2013	0.526	µg/L
RT007	Trichloroethene (TCE)	3/20/2014	0.556	µg/L
RT007	Trichloroethene (TCE)	9/20/2013	0.58	µg/L
RT007	Trichloroethene (TCE)	8/26/2013	0.589	µg/L
RT007	Trichloroethene (TCE)	2/13/2014	0.867	µg/L
RT007	Trichloroethene (TCE)	5/30/2013	1.15	µg/L
RT007	Trichloroethene (TCE)	12/12/2013	1.33	µg/L
RT007	Trichloroethene (TCE)	10/28/2013	1.49	µg/L
RT007	Trichloroethene (TCE)	11/26/2013	1.49	µg/L
RT008	Bromide ,Ion-Chromatography	8/20/2013	0.083	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	5/30/2013	12.1	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	3/20/2014	12.7	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	6/27/2013	13	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	2/13/2014	13.8	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	7/25/2013	14.7	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	11/26/2013	15	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	12/12/2013	15.1	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	8/20/2013	15.4	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	10/28/2013	15.4	mg/L
RT008	Nitrate (as NO3) ,calculated IC value	9/20/2013	15.8	mg/L
RT008	Perchlorate	11/26/2013	2.63	µg/L
RT008	Perchlorate	10/28/2013	2.75	µg/L
RT008	Perchlorate	12/12/2013	2.91	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT008	Trichloroethene (TCE)	7/25/2013	0.57	µg/L
RT008	Trichloroethene (TCE)	3/20/2014	0.577	µg/L
RT008	Trichloroethene (TCE)	2/13/2014	0.607	µg/L
RT008	Trichloroethene (TCE)	11/26/2013	1.06	µg/L
RT008	Trichloroethene (TCE)	12/12/2013	1.2	µg/L
RT008	Trichloroethene (TCE)	10/28/2013	1.21	µg/L
RT009	Nitrate (as NO3) ,calculated IC value	5/30/2013	10	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	2/13/2014	10.1	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	3/20/2014	10.1	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	9/20/2013	10.4	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	6/27/2013	10.5	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	7/25/2013	10.5	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	8/20/2013	10.9	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	12/12/2013	16.4	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	11/26/2013	17	mg/L
RT009	Nitrate (as NO3) ,calculated IC value	10/28/2013	17.3	mg/L
RT009	Trichloroethene (TCE)	2/13/2014	0.502	µg/L
RT009	Trichloroethene (TCE)	6/27/2013	0.514	µg/L
RT009	Trichloroethene (TCE)	7/25/2013	0.524	µg/L
RT009	Trichloroethene (TCE)	8/20/2013	0.56	µg/L
RT009	Trichloroethene (TCE)	12/12/2013	0.639	µg/L
RT009	Trichloroethene (TCE)	5/30/2013	0.679	µg/L
RT009	Trichloroethene (TCE)	11/26/2013	0.899	µg/L
RT009	Trichloroethene (TCE)	10/28/2013	1.01	µg/L
RT010	Nitrate (as NO3) ,calculated IC value	5/30/2013	19.2	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	1/14/2014	22.4	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	2/12/2014	24.7	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	11/25/2013	27.1	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	3/18/2014	28	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	6/25/2013	28.7	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	7/23/2013	30.6	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	8/26/2013	31.8	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	9/19/2013	32.9	mg/L
RT010	Nitrate (as NO3) ,calculated IC value	10/24/2013	33.7	mg/L
RT010	Tetrachloroethylene (PCE)	8/26/2013	0.565	µg/L
RT010	Tetrachloroethylene (PCE)	10/24/2013	0.596	µg/L
RT010	Trichloroethene (TCE)	5/30/2013	3.13	µg/L
RT010	Trichloroethene (TCE)	2/12/2014	6.9	µg/L
RT010	Trichloroethene (TCE)	1/14/2014	7.53	µg/L
RT010	Trichloroethene (TCE)	6/25/2013	9.21	µg/L
RT010	Trichloroethene (TCE)	11/25/2013	9.79	µg/L
RT010	Trichloroethene (TCE)	7/23/2013	10.2	µg/L
RT010	Trichloroethene (TCE)	3/18/2014	10.8	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT010	Trichloroethene (TCE)	9/19/2013	10.9	µg/L
RT010	Trichloroethene (TCE)	8/26/2013	12.1	µg/L
RT010	Trichloroethene (TCE)	10/24/2013	14.8	µg/L
RT011	Bromide ,Ion-Chromatography	2/12/2014	0.0743	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	5/28/2013	11.6	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	1/14/2014	13.6	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	2/12/2014	13.7	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	6/25/2013	14.8	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	3/18/2014	14.9	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	7/23/2013	15.3	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	8/22/2013	16.1	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	12/10/2013	16.2	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	10/17/2013	16.4	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	9/19/2013	16.5	mg/L
RT011	Nitrate (as NO3) ,calculated IC value	11/21/2013	18.9	mg/L
RT011	Tetrachloroethylene (PCE)	2/12/2014	0.555	µg/L
RT011	Tetrachloroethylene (PCE)	1/14/2014	0.569	µg/L
RT011	Tetrachloroethylene (PCE)	3/18/2014	0.664	µg/L
RT011	Tetrachloroethylene (PCE)	8/22/2013	0.702	µg/L
RT011	Tetrachloroethylene (PCE)	9/19/2013	0.776	µg/L
RT011	Tetrachloroethylene (PCE)	10/17/2013	0.965	µg/L
RT011	Tetrachloroethylene (PCE)	12/10/2013	1	µg/L
RT011	Tetrachloroethylene (PCE)	11/21/2013	1.33	µg/L
RT011	Trichloroethene (TCE)	5/28/2013	3.33	µg/L
RT011	Trichloroethene (TCE)	1/14/2014	7.57	µg/L
RT011	Trichloroethene (TCE)	2/12/2014	7.64	µg/L
RT011	Trichloroethene (TCE)	3/18/2014	9.18	µg/L
RT011	Trichloroethene (TCE)	6/25/2013	10.8	µg/L
RT011	Trichloroethene (TCE)	12/10/2013	11.6	µg/L
RT011	Trichloroethene (TCE)	7/23/2013	12.8	µg/L
RT011	Trichloroethene (TCE)	8/22/2013	14.3	µg/L
RT011	Trichloroethene (TCE)	9/19/2013	14.9	µg/L
RT011	Trichloroethene (TCE)	11/21/2013	15.9	µg/L
RT011	Trichloroethene (TCE)	10/17/2013	16.9	µg/L
RT012	Nitrate (as NO3) ,calculated IC value	5/28/2013	11.3	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	2/12/2014	13.5	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	1/14/2014	13.6	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	3/18/2014	14.2	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	6/25/2013	14.8	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	7/23/2013	16	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	12/10/2013	16.6	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	8/26/2013	17.5	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	9/19/2013	18	mg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT012	Nitrate (as NO3) ,calculated IC value	11/21/2013	19.2	mg/L
RT012	Nitrate (as NO3) ,calculated IC value	10/24/2013	22.6	mg/L
RT012	Perchlorate	5/28/2013	2.01	µg/L
RT012	Tetrachloroethylene (PCE)	12/10/2013	0.514	µg/L
RT012	Tetrachloroethylene (PCE)	9/19/2013	0.615	µg/L
RT012	Tetrachloroethylene (PCE)	8/26/2013	0.624	µg/L
RT012	Tetrachloroethylene (PCE)	11/21/2013	0.747	µg/L
RT012	Tetrachloroethylene (PCE)	10/24/2013	1.02	µg/L
RT012	Trichloroethene (TCE)	5/28/2013	0.764	µg/L
RT012	Trichloroethene (TCE)	2/12/2014	3.97	µg/L
RT012	Trichloroethene (TCE)	1/14/2014	4.66	µg/L
RT012	Trichloroethene (TCE)	3/18/2014	4.87	µg/L
RT012	Trichloroethene (TCE)	6/25/2013	5.35	µg/L
RT012	Trichloroethene (TCE)	12/10/2013	8.42	µg/L
RT012	Trichloroethene (TCE)	7/23/2013	8.99	µg/L
RT012	Trichloroethene (TCE)	8/26/2013	11.1	µg/L
RT012	Trichloroethene (TCE)	11/21/2013	11.1	µg/L
RT012	Trichloroethene (TCE)	9/19/2013	11.7	µg/L
RT012	Trichloroethene (TCE)	10/24/2013	18.7	µg/L
RT013	Nitrate (as NO3) ,calculated IC value	5/28/2013	11.6	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	2/12/2014	14.1	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	1/14/2014	14.2	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	3/18/2014	14.9	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	6/25/2013	15.3	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	7/23/2013	16.8	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	12/10/2013	17	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	8/26/2013	18.1	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	9/19/2013	19	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	11/21/2013	19.8	mg/L
RT013	Nitrate (as NO3) ,calculated IC value	10/24/2013	20.5	mg/L
RT013	Tetrachloroethylene (PCE)	3/18/2014	0.533	µg/L
RT013	Tetrachloroethylene (PCE)	2/12/2014	0.55	µg/L
RT013	Tetrachloroethylene (PCE)	1/14/2014	0.585	µg/L
RT013	Tetrachloroethylene (PCE)	7/23/2013	0.807	µg/L
RT013	Tetrachloroethylene (PCE)	12/10/2013	1.09	µg/L
RT013	Tetrachloroethylene (PCE)	8/26/2013	1.1	µg/L
RT013	Tetrachloroethylene (PCE)	9/19/2013	1.19	µg/L
RT013	Tetrachloroethylene (PCE)	11/21/2013	1.45	µg/L
RT013	Tetrachloroethylene (PCE)	10/24/2013	1.46	µg/L
RT013	Trichloroethene (TCE)	5/28/2013	1.37	µg/L
RT013	Trichloroethene (TCE)	2/12/2014	6.49	µg/L
RT013	Trichloroethene (TCE)	1/14/2014	7.6	µg/L
RT013	Trichloroethene (TCE)	3/18/2014	7.93	µg/L
RT013	Trichloroethene (TCE)	6/25/2013	8.9	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT013	Trichloroethene (TCE)	12/10/2013	12.1	µg/L
RT013	Trichloroethene (TCE)	7/23/2013	13	µg/L
RT013	Trichloroethene (TCE)	8/26/2013	16.3	µg/L
RT013	Trichloroethene (TCE)	11/21/2013	16.6	µg/L
RT013	Trichloroethene (TCE)	9/19/2013	17.1	µg/L
RT013	Trichloroethene (TCE)	10/24/2013	21.4	µg/L
RT014	1,2-Dichloroethene-cis	11/21/2013	0.503	µg/L
RT014	Coliform Total (CL,QT2000) ,MM0-MUG	12/10/2013	1	NUM/100ml
RT014	Nitrate (as NO3) ,calculated IC value	5/28/2013	11.2	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	2/12/2014	14.3	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	1/14/2014	14.4	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	3/18/2014	15.5	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	6/25/2013	15.8	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	7/23/2013	16.4	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	8/22/2013	17.3	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	9/19/2013	17.3	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	10/17/2013	17.4	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	12/10/2013	17.6	mg/L
RT014	Nitrate (as NO3) ,calculated IC value	11/21/2013	19.2	mg/L
RT014	Tetrachloroethylene (PCE)	6/25/2013	0.81	µg/L
RT014	Tetrachloroethylene (PCE)	7/23/2013	0.969	µg/L
RT014	Tetrachloroethylene (PCE)	2/12/2014	1.1	µg/L
RT014	Tetrachloroethylene (PCE)	1/14/2014	1.13	µg/L
RT014	Tetrachloroethylene (PCE)	8/22/2013	1.27	µg/L
RT014	Tetrachloroethylene (PCE)	3/18/2014	1.27	µg/L
RT014	Tetrachloroethylene (PCE)	9/19/2013	1.31	µg/L
RT014	Tetrachloroethylene (PCE)	12/10/2013	1.75	µg/L
RT014	Tetrachloroethylene (PCE)	10/17/2013	1.83	µg/L
RT014	Tetrachloroethylene (PCE)	11/21/2013	2.11	µg/L
RT014	Trichloroethene (TCE)	5/28/2013	8.96	µg/L
RT014	Trichloroethene (TCE)	2/12/2014	18.8	µg/L
RT014	Trichloroethene (TCE)	1/14/2014	20.3	µg/L
RT014	Trichloroethene (TCE)	3/18/2014	20.5	µg/L
RT014	Trichloroethene (TCE)	6/25/2013	24.3	µg/L
RT014	Trichloroethene (TCE)	7/23/2013	26.2	µg/L
RT014	Trichloroethene (TCE)	12/10/2013	27.4	µg/L
RT014	Trichloroethene (TCE)	9/19/2013	28.7	µg/L
RT014	Trichloroethene (TCE)	8/22/2013	29.5	µg/L
RT014	Trichloroethene (TCE)	11/21/2013	29.7	µg/L
RT014	Trichloroethene (TCE)	10/17/2013	31.7	µg/L
RT015	Nitrate (as NO3) ,calculated IC value	5/28/2013	9.48	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	1/14/2014	10.1	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	3/18/2014	10.2	mg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
RT015	Nitrate (as NO3) ,calculated IC value	2/12/2014	12.3	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	12/10/2013	14.1	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	11/21/2013	15.9	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	6/25/2013	16.9	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	7/23/2013	17.9	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	9/19/2013	19.9	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	8/22/2013	20.8	mg/L
RT015	Nitrate (as NO3) ,calculated IC value	10/17/2013	20.8	mg/L
RT015	Tetrachloroethylene (PCE)	2/12/2014	0.727	µg/L
RT015	Tetrachloroethylene (PCE)	6/25/2013	0.929	µg/L
RT015	Tetrachloroethylene (PCE)	12/10/2013	1.02	µg/L
RT015	Tetrachloroethylene (PCE)	11/21/2013	1.07	µg/L
RT015	Tetrachloroethylene (PCE)	7/23/2013	1.18	µg/L
RT015	Tetrachloroethylene (PCE)	8/22/2013	1.2	µg/L
RT015	Tetrachloroethylene (PCE)	9/19/2013	1.51	µg/L
RT015	Tetrachloroethylene (PCE)	10/17/2013	2	µg/L
RT015	Trichloroethene (TCE)	5/28/2013	4.74	µg/L
RT015	Trichloroethene (TCE)	3/18/2014	7.67	µg/L
RT015	Trichloroethene (TCE)	1/14/2014	8.91	µg/L
RT015	Trichloroethene (TCE)	2/12/2014	14.6	µg/L
RT015	Trichloroethene (TCE)	12/10/2013	20.9	µg/L
RT015	Trichloroethene (TCE)	11/21/2013	21.5	µg/L
RT015	Trichloroethene (TCE)	6/25/2013	26.1	µg/L
RT015	Trichloroethene (TCE)	8/22/2013	31.7	µg/L
RT015	Trichloroethene (TCE)	7/23/2013	33.8	µg/L
RT015	Trichloroethene (TCE)	9/19/2013	37.9	µg/L
RT015	Trichloroethene (TCE)	10/17/2013	42.6	µg/L
TJ001	Nitrate (as NO3) ,calculated IC value	12/3/2013	19.1	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	4/4/2013	20.7	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	8/8/2013	25.2	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	11/7/2013	25.3	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	7/10/2013	25.8	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	9/5/2013	25.8	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	10/3/2013	25.9	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	6/18/2013	26	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	5/21/2013	26.3	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	2/4/2014	26.3	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	3/6/2014	26.6	mg/L
TJ001	Nitrate (as NO3) ,calculated IC value	1/9/2014	26.9	mg/L
TJ001	Perchlorate	6/18/2013	2.31	µg/L
TJ001	Perchlorate	4/4/2013	2.41	µg/L
TJ003	Nitrate (as NO3) ,calculated IC value	4/17/2013	19.4	mg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ004	Nitrate (as NO3) ,calculated IC value	5/21/2013	20.1	mg/L
TJ004	Nitrate (as NO3) ,calculated IC value	6/18/2013	20.3	mg/L
TJ004	Nitrate (as NO3) ,calculated IC value	7/10/2013	20.3	mg/L
TJ004	Nitrate (as NO3) ,calculated IC value	4/4/2013	23.3	mg/L
TJ004	Nitrate (as NO3) ,calculated IC value	3/6/2014	25.9	mg/L
TJ004	Tetrachloroethylene (PCE)	6/18/2013	0.64	µg/L
TJ004	Tetrachloroethylene (PCE)	5/21/2013	0.919	µg/L
TJ004	Trichloroethene (TCE)	7/10/2013	0.764	µg/L
TJ004	Trichloroethene (TCE)	6/18/2013	0.814	µg/L
TJ004	Trichloroethene (TCE)	5/21/2013	1.09	µg/L
TJ005	Chromium (Cr) Total, ICP/MS	10/3/2013	1.2	ug/L
TJ005	Chromium (Cr) Total, ICP/MS	1/8/2014	1.9	ug/L
TJ005	Nitrate (as NO3) ,calculated IC value	8/7/2013	19.7	mg/L
TJ005	Nitrate (as NO3) ,calculated IC value	3/5/2014	20	mg/L
TJ005	Nitrate (as NO3) ,calculated IC value	9/4/2013	20.5	mg/L
TJ005	Nitrate (as NO3) ,calculated IC value	10/3/2013	20.6	mg/L
TJ005	Nitrate (as NO3) ,calculated IC value	12/4/2013	21.4	mg/L
TJ005	Nitrate (as NO3) ,calculated IC value	2/5/2014	21.8	mg/L
TJ005	Nitrate (as NO3) ,calculated IC value	1/8/2014	23.5	mg/L
TJ005	Tetrachloroethylene (PCE)	10/3/2013	0.782	µg/L
TJ005	Tetrachloroethylene (PCE)	9/4/2013	1.19	µg/L
TJ005	Tetrachloroethylene (PCE)	8/7/2013	2.26	µg/L
TJ005	Trichloroethene (TCE)	10/3/2013	1.12	µg/L
TJ005	Trichloroethene (TCE)	9/4/2013	1.64	µg/L
TJ005	Trichloroethene (TCE)	8/7/2013	3	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	1/8/2014	0.881	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	12/4/2013	1.68	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	2/5/2014	1.71	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	11/6/2013	2.29	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	8/7/2013	2.42	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	6/5/2013	2.58	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	3/5/2014	2.58	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	5/8/2013	2.89	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	7/3/2013	3.06	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	4/3/2013	3.1	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	10/9/2013	3.91	µg/L
TJ006	1,1-Dichloroethene (1,1-DCE)	9/4/2013	4.34	µg/L
TJ006	Bromide ,Ion-Chromatography	7/3/2013	0.101	mg/L
TJ006	Chromium (Cr) Total, ICP/MS	10/9/2013	1.2	ug/L
TJ006	Chromium (Cr) Total, ICP/MS	1/8/2014	1.2	ug/L
TJ006	Chromium (Cr) Total, ICP/MS	4/3/2013	1.3	ug/L
TJ006	Nitrate (as NO3) ,calculated IC value	1/8/2014	23	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	12/4/2013	24.2	mg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ006	Nitrate (as NO3) ,calculated IC value	2/5/2014	24.9	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	11/6/2013	25.9	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	8/7/2013	27.2	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	3/5/2014	27.2	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	5/8/2013	27.5	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	4/3/2013	27.8	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	6/5/2013	28	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	7/3/2013	28	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	9/4/2013	29.5	mg/L
TJ006	Nitrate (as NO3) ,calculated IC value	10/9/2013	30.1	mg/L
TJ006	Tetrachloroethylene (PCE)	1/8/2014	5.38	µg/L
TJ006	Tetrachloroethylene (PCE)	12/4/2013	9	µg/L
TJ006	Tetrachloroethylene (PCE)	11/6/2013	10.9	µg/L
TJ006	Tetrachloroethylene (PCE)	2/5/2014	11.3	µg/L
TJ006	Tetrachloroethylene (PCE)	3/5/2014	11.9	µg/L
TJ006	Tetrachloroethylene (PCE)	8/7/2013	14.2	µg/L
TJ006	Tetrachloroethylene (PCE)	6/5/2013	14.6	µg/L
TJ006	Tetrachloroethylene (PCE)	5/8/2013	15	µg/L
TJ006	Tetrachloroethylene (PCE)	7/3/2013	15.3	µg/L
TJ006	Tetrachloroethylene (PCE)	4/3/2013	17	µg/L
TJ006	Tetrachloroethylene (PCE)	9/4/2013	19.7	µg/L
TJ006	Tetrachloroethylene (PCE)	10/9/2013	21	µg/L
TJ006	Trichloroethene (TCE)	1/8/2014	5.77	µg/L
TJ006	Trichloroethene (TCE)	12/4/2013	8.62	µg/L
TJ006	Trichloroethene (TCE)	11/6/2013	10.4	µg/L
TJ006	Trichloroethene (TCE)	2/5/2014	10.8	µg/L
TJ006	Trichloroethene (TCE)	8/7/2013	11.7	µg/L
TJ006	Trichloroethene (TCE)	6/5/2013	11.8	µg/L
TJ006	Trichloroethene (TCE)	3/5/2014	12.3	µg/L
TJ006	Trichloroethene (TCE)	5/8/2013	13.3	µg/L
TJ006	Trichloroethene (TCE)	7/3/2013	13.3	µg/L
TJ006	Trichloroethene (TCE)	10/9/2013	15.3	µg/L
TJ006	Trichloroethene (TCE)	4/3/2013	15.5	µg/L
TJ006	Trichloroethene (TCE)	9/4/2013	16.5	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	6/5/2013	3.86	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	5/8/2013	4.21	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	7/3/2013	4.4	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	4/3/2013	4.57	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	8/7/2013	5.17	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	9/4/2013	5.43	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	10/9/2013	5.8	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	11/6/2013	6.25	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	3/5/2014	6.5	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	12/4/2013	7	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ007	1,1-Dichloroethene (1,1-DCE)	1/8/2014	7.04	µg/L
TJ007	1,1-Dichloroethene (1,1-DCE)	2/5/2014	7.69	µg/L
TJ007	1,2-Dichloroethene-cis	4/3/2013	0.502	µg/L
TJ007	1,2-Dichloroethene-cis	8/7/2013	0.523	µg/L
TJ007	1,2-Dichloroethene-cis	11/6/2013	0.623	µg/L
TJ007	1,2-Dichloroethene-cis	1/8/2014	0.651	µg/L
TJ007	1,2-Dichloroethene-cis	2/5/2014	0.698	µg/L
TJ007	1,2-Dichloroethene-cis	3/5/2014	0.702	µg/L
TJ007	1,2-Dichloroethene-cis	12/4/2013	0.729	µg/L
TJ007	1,4-Dioxane	10/9/2013	1.06	ug/L
TJ007	1,4-Dioxane	4/3/2013	1.12	ug/L
TJ007	1,4-Dioxane	1/9/2014	1.17	ug/L
TJ007	Carbon tetrachloride	5/8/2013	0.264	µg/L
TJ007	Carbon tetrachloride	7/3/2013	0.266	µg/L
TJ007	Carbon tetrachloride	1/8/2014	0.274	µg/L
TJ007	Carbon tetrachloride	11/6/2013	0.303	µg/L
TJ007	Carbon tetrachloride	8/7/2013	0.305	µg/L
TJ007	Carbon tetrachloride	4/3/2013	0.308	µg/L
TJ007	Carbon tetrachloride	9/4/2013	0.321	µg/L
TJ007	Carbon tetrachloride	10/9/2013	0.333	µg/L
TJ007	Carbon tetrachloride	3/5/2014	0.357	µg/L
TJ007	Carbon tetrachloride	12/4/2013	0.378	µg/L
TJ007	Carbon tetrachloride	2/5/2014	0.462	µg/L
TJ007	Chromium (Cr) Total, ICP/MS	7/3/2013	1.3	ug/L
TJ007	Chromium (Cr) Total, ICP/MS	1/8/2014	1.4	ug/L
TJ007	Chromium (Cr) Total, ICP/MS	4/3/2013	1.6	ug/L
TJ007	Chromium (Cr) Total, ICP/MS	10/9/2013	1.6	ug/L
TJ007	Nitrate (as NO3) ,calculated IC value	1/8/2014	32.3	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	4/3/2013	33	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	5/8/2013	33	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	7/3/2013	33.2	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	12/4/2013	33.3	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	6/5/2013	33.4	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	2/5/2014	33.4	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	8/7/2013	33.7	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	11/6/2013	33.8	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	3/5/2014	34	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	9/4/2013	34.2	mg/L
TJ007	Nitrate (as NO3) ,calculated IC value	10/9/2013	35.1	mg/L
TJ007	Perchlorate	7/3/2013	2.13	µg/L
TJ007	Perchlorate	8/7/2013	2.25	µg/L
TJ007	Perchlorate	6/5/2013	2.29	µg/L
TJ007	Perchlorate	5/8/2013	2.35	µg/L
TJ007	Perchlorate	4/3/2013	2.46	µg/L
TJ007	Tetrachloroethylene (PCE)	6/5/2013	14.1	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ007	Tetrachloroethylene (PCE)	5/8/2013	14.2	µg/L
TJ007	Tetrachloroethylene (PCE)	7/3/2013	14.9	µg/L
TJ007	Tetrachloroethylene (PCE)	4/3/2013	16.1	µg/L
TJ007	Tetrachloroethylene (PCE)	9/4/2013	18.2	µg/L
TJ007	Tetrachloroethylene (PCE)	8/7/2013	19.5	µg/L
TJ007	Tetrachloroethylene (PCE)	10/9/2013	19.5	µg/L
TJ007	Tetrachloroethylene (PCE)	11/6/2013	20.5	µg/L
TJ007	Tetrachloroethylene (PCE)	3/5/2014	21.7	µg/L
TJ007	Tetrachloroethylene (PCE)	12/4/2013	27.6	µg/L
TJ007	Tetrachloroethylene (PCE)	1/8/2014	29.2	µg/L
TJ007	Tetrachloroethylene (PCE)	2/5/2014	32	µg/L
TJ007	Trichloroethene (TCE)	6/5/2013	15.6	µg/L
TJ007	Trichloroethene (TCE)	5/8/2013	17.1	µg/L
TJ007	Trichloroethene (TCE)	7/3/2013	17.3	µg/L
TJ007	Trichloroethene (TCE)	4/3/2013	19.4	µg/L
TJ007	Trichloroethene (TCE)	9/4/2013	19.6	µg/L
TJ007	Trichloroethene (TCE)	8/7/2013	19.8	µg/L
TJ007	Trichloroethene (TCE)	10/9/2013	19.8	µg/L
TJ007	Trichloroethene (TCE)	11/6/2013	20.8	µg/L
TJ007	Trichloroethene (TCE)	3/5/2014	21.9	µg/L
TJ007	Trichloroethene (TCE)	12/4/2013	23.5	µg/L
TJ007	Trichloroethene (TCE)	1/8/2014	24.4	µg/L
TJ007	Trichloroethene (TCE)	2/5/2014	27.1	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	6/5/2013	3.07	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	5/8/2013	3.23	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	7/3/2013	3.35	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	8/7/2013	3.4	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	4/3/2013	3.42	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	10/3/2013	3.61	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	9/4/2013	4.01	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	11/6/2013	5.25	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	3/5/2014	6.73	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	1/8/2014	8.01	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	2/5/2014	9.11	µg/L
TJ008	1,1-Dichloroethene (1,1-DCE)	12/4/2013	9.23	µg/L
TJ008	1,4-Dioxane	1/8/2014	1.08	ug/L
TJ008	Carbon tetrachloride	4/3/2013	0.266	µg/L
TJ008	Carbon tetrachloride	11/6/2013	0.344	µg/L
TJ008	Carbon tetrachloride	3/5/2014	0.613	µg/L
TJ008	Carbon tetrachloride	1/8/2014	0.776	µg/L
TJ008	Carbon tetrachloride	12/4/2013	0.938	µg/L
TJ008	Carbon tetrachloride	2/5/2014	0.991	µg/L
TJ008	Chromium (Cr) Total, ICP/MS	4/3/2013	1.1	ug/L
TJ008	Chromium (Cr) Total, ICP/MS	1/8/2014	1.7	ug/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ008	Nitrate (as NO3) ,calculated IC value	8/7/2013	31.2	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	6/5/2013	31.5	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	5/8/2013	31.8	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	1/8/2014	31.8	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	7/3/2013	31.9	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	12/4/2013	32.2	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	9/4/2013	32.6	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	11/6/2013	32.9	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	4/3/2013	33.1	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	10/3/2013	34.7	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	2/5/2014	35.6	mg/L
TJ008	Nitrate (as NO3) ,calculated IC value	3/5/2014	38	mg/L
TJ008	Tetrachloroethylene (PCE)	5/8/2013	1.78	µg/L
TJ008	Tetrachloroethylene (PCE)	4/3/2013	1.88	µg/L
TJ008	Tetrachloroethylene (PCE)	6/5/2013	1.93	µg/L
TJ008	Tetrachloroethylene (PCE)	7/3/2013	2.07	µg/L
TJ008	Tetrachloroethylene (PCE)	8/7/2013	2.61	µg/L
TJ008	Tetrachloroethylene (PCE)	9/4/2013	2.87	µg/L
TJ008	Tetrachloroethylene (PCE)	10/3/2013	2.95	µg/L
TJ008	Tetrachloroethylene (PCE)	11/6/2013	5.32	µg/L
TJ008	Tetrachloroethylene (PCE)	3/5/2014	8.54	µg/L
TJ008	Tetrachloroethylene (PCE)	12/4/2013	9.86	µg/L
TJ008	Tetrachloroethylene (PCE)	1/8/2014	10.8	µg/L
TJ008	Tetrachloroethylene (PCE)	2/5/2014	13.2	µg/L
TJ008	Trichloroethene (TCE)	6/5/2013	7.11	µg/L
TJ008	Trichloroethene (TCE)	5/8/2013	7.71	µg/L
TJ008	Trichloroethene (TCE)	7/3/2013	7.98	µg/L
TJ008	Trichloroethene (TCE)	4/3/2013	8.47	µg/L
TJ008	Trichloroethene (TCE)	8/7/2013	8.69	µg/L
TJ008	Trichloroethene (TCE)	9/4/2013	9.11	µg/L
TJ008	Trichloroethene (TCE)	10/3/2013	9.17	µg/L
TJ008	Trichloroethene (TCE)	11/6/2013	14.8	µg/L
TJ008	Trichloroethene (TCE)	3/5/2014	19	µg/L
TJ008	Trichloroethene (TCE)	1/8/2014	19.6	µg/L
TJ008	Trichloroethene (TCE)	12/4/2013	21.1	µg/L
TJ008	Trichloroethene (TCE)	2/5/2014	22	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	11/7/2013	1.39	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	6/19/2013	1.54	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	12/3/2013	1.67	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	5/21/2013	1.71	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	7/10/2013	1.92	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	8/8/2013	1.96	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	2/6/2014	2.13	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	4/17/2013	2.3	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ009	1,1-Dichloroethene (1,1-DCE)	9/5/2013	2.3	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	1/9/2014	2.76	µg/L
TJ009	1,1-Dichloroethene (1,1-DCE)	10/16/2013	2.82	µg/L
TJ009	Nitrate (as NO3) ,calculated IC value	8/8/2013	27.7	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	6/19/2013	28.3	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	7/10/2013	28.9	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	9/5/2013	29.7	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	12/3/2013	29.7	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	1/9/2014	29.8	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	2/6/2014	30.5	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	5/21/2013	30.6	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	11/7/2013	31.1	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	4/17/2013	31.4	mg/L
TJ009	Nitrate (as NO3) ,calculated IC value	10/16/2013	33.3	mg/L
TJ009	Perchlorate	1/9/2014	2.03	µg/L
TJ009	Perchlorate	11/7/2013	2.43	µg/L
TJ009	Tetrachloroethylene (PCE)	6/19/2013	1.02	µg/L
TJ009	Tetrachloroethylene (PCE)	7/10/2013	1.09	µg/L
TJ009	Tetrachloroethylene (PCE)	5/21/2013	1.13	µg/L
TJ009	Tetrachloroethylene (PCE)	8/8/2013	1.14	µg/L
TJ009	Tetrachloroethylene (PCE)	9/5/2013	1.25	µg/L
TJ009	Tetrachloroethylene (PCE)	4/17/2013	1.33	µg/L
TJ009	Tetrachloroethylene (PCE)	10/16/2013	1.66	µg/L
TJ009	Tetrachloroethylene (PCE)	2/6/2014	1.76	µg/L
TJ009	Tetrachloroethylene (PCE)	11/7/2013	2.38	µg/L
TJ009	Tetrachloroethylene (PCE)	12/3/2013	4.1	µg/L
TJ009	Tetrachloroethylene (PCE)	1/9/2014	4.2	µg/L
TJ009	Trichloroethene (TCE)	6/19/2013	5.02	µg/L
TJ009	Trichloroethene (TCE)	8/8/2013	5.71	µg/L
TJ009	Trichloroethene (TCE)	7/10/2013	5.83	µg/L
TJ009	Trichloroethene (TCE)	5/21/2013	5.95	µg/L
TJ009	Trichloroethene (TCE)	9/5/2013	5.98	µg/L
TJ009	Trichloroethene (TCE)	10/16/2013	7.11	µg/L
TJ009	Trichloroethene (TCE)	4/17/2013	7.75	µg/L
TJ009	Trichloroethene (TCE)	2/6/2014	7.87	µg/L
TJ009	Trichloroethene (TCE)	11/7/2013	8.11	µg/L
TJ009	Trichloroethene (TCE)	12/3/2013	8.71	µg/L
TJ009	Trichloroethene (TCE)	1/9/2014	12	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	6/19/2013	0.729	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	5/21/2013	0.783	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	4/17/2013	0.833	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	7/10/2013	0.879	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	8/8/2013	1.04	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	2/6/2014	1.09	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ010	1,1-Dichloroethene (1,1-DCE)	11/7/2013	1.33	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	9/5/2013	1.36	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	3/6/2014	1.37	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	1/9/2014	1.43	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	12/3/2013	1.52	µg/L
TJ010	1,1-Dichloroethene (1,1-DCE)	10/16/2013	1.63	µg/L
TJ010	Nitrate (as NO3) ,calculated IC value	8/8/2013	27.3	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	6/19/2013	28.3	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	7/10/2013	28.8	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	9/5/2013	29.2	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	2/6/2014	29.7	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	5/21/2013	30.5	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	4/17/2013	30.7	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	10/16/2013	31.3	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	11/7/2013	31.3	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	1/9/2014	32.2	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	12/3/2013	32.8	mg/L
TJ010	Nitrate (as NO3) ,calculated IC value	3/6/2014	34.9	mg/L
TJ010	Perchlorate	9/5/2013	2.39	µg/L
TJ010	Perchlorate	11/7/2013	2.48	µg/L
TJ010	Perchlorate	10/16/2013	2.65	µg/L
TJ010	Perchlorate	2/6/2014	2.69	µg/L
TJ010	Perchlorate	8/8/2013	2.74	µg/L
TJ010	Perchlorate	7/10/2013	2.75	µg/L
TJ010	Perchlorate	12/3/2013	2.96	µg/L
TJ010	Perchlorate	5/21/2013	3.02	µg/L
TJ010	Perchlorate	1/9/2014	3.29	µg/L
TJ010	Perchlorate	4/17/2013	3.42	µg/L
TJ010	Perchlorate	6/19/2013	3.43	µg/L
TJ010	Perchlorate	3/6/2014	3.65	µg/L
TJ010	Tetrachloroethylene (PCE)	6/19/2013	1.16	µg/L
TJ010	Tetrachloroethylene (PCE)	7/10/2013	1.26	µg/L
TJ010	Tetrachloroethylene (PCE)	8/8/2013	1.28	µg/L
TJ010	Tetrachloroethylene (PCE)	5/21/2013	1.33	µg/L
TJ010	Tetrachloroethylene (PCE)	4/17/2013	1.47	µg/L
TJ010	Tetrachloroethylene (PCE)	9/5/2013	1.49	µg/L
TJ010	Tetrachloroethylene (PCE)	11/7/2013	1.71	µg/L
TJ010	Tetrachloroethylene (PCE)	10/16/2013	1.99	µg/L
TJ010	Tetrachloroethylene (PCE)	2/6/2014	1.99	µg/L
TJ010	Tetrachloroethylene (PCE)	3/6/2014	2.2	µg/L
TJ010	Tetrachloroethylene (PCE)	12/3/2013	2.21	µg/L
TJ010	Tetrachloroethylene (PCE)	1/9/2014	2.46	µg/L
TJ010	Trichloroethene (TCE)	6/19/2013	7.69	µg/L
TJ010	Trichloroethene (TCE)	8/8/2013	8.6	µg/L
TJ010	Trichloroethene (TCE)	7/10/2013	8.69	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ010	Trichloroethene (TCE)	5/21/2013	8.79	µg/L
TJ010	Trichloroethene (TCE)	9/5/2013	9.36	µg/L
TJ010	Trichloroethene (TCE)	11/7/2013	10.3	µg/L
TJ010	Trichloroethene (TCE)	4/17/2013	10.8	µg/L
TJ010	Trichloroethene (TCE)	10/16/2013	11.3	µg/L
TJ010	Trichloroethene (TCE)	2/6/2014	11.8	µg/L
TJ010	Trichloroethene (TCE)	12/3/2013	13	µg/L
TJ010	Trichloroethene (TCE)	3/6/2014	15	µg/L
TJ010	Trichloroethene (TCE)	1/9/2014	15.1	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	5/17/2013	0.898	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	6/18/2013	0.919	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	7/11/2013	1.06	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	8/21/2013	1.06	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	11/7/2013	1.12	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	10/16/2013	1.21	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	12/3/2013	1.24	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	9/5/2013	1.25	µg/L
TJ011	1,1-Dichloroethene (1,1-DCE)	1/9/2014	1.56	µg/L
TJ011	1,4-Dioxane	10/16/2013	1.02	ug/L
TJ011	1,4-Dioxane	1/9/2014	1.07	ug/L
TJ011	1,4-Dioxane	7/11/2013	1.09	ug/L
TJ011	Bromide ,Ion-Chromatography	6/18/2013	0.155	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	6/18/2013	26.1	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	7/11/2013	26.1	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	5/17/2013	26.3	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	11/7/2013	26.4	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	1/9/2014	26.5	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	12/3/2013	26.7	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	8/21/2013	26.8	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	9/5/2013	26.9	mg/L
TJ011	Nitrate (as NO3) ,calculated IC value	10/16/2013	27.8	mg/L
TJ011	Perchlorate	10/16/2013	3.91	µg/L
TJ011	Perchlorate	8/21/2013	3.96	µg/L
TJ011	Perchlorate	11/7/2013	3.96	µg/L
TJ011	Perchlorate	9/5/2013	4.04	µg/L
TJ011	Perchlorate	7/11/2013	4.3	µg/L
TJ011	Perchlorate	12/3/2013	4.33	µg/L
TJ011	Perchlorate	6/18/2013	4.51	µg/L
TJ011	Perchlorate	5/17/2013	4.73	µg/L
TJ011	Perchlorate	1/9/2014	4.81	µg/L
TJ011	Tetrachloroethylene (PCE)	6/18/2013	1.8	µg/L
TJ011	Tetrachloroethylene (PCE)	5/17/2013	1.84	µg/L
TJ011	Tetrachloroethylene (PCE)	7/11/2013	1.85	µg/L
TJ011	Tetrachloroethylene (PCE)	8/21/2013	1.98	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
TJ011	Tetrachloroethylene (PCE)	11/7/2013	2.04	µg/L
TJ011	Tetrachloroethylene (PCE)	9/5/2013	2.1	µg/L
TJ011	Tetrachloroethylene (PCE)	10/16/2013	2.18	µg/L
TJ011	Tetrachloroethylene (PCE)	12/3/2013	2.48	µg/L
TJ011	Tetrachloroethylene (PCE)	1/9/2014	2.64	µg/L
TJ011	Trichloroethene (TCE)	6/18/2013	12.8	µg/L
TJ011	Trichloroethene (TCE)	7/11/2013	13.5	µg/L
TJ011	Trichloroethene (TCE)	5/17/2013	13.6	µg/L
TJ011	Trichloroethene (TCE)	8/21/2013	13.8	µg/L
TJ011	Trichloroethene (TCE)	11/7/2013	13.8	µg/L
TJ011	Trichloroethene (TCE)	9/5/2013	14.2	µg/L
TJ011	Trichloroethene (TCE)	10/16/2013	15	µg/L
TJ011	Trichloroethene (TCE)	12/3/2013	15.9	µg/L
TJ011	Trichloroethene (TCE)	1/9/2014	17.5	µg/L
TJ012	Bromide ,Ion-Chromatography	7/11/2013	0.098	mg/L
TJ012	Bromide ,Ion-Chromatography	5/15/2013	0.105	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	2/6/2014	11	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	7/11/2013	11.1	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	4/30/2013	11.2	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	6/18/2013	11.2	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	11/7/2013	11.3	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	12/3/2013	11.3	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	5/15/2013	11.4	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	8/21/2013	11.7	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	10/3/2013	11.7	mg/L
TJ012	Nitrate (as NO3) ,calculated IC value	9/5/2013	11.8	mg/L
TJ012	Trichloroethene (TCE)	2/6/2014	0.873	µg/L
TJ012	Trichloroethene (TCE)	11/7/2013	2.09	µg/L
TJ012	Trichloroethene (TCE)	12/3/2013	2.1	µg/L
TJ012	Trichloroethene (TCE)	6/18/2013	2.24	µg/L
TJ012	Trichloroethene (TCE)	10/3/2013	2.35	µg/L
TJ012	Trichloroethene (TCE)	7/11/2013	2.37	µg/L
TJ012	Trichloroethene (TCE)	4/30/2013	2.5	µg/L
TJ012	Trichloroethene (TCE)	5/15/2013	2.51	µg/L
TJ012	Trichloroethene (TCE)	8/21/2013	2.6	µg/L
TJ012	Trichloroethene (TCE)	9/5/2013	2.71	µg/L
VE011	Bromide ,Ion-Chromatography	8/20/2013	0.325	mg/L
VE011	Carbon tetrachloride	8/20/2013	0.255	µg/L
VE011	Carbon tetrachloride	7/17/2013	0.26	µg/L
VE011	Carbon tetrachloride	1/30/2014	0.372	µg/L
VE011	Carbon tetrachloride	2/27/2014	0.377	µg/L
VE011	Carbon tetrachloride	3/27/2014	0.475	µg/L
VE011	Coliform Total (CL,QT2000) ,MM0-MUG	2/27/2014	66.3	NUM/100ml

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
VE011	Nitrate (as NO3) ,calculated IC value	5/14/2013	6.07	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	12/30/2013	7.62	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	11/27/2013	7.93	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	10/31/2013	8.51	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	7/17/2013	12	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	1/30/2014	12.3	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	9/26/2013	12.4	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	3/27/2014	12.4	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	8/20/2013	12.6	mg/L
VE011	Nitrate (as NO3) ,calculated IC value	2/27/2014	13.4	mg/L
VE011	Trichloroethene (TCE)	5/14/2013	0.964	µg/L
VE011	Trichloroethene (TCE)	12/30/2013	1.07	µg/L
VE011	Trichloroethene (TCE)	10/31/2013	1.08	µg/L
VE011	Trichloroethene (TCE)	11/27/2013	1.12	µg/L
VE011	Trichloroethene (TCE)	6/28/2013	1.43	µg/L
VE011	Trichloroethene (TCE)	7/17/2013	1.79	µg/L
VE011	Trichloroethene (TCE)	9/26/2013	1.96	µg/L
VE011	Trichloroethene (TCE)	8/20/2013	2.06	µg/L
VE011	Trichloroethene (TCE)	1/30/2014	3.29	µg/L
VE011	Trichloroethene (TCE)	2/27/2014	3.34	µg/L
VE011	Trichloroethene (TCE)	3/27/2014	3.41	µg/L
VE024	Bromide ,Ion-Chromatography	1/21/2014	0.731	mg/L
VE024	Nitrate (as NO3) ,calculated IC value	1/21/2014	4.61	mg/L
VE024	Nitrate (as NO3) ,calculated IC value	2/25/2014	4.92	mg/L
VE024	Nitrate (as NO3) ,calculated IC value	3/27/2014	4.96	mg/L
WH004	Coliform Total (CL,QT2000) ,MM0-MUG	4/18/2013	1	NUM/100ml
WH004	Nitrate (as NO3) ,calculated IC value	5/14/2013	8.02	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	1/28/2014	8.59	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	12/30/2013	8.77	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	3/27/2014	8.86	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	2/25/2014	8.95	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	11/27/2013	9.21	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	10/31/2013	9.92	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	7/16/2013	10.5	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	9/26/2013	10.9	mg/L
WH004	Nitrate (as NO3) ,calculated IC value	8/27/2013	11.1	mg/L
WH004	Tetrachloroethylene (PCE)	9/26/2013	1.94	µg/L
WH004	Tetrachloroethylene (PCE)	10/31/2013	1.94	µg/L
WH004	Tetrachloroethylene (PCE)	5/14/2013	2.1	µg/L
WH004	Tetrachloroethylene (PCE)	4/18/2013	2.11	µg/L
WH004	Tetrachloroethylene (PCE)	11/27/2013	2.11	µg/L
WH004	Tetrachloroethylene (PCE)	8/27/2013	2.15	µg/L
WH004	Tetrachloroethylene (PCE)	7/16/2013	2.19	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
WH004	Tetrachloroethylene (PCE)	2/25/2014	2.2	µg/L
WH004	Tetrachloroethylene (PCE)	12/30/2013	2.38	µg/L
WH004	Tetrachloroethylene (PCE)	6/28/2013	2.56	µg/L
WH004	Tetrachloroethylene (PCE)	1/28/2014	2.56	µg/L
WH004	Tetrachloroethylene (PCE)	3/27/2014	2.59	µg/L
WH004	Trichloroethene (TCE)	5/14/2013	0.927	µg/L
WH004	Trichloroethene (TCE)	4/18/2013	0.953	µg/L
WH004	Trichloroethene (TCE)	1/28/2014	1.57	µg/L
WH004	Trichloroethene (TCE)	12/30/2013	1.77	µg/L
WH004	Trichloroethene (TCE)	2/25/2014	1.86	µg/L
WH004	Trichloroethene (TCE)	3/27/2014	1.96	µg/L
WH004	Trichloroethene (TCE)	11/27/2013	2.04	µg/L
WH004	Trichloroethene (TCE)	6/28/2013	2.9	µg/L
WH004	Trichloroethene (TCE)	10/31/2013	3.01	µg/L
WH004	Trichloroethene (TCE)	7/16/2013	3.2	µg/L
WH004	Trichloroethene (TCE)	8/27/2013	4.26	µg/L
WH004	Trichloroethene (TCE)	9/26/2013	4.54	µg/L
WH005	Nitrate (as NO3) ,calculated IC value	3/27/2014	9.83	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	1/28/2014	9.88	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	2/25/2014	10	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	12/30/2013	10.3	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	5/14/2013	10.4	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	11/27/2013	10.9	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	10/31/2013	11.8	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	7/16/2013	13.9	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	9/26/2013	14.6	mg/L
WH005	Nitrate (as NO3) ,calculated IC value	8/27/2013	14.8	mg/L
WH005	Tetrachloroethylene (PCE)	2/25/2014	1.26	µg/L
WH005	Tetrachloroethylene (PCE)	3/27/2014	1.39	µg/L
WH005	Tetrachloroethylene (PCE)	1/28/2014	1.51	µg/L
WH005	Tetrachloroethylene (PCE)	12/30/2013	1.54	µg/L
WH005	Tetrachloroethylene (PCE)	10/31/2013	1.71	µg/L
WH005	Tetrachloroethylene (PCE)	11/27/2013	1.73	µg/L
WH005	Tetrachloroethylene (PCE)	5/14/2013	1.88	µg/L
WH005	Tetrachloroethylene (PCE)	4/18/2013	1.97	µg/L
WH005	Tetrachloroethylene (PCE)	7/16/2013	2.18	µg/L
WH005	Tetrachloroethylene (PCE)	6/28/2013	2.24	µg/L
WH005	Tetrachloroethylene (PCE)	9/26/2013	2.25	µg/L
WH005	Tetrachloroethylene (PCE)	8/27/2013	2.39	µg/L
WH005	Trichloroethene (TCE)	5/14/2013	1.21	µg/L
WH005	Trichloroethene (TCE)	4/18/2013	1.38	µg/L
WH005	Trichloroethene (TCE)	2/25/2014	2.35	µg/L
WH005	Trichloroethene (TCE)	3/27/2014	2.35	µg/L
WH005	Trichloroethene (TCE)	1/28/2014	2.87	µg/L

LOCCODE	ANALYTE	COLDATE	TestResult	RUNIT
WH005	Trichloroethene (TCE)	12/30/2013	3.34	µg/L
WH005	Trichloroethene (TCE)	6/28/2013	3.82	µg/L
WH005	Trichloroethene (TCE)	7/16/2013	3.91	µg/L
WH005	Trichloroethene (TCE)	11/27/2013	3.99	µg/L
WH005	Trichloroethene (TCE)	10/31/2013	4.43	µg/L
WH005	Trichloroethene (TCE)	9/26/2013	4.61	µg/L
WH005	Trichloroethene (TCE)	8/27/2013	4.8	µg/L
WH007	Nitrate (as NO3) ,calculated IC value	10/31/2013	2.65	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	12/30/2013	2.66	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	11/27/2013	2.68	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	1/28/2014	2.68	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	3/27/2014	2.69	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	2/27/2014	2.72	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	9/26/2013	2.78	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	5/14/2013	2.84	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	7/16/2013	8.06	mg/L
WH007	Nitrate (as NO3) ,calculated IC value	8/27/2013	9.83	mg/L
WH007	Tetrachloroethylene (PCE)	7/16/2013	1.59	µg/L
WH007	Tetrachloroethylene (PCE)	6/28/2013	1.6	µg/L
WH007	Trichloroethene (TCE)	8/27/2013	0.74	µg/L
WH007	Trichloroethene (TCE)	7/16/2013	2.79	µg/L
WH007	Trichloroethene (TCE)	6/28/2013	2.84	µg/L

APPENDIX B

CITY OF BURBANK

PUMPING AND SPREADING PLAN

2013-2018 Water Years

GROUNDWATER PUMPING

AND

SPREADING PLAN

FIVE WATER YEARS

OCTOBER 1, 2013 TO SEPTEMBER 30, 2018

BURBANK Water and Power Since 1913

WATER DIVISION

164 W. MAGNOLIA BOULEVARD

MAY 2014

Table of Contents

List of Tables

List of Figures

List of Appendices

SECTION 1: INTRODUCTION

The groundwater rights of the City of Burbank are defined by the Judgment in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et. al., Defendants". The Final Judgment (Judgment) was signed on January 26, 1979.

In 1993, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Section 2.9, Groundwater Quality Management. This addition was made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup of the ground water and limit the spread of contamination in the San Fernando basin. The 1998 revision of the Policies and Procedures now includes Section 5.0, Watermaster Management of Groundwater Quality. This report is in response to Section 5.4, Groundwater Pumping and Spreading Plan for the Upper Los Angeles River Area.

The annual Groundwater Pumping and Spreading Plan is based on the water year, October 1 to September 30, and it includes projections for five years beginning with the current water year. This Plan for Burbank will be submitted to the Watermaster in May 2014. The Watermaster will evaluate the impact of pumping and spreading by all the parties, and the ULARA Pumping and Spreading Plan compiled by the Watermaster will be released in July 2014.

Burbank's Plan was prepared by the Water Engineering and Planning Section of City of Burbank Water and Power. Questions may be addressed to Bob Doxsee, Civil Engineering Associate, at (818) 238-3500 or by e-mail to bdoxsee@ci.burbank.ca.us.

SECTION 2: WATER DEMAND

The annual total water demand for the last ten years and the projected annual water demand for the next five years are shown in Table 2.

Urgent requests for voluntary conservation began in 2007. With increasing public awareness of water supply issues, and to comply with new State legislation, the plan is for 20 percent reduction in per-capita potable water usage by 2020. That target was actually reached in Fiscal Year 2009/10, with some help from the weather. In the more recent dry years, it is not surprising that water demands were higher. Local supplies will be used as much as possible in order to reduce the demand on imported supplies from the Metropolitan Water District of Southern California (MWD). The projected water demand may vary significantly due to weather and/or economic conditions in the Burbank area; a variance of ±5% may be expected. A major expansion of the recycled system was completed in 2013, and demand on the potable water system will be offset by recycled water as additional site conversions are completed.

SECTION 3: WATER SUPPLY

The water supply for the City of Burbank is composed of purchased water from MWD, locally produced and treated groundwater, and recycled water from the Burbank Water Reclamation Plant. A discussion about each of the sources of supply is included below, and historic and projected use of each water source is shown in Table 3.

3.1 MWD

Burbank continues to directly rely on MWD for up to 70% of its water supply. Burbank purchases from MWD treated water for direct delivery to its distribution system and untreated water for basin replenishment. The City must purchase and spread water within the basin or purchase Physical Solution credits from the Los Angeles Department of Water and Power (LADWP) to operate its local groundwater wells. The economics determine which of these two options or what percentage of each Burbank will exercise in a given water year.

3.2 GAC Treatment Plant

Historically, the GAC Treatment Plant was normally operated during the summer season from May to October. The California Department of Public Health (CDPH) issued a draft Maximum Contaminant Level (MCL) for Chromium VI of 10 micrograms per liter in late 2013. This value will be adopted as final on July 1, 2014. Total chromium in the plant effluent is expected to exceed the new MCL and the GAC treatment process does not remove chromium, and facilities for blending are not available. Current plans are to keep the plant shut down, except for emergencies and water quality testing.

The GAC Treatment Plant treats the groundwater produced from Well No. 7 and Well No. 15 (Figure 3.1). The plant has a treatment capacity of 2,000 gallons per minute (gpm).

3.3 EPA Consent Decree Project

The EPA Consent Decree Project (also known as Burbank Operable Unit or BOU) became operational January 3, 1996. The source of groundwater for treatment at the BOU is Wells VO-1 through VO-8 (Figure 3.1) and the treatment plant has a capacity of 9,000 gpm. The Second Consent Decree was entered on June 22, 1998.

3.4 Recycled Water

A master plan for expansion of the recycled water system was completed in 2007 and updated in 2010. The plan detailed an expansion of the distribution system which is expected to ultimately deliver an additional 1,000 acre-feet per year (AFY) of recycled water. 625 AFY of this total will directly offset potable water deliveries. The remaining 375 AFY will offset groundwater pumped from the well at Valhalla Memorial Park (Valhalla). The distribution main construction is complete, and site conversions are in progress.

3.5 Production Wells

Burbank has eight wells that are part of the BOU collector system, plus another four wells which are mechanically and electrically operable, and two others which have had equipment removed. The eight BOU wells are on “Active” status, while all the others are on "Inactive" status with the California Department of Public Health (DPH). (See Table 1.) Except for water quality testing at Wells 7 and 15, Burbank does not plan to operate the inactive wells in WY 2013/14 unless an emergency develops. Well No. 7 produces 1,050 gpm and Well No. 15 produces 850 gpm to supply the GAC treatment plant.

TABLE 1

BWP’S WELL STATUS

Active Wells	Inactive Wells	Inactive-Pulled
VO-1	No. 6A	No. 11A
VO-2	No. 7	No. 12
VO-3	No. 13A	
VO-4	No. 15	
VO-5		
VO-6		
VO-7		
VO-8		

SECTION 4: GROUNDWATER CREDITS

The Judgment includes a number of procedures related to groundwater pumping that Burbank and the other defendants must follow. In order to pump groundwater, rights to groundwater must be established and in the San Fernando Basin, those rights are accounted for as groundwater credits. Rights and procedures related to establishing, counting and maintaining groundwater credits are discussed in the following paragraphs. Historic and projected future groundwater credits are shown in Table 4.

4.1 Import Return Water

Under the Judgment, Burbank is entitled to extract 20 percent of water it delivered (potable and recycled) in the prior water year. This is known as import return water. The import return water credited for WY 2013/14 (based on water delivered in WY 2012/13) is 4,096 AF.

Estimated import return water credit for the next water year, based on 21,553 AF of delivered water, will be 4,311 AF.

4.2 Physical Solution

Burbank has a Physical Solution right to 4,200 AFY in addition to its import return water extraction rights. This is a right to purchase up to 4,200 AFY of groundwater credits from the City of Los Angeles. The price paid to the City of Los Angeles for this groundwater is set by formula in the Judgment.

Depending on the price of MWD untreated imported water and Physical Solution water from the City of Los Angeles, a decision will be made each year regarding which to purchase. MWD untreated water is currently less expensive than Physical Solution water. Therefore, Burbank will not purchase Physical Solution water from the City of Los Angeles in WY 2013/14. The current plan reflects the spreading of imported water instead of the purchase of Physical Solution credits.

In the Judgment, Valhalla and Lockheed Martin have the right under the Physical Solution to pump up to 300 AFY and 25 AFY, respectively. Burbank will charge the Physical Solution right holders for groundwater they extracted and claim the extractions against Burbank's rights.

4.3 Stored Water Credit

Burbank has a stored water credit of 11,190 AF as of October 1, 2013. Burbank’s objective is to maintain a reserve of 10,000 AF of stored water credits. (See Appendix B.) Therefore, some combination of Physical Solution and/or spreading of imported water is necessary to avoid depleting the stored water credits.

4.4 Spreading Operations and Transfers of Credits

Burbank has purchased water for basin replenishment since 1989. The water was typically spread at the Pacoima Spreading Grounds by L.A. County Public Works Department with the assistance of the Los Angeles Department of Water and Power (LADWP). Beginning in WY 1994/95, Burbank exchanged with LADWP purchased imported water taken through MWD service connection LA-35 at the LADWP Treatment Plant for groundwater credits.

In 2010 Burbank completed a new service connection to MWD at the end of the Foothill Feeder. (See Figure 4.1.) The connection is capable of delivering 50 cubic feet per second (cfs) of untreated imported water to the Pacoima Wash, where the water is conveyed down to the Pacoima Spreading Grounds. Additionally, this service connection allows Burbank to direct water to the Lopez Spreading Grounds via the Lopez Ditch. These facilities allow Burbank to spread the 6,000 to 8,000 AFY of untreated water at the Pacoima Spreading Grounds that is needed to avoid depleting its stored groundwater credits.

Burbank received the first water delivery through the new connection on April 26, 2010. By agreement with MWD, Burbank will spread a minimum of 150 AF twice a year to maintain water quality at the end of the Foothill Feeder. After the MWD allocation ended, MWD water was available for a limited time at the lower replenishment rate, so Burbank spread as much water as possible in WY 2010/11. A total of 11,187 AF of imported water was delivered and spread at the Pacoima spreading grounds. The replenishment rate was not available after September 2011, but Burbank still spread 1,371 AF in WY 2011/12, 6,700 AF in WY 2012/13, and 7,000 AF in WY 2013/14 (through April 2014). For the remaining four water years covered by this plan, Burbank plans to purchase about 7,500 AF per year of Physical Solution credits, untreated imported water, or a combination of the two. (See Table 4.)

SECTION 5: CAPITAL IMPROVEMENTS

5.1 Wells

Burbank plans to continue the use of Wells No. 7 and No. 15 for the GAC Treatment Plant when it is operated. Wells V-01 through V-08 will continue to be operated to supply water to the BOU. No capital improvements are planned for any wells.

5.2 Groundwater Treatment Facilities

EPA Project: The EPA Consent Decree Project became fully operational on January 3, 1996. Burbank assumed responsibility for operation and maintenance of the BOU on March 12, 2001. Initially, the facility had difficulty in sustaining operation at the designed treatment rate of 9,000 gpm. Burbank, Lockheed-Martin, and the USEPA cooperated in efforts to determine the cause(s) of the reduced production. Over the past few years, several process enhancements and repairs were made to the liquid-phase GAC vessels and to the vapor-phase GAC vessels.

As part of the requirement to close the First Consent Decree, USEPA required Burbank to demonstrate that the BOU would operate at its design capacity. In the fall of 2010, Burbank successfully completed the performance test of the BOU by operating the facility at 9,000 gpm for 60-days.

The City of Burbank currently contracts with APTwater Services, LLC, for the day-to-day operation and maintenance of the BOU.

GAC Treatment Plant: The plant will remain on an active status, but will not be operated except for well water quality tests and for emergencies. No capital improvement projects are planned for the GAC Treatment Plant.

TABLE 2

ACTUAL AND PROJECTED WATER DEMAND

Water Year	Acre-Feet
2003/04	24,357
2004/05	21,790
2005/06	24,110
2006/07	25,745
2007/08	24,653
2008/09	22,532
2009/10	20,852
2010/11	19,735
2011/12	20,938
2012/13	20,937
2013/14*	21,978
2014/15*	21,752
2015/16*	21,727
2016/17*	21,667
2017/18*	21,603

* Projected

NOTES:

1) Water demand equals the total of MWD, extractions (GAC, Valley/BOU, Valhalla, and cleanup pumpers), and recycled.
2) The five-year average water demand was 20,999 AFY for WY 2008/09 through 2012/13.

TABLE 3

SOURCES OF SUPPLY

Water Year	MWD	GAC	BOU	Recycled	Valhalla	Total
2003/04	13,751	0	9,660	549	397	24,357
2004/05	14,415	0	6,399	681	295	21,790
2005/06	11,879	0	10,108	1,692	431	24,110
2006/07	13,444	0	9,780	2,082	431	25,737
2007/08	15,299	0	6,817	2,192	337	24,645
2008/09	10,202	148	9,818	2,011	346	22,525
2009/10	8,401	5	10,043	2,080	317	20,846
2010/11	7,376	4	10,394	1,568	387	19,729
2011/12	8,602	4	9,993	2,000	338	20,937
2012/13	7,507	0	11,387	1,608	435	20,937
2013/14*	8,717	0	10,583	2,278	400	21,978
2014/15*	7,354	0	11,634	2,764	0	21,752
2015/16*	7,241	0	11,634	2,852	0	21,727
2016/17*	7,128	0	11,634	2,905	0	21,667
2017/18*	7,034	0	11,634	2,935	0	21,603

*Projected

Notes:

1. Valhalla is expected to be using recycled water instead of groundwater by WY 2014/15.
2. GAC was used only for nonpotable use in the Magnolia Power Plant.
3. BOU includes small amounts of non-municipal use which is not included in the import return calculation.
4. Pumping for groundwater cleanup (about 8 AFY) is not included in this water supply table.

TABLE 4

GROUNDWATER CREDITS

Water Year	Physical Solution	Import Return	Spreading Operations	Other	Total
2003/04	0	4,847	0	44 (1)	4,891
2004/05	0	4,350	0	0	4,350
2005/06	0	4,817	0	0	4,817
2006/07	4,200	5,058	0	4,000 (2)	13,258
2007/08	4,200	4,855	0	0	9,055
2008/09	4,200	4,432	0	2,000 (3)	10,632
2009/10	0	4,103	34	0	4,137
2010/11	0	3,864	11,187	0	15,051
2011/12	0	4,117	1,371	0	5,488
2012/13	0	4,096	6,703	0	10,799
2013/14*	0	4,311	7,000	0	11,311
2014/15*	0	4,345	7,725	25 (4)	12,095
2015/16*	0	4,340	7,525	200 (4)	12,065
2016/17*	0	4,328	7,425	300 (4)	12,053
2017/18*	0	4,316	7,425	300 (4)	12,041

*Projected

Notes:

1. In WY 2003/04, 44 AF of stored water credit was transferred from Glendale to Burbank to compensate for April 2004 water transfer via system interconnection.
2. A 4,000 AF exchange of untreated MWD water for groundwater credits was arranged with LADWP for WY 2006/07.
3. A 2,000 AF exchange of untreated MWD water for groundwater credits was arranged with LADWP for WY 2008/09.
4. Beginning WY 2014/15, groundwater credits are expected from LADWP in exchange for recycled water delivered from Burbank to the LADWP system.

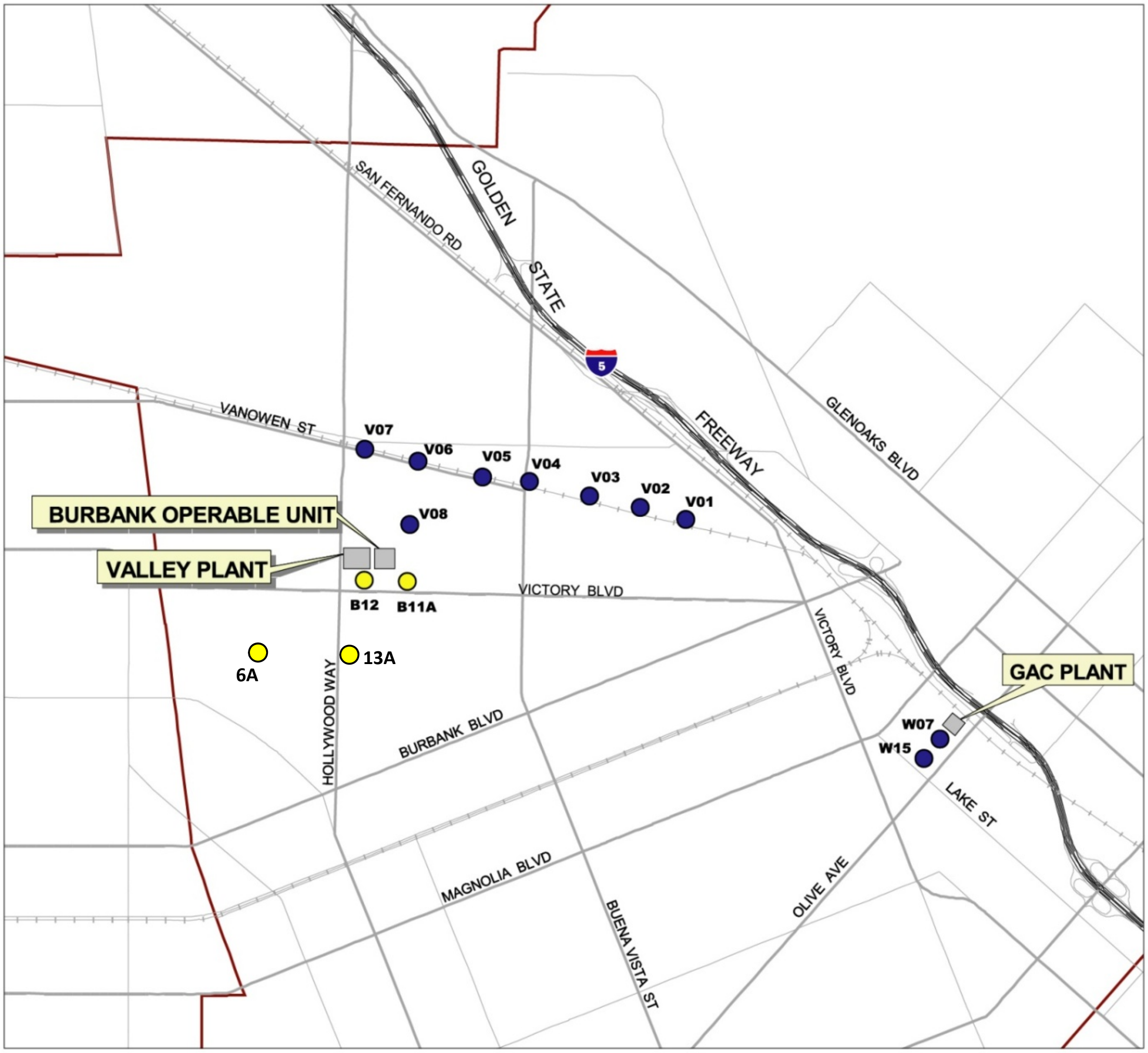


FIGURE 3.1

WELLS AND GROUNDWATER TREATMENT PLANTS

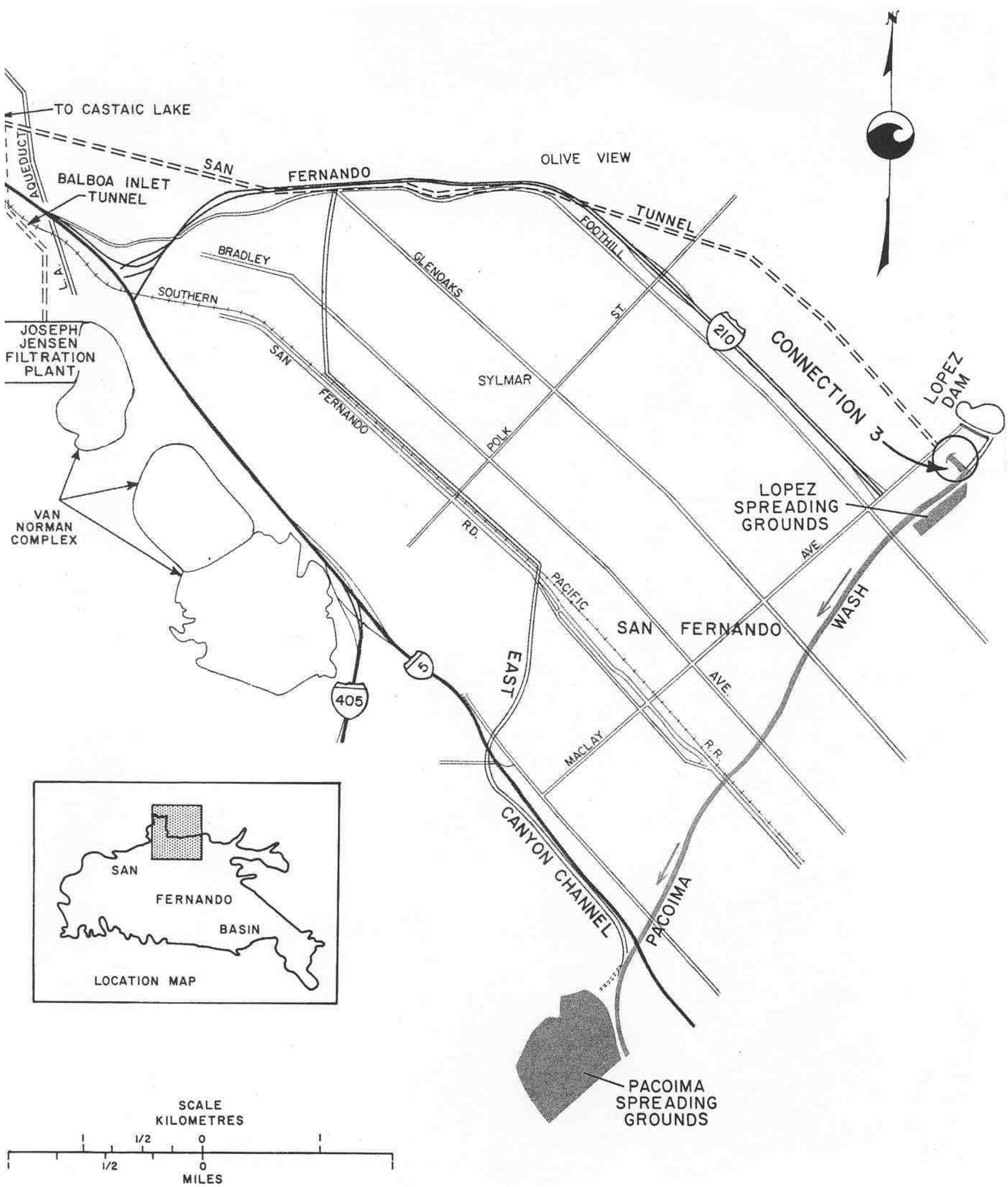


FIGURE 4.1

LOCATION OF MWD UNTREATED WATER CONNECTION

Appendix A

Water Treatment Facilities

LAKE STREET GAC TREATMENT PLANT

320 North Lake Street
Burbank CA 91502

OPERATOR:

City of Burbank
Burbank Water and Power, Water Division
Albert Lopez, Water Production/ Operations Superintendent

QUANTITY TREATED (10/1/12 through 9/30/13):

None

WATER QUALITY:

Contaminant VOC'S: TCE, PCE, 1,2-DCE, 1,2-DCA

DISPOSITION:

Magnolia Power Project
Non-potable Water

EPA CONSENT DECREE PROJECT – BURBANK OPERABLE UNIT

2030 North Hollywood Way
Burbank CA 91505

OPERATOR:

City of Burbank
Burbank Water and Power, Water Division
Albert Lopez, Water Production/ Operations Superintendent

QUANTITY TREATED (10/1/12 through 9/30/13):

11,387 AF

WATER QUALITY:

Contaminants: VOCs, Nitrate, Chromium, 1,2,3-TCP

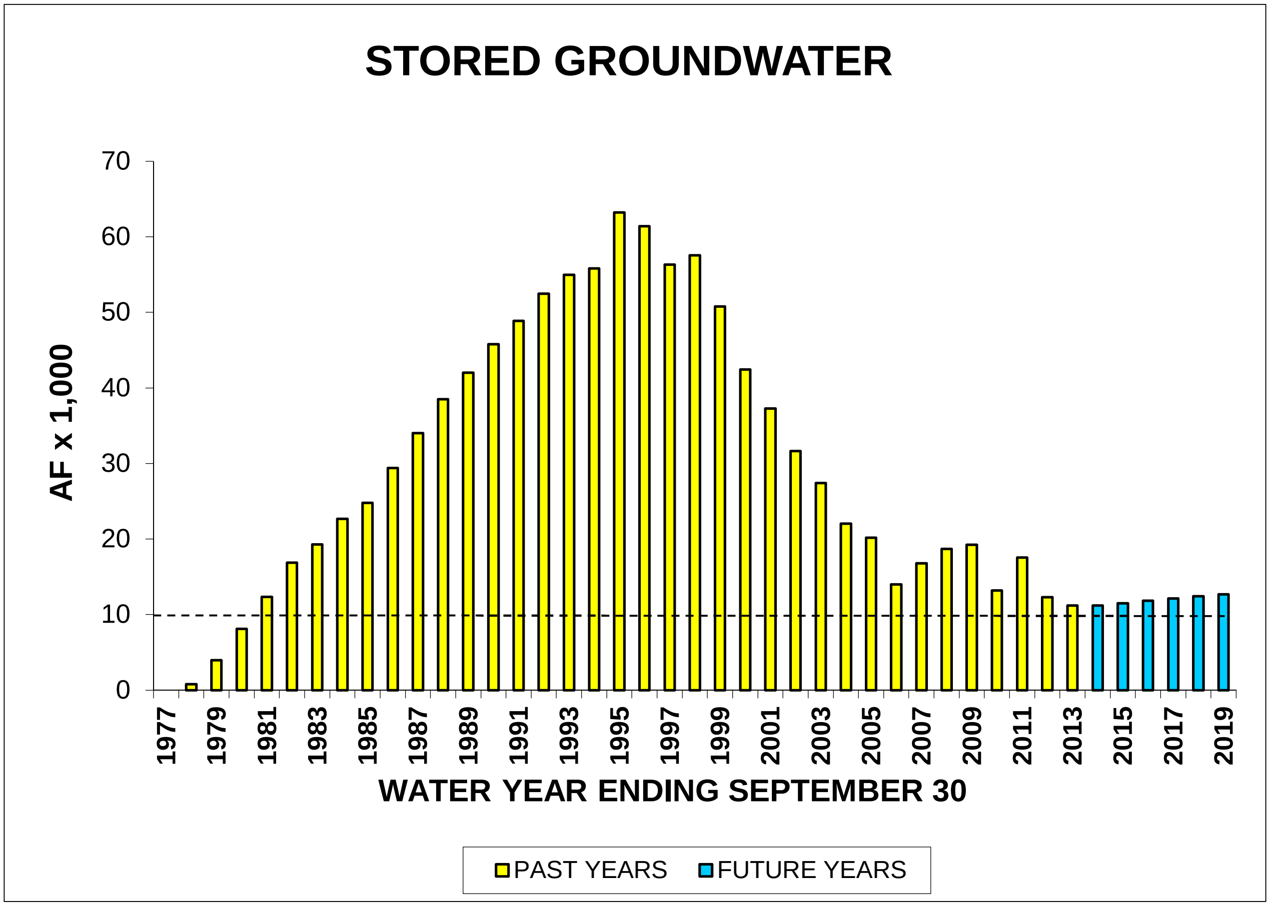
DISPOSITION:

1) Test Water- Waste
2) Operation Water (backwash, etc.) - Waste
3) Burbank Water System-(Potable water after blending)

Appendix B

Stored Groundwater

BURBANK WATER AND POWER
WATER DIVISION
WY 2012/13



NOTES:

- 10,000 AF RECOMMENDED AS BASIN BALANCE. THIS EQUATES TO ABOUT ONE YEAR OF DOMESTIC SYSTEM PRODUCTION IF REPLENISHMENT NOT AVAILABLE FROM MWD.
- STORED WATER IS REDUCED WHEN PRODUCTION EXCEEDS THE RETURN FLOW CREDIT (~4,200 AF) PLUS SPREAD WATER OR PHYSICAL SOLUTION CREDITS.
- SPREADING WATER OR GROUNDWATER CREDIT PURCHASES TO BE CONTINUED TO MAINTAIN BASIN BALANCE.

CITY OF BURBANK WATER AND POWER

WATER DIVISION

BURBANK'S STORED GROUNDWATER

WATER YEAR	DELIVERED WATER AF	RETURN FLOW CREDIT AF	SPREAD WATER AF	OTHER CREDITS AF	PUMPED GROUNDWATER AF	STORED WATER CREDIT AF
1976/77	22,743	4,549				
1977/78	22,513	4,503			3,767	(1) 782
1978/79	24,234	4,847			1,358	(2) 3,947
1979/80	24,184	4,837			677	8,117
1980/81	25,202	5,040			595	12,359
1981/82	22,120	4,424			523	16,876
1982/83	22,118	4,424			2,002	19,298
1983/84	24,927	4,985			1,063	22,659
1984/85	23,641	4,728			2,863	24,781
1985/86	23,180	4,636			123	29,386
1986/87	23,649	4,730			0	34,022
1987/88	23,712	4,742			253	38,498
1988/89	23,863	4,773			1,213	42,027
1989/90	23,053	4,611	378		1,401	45,777
1990/91	20,270	4,054	504		2,032	48,860
1991/92	20,930	4,186	503		938	52,479
1992/93	21,839	4,368	500		(3) 2,184	54,981
1993/94	24,566	4,913	0		(3) 3,539	55,810
1994/95	22,541	4,508	0	5,380	2,888	63,215
1995/96	23,124	4,625	0	2,000	8,308	61,415
1996/97	24,888	4,977	0	1,500	11,243	56,297
1997/98	22,447	4,489	0	0	3,731	57,543
1998/99	22,671	4,534	0	2,000	13,262	50,770
1999/2000	26,312	5,262	0	0	12,862	42,442
2000/01	25,619	5,124	0	0	10,440	37,264
2001/02	24,937	4,987	0	0	10,764	31,624
2002/03	23,108	4,622	0	300	9,483	27,428
2003/04	24,235	4,847	0	44	10,057	22,037
2004/05	21,749	4,350	0	0	6,694	20,190
2005/06	24,084	4,817	0	0	10,543	13,999
2006/07	25,288	5,058	0	8,200	10,220	16,796
2007/08	24,277	4,855	0	4,200	7,161	18,704
2008/09	22,160	4,432	0	6,200	10,319	19,246
2009/10	20,513	4,103	34	0	10,371	13,208
2010/11	19,322	3,864	11,187	0	10,791	17,530
2011/12	20,584	4,117	1,371	0	10,336	12,305
2012/13	20,480	4,096	6,703	0	11,822	11,190
2013/14	21,553	4,311	7,000	0	10,983	11,190
2014/15	21,727	4,345	7,725	25	11,634	11,500
2015/16	21,702	4,340	7,525	200	11,634	11,817
2016/17	21,642	4,328	7,425	300	11,634	12,126
2017/18	21,578	4,316	7,425	300	11,634	12,420
2018/19	21,500	4,300	7,425	300	11,634	12,699

NOTES:

(1) STORED WATER AS OF OCTOBER 1, 1978

(2) STORED WATER AS OF OCTOBER 1, 1979

(3) EXCLUDES 150 AF OF PUMPING FOR TESTING.

OTHER CREDITS INCLUDE PHYSICAL SOLUTION PURCHASES, IN-LIEU STORAGE,
AND OTHER TRANSFERS OF GROUNDWATER CREDITS

COLUMNS (1) THROUGH (6) - FROM ULARA WATERMASTER REPORTS

COLUMN (2) = 20% OF COL. (1)

PUMPED GROUNDWATER INCLUDES CITY, VALHALLA, LOCKHEED, DISNEY, MENASCO, HOME DEPOT

BEGINNING 2007-08, 1% IS DEDUCTED FROM THE STORED WATER AT THE END OF EACH YEAR.

SHADED AREAS OF TABLE ARE PROJECTED VALUES .

APPENDIX C

CITY OF GLENDALE

PUMPING AND SPREADING PLAN

2013-2018 Water Years

May 22, 2014

Mr. Richard C. Slade
ULARA Watermaster
Upper Los Angeles River Area
12750 Ventura Boulevard, Suite 202
Studio City, CA 91604

Subject: **Annual Pumping & Spreading Plan for 2013-2018 for City of Glendale**

Dear Mr. Slade,

Enclosed please find the annual Pumping and Spreading Plan for the City of Glendale for the Water Years 2013-2018. Glendale, as you know, does not have any spreading facilities. If you have any questions, please contact Mr. Leo Chan of my staff at (818) 548-3905.

Very truly yours,

Raja Takidin

Raja Takidin
Senior Civil Engineer

RT:lc
Enclosures

cc: Gregory R. Reed (LADWP)
Anthony Hicke (Richard C. Slade & Associates LLC)
Ramon Abueg (GWP)

CITY OF GLENDALE

GROUNDWATER PUMPING AND SPREADING PLAN

WATER YEARS 2013-2018

Prepared By

GLENDALE *WATER & POWER*

May 2014

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Introduction

This report discusses water supplies to the City of Glendale for Water Year 2013-14 and projections in local water resources available to meet future water demands and to reduce Glendale dependency on imported water. This information is used by the ULARA Watermaster and a wide group of individuals and organizations including Glendale's City Manager and Council Members, regulatory agencies and others interested in the future conditions of Glendale's water resources.

Executive Summary

Glendale receives its groundwater supply from San Fernando Groundwater Basin and Verdugo Groundwater Basin. Table 1 illustrates the actual (in bold letters) and projected pumping activities in the two basins between 2013-14 and 2018-19. Glendale currently does not have any spreading facility.

TABLE 1
ACTUAL & PROJECTED PUMPING ACTIVITIES IN WATER YEAR 2013-14 - 2018-19
(Acre Feet per Year)

Source	2013-14*	2014-15	2015-16	2016-17	2017-18	2018-19
San Fernando Basin						
Glendale OU	***7,509***	*7,300*	*7,300*	*7,300*	*7,300*	*7,300*
Forest Lawn Memorial Park	***400***	*400*	*400*	*400*	*400*	*400*
Grayson Power Plant	***24***	*36*	*36*	*36*	*36*	*36*
SF Basin Total	**7,933**	7,736	7,736	7,736	7,736	7,736
Verdugo Basin	**1,435**	2,197	3,178	3,178	3,178	3,178

** First half of the year was based on actual production data.*

Existing Water Sources and Supplies

The City of Glendale ("City") currently has four sources of water available to meet demands: groundwater from the San Fernando Basin and Verdugo Basin, imported water from the Metropolitan Water District ("Metropolitan") and recycled water from the Los Angeles/Glendale Water Reclamation Plant ("LAGWRP"). Each of these sources is described below. The entry points into the City water system for the various supplies are shown in Figure 1. Over the past forty-four (44) years, there have been changes in the mix of supplies used to meet water demands in the City. However in the future, minor changes are projected in Glendale's water supplies. These changes and sources are discussed below.

1. San Fernando Basin

The City's water right to San Fernando Basin supplies is defined by the judgment entitled "The City of Los Angeles vs. the City of San Fernando, et al." (1979) hereinafter referred to as the "Judgment"). The Judgment consists of a return flow credit, which is a type of water right based on the assumption that a percentage of water used in the City is returned to the groundwater basin. The City has a right to accumulate its return flow credits annually if its water rights are not used. In the water year of 2013-14, the City has a storage credit of 43,290 acre feet ("AF") within the basin. In addition, the Judgment contains rights for physical solution water. This is a right to produce water in excess of return flow credit and the accumulated credits, subject to a payment obligation to the City of Los Angeles based primarily on the cost of Metropolitan alternative supplies. This option to produce physical solution water in excess of the return flow credit and the accumulated credits is a significant factor in relation to the water production at the Glendale Water Treatment Plant ("GWTP"). The GWTP is part of a U.S. Environmental Protection Agency (EPA) Superfund clean-up project in Glendale. The project consists of a 5,250[(1)] gallon per minute (gpm) facility and eight wells that supply the plant. Further discussion regarding the GWTP can be found in the Section: *Past Water Use and Trend* on page 8 in this report. The various San Fernando Basin supplies are:

Return Flow Credit – Glendale is entitled to a return flow credit of twenty (20.0) percent of all City-delivered water, including recycled water, in the San Fernando Basin and its tributary hill and mountain area. A location map is shown in Figure 2 *(Source: 2011-12 Water Year ULARA Watermaster Report)*. This credit ranges from about 4,500 acre feet per year (AFY) to 5,400 AFY depending on actual water use. This is the City's primary water right in the San Fernando Basin.

Physical Solution Water – The City has an agreement to extract water over and above the return flow credit and accumulated credits, and it is chargeable against the rights of the City of Los Angeles upon payment of specified charges generally tied to Metropolitan's water rates. The City's physical solution right is 5,500 AFY.

Pumping for Groundwater Cleanup – Section 2.5 of the Upper Los Angeles River Area's ("ULARA") Policies and Procedures, dated July, 1993, provides for the extraction of basin water for SUPERFUND activities, subject to payment of specified charges similar to physical solution water. This right became a significant factor with the completion of the GWTP in 2000.

Carry-over extractions – In addition to current extractions of return flow water and stored water, Glendale may, in any one year, extract from the San Fernando Basin an amount not to exceed 10 percent of its last annual credit for import return water, subject to an obligation to replace such over-extraction by reduced extraction during the next water year. This provides important year-to-year flexibility in meeting water demands.

Footnote 1. California Department of Public Health (CDPH) approved to increase the overall treatment plant capacity from the original 5,000 gpm to 5,250 gpm in October 2008.

San Fernando Basin production has been limited in the past and was eventually eliminated for a time because of volatile organic compounds ("VOC") contamination of the groundwater. The entire San Fernando Valley is part of a U. S. Environmental Protection Agency ("EPA") Superfund cleanup program. Since the early 1990s, many water treatment plants had been constructed in the San Fernando Valley to remove VOC from the groundwater. EPA had focused on the construction of cleanup facilities in the City. The GWTP and eight extraction wells have been constructed to pump, treat and deliver water to the City via its Grandview Pumping Plant. Significant production from the basin and delivery to the City started in January 2002.

The cleanup facilities consist of seven shallow extraction wells and one deep well; the 5,250 gpm Glendale Water Treatment Plant to remove the VOC; piping to convey the untreated groundwater from the wells to the water treatment plant; a system to convey treated water from the treatment plant to the City's potable distribution system; a facility to blend the treated groundwater with water from Metropolitan, and a disinfection facility. A general layout of these facilities is shown in Figure 3.

In 2000, major agreements were signed between City of Glendale and Glendale Respondents Group (GRG), which represents forty-plus industries identified by the EPA as potentially responsible for the groundwater contamination, and the EPA. GRG retained CDM Consulting Engineers, Inc. to design, construct and operate the water treatment facilities required by the agreements. The California Department of Public Health ("CDPH") issued a permit for the City to operate the facilities in July 2000. The City started taking small quantities of water from this facility on July 23, 2001. The delivery of the water was initially limited because of the City's concern with taking water with higher chromium 6 levels than in the current water supply, even though such water met all water quality standards. In January 2002, the Glendale City Council authorized the City to start delivering 5,000 gpm from the treatment facility into the City's potable water system with a target to minimize the concentration of chromium 6 in the water. This source is expected to provide about 7,300 AFY to the City, which will meet about twenty-six percent (26%) of projected near-term water demands. There is additional groundwater production of 400 AFY by Forest Lawn Memorial Park for irrigation purposes, and about 36 AFY for use on the cooling tower and steam and gas combustion turbines at the Glendale Grayson Power Plant, for a total of approximately 7,736 AFY.

As noted above, the City can pump and treat more groundwater in times of imported water shortages based on accumulated pumping credits. The City, as of October 1, 2013, has 43,290 AF in accumulated pumping credits in the San Fernando Basin. In order to achieve 7,736 AF of San Fernando Basin production per year, Glendale must utilize its return flow credit of 5,500 AF per year and 2,236 AF of its accumulated pumping credits. Additional usage of accumulated groundwater credits could be used to meet unexpected demands or in cases of emergency. The usage of additional amounts of accumulated groundwater pumping credits was not considered in the supply-demand analysis of this Water Supply Evaluation, but rather would be in addition to the amounts of available water supplies detailed in that analysis. That these additional amounts of groundwater were not included in the supply-demand analysis further ensures that there are sufficient supplies to meet Plan demands.

2. Verdugo Basin

Historically, groundwater supplies from the Verdugo Basin contributed a small portion to the City's water supplies via five wells and an underground water infiltration system. The Judgment gave Glendale the right to extract 3,856 AFY from the Verdugo Basin. Crescenta Valley Water District also has water rights of 3,294 AFY and is the only other entity allowed to extract water from the Verdugo Basin.

Use of the Verdugo Basin supplies has been limited in the past due to water quality problems, groundwater levels, and limited extraction capacity. In order to increase the use of these supplies, the City completed construction of the Verdugo Park Water Treatment Plant ("VPWTP") in 1995. VPWTP treats water pumped from two low capacity wells, referred to as Verdugo Wells A & B, and from the water supplies in the Verdugo Pickup System, a subsurface horizontal infiltration system. The water is then pumped into the City's distribution system. The plant was originally designed to treat 1150 gpm, however, at VPWTP startup in July of 1995 the flow was 550 gpm and over the years, the production of VPWTP has slowly declined and last fiscal year (2012-13) was at approximately 350 gpm with 50 gpm from makeup water. . In 2011, the City completed the rehabilitation of the Foothill Well and the construction of the Rockhaven Well No. 1 in the Montrose area to increase its extraction capacity from the Verdugo Basin. The Rockhaven Well No. 1 is currently inactive. In 2013, the City completed the rehabilitation of the Glorietta Wells 3 & 4. The four active wells referred to as Glorietta Wells 3, 4 & 6 and Foothill Well and the VPWTP produce about 1,830 AFY in Water Year 2012-13 and account for about seven percent (7%) of Glendale's total potable water supply. The location of the VPWTP and existing wells are shown on Figure 1.

3. Metropolitan Water District of Southern California

The City relies on Metropolitan water supply to meet a majority of its current water supply requirements. For the five water years ended September 30, 2013, water deliveries from Metropolitan averaged 16 million gallons per day (approximately 17,983 acre feet per year), which constituted between sixty to seventy percent (60%-70%) of the City's total water supply. The City expects to continue reliance on Metropolitan sales of water to meet most of its future water supply requirements.

The following information regarding Metropolitan has been obtained from Metropolitan and sources that the City believes to be reliable, but the City takes no responsibility for the accuracy or completeness hereof. Additional information about Metropolitan may be obtained on Metropolitan's website at *www.mwdh2o.com*. No information contained on such website is incorporated herein by reference.

3.1. History and Background

The Metropolitan Water District of Southern California is a public agency organized in 1928 by a vote of the electorates of eleven (11) southern California cities which included the City of Glendale, under authority of the Metropolitan Water District Act (California Statutes 1927, Chapter 429, as reenacted in 1969 as Chapter 209, as amended, herein referred to as the

"Metropolitan Act"). The Metropolitan Act authorizes Metropolitan to levy property taxes within its service area; establish water rates; impose charges for water standby and service availability; incur general obligation bonded indebtedness and issue revenue bonds, notes and short-term revenue certificates; execute contracts; and exercise the power of eminent domain for the purpose of acquiring property. In addition, Metropolitan's Board of Directors ("Metropolitan's Board") is authorized to establish terms and conditions under which additional areas may be annexed to Metropolitan's service area.

Metropolitan's primary purpose is to provide a supplemental supply of water for domestic and municipal uses at wholesale rates to its member public agencies. The City is one of the 26 Metropolitan member public agencies. If additional water is available, such water may be sold for other beneficial uses. Metropolitan serves its member agencies as a water wholesaler and has no retail customers.

Metropolitan's charges for water sales and availability are fixed by Metropolitan's Board and are not subject to regulation by the California Public Utilities Commission or any other state or federal agency. Metropolitan imports water from two principal sources: northern California via the Edmund G. Brown California Aqueduct (the "California Aqueduct") of the State Water Project owned by the State of California and the Colorado River via the Colorado River Aqueduct owned by Metropolitan. Water deliveries through the Colorado River Aqueduct began in the early 1940's. This imported water supplemented the local water supplies of the original 13 southern California member cities. In 1972, to meet growing water demands in its service area, Metropolitan started receiving additional water supplies from the California Aqueduct. Metropolitan owns and operates the Colorado River Aqueduct and has a long-term contract for water from the State Water Project.

The locations of the California Aqueduct and Colorado River Aqueduct are shown in Figure 4. Metropolitan's service area also includes the southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the City of Oxnard on the north to the international boundary with Mexico border on the south, and it reaches seventy (70) miles inland from the coast. The total area served is nearly 5,200 square miles. The service area includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Metropolitan is currently composed of twenty-six (26) member agencies, including fourteen (14) cities, eleven (11) municipal water districts, and one (1) county water authority. Glendale is one of the fourteen member agency cities served by Metropolitan.

3.2. State Water Project

One of Metropolitan's two major sources of water is the State Water Project, which is owned by the State and operated by the State Department of Water Resources ("DWR"). The State Water Project (SWP) transports water from San Francisco Bay/Sacramento-San Joaquin River Delta ("Bay-Delta") south via the California Aqueduct to Metropolitan. The total length of the California Aqueduct is approximately 444 miles. The State Water Contract, under a 100 percent allocation, provides Metropolitan 1,911,500 acre feet of water per year. Water received from the SWP by Metropolitan from 2002 through 2013, including water from water transfer, groundwater banking and exchange programs delivered through the California Aqueduct, varied from a low of 908,000 acre feet in calendar year 2009 to a high of

1,800,000 acre feet in 2004. For Fiscal Year 2012-13, Metropolitan managed 1,499,312 AF of supplies through the SWP system.

At the start of Fiscal Year 2012-13, Metropolitan had a 65 percent State Water Project allocation, primarily due to a wet March, with 228 percent of normal precipitation throughout the SWP, followed by April with above-normal precipitation. In addition, Metropolitan had 4,000 AF of Turnback Pool supplies, 50,000 AF of Article 21 water, and 900,000 AF of net Colorado River Aqueduct supplies. By the end of calendar year 2012, it had increased storage by approximately 360,000 AF, bring its total dry-year storage reserves to 2.7 million AF. However, due to the low precipitation during the second half of the fiscal year, the final SWP allocation for 2013 was at 35 percent. *(Source: MWDSC Annual Report 2013)*

3.3. Colorado River Aqueduct

Metropolitan has a legal entitlement to receive water from the Colorado River under a permanent service contract with the Secretary of the Interior. Water from the Colorado River or its tributaries is also available to other users in California, as well as users in the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, resulting in both competition and the need for cooperation among these holders of Colorado River entitlements. The Colorado River Aqueduct, which is owned and operated by Metropolitan, transports water from the Colorado River approximately 242 miles to its terminus at Lake Mathews in Riverside County.

Historically, Metropolitan had been able to take full advantage of the availability of surplus water and apportioned but unused water. However, other users increased their use of water from the Colorado River beginning in 1998. Although use of water is expected to fluctuate annually, this trend is projected to continue in the future. In addition, severe droughts in the Colorado River Basin have reduced water supplies.

During Fiscal Year 2012-13, no surplus was available to Metropolitan, and California was limited to its basic appointment of 4.4 million AF. Metropolitan conveyed 767,622 AF in its Colorado River Aqueduct during this fiscal year. *(Source: MWDSC Annual Report 2013)*

3.4. Metropolitan's Services to Glendale

Glendale receives Metropolitan water through three (3) service connections as shown on Figure 1. The service connection number and capacity are summarized in Table 2 below. In total, Metropolitan has a total delivery capacity of seventy-eight (78) cubic feet-per-second (cfs). During hot summer days, it is common for Glendale to utilize the full capacity of the facilities. Any significant increase in demands on Metropolitan could require another service connection.

TABLE 2
METROPOLITAN CONNECTIONS AND CAPACITY

Service Connection Number	Capacity (cfs)
G-1	48
G-2	10
G-3	20

Over the years, Metropolitan has provided high level of reliability in meeting Glendale's supplemental water supply needs. It is believed that the reliability of water supply to the City will continue in the future as a result of the many water resource programs under way and the proposed future programs now being considered based on Metropolitan's Integrated Water Resources Plan (IRP) and the Water Shortage and Drought Management Plan (WSDM). This source will always be a major factor in meeting the water needs of the City. The City closely follows the planning activities at Metropolitan to assure that it has adequate supplies to meet the needs of its member agencies.

4. Recycled Water

The City of Glendale has been delivering recycled water from the LAGWRP since the late 1970's. This is a twenty (20) million gallon-per-day (MGD) facility owned by the Cities of Los Angeles and Glendale. Based on a 1970 contract between the Cities of Los Angeles and Glendale, Glendale is entitled to fifty percent (50%) of any effluent produced at the plant, which is more than sufficient to for all recycled water use within City of Glendale. Treated wastewater that is not used in either the Glendale or Los Angeles system is discharged to the Los Angeles River and eventually reaches the ocean.

In the 1990's Glendale Water Department began to require all new high-rise buildings (4-story or higher) to install dual-plumbing system within the Glendale Downtown area. Recycled water customers are solely responsible for funding and installing the connectors from the recycled water pipeline in the public streets to the customer's property, and for all on-site facilities to distribute recycled water to the ultimate use. The main recycled water distribution pipelines and existing recycled water facilities are shown in more detail in Figure 5.

Currently, Glendale has a total of fifty-one (51) recycled water users. These include a landfill, two golf courses, two memorial parks, six schools, seven recreation parks, and other irrigation areas. Also, three (3) high-rise buildings, Glendale Police Headquarter, the Disney Complex on Flower Street, and the new buildings at Glendale Community College are dual-plumbed to use recycled water for sanitary flushing purposes when facilities are in place to provide the water (Figure 6). In water year 2012-2013, no new account was added to the recycled water system. Figure 7 provides a general idea of the scope of the expansion program. The amount of potable water purchased from Metropolitan is expected to have a corresponding reduction.

5. Summary of Local Supplies

The current use of local groundwater resources available to the City is substantially less than its rights because of water quality and extraction problems. A general summary of the City's rights to local water resources compared to the amount currently being used is shown on Table 3.

TABLE 3
LOCAL WATER PROJECTS AND USE (AFY)

Potential Source	Right	Current Use	Future Use
San Fernando Basin	4,500 - 5,400	7,933	7,736
Verdugo Basin	3,856	1,435	3,178
Recycled Water	10,000	1,700	1,785*

** Reference: Urban Water Management Plan Table 5-2*

Past Water Use and Trends

Historically, the City used groundwater to meet a varying portion of its water demand. In the 1940s and 1950s essentially all of the City's water needs were obtained from the San Fernando and the Verdugo Basins with limited supplies from Metropolitan. In the 1960's, production from the San Fernando Basin reached a peak of about 17,000 AFY. The Grandview well water collection system in the San Fernando Basin and the Grandview Pumping Plant originally pumped a peak capacity of about 24,000 gpm (34.6 MGD) from San Fernando Basin directly into Glendale's potable water system.

In the mid-1970s, Glendale limited production from the San Fernando Basin to about 12,000 AFY as part of a court decree arising from a Water Rights lawsuit by the City of Los Angeles. In 1975, the California Supreme Court issued the Judgment in City of Los Angeles vs. City of San Fernando which further limited Glendale's production right. The current right is about 5,500 AFY based on a Return Flow Credit right from water use in Glendale, with certain additional rights as described above.

Other limitations to groundwater use occurred in the late 1970s, when production from the Verdugo pick-up system in the Verdugo Basin was discontinued because of water quality problems.

In late 1979, Assembly Bill 1803 required that all water agencies using groundwater must conduct tests for the presence of certain industrial solvents. The tests indicated that VOC such as trichlorethylene and perchloroethylene were present in the San Fernando Basin groundwater supplies in concentrations exceeding State Department of Health Services' maximum contaminant levels. Both chemicals were used extensively in the past as degreasers in manufacturing industries.

At that time, the presence and hazards to the water supplies were identified. As a result, Glendale had to further limit its use of San Fernando Basin supplies. From 1980 to 1992, Glendale reduced production; and from 1992 to 2000, Glendale totally suspended production from the basin because of the presence of VOC. During the twenty year period of reduced production, Glendale was allowed to accumulate the groundwater storage credits that could be used in the future. Glendale's storage account balance was 43,290 AF as of October 1, 2013.

The water quality problems in the San Fernando Basin and groundwater levels in the Verdugo Basin have impacted the ability of Glendale to produce water from these Basins. Glendale was able to better utilize its rights to the San Fernando Basin water supplies accumulated for many years started in 2000. The EPA has designated several locations in the San Fernando Basin as Superfund sites and required construction of cleanup treatment facilities by the industry group responsible for the contamination. The Glendale cleanup project – Glendale Operable Unit (GOU) is the last in a series of EPA-required cleanup facilities and is now complete.

The GOU is comprised of a treatment plant (the GWTP), eight (8) groundwater extraction wells, a pumping plant, a disinfection facility, and associated piping. The facility was designed to treat groundwater contaminated by TCE and PCE at a combined rate of 5,000(1) gpm using aeration and granulated activated carbon (GAC). The treated water is then blended with imported supplies to control nitrate concentrations. In December 2000, the City started operating the GOU. But due to the chromium 6 issue, only a small quantity was initially pumped and delivered. Full operation started on January 6, 2002.

The wells were being pumped and blended in a manner to limit hexavalent chromium concentrations to achieve the City's target of 5 µg/L. The City has been managing a major research effort on identifying viable treatment technologies for the removal of hexavalent chromium from its pumped groundwater. In 2010, the City constructed the Weak Base Anion (WBA) Chromium Removal facility to remove hexavalent chromium from groundwater produced by GOU Well GS-3 using WBA exchange technology. The City also constructed a 100-gpm demonstration scale facility next to the Glendale Water Treatment Plant; this plant uses reduction, coagulation and filtration (RCF) technology with microfiltration as an enhancement. These facilities have been effective in removing hexavalent chromium in the groundwater to concentration below 5 µg/L.

In the Verdugo Basin, Glendale currently has six (6) active production wells and a pick-up system (infiltration galleries), along with the VPWTP. The lower water levels have significantly reduced supplies for this source, and accordingly, the City has reduced its projections of supply from this source as well. Due to the low production from the Verdugo Wells A & B, the two wells and the VPWTP have been shut down since October 2013.

Footnote 1. California Department of Public Health (CDPH) approved to increase the overall treatment plant capacity from the original 5,000 gpm to 5,250 gpm in October 2008.

Glendale's Ability To Meet Demands

Reliability of water supplies is a key goal in the operation of Glendale's water distribution system. In Water Year 2012-13 Glendale imported approximately 70 percent of its potable water supply from Metropolitan. Consequently, the reliability of Metropolitan water supplies to meet Glendale water needs as well as the needs of its other twenty-five member agencies becomes exceptionally crucial. For Glendale, Metropolitan is the supplier of "last resort" in meeting the needs of our citizens.

Future Goals

The City has been expanding the use of its local water supplies with operation of the GWTP and increase groundwater extraction of Verdugo Basin. To maintain the reliability of the GWTP water supply, the City has continued to pursue an aggressive research program to identify viable treatment technologies for the removal of hexavalent chromium from the pumped groundwater. Two chromium research studies – the RCF Enhancement Study and AquaNano Resin Study funded by the MWD Foundational Actions Funding Program and the California Prop 50, respectively, will be conducted in the year 2014.

The City will also be working with the CDPH and the GRG to install a chromium treatment facility at GWTP in dealing with hexavalent chromium at the GN-3 Well.

The City's Water Department (GWP) has been actively trying to increase groundwater production in the Verdugo Basin by rehabilitating the Foothill Well and constructing the Rockhaven Well within the basin. The Foothill Well Rehabilitation Project was completed in January 2011 and began operation on May 18, 2011. The new Rockhaven Well No. 1 was drilled and constructed in April 2011. GWP is currently evaluating options to treat and convey the groundwater from the Rockhaven Well. In 2013, GWP rehabilitated Glorietta Wells 3 & 4. Due to the declined water level of the Verdugo Basin and conditions of the existing well, the groundwater productions have significantly reduced from these wells. GWP has scheduled to rehabilitated Glorietta Well 6 and Verdugo Wells A & B in the fiscal year 2014-15. Verdugo Wells A & B along with the VPWTP were taken offline until rehabilitation is complete.

The City also encourages the recycled water use by adding new users and expanding the marketing efforts in the City and to neighboring agencies. The City is committed to aggressively advocate the use of recycled water for irrigation & toilet flushing, which will help increased the conservation of potable water and reduced the dependency on imported supplies. GWP is currently working with Glendale Public Works to extend recycled water pipeline to its service yard and with LADWP to provide recycled water for the Bette Davis Park.

In water year 2012-2013, the City imported 70% of the total water used from the Metropolitan, which was 5% higher than projected, to compensate the reduction of local water supply during the Glorietta Wells 3 & 4 rehabilitation. With three additional well rehabilitations underway in 2014, it is the goal of the City's Water Department to maintain the City's water purchase from Metropolitan less than seventy percent (70%) of the total water use in the next year.

FIGURES

FIGURE 1

CITY OF GLENDALE WATER DEPARTMENT

SOURCES OF SUPPLY

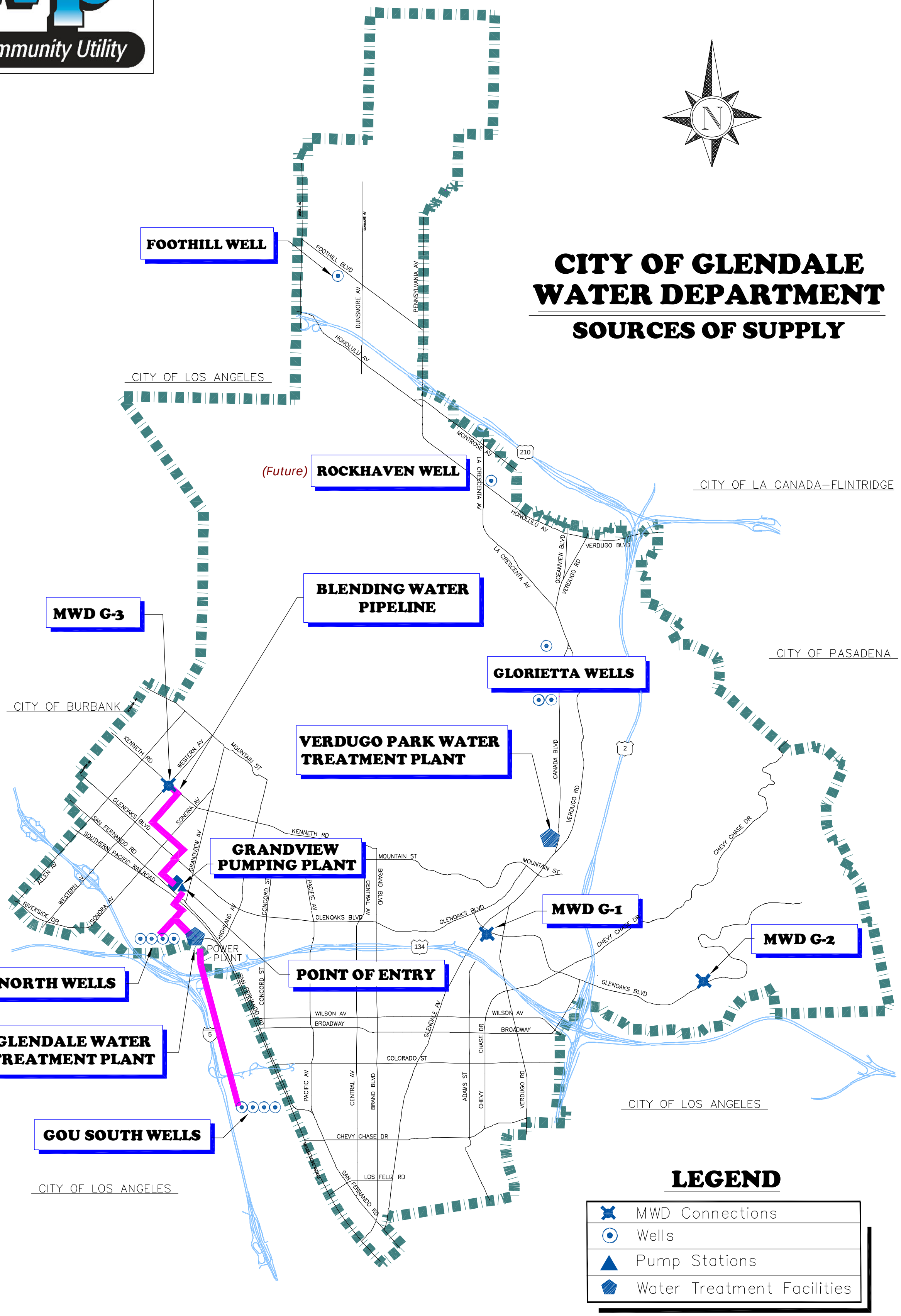
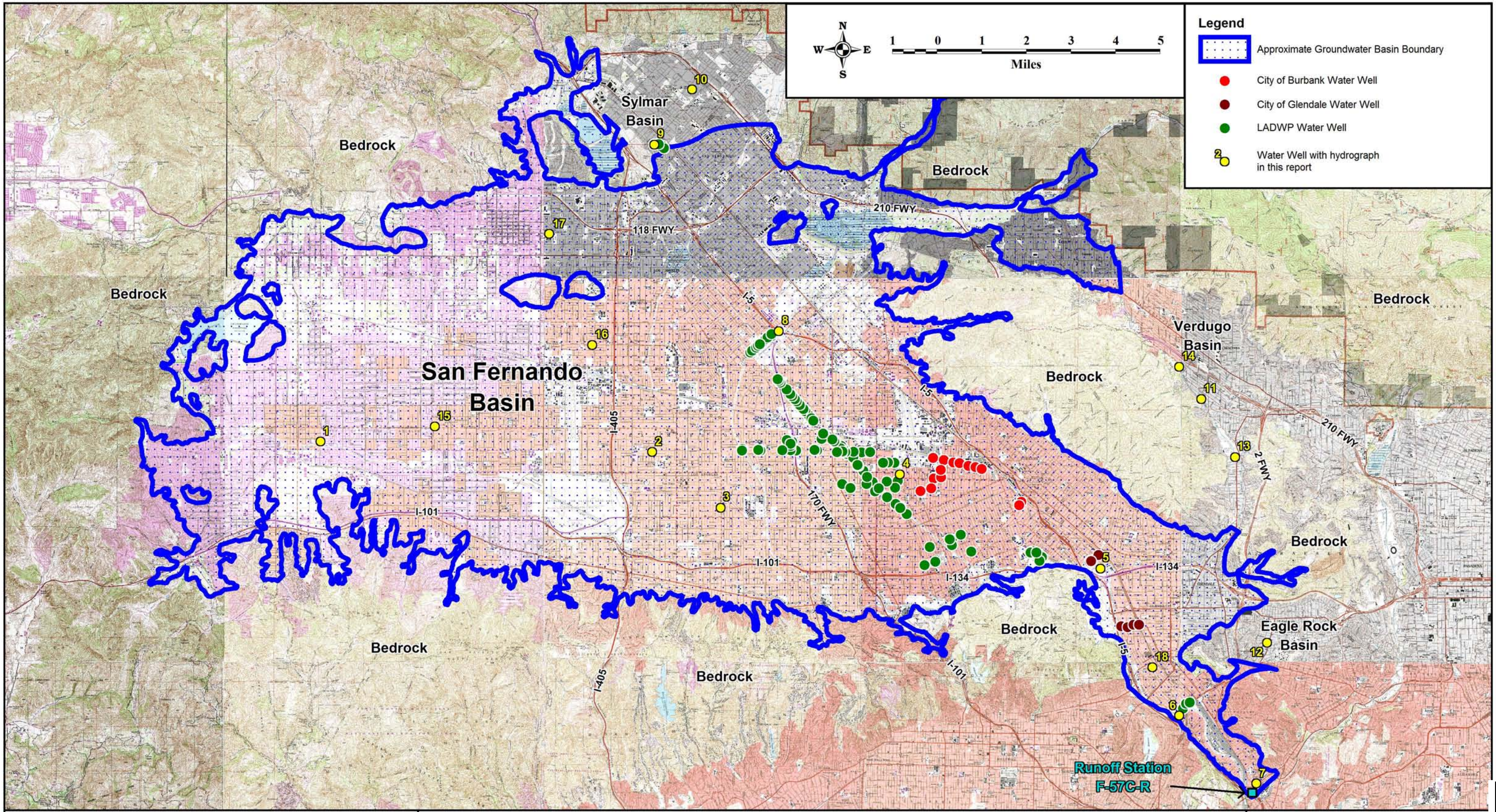


FIGURE 2



2011-2012 Water Year ULARA Wastermaster Report	Upper Los Angeles River Area: San Fernando Groundwater Basin	PLATE 1A

FIGURE 3

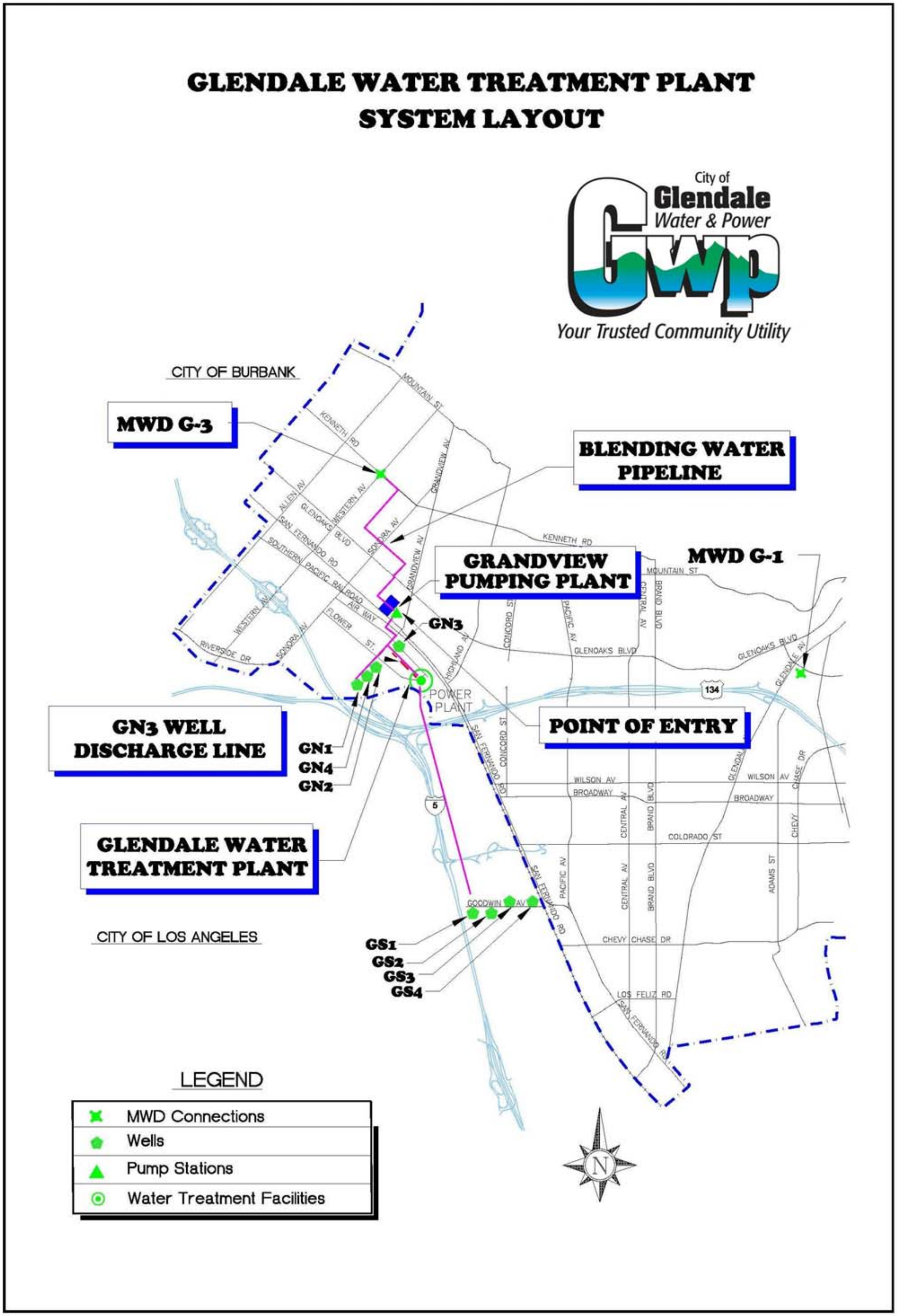

GLENDALE WATER TREATMENT PLANT
SYSTEM LAYOUT
City of
Glendale
Water & Power
Your Trusted Community Utility
CITY OF BURBANK
MWD G-3
BLENDING WATER PIPELINE
GRANDVIEW PUMPING PLANT
MWD G-1
GN3
POWER PLANT
GN3 WELL DISCHARGE LINE
GN1
GN4
GN2
POINT OF ENTRY
GLENDALE WATER TREATMENT PLANT
CITY OF LOS ANGELES
GS1
GS2
GS3
GS4
MOUNTAIN ST
KENNETH RD
GRANDVIEW AV
WESTERN AV
ALLEN AV
GLENOAKS BLVD
SONORA AV
SAN FERNANDO RD
SOUTHERN PACIFIC RAILROAD
AIR WAY
FLOWER ST
RIVERSIDE DR
HIGHLAND AV
CONCORD ST
PACIFIC AV
CENTRAL AV
BRAND BLVD
GLENOAKS BLVD
GLENDALE AV
134
5
WILSON AV
BROADWAY
COLORADO ST
CHASE DR
CHEVY
ADAMS ST
GOODWIN AV
CHEVY CHASE DR
LOS FELIZ RD
N
LEGEND
MWD Connections
Wells
Pump Stations
Water Treatment Facilities

FIGURE 4

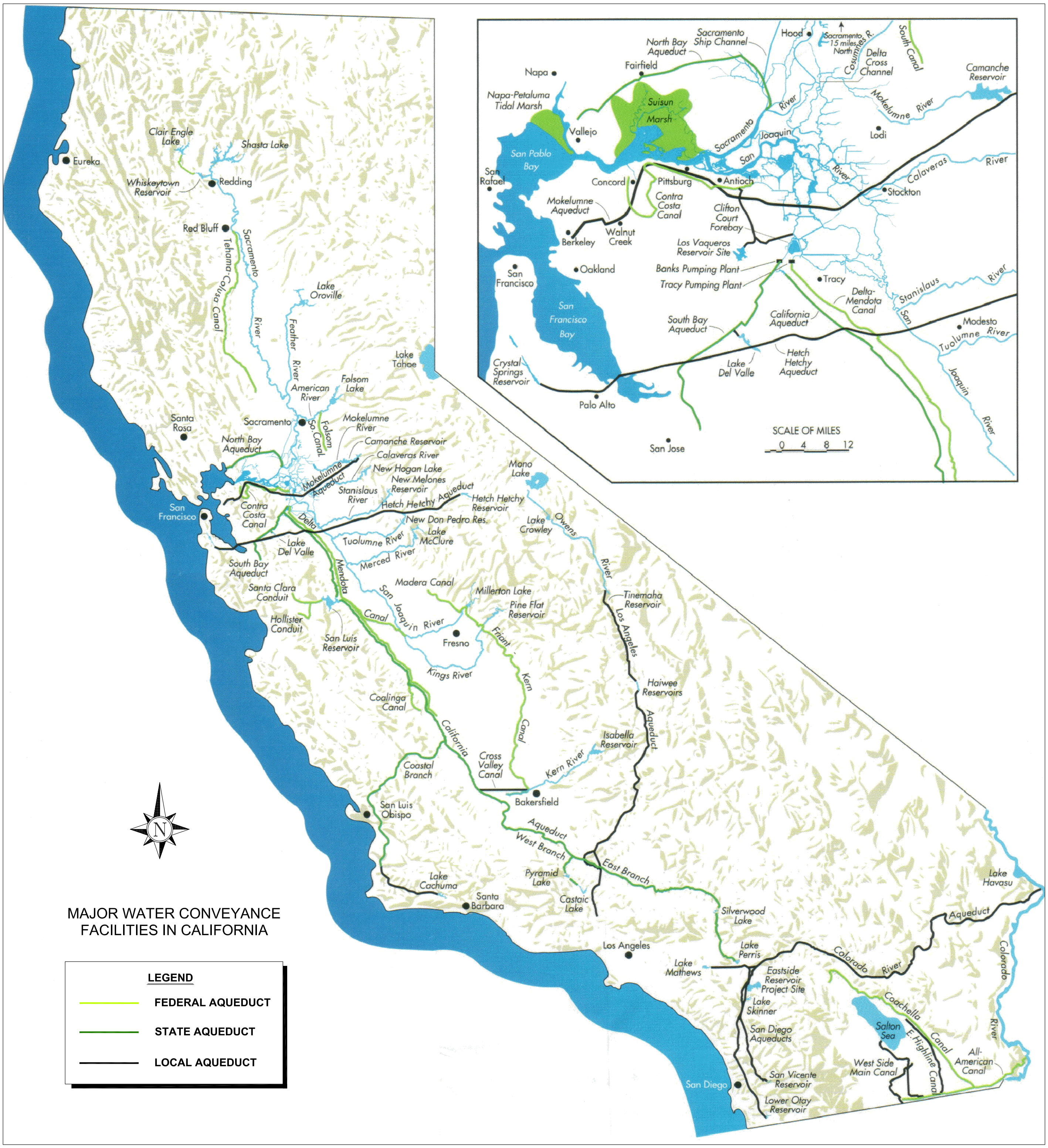

MAJOR WATER CONVEYANCE FACILITIES IN CALIFORNIA
LEGEND
FEDERAL AQUEDUCT
STATE AQUEDUCT
LOCAL AQUEDUCT
SCALE OF MILES
0 4 8 12

FIGURE 5

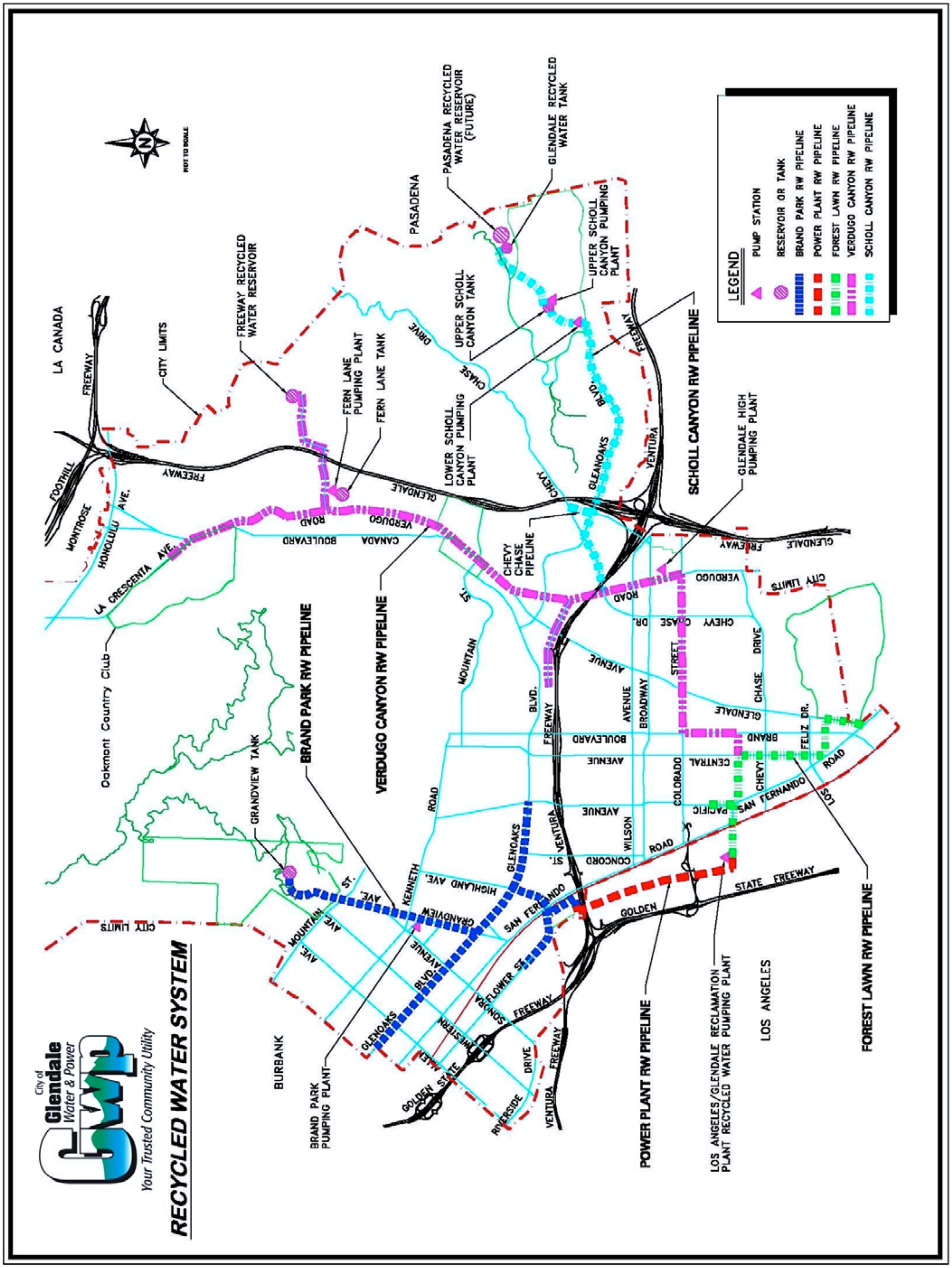

City of Glendale Water & Power
GWP
Your Trusted Community Utility
RECYCLED WATER SYSTEM
LEGEND
PUMP STATION
RESERVOIR OR TANK
BRAND PARK RW PIPELINE
POWER PLANT RW PIPELINE
FOREST LAWN RW PIPELINE
VERDUGO CANYON RW PIPELINE
SCHOLL CANYON RW PIPELINE
NOT TO SCALE
BRAND PARK RW PIPELINE
VERDUGO CANYON RW PIPELINE
SCHOLL CANYON RW PIPELINE
POWER PLANT RW PIPELINE
FOREST LAWN RW PIPELINE
BRAND PARK PUMPING PLANT
GRANDVIEW TANK
Oakmont Country Club
FREEWAY RECYCLED WATER RESERVOIR
FERN LANE PUMPING PLANT
FERN LANE TANK
UPPER SCHOLL CANYON TANK
LOWER SCHOLL CANYON PUMPING PLANT
UPPER SCHOLL CANYON PUMPING PLANT
PASADENA RECYCLED WATER RESERVOIR (FUTURE)
GLENDALE RECYCLED WATER TANK
CHEVY CHASE PIPELINE
GLENDALE HIGH PUMPING PLANT
LOS ANGELES/GLENDALE RECLAMATION PLANT RECYCLED WATER PUMPING PLANT
BURBANK
LA CANADA
PASADENA
LOS ANGELES
CITY LIMITS

FIGURE 6

CITY OF GLENDALE

Recycled Water Account Information

NO.	PROJECT NAME	ADDRESS	ACCOUNT NUMBER	NO. OF METER	DELIVERY DATE	TYPE OF USE
		FOREST LAWN PROJECT (A - 1)				
1	City of Glendale	1600 S Brand Boulevard	20241950-00	1	1995	Irrigation
2	Forest Lawn Memorial Park	1712 S Glendale Avenue	31192010-00	1	1992	Irrigation
2	Forest Lawn Memorial Park	3690 San Fernando Road	50009222-00	1	1992	Irrigation
3	Silver Crest Homes	316 W Windsor Road	50001202-00	1	2000	Irrigation
4	Cerritos Elementary School	120 E Cerritos Avenue	50006840-00	1	2006	Irrigation
4	Cerritos Elementary School	1715 S Glendale Avenue	50008277-00	1	2006	Irrigation
5	Cerritos School Park	3690 San Fernando Road	50008056-00	1	2007	Irrigation
6	Edison Elementary & Pacific Park	501 Riverdale Drive	50005134-00	1	Mar 2007	Irrigation
		POWER PLANT PROJECT (A - 2)				
7	CalTrans	943 W Doran Street	22516764-00	1	1978	Irrigation
8	Grayson Power Plant	800 Air Way	50005630-00	1	1978	Cooling Towers
9	Public Works	non metered	no account #	0		Irrigation
10	Glendale Water & Power - UOC	800 Air Way	50012227-00	1	2010	
		BRAND PARK PROJECT (A - 3)				
11	Glenoaks Median (9 meters)	2008 W Glenoaks Boulevard	12356670-00	1	1996	Irrigation
11	Glenoaks Median (9 meters)	1830 W Glenoaks Boulevard (at Irving)	12382290-00	1	1996	Irrigation
11	Glenoaks Median (9 meters)	1108 W Glenoaks Boulevard	12513010-00	1	1996	Irrigation
11	Glenoaks Median (9 meters)	978 W Glenoaks Boulevard	12520700-00	1	1996	Irrigation
11	Glenoaks Median (9 meters)	720 W Glenoaks Boulevard	12576220-00	1	1996	Irrigation
11	Glenoaks Median (9 meters)	618 W Glenoaks Boulevard	12581960-00	1	1996	Irrigation
11	Glenoaks Median (9 meters)	532 W Glenoaks Boulevard	12583040-00	1	1996	Irrigation
11	Glenoaks Median (9 meters)	1628 W Glenoaks Boulevard	22453700-00	1	1996	Irrigation
11	Glenoaks Median (9 meters)	1400 W Glenoaks Boulevard	22482860-00	1	1996	Irrigation
12	Brand Park	1700 W Mountain Street	31091775-00	1	1997	Irrigation
13	Pelanconi Park	905 Cleveland Road	31092075-00	2	1996	Irrigation
14	Grandview Memorial Park	1341 Glenwood Road	32191200-02	2	2001	Irrigation
15	Disney Complex (Dual Plumbed-Future)	1101 Flower Street	50006720-00	1	2007	Irrigation
15	Disney Complex (Dual Plumbed-Future)	1201 Flower Street	50006722-00	1	2007	Irrigation
16	San Fernando Landscape Project	5775 San Fernando Road	50009365-00	1	Jan 2009	Irrigation
17	Fairmont Street Extension Project	907 Flower Street	50012000-00	1	Mar 2010	Irrigation
18	Walt Disney Co.	900 Grand Central Ave	50018286-00	1	Sep 2012	Irrigation
18	Walt Disney Co.	1200 Grand Central Ave	50018254-00	1	Aug 2012	Irrigation
19	Power Plant	630 Kellogg Ave	33091005-00	1	May 2007	Irrigation
20	Glendale Narrow Riverwalk	900 Flower St.	50010892-00	1	Feb 2013	Irrigation
		VERDUGO SCHOLL PROJECT (B)				
21	Colorado Blvd - Parkway Irrigation	815 E Colorado Street	31492805-00	1	1997	Irrigation
21	Colorado Blvd - Parkway Irrigation	1311 E Colorado Street	10512470-00	1	1997	Irrigation
21	Colorado Blvd - Parkway Irrigation	1401 E Colorado Street	10511248-00	1	1997	Irrigation
22	CalTrans	1970 E Glenoaks Blvd (E/S,W/S I2)	10661215-00	2	1995	Irrigation
22	Caltrans	406 N Verdugo Rd (at Chevy Chase Dr)	10915398-00	1	1995	Irrigation
22	Caltrans	709 Howard Street (at Monterey Road)	11621385-00	1	1995	Irrigation
22	Caltrans	2000 E Chevy Chase Drive (at Harvey)	20613615-00	1	1995	Irrigation
23	741 S. Brand Median	741 S Brand Boulevard (Median)	10228900-00	1	1995	Irrigation
24	Montecito Park	2978 N Verdugo Road (at Sparr)	21026940-01	1	1995	Irrigation
25	N. Verdugo Rd Median/La Cresenta Ave	3220 N Verdugo Road/Median/ La Crescenta Avenue *OPP	21130300-00	1	1996	Irrigation
26	Verdugo Rd/Canada (North Median)	3021 N Verdugo/Canada Median	21452650-00	1	1996	Irrigation
27	Verdugo Rd/Canada South Overpass	Verdugo/Canada (South) Overpass	21615900-01	1	1995	Irrigation
28	Parque Vaquero	1285 N Verdugo Road	21680110-00	1	1998	Irrigation

CITY OF GLENDALE

Recycled Water Account Information

NO.	PROJECT NAME	ADDRESS	ACCOUNT NUMBER	NO. OF METER	DELIVERY DATE	TYPE OF USE
29	701 N. Glendale Ave - Median @ Monterey Rd	701 N Glendale Avenue (Median)	21688594-00	1	1995	Irrigation
30	Civic Auditorium	1401 N Verdugo Road	31091125-00	1	1996	Irrigation
31	Sports Complex	2200 Fern Lane	31091370-00	1	1998	Irrigation
32	Adult Recreation Center	201 E Colorado Street	31092175-00	1	1995	Irrigation
33	Glenoaks Park	2531 E Glenoaks Boulevard	31092325-00	1	1995	Irrigation
34	Scholl Canyon Park	2849 E Glenoaks Boulevard	31092375-00	1	1996	Irrigation
35	Scholl Canyon Ballfield	3200 E Glenoaks Boulevard	31092600-00	1	1997	Irrigation
36	Glendale High School	1440 E Broadway	31691142-00	1	1995	Irrigation
37	Wilson Junior High School	1220 Monterey Road	31692740-00	1	1995	Irrigation
38	Glendale Adventist Hospital	1520 E Chevy Chase Drive	31791090-00	1	1997	Irrigation / Cooling Towers
39	Glenoaks Elementary School	2015 E Glenoaks Boulevard	31791182-00	1	1998	Irrigation
40	Glendale Community College	1500 N Verdugo Road	31891780-00	2	1996 & 2004	Irrigation / Toilet Flushing
41	Oakmont Country Club	3100 Country Club Drive	31893000-00	1	1996	Irrigation
42	Central Library	222 E Harvard Street	32093752-00	2	1995	Irrigation
43	Armory	220 E Colorado Street	32290830-00	1	1996	Irrigation
44	Scholl Canyon Golf Course	3800 E Glenoaks Boulevard	33093165-01	1	1998	Irrigation
45	Scholl Canyon Landfill (PW)	3798 E Glenoaks Boulevard	33093180-01	2	1996	Irrigation/ Soil Compaction/ Dust Control
46	Scholl Canyon Landfill (LACSD)	2847 E Glenoaks Boulevard	50008944-00	1	1997	Irrigation/ Soil Compaction/ Dust Control
47	Public Works (Scholl Canyon)	3798 E Glenoaks Boulevard	50008945-00	1	1996	Irrigation
47	Public Works (Scholl Canyon)	3798 E Glenoaks Boulevard	50009170-00	1	1996	Irrigation
48	Fern Lane (Freeway Tank + Median)	1926 Fern Lane	50005823-00	1	1997	Irrigation
49	Glendale Retirement Home	1551 E Chevy Chase Drive	50008949-00	1	Jul-09	Irrigation
50	Americana at Brand LLC	233 S Brand Boulevard	50009495-00	1	Apr-09	Irrigation
51	Monterey Community Garden	870 Monterey Road	50010690-00	1	Aug-09	Irrigation
52	City of Glendale - CCBG	827 Monterery Road	50012392-00	1	Jan-11	Irrigation

FIGURE 7

CITY OF GLENDALE

FUTURE RECYCLED WATER USERS

***As of* September 30, 2013**

	FUTURE RECYCLED WATER USERS	Anticipated	User	Quantity	Type of
	PROJECT	Delivery Date		AFY	Use
	FOREST LAWN PROJECT				
1	Building - 1255 S. Central Ave (Verdugo Job Center)*	Completed	NO	5	Irrigation
2	Glendale Plaza - 655 N Central Avenue*	Completed	NO	10	Flushing Toilets
3	Building - 610 N. Central*	Completed	NO	6	Flushing Toilets
4	Glendale Memorial Hospital (1420 S. Central Ave.)	Planning	NO	15	Irrigation & Cooling Towers
5	328 Mira Loma Ave (44 residential units)	Construction	NO	10	Irrigation
6	Vassar Villas (San Fernando Rd & Glendale Ave)*	Completed	NO	5	Irrigation
7	Americana Orange Extension (Nordstorm) **(PROPOSED for 2012)**	Design	NO	5	Irrigation
8	Los Feliz Mixed-Used **(Proposed for 2012)**	Design	NO	5	Irrigation
9	Glendale Triangle (3900 San Fernando Road) **(Proposed for 2012)**	Planning	NO	5	Irrigation
10	Glendale Tropico South Project (3901 San Fernando Road)	Design	NO	5	Irrigation
11	Tropico Apartments (435 W. Los Feliz)	Design	NO	5	Irrigation
12	625-629 Pacific	Design	NO	5	Irrigation
13	Link Project (3901-3915 San Fernando Rd)	Design	NO	5	Irrigation
14	525 W. Elk	Design	NO	5	Irrigation
15	124 E. Colorado St & 203 W. Elk Ave	Design	NO	5	Irrigation
	POWER PLANT PROJECT				
	VERDUGO SCHOLL PROJECT				
16	John Marshall School*	Completed	NO	5	Irrigation
17	Fremont Elementary School*	Planning Stage	NO	5	Irrigation
18	Polygon Homes Housing Tracks (Camino San Rafael)*	Planning Stage	NO	85	Irrigation
19	Chevy Oaks Homes*	Planning Stage	NO	25	Irrigation
20	Chevy Chase Country Club*	Planning Stage	NO	100	Irrigation
21	Building - 111 N. Brand*	Planning Stage	NO	5	Irrigation
22	Building - 295 E. Garfield*	Planning Stage	NO	10	Irrigation
23	Building - 800 N. Brand (Nestle)	Planning Stage	NO	10	Cooling Towers
24	Caltrans Fwy 210	Planning Stage	NO	20	Irrigation
25	Residential Building -720 S. Maryland	Design Stage	NO	5	Irrigation
26	3-Story Multi Use - 415 E. Broadway	Construction	NO	5	Irrigation
27	Doran Garden (Mixed Use) 331 W. Doran **(Completed in March 2012)**	Construction	NO	5	Irrigation
28	Building - 400 N Brand*	Completed	NO	10	Flushing Toilets
29	Building - 450 N Brand*	Completed	NO	10	Flushing Toilets
30	Police Building - Isabel Street*	Completed	NO	5	Flushing Toilets
31	Building - 611 N Brand*	Completed	NO	10	Flushing Toilets
32	Building - 207 Goode Ave*	Completed	NO	10	Flushing Toilets
33	Fire Station No. 21*	Completed	NO	10	Irrigation
34	Mayor's Bicentennial Park	Planning Stage	NO	5	Irrigation
35	Carr Park	Planning Stage	NO	5	Irrigation
36	Glorietta Pump Station	2002	NO	5	Irrigation
37	Monterey Road Median - WJH	2002	NO	1	Irrigation
38	Deukmejian Wilderness Park	Planning Stage	NO	200	Irrigation
39	Crescenta Valley Park	Planning Stage	NO	20	Irrigation
40	Lutheran School of the Foothills	Planning Stage	NO	5	Irrigation
41	Saint James the Less School	Planning Stage	NO	5	Irrigation
42	Dunsmore Park/Elementary	Planning Stage	NO	25	Irrigation
43	Hillside Irrigation (Camino San Rafael)	Planning Stage	NO	20	Irrigation
44	Montrose Community Park	Planning Stage	NO	15	Irrigation
45	Verdugo Hills Hospital	Planning Stage	NO	30	Irrigation
46	222 Glendale Ave (Orange Grove)	Planning Stage	NO	5	Irrigation
47	Cedar Mini Park*	Completed	NO	5	Irrigation
48	Sleepy Hollow HOA	Planning Stage	NO	5	Irrigation
49	Verdugo Woodlands Elementary School	Planning Stage	NO	5	Irrigation
50	Maryland Mini Park **(Cancelled)**	Design Stage	NO	5	Irrigation
51	Habitat for Humanity - 711 N. Kenwood*	Completed	NO	5	Irrigation

CITY OF GLENDALE

FUTURE RECYCLED WATER USERS

***As of* September 30, 2013**

	FUTURE RECYCLED WATER USERS	Anticipated	User	Quantity	Type of
	PROJECT	***Delivery Date***		***AFY***	***Use***
52	Habitat for Humanity - 625 Geneva Street* **(To be completed in 2014 FUTURE)**	Construction	NO	5	*Irrigation*
53	Multi-Family - 220 E. Broadway **(2011 for future connection)**	Completed	NO	5	*Irrigation*
54	North Central Apartments (500 & 600 block of N Central Ave)	Design Stage	NO	5	*Irrigation*
55	4201 Pennsylvania	Design Stage	NO	5	*Irrigation*
56	500 N. Central Avenue	Design Stage	NO	5	*Irrigation*
57	125 N. Cetnral & 318 W. Wilson	Design Stage	NO	5	*Irrigation*
58	Colorado Paseo	Final Design	NO	5	*Irrigation*
	BRAND PARK PROJECT				
59	Homestead Studio Suites (1377 W. Glenoaks Blvd)	Completed	NO	5	*Irrigation*
60	Toll Jr High*	Design	NO	10	*Irrigation*
61	Hoover High School*	Design	NO	21	*Irrigation*
62	Keppel High School*	Design	NO	10	*Irrigation*
63	Disney Campus*	Planning Stage	NO	80	*Irrigation / Flushing Toilets*
64	Dreamworks - Flower Street **(Backflow Issue-Not Connected)**	Completed	NO	20	*Irrigation*
65	Disney Child Care Center (1500 Flower Street)*	Completed	NO	10	*Irrigation*
66	Disney Landscape - 1401 Flower Street*	Completed	NO	10	*Irrigation*
67	Grandview Condos	Design Stage	NO	5	*Irrigation*
68	Griffith Manor Park* **(2011 for future connection)**	Completed	NO	5	*Irrigation*
69	Caltrans I-5	Planning Stage	NO	30	*Irrigation*
70	Public Works - Street Sweeping/Yard **(to be completed in 2014)**	Design Stage	NO	20	*Street Sweeping*
71	GWP-UOC - Airway	Design Stage	NO	10	*Irrigation / Flushing Toilets*
72	Disney GCAT	Design Stage	NO	10	*Irrigation / Flushing Toilets*
73	Public Storage (5500 San Fernando Rd)	Design Stage	NO	5	*Irrigation*
	TOTAL			***1083***	
	** RW main service not yet available.*				
	*** Pasadena and Los Angeles Demand not included*				

APPENDIX D

CITY OF SAN FERNANDO

PUMPING AND SPREADING PLAN

2013-2018 Water Years

CITY OF SAN FERNANDO

GROUNDWATER PUMPING AND SPREADING PLAN

OCTOBER 1, 2013 TO SEPTEMBER 30, 2018

2013-2014 Water Year

Prepared by:

Public Works Department

Water Division

117 Macneil Street

San Fernando, California 91340

May 2014

TABLE OF CONTENTS

Section **Page No.**

I. INTRODUCTION

The ground water rights of the City of San Fernando were defined by the JUDGMENT in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et. al., Defendants." The Final Judgment was signed on January 26, 1979.

On August 26, 1983, the Watermaster reported to the court pursuant to Section 10.2 of the Judgment that the Sylmar Basin was in condition of overdraft. On October 1, 1984, San Fernando and Los Angeles were assigned equal rights to pump the safe yield of the Basin (6,210 acre-feet) thus, San Fernando and Los Angeles were each allowed to pump approximately 3,105 acre-feet per year. Thereafter, on October 1, 1996, the safe yield of the Basin was determined to be 6,510 acre-feet per year. A stipulation approved by the Court, on December 13, 2006, allows for a temporary increase in the safe yield of the Basin to 6,810 AF/Y beginning October 1, 2006. Therefore, San Fernando and Los Angeles are now allowed to each pump approximately 3,405 acre-feet per year.

In 1993, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Section 2.9, Groundwater Quality Management. This addition has been made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup and limiting the spread of contamination in the San Fernando Valley. This report is in response to Section 2.9.4, Groundwater Pumping and Spreading Plan.

The Groundwater Pumping and Spreading Plan is based on the water year, October 1 to September 30. The Draft Plan for San Fernando will be submitted in May to the Watermaster for the current water year.

II. WATER DEMAND

The annual total water demand for the last five years and the projected annual water demand for the next five years are shown on Table 2.1.

Water demand during the early 1990's was affected by drought conditions in the Southern California region. However, the City of San Fernando has imposed voluntary conservation since 1977.

Projected water demands for the next five years is expected to slightly decrease or remain the same due to conservation efforts.
The projected water demand may vary significantly due to weather conditions, economic conditions and/or social conditions in the San Fernando area. A variance of ± 10 percent can be expected.

III. WATER SUPPLY

The water supply for the City of San Fernando is composed of locally produced and treated groundwater. Supplemental water is purchased from the Metropolitan Water District of Southern California (MWD). In case of emergency, there is an existing 6-inch water connection to the City of Los Angeles (DWP) water system at 12900 Dronfield Avenue, in Sylmar.

A. MWD: Treated water is purchased from the MWD to supplement ground water supplies. Historic and projected use of MWD water is shown in Table 2.1.

B. Production Wells: The City of San Fernando owns and operates three (3) wells that are on "active status" with the Department of Health Services as indicated below:

1. ***Well 2A***
Location: 14060 Sayre Street, Sylmar
Capacity: 2125 GPM

2. ***Well 4A***
Location: 12900 Dronfield Avenue, Sylmar
Capacity: 375 GPM

3. ***Well 3***
Location: 13003 Borden Avenue, Sylmar
Capacity: 1200 GPM
This well shown is on "stand-by status" with the Department of Public Health Services and quarterly samples are collected by waste pumping.

4. ***Well 7A***
Location: 13180 Dronfield Avenue, Sylmar
Capacity: 900 GPM
This well was placed on "inactive status" with the Department of Public Health Services and has been physically disconnected from the water system. Plans are to activate this well in 2014 and install a new Envirogen ion exchange nitrate removal unit to be located at our lower reservoir site.

C. Quantity (Acre-Feet) of Water Pumped From Each Well (2012-2013)

1.	Well 2A	2,870.54
2.	Well 3	.50
3.	Well 4A	408.02
4.	Well 7A	0
	Total	3,279.06

D. Wells Groundwater Level Data

1.	Well 2A	1078.5 Taken 4/13	(Transducer out of service)
2.	Well 3	1085.2 Taken 12/13	
3.	Well 4A	1027.1 Taken 12/13	
4.	Well 7A	1085.3 Taken 12/13	

E. <u>Well Locations</u>

Well 2A - 14060 Sayre Street, Sylmar

Well 3 - 13003 Borden Street, Sylmar

Well 4A - 12900 Dronfield Avenue, Sylmar

Well 7A 13180 Dronfield Avenue, Sylmar

IV JUDGMENT CONSIDERATIONS

A. Native and Imported Return Water

The safe yield of the Sylmar Basin was 6,810 acre-feet and the cities of San Fernando and Los Angeles have equal rights to pump from this basin. After subtracting the overlaying pumping rights of two private parties, San Fernando and Los Angeles were each allowed to pump approximately 3,405 acre-feet per year.

A stipulation approved by the Court May 01, 2013 allows for a temporary increase in the safe yield of the Basin to 7,140 AF/Y beginning October 1, 2012. Therefore, San Fernando and Los Angeles are now allowed to each pump approximately 3,570 acre-feet per year, for the next five years (2011-12 through 2016-17)

B. Stored Water Credit

San Fernando and Los Angeles each have the right to store water in the Sylmar Basin and the right to extract equivalent amounts.
As of September 30, 2013 the City of San Fernando has a stored water credit of 1,848.50 acre-feet accumulated during previous years through the 12-13 water year.

TABLE 2.1
FIVE-YEAR HISTORIC AND PROJECTED WATER DEMAND
PUMPED AND IMPORTED WATER
CITY OF SAN FERNANDO

(Acre – Feet)

FY	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
DEMAND											
WELLS	3,669	3,473	3,143	3,082	3,202	3,279	3,250	3,275	3,300	3,300	3,300
MWD	0	0	51	18	106	82	50	25	0	0	0
TOTAL	3,669	3,473	3,194	3,100	3,308	3,361	3,300	3,300	3,300	3,300	3,300
	ACTUAL						PROJECTED				

APPENDIX A

WATER QUALITY DATA

SEE ATTACHED WATER QUALITY REPORT, 2012

CITY OF SAN FERNANDO

- WELL NO. 3
- WELL NO. 4A
- WELL NO. 2A
- WELL NO. 7A

APPENDIX B

POLICIES AND PROCEDURES

(By ULARA)

WATERMASTER SERVICE

UPPER LOS ANGELES RIVER AREA

POLICIES AND PROCEDURES

February 1998

APPENDIX E

CRESCENTA VALLEY WATER DISTRICT

PUMPING AND SPREADING PLAN

2013-2018 Water Years

CRESCENTA VALLEY WATER DISTRICT

GROUNDWATER PUMPING & SPREADING PLAN

FOR

WATER YEARS

OCTOBER 1, 2013 TO SEPTEMBER 30, 2018

Prepared by:
David S. Gould, P.E.
District Engineer

Prepared for:
ULARA Watermaster's Office

July 2014

I. INTRODUCTION

The ground water rights of the Crescenta Valley Water District (CVWD) were defined by the JUDGEMENT in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et. al., Defendants". The Final Judgment was signed on January 26, 1979.

This report as prepared by CVWD is in response to Section 5.4, Groundwater Pumping and Spreading Plan. This report refers to groundwater pumping only since there is no groundwater spreading performed by CVWD.

The Groundwater Pumping Plan is based on the water years October 1, 2013 to September 30, 2018.

II. WATER DEMAND

The annual total water demand for the last five (5) years and the projected annual water demand for the next five (5) years are shown in Table 2.1.

Water demands between WY 2008/09 and WY 2012/13 were affected by a number of factors including variable annual rainfall, natural and man-made disaster events such as fire and power outages, a three-year statewide drought, the unstable economy, and water conservation efforts within the Crescenta Valley.

Additionally, demands in the CVWD's service area vary due to seasonal conditions, which can be attributed to the residential character of the District and the large percentage of water consumption for outdoor landscaping.

CVWD anticipated an overall annual decrease in water demand of approximately 1% to 2% per year over the next five (5) years in responses to the increased need for water conservation and the continuing drought.

In WY 2012/13, CVWD saw a slight decrease of -0.6% in water demand as compared to WY 2011/12, which is attributed to a slightly improved economy and CVWD's effort in water conservation.

Statewide Drought and Water Conservation:

In January 2014, the Governor declared a statewide drought and future regulations may be imposed over the next year. In WY 2012/13, CVWD remained in a volunteer water conservation program.

The forecast for WY 2013/14 is that CVWD will increase their water conservation efforts as the State and Metropolitan Water District of Southern California (MWD) consider a water allocation program for the coming year.

III. WATER SUPPLY

A. Existing Water Supply Overview:

The water supply for CVWD is composed of locally produced and treated groundwater, and imported water from MWD purchased on a wholesale basis from Foothill Municipal Water District (FMWD). In WY 2012/13, CVWD had an overall ratio of 64% local groundwater and 36% imported water from FMWD.

In WY 2012/13, CVWD saw a decrease in groundwater production as compared to WY 2011/12. CVWD's wells produced 2,926 ac-ft, which is 368 ac-ft under adjudicated right of 3,294 AFY.

In general, the well levels in the Verdugo Basin have decreased over the last year as shown in the decreased amount of groundwater production, which is attributed to less than average rainfall for two (2) consecutive years and well rehabilitation projects at Well 1 and 12.

CVWD is planning in WY 2013/14 to perform well rehabilitation on Wells 5, 8, and 9 to obtain better well efficiency and to potentially increase groundwater production.

B. PRODUCTION WELLS

Currently CVWD has twelve (12) active wells in operation. Historic and projected production from these wells is shown in Table 3.1.

In WY 2012/13, CVWD observed a decrease in the water levels in its groundwater wells over the year due to the below average rainfall received in the Crescenta Valley. In addition, the overall well capacity for WY 2012/13 was 3.15 MGD, which was less than WY 2011/12 at 3.62 MGD, an overall decrease of 13% in capacity. This is largely due to declining water levels and Wells 1 & 12 being out of service for approximately two (2) months for rehabilitation.

B.1 Nitrate (NO_3) in Production Wells

CVWD’s groundwater wells produce water which typically contains nitrate (as NO_3) levels above the 45 mg/L maximum contaminant level (MCL) as set by the EPA and California Department of Public Health (CDPH).

B.1.1 Glenwood

The Glenwood Nitrate Removal Treatment Plant is an ion-exchange process used to treat and remove nitrates from CVWD’s well water. Untreated water and water treated at the Glenwood Plant are blended to produce water with a nitrate level less than the MCL.

In WY 2012/13, the ion-exchange plant was in operation for twelve (12) months, with very minor flows for four (4) of those months and was used to maximize the use of local groundwater.

B.1.2 Mills

Water production at CVWD's Mills Plant is blended with FMWD water to decrease the nitrate levels below the MCL.

B.2 Methyl tertiary-butyl ether (MTBE) in Wells

In 2004, CVWD detected low levels of MTBE in Well 5 during routine sampling. In 2006, Well 7 was taken out of service because of MTBE above the 13 ug/L MCL. In 2008, Well 5 was taken out of service when the MTBE level reached 14 ppb, which is above the MCL of 13 ppb. MTBE levels have decreased below the MCL and Wells 5 & 7 are back in service.

B.2.1 MTBE Levels

In WY 2012/13, the MTBE levels in CVWD's wells ranged from Non-Detect (ND) to 0.38 ug/L.

B.2.2 Verdugo Basin MTBE Task Force

In 2006, CVWD made a request to the Watermaster's office to create the Verdugo Basin MTBE Task Force. CVWD has been working with RWQCB, CDPH, stakeholders, and RP's on remediation and clean-up of the MTBE.

In WY 2012/13, the Task Force did not meet and was suspended until MTBE levels are higher than 1.0 ug/L.

B.2.3 Groundwater Recharge - Rainfall

CVWD has observed swings in the amount of rainfall in the Verdugo Basin over the past five (5) years as shown in the table below. In WY 2012/13, the rainfall was 12.25 inches, which was 48% below the annual average of 23.3 inches.

CVWD Annual Rainfall Total	
Water Year	**Total Rainfall (In)**
12-13	**12.25**
11-12	**14.10**
10-11	**32.31**
09-10	**27.68**
08-09	**15.15**

The forecast for WY 2013/14 is another dry year for rainfall and CVWD is planning for potential water conservation measures to be imposed within the next year.

C. WELL REPLACEMENT PROGRAM

The District's active wells range in age from 12 to 82 years and are mostly beyond their useful life. CVWD has included in its 10-year CIP program a project to install a new water production well within the next 5 – 10 years to replace its aging well system.

C.1 Rockhaven Well Project

CVWD has been working with Glendale Water and Power (GWP) on a project to activate the Rockhaven Well located at 2740 Hermosa Ave. The Rockhaven Well project will be a joint project between CVWD and GWP to activate a groundwater well which was constructed by GWP and has not been put into service due to water quality (nitrate) issues. The project will use CVWD's existing Nitrate Treatment Removal Facility to treat the local groundwater to Federal and State water standards.

The project will provide for the immediate use of potable water from a local known water source, reduce CVWD and GWP dependence on MWD, and provide the additional benefit of reducing the amount of nitrates within the Verdugo Basin. The project is estimated to produce about 480 ac-ft per year of additional local water. The historic and projected GWP (Rockhaven) Water production is shown in Table 3.5.

CVWD and GWP have submitted a 2014 Drought Grant application as part of Proposition 84 for funding for the design and construction of the Rockhaven Well project. If grant funding is approved, the Rockhaven Well project is planned to be completed by July 2015.

D. WELL REHABILITATION PROGRAM

CVWD continues performing well rehabilitation on its existing wells to maintain well capacity and extend the life of the wells. In WY 2012/13, CVWD performed well rehabilitation on Wells 1 and 12. In WY 2013/14, CVWD is planning to perform well rehabilitation on Wells 5, 8, & 9 and in WY 2014/15 on Wells 7 & 11.

E. GLENWOOD NITRATE REMOVAL PLANT

The Glenwood ion-exchange nitrate removal plant was placed into operation in 1990. CVWD replaced the ion-exchange resin in WY 2010/11 during its annual maintenance shut-down.

During WY 2012/13, the plant was in operation during twelve (12) months of the year to maximize the use of groundwater production and this trend will continue in WY 2013/14. The historic and projected production from the Glenwood Plant is shown in Table 3.2.

F. PICKENS GRAVITY TUNNEL PRODUCTION

A small portion of the total demand for CVWD is supplied by the Pickens Gravity Tunnel. Historic and projected production from Pickens Tunnel is shown in Table 3.3.

G. FMWD/MWD – IMPORTED WATER

In WY 2012/13, the amount of imported water purchased from MWD via FMWD increased from previous years because of an overall decrease in groundwater production. Proportionally, the ratio of groundwater to import water in WY 2012/13 was 64/36, which was a slight decrease in GWP production from previous years.

In WY 2013/14, CVWD anticipates an increase in the amount of imported water received from FMWD as the overall water demand continues to increase and the production from CVWD's wells continue to decrease due to lower than average rainfall.

Historic and projected use of FMWD/MWD water shown in Table 3.4 reflects the additional water from the Rockhaven Well project.

H. CITY OF GLENDALE INTERCONNECTION

In 2004, CVWD completed the installation of a new water supply interconnection with the City of Glendale. This connection allowed CVWD to increase its water supply capacity by 5.0 cfs or 3.2 mgd. An agreement between the City of Glendale, FMWD, and CVWD was signed in 2004, where CVWD will pay FMWD for the water and the City of Glendale for the maintenance and operation of bringing the water to CVWD.

In WY 2012/13, CVWD used 1.95 MG of water from the Glendale/CVWD interconnection (GCI) in February 2013. This was used for emergency water supply due to a MWD/FMWD shut-down for maintenance.

I. CITY OF LOS ANGELES INTERCONNECTION

In 2006, CVWD received a Proposition 50, Water Security Grant from CDPH to install an emergency water supply connection with the City of Los Angeles. The new connection will provide 2.2 cfs or 1.44 mgd. In addition, the new interconnection and associated facilities will allow CVWD to provide water during an emergency to FMWD and its sub-agencies in case of a local disaster or when MWD's Weymouth plant is out of service.

In WY 2012/13, the project was in the final design stage and was waiting on approval from CDPH. CVWD anticipates construction of the project to begin in WY 2013/14 and completed in WY 2014/15.

J. STORMWATER RECHARGE FEASILIBLITY STUDY

CVWD's Verdugo Basin Groundwater Recharge, Storage, and Conjunctive Use Feasibility Study was completed in 2005 and recommended methods of stormwater recharge and storage within the basin. In WY 2012/13, CVWD received a Local Groundwater Assistance (LGA) grant from the Department of Water Resources (DWR) to perform a feasibility study for stormwater recharge within the Verdugo Basin.

The study is a cooperative effort with the City of Glendale, the County of Los Angeles, and other local stakeholders to determine if stormwater can be stored at Crescenta Valley County Park. The feasibility study started in August 2013 and the feasibility study should be completed by December 2015.

IV. JUDGEMENT CONSIDERATIONS

The adjudicated rights of CVWD from the Verdugo Basin are 3,294 acre-feet per year:

- WY 1978/79 to WY 1991/92 - CVWD pumped 1,700 to 2,900 ac-ft/yr.
- WY 1993/94 to WY 2000/01 - CVWD pumped over its adjudicated right, up to 500 ac-ft/yr, which was allowed by the Watermaster's office.
- WY 2001/02 to WY 2003/04 - CVWD pumped below its adjudication due to declining basin production.
- WY 2004/05 - CVWD increased its water production because of higher than normal rainfall and was able to pump over the adjudication by 16 ac-ft.
- WY 2005/06 - CVWD pumped over the adjudication by 59 ac-ft. CVWD and the City of Glendale agreed upon compensation for the amount of water pumped over the adjudication for WY 2004/05 & WY 2005/06.
- WY 2006/07 - CVWD planned to maintain well production within the adjudication, however due to operator error, CVWD pumped over the adjudication by 11 ac-ft. CVWD and Glendale agreed upon compensation for the amount of water pumped based on the WY 2005/06 agreement.
- WY 2007/08 - CVWD adjusted its pumping schedule to maintain well production within the adjudication, and was 15 ac-ft below, since Well 7 was out of service for high MTBE levels.
- WY 2008/09 – CVWD pumped below its adjudication by 330 ac-ft, due to Well 5 being out of service for high MTBE levels and Well 9 being out of service due to bacteriological problems.
- WY 2009/10 - CVWD pumped below its adjudication by 640 ac-ft, which was due to Well 5 being out of service for high MTBE levels, Well 9 being out of service due to bacteriological problems, and Well 11 being out of service due to pump failure.
- WY 2010/11 - CVWD pumped below its adjudication by 368 ac-ft, which was due to Well 5 being out of service for high MTBE levels for three (3) months and decrease in water demand.

IV. JUDGEMENT CONSIDERATIONS (Cont.)

- WY 2011/12 - CVWD pumped below its adjudication by 195 ac-ft, this increase in production over previous years was due mainly to an increase in well efficiency from rehabilitation.
- WY 2012/13 - CVWD pumped below its adjudication by 368 ac-ft due to Well 1 and 12 being out of service for rehabilitation and declining water levels.

TABLE 2.1

HISTORIC AND PROJECTED WATER DEMAND (Acre-Feet)

2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
4,852	4,405	4,363	4,633	4,607	4,710	4,445	4,390	4,405	4,405
ACTUAL					PROJECTED				

TABLE 3.1

HISTORIC AND PROJECTED COMBINED WELL AND TUNNEL GROUNDWATER PRODUCTION (Acre-Feet)

2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
2,964	2,651	2,926	3,099	2,926	2,340	2,670	2,810	2,950	3,010
ACTUAL					PROJECTED				

TABLE 3.2

HISTORIC AND PROJECTED GLENWOOD NITRATE REMOVAL PLANT PRODUCTION BEFORE BLENDING (Acre-Feet)

2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
459	410	592	447	488	150	250	350	450	550
ACTUAL					PROJECTED				

NOTES:

(1) The Glenwood Treatment Plant has a capacity of 2.1 MGD of blended water.

(2) The Glenwood Treatment Plant began operation January 1990.

TABLE 3.3

HISTORIC AND PROJECTED
PICKENS TUNNEL WATER PRODUCTION
(Acre-Feet)

2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
60	56	57	59	61	59	60	60	60	60
ACTUAL					PROJECTED				

TABLE 3.4

HISTORIC AND PROJECTED
FMWD/MWD TREATED WATER PRODUCTION
(Acre-Feet)

2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
1,888	1,754	1,437	1,534	1,682	2,370	1,655	1,100	975	915
ACTUAL					PROJECTED				

TABLE 3.5

HISTORIC AND PROJECTED
GWP (Rockhaven) WELL WATER PRODUCTION
(Acre-Feet)

2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
0	0	0	0	0	0	120	480	480	480
ACTUAL					PROJECTED				

NOTES:

(1) GWP (Rockhaven) Well Production to be included in GWP's adjudicated right.

\\fscvwd\data\engineering\ulara\annual pump spread plan\wy 13-14\cvwd groundwater pumping plan 2013-2018.docx

APPENDIX F

ANNUAL MUNICIPAL EXTRACTIONS IN ULARA

1979-2013

ANNUAL MUNICIPAL EXTRACTIONS IN ULARA
1979-80 through 2011-12
(acre-feet)

Water Year	San Fernando Basin*				Sylmar Basin			Verdugo Basin			ULARA TOTAL
	Burbank	Glendale	Los Angeles	TOTAL	Los Angeles	San Fernando	TOTAL	CVWD	Glendale	TOTAL	
2012-13	11,387	7,176	52,751	71,314	1,673	3,284	4,957	2,917	1,670	4,587	80,858
2011-12	9,997	7,876	49,273	67,146	1,093	3,202	4,295	3,090	1,982	5,072	76,513
2010-11	10,398	7,476	43,951	61,825	964	3,082	4,046	2,927	1,826	4,753	70,624
2009-10	10,048	7,935	59,958	77,941	2,544	3,143	5,687	2,645	2,135	4,780	88,408
2008-09	9,966	7,151	52,896	70,013	868	3,473	4,341	2,957	2,087	5,043	79,397
2007-08	6,817	7,411	50,009	64,237	2,997	3,670	6,667	3,270	2,687	5,957	76,861
2006-07	9,780	7,622	76,251	93,653	3,919	2,894	6,813	3,294	2,568	5,862	106,328
2005-06	10,108	7,374	38,042	55,523	2,175	2,857	5,032	3,354	2,390	5,744	66,299
2004-05	6,399	7,792	49,085	63,276	1,110	3,143	4,253	3,310	2,358	5,668	73,197
2003-04	9,660	7,282	68,626	85,568	3,033	3,454	6,487	2,568	2,117	4,685	96,740
2002-03	9,170	8,507	73,676	91,353	3,549	3,357	6,906	2,836	1,613	4,449	102,708
2001-02	10,540	6,838	66,823	84,201	1,240	3,766	5,005	3,266	2,129	5,396	94,602
2000-01	12,547	6,886	65,409	84,843	2,606	3,696	6,301	3,422	2,227	5,649	96,793
1999-00	12,547	1,023	98,016	111,586	2,634	3,807	6,441	3,699	2,727	6,426	124,453
1998-99	10,729	31	123,207	133,966	4,536	3,528	8,064	3,797	2,627	6,424	148,455
1997-98	3,964	28	85,292	89,284	3,642	3,308	6,950	3,747	2,820	6,567	102,802
1996-97	11,171	20	89,935	101,126	2,482	3,259	5,741	3,672	2,674	6,346	113,213
1995-96	8,067	26	72,286	80,379	2,766	2,985	5,752	3,705	2,133	5,838	91,969
1994-95	3,052	53	55,478	58,583	2,311	3,421	5,732	3,708	1,633	5,341	69,656
1993-94	2,773	115	60,480	63,368	2,052	3,398	5,451	3,634	1,402	5,037	73,855
1992-93	1,354	91	34,973	36,419	1,369	2,145	3,514	2,557	990	3,547	43,480
1991-92	39	489	75,684	76,213	3,292	2,826	6,118	2,631	633	3,264	85,596
1990-91	1,278	2,755	67,032	71,065	3,281	2,266	5,546	2,615	1,230	3,845	80,456
1989-90	16	1,500	79,949	81,465	2,626	2,763	5,389	2,903	1,329	4,232	91,086
1988-89	29	1,315	126,630	127,974	3,259	2,199	5,459	2,285	2,064	4,349	137,781
1987-88	30	1,020	104,419	105,470	3,133	777	3,911	2,268	2,096	4,364	113,745
1986-87	29	5,758	85,845	91,632	3,113	3,026	6,139	2,255	2,619	4,874	102,645
1985-86	123	5,819	80,963	86,904	3,075	3,166	6,241	2,075	3,418	5,493	98,639
1984-85	2,863	3,086	95,641	101,591	3,130	3,102	6,232	1,997	3,837	5,834	113,657
1983-84	1,063	1,708	112,840	115,611	3,106	3,907	7,013	2,009	3,551	5,560	128,184
1982-83	2,187	1,028	65,178	68,394	3,048	3,133	6,181	1,759	3,427	5,187	79,761
1981-82	523	952	83,207	84,682	3,486	3,290	6,775	1,876	3,732	5,607	97,065
1980-81	595	1,129	91,067	92,791	4,117	3,380	7,497	2,140	2,122	4,262	104,550
1979-80	677	934	57,304	58,915	3,111	2,991	6,102	1,873	1,434	3,307	68,325
Average	5,586	3,712	73,299	82,597	2,687	3,109	5,795	2,855	2,244	5,099	93,491

*Includes municipal pumping only for years Prior to 2010. After 2010, includes physical solution pumping in the cities of Burbank and Glendale.