

SOURCE WATER ASSESSMENT &  
CONTAMINANT ASSESSMENT FOR  
NORTH HOLLYWOOD WEST, RINALDI-TOLUCA &  
TUJUNGA WELLFIELDS  
(Step 1 of 97-005 Evaluation)

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*Prepared for*

State Water Resources Board, Division of Drinking Water

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**December 2020**

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## **List of Acronyms**

- 1,1-DCE :1,1-Dichloroethene
- 1,2,3-TCP: 1,2,3-Trichloropropane
- AFY: Acre Feet per Year
- AOP: Advanced Oxidation Process
- bgs: Below Ground Surface
- BOU: Burbank Operable Unit
- CFS: Cubic Foot per Second
- COC: Contaminants of Concern
- CPS: Cleanup Program Sites
- CTET: Carbon Tetrachloride
- DDW: Division of Drinking Water
- DTSC: Department of Toxic Substances
- EPA: Environmental Protection Agency
- Freon 11: Trichlorofluoromethane
- FS: Feasibility Study
- GCOU: Glendale Chromium Operable Unit
- GNOU: Glendale North Operable Unit
- GSOU: Glendale South Operable Unit
- GPM: Gallon per Minute
- GSIS: Groundwater System Improvement Study
- LAA: Los Angeles Aqueduct
- LADWP: Los Angeles Department of water and Power
- LGAC: Liquid-phase Granulated Activated Carbon
- LUST: Underground Storage Tank



- MCL: Maximum Contaminant Level
- MG: Million Gallon
- MTBE: Methyl-t-butyl-ether
- MW: Monitoring Well
- MWD: Metropolitan Water District
- ND: Non- detect
- NDMA: N-Nitrosodimethylamine
- NHO: North Hollywood Operable Unit
- NHW: North Hollywood West
- NL: Notification Level
- OU: Operable Unit
- PCE: Tetrachloroethylene
- PRP: Potentially Responsible Party
- RI: Remedial Investigation
- ROR: Report of Referee
- RT: Rinaldi -Toluca
- RWQCB: Regional Water Quality Control Board
- SA/CA: Source Assessment/ Contaminant Assessment
- SFB: San Fernando Basin
- SMCL: Secondary maximum Contaminant Level
- SVE: Soil Vapor Extraction
- TCE: Trichloroethylene
- TDS: Total Dissolved Solids
- TJ: Tujunga
- ULARA: Upper Los Angeles River Aquifer
- UST: Underground Storage Tank

- VOC: Volatile Organic Compounds
- WDR: Waste Discharge Requirements
- WRP: Water Reclamation Plant

# **SOURCE WATER ASSESSMENT AND CONTAMINANT ASSESSMENT (SA/CA)**

## **Introduction**

The purpose of the Drinking Water Source Assessment and Contaminant Assessment (SA/CA) is to determine the extent to which the aquifer is vulnerable to contaminating activities in the area. This section will identify contaminants that have been detected in the groundwater in various Los Angeles Department of Water and Power (LADWP) wellfields in the San Fernando Basin (SFB), identify chemicals that have been historically used in the SFB, identify the hazardous waste generators, and the locations of known potentially responsible parties (PRPs). This will assure that LADWP's future remediation facilities in the SFB will be designed to capture and treat the highest concentration of the localized Volatile Organic Compounds (VOC) plume, as well as the maximum anticipated long-term concentrations of water quality contaminants in the vicinity of each wellfield.

## **1. Source Water Assessment**

### **1.1. Delineation of Source Water Capture Zone**

#### **1.1.1. Basin Geology**

##### **1.1.1.1. Geologic Setting**

The San Fernando Basin (SFB) is located in the Transverse Ranges physiographic province, which is a large east-west-trending fold belt. North-south compression along the San Andreas Fault system has produced trough-shaped basins that are elongated in an east-west direction. The rapid uplift of the mountains relative to the basins has generated sediment that has been deposited as alluvial fans. These sediments serve as the primary source of groundwater.

Southern California is situated on an active boundary between two major crustal plates. The San Andreas Fault is the present boundary between the Pacific and North

American plates. The Pacific Plate on the west has been moving northwest relative to the North American Plate for about 26 million years.

The SFB is an inland alluvial valley bordered by high mountain ranges within the South Coastal Basin of California. The valley is underlain and surrounded by relatively impermeable rock, forming a structural basin. A complex coalescing of alluvial fans deposited by streams that drain the surrounding mountains and hills is present in the valley fill (JMM 1992; CH2M Hill 2011). Along the western boundary of the SFB, the relatively gentle structural relief of the mountains has resulted in subdued topography and low stream profiles. In comparison, the higher elevations and deeply eroded bedrock of the uplifted mountains along the eastern boundary of the SFB have resulted in steeper stream profiles that contributed relatively coarse-grained sediment to the alluvial fans in the eastern portion of the SFB study area (JMM 1992; CH2M Hill 2011).

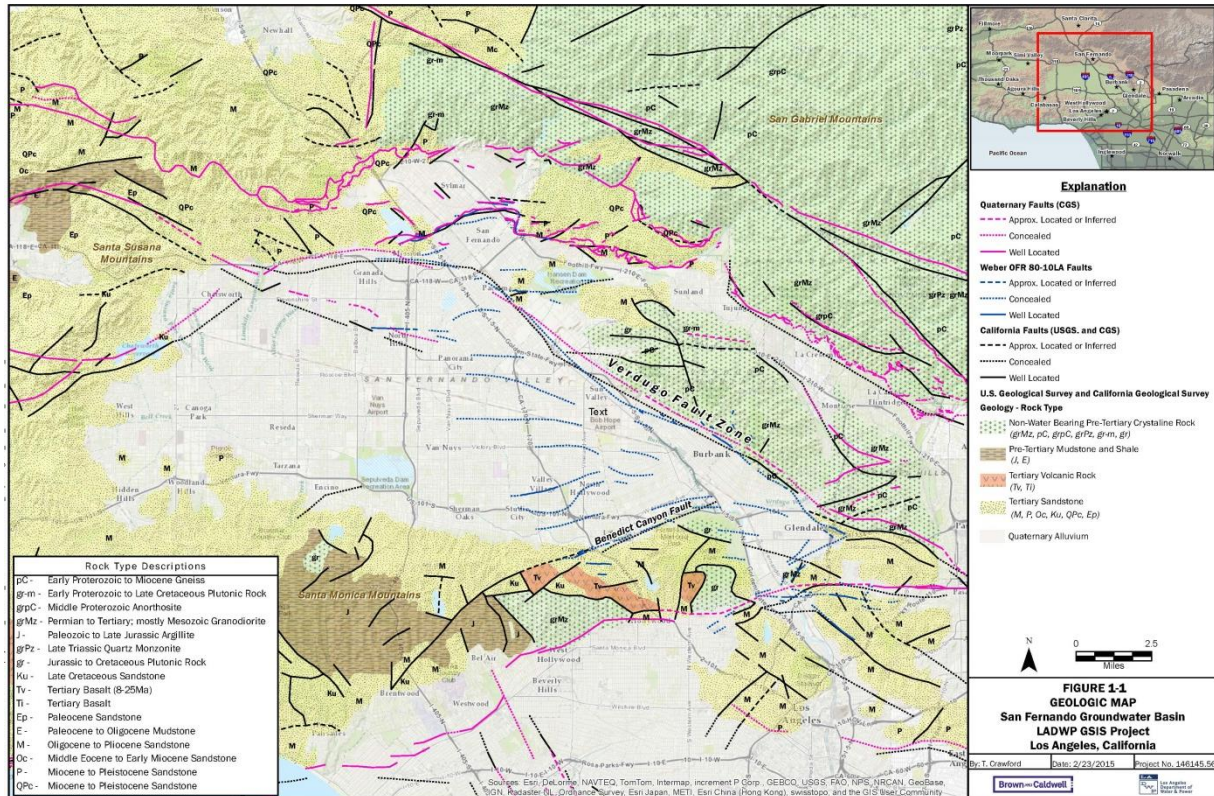
#### **1.1.1.2. Depositional Environment**

Most of the subsurface alluvial deposits in the SFB area were deposited by three prominent area stream channels that drain the Verdugo and San Gabriel Mountains to the north: the Big Tujunga, Little Tujunga, and Pacoima washes. The Tujunga alluvial fan is the dominant geomorphic feature and contains the coarsest gravel. The alluvial fan depositional environment produces coarse-grained subsurface paleochannels within the successive sheet flow deposits of the Tujunga and Pacoima alluvial fans that form preferential flow paths (due to aquifer anisotropy) that locally deviate from regional flow directions suggested by the hydraulic gradient alone (Campbell, 2007). Farther down gradient and laterally on the alluvial fans, diminished gradients and flows generally produce finer-grained and more stratified deposits (LADWP, 1992).

#### **1.1.1.3. Faults**

The regional stress regime has produced two sets of strike-slip and reverse faults typical of this portion of the Southern California region (JMM 1992). The major fault zones in the eastern portion of the SFB are the Verdugo, Benedict Canyon, and

Raymond Fault systems (JMM 1992). Further details on these fault zones and observations of their effect on groundwater flow in the SFB are presented below and the fault traces are included in Figure 1-1 below:



- The Verdugo Fault Zone is part of a large west-northwest trending fault system that splays off from the frontal fault system of the Transverse Ranges. The faults of the Verdugo system define the northeast margin of the SFB Basin south of the Sunland-Tujunga area. This system was originally considered to be an apparent groundwater barrier as documented in the Report of Referee (ROR) (SWRCB 1962). However, CH2M Hill notes that more recent evaluations indicate that it is unlikely that the Verdugo Fault acts as an impermeable barrier throughout the Tujunga area (CH2M Hill 2011).
- The Benedict Canyon Fault Zone is a collection of small faults identified near the bend in the Los Angeles River (Weber 1980). This fault system defines the southern

margin of the eastern portion of the SFB. Although this fault system has long been considered to not affect groundwater flow in the alluvium, the lack of sharp drawdown effects at shallow monitoring wells near the pumping area suggest that the impact of the fault system as an impediment occurs only at depths below the shallow zone (JMM 1992).

- The Raymond Fault Zone is located in the Los Angeles River Narrows, and extends westward across the Los Angeles River Narrows from fault scarps in the San Rafael Hills (JMM 1992). The fault acts as a groundwater barrier between the SFB and the Eagle Rock Basin. However, data from numerous wells in the area provide evidence that the fault acts as a groundwater impediment in the deeper alluvium but not the shallow alluvium.

#### **1.1.1.4. Bedrock**

Bedrock underlies all potentially water-bearing sediments in the SFB and is exposed at ground surface in all of the hill and mountain watershed areas of the Upper Los Angeles River Aquifer (ULARA). The top of the bedrock is considered to be synonymous with the base of the valley fill when discussing the subsurface of the eastern portions of the SFB (LADWP, 1992). It includes pre-Tertiary basement complex igneous and metamorphic rocks and Tertiary and Cretaceous sedimentary rocks. These geologically older rocks are well lithified, cemented and/or crystalline in nature, and as such, they are considered to display only secondary porosity and their permeability is low to very low. The non-marine early Pleistocene Saugus Formation consists of poorly consolidated, light colored conglomerate and sandstone that was deposited as alluvial fan sediments (SWRB, 1962). Although not documented in the eastern ULARA, the Saugus most likely comprises part of the deeper valley fill. The Saugus Formation is considered to be water-bearing, where it is overlain by unconsolidated, water-saturated alluvium (LADWP, 1992).

### 1.1.2. Hydrogeologic Setting

The alluvial fill in SFB consists primarily of permeable sand and gravel interbedded with localized lenses of low permeable silt and occasional clays. Geologic cross sections are presented in the *Remedial Investigation of Groundwater Contamination in the SFB, Remedial Investigation Report* (LADWP, 1992) Section 3 and Attachment B of this report. The depth to groundwater ranges from approximately 200 to 350 feet below ground surface (bgs). Regionally, groundwater flow is to the southeast, toward the Los Angeles River Narrows (USEPA, 1996). Locally, groundwater flow direction is influenced by groundwater recharge at the Hansen, Branford, and Tujunga (TJ) Spreading Grounds (USEPA, 1996). Historic and current pumping operations at LADWP's various wellfields also have localized influences on the regional flow direction depending on individual wellfield demands and operational constraints. Groundwater recharge is comprised of direct percolation of rainfall, including hill-and-mountain runoff to the basin, and the spreading of storm water at the Hansen, Tujunga, Pacoima and Branford spreading basins.

### 1.1.3. Hydrostratigraphy

#### 1.1.3.1. SFB RI Hydrostratigraphic Zones

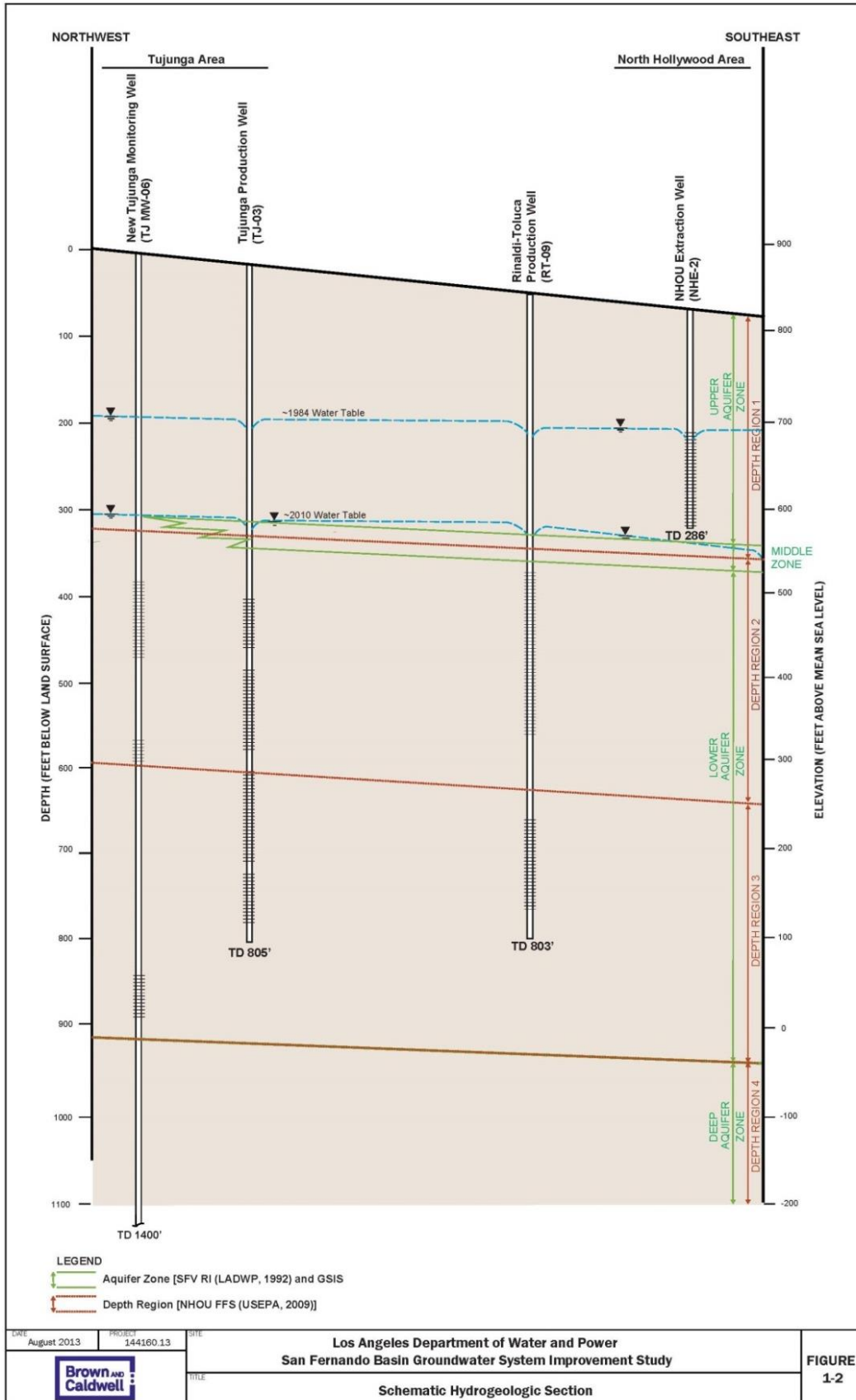
The SFB Remedial Investigation (RI) divided the alluvial valley fill of the eastern portion of the SFB into four hydrostratigraphic zones, with the following approximate depths in the North Hollywood (NH) area (Figure 1-2):

- The Upper Zone, the shallow aquifer that occurs between the present ground surface and 200 to 250 feet bgs and is composed of variable alluvial deposits.
- The Middle Zone, an aquitard that typically occurs between approximately 250 and 300 feet bgs, averages 50 ft thick and is characterized by relatively abundant fine-grained sands, silts, and clays.

- The Lower Zone, the main water supply aquifer that occurs between approximately 300 and 850 ft bgs, is approximately 300 to 500 ft in thickness and is characterized primarily by coarse sand and gravel horizons.
- The Deep Zone, which occurs to a depth of at least 1,200 ft bgs and is composed of fine to coarse alluvium with variable permeability.

The Middle Zone rises with the topography toward the northwest from the NH to the TJ area and pinches out in the vicinity of the TJ Wellfield (Attachment B; Figure A-2: Cross section B-B'). The Middle Zone drops in elevation to the south and is locally over 50 ft below the water table (Sections C-C' and D-D').





#### 1.1.4. Hydrology of the SFB

The SFB is the largest of the four basins within the ULARA and has a surface area of approximately 112,000 acres, representing 91.2 percent of the total surface of all four groundwater basins (i.e., the total of all valley fill areas). The lateral or ground surface boundaries of this basin are formed by non-water-bearing bedrock and/or crystalline basement rock in the adjoining hills/mountains, as follows:

- On the east and northeast by the San Rafael Hills, Verdugo Mountains, and San Gabriel Mountains
- On the north by the San Gabriel Mountains and the eroded south limb of the Little Tujunga syncline, which separates it from the Sylmar Basin on the north, and on the northwest and west by the Santa Susana Mountains and Simi Hills
- On the south by the Santa Monica Mountains (ULARA Watermaster 2013a)

##### 1.1.4.1. Inflows

The SFB receives groundwater imports from the Sylmar Basin plus a small amount of subsurface flow from the three adjacent basins: Sylmar, Verdugo, and Eagle Rock (ULARA Watermaster 2013a; JMM 1992). Inflows described herein include precipitation, subsurface inflow, imported water, and water spreading.

##### ➤ Precipitation

Precipitation falling directly on the valley floor as well as on the surrounding hill and mountains areas (hill and mountain runoff) constitutes the native supply of water to the SFB. Climate change and related changes in precipitation patterns affect the water supply and storage significantly. Precipitation is usually in the form of rainfall with some snowfall occurring at the highest elevations of the San Gabriel Mountains. Most precipitation is received during the winter months. Large variations in the amount of precipitation falling onto the valley floor are observed from year to year as well as season to season. Within the ULARA, approximately two-thirds of the total water from

precipitation is from the surrounding hill and mountain areas because of the larger surface area and higher elevations. This distribution is important in that it affects the location and pattern of groundwater recharge, and thus groundwater movement. Precipitation also affects surface water flow and sediment transport, and in turn sediment deposition within the valley (JMM 1992).

➤ **Subsurface Inflow**

Subsurface inflow is a small component of the water balance and occurs from the surrounding basins into the SFB (SWRCB 1962). These inflows were quantified as part of the 1992 RI work, using a 10-year average. JMM (1992) reported that the Sylmar Basin contributed the most subsurface inflow (approximately 740 AFY), with an additional small amount of subsurface inflow (approximately 70 AFY) coming from the Verdugo Basin near the mouth of Verdugo Canyon. Subsurface inflow from the Eagle Rock Basin is considered insignificant (JMM 1992).

➤ **Imported Water**

Imported water refers to water brought into the SFB from sources located outside of the basin. Imported water is brought to the ULARA by the City's Los Angeles Aqueduct (LAA) that delivers water from the Eastern Sierra region (Owens Valley–Mono Basin) as well as the Metropolitan Water District's (MWD) distribution system. These waters are conveyed through a complex array of pipelines and aqueducts. In addition, there are groundwater transfers from the Verdugo and Sylmar Basins. The portion of imported water that is not consumptively used, exported, or left the basin as surface outflow remains within the basin as recharge to groundwater.

➤ **Water Spreading**

This is an artificial recharge practice used in the SFB via the ongoing use of existing spreading basins. Excess runoff and imported water is spread for groundwater recharge purposes. A total of 10,781 AF of water was spread in WY 2012–13. The average annual spreading of native water during the period 1968–2012 was 32,848 AF.

### 1.1.4.2. Outflows

Outflows leaving the basin include surface outflow, subsurface outflow, exported water, and evaporation and transpiration (collectively termed “consumptive use”).

#### ➤ **Surface Outflow**

Surface outflows leaving the basin are determined by measuring the flow of the Los Angeles River passing Gaging Station F-57C-R, which lies in the main channel of the Los Angeles River and records all surface outflows from the ULARA. Surface flow at this gage includes:

- ✓ **Stormwater runoff:** This is typically the largest component of the total surface flow, and storm flows principally occur in the winter months.
- ✓ **Waste discharge:** This includes treated wastewater, which is a significant factor affecting surface water runoff in the Los Angeles area. Four water reclamation plants (WRPs) are currently in operation in the ULARA: Tillman, Burbank, Los Angeles-Glendale, and the Las Virgenes Municipal Water District. Releases from the Los Angeles-Glendale WRP, Burbank WRP, and Tillman WRP appear to have begun in 1976–77, 1967, and 1985, respectively.
- ✓ **Industrial discharges and irrigation runoff:** This occurs upstream of the gage and is relatively small, contributing a moderate amount of surface flow to the Los Angeles River. Field inspections have recorded unmetered flows from residential areas, golf courses, and industrial sites.
- ✓ **Rising groundwater:** This is a constant source of loss from the Verdugo and San Fernando groundwater basins. Rising groundwater occurs above the Verdugo Wash Narrows and in the unlined reach of the Los Angeles River (Los Angeles River Narrows) immediately upgradient of Gage F-57C-R. Releases of treated wastewater also influence rising groundwater. These large year-round releases tend to keep the alluvium beneath the Los Angeles River saturated, even in dry years.

➤ **Subsurface Outflow**

This is a small amount of water that is lost from the area through the alluvium beneath Gage F-57C-R (MWD 2007). The 1992 RI reported that the 10-year average for this outflow was only 420 AF (JMM 1992).

➤ **Exported Water**

Water that is exported includes imported LAA and MWD water (pass-through water), as well as groundwater extracted by LADWP. Exports of wastewater are delivered via pipeline to the Hyperion Treatment Plant in the Playa del Rey area of the city of Los Angeles.

➤ **Consumptive Use**

This is a component of the water budget composed of evaporation, transpiration, and water that is otherwise used. Quantification of this amount is complex. The 10-year average reported for the SFB in the 1992 RI was 248,340 AFY, which closely matched consumptive use calculated by the State Water Resources Control Board (SWRCB) of 227,200 AFY (SWRCB 1962).

#### **1.1.4.3. Change in Storage**

The SFB change in water storage is the net amount of water added to and/or depleted from surface water and groundwater reservoirs. The storage change in surface reservoirs is considered negligible compared to the overall quantity of water in the basin because there are no major surface water reservoirs. In contrast, the annual change in groundwater storage can be significant because the basin is managed for storage of water during wet years and for use during dry years. However, long-term change in storage is expected to be small.

Annual change in water storage is calculated by the ULARA Watermaster. The volume of groundwater in storage in the SFB is estimated to have increased by 10,338 AF between WYs 2010–11 and 2011–12. Based on the 2011–12 storage, approximately

449,573 AF of groundwater storage space was available in the SFB. This space can be used to capture and store additional native water or imported water supplies during wet years (ULARA Watermaster 2013a).

### **1.1.5. Capture Zones**

#### **1.1.5.1. Description of the Groundwater Model**

LADWP's Flow Model is based on the original 1992 RI Model. It consists of four vertical model layers and is divided laterally into a grid of 64 north-south rows and 86 east-west columns. The lateral grid cell size ranges from a minimum of 1,000 feet by 1,000 feet in the southeast portion of the model domain to a maximum of 3,000 feet by 3,000 feet in the northwest portion of the model domain. Production wells are simulated using the standard MODFLOW Well Package. Wells with screens that penetrate multiple model layers have pumping manually apportioned in the Well Package input file to allocate pumping to each layer by the relative transmissivity values of each layer. Spreading basin recharge is also represented using the MODFLOW Well Package to add the spreading recharge volumetric fluxes to model layer 1. Areal precipitation recharge is simulated using the standard MODFLOW Recharge Package.

The physical characterization of the SFB with regard to its geology, hydrology, hydrogeology, and contamination was developed and presented in the RI. The physical characterization of the Flow Model was based on an evaluation of data from hundreds of wells including more than 90 RI monitoring wells that were drilled, logged, constructed and sampled as part of the RI.

The Flow Model is a three-dimensional model that was developed using MODFLOW program. The physical boundaries and parameters of the SFB were based on geologic and hydrogeologic data from the RI monitoring wells, and other data used for the SFB physical characterization were incorporated into the MODFLOW program to develop the Flow Model. Attachment B provides a detailed description of the Model and its assumptions.

Historical annual hydrogeologic recharge and pumping data were used as inputs to perform a ten-year simulation. The simulated gradients were compared to the historical water levels to adjust and calibrate the model. The Flow Model was also calibrated with the same approach on a month-to-month basis to ensure accuracy of simulations since LADWP operates the SFB by pumping higher amounts of groundwater in the summer months and lower amounts of groundwater in the winter months to promote conjunctive use of its water resources. The month-to-month Flow Model calibration also provided verification of the trend of vertical gradients that were observed in the RI cluster wells located near major pumping areas of the SFB. Inputs to the Flow Model include recharge and extractions. Recharge is from precipitation, delivered water, hill and mountain runoff, subsurface inflow, and spreading at Tujunga, Pacoima, Branford and Hansen Spreading Grounds (including the anticipated East Valley Water Recycling Project) and extraction is by the Cities of Los Angeles, Burbank, Glendale, and other individual pumpers. A fault line running parallel to San Fernando Road impedes to some degree the influence of spreading of recycled water to the Tujunga Wellfield from the northeast.

Since the completion of the RI, the Flow Model has been used by LADWP as an analytical and predictive tool in numerous applications including, but not limited to, the following:

- Developing the Capture Zone analysis for the Groundwater System Improvement Study (GSIS) and for the Temporary Treatment at the Tujunga Wellfield.
- Drinking Water Source Assessment Program for LADWP Wellfields in the San Fernando Basin.
- Evaluation of the East Valley Water Recycling Project.
- Evaluation of the Pollock Wellfield Remediation Project.
- Evaluation of the Headworks Wellfield Remediation Project.

- Annual Report for “Watermaster Services of the Upper Los Angeles River Area” (ULARA) (submitted to the Superior Court annually as part of the 1979 SFB groundwater adjudication).
- Annual ULARA “Groundwater Pumping and Spreading Plan.”

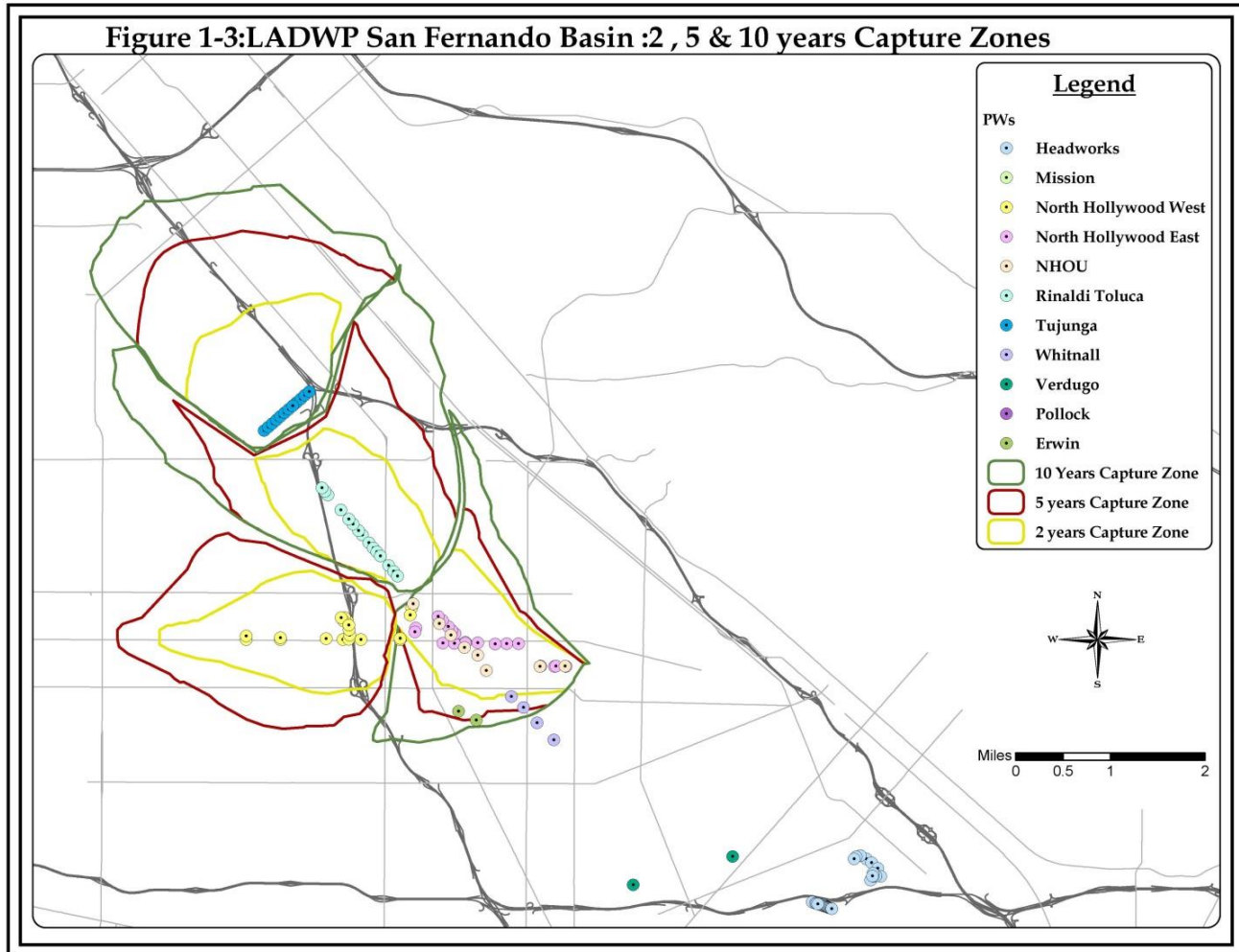
#### **1.1.5.2. Capture Zone Approach**

The area of influence with regard to each of LADWP Wellfields is determined by the “capture zone” or the portion of the SFB that supplies groundwater long-term to the wellfield. The SFB Groundwater Flow Model (Flow Model) was used to simulate the long-term operations of the SFB to determine groundwater gradients and flow directions in response to estimated recharge and pumping activities.

A ten-year projected operation and recharge condition for the SFB was simulated to calculate the 2-, 5-, and 10-year capture zones utilizing the Flow Model. The model delineates the “capture zone” that develops as a result of the long-term operation with regard to each of LADWP’s Wellfields. Figure 1-3 below shows TJ, Rinaldi Toluca (RT) and NH East and West wellfields and their corresponding 2-, 5- and 10- years capture zones.

The method known as “Capture Zone Analysis” will be used to visually estimate the maximum expected contaminant concentrations for each wellfield based on the ten-year capture zone produced by the wellfield and superimposed on the contaminant plume map. In addition, the concentration of contaminants in production and monitoring wells will be used as well.





**Figure 1-3: LADWP San Fernando Basin: 2, 5 & 10 Years Capture Zone**

## 1.2. Origin of Known Chemicals and Prediction of Contaminant Trends

### 1.2.1. History of Chemical Usage in the SFB

During the late 1800s, the SFB was dominated by agriculture and farming activities. The early 1900s gave rise to early industrialization and urbanization. By the 1940s, rapid industrialization of the SFB was under way, including aerospace and defense

manufacturing, machinery degreasing, dry cleaning, metal plating, and more. Rapid industrialization coincided with the unregulated chemical waste disposal practices of the times.

In the early 1980s, groundwater monitoring in the SFB detected concentrations of VOCs, including trichloroethene (TCE) and tetrachloroethene (PCE) in excess of state and federal drinking water standards. These solvents were widely used in a number of industries in the SFB. In 1981, LADWP began a 2-year study to assess the severity of groundwater contamination at several of its municipal water supply wellfields in the SFB. Contamination was found in approximately 45 percent of LADWP's existing SFB water supply wells.

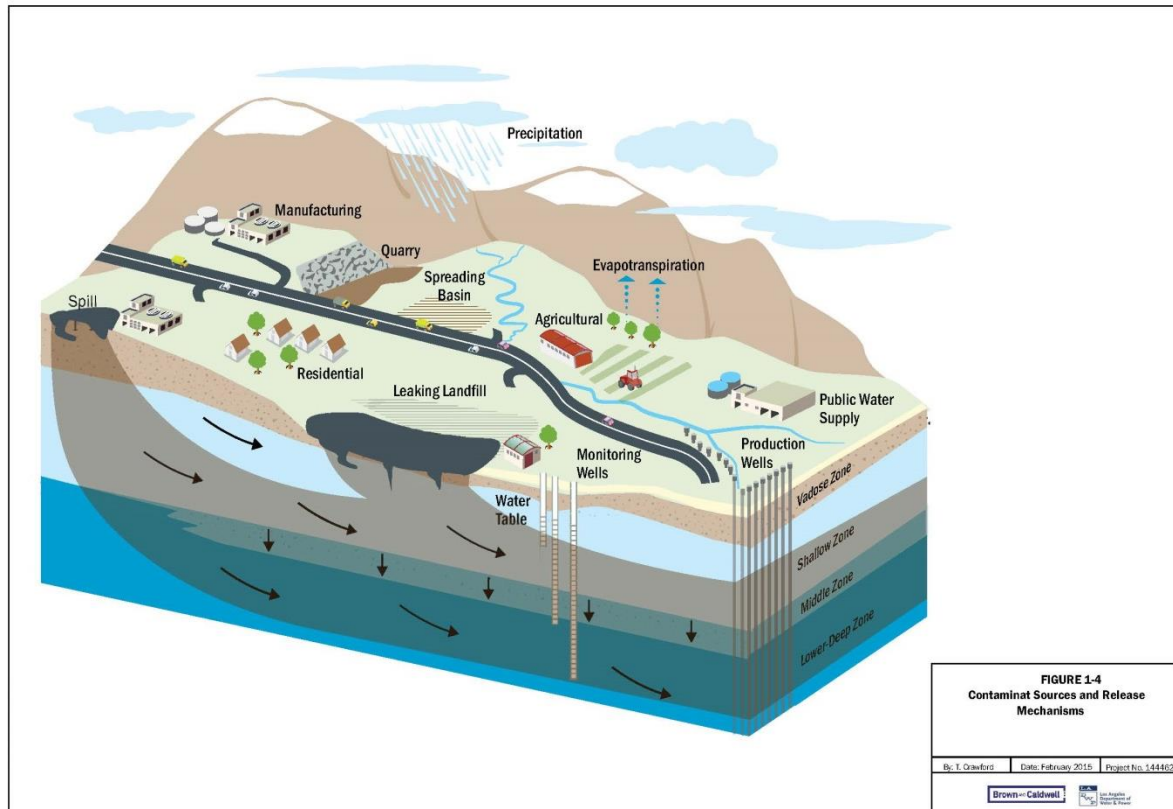
Shortly thereafter, Environmental Protection Agency (EPA) and other agencies became involved in coordinating efforts to address the large-scale contamination in the SFB. A Cooperative Agreement between EPA and LADWP was signed in 1987 to perform a RI of groundwater contamination in the eastern SFB. The 1992 RI served to delineate the nature and extent of widespread contamination in the SFB, both vertically and horizontally. The majority of contamination in groundwater was found in the shallow groundwater, with the most prevalent compounds detected being TCE and PCE. In effect, the 1992 RI (JMM, 1992) provided a basis for a Feasibility Study (FS) to address possible strategies for remediation of contaminated groundwater on a basin-wide scale. It also identified the need for further investigation on a more localized scale. EPA identified five operable units (OUs) to focus remediation efforts and to accelerate regional cleanup:

- North Hollywood OU (NHOU)
- Burbank OU (BOU)
- Glendale North OU (GNOU)
- Glendale South OU (GSOU)
- Glendale Chromium OU (GCOU) (established in 2007 as the fifth OU to investigate chromium in groundwater within the Glendale area)

Despite regional cleanup efforts, full containment of VOC contamination has not been achieved, and the groundwater in the eastern SFB remains contaminated. Some plumes have escaped containment and continued to spread while new contamination sources were discovered, adversely impacting LADWP wells and further degrading the local groundwater resources. The migration of VOC contamination is further complicated by the detection of contaminants of emerging concern, such as 1,4-dioxane, hexavalent chromium Cr(VI), n-Nitrosodimethylamine (NDMA), and perchlorate.

### **1.2.2. Sources of Contamination in the SFB**

Sources of chemical releases in the SFB have originated from multiple anthropogenic activities. Figure 1-4 below shows a generalized figure of sources and release mechanisms in the SFB. For chlorinated solvents and hexavalent chromium, the primary releases were typically leaking storage tanks or piping, leaching from sumps of other disposal practices, spills or generally poor housekeeping from the aerospace manufacturers and supporting industries. For other chemicals, such as nutrients (nitrate and manganese) and other inorganic chemicals (e.g., perchlorate), there are multiple potential sources such as agricultural practices, and other industrial and/or municipal practices in the SFB. It should also be noted that closed landfills could be a source of both organic and inorganic chemicals if they are unlined or a liner failure has occurred. Over the last 30 years, as the impacts have been identified, the releases have decreased or ceased entirely due to reduced use of chemicals, better housekeeping, and employing best management practices to prevent future releases. This is especially true for former manufacturing facilities in the SFB. However, there may be are operations that continue to impact soil and groundwater due to the size and diverse land uses of the SFB. If unmitigated, some sources, such as landfills, would cause long-term and continual impacts to the SFB.



**Figure 1-4: Contaminant Sources and Release Mechanisms**

As can be seen from Figure 1-4, because of the depth to groundwater (typically 50 to 400 feet bgs depending on location), impacts started out as releases to soil. The chemicals in soil have migrated downward through the unsaturated (vadose) zone to groundwater naturally through infiltration or through a steady release, such as a leaking tank or pipeline. As the chemicals moved vertically through the vadose zone, adsorption and other processes cause the chemicals to accumulate in the vadose zone, leaving residual concentrations in soil. Through remediation by the PRPs, the concentrations of these chemicals have been and will continue to be diminished over time.

Once in groundwater, these sources have created dissolved-phase chemical plumes that have migrated with natural groundwater flow and/or been transported through groundwater extraction and created large diffuse plumes downgradient of the source areas. Because of the mass of chemicals in the saturated zone, these source areas

contribute ongoing mass to the dissolved-phase groundwater plumes. Through remedial activities by the PRPs, these sources can also be reduced in strength and contained to a limited area, or even eliminated.

### 1.2.3. Nature of Contamination

The LADWP RI Report update (Brown and Caldwell, 2015) identified 93 chemicals in groundwater in the SFB; however, only a portion of these chemicals pose a long-term risk to human health or the environment. To prioritize these COCs, each of the 93 chemicals were evaluated with respect to occurrence in the SFB and LADWP production wells, toxicity, and relation to regulatory thresholds, as well as treatment requirements. Based on these criteria, a total of 12 COCs were identified as high priority in the basin, which consist of the following:

- TCE
- PCE
- *cis*-1,2-Dichloroethene (*cis*-1,2-DCE)
- 1,1-Dichloroethene (1,1-DCE)
- 1,2-Dichloroethane (1,2-DCA)
- Carbon tetrachloride (CTET)
- 1,2,3-trichloropropane (1,2,3-TCP)
- 1,4-dioxane
- N-Nitrosodimethylamine (NDMA)
- Hexavalent Chromium (Cr(VI))
- Perchlorate
- Nitrate

Other chemicals such as 1,1-DCA and MTBE were reported above established regulatory limits and/or met other criteria in the screening but did not meet the criteria for high-priority chemicals, thus will continue to be evaluated as lower priority chemicals.

Many of these chemicals will also be removed through remediation of the high-priority COCs.

LADWP will be developing screening criteria and revising the list of COCs specific to individual wellfields. The revised list will be discussed in the Raw Water Quality Characterization Section of the 97-005 evaluation.

#### **1.2.3.1. Extent of High-Priority Organic and Inorganic COCs**

As part of the LADWP RI Update, a total of nine organic chemicals were identified as high-priority COCs. The organic COCs are generally associated with use of chlorinated solvents in the basin and are either a primary solvent (TCE, PCE, 1,2,3-TCP and CTET), a daughter product of a primary solvent from abiotic or biotic reduction (cis-1,2-DCE, 1,1-DCE, 1,2-DCA), or in the case of 1,4-dioxane, directly associated with chlorinated solvent usage as a chemical stabilizer. Due to the relationship between these compounds, they were generally released simultaneously or in sequence as substitutions in solvents were made in industry application (e.g., TCE usage gave way to 1,1,1-TCA in the 1970's); hence, they have a generally similar horizontal and vertical distribution.

Three inorganic COCs were identified as high-priority: Cr(VI), perchlorate, and nitrate. Unlike the organic COCs, the inorganic COCs come from diverse sources. Cr(VI) comes from both natural and manufacturing sources. Perchlorate comes from currently not-yet-identified sources, though likely through explosive manufacturing, rocket fuel manufacturing, or disposal of products related to these two sources. Nitrate can be primarily attributed to historical agricultural and domestic land uses in the SFB.

Attachment D shows shallow and deep plume maps for TDS and the following high-priority COCs in groundwater: cis-1,2-DCE, 1,1-DCE, nitrate (shallow zone only), and perchlorate. These plume maps were developed in February, 2015 under the GSIS project using data from GSIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly production well sampling results, and concentration values provided by the EPA from the 2012 to 2014 monitoring years.

CTET, 1,2-DCA and NDMA are high-priority COCs, but due to their sporadic detection in monitoring wells and production wells in the SFB, maps of their distribution have not been developed. Though not presented, these chemicals generally occur in the same areas as the other organic chemicals and are related to the primary releases.

Attachment E provides EPA's plume maps for TCE, PCE, hexavalent chromium, total chromium, 1,4-dioxane and 1,2,3-TCP. These plume maps were developed in 2014 using the most recent analytical results available to EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.

#### **1.2.4. Known and Potential Contaminants Sources**

An assessment was conducted to identify the origin of known detected contaminants in groundwater and to identify the potential contamination sources currently or historically present in the source water capture zones. The search was completed using reasonably ascertainable environmental databases, including:

- ❖ GeoTracker, the Regional Water Quality Control Board (RWQCB) database. This database provides regulatory data for the following type of sites/facilities:
  - ✓ Leaking Underground Storage Tanks (LUST) cleanup sites
  - ✓ Cleanup Program Sites (CPS, also known as Site Cleanups, or SC)
  - ✓ Military sites (consisting of Military UST sites, Military Privatized sites, and Military Cleanup sites, formerly known as DoD non UST)
  - ✓ Land Disposal sites (Landfills)
  - ✓ Permitted UST facilities
  - ✓ Waste Discharge Requirement (WDR) sites
  
- ❖ EnviroStor, the Department of Toxic Substances Control (DTSC) database. This database provides all existing information on permits and corrective action at hazardous waste facilities, as well as site cleanup projects.

Tables 1-1 and 1-2 below provide the lists of open contamination sites within the 10-year capture zones of the three wellfields, NHW, RT and TJ obtained from the RWQCB and DTSC databases. Figure 1-5 below shows the contaminant sources in the SFB while figure 1-6 through 1-8 display the 2-, 5- and 10-year capture zones superimposed over the locations of various contaminant source sites in NHW, RT and TJ wellfields.



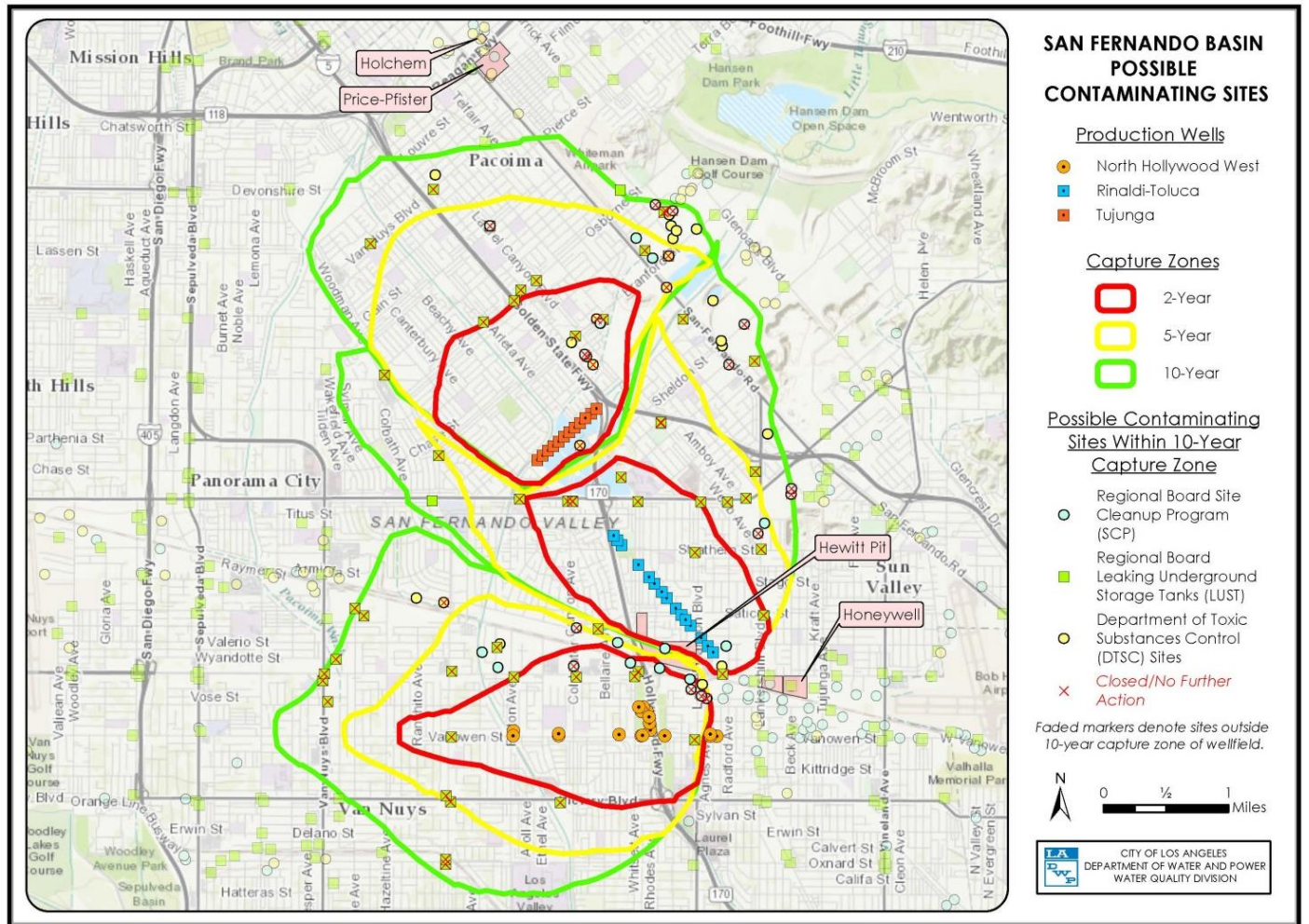


Figure 1-5: Possible Contaminating Sites in the SFB

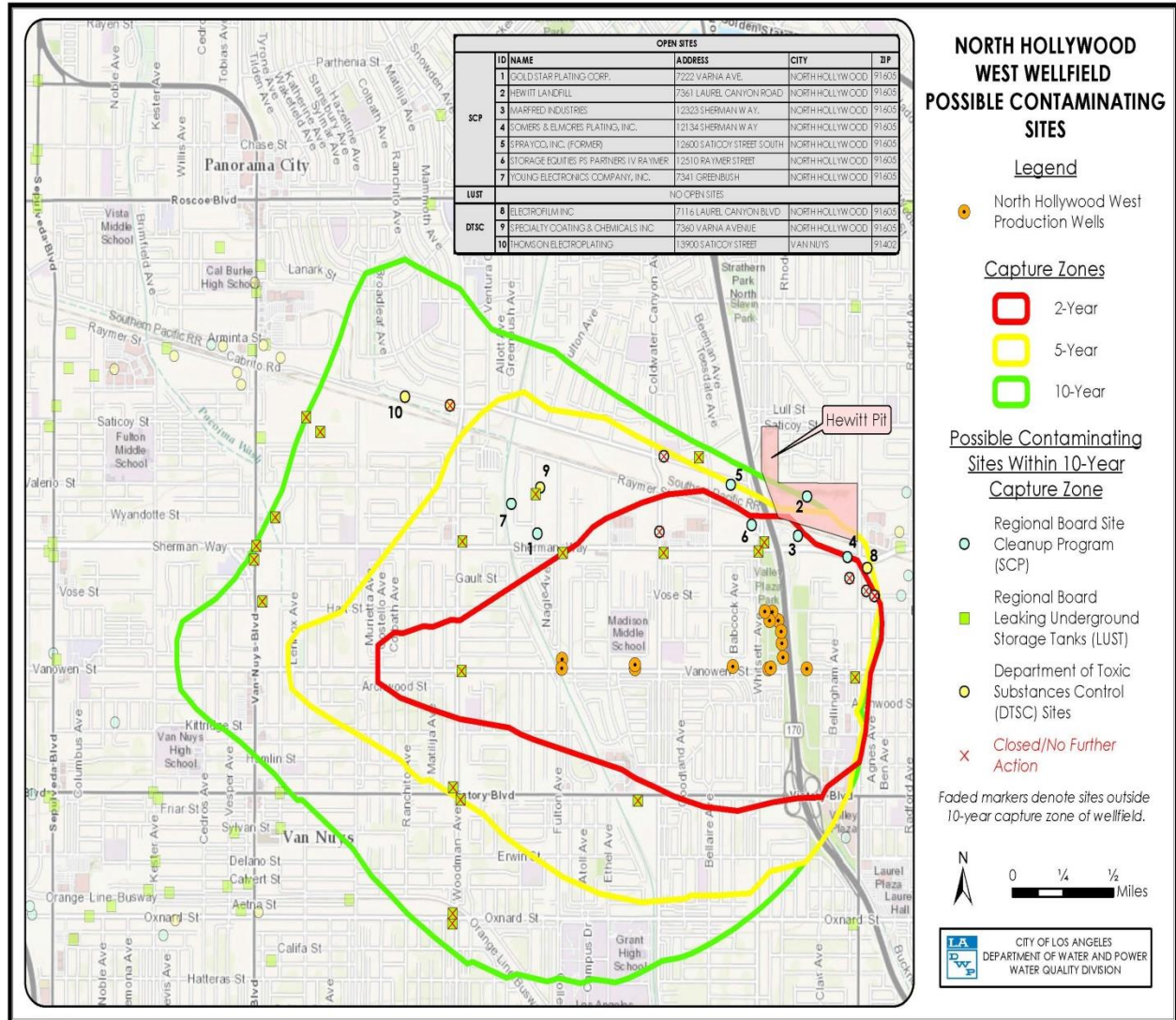


Figure 1-6: Possible Contaminating Sites within NHW 10-Year Capture Zone



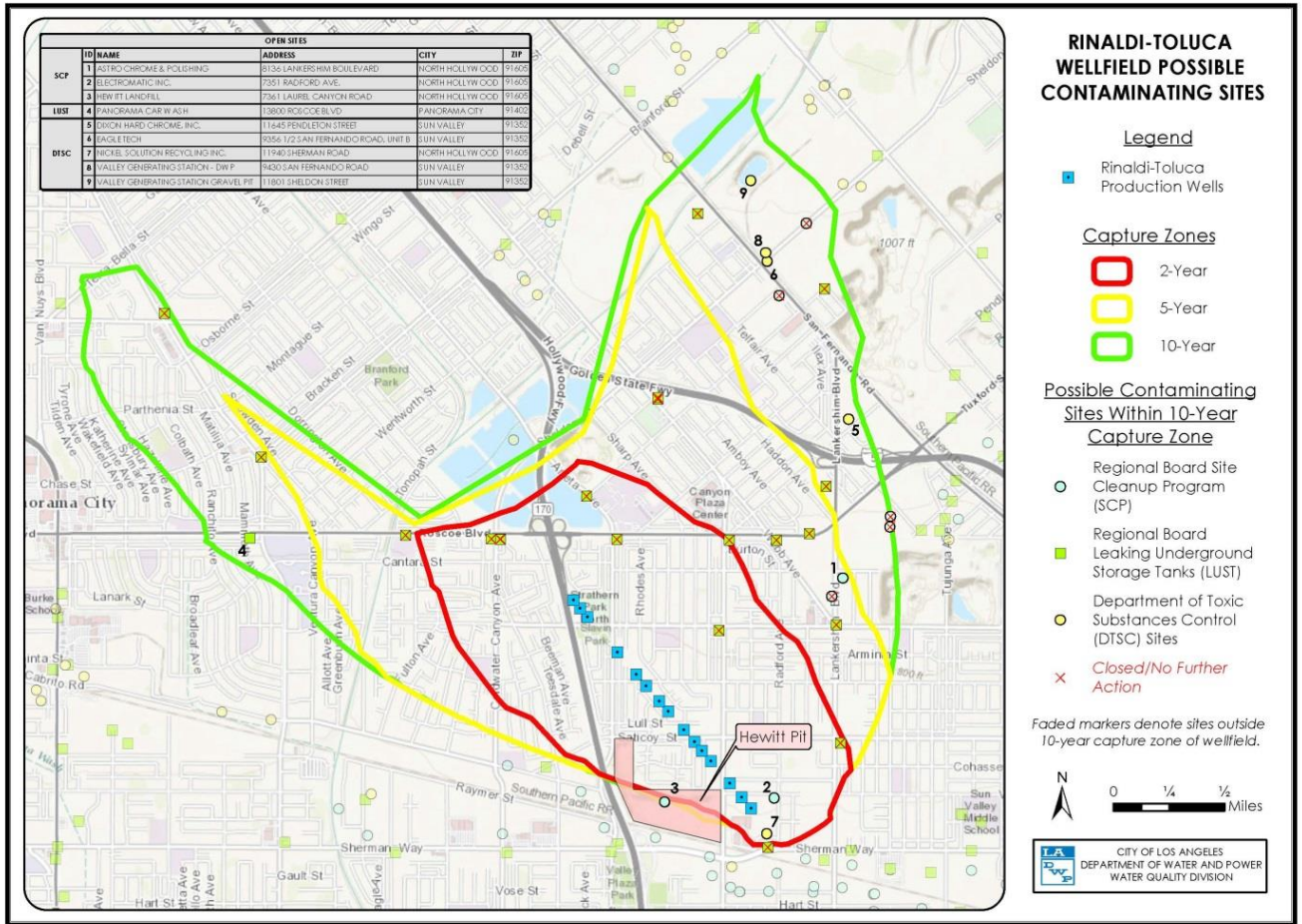


Figure 1-7: Possible Contaminating Sites within RT 10-Year Capture Zone

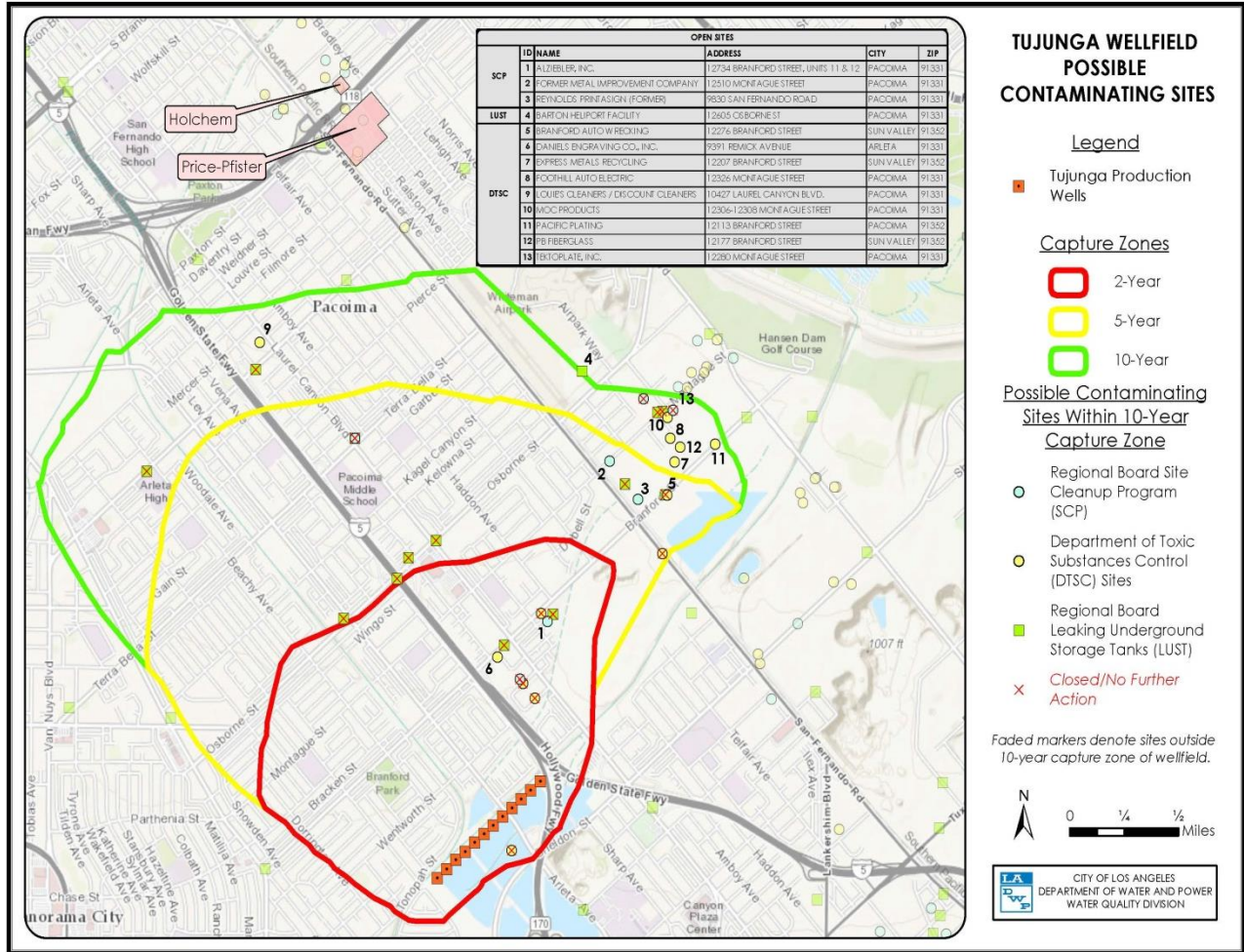


Figure 1-8: Possible Contaminating Sites within TJ 10-Year Capture Zone

**Table 1-1: RWQCB Open Sites within TJ, RT and NHW 10 Year Capture Zones**

PROJECT_NAME	PROJECT_TYPE	STATUS	STATUS_DATE	Confirmed_COCS	Suspected_COCS
ABBOT INDUSTRIAL SUPPLIES INTERNATIONAL INC.	CLEANUP PROGRAM SITE	OPEN - ASSESSMENT & INTERIM REMEDIAL ACTION	5/13/2014		VOCs, Dioxane
ALLIED SIGNAL INC-N HOLLYWOOD	CLEANUP PROGRAM SITE	OPEN - REMEDIATION	7/20/2010	VOCs, Dioxane, CrVI	
ALZIEBLER, INC.	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	2/3/2016		VOCs
ASTRO CHROME & POLISHING	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	8/18/2014		VOCs, CrVI
AVECOR, INC.	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	2/17/2016		VOCs, CrVI
BURBANK PLATING SER.	CLEANUP PROGRAM SITE	OPEN - INACTIVE	10/30/2014		VOCs, CrVI
CALIFORNIA TECHNICAL PLATING, INC.	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	3/2/2015	VOCs, CrVI	
ELECTROMATIC INC.	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	12/23/2015		VOCs, CrVI
FORMER METAL IMPROVEMENT COMPANY	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	5/17/2016		VOCs
GOLD STAR PLATING CORP.	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	9/24/2015		VOCs, CrVI
HEWITT LANDFILL	CLEANUP PROGRAM SITE	OPEN - ASSESSMENT & INTERIM	9/22/2015	VOCs, Dioxane,	
HOLCHEM INCORPORATED	CLEANUP PROGRAM SITE	OPEN - INACTIVE	1/30/2015	VOCs, CrVI	
JESSE'S PLATING (FORMER HVC)	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	2/11/2016		VOCs, CrVI
KAISER PERMANENTE	CLEANUP PROGRAM SITE	OPEN - INACTIVE	11/3/2014		VOCs
KLEANERETTE CLEANERS	CLEANUP PROGRAM SITE	OPEN - INACTIVE	10/30/2014	VOCs	
MARFRED INDUSTRIES	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	2/18/2016		VOCs, Dioxane
MAYONI ENTERPRISES, INC.	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	12/16/2015		VOCs
NORTH HOLLYWOOD INDUSTRIAL L.L.C.	CLEANUP PROGRAM SITE	OPEN - ASSESSMENT & INTERIM	5/7/2014		VOCs, Dioxane
PRICE PFISTER	CLEANUP PROGRAM SITE	OPEN - REMEDIATION	9/22/2015	VOCs, CrVI, Dioxane	
REYNOLDS PRINTASIGN (FORMER)	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	3/23/2016		Dioxane
SOMERS & ELMORES PLATING, INC.	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	3/2/2015		VOCs, CrVI
SPRAYCO, INC. (FORMER)	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	8/25/2015	VOCs	
STORAGE EQUITIES PS PARTNERS IV RAYMER	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	6/4/2014		VOCs
YOUNG ELECTRONICS COMPANY, INC.	CLEANUP PROGRAM SITE	OPEN - SITE ASSESSMENT	7/27/2015		VOCs, CrVI

**Table 1-2: DTSC Contaminant Sources within TJ, RT and NHW 10 Year Capture Zone**

SITE_FACILITY_NAME	ADDRESS_DESCRIPTION	CITY	Confirmed COCs	Suspected COCs
ALERT PLATING	9939 GLENOAKS BLVD.	SUN VALLEY		VOCs, CrVI
AMERICAN ETCHING AND MANUFACTURING	13730 DESMOND ST	PACOIMA		VOCs
AMERICAN ETCHING MANUFACTURING	13730 DESMOND ST	PACOIMA		VOCs
AUTO HEAVEN DISMANTLING	14546 RAYMER ST	VAN NUYS		petroleum
BRANFORD AUTO WRECKING	12276 BRANFORD ST	SUN VALLEY		
BURBANK PLATING	13561 DESMOND ST	PACOIMA		CrVI, cadmium, cyanide, zinc
D & M STEEL, INC.	11035 SUTTER AVE	PACOIMA		
DANIELS ENGRAVING CO., INC.	9391 REMICK AVE	ARLETA		VOCs
DIXON HARD CHROME, INC.	11645 PENDLETON ST	SUN VALLEY		VOCs, CrVI
EAGLE TECH	9558 1/2 SAN FERNANDO RD	SUN VALLEY		VOCs, CrVI
ELECTROFILM INC	7116 LAUREL CANYON BLVD	NORTH HOLLYWOOD		
EXPRESS METALS RECYCLING	12207 BRANFORD ST	SUN VALLEY		lead, mercury, PCBs
FLAME-X CONTROL CORPORATION	14810-18 RAYMER ST	VAN NUYS		
FOOTHILL AUTO ELECTRIC	12326 MONTAGUE ST	PACOIMA		
FORMER JESSE'S PLATING	11103 RANDALL ST	SUN VALLEY		VOCs
FORMER TURBO PRODUCTS	12177 MONTAGUE ST	PACOIMA		VOCs
GENERAL MOTORS CORP - GM ASSEMBLY DIV	8000 VAN NUYS BLVD	VAN NUYS		
GENERAL MOTORS VAN NUYS ASSEMBLY PLANT	8000 VAN NUYS BLVD	VAN NUYS		
HR TEXTRON	12137 MONTAGUE	PACOIMA	VOCs	
INDUSTRIAL METAL PLATING	12300 BRANDFORD STREET	SUN VALLEY		VOCs, CrVI
JESSE'S PLATING	12229 MONTAGUE ST	PACOIMA		VOCs, CrVI
LA DEPARTMENT WATER & POWER	14453 OXNARD ST	VAN NUYS	lead, PCB, petroleum	
LEDGER LANDFILL	10403 GLENOAKS BLVD	PACOIMA	VOCs	
LOUIE'S CLEANERS / DISCOUNT CLEANERS	10427 LAUREL CANYON BLVD.	PACOIMA		PCE
M & R PLATING	11679 SHELDON ST	PACOIMA		VOCs
MOC PRODUCTS	12508-12508 MONTAGUE ST	PACOIMA		VOCs
NICKEL SOLUTION RECYCLING INC.	11940 SHERMAN ROAD	NORTH HOLLYWOOD		metals
OCCIDENTAL COATING COMPANY	14533 KESWICK ST	VAN NUYS		metals
PACIFIC PLATING	12113 BRANFORD ST	PACOIMA		VOCs, CrVI
PB FIBERGLASS	12177 BRANFORD ST	SUN VALLEY		metals, BTEX
SPECIALTY COATING & CHEMICALS INC	7360 VARNA AVE	NORTH HOLLYWOOD		VOCs
TEC PROCESSING	11263 ILEX AVE	PACOIMA		VOCs
TEKTOPLATE, INC.	12280 MONTAGUE ST	PACOIMA		VOCs
THERMAL TECHNOLOGIES	11660 SHELDON ST	PACOIMA		VOCs
THOMSON ELECTROPLATING	13900 SATICOY ST	VAN NUYS		VOCs, cyanide
TRUESDALE CENTER - LA DWP	11791 TRUESDALE ST	SUN VALLEY		lead, petroleum, PCBs
ULTRAMET	12173 MONTAGUE ST	PACOIMA	HCl, HNO3	
VALLEY GENERATING STATION - DWP	9430 SAN FERNANDO RD	SUN VALLEY		metals
VALLEY GENERATING STATION GRAVEL PIT	11801 SHELDON ST	SUN VALLEY		metals, PCBs
VISHAY TECHNO	7803 & 7777 LEMONA AVE	VAN NUYS	VOCs	

### **1.2.5. Water Quality and Prediction of Contaminants Trends in Source Water**

The source water evaluated in this section is the groundwater contained within the capture zones of NH West, RT and Tujunga wellfields. These production wells are located in the north area of the SFB. Figure 1-3 shows the location of these wellfields and their 2-, 5-, and 10-year capture zones. This section will give an overview of each of the above-mentioned wellfields, their historical water production, and historical water quality. Additionally, an analysis of the extent of contamination and the estimated water quality trends in each of the wellfields will be presented. A series of charts providing a 16-year time series for the primary COCs as well as their historical maxima, average current concentrations in each wellfield are included in Attachment C.

Table 1-3 provides a 16-year summary of historical water quality data (Maximum, Average and Current). The historical water quality data does not just include the 12 high priority COCs identified in the RI Update Report of 2015, but also covers the 17 primary contaminants that LADWP monitors as part of its blending plan with DDW. The list of 17 contaminants includes: TCE, PCE, 1,1-DCE, 1,2,3-TCP, MTBE, carbon tetrachloride, NDMA, 1,4-dioxane, nitrate, TDS, perchlorate, total chromium, hexavalent chromium, iron, manganese, uranium and Freon 11.



**Table 1-3: NHW, RT, and TJ Wellfields 17 Water Quality Constituents Summary Table  
(January 1, 2000 to April 30, 2016)**

Well	1,1-DCE			1,2,3-TCP			1,4-Dioxane		
	MCL: 6 µg/L			NL: 0.005 µg/L			NL: 1 µg/L		
	max	avg	current	max	avg	current	max	avg	current
<b>North Hollywood West</b>									
NH004	ND	ND	ND	ND	ND	ND	ND	ND	ND
NH007	ND	ND	ND	ND	ND	ND	ND	ND	ND
NH022	7.1	1.14	ND	0.0108	0.0016	ND	ND	ND	ND
NH023	2.43	0.16	ND	ND	ND	ND	7.6	2.37	ND
NH025	2.2	0.23	ND	ND	ND	ND	0.044	0.00	ND
NH026	2.02	0.11	ND	ND	ND	ND	2.31	0.68	ND
NH032	ND	ND	ND	ND	ND	ND	ND	ND	ND
NH033	ND	ND	ND	ND	ND	ND	ND	ND	ND
NH034	14.7	1.84	ND	ND	ND	ND	3.17	0.92	ND
NH036	9.3	1.28	ND	0.00662	0.00039	ND	1.34	0.36	ND
NH037	12	1.06	ND	ND	ND	ND	15.1	6.23	ND
NH043A	2.63	0.23	0.83	0.0021	0.00012	ND	35.2	10.45	12.3
NH044	0.75	0.02	ND	ND	ND	ND	2.2	0.59	0.546
NH045	0.79	0.05	ND	ND	ND	ND	7.59	1.92	0.914
<b>Rinaldi Toluca</b>									
RT001	ND	ND	ND	ND	ND	ND	0.15	0.03	ND
RT002	ND	ND	ND	ND	ND	ND	0.543	0.09	ND
RT003	0.99	0.07	ND	ND	ND	ND	ND	ND	ND
RT004	0.94	0.05	ND	ND	ND	ND	0.762	0.19	ND
RT005	0.64	0.005	ND	ND	ND	ND	ND	ND	ND
RT006	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT007	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT008	ND	ND	ND	ND	ND	ND	0.048	0.01	ND
RT009	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT010	ND	ND	ND	ND	ND	ND	0.084	0.02	ND
RT011	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT012	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT013	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT014	0.58	0.01	ND	ND	ND	ND	ND	ND	ND
RT015	ND	ND	ND	ND	ND	ND	1.14	0.36	0.774
<b>Tujunga</b>									
TJ001	ND	ND	ND	ND	ND	ND	ND	ND	ND
TJ002	1.7	0.05	ND	ND	ND	ND	ND	ND	ND
TJ003	3.54	0.28	ND	0.006	0.0002	ND	0.15	0.01	ND
TJ004	3.7	0.48	ND	0.020	0.0042	ND	ND	ND	ND
TJ005	7.35	1.32	ND	0.013	0.0022	0.0112	ND	ND	ND
TJ006	12.9	3.13	2.7	ND	ND	ND	1.45	0.39	0.61
TJ007	14.6	4.99	6.6	0.0051	0.0001	ND	1.53	0.71	1.53
TJ008	15.9	3.61	5.05	ND	ND	ND	1.08	0.19	0.839
TJ009	8.52	1.68	2.87	ND	ND	ND	0.954	0.28	0.677
TJ010	2.56	0.58	1.63	ND	ND	ND	1.57	0.48	0.979
TJ011	2.42	0.53	0.94	ND	ND	ND	1.1	0.86	1.1
TJ012	2	0.09	ND	ND	ND	ND	0.2	0.01	ND



Well	Carbon Tetrachloride			Hexavalent Chromium			Total Chromium		
	MCL: 0.5 µg/L			MCL: 10 µg/L			MCL: 50 µg/L		
	max	avg	current	max	avg	current	max	avg	current
<b>North Hollywood West</b>									
NH004	ND	ND	ND	1.1	0.08	0.204	4.4	0.2	ND
NH007	ND	ND	ND	1.49	0.05	ND	6.6	0.4	1.2
NH022	ND	ND	ND	2.69	1.44	1.32	3.4	0.8	ND
NH023	ND	ND	ND	3.02	2.08	1.67	2.7	1.2	1.8
NH025	ND	ND	ND	1.84	1.16	0.85	1.8	0.7	1.3
NH026	ND	ND	ND	2.37	1.70	1.75	2.5	1.0	1.7
NH032	ND	ND	ND	ND	ND	ND	ND	ND	ND
NH033	ND	ND	ND	0.5	0.08	ND	ND	ND	ND
NH034	ND	ND	ND	4.52	3.66	4.38	6.8	1.8	4.1
NH036	ND	ND	ND	5.1	3.46	3.4	4.3	1.6	4.1
NH037	ND	ND	ND	7.2	3.53	2.77	6.8	3.2	4.1
NH043A	ND	ND	ND	2.5	1.08	0.993	2.8	0.4	1.1
NH044	ND	ND	ND	2.2	1.23	1.17	2.9	0.6	1.7
NH045	ND	ND	ND	4.1	3.17	2.47	4.3	1.4	3.2
<b>Rinaldi Toluca</b>									
RT001	ND	ND	ND	1.25	0.93	0.629	1.7	0.6	ND
RT002	ND	ND	ND	2.37	1.75	1.6	2.1	1.0	1.6
RT003	ND	ND	ND	2.42	1.83	2.42	2.6	1.1	2.6
RT004	ND	ND	ND	2.54	2.01	2.15	2.7	1.5	1.6
RT005	ND	ND	ND	2.72	2.22	2.26	3.1	1.6	2.2
RT006	ND	ND	ND	2	1.56	1.5	2.6	1.2	1.6
RT007	ND	ND	ND	1.92	1.59	1.69	2.2	1.1	1.6
RT008	ND	ND	ND	2.4	1.46	1.94	2.6	1.1	1.2
RT009	ND	ND	ND	1.62	1.12	1.36	1.5	0.4	1.3
RT010	ND	ND	ND	2.3	1.39	1.21	2.7	0.7	1.1
RT011	ND	ND	ND	1.6	1.40	1.05	1.8	0.6	1.1
RT012	ND	ND	ND	2	1.71	1.63	6.1	1.5	1.2
RT013	ND	ND	ND	2	1.77	1.7	2.5	1.2	1.1
RT014	ND	ND	ND	1.4	1.15	0.85	2	0.6	ND
RT015	ND	ND	ND	1.8	1.62	1.59	2.7	1.1	ND
<b>Tujunga</b>									
TJ001	ND	ND	ND	3.8	3.14	3.67	3.7	2.0	3.6
TJ002	ND	ND	ND	4	2.40	2.47	3.1	1.5	3.1
TJ003	ND	ND	ND	1.95	1.31	1.95	1.7	0.6	1.7
TJ004	0.513	0.003	ND	2.9	1.79	1.87	2	0.7	2
TJ005	1.25	0.103	ND	1.8	1.31	1.3	2.1	1.2	1.8
TJ006	1.8	0.135	ND	4.3	1.62	1.39	3.6	1.1	1.3
TJ007	2.03	0.452	0.268	2.6	1.70	1.41	2.3	1.3	1.8
TJ008	1.8	0.295	0.256	2.6	1.58	0.79	2.2	0.4	1.3
TJ009	0.785	0.028	ND	1.3	0.96	0.74	1.2	0.1	ND
TJ010	ND	ND	ND	2.5	0.99	0.867	1.3	0.3	ND
TJ011	ND	ND	ND	2.5	1.58	1.11	1.9	0.6	1
TJ012	ND	ND	ND	1.8	0.65	0.69	1.2	0.2	ND

Well	Iron			Freon 11			Manganese		
	SMCL: 300 µg/L			MCL: 150 µg/L			SMCL: 50 µg/L		
	max	avg	current	max	avg	current	max	avg	current
<b>North Hollywood West</b>									
NH004	204	63.3	204	ND	ND	ND	9.7	3.4	4.5
NH007	15000	5379.0	1050	ND	ND	ND	413	257.5	290
NH022	81.5	48.5	39	ND	ND	ND	10.9	3.5	ND
NH023	312	50.8	33.3	0.727	0.024	ND	8.6	3.6	ND
NH025	31.8	10.6	31.8	ND	ND	ND	4.5	1.0	ND
NH026	ND	ND	ND	0.28	0.005	ND	ND	ND	ND
NH032	31.4	15.7	31.4	ND	ND	ND	108	52.8	46.4
NH033	172	86.0	ND	ND	ND	ND	3.2	1.5	ND
NH034	465	222.8	34.4	ND	ND	ND	7.7	2.8	ND
NH036	55.1	27.6	ND	ND	ND	ND	2.1	0.5	ND
NH037	39.9	27.8	25.6	ND	ND	ND	11.1	2.8	ND
NH043A	100	38.3	100	0.663	0.014	0.614	2.9	1.7	2.9
NH044	902	127.6	60.5	ND	ND	ND	19.9	5.8	5.6
NH045	ND	ND	ND	ND	ND	ND	ND	ND	ND
<b>Rinaldi Toluca</b>									
RT001	ND	ND	ND	ND	ND	ND	0.38	0.08	ND
RT002	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT003	76.3	54.4	76.3	ND	ND	ND	ND	ND	ND
RT004	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT005	30	10	30	ND	ND	ND	ND	ND	ND
RT006	ND	ND	ND	ND	ND	ND	ND	ND	ND
RT007	21.7	7.2	ND	1.26	0.10	ND	ND	ND	ND
RT008	35	19.5	23.4	3.43	0.36	1.64	2.6	1.0	ND
RT009	ND	ND	ND	1.66	0.10	0.682	4.3	0.9	ND
RT010	31.3	7.8	ND	ND	ND	ND	0.19	0.03	ND
RT011	56.8	18.9	ND	ND	ND	ND	2.3	0.6	ND
RT012	29.5	14.8	ND	ND	ND	ND	8.5	2.1	ND
RT013	21.5	10.8	ND	ND	ND	ND	ND	ND	ND
RT014	45.6	15.2	ND	ND	ND	ND	284	58	ND
RT015	668	272.7	141	ND	ND	ND	57.4	16.8	6.1
<b>Tujunga</b>									
TJ001	ND	ND	ND	40.4	0.30	ND	ND	ND	ND
TJ002	ND	ND	ND	ND	ND	ND	ND	ND	ND
TJ003	78.6	26.2	ND	ND	ND	ND	ND	ND	ND
TJ004	ND	ND	ND	ND	ND	ND	ND	ND	ND
TJ005	ND	ND	ND	0.566	0.0	ND	ND	ND	ND
TJ006	26.1	4.4	26.1	6.93	0.6	1.78	2.1	0.23	ND
TJ007	ND	ND	ND	35.1	5.7	14.9	ND	ND	ND
TJ008	ND	ND	ND	30.5	1.3	1.98	2.4	0.3	ND
TJ009	ND	ND	ND	29.2	2.9	9.56	ND	ND	ND
TJ010	20.7	5.2	20.7	83.1	12.7	32.7	0.18	0.04	ND
TJ011	ND	ND	ND	140	22.5	24.1	ND	ND	ND
TJ012	ND	ND	ND	244	32.9	27.7	ND	ND	ND

Well	MTBE			NDMA			Nitrate (N)		
	MCL: 5 µg/L			NL: 10 ng/L			MCL: 10 mg/L		
	max	avg	current	max	avg	current	max	avg	current
<b>North Hollywood West</b>									
NH004	ND	ND	ND	ND	ND	ND	3.92	2.01	2.56
NH007	ND	ND	ND	-	-	-	5.79	3.03	4.65
NH022	ND	ND	ND	-	-	-	9.1	5.12	6.91
NH023	ND	ND	ND	ND	ND	ND	10.5	6.54	7.73
NH025	ND	ND	ND	ND	ND	ND	4.92	3.80	3.81
NH026	ND	ND	ND	-	-	-	9.2	5.16	5.1
NH032	ND	ND	ND	-	-	-	2.01	0.92	1.04
NH033	ND	ND	ND	ND	ND	ND	1.83	0.92	0.493
NH034	ND	ND	ND	-	-	-	7.31	3.51	1.55
NH036	ND	ND	ND	-	-	-	7.32	3.48	1.41
NH037	ND	ND	ND	ND	ND	ND	7.67	3.17	1.5
NH043A	ND	ND	ND	ND	ND	ND	10.4	3.45	6.95
NH044	ND	ND	ND	ND	ND	ND	3.12	1.83	1.35
NH045	ND	ND	ND	-	-	-	4.18	2.45	3.17
<b>Rinaldi Toluca</b>									
RT001	ND	ND	ND	ND	ND	ND	6.58	3.15	4.15
RT002	ND	ND	ND	-	-	-	7.09	3.91	2.74
RT003	ND	ND	ND	-	-	-	5.94	3.94	4
RT004	ND	ND	ND	-	-	-	5.64	4.33	4.81
RT005	ND	ND	ND	-	-	-	6.56	4.40	5.7
RT006	ND	ND	ND	-	-	-	5.37	3.43	4.69
RT007	ND	ND	ND	-	-	-	4.9	3.68	4.59
RT008	ND	ND	ND	ND	ND	ND	5.14	3.11	4.12
RT009	ND	ND	ND	-	-	-	9.78	2.86	3.81
RT010	ND	ND	ND	ND	ND	ND	8.92	4.66	5.23
RT011	ND	ND	ND	-	-	-	6.18	2.75	3.23
RT012	ND	ND	ND	4.1	4.1	4.1	6.03	2.53	2.6
RT013	ND	ND	ND	-	-	-	5.65	2.55	3.01
RT014	ND	ND	ND	-	-	-	4.55	2.77	3.91
RT015	ND	ND	ND	ND	ND	ND	7.35	2.58	4.9
<b>Tujunga</b>									
TJ001	ND	ND	ND	ND	ND	ND	6.81	5.03	6.55
TJ002	1.06	0.008	ND	ND	ND	ND	6.14	4.33	5.21
TJ003	ND	ND	ND	ND	ND	ND	7.07	4.73	5.55
TJ004	ND	ND	ND	ND	ND	ND	9.01	5.27	4.94
TJ005	ND	ND	ND	2.4	0.06	ND	9.75	6.00	4.07
TJ006	1.54	0.008	ND	35	1	ND	10.6	6.81	5.49
TJ007	ND	ND	ND	33	1.05	ND	12	8.05	7.46
TJ008	ND	ND	ND	4.3	0.15714	ND	13.2	7.27	8.58
TJ009	2.36	0.015	ND	ND	ND	ND	12	6.73	8.95
TJ010	2.34	0.015	ND	ND	ND	ND	14.3	6.45	7.84
TJ011	1.56	0.011	ND	ND	ND	ND	12	5.21	7.26
TJ012	ND	ND	ND	ND	ND	ND	5.82	3.08	3.65

Well	PCE			Perchlorate			TCE		
	MCL: 5 µg/L			MCL: 6 µg/L			MCL: 5 µg/L		
	max	avg	current	max	avg	current	max	avg	current
<b>North Hollywood West</b>									
NH004	1.68	0.12	ND	ND	ND	ND	0.924	0.007	ND
NH007	1.64	0.19	0.554	ND	ND	ND	ND	ND	ND
NH022	1.53	0.21	ND	ND	ND	ND	12.3	1.8	ND
NH023	15.2	3.41	1.48	ND	ND	ND	35.1	14.6	7.7
NH025	0.25	0.00	ND	ND	ND	ND	2.49	0.3	ND
NH026	5.38	1.14	ND	ND	ND	ND	15.6	3.6	ND
NH032	0.669	0.01	ND	ND	ND	ND	ND	ND	ND
NH033	ND	ND	ND	ND	ND	ND	ND	ND	ND
NH034	3.13	0.55	ND	ND	ND	ND	10.5	1.9	ND
NH036	2.84	0.32	ND	ND	ND	ND	17.8	1.9	ND
NH037	8.32	1.53	ND	ND	ND	ND	10.2	2.2	ND
NH043A	15.6	1.80	15.4	ND	ND	ND	33	3.9	25.5
NH044	1.88	0.16	0.636	4.5	0.17	ND	8.1	1.0	1.34
NH045	2.31	0.43	1.49	ND	ND	ND	8.37	1.2	5.21
<b>Rinaldi Toluca</b>									
RT001	5.88	1.09	2.46	ND	ND	ND	52.6	10.8	23.4
RT002	2.7	0.39	ND	5.97	0.85	ND	17	3.3	3.53
RT003	3.1	0.42	1.13	9.42	2.23	ND	7.53	1.5	6.96
RT004	2.45	0.56	1.65	8.25	1.94	ND	5.99	1.2	5.99
RT005	2.62	0.25	2.49	2.41	0.37	ND	2.12	0.3	1.9
RT006	0.518	0.00	ND	9.2	0.53	ND	1.55	0.1	ND
RT007	ND	ND	ND	7.9	2.32	ND	2.67	0.6	ND
RT008	ND	ND	ND	6.6	0.83	ND	1.53	0.4	ND
RT009	ND	ND	ND	ND	ND	ND	1.25	0.2	ND
RT010	3.66	0.93	3.31	ND	ND	ND	48.7	11.2	18.4
RT011	4.6	0.67	1.84	ND	ND	ND	49.9	8.0	11.8
RT012	2.91	0.23	1.07	2.43	0.14	ND	29.9	3.2	5.16
RT013	3.46	0.40	1.74	ND	ND	ND	42	5.1	9.32
RT014	3.44	0.90	2.24	ND	ND	ND	41.7	10.6	29
RT015	5.32	0.89	2.59	ND	ND	ND	69	9.8	39.1
<b>Tujunga</b>									
TJ001	1.82	0.01	ND	4	0.70	ND	11.2	0.1	ND
TJ002	7.44	0.32	ND	2	0.05	ND	10.5	0.5	ND
TJ003	18.2	1.43	ND	2	0.04	ND	25.1	2.4	ND
TJ004	14.9	2.04	ND	3.67	0.38	ND	22.5	4.5	ND
TJ005	15.7	3.26	0.702	4.7	0.35	ND	29.2	7.3	0.962
TJ006	43.1	11.02	17.1	4.8	0.38	ND	46.4	13.7	11.9
TJ007	34.8	11.16	28.5	5.4	0.86	2	45.2	16.2	21.4
TJ008	27.6	3.28	10.6	4.9	0.28	ND	37.5	9.8	19.8
TJ009	8.77	1.73	4.81	5.5	0.65	2.08	21.5	6.8	13.1
TJ010	7.42	1.45	2.78	11	2.70	2.81	18.6	7.4	12.9
TJ011	2.81	1.10	2.13	21	4.65	2.77	20.1	8.8	12.4
TJ012	2.34	0.52	0.847	11	1.22	ND	11.1	3.2	4.29

Well	TDS			Uranium		
	SMCL: 500 mg/L			MCL: 20 pCi/L		
	max	avg	current	max	avg	current
<b>North Hollywood West</b>						
NH004	1100	1009	1060	6	5.0	5.36
NH007	1000	954	934	7.3	5.8	5.36
NH022	1160	980	858	3.95	3.6	3.28
NH023	957	710	684	3.7	3.0	3.02
NH025	990	942	971	3.8	3.6	3.35
NH026	1020	880	825	4.15	4.1	4.15
NH032	834	790	826	4.22	4.0	4.22
NH033	858	781	780	2.61	2.5	2.61
NH034	1020	851	695	4.09	3.9	3.75
NH036	974	914	974	3.89	3.7	3.69
NH037	796	730	675	4.8	3.8	3.55
NH043A	860	763	795	3.5	3.0	2.48
NH044	940	805	785	3.2	2.6	2.08
NH045	924	783	795	3.82	3.8	3.82
<b>Rinaldi Toluca</b>						
RT001	408	373	393	3.82	3.1	3.82
RT002	431	388	342	2.95	2.6	2.48
RT003	470	422	437	3.89	3.2	3.08
RT004	648	491	471	4.15	3.9	4.09
RT005	548	476	537	4.15	3.6	4.15
RT006	463	424	463	3.62	3.2	3.62
RT007	486	408	476	3.48	2.6	3.48
RT008	413	359	355	2.61	2.2	2.01
RT009	409	355	409	2.55	1.9	2.55
RT010	632	400	383	4.09	3.1	3.69
RT011	412	377	364	3.28	3.0	3.28
RT012	389	357	380	3.22	2.6	2.68
RT013	414	355	379	3.28	2.6	2.41
RT014	418	359	371	3.69	2.9	3.69
RT015	414	346	378	4.36	2.6	4.36
<b>Tujunga</b>						
TJ001	630	401	630	3.62	2.6	3.62
TJ002	430	379	386	2.01	1.9	2.01
TJ003	373	328	373	1.88	1.6	1.88
TJ004	392	365	392	1.94	1.8	1.94
TJ005	411	362	339	2.01	1.8	1.68
TJ006	469	383	410	2.61	2.2	2.61
TJ007	519	435	494	3.69	2.7	3.69
TJ008	569	407	549	3.95	2.9	3.89
TJ009	584	415	584	4.15	3.0	4.15
TJ010	600	484	554	6.16	4.7	4.42
TJ011	585	449	524	4.76	3.9	4.76
TJ012	483	417	483	5.63	3.8	5.63

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level

NL = Notification Level

ND = not detected

- not sampled

### 1.2.5.1. North Hollywood West (NHW) Wellfield Water Quality and Estimated Contaminant Trends

- **NHW Wellfield Overview**

The NHW wellfield is owned and operated by the LADWP as a permitted drinking water source for the City of Los Angeles. A total of 18 wells comprise the NHW wellfield, some of which have been destroyed or shut down indefinitely. While some wells were drilled as early as 1924 (NH-4), others have been drilled as recently as 1984 (NH-45) to provide additional supply for the City. The layout of the NHW wells is shown in Figure 1-9. Many of the newer wells are located in and around the Whitsett Fields Park. All NHW wells are taken south into a common collector line on Vanowen St., which flows east into the North Hollywood Pump Station for distribution.

The depth of the wells varies, with the newer wells typically being deeper (up to 944' in NH-37) than older wells (typically around 500'-600'). This is due to the larger production required from the newer wells. NH-45, for example, has a capacity of 7.7 cfs, while many of the older NHW wells are between 2 and 4 cfs. Attachment A, Pages F-4 through F-6 show a list of various design parameters of the NHW wells, such as capacity, drilling method, year drilled, etc.

Historically, the NHW wellfield has provided significant amounts of groundwater production to the City, while recent production has been more limited due to contamination.



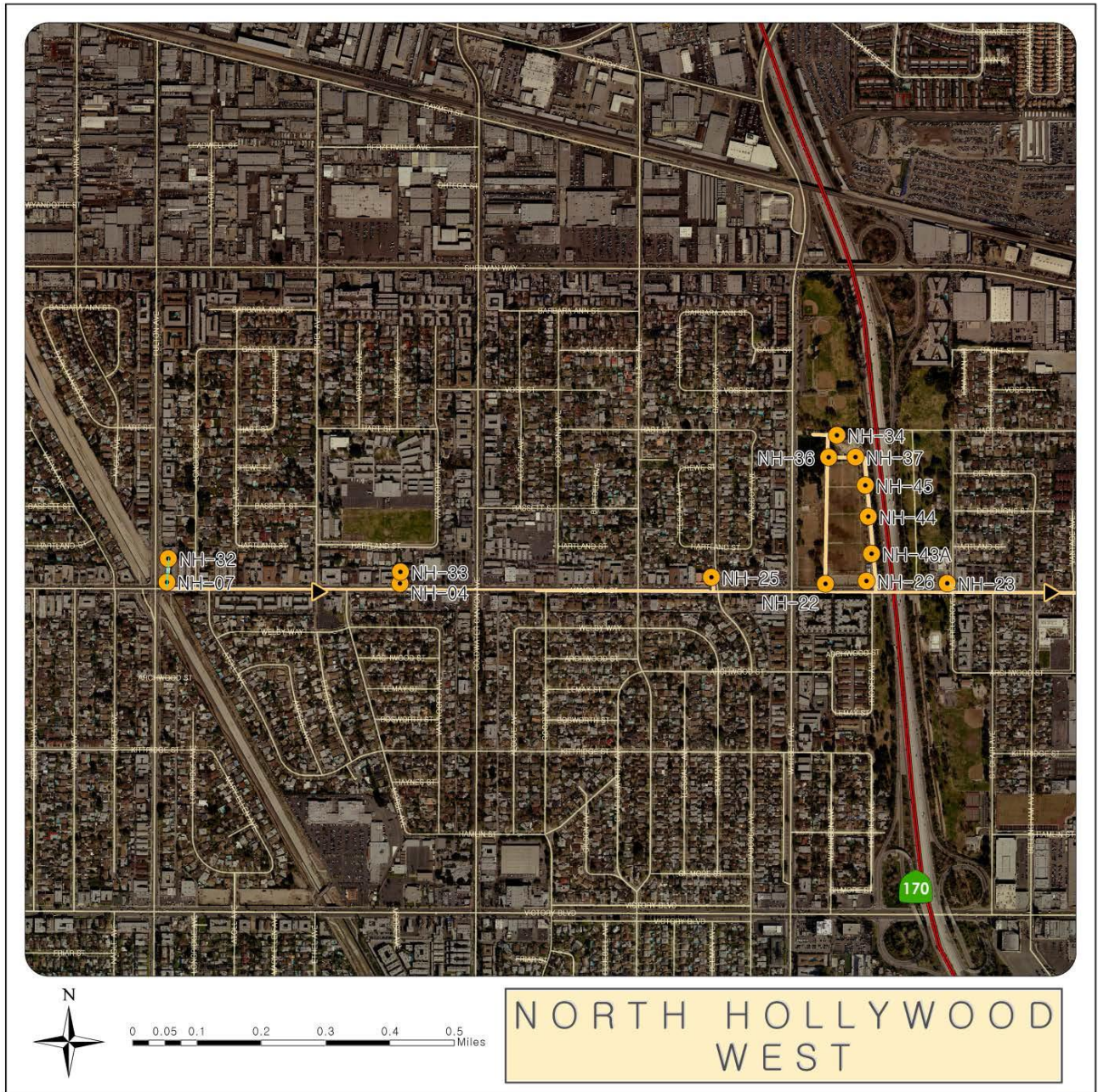


Figure 1-9: North Hollywood West Wellfield Layout

- **NHW Wellfield Contaminant Trends**

- **TCE**

Out of the three northern wellfields, TCE is the most prevalent in the NH wellfield, specifically the eastern portion of the wellfield near the NHOU source area. In the NHW portion of the wellfield, the TCE impacts are generally confined to the area east of the NH-22 production well, with the highest concentrations occurring between the NHW production wells and the southern section of the RT production wells. A previously unidentified area of elevated TCE concentrations (5 µg/L) was observed in monitoring well NH-MW-10 installed in 2014 approximately two miles west of the RT wellfields. There are currently no upgradient wells to evaluate the extent or location of another potential source area.

Historically, multiple NHW wells, especially wells NH-23, NH-26, and NH-43a, have shown maximum levels of TCE of 35.1 µg/L, 15.6 µg/L, and 33 µg/L, respectively (See table 1-3 above). With the exception of well NH-26, which shows decreasing concentrations below MCL, the general trend for the other 2 wells (Wells NH-23 and NH-43A) is stable but mostly above MCL.

- **PCE**

Unlike TCE, there appears to be a number of PCE sources besides the NH area in the vicinity in the NHW and NHE areas. There is a potential source area north of the NHW production wells near the Hewitt Pit that appears to be captured by the NHW wellfield (See Attachment E, page E-2). This can be observed in elevated concentrations of PCE in several of the northernmost NHW wells, including NH-37, where there are consistent detections of PCE during periods of pumping (See attachment C page C-42)

Based on the wells installed west of the RT wellfield, there also appears to be a potential source of PCE west of the NHW wells. This can be observed through concentrations in the westernmost monitoring well (NH-MW-08) at 22 and 0.54 µg/L at depths of 430 and 770 feet bgs, respectively (See table 1-4). NH-23 has had



consistent PCE detections since 2009 with a generally increasing trend and historical maximum of 15.2 µg/L (see attachment C, pages C-42 & C-43). PCE in NH-32, located in the vicinity of NH-06, has generally been below the laboratory reporting limit, but this is likely due to the depth and greater pumping from this well causing dilution of PCE results.

➤ **1,1-DCE**

The NHW wellfield has historically shown detectable concentrations of 1,1-DCE; however, no significant concentrations of this chemical were found during the 2012 through 2014 sampling of new or existing wells. However, historical water quality data of the well within the NHW wellfield shows that wells NH-22, NH-34 and NH-36 have had exceedances above the MCL. Observing the time series for each the three wells shows that the general trend of concentrations in these wells is declining and that concentrations have been mostly below the MCL in these wells, as well as others within the NHW wellfield.

➤ **1,4-Dioxane**

In the vicinity of the NHW production wells, 1,4-dioxane in shallow groundwater above the notification level is generally located immediately east of the wellfield. These concentrations appear to be influenced by the plume emanating from the Hewitt Pitt area north of the wellfield. Concentrations in wells immediately east of the NHW production wells are generally above the notification level. For example, well NH-C09-310 (located ¼ mile east of the wellfield) has a 1,4-dioxane concentration of 110 µg/L based on the sampling performed on 7/3/2013. Concentrations in this area generally decrease with depth, though there is a separate area west of the production wells where 1,4-dioxane was only detected in deeper groundwater (NH-MW-08-430 at 0.13 µg/L).

➤ **Hexavalent Chromium**

Concentrations of Cr (VI) in NHW generally increase from west to east towards the source area in the NHE area. The maximum concentration observed in NHW, 8.7 µg/L, is from the shallow monitoring well at NH-MW-06. There are additional elevated concentrations of Cr(VI) northwest of the production wells, with the maximum concentration observed in NH-MW-09 at a concentration of 7.7 µg/L. NHW production wells have concentrations generally ranging between 2 and 5 µg/L.

➤ **Perchlorate**

Perchlorate is generally not reported in shallow or deep groundwater in the NHW area. None of LADWP's monitoring wells or production wells in the wellfield have current detectable concentrations of perchlorate.

➤ **Nitrate**

Nitrate concentrations in the vicinity of the NH wellfields range from values below the laboratory reporting limit to a maximum value of 85 mg/L as NO<sub>3</sub> during the 2013/14 GSIS sampling program. Values above the MCL are confined to the NHE wellfield, with concentrations becoming progressively higher from NHW to NHE. Based on historical water quality data and historical extraction, it appears there is a response in nitrate concentration to pumping in the NHW wells, indicating that there may be some mobilization and capture of the nitrate plume from the east during intervals of higher pumping. Please see Historical Nitrate concentrations in attachment C page C-61 & C-62 and historical water extractions from NHW wellfield in attachment F page F-11. Historical water quality data show that average concentrations in NHW range between 5 to 25 mg/L as NO<sub>3</sub> which is below the MCL of 45 mg/L as NO<sub>3</sub>.

### ➤ **Other Contaminants of Concern**

Historical water quality for other contaminants of concern such as methyl tert-butyl ether (MTBE), CTET and NDMA have been examined and they were generally not reported in shallow or deep groundwater in the NHW area. See attachment C.

#### **1.2.5.2. Rinaldi Toluca (RT) Wellfield Water Quality and Estimated Contaminant Trends**

##### **• RT Wellfield Overview**

The RT wellfield is owned and operated by the LADWP as a permitted drinking water source for the City of Los Angeles, and is a relatively new wellfield within the City consisting of 15 wells, numbered from RT-1 through RT-15. The wells were drilled between 1985 and 1988 and were intended to supplement production to the City after contamination was discovered in other wellfields such as North Hollywood East. A layout of the wellfield is shown in Figure 1 1-10; unlike the North Hollywood West wells, the arrangement of the RT wells is fairly straightforward, appearing to be in roughly a straight line. The wells are bounded by the 170 freeway to the west, Radford Avenue to the east, Cantara Street to the north, and Sherman Way to the south. The RT wells were drilled within the LADWP Power System right-of-way corridor, in which multiple sets of high-voltage power lines run from northwest to southeast. The space between the wells varies between roughly 300 feet to almost 1,000 feet. Note that although the wells appear to run in one direction along this path, the wells are not numbered sequentially. Groundwater from this wellfield is collected in a common collector line that runs along the same general path to the southeast, and then makes a turn to the southwest, just south of Sherman Way. Shortly thereafter, the collector line passes through the Lankershim Yard site (11845 Vose St., North Hollywood, CA) where the water is chlorinated at the Rinaldi-Toluca chlorination station along with water from the NHOU wells. After chlorination, the water flows south into the North Hollywood Pump Station for ammoniation and entry into the distribution system.

With the exception of RT-10 (680' deep), the RT wells were drilled to around 800' deep and screened at various intervals between 360' and 780'. The deep screening of these

wells allows for high flow capacity, between 6.7 cfs and 8.3 cfs per well and a total of 106.3 cfs across all 15 wells. Attachment F, pages F-7 to F-8 shows various design parameters of the RT wells such as year drilled, county number, drilling method, etc.

While the RT wellfield consists of large wells, many of them have been shut down at some point or are currently shut down, mainly due to TCE contamination. Shortly after it began full operation, the wellfield produced nearly 60,000 AF in WY 1988-89. However, production has declined significantly, sometimes to below 10,000 AF in recent years. The southern RT wells, in particular, have had their production limited for roughly 15 years. Figure 1-10 and Attachment F show the wellfield layout and total production, respectively, within the RT wellfield since its inception.



Figure 1-10: Rinaldi-Toluca Wellfield Layout



- **RT Wellfield Contaminant Trends**

- **TCE**

The RT area appears to have TCE primarily associated with mobilization of the southern TCE plumes during increased pumping. Recent Monitoring results of the RT area reported maximum concentrations in the monitoring wells of 120 µg/L (NH-C11-295 sampled on 7/11/2013) and 29 µg/L (RT-14 sampled on 3/18/2016) in the production wells. TCE is generally confined to the southern section of the RT wellfield, south of production well RT-02. The highest concentrations near the RT wellfield are in two areas; one is east of the southern RT wellfield and north of the NHW wellfield near the Hewitt Pit where several wells are above 120 µg/L (e.g. Hewitt Pit MW-01, 150 µg/L), and another area directly south of the RT wellfield in the NHOU, where a number of wells are greater than 100 µg/L (See Attachment E, page E-7). Similar to the rest of the SFB, TCE is generally highest in the shallow zone near the RT wellfield, but there is also an area of higher deep-zone concentrations at monitoring well RT-MW-02 with a concentration of 4 µg/L. For reference, this well is screened between 790-830 feet bgs. Based on the location of the TCE plumes in the southern section of the wellfield and the concentration trends (see attachment C page C-22 and attachment E page E-7), it appears that the TCE plume is pulled northward during operation of the RT production wells during pumping cycles, followed by retreat of the plume during periods of inactivity. Looking at the historical times series for the last 16 years, it appears that the eight northern wells have been showing low concentrations mostly below MCL, while the four southern-most contaminated wells show high concentrations that have reached up to 69 µg/L.

- **PCE**

PCE is not as prevalent in the RT area as in other wellfields, as shown by a relatively low maximum concentration of 2.22 µg/L (RT-01) in the LADWP production wells. With that said, there is a potential source of PCE west of the RT wellfield and just north of the NHW wellfield near the Hewitt Pit, with a number of wells above the

MCL and a maximum concentration of 170 µg/L at Hewitt Pit MW-01. There is likely another source area east of the RT production wells based on the high concentration (>60 µg/L) observed in USEPA well NH-C01 in April 2012 and up to 134 µg/L observed in the same well in June 1997 (see Attachment E, page E-8). Both of these areas appear to impact the southern RT production wells, with increasing trends of PCE in these wells generally following periods of elevated pumping, indicating that the plume is pulled towards these wells during operation.

Vertically, concentrations are the highest in shallow groundwater near the RT wellfield with concentrations generally being an order of magnitude lower at depth. The 16-year (Jan 1, 2000 to April 3, 2016) time series for the RT wellfield show that PCE concentrations have been consistently below the MCL in all of the wells except for RT-01, which had one recorded exceedance of 5.88 µg/L on December 2007. However, it is important to note that many of the RT wells have been shut down due to TCE contamination. There may be an increase in PCE concentrations coming from the above-mentioned sources if previously shut down wells are restarted.

➤ **1,1-DCE**

In the RT wellfield, 1,1-DCE is generally reported in the production wells at very low concentrations and, unlike TCE, there does not appear to be significant movement of the plumes during pumping based on the time series plots. The 16-year time series shows that all RT wells have been consistently below the MCL with a historical maximum not exceeding 1 µg/L, which is significantly below the MCL of 6 µg/L.

➤ **1,2,3-TCP**

1,2,3-TCP was generally released at similar locations to TCE and PCE. It is not as prevalent in the SFB. Based on the most recent sampling results, 1,2,3-TCP was not reported above the action level in RT wellfield. 1,2,3-TCP concentrations in shallow and deep groundwater are shown in Attachment D, Page E-12. Historical time series

show that 1,2,3-TCP has not been detected in any of the RT wells for the last 16 years.

➤ **1,4-Dioxane**

1,4-dioxane in the vicinity of the RT wellfield occurs in two general areas: near the Hewitt Pit east of the production wells, as well as west of the production wells near the Penrose, Strathern, and Tuxford Landfills. Concentrations in these two areas are generally above the notification level. Near the 0.11-square mile Hewitt Pit site, the maximum concentration is 560 µg/L at MW-04 (860 µg/L was observed in Lysimeter well MW-5).

Vertically, 1,4-dioxane is highest in shallow groundwater with impacts in deeper wells generally being an order of magnitude lower. The RT production wells tend to reflect the presence of the deep-zone concentrations. The highest concentration during recent monitoring was observed in the southern most section of the wellfield at RT-15 (1.14 µg/L) but the levels tend to be steady.

➤ **Hexavalent Chromium**

Cr (VI) is not prevalent in the RT area and concentrations are generally similar between shallow and deep groundwater wells. Historical time series data shows steady, low concentrations that are significantly below MCL (historical maximum of 2.72 µg/L at RT- 05). However, two consistent concentrations of 6.3 and 12 µg/L in RT-MW-10 and RT-MW-09, respectively were recorded during the recent GSIS sampling program of 2013/2014. These concentrations are significantly greater than the other wells in the RT wellfields. Both of these detections were in shallow groundwater in the western section of the RT area, away from the known source areas in the SFB.



➤ **Perchlorate**

The RT production and monitoring wells have elevated perchlorate in the northern section of the wellfield. Unlike other areas of perchlorate contamination, perchlorate is mostly reported in the deep monitoring wells at RT-MW-03, RT-MW-04, RT-MW-06 and RT-MW-10 below a depth of 500 feet bgs. The perchlorate plume in this area occupies approximately 0.85 square miles, and based on the groundwater flow direction and configuration of the plume, the perchlorate appears to be emanating from a source to the east where it is captured by the RT production wells.

Based on concentrations in the RT production wells, this plume has impacted RT-02, RT-03 and RT-04 with concentrations near or exceeding the MCL frequently since 2011. Perchlorate concentrations generally follow pumping cycles in the RT wellfield. With that said, concentrations have appeared higher in the production wells since 2011, which may indicate that more of the plume is being captured as it has expanded from the source area (see Attachment D, pages D-11 and D-15).

➤ **Nitrate**

Though there are some nitrate concentrations above the MCL south of the RT wellfield, the monitoring wells and RT production wells do not generally have high nitrate concentrations. The highest concentrations in the RT production wells occur towards the center of the wellfield with RT-10 having the highest current concentrations ranging between 20 and 30 mg/L as NO<sub>3</sub> during recent monitoring events (see Attachment C, page C-32& C-33).

➤ **Other Contaminants of Concern**

LADWP has examined other COCs in this wellfield such as NDMA, Carbon Tetrachloride and Freon 11. These contaminants are either not detected or were detected at very low concentrations that do not pose a significant concern at this time. Historical water quality data including all the contaminants of concerns that LADWP monitors as part of its blending plan are included in attachment C.

### 1.2.5.3. Tujunga Wellfield Water Quality Summary and Contaminant Trends

- **TJ Wellfield overview**

The Tujunga Wellfield is owned and operated by LADWP as a permitted drinking water source for the City of Los Angeles. The wellfield consists of 12 production wells aligned in a SW to NE orientation adjacent to the Tujunga Wash and the Tujunga Spreading Grounds. The wells are rated to pump 4,500 gpm each. The average well depth is about 800 feet with a screen length of approximately 333 feet. The wells are located approximately 300 feet apart (see figure 1-11). The wells are pumped to a common collector line which discharges into the 3.6-million- gallon (MG) Tujunga Tank. Water from the Tujunga Tank is subsequently pumped to the distribution system by the Tujunga Pumping Station into the City Trunk Line to blend with treated surface water from the Los Angeles Reservoir Complex prior to reaching the first customer. Due to the high volume of water pumped, treated and distributed from this site, Division of Drinking Water (DDW) has designated the Tujunga Wellfield a T-4 facility. Throughout the years, contaminated plumes of VOCs, mainly TCE and PCE, have limited production of the wellfield to less than 25 percent of its original design capacity. To increase production, two wells (Tujunga Well 6 and Well 7) were selected for treatment by liquid-phase granular activated carbon (LGAC) adsorption. On May 4, 2010, DDW issued a permit amendment allowing LADWP to treat Tujunga Wells 6 and 7 (TJ006 and TJ007) with a LGAC system. The first day treated water from TJ006 and TJ007 was pumped into LADWP's distribution system was on May 18, 2010.

Attachment F, pages F-9 and F-10 shows a list of various design parameters of the TJ production wells as well their historical extractions.



**Figure 2-11: Tujunga Wellfield Layout**

- **TJ Wellfield Contaminants Trends**

- **TCE**

In the vicinity of the TJ wellfield, TCE is reported in a number of wells. The area of contamination in the shallow groundwater extends from the production wells approximately 3.4 miles to the northeast, occupying an area of approximately 2 square miles. Maximum concentrations in the TJ area were observed at 91 µg/L (TJ-MW-10) and 29.2 µg/L (TJ-05) during the GSIS sampling of 2013/2014. Unlike other areas of the SFB, TCE concentrations are generally greater at depth in the TJ area, with the highest concentrations in the monitoring wells being reported at TJ-MW-10, a well that is screened between 840 and 880 feet bgs. The production wells with the highest concentrations are located in the center of the wellfield and include TJ-05 through TJ-08. Based on the depth of the TCE contamination and lack of contamination downgradient, it appears the production wells are capturing the plume migrating downgradient from the north. This is supported by the TCE trends in the production wells that show increased concentrations during pumping as the plume is funneled to the center of the well fields and a leveling of concentrations as equilibrium is established from the source water to the production wells.

- **PCE**

The maximum concentrations of monitoring wells and production wells in the TJ area during GSIS sampling program of 2013/2014 were 110 (TJ-MW-10-860) and 43.1 µg/L (TJ-06), respectively. The PCE impacts in shallow groundwater extend from the production wells approximately 3.3 miles to the north, occupying an area of 2 square miles. Similar to TCE, PCE is found in both shallow and deep groundwater with the highest concentrations being located in TJ-MW-10.

PCE in the TJ production wells is highest in the center of the wellfield in wells TJ-05 through TJ-08. PCE concentrations are generally increasing in the production wells in the center of the TJ wellfield, and it appears that the production wells are capturing the plume migrating from the north.

➤ **1,1-DCE**

1,1-DCE has been reported in the vicinity of the TJ wellfield at maximum concentrations of 27 µg/L (TJ-MW-11-900) in monitoring wells and 9.23 µg/L (TJ-08) in the production wells. Similar to TCE and PCE, concentrations of 1,1-DCE are the highest in the deeper groundwater samples from 500 to 900 feet bgs, and have a similar pattern emanating from a source hydraulically upgradient of the TJ production wells. As with other chlorinated solvents, the impacts are highest in the center of the TJ wellfields, as observed by TJ-06 and adjacent wells.

➤ **1,2,3-TCP**

1,2,3-TCP is not a prevalent contaminant in the TJ wellfield. The historical time series (Attachment C, page C-7) show that the average concentrations have been steadily below NL in all TJ production wells. The reported maximum detections above MCL were 0.006 µg/L, 0.0139 µg/L and 0.0113 µg/L at TJ-03, TJ-04 and TJ-05, respectively. During current sampling, all TJ wells showed non-detectable concentration of 1,2,3-TCP except for TJ-05 where a concentration of 0.011 µg/L was recorded in April 2016.

➤ **1,4-Dioxane**

1,4-dioxane north of the TJ production wells occupies an area of 2.0 square miles in shallow groundwater and 2.5 square miles in deeper groundwater zones. Similar to the other high-priority organic compounds, concentrations are higher in deeper screened wells with a maximum concentration of 7.7 µg/L being observed in well TJ-MW-10. 1,4-dioxane was reported at a maximum concentration of 1.6 µg/L in the TJ production wells with the highest levels in the center of the wellfield and on the eastern end.

### ➤ **Hexavalent Chromium**

Cr(VI) concentrations are generally low in the TJ area, with concentrations ranging from below the method detection limit up to 3.9 µg/L in both the production wells and monitoring wells sampled by LADWP. There are several monitoring wells approximately three miles north and upgradient of the TJ production wells where concentrations exceed MCL, with a maximum concentration greater than 100 µg/L. This maximum-level area is small, occupying an area of only 0.1 square miles. Vertically, Cr(VI) is similar in shallow and deep groundwater in the TJ area.

### ➤ **Perchlorate**

Perchlorate is reported in both shallow and deep groundwater in the TJ wellfield, with the highest concentrations reported in the shallow zone immediately adjacent to the eastern section of the TJ wellfield (TJ-MW-06 at a concentration of 5.5 µg/L). Though concentrations are reported in this well to a maximum depth of 860 feet bgs, they may not be homogeneous in some intervals. For example, the top and bottom screen intervals of TJ-MW-06 have reported concentrations, but not for the middle screen interval.

Though a specific source has not yet been identified, it appears that perchlorate is present in a fairly small area to the northeast of the TJ wellfield (approximately 1 square mile in size) with another small area approximately three miles to the north (See Attachment D, pages D-20 and D-24). The area of impacts adjacent to the wellfields appears to be captured by the eastern production wells (TJ-10, TJ-11, and TJ-12).

### ➤ **Nitrate**

Concentrations of nitrate in the TJ wellfield above the MCL are located in a plume that extends generally from the center of the wellfield upgradient to the north approximately two miles and occupies an area of approximately 1.4 square miles. The highest concentration from GSIS sampling of 2013/14 was observed in TJ-MW-06, immediately adjacent to the wellfield at a concentration of 77 mg/L. Historically,

nitrate concentrations in the TJ production wells have been in the range of 20 to 30 mg/L as NO<sub>3</sub> with slightly higher concentrations in the center of the wellfield, as compared to the eastern or western sides.

➤ **Trichlorofluoromethane (Freon 11)**

Freon 11 has been reported at eight of the Tujung wells, mostly in the northeastern area of the wellfield. A historical maximum of 244 µg/L which exceeds the MCL of 150 µg/L was observed at TJ-012. Concentrations are higher at the center of the wellfield; namely, TJ-07, TJ-10, TJ 11, and TJ-12. Attachment C page C-19 shows historical time series of these four wells which have generally increasing trends.

➤ **Carbon Tetrachloride (CTET)**

Concentrations of CTET above MCL were observed in the center of the wellfield in TJ-05 through TJ-08 with a historical maximum of 2 µg/L observed at TJ-07. Historical time series of the most contaminated wells (TJ-05 thru TJ-08) show generally decreasing trends with concentrations below MCL for the last two years. The highest concentration from GSIS monitoring was 0.6 µg/L recorded at TJ-MW - 06-860, located next to the center of wellfield.

➤ **Other Contaminants of Concern**

Similar to other wellfields, we have looked at other COCs in this wellfield such as NDMA, uranium, iron and manganese; most of these contaminants are detected at very low concentrations and currently do not pose a threat to the wellfield production. Historical water quality data including all the contaminants of concerns that LADWP monitors as part of its blending plan are included in attachment C.



## **2. Contaminant Assessment**

### **2.1. Contamination Sites**

Four main contamination sites have been identified in the SFB based on the area of contamination and the location of the sites—Hewitt Landfill, AlliedSignal/Bendix Corporation/Honeywell site, Holchem/Former Chase Chemical Company site, and Price Pfister site. Below is a brief description of the site history, soil and groundwater investigations, and remedial efforts of each contamination site. More details on the groundwater contamination levels can be found in Attachment G.

#### **2.1.1. HEWITT LANDFILL**

The Hewitt landfill site was used for gravel mining from 1923 to 1962, excavated to depths of 130 to 150 feet deep below the ground surface. Then from 1962 to 1975, the site was used as a municipal solid waste landfill and was capped during that time. It is not equipped with a liner or leachate collection and removal system.

In 1988, site subsurface investigations were initiated, leading to the installation of 17 groundwater monitoring wells (12 shallow and 5 deep), soil vapor monitoring probes, sampling of landfill gas extraction wells, and leachate sampling wells. The Regional Board issued an investigative order requiring a groundwater monitoring program in 2014, as well as a Cleanup and Abatement Order (CAO) in 2015. The CAO requires responsible parties to laterally and vertically delineate the extent of on-site and off-site contamination and to remediate.

The main contaminants observed at this site are Volatile Organic Compounds (VOCs) (mainly Trichloroethylene [TCE] and Tetrachloroethylene [PCE]), 1,2,3-Trichloropropane (1,2,3-TCP), Hexavalent Chromium, 1,4-Dioxane, Perchlorate, and N-Nitrosodimethylamine (NDMA). Table 2-1 below shows the highest value observed at the site for these contaminants (data from GeoTracker Gama):



Table 2-1: Maximum Concentration of Main Contaminants at Hewitt Landfill

Contaminant	Maximum Concentration	Unit	Date	Well
TCE	150	µg/L	10/13/2015	MW-1
PCE	170	µg/L	8/12/2015	MW-1
1,2,3-TCP	0.28	µg/L	6/5/2015	MW-10
Hexavalent Chromium	6.4	µg/L	10/14/2015	MW-9
1,4-Dioxane	590	µg/L	7/12/2013	MW-04
Perchlorate	200	µg/L	6/5/2015	MW-10
NDMA	0.055	µg/L	8/12/2015	MW-10

### 2.1.2. ALLIEDSIGNAL / BENDIX CORPORATION / HONEYWELL

The AlliedSignal/Bendix Corporation/Honeywell site was used for the production of hydraulic and pneumatic valves from 1941 to 1992, which involved degreasing with chlorinated solvents, chrome plating, and chemical storage and usage. Site assessment began in 1980, and groundwater monitoring began in 1991. Currently, there are 41 monitoring wells, 27 on-site and 14 off-site, which are sampled quarterly.

From 1994 to 2000, soil contaminated with Hexavalent Chromium was excavated, and from 2001 to 2003, a Soil Vapor Extraction (SVE) system was implemented to remove VOCs from the on-site soil. With the waste discharge permit approval from Regional Board in 2007, groundwater extraction, treatment, and reinjection started in 2009. Treatment includes ion-exchange for Hexavalent Chromium, Advanced Oxidation Process (AOP) for 1,4-Dioxane, and Carbon Adsorption for VOCs. Then in 2016, Regional Board approved a WDR for the injection of 5.2 million gallons of 1.5% calcium polysulfide solution and 10.4 million gallons of chase water into 12 injection wells over 9 months.

The main contaminants observed at this site are Trichloroethylene (TCE), Tetrachloroethylene (PCE), Hexavalent Chromium, and 1,4-Dioxane. Table 2-2 below shows the highest value observed at the site for these contaminants (data from GeoTracker Gama):

Table 2-2: Maximum Concentration of Main Contaminants at Honeywell Facility

Contaminant	Maximum Concentration	Unit	Date	Well
TCE	2,900	µg/L	10/25/2006	GW-07
PCE	1,200	µg/L	11/30/2007	MW-6
Hexavalent Chromium	440,000	µg/L	8/13/2010	GW-14A
1,4-Dioxane	1,300	µg/L	2/12/2010	GW-03

### 2.1.3. HOLCHEM/ FORMER CHASE CHEMICAL COMPANY

The Holchem/Former Chase Chemical Company site was used for chemical distribution since 1967. Historically, it had 23 aboveground storage tanks (ASTs), 19 underground storage tanks (USTs), a clarifier, 2 sumps, and a drum storage area large enough for 300 drums. Chemicals stored in the tanks were chlorinated hydrocarbons, Trichloroethylene (TCE), methylene chloride (dichloromethane), acetone, and 1,1,1-Trichloroethane (1,1,1-TCA).

The Regional Board issued a letter in 1983 requiring a subsurface assessment, leading to the discovery of high levels of petroleum and chlorinated hydrocarbons in the soil and groundwater. A 2011 off-site groundwater investigation was also performed, in which channel fill deposits allowing groundwater flow across the Verdugo Fault Zone in certain locations were identified.

Currently, there are 25 monitoring wells that are monitored on a quarterly basis. From 2003 to 2010, Soil Vapor Extraction and Bioventing systems were operated to remove 27,725 pounds of VOCs from the subsurface. The main contaminants of concern observed at this site are Trichloroethylene (TCE), Tetrachloroethylene (PCE), 1,4-Dioxane, benzene, toluene, vinyl chloride, and 1,1,1-Trichloroethane (1,1,1-TCA). Table 2-3 below shows the highest value observed at the site for these contaminants (data from EPA EQuIS Enterprise):

Table 2-3: Maximum Concentration of Main Contaminants at HOLCHEM Facility

Contaminant	Maximum Concentration	Unit	Date	Well
TCE	27,400	µg/L	1/1/1988	V15HOLW01
PCE	9,600	µg/L	12/15/1998	V15HOLW01
1,4-Dioxane	600	µg/L	8/23/2007	V15HOLW01
Benzene	1,300	µg/L	11/12/2002; 3/8/1990	V15HOLW01; V15HOL106
Toluene	174,900	µg/L	1/1/1988	V15HOLW01
Vinyl Chloride	1,300	µg/L	11/12/2002	V15HOLW01
1,1,1-TCA	43,900	µg/L	1/1/1988	V15HOLW01

#### 2.1.4. PRICE PFISTER SITE

The Price Pfister, and subsequently Black and Decker, site was used to manufacture faucet components and plumbing fixtures from 1960 to 2002, in which petroleum hydrocarbons, chlorinated VOCs, and metal-containing compounds were used. In 1984, a site environmental assessment began, leading to remedial efforts in 2005. This included excavation of the top 3 feet of contaminated soil (3,400 cubic yards), skimming to recover over 6,000 gallons of oil from groundwater, Soil Vapor Extraction (SVE) systems to extract over 50 pounds of VOCs, and bioventing to degrade over 250,000 pounds of hydrocarbons from the vadose zone. Also, from 2007 to present, emulsified vegetable oil solution was injected into the groundwater to reduce Hexavalent Chromium with a waste discharge requirements (WDR) permit. Recently, a laboratory-scale testing of biodegradation of 1,4-Dioxane has been conducted by the responsible party's consultant.

A quarterly groundwater monitoring program began in 2004, and there are currently 30 wells available. The main contaminants of concern observed at this site are chlorinated VOCs, 1,4-Dioxane, and Hexavalent Chromium. Table 2-4 below shows the highest value observed at the site for these contaminants (data from GeoTracker Gama):

Table 2-4: Maximum Concentration of Main Contaminants at Price Pfister Site

Contaminant	Maximum Concentration	Unit	Date	Well
TCE	86	µg/L	4/6/2005	PMW-9
PCE	160	µg/L	10/5/2005	MW-5
1,4-Dioxane	1,300	µg/L	4/3/2007	MW-5
Hexavalent Chromium	8,300	µg/L	8/19/2010	PMW-43

## 2.2. Addressing Potential Data Gaps

In November 2015, LADWP completed the Groundwater System Improvement Study (GSIS) 97-005 Sampling where constituents included in the 97-005 requirements were sampled. The 97-005 sampling included the existing monitoring and production wells in the SFB, and the 25 new monitoring wells installed in the SFB (new wells placed in the 10 year capture zones of Tujunga, Rinaldi Toluca, and North Hollywood West Wellfields). Through the study, LADWP was able to screen through potentially unidentified chemical species and identify the main contaminants of concern in the Basin. Chemicals were prioritized based on the United States Environmental Protection Agency (USEPA) Region 8 protocols (USEPA 1194), and the criteria for establishing and prioritizing the Chemicals of Concern were:

1. Original 1992 Remedial Investigation (RI) COC
2. Commonly reported
3. Above the California Maximum Contaminant Level (MCL)
4. Reported above MCL in production wells
5. Carcinogen or high toxicity
6. Requires specialized treatment

Prioritization was done base on how many of the criteria were met by each chemical.

The attached 97-005 Assessment Table (Table 1-4) shows the details of the extensive sampling done for Tasks 4.1 and 4.2, and Attachment G which consists of the Presentation Slides summarizes the main contaminants of concern that exceeded the MCL during that round of sampling.

In agreement with DDW based on the GSIS results and the historical contaminant trends of the SFB wells, a general list of 17 Contaminants of Concern was created for constant monitoring through the LADWP Well Blending Operations Plan.

The 17 contaminants of Concerns were:

- Trichloroethylene (TCE),
- Tetrachloroethylene (PCE),
- 1,1-Dichloroethene (1,1-DCE),
- 1,4-Dioxane, Nitrate (as N),
- Trichlorofluoromethane (Freon 11),
- Perchlorate,
- Carbon Tetrachloride,
- Hexavalent Chromium,
- Total Chromium,
- 1,2,3-Trichloropropane (1,2,3-TCP),
- Methyl-t-butyl-ether (MTBE),
- N-Nitrosodimethylamine (NDMA),
- Iron, Manganese,
- Total Dissolved Solids (TDS),
- Uranium.

LADWP provides DDW a monthly update on the levels of these 17 contaminants for all San Fernando Basin wellfields.

















Table 1-4  
97-005 Assessment Table for NHW, RT and TJ Wellfileds

		Acetochlor ESA	Acetochlor OA	Alachlor ESA	Alachlor OA	Adicarb	Adicarb sulfone	Adicarb sulfoxide	Bromochloroacetic Acid (BCAA)	Carbaryl	Carbofuran	Dibromoacetic Acid	Dichloroacetic acid	Dequat	Duon	Ethionath	Fenobos	Formaldehyde	Glyoxal	Glyphosate	Helioacetic acids (HAs)	Coliform, Total	Escherichia coli	Fecal Coliform	Heterocyclic Plate Count (R2A)	Aluminum		
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	18	µg/L	µg/L	20	µg/L	100	µg/L	µg/L	µg/L	µg/L	60	MPN/100mL	MPN/100mL	MPN/100mL	CFU/mL	µg/L		
TUJUNGA WELL FIELD	Well Name																											
	Production Wells																											
	TJ001																						0					
	TJ002																						0					
	TJ003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	ND	
	TJ004																						0					
	TJ005																						0					
	TJ006																						0					
	TJ007																						0					
	TJ008																						0					
	TJ009																						0					
	TJ010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	ND
TJ011																						0						
TJ012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	2.5	
Monitoring Wells																												
EV-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	ND	ND	ND	80	ND	ND	140	7.7		
EV-03																												
EV-09-375	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	420	ND		
EV-09-490																												
EV-09-550																												
EV-09-680	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	8.1		
HR-MW-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	170	ND	ND	1100	4.6		
NH-VPB-13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND	23	ND	ND	440	9.6		
PA-01																												
PA-02																												
TJ-MW-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4	3.1		
TJ-MW-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	8.9		
TJ-MW-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	4.4			
TJ-MW-04 (EV-08)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ND	5.3		
TJ-MW-06-400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48	4.2		
TJ-MW-06-570	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22	5.4		
TJ-MW-06-860	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	6.2		
TJ-MW-07-420	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	3.3		
TJ-MW-07-690	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	780	8		
TJ-MW-07-860	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	75	8		
TJ-MW-08-390	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1400	39		
TJ-MW-08-530	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120		
TJ-MW-08-820	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5700	140		
TJ-MW-09-580	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5700	120		
TJ-MW-09-850	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1300	8.3		
TJ-MW-10-440	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1200	ND		
TJ-MW-10-560	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.99	ND	ND	ND	ND	ND	ND	1600	ND		
TJ-MW-10-860	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1500	ND		
TJ-MW-11-440	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5		
TJ-MW-11-560	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.85	ND	ND	ND	ND	ND	ND	1600	7.1		
TJ-MW-11-900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	ND	ND	ND	ND	ND	ND	120	7.3		
TJ-MW-12-490	ND	ND	ND	ND	ND	ND	ND	ND	0.37	ND	ND	ND	ND	ND	ND	ND	ND	2.5	ND	ND	ND	ND	ND	ND	100	7.3		
TJ-MW-12-590	ND	ND	ND	ND	ND	ND	ND	0.6	ND	ND	0.92	6.5	ND	ND	ND	ND	ND	8.4	ND	ND	ND	18	ND	ND	66	6.1		
TJ-MW-12-910	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	13		
TJ-MW-13-460	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.43	ND	ND	ND	2.6	ND	ND	ND	ND	ND	ND	860	3.5		
TJ-MW-13-670	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.38	ND	ND	ND	2.6	ND	ND	ND	ND	ND	ND	61	4.5		
TJ-MW-13-910	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5	0.93	ND	ND	ND	ND	ND	65	5.2		
TJ-MW-14-460	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.7	ND	ND	ND	2	ND	ND	880	2		
TJ-MW-14-580	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.3	ND	ND	ND	ND	ND	ND	1300	5.3		
TJ-MW-14-900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2	ND	ND	ND	ND	ND	ND	34	7.2		
Production Wells																												
RT001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	3.6		
RT002																												
RT003																												
RT004																												
RT005																												
RT006																												
RT007																												
RT008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	160	17		
RT009																												
RT010	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND		
RT011																												
RT012																												
RT013																												
RT014																												
RT015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.53	ND	ND	ND	ND	ND	ND	1	4.6		
Monitoring Wells																												
EV-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	59	ND	ND	92	83		
EV-04-285	ND	ND	ND	ND																								



Table 1-4  
7-005 Assessment Table for NHW, RT and TJ Wellfields

Well Name	Aluminum, dissolved	Antimony	Antimony, dissolved	Arsenic	Arsenic III	Arsenic III, dissolved	Arsenic V	Arsenic V, dissolved	Arsenic, dissolved	Barium	Barium, dissolved	Beryllium	Beryllium, dissolved	Boron	Boron, dissolved	Cadmium	Cadmium, dissolved	Calcium	Calcium, dissolved	Chromium	Chromium, dissolved	Chromium, Hexavalent	Cobalt	Cobalt, dissolved	Copper		
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
	1000	6	6	10						1000	1000	4	4			5	5			50	50				1300		
	200													1000	1000										1000		
TUJUNGA WELL FIELD																											
Production Wells																											
TJ001																				2.2		3.7					
TJ002																				1.8		2.22					
TJ003	3.5	ND	ND	0.43	ND	ND	0.47	0.4	0.41	110	110	ND	ND	89	89	ND	0.029	65.1	65	0.93	0.93	1.2	0.076	0.076	0.95		
TJ004																				1.7		2.9					
TJ005																				1.1		1.36					
TJ006																				1.3		1.48					
TJ007																				1.7		1.71					
TJ008																				1.1		0.97					
TJ009																				1.2		0					
TJ010	4.4	0.045	0.087	0.46	ND	ND	0.51	0.49	0.45	180	180	ND	ND	100	99	ND	ND	87	89	0.62	0.61	0.65	0.2	0.22	1.8		
TJ011																				1.1		1.1					
TJ012	6.1	ND	0.061	0.39	ND	ND	0.38	0.38	0.35	110	110	ND	ND	150	140	0.022	0.028	75.7	74	0.5	0.45	0.64	0.16	0.17	6.2		
Monitoring Wells																											
EV-01	2.5	0.13	0.16	0.59	ND	ND	0.95	0.88	0.63	63	62	ND	ND	160	160	ND	ND	72.7	73.5	0.098	ND	ND	0.13	0.12	1.6		
EV-03																											
EV-09-375	2.5	ND	0.043	0.31	ND	ND	0.61	0.47	0.25	130	130	ND	ND	68	68	ND	ND	77.4	80.1	3.4	1.8	1.2	0.15	0.15	0.39		
EV-09-490																											
EV-09-550																											
EV-09-680	6.9	0.053	0.067	0.46	ND	ND	0.71	0.35	0.39	77	77	ND	ND	88	86	0.026	ND	26	27	0.62	0.58	0.74	0.062	0.075	0.32		
HR-MW-01	2.4	0.099	0.11	0.61	ND	ND	0.69	0.73	0.42	73	74	ND	ND	270	270	0.035	0.06	122	121	0.58	0.34	ND	0.33	0.35	4.8		
NH-VPB-13	2.5	0.06	0.077	0.29	ND	ND	0.4	0.45	0.29	130	140	ND	ND	150	150	ND	ND	76.1	79.1	0.66	0.28	0.33	0.2	0.22	0.81		
PA-02																											
TJ-MW-01	2.5	0.054	0.07	0.47	ND	ND	0.53	0.52	0.41	110	120	ND	ND	170	160	0.024	0.026	58.5	61.2	ND	ND	ND	0.16	0.22	5.6		
TJ-MW-02	6.4	0.047	0.086	0.29	ND	ND	0.58	0.53	0.2	100	100	ND	ND	51	51	ND	ND	60.2	51.5	3.1	1.3	0.98	0.11	0.11	1.9		
TJ-MW-03	2.9	0.073	0.089	0.39	ND	ND	0.65	0.59	0.49	130	130	ND	ND	320	300	0.034	0.033	79	78.9	ND	ND	ND	0.18	0.18	3.1		
TJ-MW-04 (EV-08)	0.475	0.075	0.075	0.42	ND	ND	0.48	0.48	0.4	100	100	ND	ND	130	130	0.022	0.028	69.4	67	0.86	0.43	ND	0.13	0.13	1.9		
TJ-MW-06-400	4.2	ND	ND	0.29	ND	ND	0.38	0.44	0.16	220	210	ND	ND	85	81	ND	0.023	100	98.9	2.7	2.8	3.3	0.069	0.48	0.25		
TJ-MW-06-570	5.5	0.037	0.044	0.39	ND	ND	0.51	0.61	0.48	160	150	ND	ND	93	90	ND	0.023	95.1	94.4	1.1	1.1	1.4	0.1	0.1	0.28		
TJ-MW-06-860	6.1	0.041	0.043	0.56	ND	ND	0.62	0.59	0.45	120	120	ND	ND	120	110	ND	ND	89.7	86.9	1.3	1.3	1.7	0.068	0.066	0.16		
TJ-MW-07-420	5.8	ND	ND	0.31	ND	ND	0.49	0.48	0.18	73	70	ND	ND	110	120	ND	ND	69.1	68.9	0.23	0.24	0.45	0.052	0.049	0.59		
TJ-MW-07-600	7.7	0.043	0.052	0.55	ND	ND	1.2	1.2	0.62	73	73	ND	ND	170	180	ND	ND	74	74.8	0.19	0.23	ND	0.058	0.054	0.38		
TJ-MW-07-800	6.5	0.049	0.071	0.73	ND	ND	0.96	1	0.77	95	96	ND	ND	240	240	ND	0.022	87.5	86	0.67	0.67	0.72	0.063	0.064	0.37		
TJ-MW-08-390	9.2	0.13	0.12	0.67	ND	ND	0.95	1.3	0.66	140	140	ND	ND	68	66	0.089	0.085	75.4	77	4.1	3.9	3.9	0.28	0.26	3.2		
TJ-MW-08-530	16	0.14	0.14	0.61	ND	ND	0.94	1	0.58	52	54	ND	ND	81	86	0.11	0.12	43.3	44	1.4	0.98	1	0.23	0.17	3.2		
TJ-MW-08-820	15	0.12	0.1	0.49	ND	ND	1	1.1	0.47	75	71	ND	ND	88	84	0.32	0.32	51	54	2.7	1.3	1.4	0.24	0.14	15		
TJ-MW-09-580	8.1	0.17	0.071	0.53	0.042	ND	0.58	0.61	0.53	130	130	ND	ND	160	170	0.062	0.059	74.5	74.9	0.75	0.73	0.63	0.31	0.26	1.5		
TJ-MW-09-850	2.1	0.047	0.062	0.4	ND	ND	0.56	0.41	0.53	160	160	ND	ND	210	210	0.031	0.027	111	111	0.55	0.59	0.64	0.36	0.37	1.4		
TJ-MW-10-440																											
TJ-MW-10-560																											
TJ-MW-10-860																											
TJ-MW-11-440	6.8	0.093	0.12	0.77	ND	ND	1	1.1	0.72	190	190	ND	ND	110	110	ND	ND	118	120	1.8	1.9	2.3	0.075	0.068	0.2		
TJ-MW-11-560	6.8	0.046	0.046	0.4	ND	ND	0.88	0.82	0.28	170	170	ND	ND	120	120	ND	ND	123	122	2.3	2.2	2.7	0.069	0.07	0.16		
TJ-MW-11-900	7.6	0.085	0.1	0.42	ND	0.026	0.96	1.1	0.49	120	120	ND	ND	86	84	ND	ND	101	98.1	1.6	1.6	2.3	0.069	0.069	0.13		
TJ-MW-12-490	6.8	0.065	0.076	0.37	ND	ND	0.68	0.75	0.34	65	63	ND	ND	200	210	ND	0.031	170	172	0.069	0.053	ND	0.099	0.12	1.6		
TJ-MW-12-590	5.2	0.33	0.34	0.58	ND	ND	0.63	0.62	0.4	120	120	ND	ND	150	150	0.018	ND	104	105	2.6	2	2.8	0.063	0.059	0.45		
TJ-MW-12-910	13	0.29	0.31	1.1	0.85	0.89	0.21	0.22	1.2	52	53	ND	ND	220	230	0.028	ND	33.4	33.8	ND	ND	ND	0.11	0.12	0.4		
TJ-MW-13-460	3.7	0.034	0.061	0.18	ND	ND	0.71	0.66	0.31	190	190	ND	0.016	130	140	ND	ND	102	104	0.71	0.73	0.99	0.093	0.11	0.18		
TJ-MW-13-670	4.4	0.071	0.076	0.38	ND	ND	0.51	0.97	0.45	210	210	ND	ND	140	140	ND	ND	107	109	1.2	1.3	1.6	0.11	0.093	0.26		
TJ-MW-13-910	5	0.15	0.16	0.85	ND	ND	0.85	0.88	0.74	170	160	ND	ND	140	140	ND	0.024	103	103	0.38	0.35	0.59	0.12	0.11	0.2		
TJ-MW-14-460	4.1	0.082	0.087	0.41	ND	ND	0.37	0.47	0.62	100	110	ND	ND	270	270	ND	ND	116	116	0.34	0.36	0.66	0.072	0.084	0.16		
TJ-MW-14-580	5.8	0.049	0.057	0.49	ND	ND	0.54	0.52	0.54	110	110	ND	ND	270	260	0.018	ND	114	110	0.22	0.22	0.5	0.15	0.16	0.15		
TJ-MW-14-900	6.9	0.076	0.064	1.1	0.17	0.18	0.72	0.7	1.2	71	73	ND	ND	120	120	ND	ND	115	112	ND	ND	ND	0.28	0.31	0.086		
RIVALDI/TUJUNGA WELL FIELD																											
Production Wells																											
RT001	4	ND	0.058	0.39	ND	ND	0.65	0.62	0.35	87	84	ND	ND	110	100	ND	ND	72	71	0.89	0.93	0.92	0.14	0.16	1.2		
RT002																											





# **Attachment A**

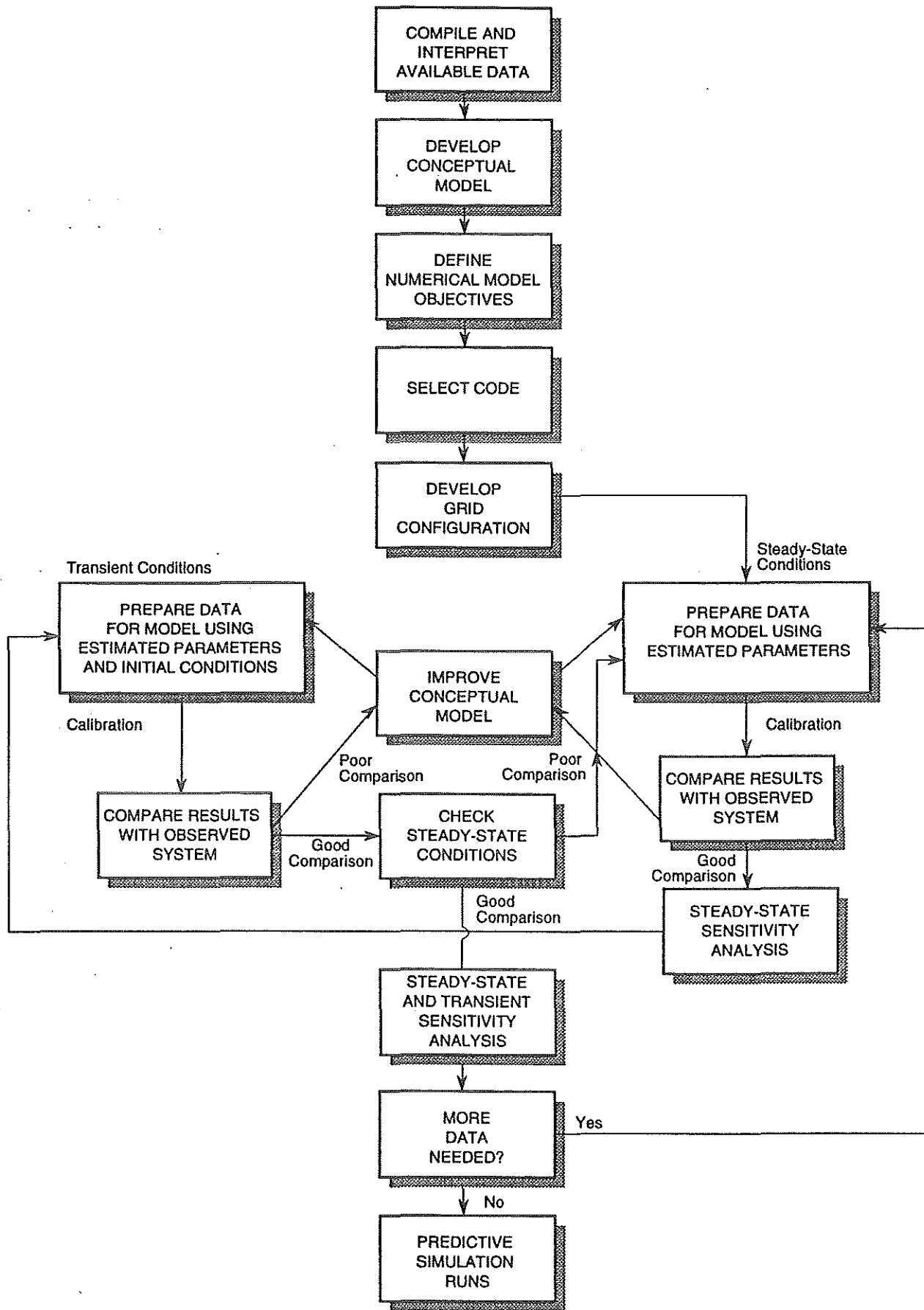
## **Groundwater Flow Model Background and Assumptions**

## 6.0 SAN FERNANDO BASIN GROUNDWATER FLOW MODEL

This section presents the development and calibration of a three-dimensional groundwater flow model of the San Fernando Basin with an emphasis on the San Fernando Basin Study Area (See Figure 1-2 and Section 1.1). The intent of the model is to define regional flow fields of the San Fernando Basin by incorporating regional physical features. The developed model is a representation of the known and estimated properties of the system. It has both a conceptual and a mathematical component; the conceptual model provides the qualitative physical description of the system and its operation, and the mathematical model represents the conceptual system with mathematical equations that describe the system in approximate terms. The conceptual model developed for this system was based on an understanding of the geology, hydrology, and hydrogeology of the basin, which are discussed in Sections 3.0, 4.0, and 5.0, respectively. The numerical model was used to apply and improve the conceptual model and can be used to simulate three-dimensional groundwater flow throughout the basin.

The numerical modeling of the San Fernando Basin began during the early stages of the RI and has been improved iteratively throughout its execution. The model was an integral part of the remedial investigation and feasibility study process. As new data influenced the conceptual understanding of the physical processes of groundwater flow in the basin, the numerical model was modified and updated. The model was used to interpret between isolated field samples and create a more comprehensive characterization. The model was also used to help assess the performance of remedial actions during the operable unit feasibility studies. The general model development and calibration process is illustrated in Figure 6-1. An important aspect of the model was its use as an investigative tool; hydrogeologic hypotheses were tested and data needs were identified, which aided in the development of the field investigation.

Potential future uses of the calibrated groundwater flow model include planning and management applications as well as assessing contaminant migration and remediation. The model is capable of estimating the effects of pumping centers and conjunctive water supply usage in the San Fernando Basin. The calibrated model can also be used to provide boundary conditions and



**FIGURE 6-1**  
**BLOCK DIAGRAM ILLUSTRATING**  
**MODEL DEVELOPMENT AND CALIBRATION**

hydrogeologic parameters for site-specific solute transport models within the San Fernando Basin and can predict basin-wide effects of remedial actions that may be implemented at various locations. The effects of the remedial actions on groundwater flow are important to basin-wide management of contaminant migration as well as groundwater supply operations.

Sections 6.1 and 6.2 describe the model objectives and code selection, respectively, for the San Fernando Basin basin-wide groundwater flow model. Sections 6.3 and 6.4 describe how the conceptual hydrogeologic model was translated into a mathematical representation of groundwater flow within the San Fernando Basin, and Section 6.5 describes the calibration process under both steady-state and transient conditions. Finally, discussions of the model sensitivity, limitations, and recommendations for future modeling work are provided in Sections 6.6, 6.7, and 6.8, respectively.

## **6.1 MODELING OBJECTIVES**

The objectives of the basin-wide model of the San Fernando Basin Study Area are to:

- Assist in the development of a geologic and hydrogeologic conceptual model of the San Fernando Basin incorporating data from past and current characterizations.
- Assess and verify the hydrogeologic characterization of the San Fernando Basin Study Area.
- Predict and evaluate the basin-wide effects of remedial actions that may be implemented at various locations within the basin during preparation of the basin-wide feasibility study.
- Generate groundwater-flow boundary conditions for site-specific solute transport models.
- Develop and provide hydrogeologic parameters for predicting fate and transport of target compounds.
- Aid in making groundwater management decisions.

The first two objectives needed to be sufficiently satisfied before the model was (can be) used to accomplish the remaining objectives, which are essentially the applications of the developed model. To satisfy the initial objectives, the model was set up and the parameters and boundary conditions were evaluated, as shown in Figure 6-1, to ensure that they were consistent with the field data and the conceptual understanding of the groundwater flow system.

## 6.2 CODE SELECTION

The remedial investigation objectives described in Section 1.0 as well as the modeling objectives outlined above dictated the model code selection for the San Fernando Basin aquifer. To meet these objectives, the selected code must be:

- Available in the public domain
- Accepted by regulatory agencies
- Tested and verified
- Easily modified
- Main-frame and personal-computer compatible
- Capable of rectangular grid discretization
- Capable of simulating full- or quasi-three-dimensional flow fields.

Several model codes that were available in the public domain at the beginning of the project were evaluated for compliance with the above criteria. These include:

- PLASM, developed by T.A. Prickett and C.G. Lonquist (1971 and updated subsequently)
- USGS-3D, developed at U.S. Geological Survey (USGS) by J.D. Bredehoeft and G.F. Pinder (1970)
- FE3DGW, developed by S.K. Gupta, C.R. Cole, and F.W. Bond (1975, updated 1979)
- USGS-3D-FLOW, developed at USGS by P.C. Trescott (1975, updated 1982)
- FEMWATER, developed by G.T. Yeh and D.S. Ward (1980)
- CFEST, developed by S.K. Gupta et. al. (1981)

- MODFLOW, developed at USGS by M.G. McDonald and A.W. Harbaugh (1988)
- HST3D, also developed at USGS by K.L. Kipp (1987)

Three of these codes, FE3DGW, FEMWATER, and CFEST, are finite-element codes; the remaining codes are finite-difference codes. Both finite-difference and finite-element methods solve the partial differential equations describing three-dimensional flow in porous media.

The USGS codes USGS-3D and USGS-3D-FLOW were not considered further since MODFLOW was developed at the same agency as a replacement for those codes with numerous improvements. Similarly, FE3DGW was not considered in lieu of the newer code, CFEST. PLASM was also not considered further because of the availability of only one solver in the code, which experience suggested a potential for unstable results when applied to complex problems. FEMWATER, developed as the flow component of the FEMWASTE solute transport model, was not being continually updated, and therefore was not considered further. The CFEST program, also designed to do solute transport simulations, was only capable of simulating confined flow conditions. Although an upgraded version of the CFEST code was under development for unconfined applications at the time of code selection, it was decided that the new code would not be ready and verified in time for the RI project. HST3D was also not selected because the code could not be run without executing the transport component of the model, resulting in a significantly longer execution time compared to MODFLOW. The MODFLOW code was, therefore, chosen since it met all the requirements listed above. In addition, this code has been extensively applied by JMM and others at basins with similar sizes and complexities as the San Fernando Basin.

MODFLOW is a three-dimensional finite-difference code that incorporates various physical and mathematical aspects of flow in porous media in a modular program structure (McDonald and Harbaugh, 1988). The modular structure consists of a Main Program and a series of highly independent subroutines called "modules" that are grouped into "packages." Each package deals with a specific feature of the hydrologic system that is to be simulated, such as flow to or from



a river, or with a specific method of solving linear equations which describe the flow system, such as the Strongly Implicit Procedure (SIP).

An advantage of the division of the program into modules is that it permits the user to examine specific hydrologic features of the model independently. These divisions also allow new packages to be added to the program, without modifying the existing packages. The input and output system of the computer program are also designed to allow maximum flexibility.

Groundwater flow within the aquifer is simulated using a block-centered grid approach. Layers can be simulated as confined, unconfined, or as a combination of both. Flow associated with external stresses, such as wells, areal recharge, evapotranspiration, drains, and streams, can also be simulated. The finite-difference equations can be solved using either the SIP, Slice-Successive Overrelaxation (SSOR), or Preconditioned Conjugate-Gradient (PCG) methods.

The program language is FORTRAN 77; thus, the model can be run without modification on most computers that have a FORTRAN 77 compiler. For simulating the basin-wide flow in the San Fernando Basin, the MODFLOW code was compiled using NDP Fortran (Microway, Inc., 1989) and the Phar Lap memory manager (Phar Lap Software, Inc., 1989) to address the protected memory of the Intel 386- or 486-based personal computers.

### **6.3 MODEL DEVELOPMENT AND SETUP**

There were five steps during development and setup of the San Fernando Basin groundwater flow model, which include the following:

- Selection of the model area
- Identification of boundary conditions
- Selection of model grid and layout
- Designation of model layers
- Identification of barriers to groundwater flow

The first component in the development and setup of the model was the selection of the model area. Selection of boundary conditions was considered to be the most critical next step in conceptualizing and developing the model of the groundwater system. The selection of boundary conditions for the model involved a degree of simplification of the actual hydrogeologic conditions. For the San Fernando Basin Groundwater Flow Model, the model area includes the entire groundwater aquifer and its natural boundaries. Using natural boundaries for model boundaries reduces the number of assumptions that must be made about the groundwater-flow conditions at the model boundaries and about the groundwater budget.

Once the model area and boundaries were selected, the model grid and layers were laid out to optimize the utilization of the available data and meet the objectives of the RI for the study area within the San Fernando Basin. In addition, impediments to flow were also considered as boundary conditions. As part of the conceptualization of the San Fernando Basin groundwater system, certain geologic faults were identified as potential impediments to groundwater flow (SWRB, 1962). Observations of the groundwater levels suggest that these features play an important role in the groundwater-flow regime.

Once the model layout was established, all major elements of the groundwater budget of the San Fernando Basin were incorporated in the model. Inflows simulated within the model area were:

- subsurface flow from adjacent basins
- recharge from hill and mountain runoff
- recharge from precipitation on the valley floor
- artificial recharge such as water distributed to spreading grounds
- return flow from delivered water
- recharge from the Los Angeles River

Outflows simulated within the model area were:

- subsurface outflow
- groundwater extractions
- groundwater flow to the Los Angeles River

The effect of evapotranspiration was included in the estimates of recharge from precipitation and runoff; therefore it was not considered separately. Infiltration to the groundwater aquifer from lakes and reservoirs was considered negligible. Sections 4.0 and 5.0 describe the hydrologic and groundwater balance components in more detail.

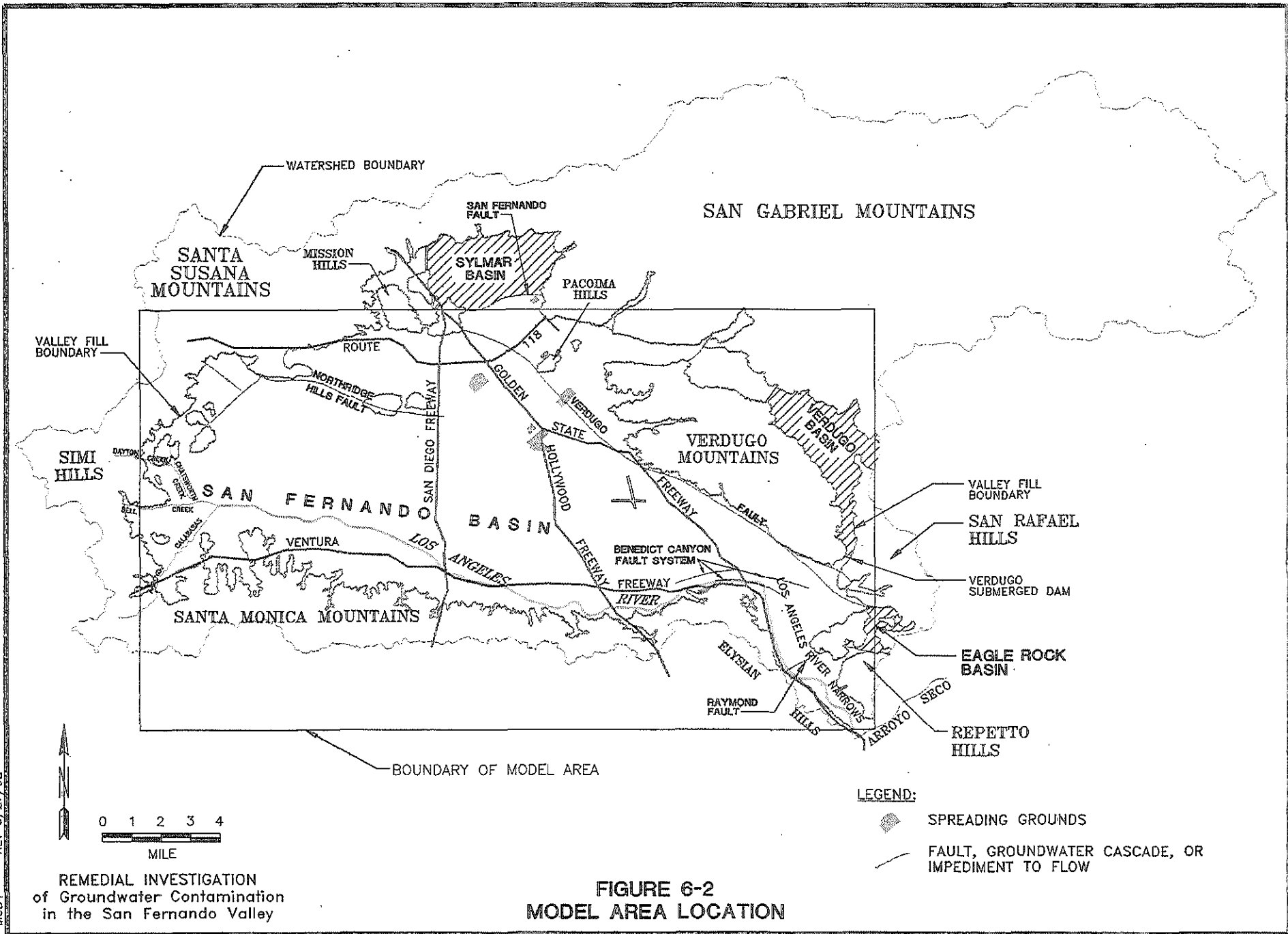
Section 6.3.1 describes the model area. The selected model grid and layers are discussed in Sections 6.3.2 and 6.3.3, respectively. Section 6.3.4 discusses the boundary conditions established for the model, and Section 6.3.5 describes impediments to groundwater flow.

### 6.3.1 Model Area

The San Fernando Basin Study Area is located in the eastern portion of the San Fernando Basin, where the North Hollywood, Crystal Springs, and Pollock NPL sites are located (refer to Section 2.0). The basin-wide numerical model area, shown in Figure 6-2, includes the entire San Fernando Basin, extending from the Simi Hills on the west to the Verdugo and San Gabriel mountains on the east. The model covers approximately 163 square miles of surface area above the groundwater basin, which extends to the physical boundary of the relatively impermeable hills and mountains surrounding the San Fernando Basin (Section 3.1). As described previously, the boundary of the active model node area is coincident with the natural hydrogeologic boundaries of the aquifer. The natural hydrogeologic boundary of the San Fernando Basin is the physical boundary of the surrounding hills and mountains except where the San Fernando Basin joins the northern end of the Verdugo Basin; here the hydrogeologic boundary is a groundwater divide. The model area outside the model boundary is considered inactive and does not contribute to flow inside the active model area.

The active model area does not include the Verdugo Basin or the Eagle Rock Basin. The Eagle Rock Basin is not included in the San Fernando Valley Study Area and the flow conditions at the boundary of the Eagle Rock Basin and the San Fernando are reasonably well known (SWRB, 1962). A negligible amount of groundwater is considered to flow from this basin to the San Fernando Basin.

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MOD1



Although the Verdugo Basin is included in the San Fernando Valley Study Area, contaminant concentrations have been decreasing and the focus of the RI has been on the three NPL sites in the eastern San Fernando Basin. Furthermore, the geometry of the Verdugo Basin differs significantly from that of the San Fernando Basin, which makes it very difficult and inefficient to model the two basins together. The Verdugo Basin, which is discussed in Section 5.3, is a steep narrow trough compared to the San Fernando Basin. The grid resolution necessary to adequately represent the Verdugo Basin would not have been consistent with the available data for that area. The flow contribution from the Verdugo Basin to the San Fernando Basin is, therefore, simulated by two distinct boundaries between the two basins, the groundwater divide on the north and the submerged dam on the south (Section 5.0). Groundwater flow at the submerged dam between the Verdugo Basin and the San Fernando Basin is well documented and hence the model boundaries were established with no assumptions (SWRB, 1962). The boundaries are discussed further in Section 6.3.4.

### 6.3.2 Model Grid

The MODFLOW model uses a block-centered finite-difference technique to solve the partial differential equations describing groundwater flow in porous media. In the block-centered grid, the blocks formed by the sets of parallel and perpendicular lines are termed cells; the points at which hydraulic heads are calculated, termed nodes, are located at the center of the cells. All model parameters are assigned at each node.

The selection of the model grid was based on the geometry of the study area, the distribution of the available hydrogeological data, and the desired degree of resolution of the model-simulated head. Several grid alternatives were reviewed. It was determined that sufficient data was available in the San Fernando Basin Study Area to use a relatively fine grid, which is necessary to provide finer resolution of results to meet RI objectives and the basin's current and anticipated future groundwater management needs.

The number of nodes in a grid affects both the model predictions and the level of effort required to develop and calibrate the model. Following an extensive screening process, three model grid layout scenarios were developed, each requiring different levels of effort and meeting different modeling objectives. The objective of the original model task was to develop boundary conditions for the site-specific solute transport models to be developed as part of the operable unit feasibility studies. A grid layout was developed to accomplish this objective that consisted of 42 rows and 69 columns in two to three model layers.

A second objective of the modeling was to develop and utilize the model for evaluating safe yield, mass balance, and change in storage of the groundwater basin with various aquifer development scenarios. A second grid layout comprised of 76 rows, 85 columns, and three to four layers that meet both objectives was developed.

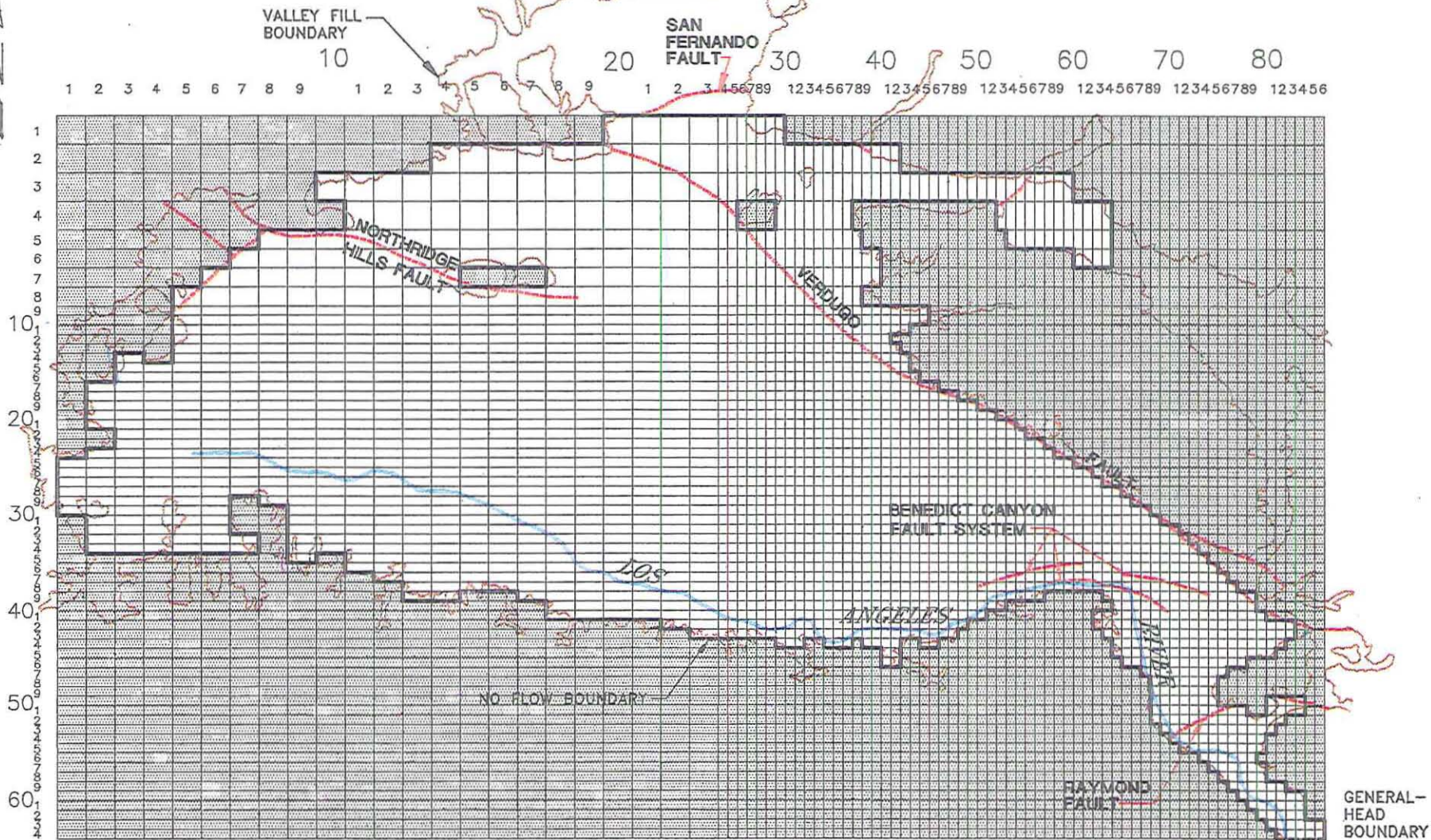
A third grid scenario was evaluated to allow location-specific aquifer development decisions within the basin. After careful evaluation of the existing data, a grid layout consisting of 107 rows, 155 columns, and three to five model layers was developed.

Each of the three grid options, in addition to satisfying different objectives, required significantly different data needs, model development, calibration, execution, and computer run time. To satisfy technical objectives as well as time and budgetary requirements, a grid layout was selected that was an enhancement of the second scenario described above.

The developed grid layout is shown in Figure 6-3. The model grid consists of 64 rows and 86 columns, totaling 5,504 cells for each of four model layers covering the saturated alluvium of the San Fernando Basin. Available hydrogeologic data is in the vicinity of major pumping centers and is concentrated in the San Fernando Basin Study Area in the eastern half of the model area. Therefore, a variable grid size was used to optimize the resolution of results in this study area while reducing the total number of model nodes. The grid sizes shown in Figure 6-3 range from 3,000 feet by 3,000 feet in the northwest to 1,000 feet by 1,000 feet in the southeast.



MOD2 FIG6-3 REV 9/04/92 1=15840



- LEGEND:**
- FAULT, GROUNDWATER CASCADE OR IMPEDIMENT TO FLOW
  - ACTIVE MODEL NODE
  - INACTIVE MODEL NODE

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**FIGURE 6-3**  
**MODEL GRID AND BOUNDARIES**



The fine model grid of 1,000 feet by 1,000 feet was used for the southeastern model area, which includes North Hollywood, Pollock, and Crystal Springs study areas.

### 6.3.3 Model Layers

The saturated aquifer thickness is greater than 1,000 feet in the eastern portion of the basin and thins on the western portion and along the edges of the saturated sediment boundary. The alluvial sediments that make up the aquifer are heterogeneous, vertically and horizontally. The heterogeneity of the alluvial sediments is described in Sections 3.0 and 5.0 as well as in previous reports. For example, both lithologic and electric log data suggest stratification of the water-bearing sediments in many areas (Section 3.2.3); water levels measured in cluster wells installed at different depths vary by as much as several feet (Section 5.2.4); and contaminant concentrations also vary by depth (Section 7.3). To simulate these local and basin-wide changes in lithologic conditions and vertical gradients that may affect contaminant transport, a multi layer, three-dimensional model was developed to simulate groundwater flow in the San Fernando Basin.

Four model layers were used to represent the variable thickness and vertical heterogeneity of the San Fernando Basin. The model layering was based on the geologic and hydrogeologic characterization of the stratification of the saturated alluvium. During preliminary review of existing data consisting of drillers' logs and the geologic interpretations of the Report of Referee (SWRB, 1962), four aquifer zones were identified within the saturated alluvium of the San Fernando Basin for modeling purposes. The first zone represented the sand and gravel deposits open to surface recharge (the water-table zone). This zone was identified by the accumulated deposits of erosional material flowing from the granitic San Gabriel Mountains in the east and the sedimentary Simi Hills and Santa Susana Mountains in the west (Section 3.0). The deposits in the east are composed of coarse-grained sands and gravels grading to finer-grained sands and silts in the west. The second zone was identified as a low-permeability zone, consisting predominantly of silts and clays, estimated as averaging 200 feet in thickness. This zone was not considered homogenous in lithology; sand and gravel lenses were identified within the zone,

which were suspected of affecting its ability to retard vertical migration of water. The third zone was identified as coarse alluvial sediments, bounded by the aquifer above, while the fourth zone included the sediments below this aquifer to the base of the valley fill. The fourth zone was identified separately because there was uncertainty in the total thickness of the aquifer and the zone was generally believed to exist below the portions of the aquifer used for production. These zones were identified based on the preliminary review of existing well logs and cross sections.

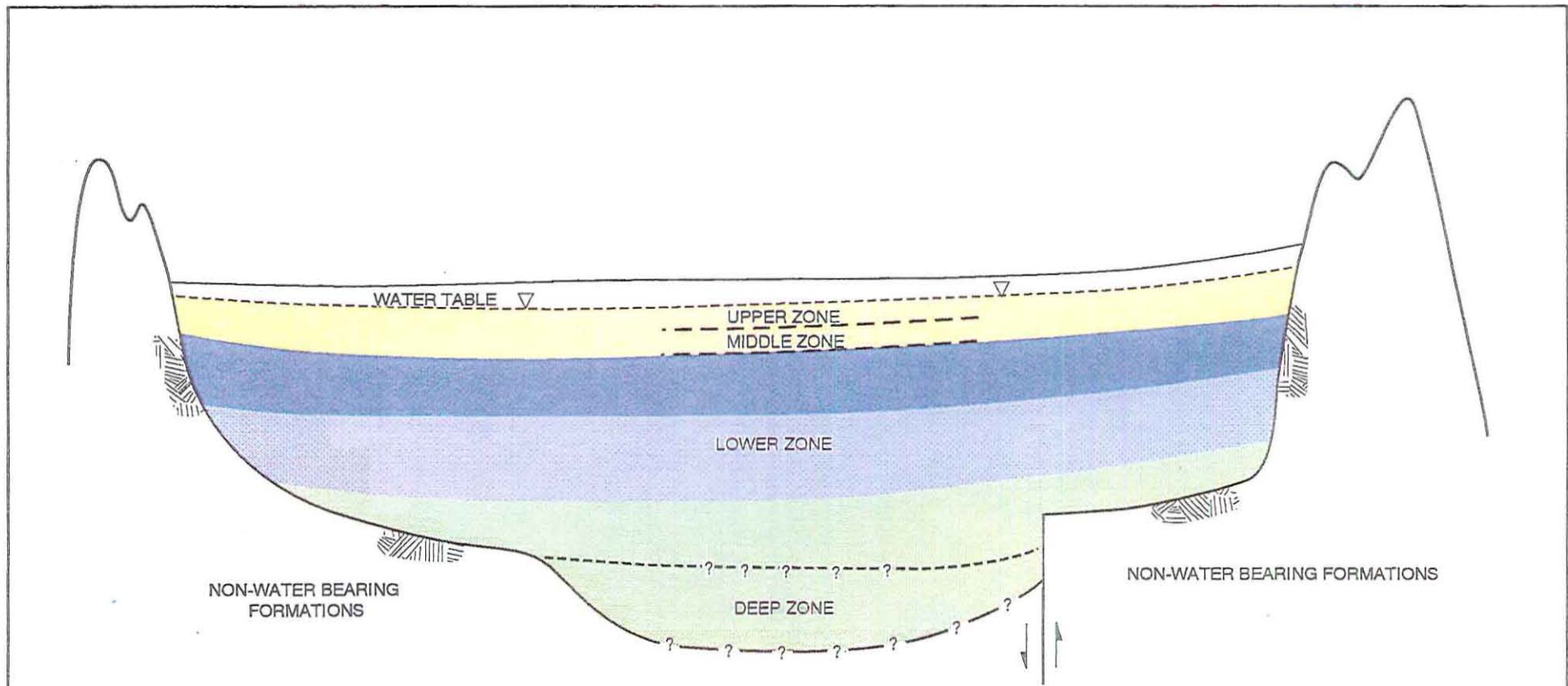
The initial model layer configuration was developed according to the preliminary geologic interpretation with the use of the geologic cross sections presented in the Report of Referee. The model layer thicknesses were generalized and followed the geometry of the basin, with the upper layer representing the water-table zone. The layers below comprised the remaining thickness of the saturated alluvium (refer to Appendix L, Figure L-2).

The geologic and hydrogeologic data from the RI field investigation provided some refinements to the initial conceptual model of the San Fernando Basin. In the study area, four distinct lithologic zones were again identified and their characteristics further clarified (Section 3.2.3). The zones are referred to as the Upper Zone, Middle Zone, Lower Zone, and Deep Zone. The existing model layers were modified to incorporate the characteristics identified during the field investigation. This modification was required to improve the degree to which the numerical model represented the physical conditions of the groundwater system, thus allowing better understanding and use of the model results. Figure 6-4 is a conceptual representation of the model layer configuration based on the stratification described in Section 3.0. Layer 1 is the water table layer, which includes all of the Upper Zone as well as the Middle Zone, because the top of the middle zone is not as clearly defined as the bottom. An additional reason for combining the Upper and Middle zones was the high degree of water level fluctuations that occur, often leaving the Upper Zone unsaturated in some areas. During modeling, such excessive desaturation of nodes could lead to numerical instability.

The boundaries of layer 2 were adjusted to include the upper 150 feet of the Lower Zone, which was identified as containing a high proportion of coarse gravels. A large percentage of groundwater extracted from the aquifer comes from this interval. Geophysical logs also indicate that most of the highly transmissive materials occur within this interval. Thus, a separate layer was assigned to this portion of the Lower Zone.

The remaining portion of the Lower Zone and the Deep Zone are represented by layers 3 and 4. The thicknesses of these layers, relative to the aquifer stratification, are somewhat arbitrary in that the division between the Lower Zone and the Deep Zone is not currently well understood from the existing data. Although this division has not been clearly identified, a fourth layer was maintained in the model to represent those portions of the saturated alluvium that may influence the local groundwater flow patterns when vertical hydraulic gradients are changed. Together, the four model layers represent the entire thickness of the saturated alluvium to the extent known. The model layers identified in the vicinity of the available RI field data were extended to the basin boundaries. Some of the heterogeneous characteristics of each layer were incorporated in the model parameters with the use of well log data; the aquifer parameters were not generalized based on local conditions in the study area. Areally, the number of layers varies from four layers in the deep central portion of the basin to one layer in the thinner Los Angeles River Narrows and near the basin boundaries. Figure 6-5 illustrates the different areal extent of the boundaries of each layer superimposed on the model grid.

Figure 6-6 shows the saturated thickness of layer 1, based on the fall 1981-82 water table. As described above, the bottom of layer 1 is defined in the model by the bottom of the Middle Zone, as described in Section 3.0. Where the Middle Zone has not been inferred, such as west of the Pacoima Wash, in the Los Angeles River Narrows, and north of the study area, the bottom of layer 1 is projected to the edges of the basin. Layer 1 is simulated as an unconfined layer and areally varies in thickness from about 10 feet to 420 feet. The thickness of layer 1 varies also with time and depends on the saturated thickness of the aquifer.

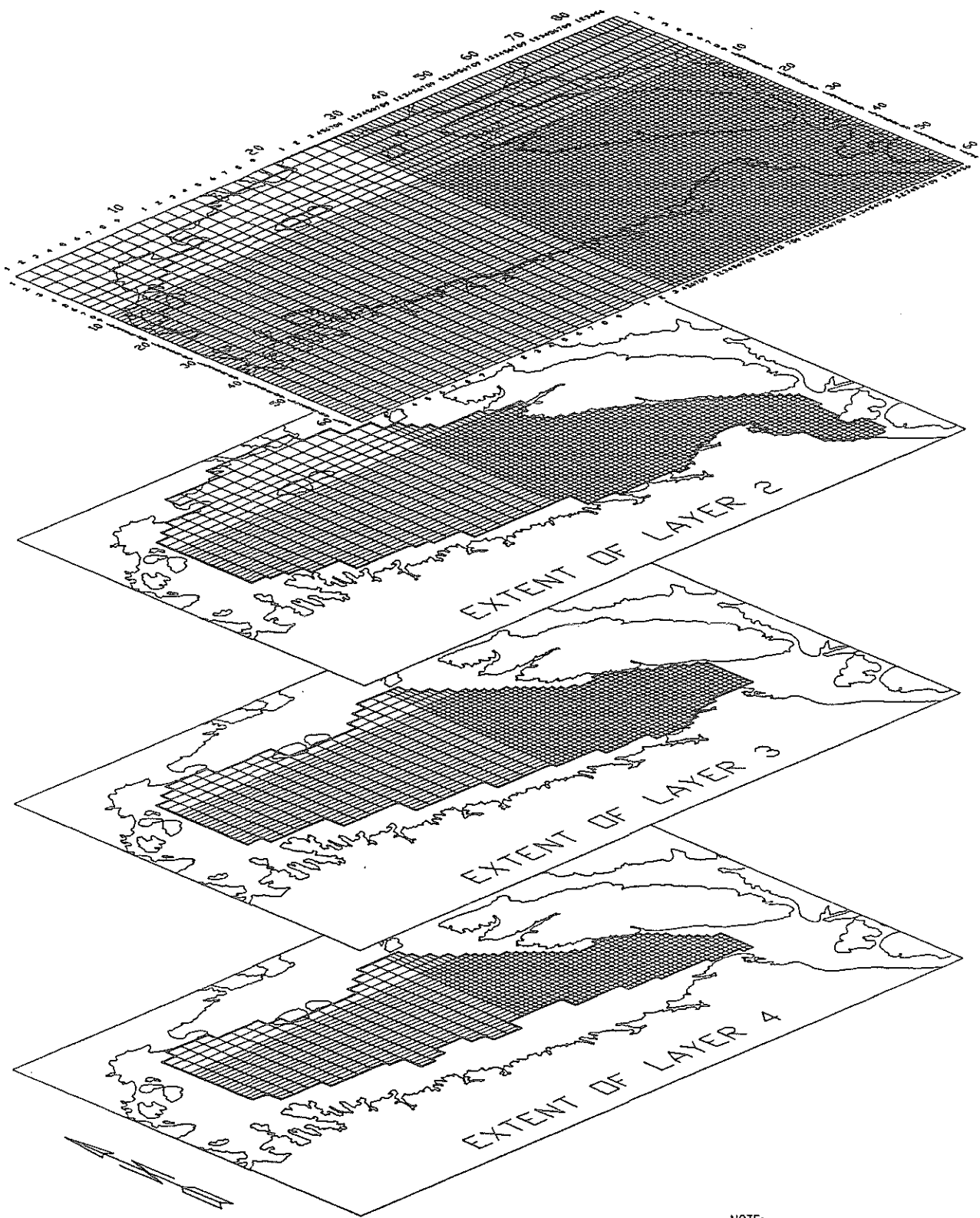


LEGEND:

- MODEL LAYER 1
- MODEL LAYER 2
- MODEL LAYER 3
- MODEL LAYER 4

- FAULT TRACE
- APPROXIMATE DIVISION BETWEEN LOWER AND DEEP ZONES
- UNKNOWN DEPTH

FIGURE 6-4  
 CONCEPTUAL REPRESENTATION OF MODEL LAYERS  
 SUPERIMPOSED ON A CONCEPTUAL GEOLOGIC CROSS SECTION



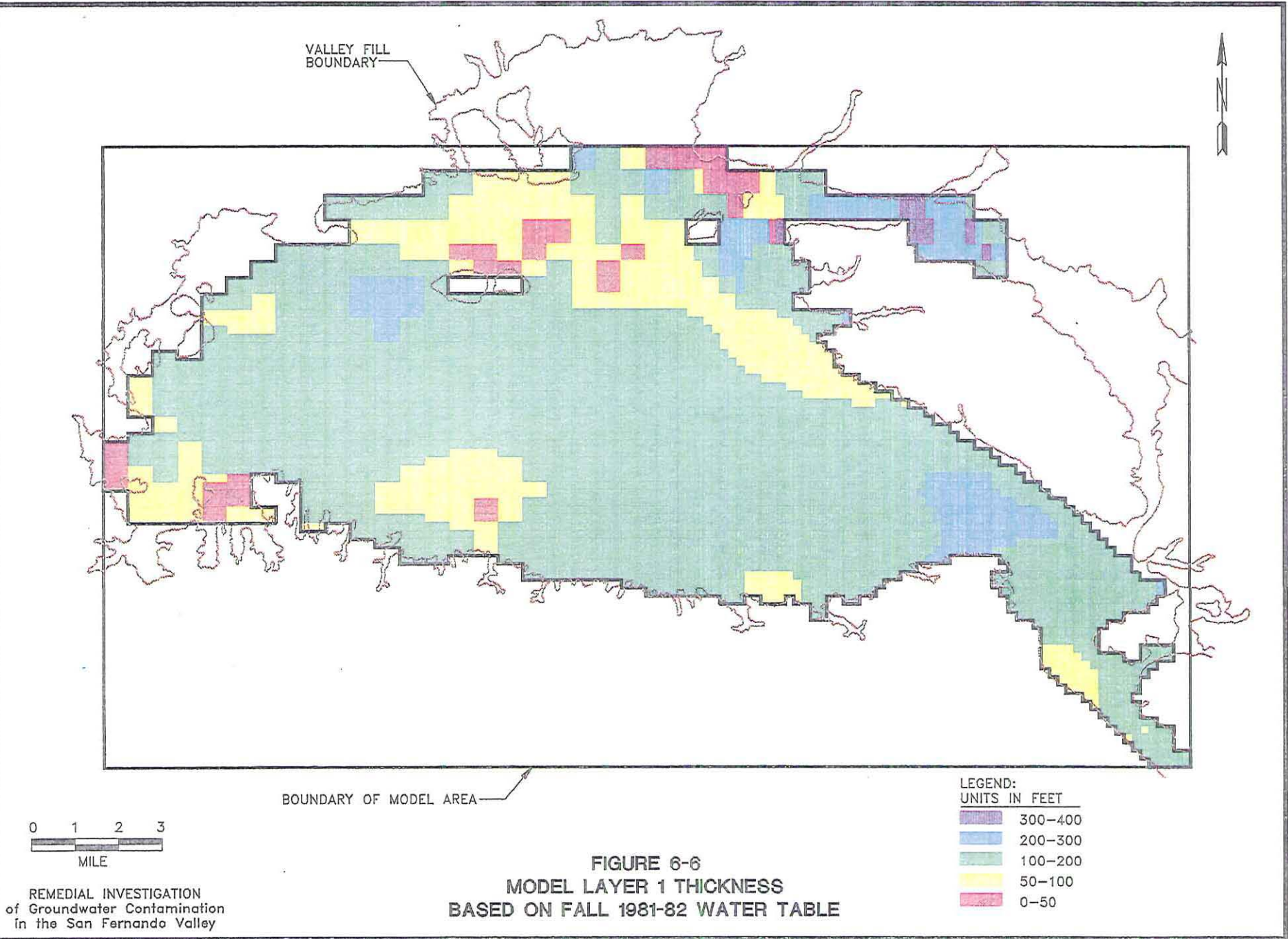
NOTE:  
LAYER SURFACES ARE SHOWN IN TWO  
DIMENSIONS FOR THE PURPOSE OF  
THIS ILLUSTRATION ONLY. ACTUAL  
MODEL LAYER THICKNESS VARIES BY  
NODE.

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FIGURE 6-5  
MODEL LAYER CONFIGURATION



MOD4. FIG6-6 REV. 8/31/92. 1=15840



BOUNDARY OF MODEL AREA

LEGEND:  
UNITS IN FEET

300-400
200-300
100-200
50-100
0-50

FIGURE 6-6  
MODEL LAYER 1 THICKNESS  
BASED ON FALL 1981-82 WATER TABLE

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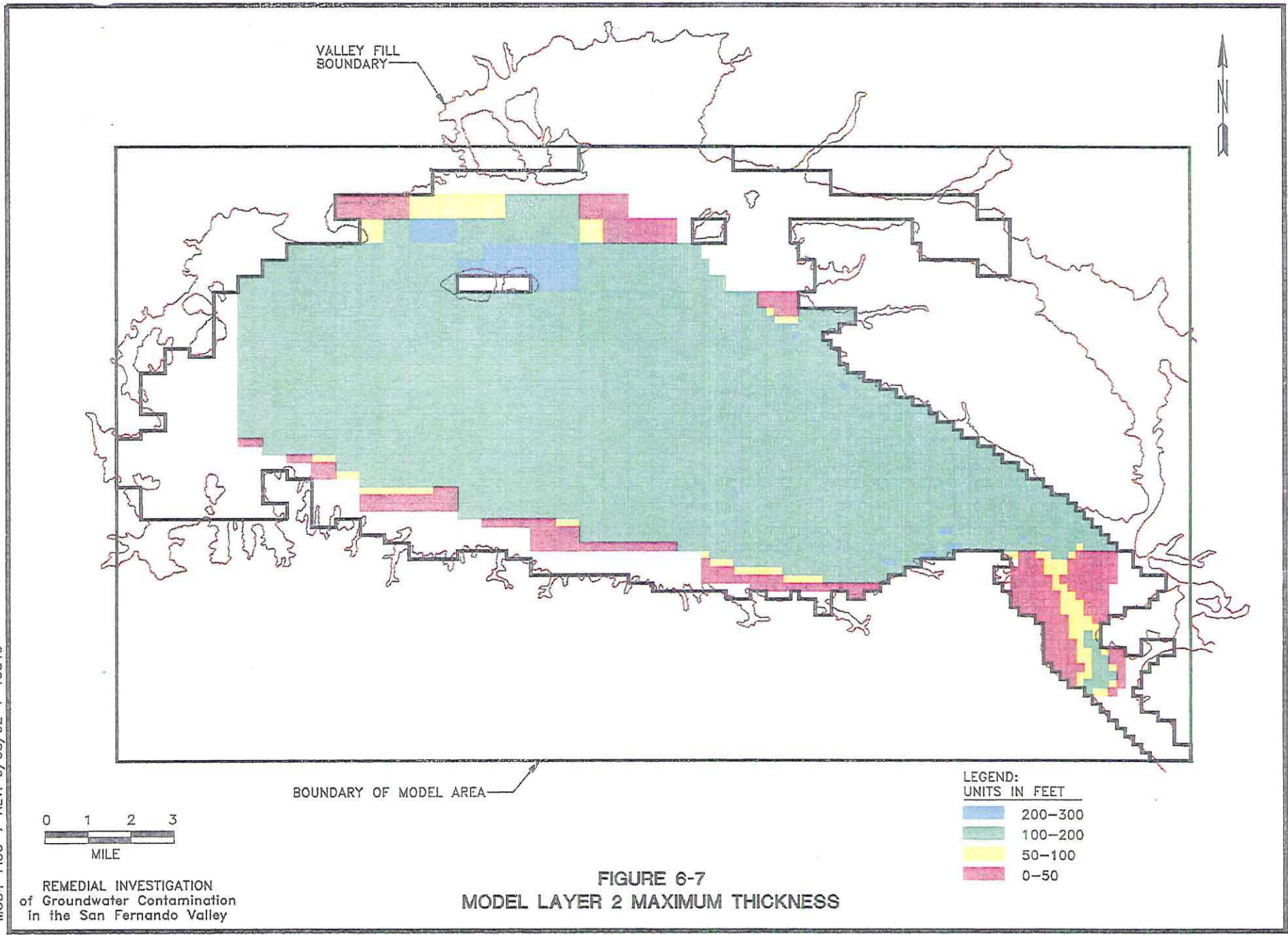
Layer 2 is defined in the model such that either confined or unconfined conditions can be simulated. Generally, this layer is represented as confined by the model layer above; however, in the event that the layer above (layer 1) is dewatered, which may occur during heavy groundwater pumping in the North Hollywood area (see Figure 3-11), layer 2 is simulated as unconfined in the dewatered areas. Layer 2, shown in Figure 6-7, generally has a maximum thickness of 150 feet in the main portion of the basin when layer 1 is fully saturated. Near the edges of the basin, layer 2 pinches out as the total thickness of the alluvial sediments thins. Layers 3 and 4 are simulated as confined layers (confined in the model by the layers above), and therefore their saturated thicknesses do not change with time.

#### **6.3.4 Boundary Conditions**

The boundary conditions define the hydraulic conditions under which the model flow domain is defined. In MODFLOW, there are three available types of model cells: constant head, no flow (or inactive), and variable head (McDonald and Harbaugh, 1988). All three cell types can be used to represent conditions along boundaries. The San Fernando Basin Model has both no-flow and variable-head boundaries. No-flow boundaries are those for which no flow into or out of the boundary is allowed. The variable-head boundary condition, in which the head is allowed to vary with time, can be simulated as either constant flow or variable flow to the model area. Constant flow is commonly represented by wells, while variable flow is represented by wells, river, drain, or general-head components. These boundaries represent external source and sink terms.

The four types of boundary conditions that were used in the San Fernando Basin model include no flow, constant flux, general head, and river. A general-head boundary is a type of variable-flux condition. Constant-flux and general-head boundaries were simulated with external source terms. A river boundary designation was included because the model simulates the interaction with a river in a manner that is similar to the general-head boundary. These boundary conditions, all used in the San Fernando Basin model, are described in detail below.

MOD4 FIG-7 REV. 9/08/92 1-15840



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FIGURE 6-7  
MODEL LAYER 2 MAXIMUM THICKNESS



**6.3.4.1 No-Flow Boundaries.** The boundaries of the San Fernando Basin and of the groundwater flow system extend from the Santa Monica Mountains on the south to the Santa Susana Mountains and San Gabriel Mountains on the north, the Simi Hills on the west, and the Verdugo Mountains on the east. Practically the entire aquifer is surrounded by this relatively impermeable contact between saturated alluvium and the mountains. Only a negligible amount of water flows from mountain formations into the saturated alluvium aquifer (SWRB, 1962). As shown on Figure 6-3, the aquifer boundary is designated by no-flow cells throughout except where subsurface flow is known to occur.

**6.3.4.2 Constant-Flux Boundaries.** A constant-flux boundary represents a condition in which groundwater moves into or out of a boundary cell as a result of an external source or sink, such as an adjoining groundwater system. Along the boundaries between the San Fernando Basin and the Sylmar Basin, as well as the San Fernando Basin and Verdugo Basin (Figure 6-2), subsurface flow into the San Fernando Basin is known to occur (Section 5.0). Specifically, average annual subsurface flow is estimated to be about 400 acre-feet at Sylmar Notch and 350 acre-feet at Pacoima Notch from the Sylmar Basin (SWRB, 1962). At the boundary of the southern end of the Verdugo Basin, annual subsurface flow to the San Fernando Basin has been estimated as 70 acre-feet (ULARA Watermaster, 1992). The subsurface flow at the model boundaries along these locations are simulated with injection wells set at a constant annual flow rate. Because of the small flow quantities and distances from the areas of concern in the eastern San Fernando Basin, these rates were not varied during transient simulations.

Runoff from the surrounding hill and mountain surfaces, which recharges the aquifer near the boundary of the valley fill, is also simulated as a constant-flux boundary. Several nodes along the model boundary, particularly near the San Gabriel mountains, are assigned a recharge value that changes yearly. These recharges are implemented in the model as injection wells, similar to the subsurface flow described above.

**6.3.4.3 General-Head Boundaries.** A general-head boundary represents a condition in which groundwater flow into or out of a boundary cell from an external source during a stress

period is based on the difference between the head in the cell and the constant head assigned to the external source. This boundary condition is used to describe the subsurface flow out of the basin at the southern end of the Los Angeles River Narrows (Figure 6-3). The special parameters that were defined for the general-head cell are the conductance between the general-head model cell and the external source and the head at the external source, which remained constant for the simulation period. Flow into or out of the model at this boundary varies as the head in the general-head cell fluctuates, thus varying the gradient. An initial estimate of the general-head boundary conductance was made with the 1981-82 conditions using the local hydraulic gradient and the estimate of subsurface flow. The conductance term was then adjusted during model calibration to match the known head and estimated flow. A general-head boundary was used at the southern boundary of the Los Angeles River Narrows rather than a constant-flux boundary because this boundary is closer to a portion of the study area than those at the Sylmar Basin border, and the flows are estimated annually at this location and vary over time.

**6.3.4.4 Los Angeles River.** The mathematical representation of the Los Angeles River is similar to a general-head boundary. MODFLOW simulates flow to or from river nodes, based upon an assigned river stage (level of water in the river) and streambed conductance. The river stage varies from node to node, but was assumed to be constant with time for the purposes of the model. Nodes representing the Los Angeles River are shown in Figure 6-8. Both lined and unlined portions of the river were simulated in the model. This was done for a number of reasons. First, each node has its own streambed conductance and thus can be adjusted to provide more or less interaction with the aquifer. Second, the lined portions of the river were constructed with a layer of gravel beneath the river invert, and there are drainage holes to drain into the river during high water conditions along the lined reaches. Third, regional groundwater contours suggest an influence from the river on groundwater flow patterns throughout the basin.

The streambed conductances were initially estimated from the river reach dimensions and an estimated conductivity of riverbed material, based on the following equation:

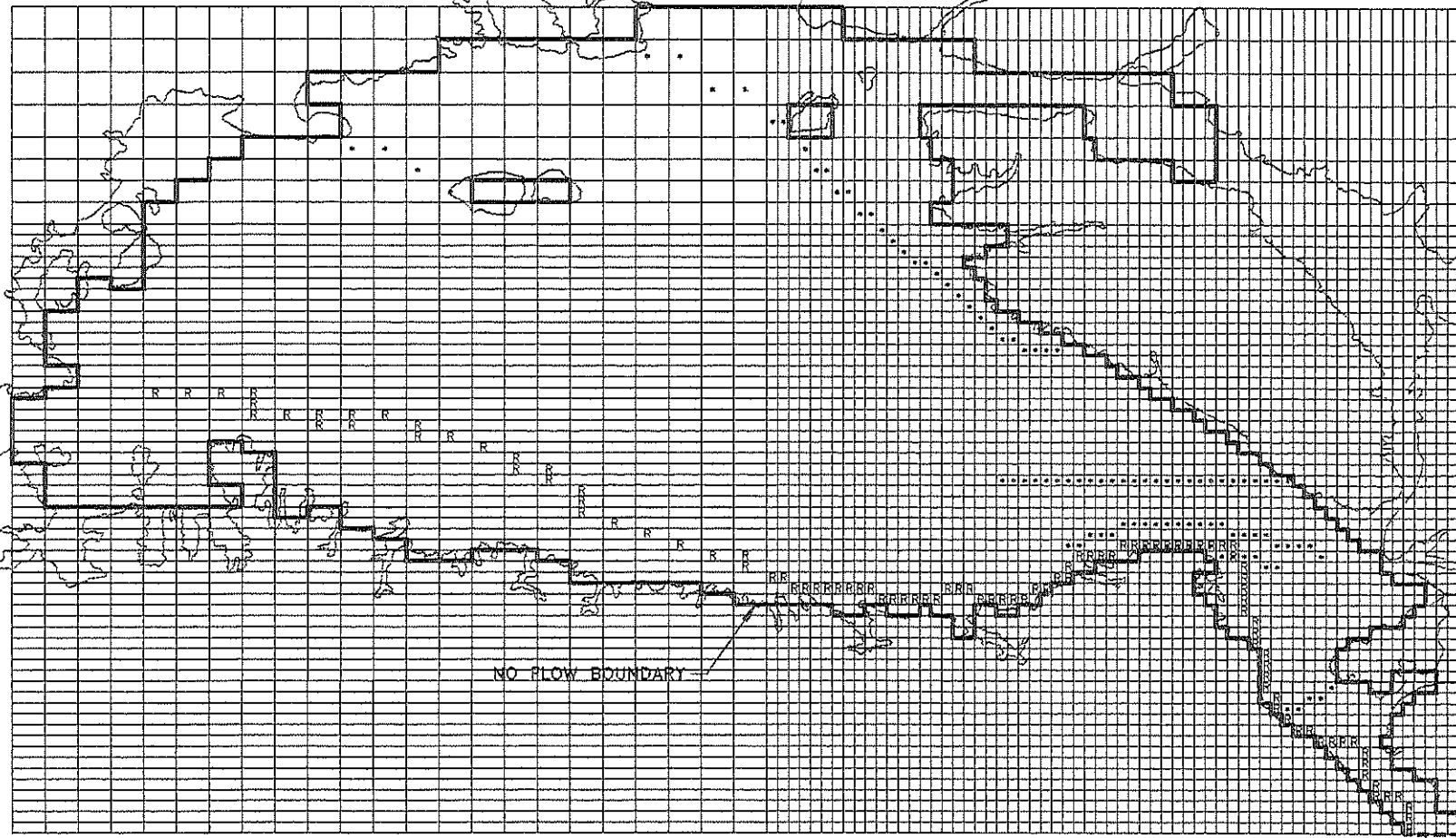
MOD2 FIG6-8 REV. 9/04/92 1=15840



VALLEY FILL BOUNDARY

10 20 30 40 50 60 70 80  
1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9 1 2 3 4 5 6

1  
2  
3  
4  
5  
6  
7  
8  
10  
20  
30  
40  
50  
60



NO FLOW BOUNDARY

GENERAL-HEAD BOUNDARY

**LEGEND:**

- R NODE FOR LOS ANGELES RIVER
- NODE FOR FAULT OR IMPEDEMENT TO FLOW



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**FIGURE 6-8**  
**NODAL LOCATIONS FOR THE LOS ANGELES RIVER**  
**AND FAULTS AFFECTING GROUNDWATER FLOW**

$$\text{Streambed Conductance} = \frac{KLW}{M}$$

where: K = hydraulic conductivity of streambed sediments  
L = length of the reach  
W = width of the reach  
M = thickness of the streambed sediments (McDonald and Harbaugh, 1988).

The streambed sediments were given a hydraulic conductivity for fine sands and gravels and rough estimates were supplied for the length of the stream reach (for each node). For example, a river reach in a 1,000 by 1,000 foot node with a length of 1,000 feet, a width of 20 feet, a streambed thickness of 5 feet, and a hydraulic conductivity of 50 ft/day would have a conductance of 200,000 ft<sup>2</sup>/day. After the initial estimates were made, the conductance values were adjusted during calibration. The river stage was estimated relative to the river bottom elevations from USGS topographic maps because there were too few stream gaging data available.

### 6.3.5 Impediments to Groundwater Flow

Certain faults are known to impede groundwater flow. The faults that have been identified as affecting the movement of groundwater within the alluvium of the San Fernando Basin were simulated in the model as vertical zones of lower permeability (see Section 5.2.3 for a discussion of the individual faults). The nodal locations of these faults are shown on Figure 6-8. All of the faults were simulated in layers 2, 3, and 4, with the exception of the Verdugo Fault, which is simulated in all layers and the San Fernando Fault, which forms the no-flow boundary between the Sylmar Basin and the model area. The hydraulic conductivities assigned to the appropriate model fault nodes were initially estimated based on the observed water-table gradients across the fault zone, then adjusted during the calibration to match the observed water levels across the fault zone.

The Verdugo, the Raymond, and the Northridge Hills faults were included in the model as part of the initial conceptual model of groundwater flow in the San Fernando Basin. The effect of the Northridge Hills fault on groundwater flow, however, was not well understood because of a lack of groundwater-level data near the fault in 1981-82. However, later groundwater contour maps indicate a break in the groundwater surface across the Northridge Hills fault. During the steady-state and transient calibration, various scenarios were tested to estimate the degree of impedance, if any, that this fault has on groundwater flow. This fault was found to provide a better match to local groundwater levels when acting as an impediment to flow compared to simulations with no impediment. The Benedict Canyon fault zone, a group of faults in the Crystal Springs Study Area (see Section 3.1.2.1), was incorporated during steady-state calibration to aid in simulating the occurrence of a pumping depression in the Glendale area.

During the calibration, an additional fault was incorporated into the model in the Crystal Springs Study Area. A major hypothesized fault was added north of the Benedict Canyon fault zone to simulate the fault-like steep groundwater gradients suggested by the RI data near CS-VPB-03 (Section 5.2.4, Figures 5-18 through 5-23). The possible occurrence of such a fault is further supported by the numerous existing faults, trending generally east-west (Sections 3.1.1 and 3.1.2). The influence of these faults is discussed further in Section 6.5.

#### 6.4           AQUIFER CONDITIONS

The finite-difference equations approximate groundwater flow at each model node based on the hydraulic properties of the model cell, the aquifer stresses, and the initial head conditions defined for the model area. For the basin-wide model of the San Fernando Basin, values were assigned to each node for horizontal transmissivity (hydraulic conductivity and saturated thickness for layers 1 and 2) vertical hydraulic conductivity, and storativity. These parameters are discussed in Sections 6.4.1 through 6.4.3. The aquifer stresses simulated by the model are discussed in Section 6.4.4. The initial conditions for the steady-state and transient conditions are discussed in Section 6.5, Model Calibration.

#### 6.4.1 Hydraulic Conductivity and Transmissivity

The San Fernando Basin Model is three-dimensional and has three components of hydraulic conductivity. In the most general case, however, there are actually nine components of hydraulic conductivity in a three-dimensional system. The condition that allows this generalization of the flow equation from nine components of hydraulic conductivity to three, is that the principal directions of anisotropy (the directions in space at which the hydraulic conductivity attains its maximum and minimum values) coincide with the  $x$ ,  $y$ , and  $z$  coordinate axes (Freeze and Cherry, 1979). The coordinate system for the model is selected so that it satisfies this requirement. It should be noted that in an actual heterogeneous and anisotropic system, the principal directions of anisotropy will likely vary to some degree at different locations within a formation. The degree to which the actual system fits the simplifying assumption must be considered when evaluating model simulations. In the case of the San Fernando Model, a modification was made to the way the model assigns anisotropy to account for some of the spacial variability in anisotropy. This modification is discussed later in this section and in Appendix L.

The three components of hydraulic conductivity are a vertical component, represented in the model within the vertical leakance parameter, and two horizontal components represented by the hydraulic conductivity (or transmissivity) matrix and an anisotropy factor. The two horizontal components of transmissivity are parallel to the row and column directions established by the model grid orientation. Because the model input consists of a single matrix for hydraulic conductivity (or transmissivity) for each layer, the anisotropy factor is used to compute one horizontal component of transmissivity from the other. The input matrix of hydraulic conductivity (or transmissivity) defines the component in the row direction. The model multiplies the matrix by the anisotropy factor to calculate the hydraulic conductivity (or transmissivity) in the column direction.

Horizontal hydraulic conductivity and transmissivity were estimated using lithologic logs from 645 wells within the San Fernando Basin along with pumping and specific-capacity test data

from 25 wells. The lithologic logs used included those from wells drilled for municipal water supply, irrigation, water quality monitoring, aquifer testing, and oil and gas exploration. Most of the well logs were produced by the drillers, and thus varied in degree of detail and accuracy. Information from these logs was evaluated and entered into a database using 14 lithologic categories that corresponded to most of the drillers' descriptions, to establish consistency and identify broad correlations. These lithologic categories are listed in Appendix L. By using the lithologic logs, the horizontal and vertical variability in the aquifer materials were incorporated into the model input. The method used to make the initial estimates of hydraulic conductivity and transmissivity for the model from the drillers' logs is discussed in more detail in Appendix L.

Anisotropy describes the condition under which one or more hydraulic properties of an aquifer vary according to the groundwater flow direction (Fetter, 1980). On a small scale, the primary cause of anisotropy is the orientation of clay minerals in unconsolidated sediments (Freeze and Cherry, 1979). Thus, it follows that the occurrence of clay within the alluvial sedimentary deposits also effects the anisotropy. On a larger scale, many other hydrogeologic factors may influence anisotropy, such as the vertical heterogeneity caused by horizontal layering and the regional patterns of deposition within the basin.

An anisotropy factor for the horizontal transmissivity is determined during model calibration. The MODFLOW program allows only a single value of anisotropy to be specified for each model layer. Modifications have been made to the model code, however, to allow the direction of the anisotropy to change along the Los Angeles River Narrows (east of column 62 and south of row 34). These modifications are described in Appendix L. It is assumed that the principal directions of hydraulic conductivity (directions at which hydraulic conductivity attains its maximum and minimum values) are parallel and normal to the direction of regional hydraulic gradient: west to east in the main portion of the basin and north to south through the Narrows (refer to Figure 5-13). Several values of anisotropy, including 1 for isotropic conditions, were tested for the different layers to arrive at the condition that produced the best results. This is described further in Section 6.5.1.



East of the Pacoima Wash, the assumed anisotropy does not coincide with the principal direction of sediment deposition, except roughly along the southern margin of the basin and within the Los Angeles River Narrows. However, other hydrogeologic factors are believed to influence the anisotropy in this area. These factors may include, but are not limited to, such features as west-east trending faults and folds in the eastern portion of the basin, several of which were identified by Weber (1980). Other possible factors influencing groundwater flow and thus the principal direction of anisotropy are the regional variation in fine- and coarse-grained sediments, basin geometry, and aquifer development patterns. The complete effect of the anisotropic conditions are simulated in the model by the combined effect of the regional anisotropy factor, the variation in hydraulic conductivity and transmissivity, the impediments to groundwater flow, aquifer development patterns and the basin geometry (model boundaries).

#### 6.4.2 Vertical Hydraulic Conductivity

To estimate the flow from one model layer to the next, the model uses vertical leakance to calculate vertical conductance. For a single model layer with vertical hydraulic conductivity  $K_z$ , vertical conductance,  $C$ , is defined as:

$$C = \frac{K_z A}{d}$$

where  $A$  is the model cell area, and  $d$  is the layer thickness (McDonald and Harbaugh, 1988). The value used as input to the model is vertical leakance. The vertical leakance between two layers (from the middle of one layer to the middle of the layer below),  $V_{cont}$ , is defined as:

$$V_{cont} = \frac{C_{total}}{A}$$

where  $C_{total}$  is the interval conductance which is determined by treating the layer conductances in series. Thus vertical leakance between two layers (layer 1 and layer 2 for example) is defined as:

$$V_{cont} = \frac{1}{\frac{d_1/2}{(K_x)_1} + \frac{d_2/2}{(K_x)_2}}$$

The input data incorporate both thickness and vertical hydraulic conductivity of a cell in a single term. The program multiplies the vertical leakance by the cell area to obtain vertical conductance.

The vertical leakance in the San Fernando Basin model is variable from node to node. The initial estimates of vertical leakance between layers were based on the estimated distribution of horizontal hydraulic conductivity in the upper layer; for example, initial estimates of the value of vertical leakance from layer 1 to layer 2 were based on the distribution of horizontal hydraulic conductivity of layer 1. This approach was used for two reasons: 1) the horizontal hydraulic conductivity was estimated from well log data to incorporate variations that may exist in the composition of the aquifer materials, which allows the variations in the aquifer material to be reflected in the vertical leakance distribution; and 2) the vertical leakance input value has a direct relationship with vertical hydraulic conductivity, which, assuming some anisotropy from the evident heterogeneity, can be related to the horizontal hydraulic conductivity by an estimated anisotropy ratio ( $K_x:K_z$ ). Initial estimates of horizontal to vertical anisotropy ratios ranged between 1:100 and 1:1,000. A multiplication factor incorporating the anisotropy and the interval thickness was used to convert the matrix of  $K_x$  values to  $V_{cont}$  values. The final magnitude of and local variation in the vertical leakance values were estimated through model calibration (Section 6.5.1).

### 6.4.3 Specific Yield and Storage Coefficient

As discussed previously, model layer 1 is treated as a water table aquifer, layer 2 as a confined or unconfined aquifer, and layers 3 and 4 as confined aquifers. For transient simulations, the model requires specification of a dimensionless storage coefficient value for each node. For a confined layer the storage coefficient values are given by the storativity of the cell material. For an unconfined layer, the storage coefficient values are equal to the specific yield of the cell material. Based on drillers' logs and the specific yield values associated with different soil types, as given in the Report of Referee, the specific yield and the storage coefficient values were estimated at each active model node. The Report of Referee specific yield values are presented in Table 6-1. The method used to obtain initial estimates of the storage coefficient values for the model is presented in Appendix L.

Storativity of the San Fernando Valley is discussed in Section 5.0, and in the Report of Referee. Section 5.0 presents ranges of storativity and specific yield that reflect only the zones containing observation wells used in the aquifer tests. However, the storage values derived from analysis of the aquifer tests support the model values. The specific yield at the water table (unconfined zone) estimated from the North Hollywood aquifer test was 0.1 percent. From the Crystal Springs aquifer test, the specific yield of the unconfined zone was estimated at 1 percent. Storage values calculated from short-term pumping tests typically reflect water that is released from storage as a result of pressure changes in the aquifer, as in a confined aquifer. Thus, these values are smaller than expected values of specific yield.

The storage coefficient values for the aquifer below the water table (semiconfined or confined zones) at the North Hollywood test site ranged from 0.00001 to 0.001. At the Crystal Springs aquifer test site, the storage coefficient values below the water table ranged from 0.00006 to 0.001.

TABLE 6-1

**SPECIFIC YIELD VALUES SELECTED FOR  
SAN FERNANDO VALLEY REFERENCE**

Percent	Soil Type	
0	Hard granite rock	Soil rock
3	Adobe	Hard pan
	Boulders in clay	Hard sandy shale
	Cemented clay	Hard shell
	Clay	Muck
	Clay loam	Sandy clay loam
	Decomposed shale	Shale
	Dirt	Shaley clay
	Granite clay	Shell rock
	Hard clay	Soapstone
5	Cemented sand	Sandstone
	Clay and gravel	Sand and clay
	Clayey sand	Sandy clay
	Conglomerate	Sediment
	Decomposed granite	Shaley gravel
	Gravelly clay	Silt
	Loam	Silty clay
	Rotten conglomerate	Silty loam
	Rotten granite	Soil
	Sand rock	Soft sand
10	Cemented boulders	Hard sand
	Cemented gravel	Heavy rocks
	Cemented sand and gravel	Sandy loam
	Dead gravel	Soft sandstone
	Dead sand	Tight boulders
	Dirty pack sand	Tight coarse gravel
	Hard gravel	
14	Boulders	Large gravel
	Broken rocks	Rocks
	Coarse gravel	Sand and gravel, silty
	Cobbles and gravel	Tight fine gravel
	Gravel and boulders	Tight medium gravel
16	Fine sand	Sand and boulders
	Heaving sand	Tight sand
	Quicksand	
19	Sand and gravel	
21	Dry gravel	Medium gravel
	Gravel	Sand
	Gravelly sand	Water gravel
	Loose gravel	
26	Coarse sand	Medium sand
	Fine gravel	

\* Source, Report of Referee (SWRB, 1962).

#### 6.4.4 Aquifer Stresses

In addition to the boundary conditions and hydraulic aquifer properties input to the model, the conceptual hydrogeologic characterization of the San Fernando Basin also included hydrologic components associated with external stresses. These hydrologic components include the following aquifer recharge and discharge items:

- precipitation
- hill and mountain runoff
- return flow from delivered water
- spread water
- groundwater extraction
- flow to and from the Los Angeles River (discussed in Section 6.3.4.4)

The model inputs were derived from annual and monthly groundwater supply tabulations as discussed in Sections 4.0 and 5.0. Table 6-2 summarizes the groundwater balance components for 1981-82 indicating the source of the data for each component. Table 6-3 summarizes the groundwater balance components on a yearly basis for 1981-82 through 1990-91, the 10-year calibration period. The time period selected for the transient calibration is discussed in Section 6.5.2 and 6.5.3. With the exception of some of the delivered water, mainly in the western San Fernando Basin, the water balance components were input to the transient model by quarterly stress periods determined from monthly data for 1981-82 through 1989-90. Monthly stress periods were used for 1990-91 for the calibration to the RI data.

Both tables show also the estimated change in storage. Table 6-2 shows the change in storage estimated by the Specific Yield Method used by the ULARA Watermaster and reported in the ULARA Watermaster Report (1983) (Section 4.3.2). Table 6-3 presents the change in storage estimated by the Specific Yield Method as well as the change in storage based on the balance of inflows and outflows (Inflow-Outflow Method). The Specific Yield and the Inflow-Outflow methods for estimating values of change in storage are both valid. The Inflow-Outflow Method includes the annual variation that occurs in estimates made for recharge from precipitation on the valley fill and the hill and mountain runoff that is not spread. There may also be some

TABLE 6-2

## GROUNDWATER BALANCE COMPONENTS FOR WATER YEAR 1981-82

Component <sup>a</sup>	Subtotals (acre-feet)	Total (acre-feet)	Source
<b>INFLOW</b>			
1. RECHARGE (areal recharge)		60,020	
1a. Recharge from precipitation on the valley fill <sup>b</sup>	11,940		17.18 in x 8% x 104,202 active model node acres
1b. Delivered water return recharge	48,080		Watermaster Report, page 36, Table 9 with LADWP Aqueduct Division analog node system metered values (see Section 6.4.4.3)
2. WELLS (injection wells)		28,830	
2a. Spread water recharge	24,250		items 2a(1) + 2a(2)
2a(1). runoff <sup>c</sup>	24,250		Watermaster Report, page 9, Table 1A
2a(2). import	0		Watermaster Report, page 9, Table 1A
2b. Hill and Mountain runoff (not spread) <sup>c</sup>	3,760		Back calculated value (6+5+4+3-1-2a-2c)
2c. Subsurface Inflow (Sylmar and Verdugo basins)	820		Watermaster Report, page 38, Table 9 and ROR, Appendix P (Sylmar and Notch [400] + Pacoima Notch [350] + Verdugo Basin [70]) <sup>d</sup>
<b>TOTAL</b>		<b>88,850</b>	
<b>OUTFLOW</b>			
3. WELLS (extraction wells)		87,670	Watermaster Report, Appendix A
Groundwater extractions			
4. HEAD-DEPENDENT BOUNDARIES		430	Watermaster Report, page 36, Table 9
Subsurface outflow			
5. NET RIVER		1,280	Watermaster Report, page 14, Table 4
Rising water discharge to river			
<b>TOTAL</b>		<b>89,380</b>	
6. CHANGE IN STORAGE		-530	Watermaster Report, page 35, Table 8A

<sup>a</sup> Components are grouped in the table by the type of model input or output that applies.

<sup>b</sup> Weighted-average valley floor precipitation is 17.18 inches (ULARA Watermaster, 1983, page 10).

<sup>c</sup> Total deep percolation of hill and mountain runoff is 2a(1) + 2b = 28,010 acre-ft.

<sup>d</sup> Estimates given in some ULARA Watermaster Service reports for subsurface flow from Sylmar Basin are incorrect; the correct values are obtained from the Report of Referee (SWRB, 1962) (ULARA Watermaster, 1992b personal communication 2/20/92).

TABLE 6-3

SAN FERNANDO BASIN  
8- AND 10-YEAR GROUNDWATER INVENTORY SUMMARY

GROUNDWATER INVENTORY COMPONENTS <sup>a</sup>	TOTALS AND AVERAGES <sup>b</sup> (acre-feet)											
	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	8-yr Average	1989-90	1990-91	10-yr Average
<b>INFLOW</b>												
1. RECHARGE (areal recharge)	60,013	74,228	64,726	62,369	70,171	61,907	68,958	61,405	65,472	61,498	57,249	64,253
1a. Recharge from precipitation (8% used) <sup>c</sup>	11,935	27,537	6,926	7,641	14,081	4,161	12,935	6,335	11,444	5,696	9,989	10,724
1b. Delivered water return recharge	48,078	46,691	57,800	54,728	56,090	57,746	56,023	55,070	54,028	55,802	47,260	53,529
2. WELLS (injection wells)	28,839	113,062	40,803	25,489	32,770	9,622	28,181	8,383	35,894	6,474	22,588	31,621
2a. Spread water recharge	24,253	102,925	38,283	22,569	28,350	7,952	23,161	5,713	31,651	4,154	18,718	27,608
2b. Hill and mountain runoff (not spread)	3766	9317	1700	2100	3600	850	4200	1850	3,423	1500	3050	3,193
2c. Subsurface inflow	820	820	820	820	820	820	820	820	820	820	820	820
TOTAL	88,852	187,290	105,529	87,858	102,941	71,529	97,139	69,788	101,366	67,972	79,837	95,874
<b>OUTFLOW<sup>d</sup></b>												
3. WELLS (groundwater extractions)	87,672	71,310	119,560	105,782	90,833	96,604	109,624	132,581	101,746	86,898	76,082	97,695
4. HEAD-DEPENDENT BOUNDARIES (subsurface outflow)	430	430	420	420	420	425	413	421	422	421	421	422
5. NET RIVER (rising water discharge)	1,280	3,460	3,000	3,260	3,880	3,000 <sup>e</sup>	3,000 <sup>e</sup>	3,000 <sup>e</sup>	2,985	3,500 <sup>e</sup>	3,203	3,058
TOTAL	89,382	75,200	122,980	109,462	95,133	100,029	113,037	136,002	105,153	90,819	79,706	101,175
<b>6. CHANGE IN STORAGE<sup>f</sup></b>												
6a. Inflow - Outflow Method	-530	112,090	-17,451	-21,604	7,808	-28,500	-15,898	-66,214	-3,787	-22,847	131	-5,301
6b. Specific Yield Method	-530	121,090	-63,180	-31,690	-7,980	-31,940	-5,000	-30,550	-6,223	-23,600	-8,740	-8,212

<sup>a</sup> Inventory components are grouped in the table by the type of model input or output that applies.

<sup>b</sup> Data is compiled from annual Watermaster Service reports (ULARA Watermaster, 1983 through 1992) except delivered water which includes data from the LADWP and item 2b which was estimated separately (ULARA Watermaster, 1992b). (See Section 6.4.4.2.)

<sup>c</sup> Deep percolation of precipitation on the valley floor is calculated as 8 percent of the active node area based on model grid spacing (104,202 acres).

<sup>d</sup> Items in italics are estimated or measured flow values and are not input to the model but were used in the calibration.

<sup>e</sup> Values of rising water reported for 1986-87 through 1989-90 are under re-evaluation by the Watermaster, values used here are estimates (ULARA Watermaster, 1992b).

<sup>f</sup> Inflow - Outflow Method is based on water balance component estimates presented in this table, Specific Yield Method values are reported in the annual ULARA Watermaster reports (ULARA Watermaster, 1992).



annual differences in assuming that the delivered water recharge for the City of Los Angeles, for example, is 20.8 percent for each year (percent varies for each city), which is required by the 1979 Judgment (California Superior Court, 1979). Thus, these estimates are expected to have some differences in the annual change-in-storage values resulting from unaccounted for water and discrepancies in the individual inventory components, but the long-term (10 years or more) results should, and do, indicate the same trend. Furthermore, the methods used for the annual water balances and estimates made for each component of the balance are based on the best available data and methods and are valid for the purposes of the San Fernando Basin model (ULARA Watermaster, 1992c). The water balance components provide initial input for the model, which can be adjusted as the model is verified.

**6.4.4.1 Precipitation.** Precipitation is applied to the uppermost model layer as an areally constant percentage of an area-weighted average monthly rainfall determined from several rainfall stations on the valley floor (Section 4.2). Monthly totals for the San Fernando Basin valley floor were obtained from the LADWP Hydrology Division. Recharge from precipitation on the valley floor is a model-calibrated percentage that accounts for losses from evaporation and transpiration and the reduced available recharge area resulting from urbanization. Most of the groundwater balance components are fixed quantities, such as the amount of groundwater extracted. Other items, like recharge from precipitation, are difficult to measure directly and have a range of expected values. In the conceptualization of the model, the recharge from precipitation was estimated as 10 percent to 15 percent of rainfall. During the steady-state calibration process, several recharge amounts were tested until one was found that agreed with the various other groundwater balance components and produced heads matching observed heads within the calibration criteria; this process is discussed in Section 6.5.1.

**6.4.4.2 Hill and Mountain Runoff.** Most of the runoff from the surrounding hill and mountain terrain and from impervious areas of the valley floor (residual rain) is diverted through washes and channels to either spreading basins or the Los Angeles River. Nevertheless, a small amount of this runoff recharges the aquifer by deep percolation near the edges of the valley fill and is simulated in the model as an applied flux to specified nodes around the model boundary

that borders the hill and mountain area. The nodes, shown on Figure 6-9, were selected for their proximity to source areas and to help match 1981-82 water-level contours.

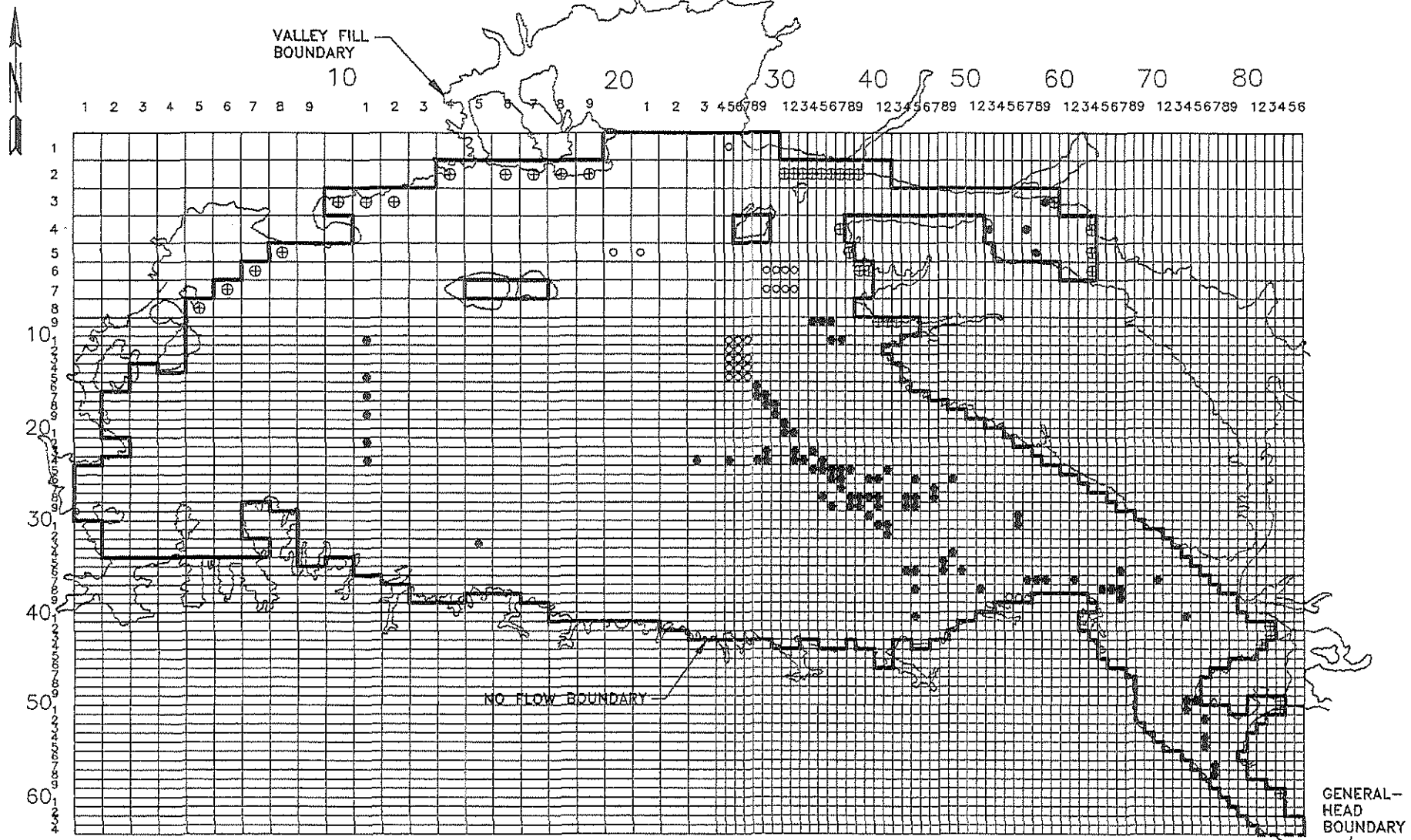
The actual amount of hill and mountain runoff recharge is difficult to measure directly and has been estimated for modeling purposes by the ULARA Watermaster (ULARA Watermaster, 1992b). The actual amount of hill and mountain runoff recharge is difficult to measure directly and has been estimated for modeling purposes by the ULARA Watermaster (ULARA Watermaster, 1992c). For 1981-82, this recharge was estimated as the residual from the water balance (Table 6-2). The change-in-storage value from the ULARA Watermaster Service Report (1983) was used in this calculation. The hill and mountain runoff recharge for the remaining water years for the 10-year model period was referenced to the water year 1981-82 using precipitation and recharge as follows:

$$\frac{\text{Yearly Hill and Mountain Runoff Recharge (Not Diverted)}}{\text{Yearly Hill and Mountain Precipitation 1981-82 Hill and Mountain Precipitation}} = \frac{\text{Yearly Hill and Mountain Precipitation}}{\text{1981-82 Hill and Mountain Precipitation}} \times \frac{\text{1981-82 Hill and Mountain Runoff Recharge (Not Diverted)}}{\text{1981-82 Hill and Mountain Precipitation}}$$

Minor adjustments based on precipitation duration and intensity, and the amount of water spread were made, based on judgment. These adjustments were small and were added or subtracted from the value estimated in the equation above. The estimate of recharge from hill and mountain runoff that is not diverted to spreading grounds is shown as item 2b on Tables 6-2 and 6-3. Because this value is relatively small compared to other water-balance components, small errors in estimation and application of hill and mountain runoff recharge do not significantly impact model results.

**6.4.4.3 Return Recharge.** Recharge from imported water and other water delivered to users in the basin varies by land use and water use. A percentage of the measured quantity of this delivered water, representing return recharge to the groundwater aquifer has been established for each city by the Judgment (Superior Court of the State of California, 1979). The estimated percentage remains the same from year to year. Annual totals based on these percentages are shown as item 1b on Table 6-3. The return recharge (sometimes called "import

MOD2 FIG6-9 REV.9/04/92 1=15840



- LEGEND:**
- WELL NODE
  - SPREADING GROUND NODE
  - ⊕ HILL AND MOUNTAIN RUNOFF NODE

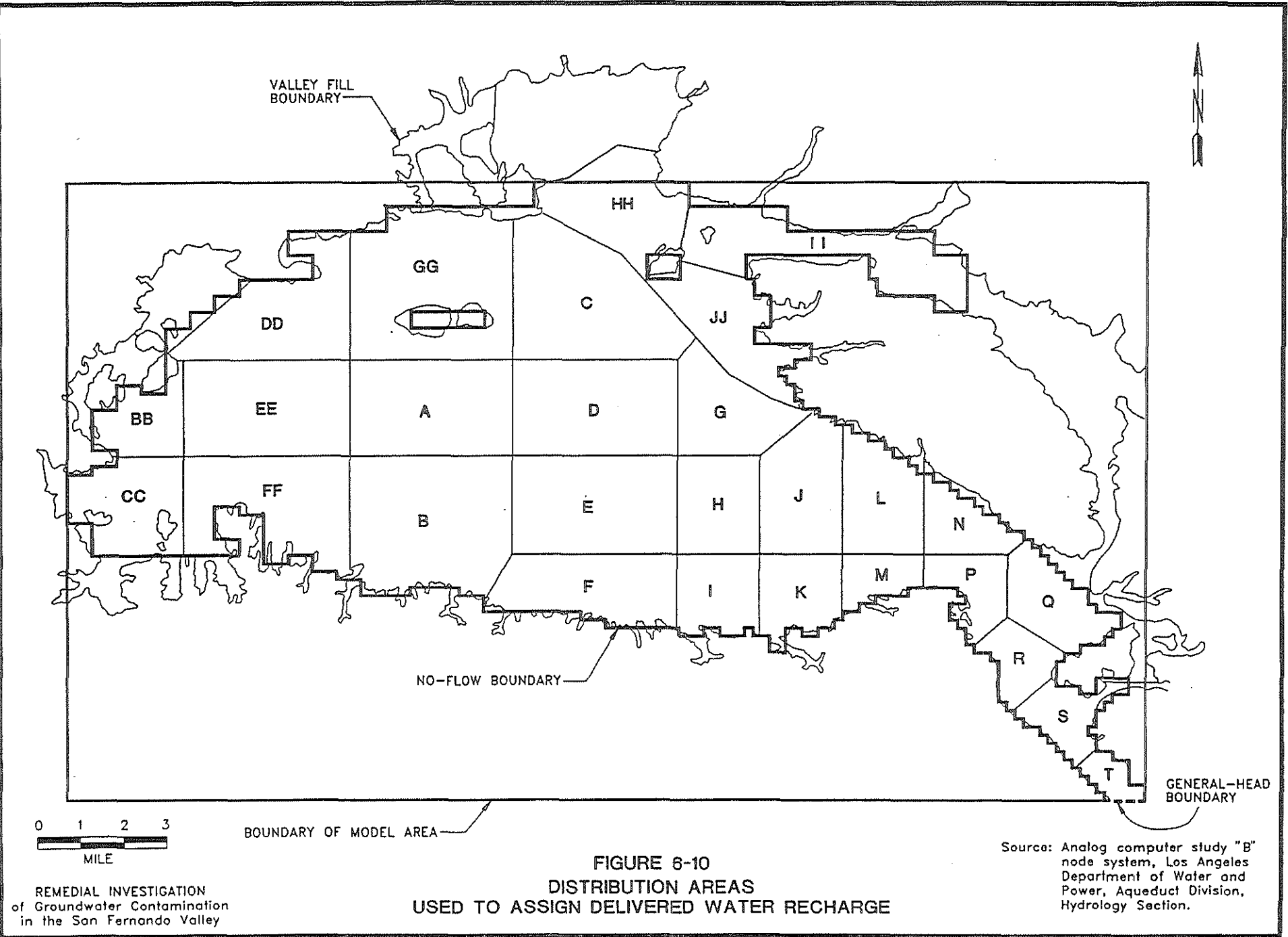
**FIGURE 6-9**  
**NODAL LOCATIONS OF HILL AND MOUNTAIN RUNOFF,**  
**EXTRACTION WELLS, AND SPREADING GROUNDS**

REMEDIAL INVESTIGATION  
of Groundwater Contamination  
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return") was applied regionally to the model's upper layer by overlaying a regional map of polygons for which delivered water is reported monthly with the model grid. Figure 6-10 shows the regional distribution areas. Monthly delivered-water quantities for certain City of Los Angeles distribution areas in the central and eastern portion of the basin are recorded by the LADWP Aqueduct Division. On Figure 6-10, these areas are designated by the single-letter identifiers. Monthly delivered-water values are also available from the LADWP Aqueduct Division for area "II", which is the Sunland-Tujunga area. Delivered water recorded for these areas was distributed evenly to all nodes within each area. Total delivered-water tabulations for the San Fernando Basin were available in the annual Watermaster Service reports (ULARA Watermaster, 1991), and were used with the monthly totals to estimate total return flow recharge. The difference between the total for the basin and the total for the single-letter areas (including "II") for the City of Los Angeles was distributed to the double-letter areas at a constant yearly rate. Distribution of the difference to each double-letter area was determined by calibration. Only yearly totals of delivered water were available for the cities of Burbank and Glendale, and these were distributed evenly to the appropriate nodes ("L" and "M" for Burbank, and "N", "P", and "Q" for Glendale). As illustrated in Table 6-2, recharge from delivered water return flow is a large percentage of the overall inflow components, averaging about 40 percent for the 8-year period.

The values used in the model differ slightly, by an average of about 4 percent, from the values in the annual ULARA Watermaster Service reports. Part of this deviation results from the difference between the model area and the actual San Fernando Basin area, which is larger. Another source for the deviation from values given in the Watermaster Service reports is the method by which the monthly delivered water is recorded for the City of Los Angeles polygon areas (covering only a portion of the entire San Fernando Basin Model Area); these values are determined from actual meter readings which are known to be occasionally inaccurate. Additionally, water delivered to the hill and mountain areas was not included in the totals for delivered water used for calculation of delivered-water recharge to the valley floor. For the City of San Fernando, this value is reported in the Watermaster Service reports. For Burbank and Glendale, however, these values are no longer reported.

MODFIG15 REV. 9/04/92 1=15840



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FIGURE 8-10  
DISTRIBUTION AREAS  
USED TO ASSIGN DELIVERED WATER RECHARGE

Source: Analog computer study "B"  
node system, Los Angeles  
Department of Water and  
Power, Aqueduct Division,  
Hydrology Section.

Estimates of water delivered to the hill and mountain areas for Burbank and Glendale were made by comparing the quantity of water delivered to hill and mountain areas in 1968-69 to quantities for 1975-76. The comparison indicated an increase for the City of Burbank which has a growing population in the hill and mountain areas. The annual increase was calculated and values for 1981-82 through 1990-91 were extrapolated from the annual rate. For the City of Glendale, the comparison indicated a minimal decrease and the hill and mountain area growth was estimated to have stabilized. Therefore, an average of the two years was used as an estimate of a constant annual rate of water delivered to Glendale's hill and mountain areas.

**6.4.4.4 Spread Water.** Spread water was simulated in the model by assigning a known constant flux (tabulated monthly) equally to the appropriate nodes. The location of the nodes for applying spreading water was determined by overlaying the model grid on the basin map with the location of the individual spreading grounds. These spreading-ground nodes are shown on Figure 6-9. Monthly summaries of spread water are reported annually by the Watermaster's Office for the active spreading grounds in the San Fernando Basin. Annual totals of imported water that is delivered to spreading grounds are shown as item 2a on Table 6-3.

The location of the Hansen spreading grounds was digitized from a basemap and appears on top of the Verdugo fault (Figure 6-9). No investigation was made to determine the distribution of spreading within the spreading ground relative to the fault location. Water levels downgradient of the fault have been noted to increase when the spreading grounds are in operation. Therefore, the spread water is distributed evenly in the model between non-fault nodes coincident with the spreading ground location. A smaller quantity of water is recharged to the fault nodes because of their smaller hydraulic conductivity values and thus smaller recharge capacity. Also, as a result of the spreading ground nodes coinciding with fault nodes, the areal coverage of the spreading grounds is slightly larger.

Another exception to the above described representation of spreading operations is the Tujunga spreading grounds. For the Tujunga spreading grounds, the influx of water was spread over more nodes than are actually covered by the spreading-ground area. This was necessary to

simulate the natural movement of the water as it migrates down to the water table, which is 200 to 300 feet below the ground surface.

**6.4.4.5 Groundwater Extractions.** Groundwater extractions were simulated by a flux term at model nodes that correspond to the extraction well locations. Monthly data for the amount of water extracted from the aquifer were available in the annual Watermaster Service reports. The vertical distribution of groundwater extraction between model layers was based on the depth of the well's screened intervals and the relative transmissivity of the model layers through which the well was screened. For example, a well that has screens in both layers 2 and 3 extracts groundwater from layers 2 and 3. The rate of extraction was determined from the ratio of transmissivity of the cell in which the well is located. A sample calculation of extraction is included in Appendix L. Nodal locations where groundwater extractions were simulated for the period from water year 1981-82 to 1990-91 are shown on Figure 6-9. Table 6-3 shows the annual totals for groundwater extractions, which is approximately more than 95 percent of the total outflows from the aquifer.

## **6.5 MODEL CALIBRATION**

Following the system conceptualization and the model setup, the initial estimates of aquifer parameters were made based on the available data. These estimates were tested and refined during calibration using an iterative method in which the model results were interpreted and compared to observed water-level data. The initial assumptions and aquifer parameters were adjusted for subsequent simulations to improve the match between model-generated water levels and those observed in monitoring wells. With this procedure, an improved understanding of the conceptual hydrogeologic system was attained and a calibrated model of the groundwater flow system was developed. During the development, interim versions of the model were used as the basis for site-specific models. The model is currently available to be used to predict aquifer behavior under various hydrologic conditions and aquifer stresses for both the basin-wide applications and to provide boundary conditions to smaller site-specific models.



The steady-state calibration of the model was made primarily to realign and change basin boundaries (including bottom elevations) and to adjust all aquifer parameters except specific yield and storage coefficient. The transient calibration was done for an 8-year period beginning with the steady-state year (1981-82 to 1988-89) to adjust specific yield and storage coefficient values. An additional transient calibration process was implemented to adjust model parameters based on the findings of the field investigation, which was completed during the modeling process (see Sections 3.0, 4.0, and 5.0). For these simulations, the transient period was extended two additional years (1989-90 and 1990-91) to include the findings of the field investigation. Sections 6.5.1 and 6.5.2 describe the approach and results of the steady-state and transient calibration of the basin-wide model. The additional transient calibration results are discussed in Section 6.5.3.

### **6.5.1 Steady-State Model Calibration**

A steady-state simulation of the numerical model was used to calibrate the model parameters against 1981-82 conditions in which essentially no change in storage occurred. The results of the calibrated steady-state model were then used as the initial conditions for the transient calibration so that the estimated initial head data and the model hydrologic inputs and parameters were consistent with each other. Section 6.5.1.1 describes the objectives and approach of the steady-state calibration, and Section 6.5.1.2 presents the results.

**6.5.1.1 Objectives and Approach.** In general, the objectives of the steady-state calibration were to adjust the hydraulic conductivities, transmissivities, hydrologic inputs, and boundary conditions in order to match a given aquifer head distribution, and to generate initial conditions for the transient calibration. These objectives were accomplished by first identifying a hydrologic period during which the groundwater system was essentially in equilibrium, a period during which inflows and outflows were equal resulting in no change in storage. Next, the model was calibrated using aquifer parameters that fell within a reasonable range of values to produce computed water levels that matched the measured water levels within the predetermined criteria. The parameters adjusted during the steady-state calibration include

hydraulic conductivity, transmissivity, horizontal anisotropy, vertical leakance between layers, conductance at general-head boundaries, river interaction with the aquifer, hill and mountain recharge, and recharge from precipitation. In adjusting model parameters during calibration, prior information was used to constrain the unknowns to site-specific hydrogeologically reasonable values. For example, the transmissivities of various aquifer zones have been estimated from aquifer tests. These data were used both to establish the initial estimates for the model nodes and against which to compare the calibrated values. As another example, rainfall recharge has been estimated independently and the values used during calibration were constantly assessed against available estimates.

Since the groundwater system of the San Fernando Basin is not in a natural equilibrium state because of extensive aquifer utilization, a hydrologic period was chosen that had sufficient available data for calibration and minimal change in storage. The 1981-82 water year was chosen since it met both of the criteria. First, the 1981-82 water year is the beginning of a period during which the most comprehensive observed and calculated data were collected. Second, the 1981-82 hydrologic period was selected, although it does not represent a steady-state system in which groundwater levels and flow directions are unchanging, because field measurements and groundwater contour maps indicate a minimal change in groundwater storage from the year before (1980-81), as illustrated in Figure 6-11. At the same time, hydrographs and storage plots illustrate that groundwater conditions in 1981-82 were not in a true steady-state condition (see Plate 4). However, the calibration period selected is believed to be valid because the transients in the basin (such as water-level changes from groundwater extractions and deep percolation of rainfall and spreading) occur rather quickly. Thus, model inaccuracies and problems with the transient calibration caused by calibration to non-existent steady-state conditions, are expected to be small.

The groundwater contours used for the steady-state calibration, shown in Figure 6-12, were developed from fall of 1981-82 water-level measurements and the ULARA Watermaster Service Report fall 1982 groundwater contour map (ULARA Watermaster, 1983). The fall water levels were selected for the steady-state calibration because the water levels, although dynamic during

SOURCE: ULARA Watermaster Service Report, 1992

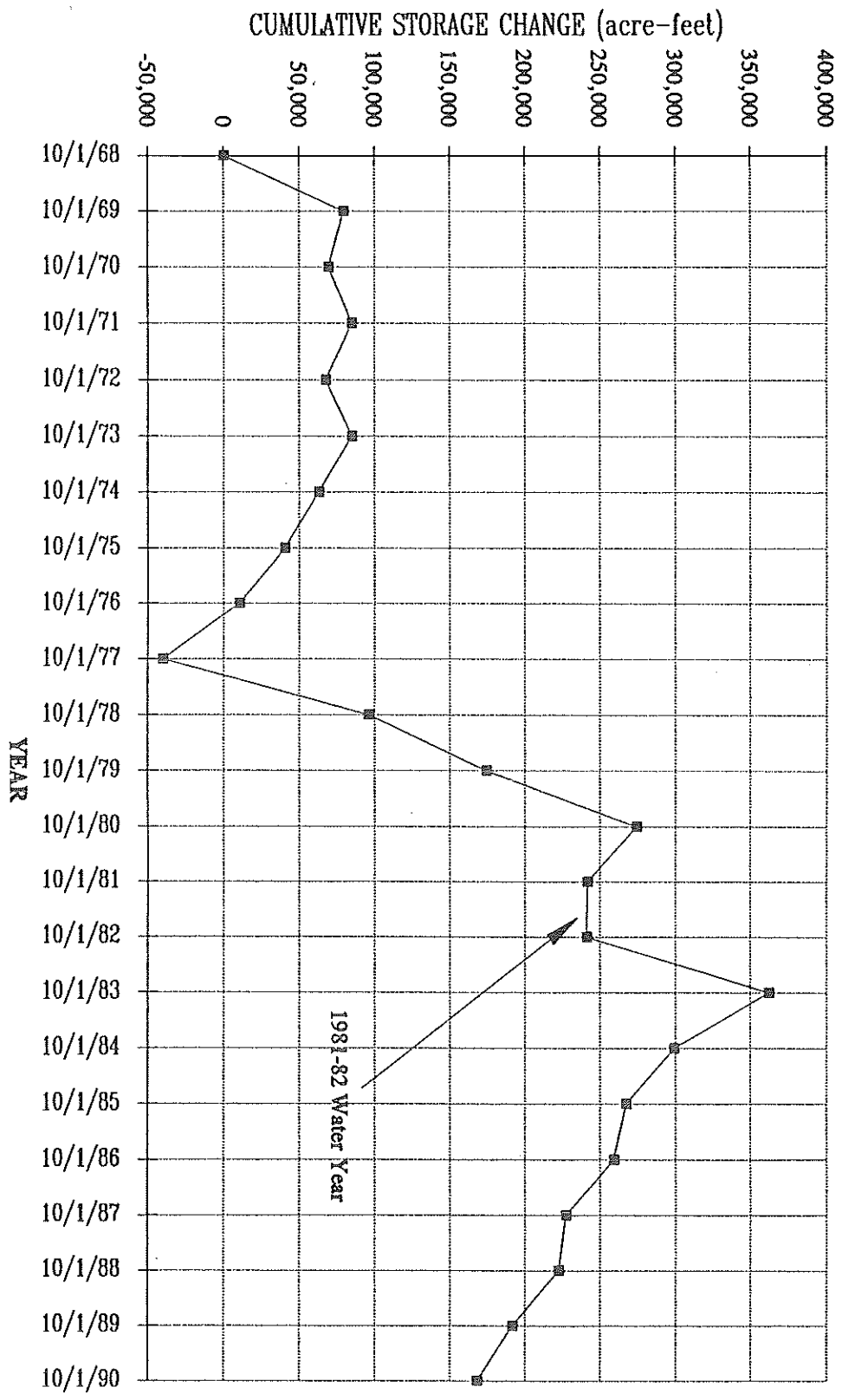


FIGURE 6-11  
CUMULATIVE CHANGE IN STORAGE BEGINNING WITH 1967-68 AS ZERO

the water year, were essentially the same from fall 1981 to fall 1982. Fall groundwater contours and data are typically used to evaluate the changes in groundwater conditions within the San Fernando Basin. Furthermore, the water level maps provided in the annual Watermaster Service Report were the only available maps that could be matched for a steady-state run of the water year 1981-82.

It is important to note that many of the wells used to develop the fall 1982 steady-state groundwater contours are screened at multiple depths within the aquifer. Interpretations between discrete well measurements have been made in areas where little data is available, as well as in areas where more wells are present to compare the model simulation with the 1982 conditions. The interpretations in the eastern San Fernando Basin are believed to present a close approximation to actual conditions because the data coverage is highest in this area. Interpretations of water levels in other areas, such as near the basin boundaries and in the Hansen sub-area, have considerable uncertainty because of a lack of data and the steeper water-table gradients that may exist.

As indicated in previously, groundwater level elevations in the San Fernando Basin are measured in wells that are screened at various and multiple depths. Therefore, the contour map shown in Figure 6-12 is representative of an average head throughout most of the thickness of the aquifer. To match these average heads, an arithmetic mean of simulated heads in all four model layers, called here a composite head, was generated from the model results. Contour maps of the composite heads simulated by the model and of the deviations between composite and measured heads have been used to check the model results.

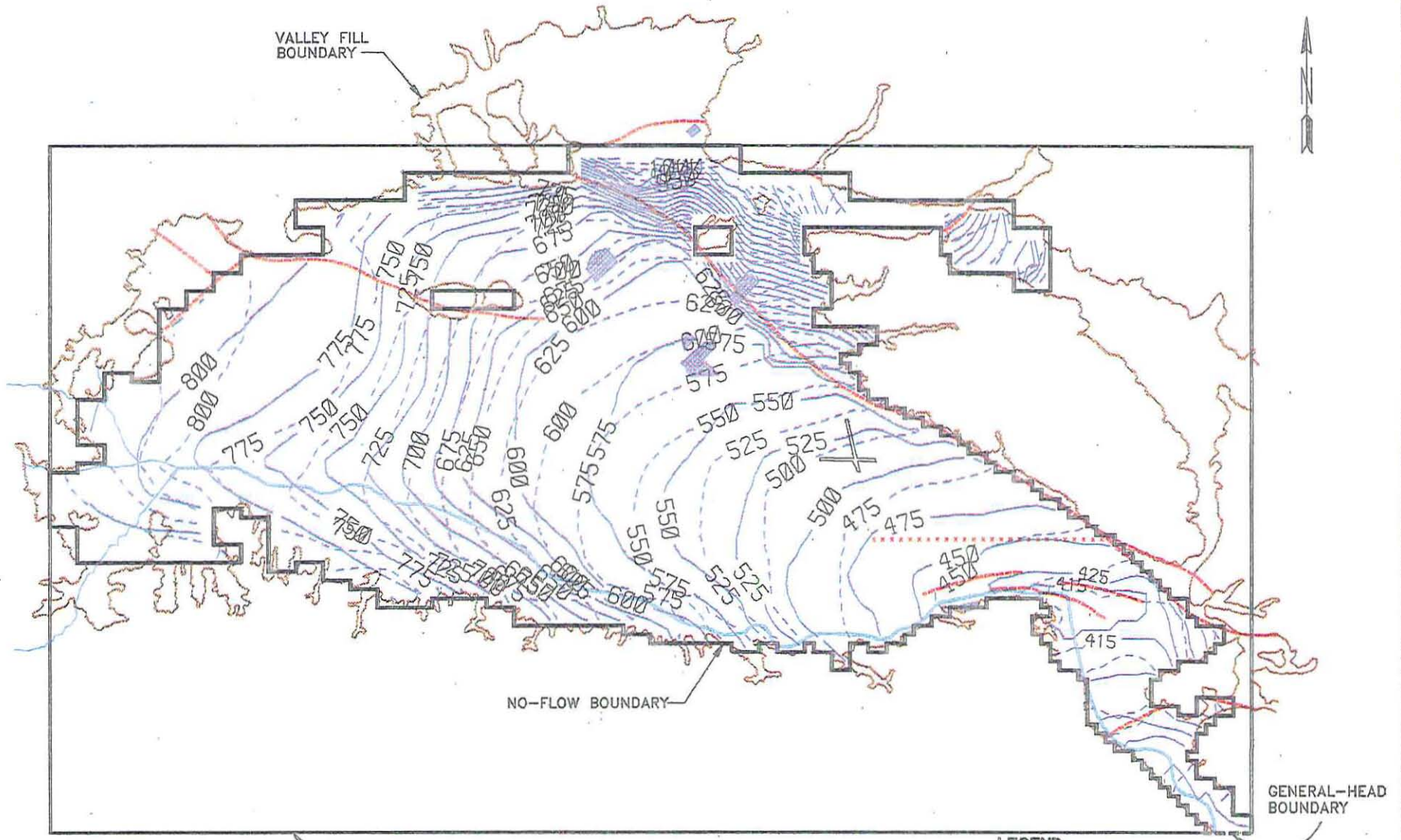
Criteria for determining an acceptable match between steady-state simulated heads and field-measured heads were established after extensive review of available data. The accuracy of model results, and thus the criteria to match field conditions, was a function of the model grid size, the coverage of available data, and the expected model uses. The criteria that were selected after screening are:

- A maximum deviation of 10 feet between simulated heads and measured heads within the 1,000-foot-square grid area of the model (finer gridded portion shown in Figure 6-3).
- A maximum deviation of 20 feet outside the 1,000-foot-square gridded area where actual field data is available.
- Simulated flow patterns and gradients that follow the trends of observed patterns and gradients as shown in Figure 6-12.

The focus of the calibration criteria was the San Fernando Basin Study Area where the smallest grid nodes (1,000 feet by 1,000 feet) are located. A match between measured and simulated head conditions outside this area was not considered critical for model calibration, because these areas are outside the San Fernando Basin Study Area and field conditions are not well known. The calibration process and results within specific areas of the San Fernando Basin will be discussed in the following subsection.

**6.5.1.2 Results.** The composite head (arithmetic mean of simulated head in all model layers) for the steady-state calibration results is shown on Figure 6-13 overlain with the measured 1981-82 heads to show the match achieved in flow directions, water levels, and gradients. Figure 6-14 shows the deviation of the simulated composite heads from the measured heads. The contour maps of measured water levels shown in Figures 6-12 and 6-13 represent interpolations from measurements at actual well locations (depth specific and multiple screened) as well as estimations in areas with a lack of data, such as west and north of the study area and around the edges of the basin. Therefore, the deviations shown in Figure 6-14 outside of the general study area are not as representative of the model accuracy as the deviations inside the study area because the conditions with which the results are compared are estimates based on fewer data points. Similarly, the study area also has locations at which the initial water-level conditions are not well known, in particular, in the vicinity of the steep terrain along the western edge of the Verdugo Mountains where almost no water-level monitoring data are available. Figure 6-14 indicates that the model-simulated water levels near the Burbank area deviate from initial conditions by 20 feet or more as one approaches the Verdugo Mountains. These deviations were not considered as serious departures from the calibration criteria given the





VALLEY FILL  
BOUNDARY



NO-FLOW BOUNDARY

GENERAL-HEAD  
BOUNDARY

**LEGEND:**

-  FAULT, GROUNDWATER CASCADE OR IMPEDIMENT TO FLOW
-  POSSIBLE FAULT
-  1981-82 GROUNDWATER ELEVATION (feet above msl)
-  SIMULATED 1981-82 GROUNDWATER ELEVATION (CI=25 ft. unless otherwise noted)



BOUNDARY OF MODEL AREA

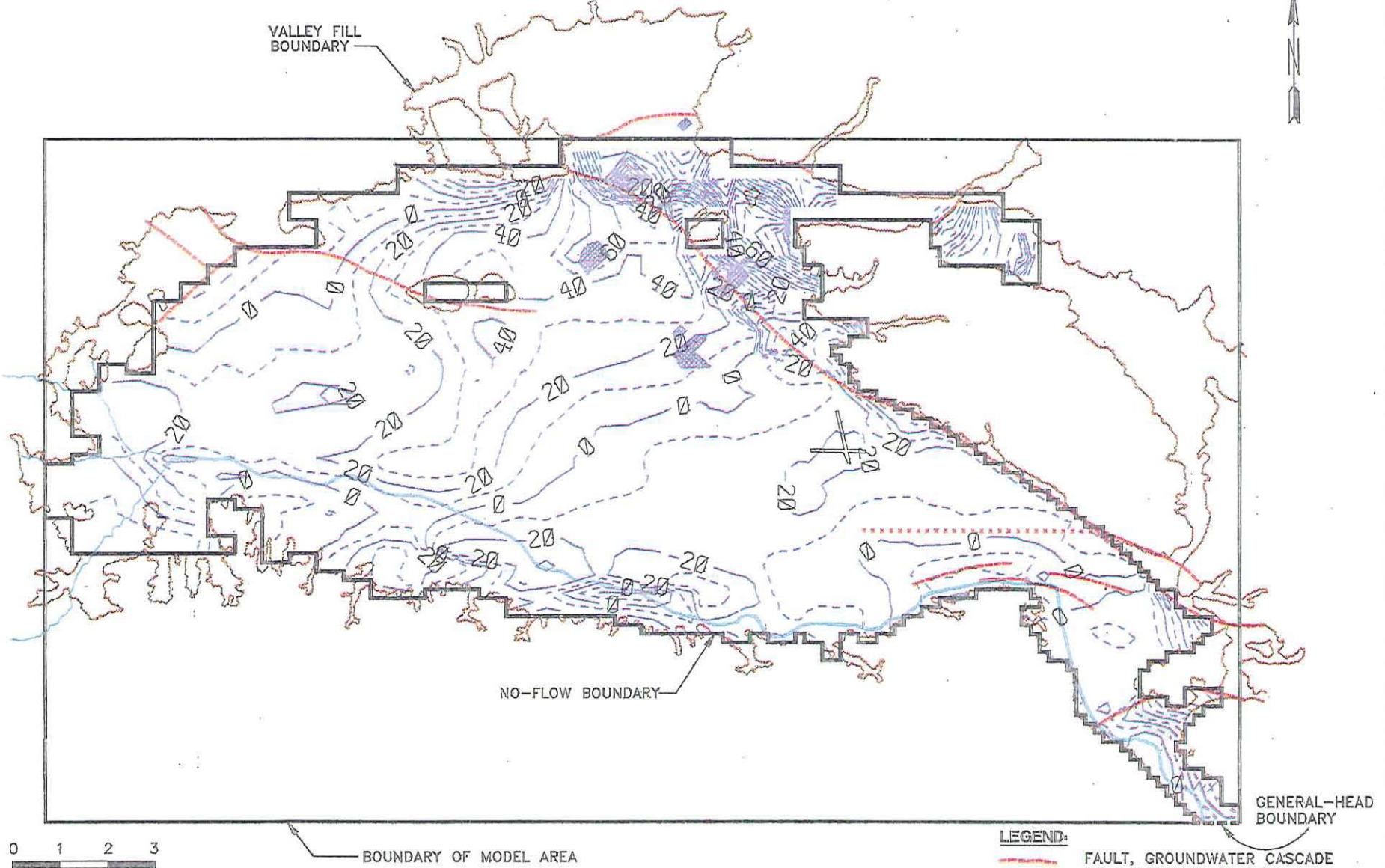
**FIGURE 6-13**  
**SIMULATED GROUNDWATER CONTOURS**  
**WITH ACTUAL 1981-82 CONTOURS**

MODFIG13 REV. 9/04/92

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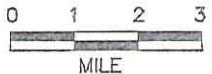


VALLEY FILL BOUNDARY



NO-FLOW BOUNDARY

GENERAL-HEAD BOUNDARY



BOUNDARY OF MODEL AREA

**LEGEND:**

- FAULT, GROUNDWATER CASCADE OR IMPEDIMENT TO FLOW
- POSSIBLE FAULT
- LINE OF EQUAL DEVIATION (CI=20 ft.)
- MINOR CONTOUR

**FIGURE 6-14**  
**DEVIATION BETWEEN SIMULATED**  
**AND ACTUAL GROUNDWATER CONTOURS.**

MODFIG14 REV. 9/04/92

REMEDIAL INVESTIGATION  
of Groundwater Contamination  
in the San Fernando Valley

generally close match elsewhere in the study area and the uncertainty in the initial conditions against which the model-simulated heads are compared. As shown in Figures 6-13 and 6-14, calibration criteria were met throughout most of the basin. Elsewhere, the deviations in head are reasonable given the uncertainty in actual conditions and expected model accuracy outside the fine-grid area. The resulting discrepancy in the volumetric water balance of the calibrated steady-state model was less than 1 percent.

During the steady-state calibration of the model, the aquifer parameters mentioned before were adjusted basin-wide or within subareas of the model. The calibrated aquifer parameters are summarized in Table 6-4. In general, hydraulic conductivity and transmissivity values were lowered from the initial estimates within the finer-grained sediments of the west, where contrasts in flow characteristics (i.e., gradients) were not represented by the initial estimations because of the sparse data in this area. The hydraulic conductivities from the calibrated model ranged from 2 ft/day to 200 ft/day for layer 1 and 2 ft/day to 510 ft/day for layer 2. In Section 5.2.2.2, estimates of hydraulic conductivity from field test data are discussed for the North Hollywood, Crystal Springs, and Pollock study areas. The field hydraulic conductivities from the Upper Zone, corresponding to model layer 1, ranged from 30 ft/day to 310 ft/day in the North Hollywood Study Area. A single hydraulic conductivity estimate of 100 ft/day was available for the Upper Zone in the Crystal Springs Study Area. The model values are slightly lower than the field values primarily because the 2-200 ft/day range applies to the whole model area. Similarly, the layer 2 model-calibrated hydraulic conductivity range is low compared to estimates from field data which range from 190 ft/day to 860 ft/day. Again, the model values are smaller, but are comparable. The lower ranges of values from the calibrated model represent an average over the entire volume of the model cell. In contrast, much of the field data is derived from well test results which are representative of the perforated intervals and are biased towards the most productive aquifer zones. Thus, the model values would be expected to be lower than values estimated from the field test data. Figures 6-15 and 6-16 illustrate the calibrated layer 1 and layer 2 hydraulic conductivities, respectively.



**TABLE 6-4**  
**SUMMARY OF CALIBRATED AQUIFER PARAMETERS**  
**FOR THE SAN FERNANDO BASIN**

Parameter	Average <sup>a</sup>			Range <sup>a</sup>
	All	West <sup>b</sup>	East <sup>c</sup>	
<b>LAYER 1</b>				
Hydraulic conductivity <sup>d</sup> (ft/day)	60	20	80	2 - 200
Specific yield (unitless)	0.08	0.07	0.08	0.01 - 0.19
Vertical leakance (l/day)	3.0x10 <sup>-3</sup>	4.7x10 <sup>-4</sup>	3.9x10 <sup>-3</sup>	5.0x10 <sup>-5</sup> - 4.0x10 <sup>-2</sup>
<b>LAYER 2</b>				
Hydraulic conductivity <sup>d</sup> (ft/day)	170	40	220	2 - 510
Specific yield <sup>e</sup> (unitless)	0.05	0.03	0.05	3.3x10 <sup>-3</sup> - 0.08
Storage coefficient (unitless)	4.7x10 <sup>-5</sup>	9.8x10 <sup>-6</sup>	6.0x10 <sup>-5</sup>	1.0x10 <sup>-6</sup> - 1.7x10 <sup>-3</sup>
Vertical leakance (l/day)	1.0x10 <sup>-2</sup>	1.2x10 <sup>-3</sup>	1.0x10 <sup>-2</sup>	6.6x10 <sup>-5</sup> - 2.0x10 <sup>-2</sup>
<b>LAYER 3</b>				
Transmissivity <sup>d</sup> (ft <sup>2</sup> /day)	10,790	3,510	13,590	60 - 29,220
Storage coefficient (unitless)	1.3x10 <sup>-4</sup>	8.6x10 <sup>-5</sup>	1.5x10 <sup>-4</sup>	3.0x10 <sup>-5</sup> - 2.5x10 <sup>-4</sup>
Vertical leakance (l/day)	4.7x10 <sup>-5</sup>	2.0x10 <sup>-5</sup>	5.9x10 <sup>-5</sup>	1.0x10 <sup>-6</sup> - 1.2x10 <sup>-4</sup>
<b>LAYER 4</b>				
Transmissivity <sup>d</sup> (ft <sup>2</sup> /day)	440	160	570	20 - 1,220
Storage coefficient (unitless)	1.3x10 <sup>-4</sup>	8.6x10 <sup>-5</sup>	1.5x10 <sup>-4</sup>	3.0x10 <sup>-5</sup> - 2.5x10 <sup>-4</sup>

<sup>a</sup> Values assigned to fault nodes are not included.

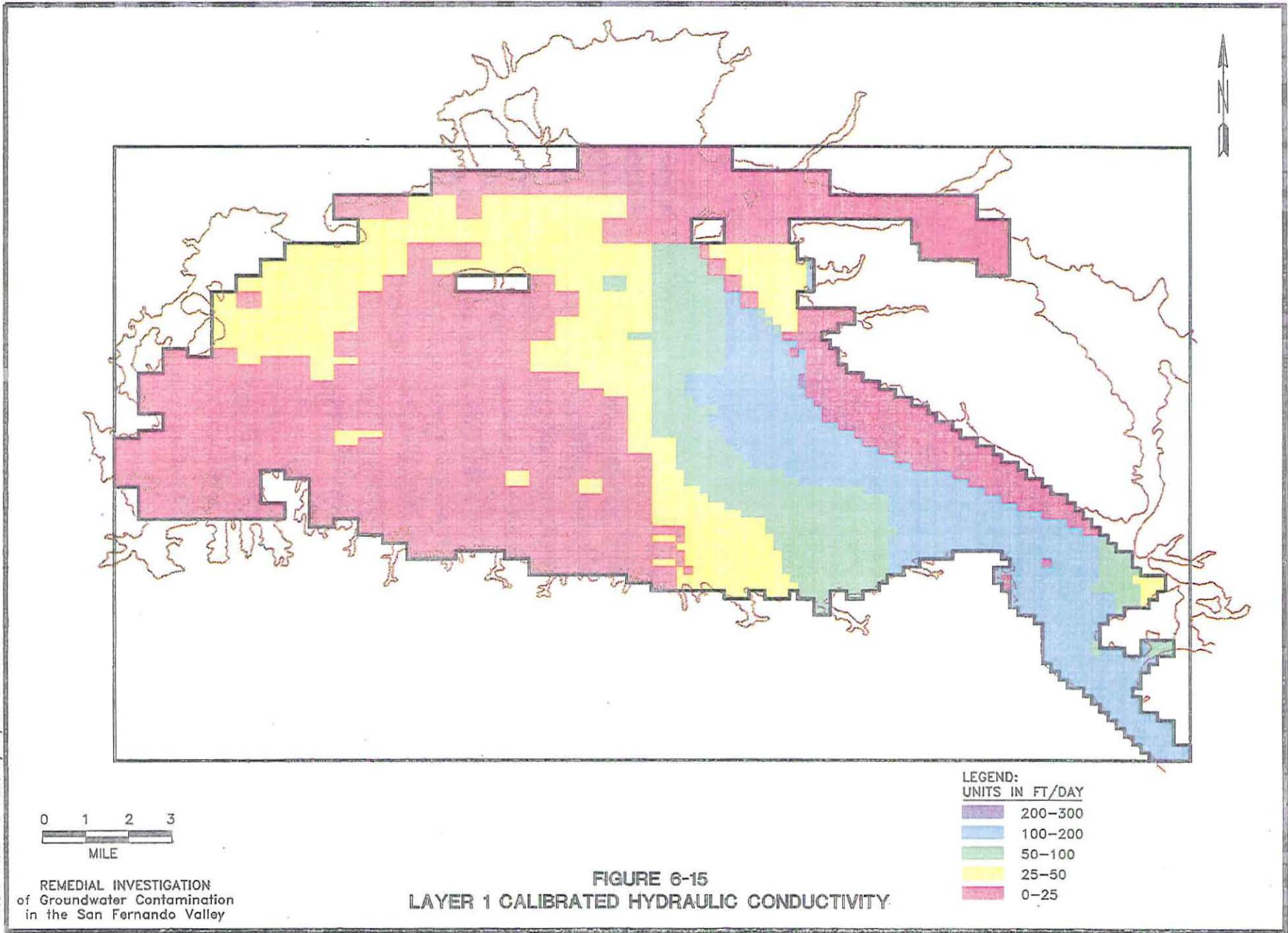
<sup>b</sup> Denotes nodes west of column 22 in the model.

<sup>c</sup> Denotes nodes east of column 22 in the model.

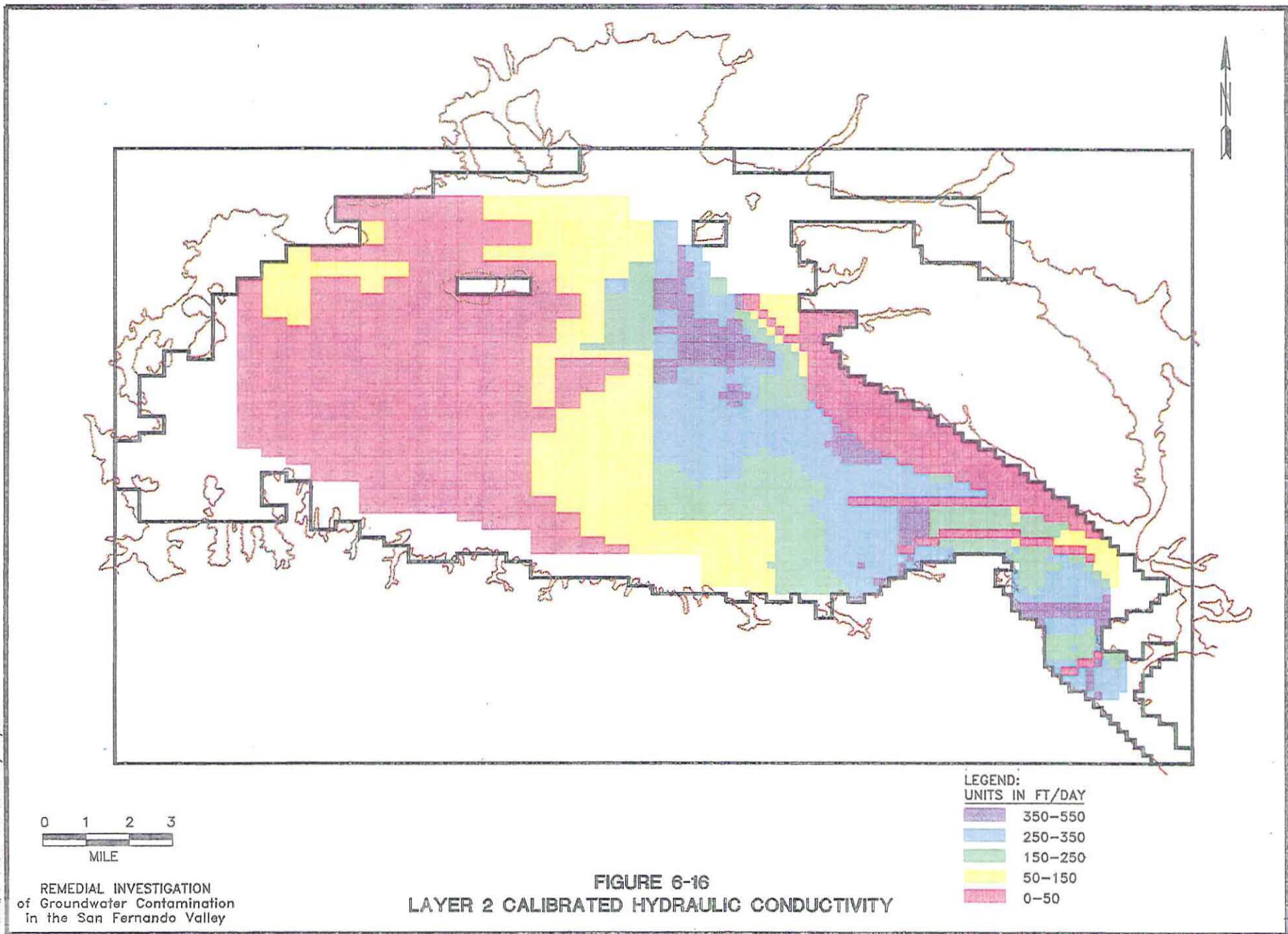
<sup>d</sup> Values do not include anisotropy effects.

<sup>e</sup> The values given in the table for layer 2 specific yield are not necessarily representative of actual conditions because, during the transient calibration period (October 1981-October 1991), water table conditions did not exist in layer 2, except in small areas for short time periods.

MOD4 FIG6-15 REV. 8/26/92 1-15840



MDD4 FIG6-16 REV. 5/11/92

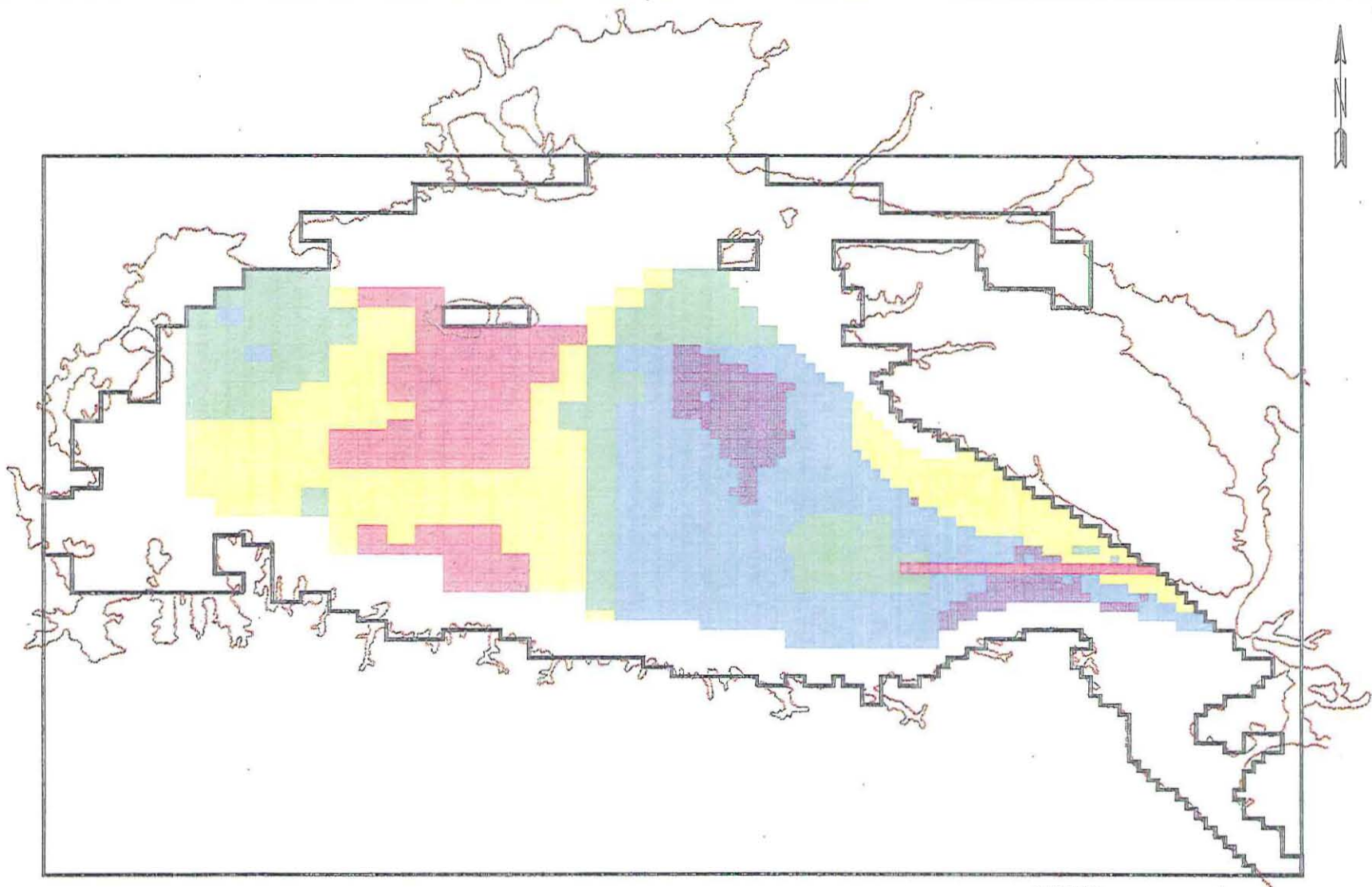


Transmissivities from the calibrated model ranged from 60 ft<sup>2</sup>/day to 29,220 ft<sup>2</sup>/day for layer 3 and 20 ft<sup>2</sup>/day to 1,220 ft<sup>2</sup>/day for layer 4 (Table 6-4). Figures 6-17 and 6-18 illustrate layer 3 and layer 4 calibrated transmissivities, respectively. The regional variation in lithology and transmissive characteristics within the basin is evidenced by the notably higher values of transmissivity and conductivity in the east where the major groundwater pumping centers are located, compared to lower values estimated in the west of the basin.

Changes in the anisotropy factor modify the horizontal hydraulic conductivity and transmissivity, basin-wide, in either the east-west direction (along the rows) or in the north-south direction (along the columns) in order to depict preferential flow directions (see Section 6.4.1). An anisotropy factor of 0.5 was applied to the hydraulic conductivities and transmissivities of layers 1, 2, and 3 which means that the north-south component of transmissivity was half of the east-west component of transmissivity. Modifications to the model code allowed the primary direction of transmissivity, which is determined by the anisotropy factor, to be reversed in the Los Angeles River Narrows from the direction assigned to the rest of the model grid. In other words, the model reads the matrix values for the transmissivity in the north-south direction and uses the anisotropy factor to calculate the transmissivity in the east-west direction. No anisotropy factor was assigned to layer 4, which has significantly smaller transmissivities and does not contribute much to the groundwater flow in layers above. Various anisotropy factors were tested for both north-south and east-west directions of primary flow from 0.1 to 1 (1 indicates no anisotropy). With no anisotropy assigned to the transmissivity in the model, groundwater-flow patterns deviated significantly from those shown on Figure 6-13. Likewise, reversing the primary flow direction by assigning an anisotropy factor of 2 also produced inaccurate flow patterns.

Vertical leakance, which incorporates both vertical hydraulic conductivity and thickness of a layer, is primarily a model-calibrated parameter. The vertical leakance at any location is controlled by the most confining lithologic unit within the represented interval. The high heterogeneity of the alluvial sediments make it difficult to compile enough field measurements to characterize the entire study area. To incorporate this heterogeneity, vertical leakance



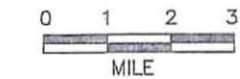
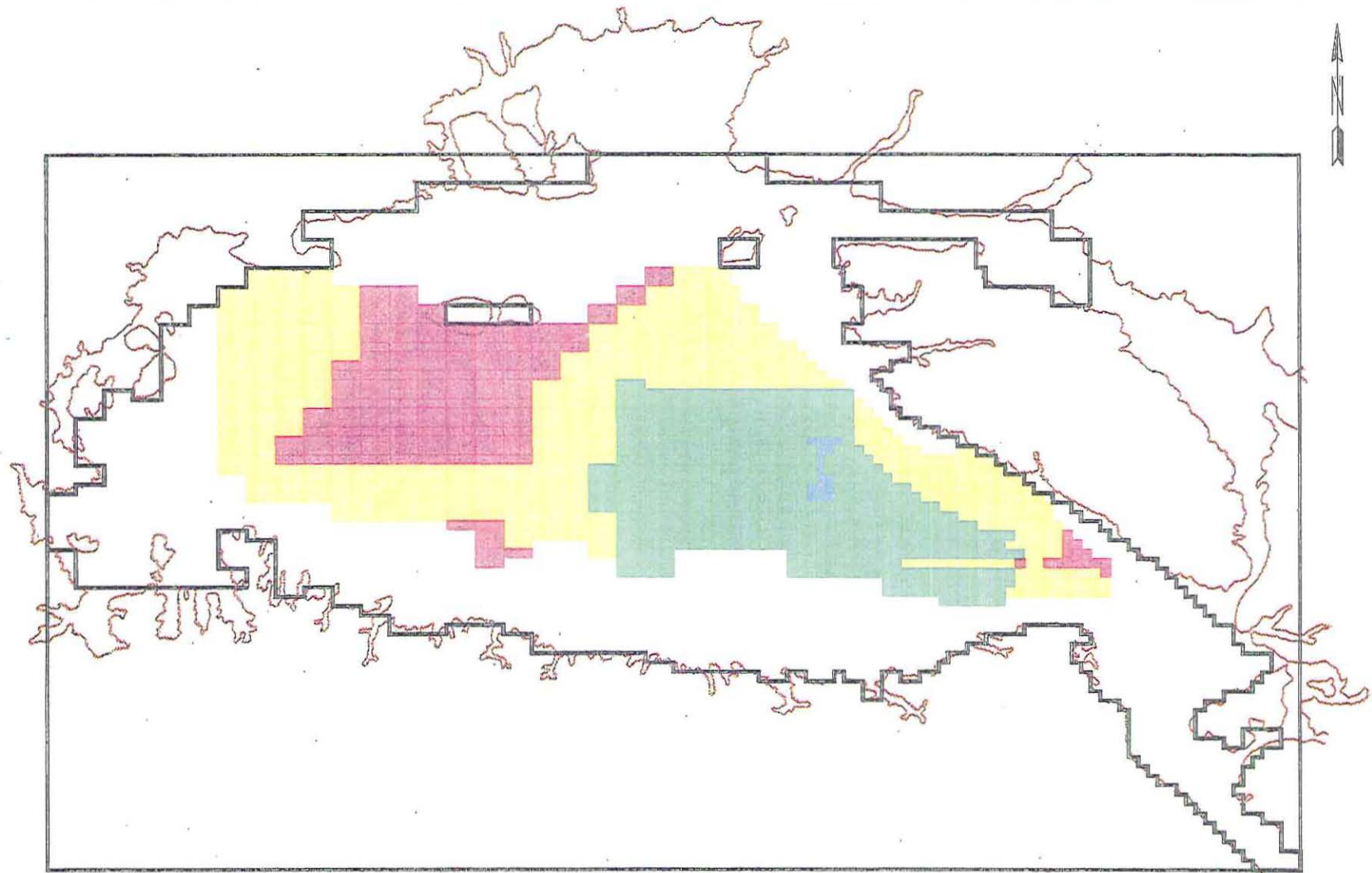


LEGEND:  
UNITS IN FT<sup>2</sup>/DAY

20000-30000
10000-20000
5000-10000
500-5000
0-500

FIGURE 6-17  
LAYER 3 CALIBRATED TRANSMISSIVITY

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of Groundwater Contamination  
in the San Fernando Valley

FIGURE 6-18  
LAYER 4 CALIBRATED TRANSMISSIVITY

LEGEND:  
UNITS IN FT<sup>2</sup>/DAY

Blue	1000-1500
Green	500-1000
Yellow	50-500
Pink	0-50

matrices incorporate the horizontal hydraulic conductivity values with matrix multiplication factors to establish the horizontal to vertical anisotropy and the layer thicknesses. Adjustments to the vertical leakance between layers were made generally on a basin-wide scale by changing the matrix multiplication factors. The calibrated ratios of horizontal to vertical hydraulic conductivity average about 150:1 between layers 1 and 2; 90:1 between layers 2 and 3; and about 4,900:1 between layers 3 and 4. The ratios of horizontal to vertical hydraulic conductivity between layers 2 and 3, and layers 3 and 4 are estimated based on an estimate of the average thickness of layers 3 and 4. As discussed in Section 3.0, the total thickness of the alluvium is unknown and the base of the valley fill shown on cross sections represents a minimum estimated thickness. As discussed above and in Section 6.4.2, the model calibrated leakance values vary based on the spatial variability in the hydraulic conductivity and transmissivity characteristics of the alluvial sediments which are illustrated in Figures 6-15 through 6-17 for layers 1, 2, and 3, respectively.

Nodes that represented boundary or boundary-like conditions also were calibrated. Boundary conditions account for the effects on the model area of conditions outside the region being modeled. Boundary conductances at general-head boundary nodes were adjusted to match known fluxes from the San Fernando Basin to the Central Basin at the south end of the Los Angeles River Narrows. Figure 6-3 shows the location of this boundary on the model grid. The conductance term used by the General-Head Boundary Package is conceptually equivalent to the product of hydraulic conductivity of the material between the cell and the external constant-head source and the cross-sectional area of flow divided by the length of the flow path between the model cell and the external source (McDonald and Harbaugh, 1988). Calibration of this term consists of adjustments to match the flow conditions across the boundary. For the most part, the conductance term is a model-calibrated parameter and is considered reasonable if the external source head and calibrated flow terms are reasonable.

The river bottom, stage, and streambed conductances were adjusted on a zone and regional basis to match the head distribution in the aquifer along the river and to match the total base low-flow conditions reported for the calibration period. The simulation of the effects of faulting in the



alluvium is considered here a boundary-like condition. The hydraulic conductivities at nodes representing faults were adjusted to match observed water level gradients across the faults.

Matching steady-state conditions in the Crystal Springs Study Area proved to be particularly difficult. Allowing a north-south primary direction of flow through the Narrows by modifying the anisotropy resulted in better matching simulations in the Crystal Springs Area. However, simulated water levels in this area were still consistently high while other areas upgradient and downgradient met the established calibration criteria. Numerous simulation scenarios were tested to improve the calibration; for example, the hydraulic conductivities of layers 1 and 2 were increased locally to allow more flow through the area and were decreased to allow greater drawdown from pumping in the area. Similarly, both an increase and a decrease in vertical leakance was tested relative to the surrounding areas. These scenarios resulted in small, if any, decreases in water levels.

A modification made to the original conceptual model, however, did result in improved water levels. This modification was the inclusion of the Benedict Canyon fault zone in layers 2, 3, and 4 as an impediment to groundwater flow. Although this fault zone had been identified in a previous investigation (Section 3.1.2) it was not shown on current contour maps as an impediment to flow. The faults were simulated with very low horizontal transmissivity values, which provided low-permeability boundaries near the groundwater extraction wells while limiting inflow from upgradient areas, resulting in increased drawdowns and lower water levels.

A similar modification to the conceptual model was made north of the Crystal Springs area. Groundwater contour maps produced for the Upper Zone and the Lower Zone from RI data indicated steep groundwater gradients just north of the bend in the Los Angeles River, suggesting another possible impediment to flow possibly caused by east-west trending faults in the area (Section 5.2.4). The high degree of tectonic activity in the basin (Section 3.1.1) supports the possibility of another, as yet unidentified, east-west trending fault. This impediment was incorporated into model layers 2, 3 and 4, and significantly improved the match of both gradients and composite-head distribution in this area.

The hydrologic balance components associated with recharge from precipitation (Table 6-2) were also adjusted upward and downward within ranges of values presented in the Report of Referee (SWRB, 1962). The distribution of recharge from runoff caused by precipitation on the hill and mountain areas was adjusted to simulate observed groundwater-flow patterns near the sediment boundaries. This element of the groundwater balance was further modified during the transient calibration, which gave a better picture of the distribution and effects of recharge from hill and mountain runoff. The steady-state calibration resulted in an estimate of 8 percent recharge to groundwater from precipitation falling on the valley floor. Figure 6-19 shows the combined areal recharge from precipitation (constant for the entire model area) and delivered water (variable throughout the model area). The calibrated value of 8 percent is below the initial estimates of 10 to 20 percent, but is still within the range of values for areas with similar climate and density of residential and commercial development.

#### **6.5.2 Transient Model Calibration**

There are two types of transient response of water levels within the San Fernando Basin: a short-term response in which the reactions in water levels are almost immediate, and a long-term response in which the reactions take place over years or decades. An example of the short-term response is the water-level decline that occurs in the eastern portion of the basin during the time of year when most of the production wells are in operation (Figures 5-18 and 5-19); subsequent recovery of these water levels occurs after the production wells are turned off, showing a relatively quick and short-term response (Figures 5-20 and 5-21). Over longer periods of time, when the groundwater extraction exceeds the aquifer safe yield, the water levels will show a long-term decline in addition to seasonal fluctuations, providing a late response. The ULARA Watermaster oversees the operation of the San Fernando Basin to maintain the basin's safe yield for the long term. Therefore, the basin water levels are expected to eventually stabilize in the long term (i.e., show no continuous decline or increase in water level) when sources of recharge are available to restore the basin (e.g., during years following drought periods). Under these conditions average recharge and average discharge for the basin reach an equilibrium over extended periods.

MOD4 FIG6-19 REV. 7/13/92 1=15840

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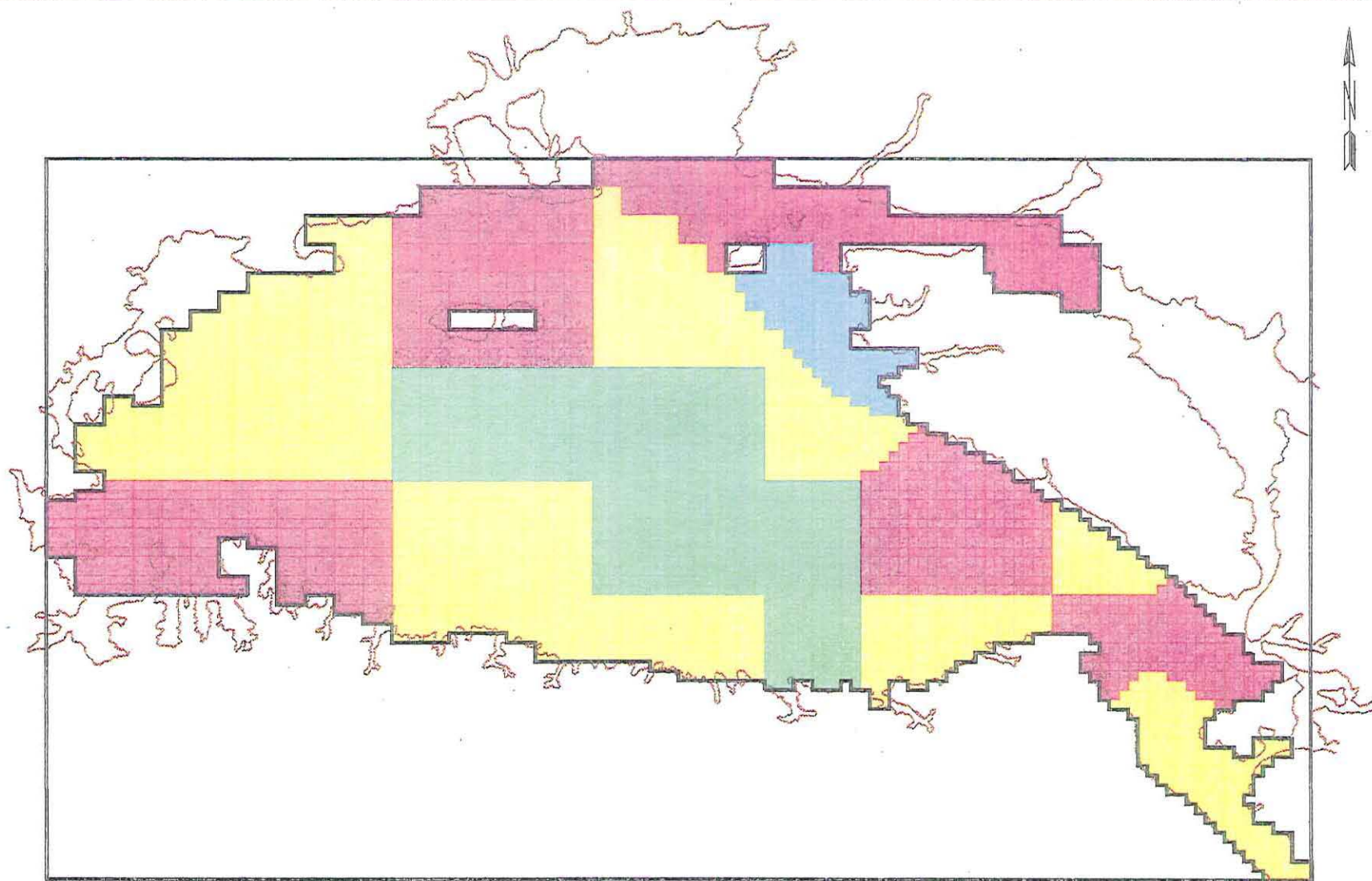


FIGURE 6-19  
DISTRIBUTION OF AREAL RECHARGE FOR 1981-82

LEGEND:  
UNITS IN INCHES/YEAR

Blue	10.0-12.5
Green	7.5-10.0
Yellow	5.0-7.5
Pink	0-5.0

Thus, one of the most important parts of the model calibration process is to simulate the long- and short-term transient-flow system of the San Fernando Basin by allowing water to be removed from or added to storage during individual time periods. The parameter describing the water-storage capability of a hydrogeologic unit (represented by a model cell) is called the storage coefficient. For a confined layer, the storage coefficient is given by the specific storage of the cell material multiplied by the layer (cell) thickness. For an unconfined layer, the storage coefficient is equal to the specific yield of the cell material. For transient-flow conditions, the values of storage coefficient and specific yield contribute to the determination of hydraulic head distribution at a given time period.

In multilayered models, like the San Fernando Basin Model, the uppermost layer (layer 1) is the only unconfined layer with specific yield, and the layers below are confined by this uppermost layer (i.e., groundwater is released to or from storage only at the upper layer as a result of a decline or rise in water levels within the layer). The exception to this condition occurs when layer 1 dries because of pumping or drought conditions, and layer 2 then contains a free water surface. For this reason, the second model layer of the San Fernando Basin Model is set up with both a storage coefficient matrix for normal flow conditions and a specific yield matrix for conditions when water levels fall below the bottom of layer 1.

**6.5.2.1 Objectives and Approach.** The primary objective of the transient calibration for the San Fernando Basin Model follows from the discussion presented above. The objective was to simulate time-variant fluctuations in the groundwater levels (water added to or released from storage) using known or calculated inflow and outflow quantities. Additional objectives included the re-evaluation and verification of the conceptual hydrogeologic framework and the generation of flow fields for smaller models.

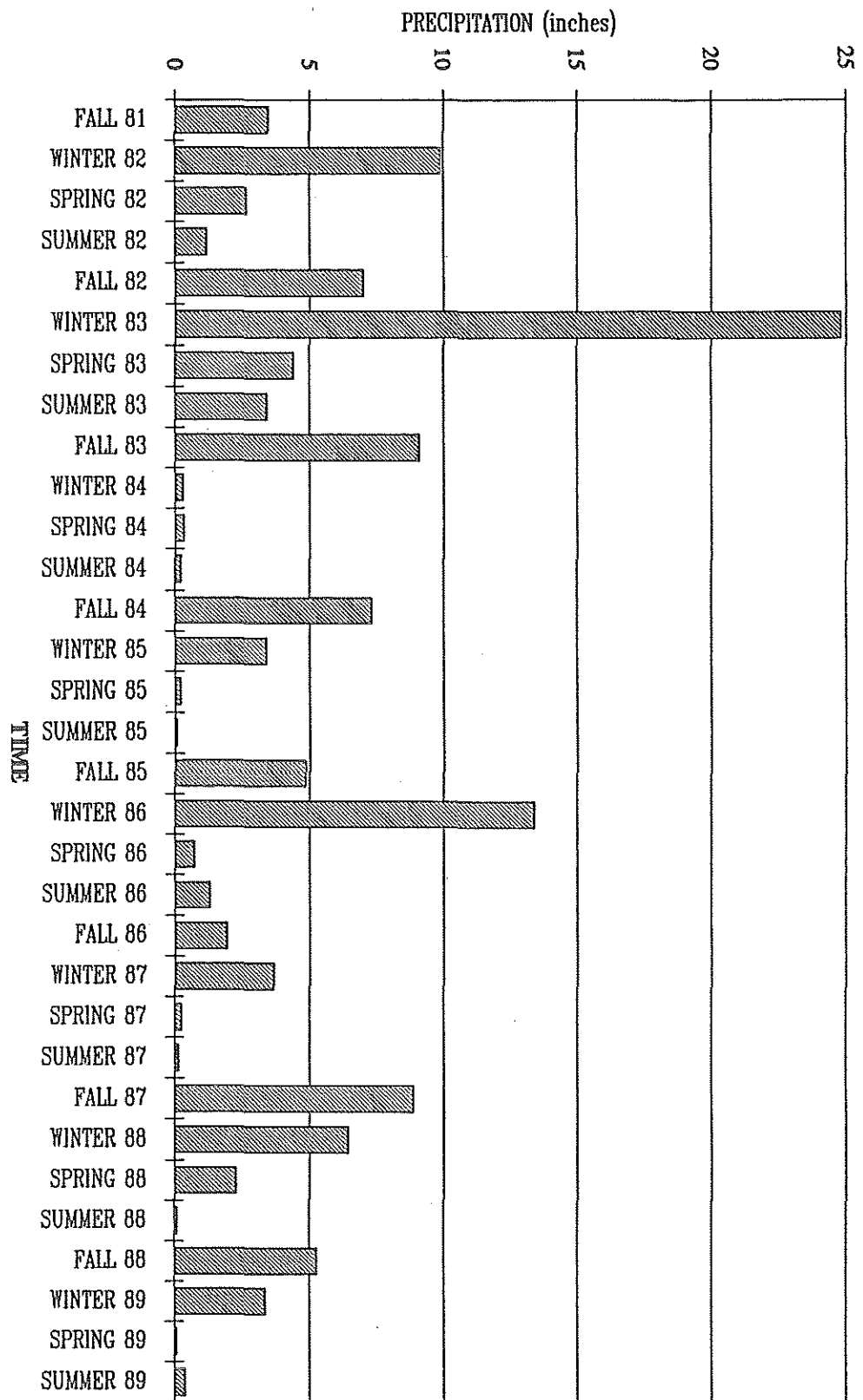
In summary, the transient calibration process involved iterative adjustments to the initial estimates of the specific yield and storage-coefficient values to match the simulated head fluctuations with the measured fluctuations at selected key well locations over a selected time period. As shown in Figure 6-1, the transient calibration incorporated an iterative process of

conceptual model improvement followed by steady-state recalibration and rechecking of transient-flow parameters.

A period of 8 years, extending from October 1, 1981 through September 30, 1989, was selected for the transient calibration. There were three primary reasons for selecting this period. First, the 8-year period represented a period during which the most comprehensive observed and calculated data were collected. Second, the transient calibration period followed the (steady-state) calibration accomplished for the hydrologic year 1981-82. Finally, the 8-year period closely approximated the long-term average rainfall conditions while covering both high precipitation (1983-84) and long-term drought conditions (1986-87 to 1990-91). Figure 6-20 shows quarterly precipitation for the 8-year calibration period. Precipitation averaged 16.47 inches on the valley floor during this period compared to the 100-year average of 16.48 inches. Therefore, the long-term aquifer water level increases and decreases from wet and dry periods could be calibrated for late response as well as short-term fluctuations due to seasonal pumpage and recharge (early response).

As noted previously, average annual precipitation on the valley floor for the 8-year period selected for the transient calibration closely approximates the long-term average annual precipitation. However, the native recharge for the San Fernando Basin during this 8-year period would not be expected to equal the long-term average Native Safe Yield, which is legally defined as that portion of the safe yield of the basin derived from surface and groundwaters originating from precipitation within the ULARA (California Superior Court, 1979). Native recharge is a function not only of total precipitation, but of duration, intensity and frequency of precipitation. The average annual native recharge for the 8-year period (1981-82 to 1988-89) based on the water balance estimates presented in Table 6-3 and other data from the ULARA Watermaster Service reports is presented below (ULARA Watermaster, 1992c).

FIGURE 6-20  
 PRECIPITATION OVER 8-YEAR TRANSIENT SIMULATION PERIOD (1981-1989)



Recharge from Precipitation	11,444	acre-feet
Native Water Spread	23,450	acre-feet
Recharge from Hill and Mountain Runoff	3,423	acre-feet
Recharge from Delivered Groundwater	1,000	acre-feet
<b>TOTAL NATIVE RECHARGE</b>	<b>39,317</b>	<b>acre-feet</b>

The recharge from delivered groundwater within the San Fernando Basin, legally, can only be from Los Angeles Department of Water and Power waters for the City of Los Angeles. The cities of Glendale and Burbank have only imported waters delivered within the service areas, including the groundwater which is return flow from imported waters. The 8-year average recharge from native waters is 39,317 acre-feet compared to the 1979 Judgment value for long-term average native recharge of 43,660 acre-feet. Thus, precipitation averages about 96 percent of the long-term average precipitation, and the native recharge averages about 90 percent of the long-term average native recharge.

As discussed in Section 6.4.4, the 8-year transient period was simulated with aquifer stresses varying on a quarterly basis. This time discretization provided adequate resolution in simulating the seasonal fluctuations in precipitation, artificial recharge activities and groundwater extractions. For all water balance components, quarterly inputs were generated from monthly data except for delivered-water return flow in the western and northern portions of the basin, which are outside of the San Fernando Basin Study Area, and in portions of Glendale and Burbank.

Ten key wells were selected for the transient model calibration based on their location in the basin and the availability of water-level data for the 8-year period as reflected by the hydrographs for each well. These key wells, shown on Figure 6-21 and listed in Table 6-5, were selected so that the groundwater fluctuations could be adequately simulated both in and around the study area as well as both near to and far from pumping wells. Measured water levels were matched to simulated water levels averaged for the layers corresponding to the well



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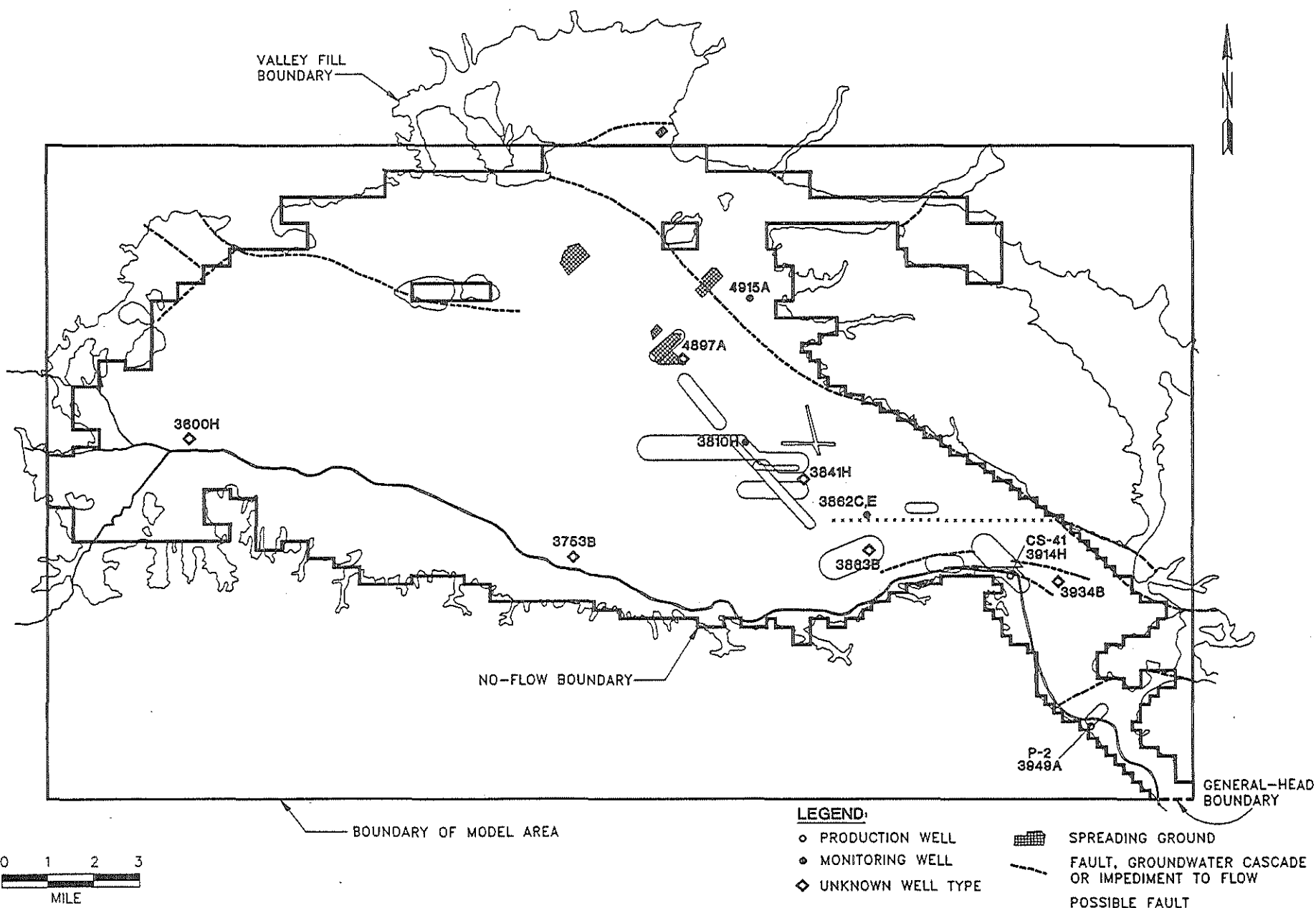


FIGURE 6-21  
TRANSIENT CALIBRATION WELLS

REMEDIAL INVESTIGATION  
of Groundwater Contamination  
in the San Fernando Valley

## TRANSIENT CALIBRATION KEY WELLS

Well	Model Cell Location (row, col)	Approximate Distance to Nearest Pumping Well <sup>a</sup> (ft)	Perforated Intervals (ft msl)	Model Layer Boundaries (ft msl)		Model Layers	Extraction Wells in Same Cell (1981-82 - 1990-91)
				Bottom of 1	Bottom of 2		
3600H	23,6	15,550 (3650B)	unknown	630	480	2 <sup>b</sup>	No
3753B	36,21	12,300 (3785A)	567.3-559.3	471	321	1	No
3810H	23,35	850 (3810P)	600.0-380.0	396	246	1,2	No
3841H	27,42	1,000 (3831F)	665.0-427.0 521.0-511.0 455.0-445.0	396	219	1	No
3863B	36,49	1,100 (3863H)	493.9-373.9 <sup>c</sup> 303.9-202.9 161.9-23.9	314	164	1,2,3	No
3914H	38,65	200 (3914S)	388.0-352.0 340.0-286.0 243.0-139.0	245	75	1,2	Yes layers 1 and 2
3934B	39,71	1,950 (3934A)	259.9-249.9	255	151	2 <sup>d</sup>	No
3949A	56,75	1,100 (3959E)	329.2-250.2 241.2-182.2	245	146	1,2	No
4897A	14,29	2,700 (4898H)	771.5-756.5 741.5-726.5 701.5-686.5 651.5-461.5	446	296	1	No
4915A	7,36	3,050 (4916B)	650.4-615.4	481	No layer 2	1	No

<sup>a</sup> Includes only production and some private wells that were in operation anytime between October 1, 1981 and September 1, 1991. Distances are generally approximated to the nearest 50 feet and the well name is included in parentheses.

<sup>b</sup> The default for wells with unknown perforated interval locations was layer 2.

<sup>c</sup> There are several perforated intervals within the elevation ranges shown for well 3863B.

<sup>d</sup> There is less than 5 feet of well screen in model layer 1, therefore the well was assigned to layer 2 only, which had 98.9 feet of well screen.

perforations. The model layers selected for each of the key wells are given in Table 6-5. Two of the selected wells (3600H and 3753B) are located in the western and central portions of the San Fernando Basin to match general groundwater patterns. One well (4915A) located in the Hansen subarea above the Verdugo Fault was selected to calibrate transient groundwater flow across the Verdugo Fault. Three wells (3914H, 3934B, and 3949A) were selected within the Los Angeles River Narrows because this area represents aquifer discharge locations, both as rising water and underflow from the basin as well as recharge to or from the river in the unlined river section. The remaining four wells are distributed throughout the eastern San Fernando Basin where the flow conditions are most dynamic (i.e., with numerous pumping centers and spreading grounds contributing to the fluctuation in water levels).

The transient calibration process mainly involved the variation of specific yield and storage-coefficient values, both regionally and locally, until the fluctuations at the 10 key wells met established criteria. The match criteria for key wells were evaluated for each well, based on model grid size, data availability, and water-level response. These criteria are:

- A maximum deviation of 20 feet between actual and simulated average water levels.
- A maximum deviation of 10 feet between the magnitude of actual and simulated water-level fluctuations.

In addition to matching observed water levels at the 10 key wells, two other components of the model output were utilized to evaluate the calibration. Groundwater contour maps were checked against maps prepared from field data to evaluate flow patterns, and the volumetric balance generated by the model was used to compare simulated flows with known flows such as groundwater discharge to or from the Los Angeles River.

The initial transient model calibration was accomplished by simulating the steady-state conditions of inflow and outflow for a period of 10 years with the estimated values of the specific yield and storage coefficient. The parameters were adjusted until the steady-state heads and the 10-year 1981-82 simulation heads, evaluated with basin-wide contour maps, were within 10 feet in the

study area and 20 feet elsewhere in the basin. This process allowed for general adjustments to the specific-yield and storage-coefficient values and incorporated the transient storage effects into the initial head conditions. Thus, the actual transient model response would not reflect adjustments of head values to offset any lack of correspondence between model hydrologic inputs and parameters and the initial head values. The next step in transient calibration was to run the 8-year simulation (1982 to 1989) to adjust storativity and specific-yield values to match the observed fluctuations at the key wells.

The following section is a brief summary of the transient calibration results that includes a more detailed discussion of each of the components of the calibration.

**6.5.2.2 Results.** Figures 6-22 through 6-31 show the simulated and observed water level elevations at the key wells. In general, the model matched observed groundwater elevations within 20 feet at all wells except at 4897A and 4915A, located in the northeastern portion of the San Fernando Basin (Figure 6-21). In all wells, the simulated water levels were, in general, consistently above or consistently below (mostly above) the measured water levels when the difference was greater than 10 feet. The model matched groundwater fluctuations in magnitude within about 10 feet at all wells except 4915A. In seven of the 10 wells, the magnitude of groundwater fluctuations matched within 5 feet. Although the model did not meet one calibration criterion for well 4897A and neither criteria for well 4915A, the simulation at these wells is considered quite good because both the early and late aquifer response patterns are matched well in the simulated groundwater elevations.

The overall model water balance for the 10-year calibration period is shown in Table 6-6. Given the components of recharge and discharge as discussed in Section 6.4.4, the predicted change in groundwater storage (Table 6-6, item 6) compared favorably, on a year-to-year basis, to those estimated by the Inflow-Outflow Method (Table 6-3, item 6a) and on a 10-year basis to change in storage by both the Inflow-Outflow and Specific Yield methods. The model-simulated flows for rising water in the Los Angeles River, given the uncertainties in the calculation of rising water, matched reported flow values reasonably well (Table 6-3, item 5). Underflow out of the

TABLE 6-6

SAN FERNANDO BASIN  
8- AND 10-YEAR VOLUMETRIC WATER BALANCE SUMMARY OF MODEL RESULTS

GROUNDWATER INVENTORY COMPONENTS <sup>a</sup>	TOTALS AND AVERAGES (acre-feet)											
	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	8-yr Average	1989-90	1990-91	10-yr Average
<b>INFLOW</b>												
1. RECHARGE (areal recharge)	59,938	74,105	64,663	62,314	70,087	61,846	68,228	61,341	65,315	61,433	57,185	64,223
Recharge from precipitation (8% used)												
Delivered water return recharge												
2. WELLS (injection wells)	25,517	113,049	40,801	25,491	32,769	9,619	28,191	8,379	35,477	6,474	22,590	31,669
Spread water recharge												
Hill and mountain runoff (not spread)												
Subsurface inflow												
<b>TOTAL</b>	<b>85,455</b>	<b>187,154</b>	<b>105,464</b>	<b>87,805</b>	<b>102,856</b>	<b>71,465</b>	<b>96,419</b>	<b>69,720</b>	<b>100,792</b>	<b>67,907</b>	<b>79,775</b>	<b>95,402</b>
<b>OUTFLOW</b>												
3. WELLS (groundwater extractions)	87,670	71,056	119,557	106,244	91,093	96,373	110,101	132,163	101,782	86,203	75,436	97,971
4. HEAD-DEPENDENT BOUNDARIES (subsurface outflow)	314	337	681	349	314	301	311	301	364	298	302	351
5. NET RIVER <sup>b</sup> (rising water discharge)	-2,535	1,587	8,540	5,971	5,372	5,478	7,876	6,281	4,821	6,253	5,744	5,035
<b>TOTAL</b>	<b>85,449</b>	<b>72,980</b>	<b>128,778</b>	<b>112,564</b>	<b>96,779</b>	<b>102,152</b>	<b>118,288</b>	<b>138,745</b>	<b>106,967</b>	<b>92,754</b>	<b>81,482</b>	<b>102,997</b>
6. CHANGE IN STORAGE	-79	113,642	-23,563	-24,208	6,329	-30,732	-21,283	-68,131	-6,003	-25,046	-1,676	-7,475

<sup>a</sup> Inventory components are grouped in the table by the type of model input or output that applies.

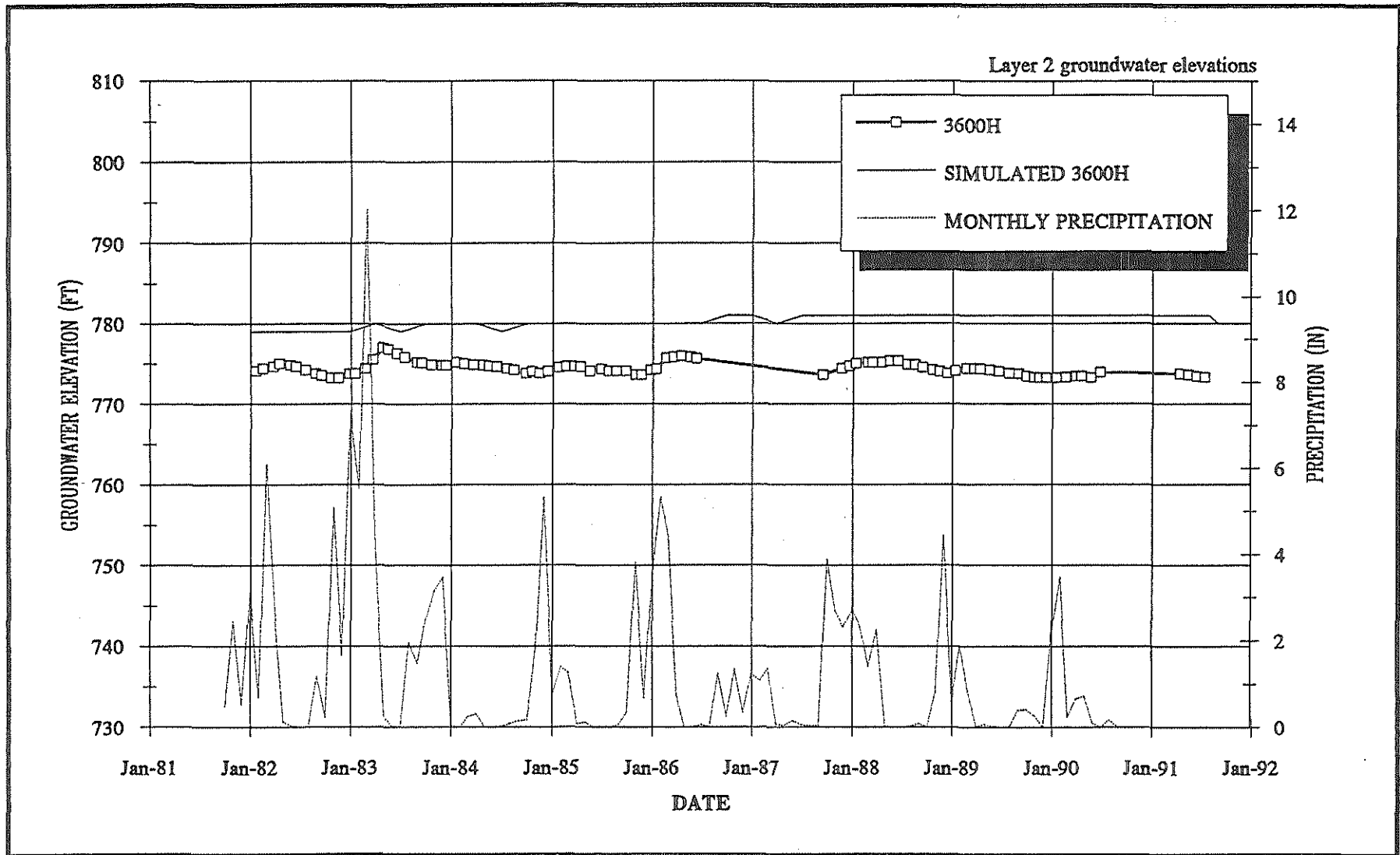
<sup>b</sup> A negative indicates net river flow is inflow to the aquifer rather than outflow to the river.

basin at the south end of the Los Angeles River Narrows also matched estimated flows reasonably well (Table 6-3, item 4).

The percent of precipitation on the valley fill that recharges the aquifer was assumed to be constant for the transient calibration. Although this recharge is sensitive to seasonal and yearly climate conditions and variations in precipitation, the water-level fluctuations on the calibration wells were matched quite well by the model with a constant percentage used. Therefore, no changes to this variable were needed.

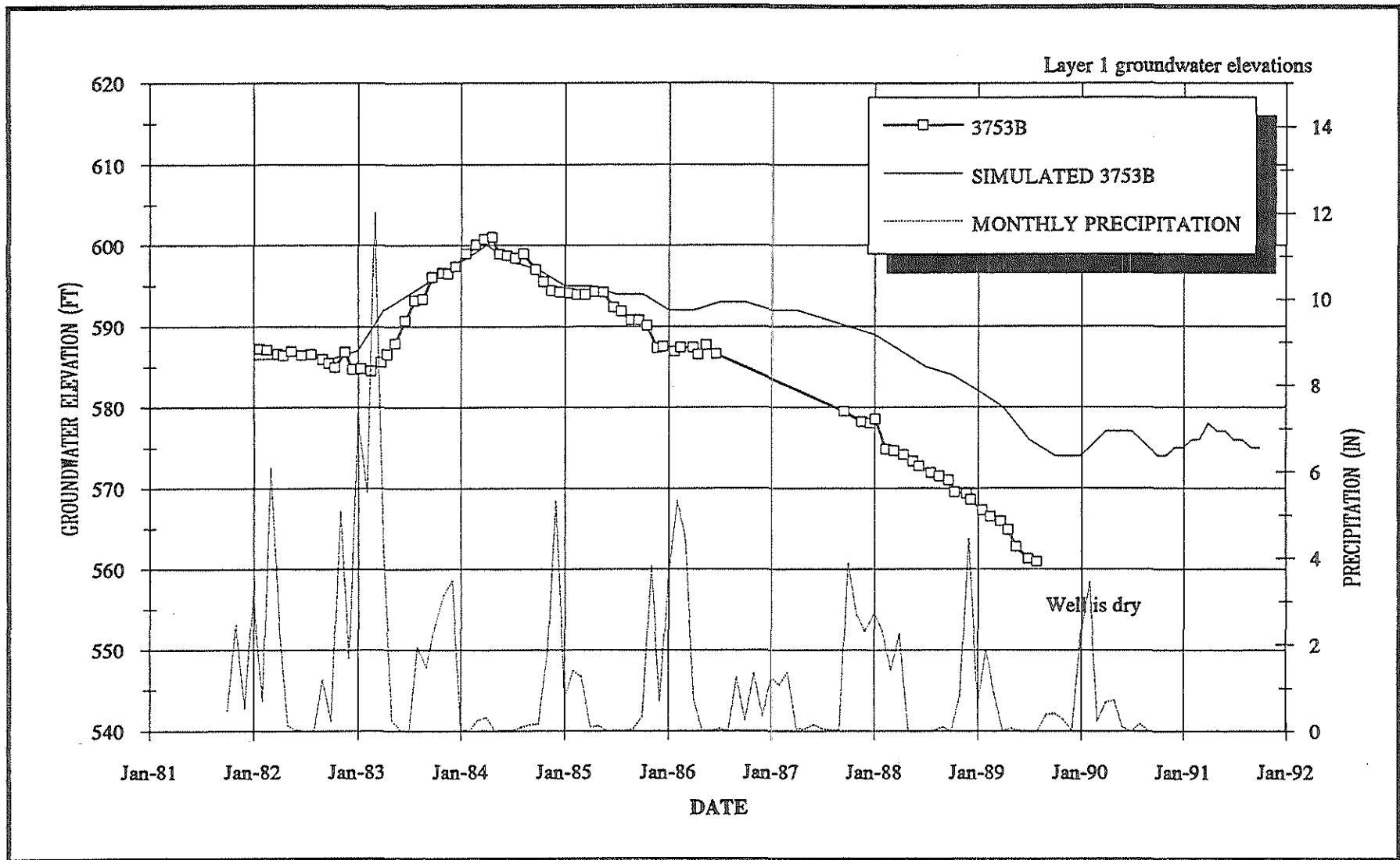
As discussed above, the model was successful in simulating both short-term and long-term aquifer responses in all of the key wells by allowing water to be removed from or added to storage. Figures 6-32 and 6-33 show the model-calibrated specific-yield values, which average about 8 percent for layer 1 and 5 percent for layer 2. The calibrated storage coefficients averaged  $4.7 \times 10^{-5}$  for layer 2 and  $1.3 \times 10^{-4}$  for both layers 3 and 4. The calibrated storage coefficients for layers 2, 3, and 4 are shown in Figures 6-34, 6-35, and 6-36, respectively. The calibrated values of specific yield in the eastern portion of the basin were somewhat lower than those reported in Bulletin 45 (Eckis, 1934), which was the first investigation of specific yield in the San Fernando Basin. For the eastern half of the basin, the specific yield from Bulletin 45 ranges from about 6 percent to 16 percent for a 100-foot-thick interval centered at the 1933 water table. Values of specific yield reported in the Report of Referee (SWRB, 1962) were based on several previous investigations, including the South Coastal Basin investigation (Bulletin 45). These specific-yield values are slightly higher than those reported in Bulletin 45 for clay and lower for sands and nearly the same for gravels. Although no specific-yield distribution was developed from the Report of Referee investigation, this comparison indicates that estimates in the Report of Referee are generally similar or slightly lower than the estimates in Bulletin 45. This, in turn, suggests that the calibrated values of specific yield are within the ranges of values from these previous investigations.

**Hydraulic Heads in Key Wells.** The simulated water levels at wells 4897A and 4915A (Figures 6-30 and 6-31, respectively) deviated the most from the measured water levels. There



**FIGURE 6-22**  
**MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 3600H (NODE 23,6)**





**FIGURE 6-23**  
**MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 3753B (NODE 36,21)**

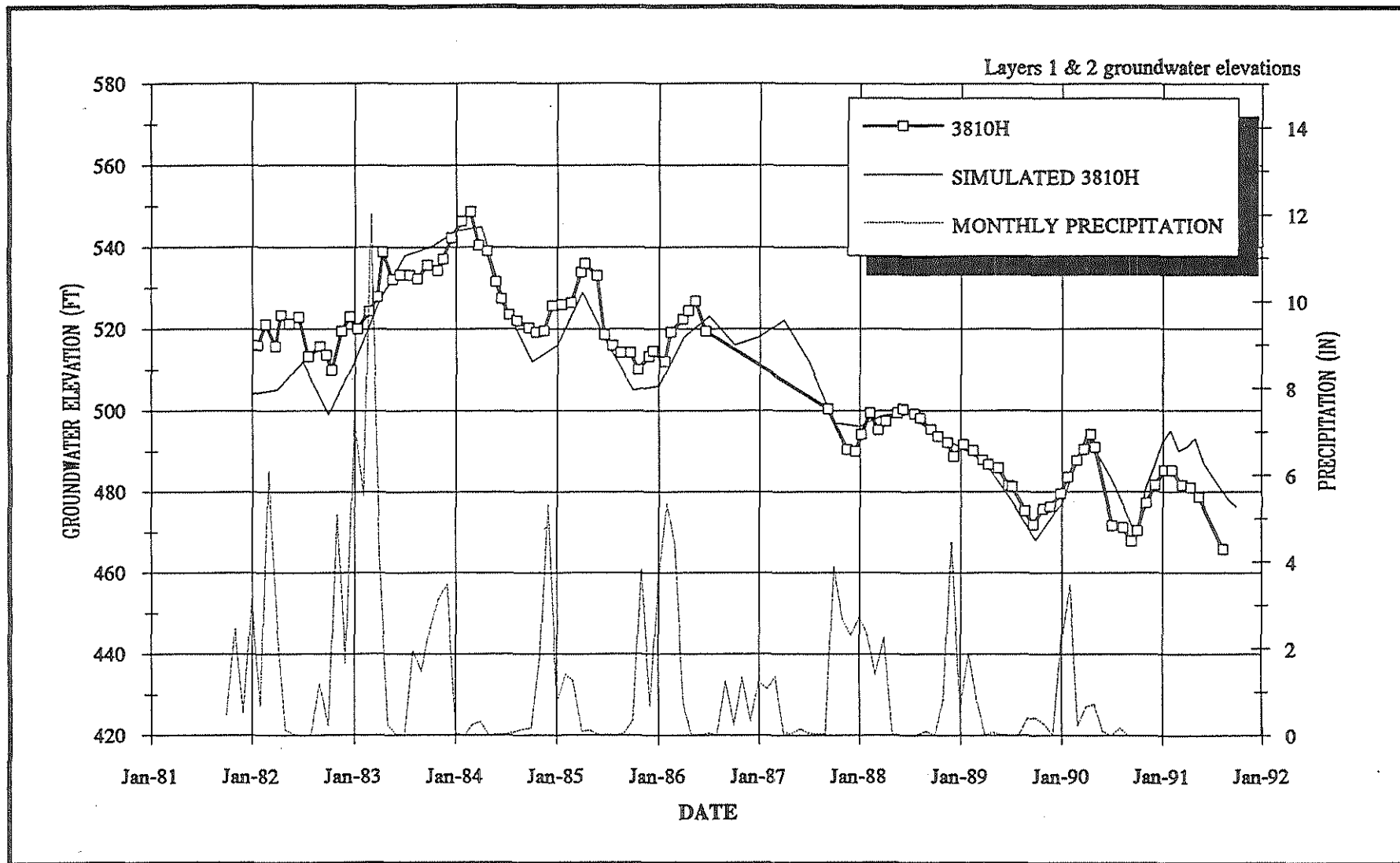
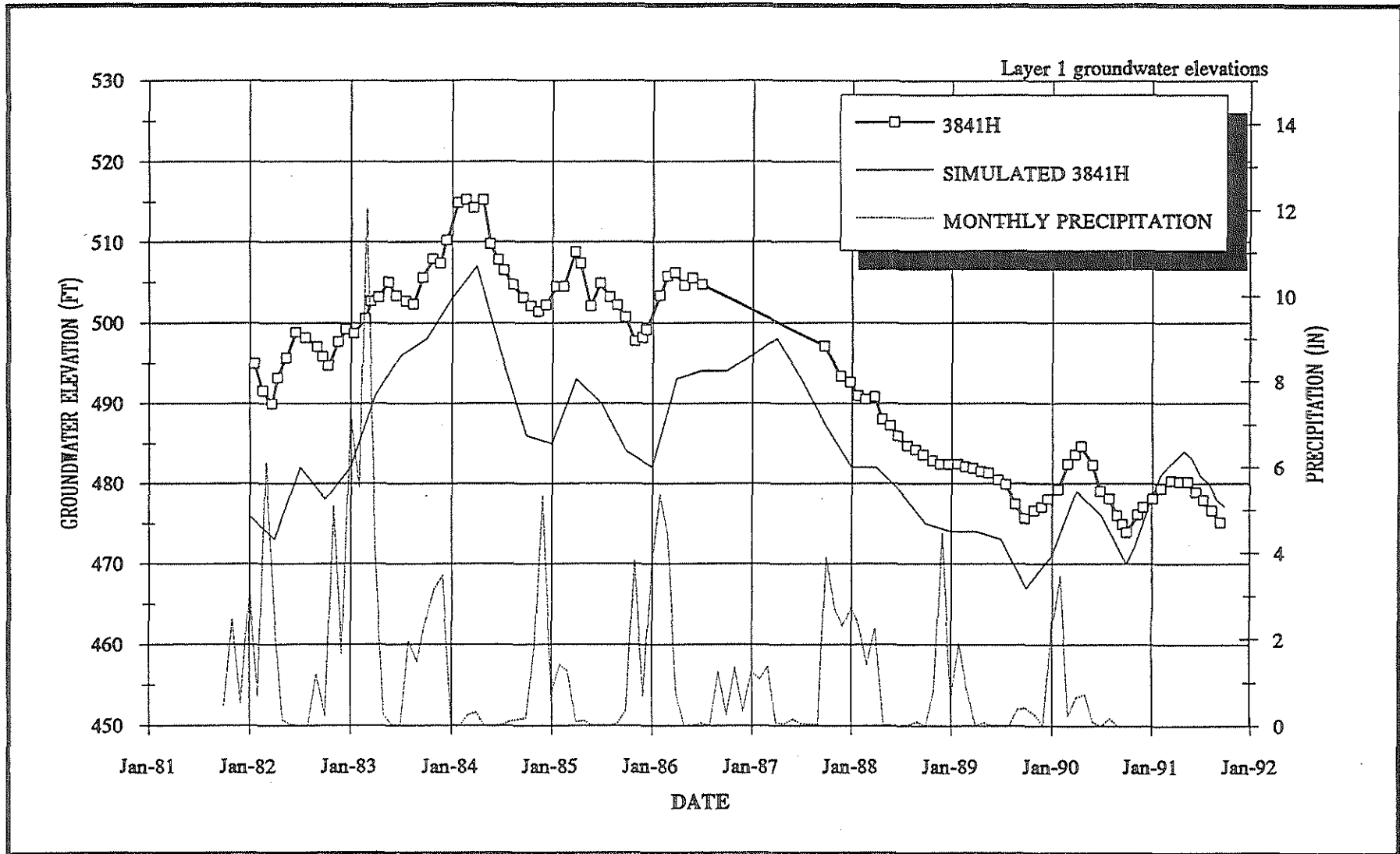
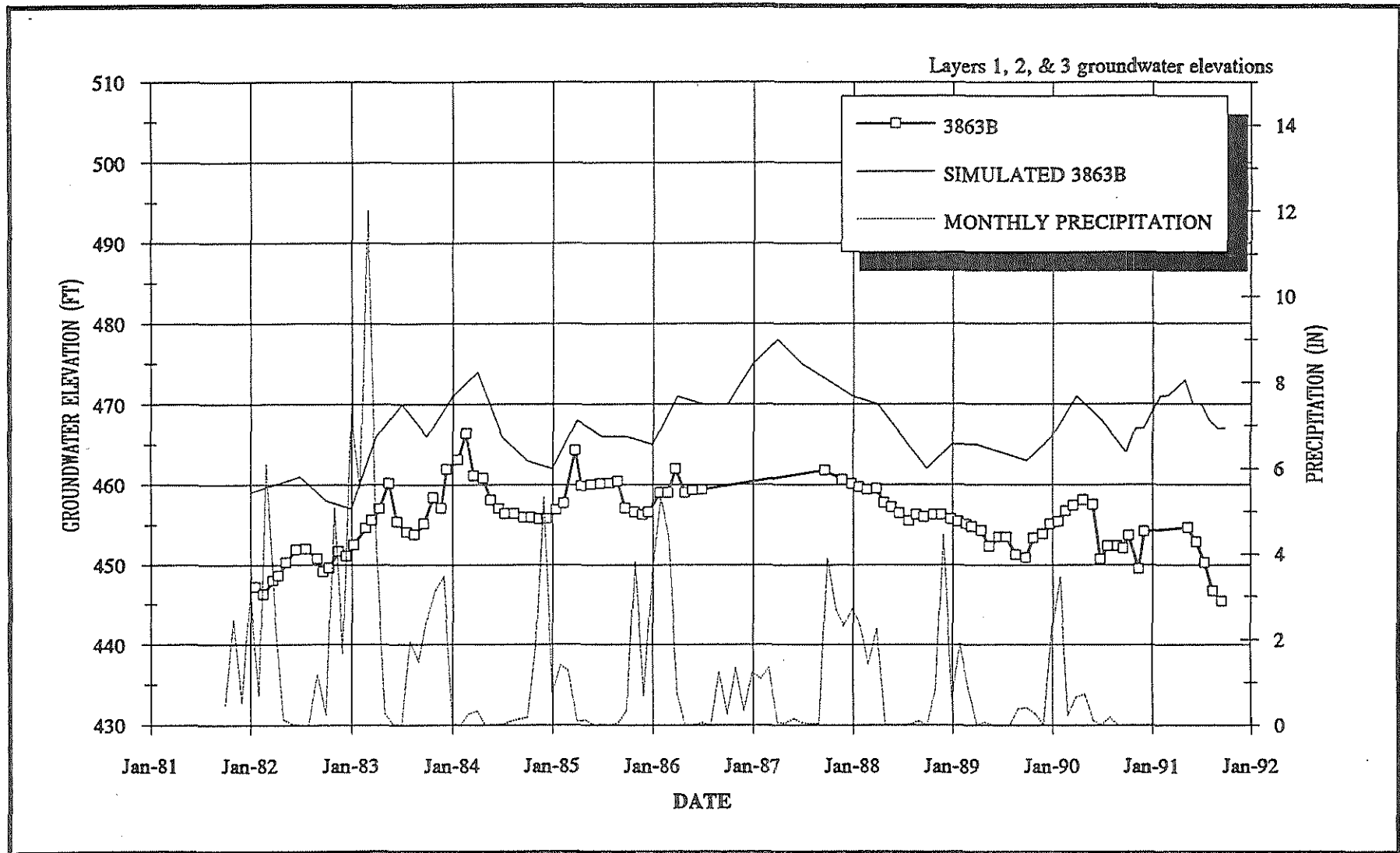


FIGURE 6-24  
 MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 3810H (NODE 23,35)



**FIGURE 6-25**  
**MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 3841H (NODE 27,42)**



**FIGURE 6-26**  
**MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 3863B (NODE 36,49)**

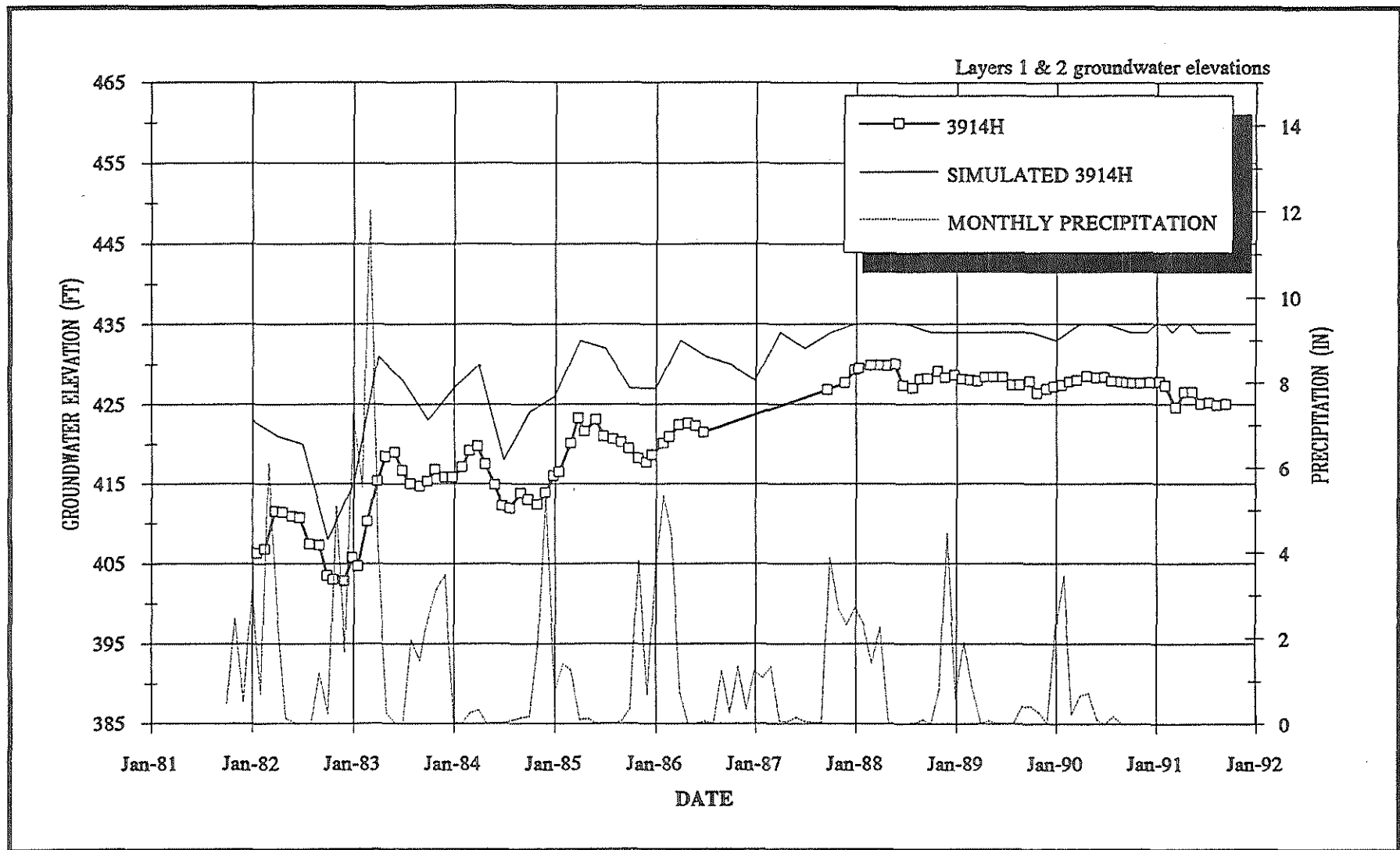
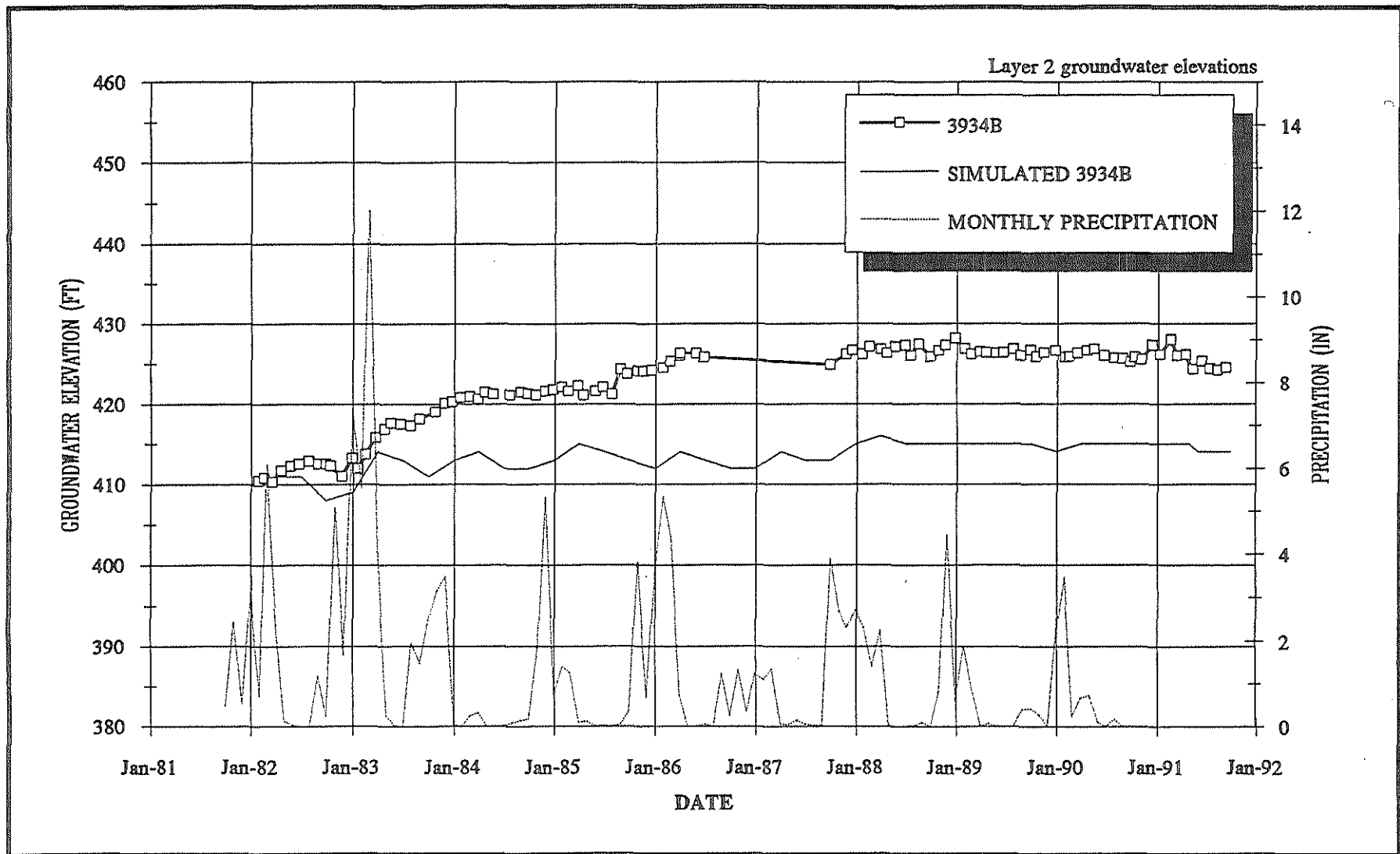
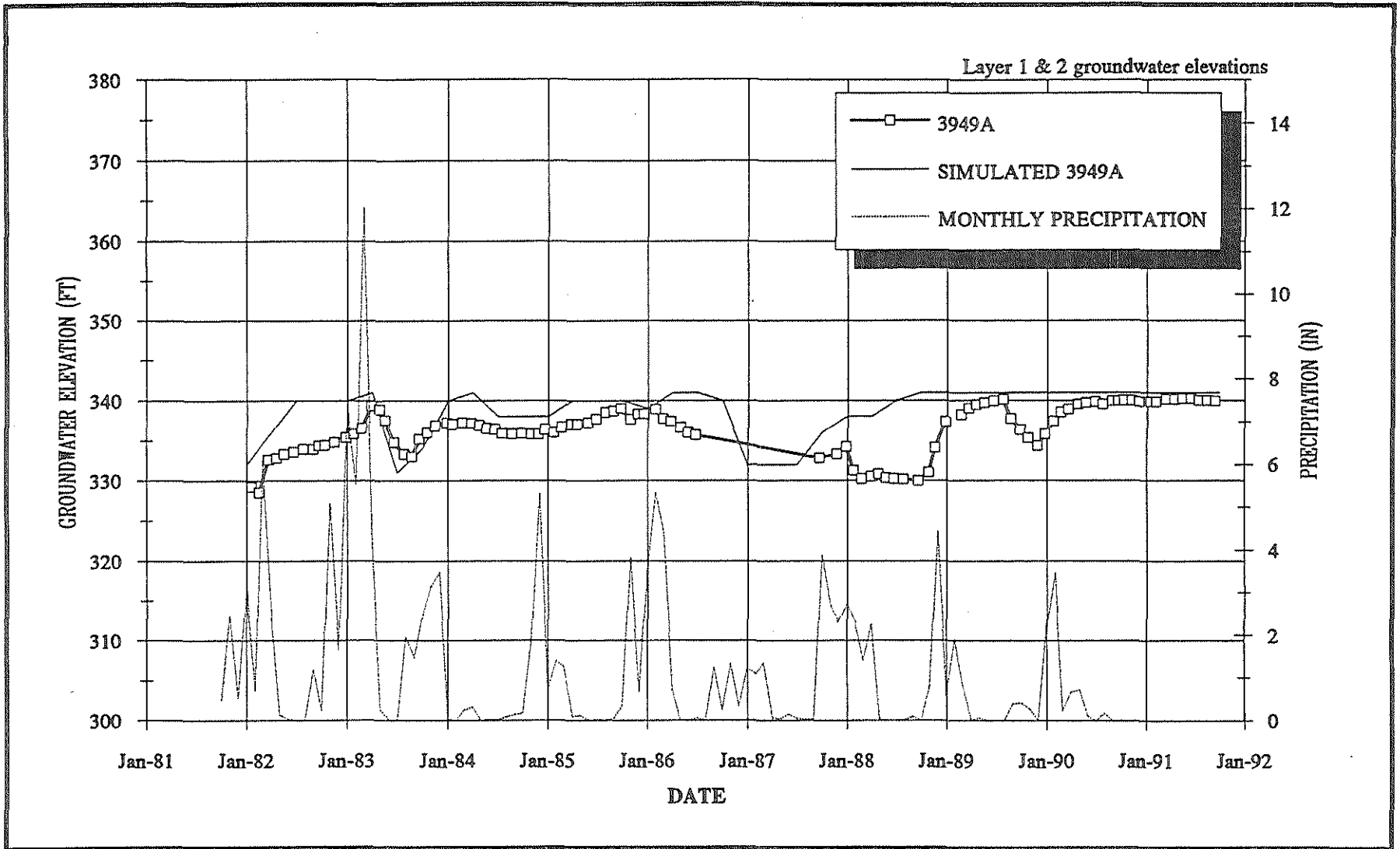


FIGURE 6-27  
 MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 3914H (NODE 38,65)

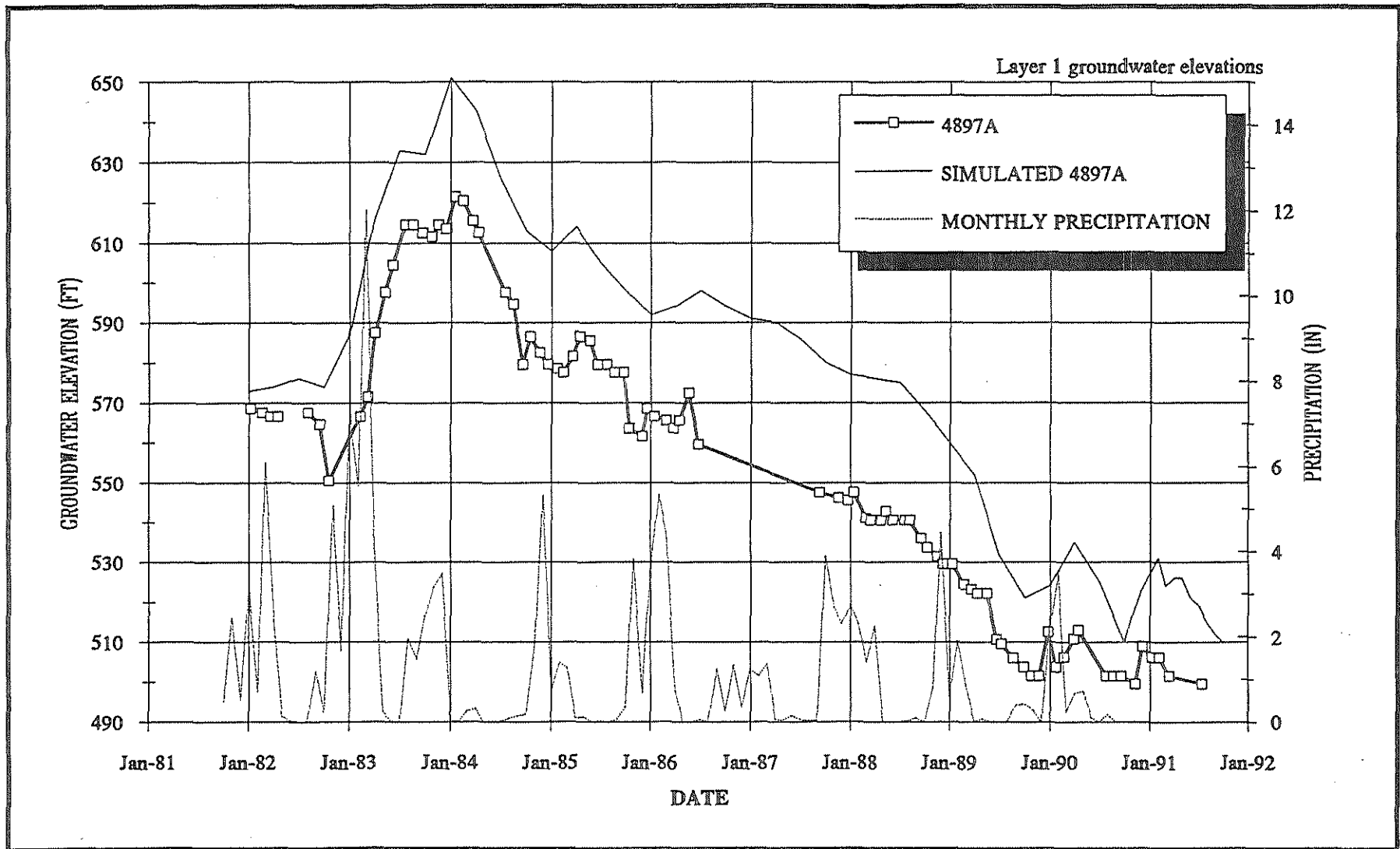


**FIGURE 6-28**  
**MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 3934B (NODE 39,71)**



**FIGURE 6-29**  
**MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 3949A (NODE 56,75)**





**FIGURE 6-30**  
**MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 4897A (NODE 14,29)**

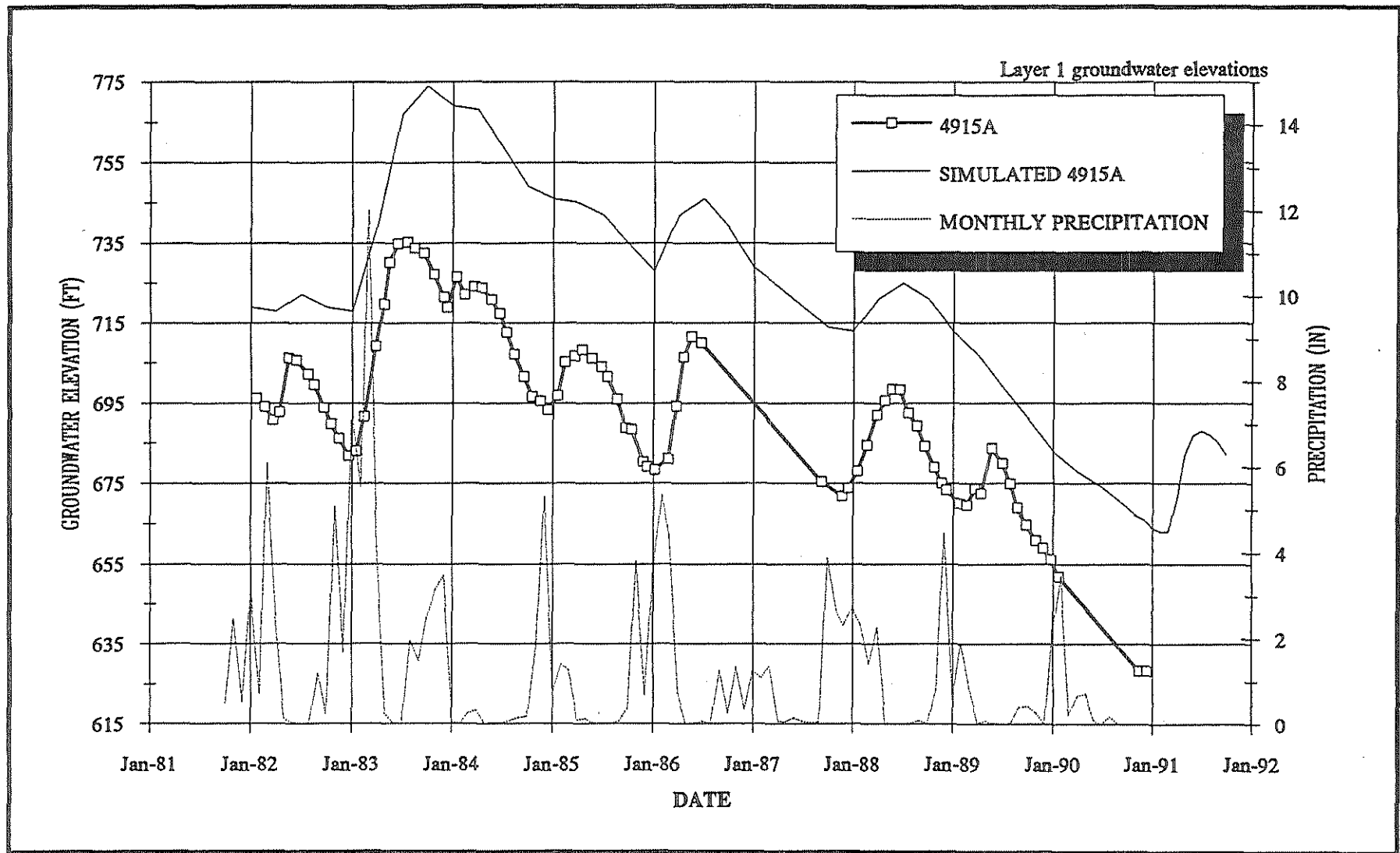
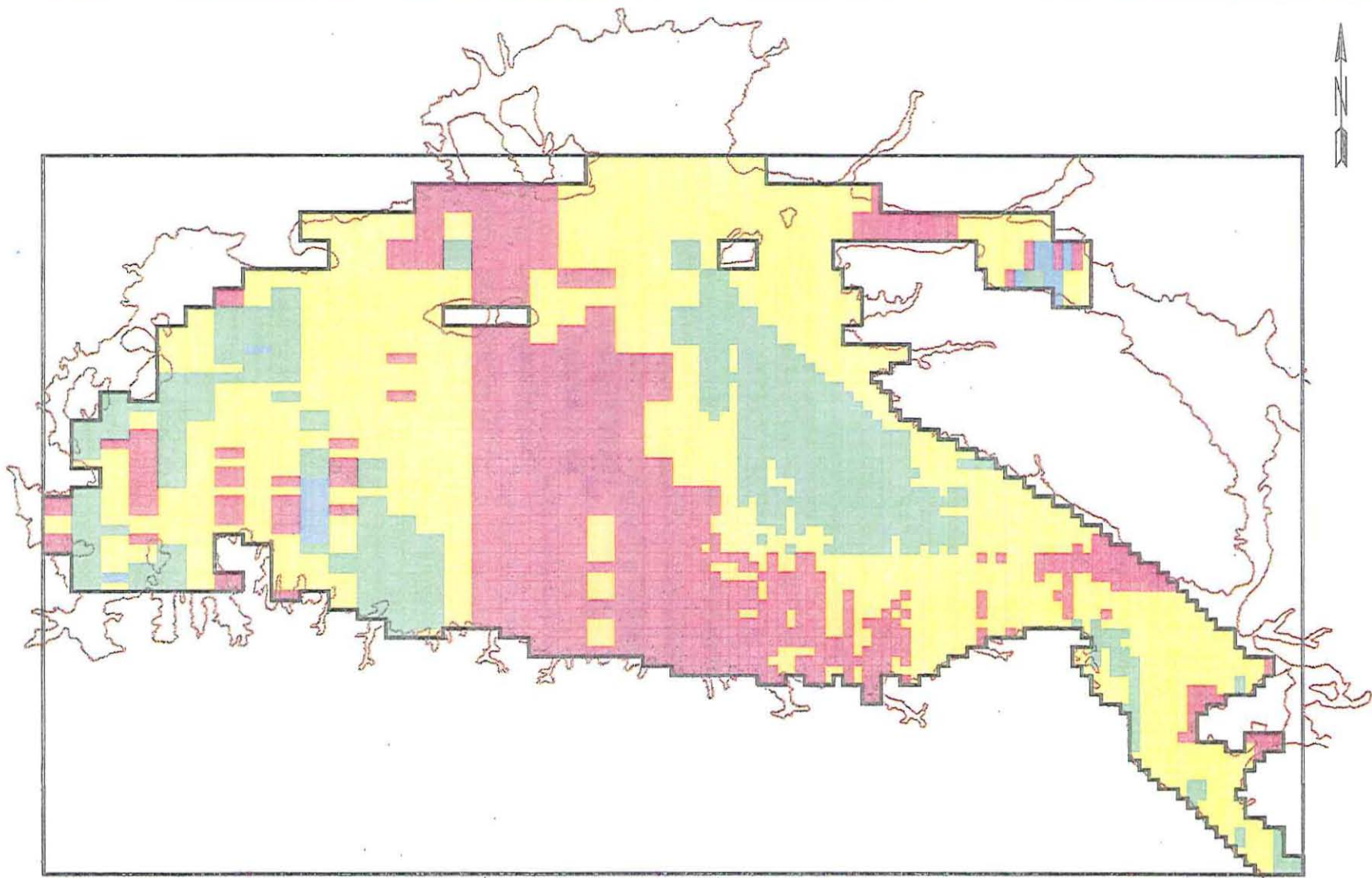


FIGURE 6-31  
 MEASURED AND MODEL-SIMULATED WATER LEVELS AT WELL 4915A (NODE 7,36)

MOD4 FIG6-32 REV. 9/02/92 1-15840



LEGEND:  
UNITLESS

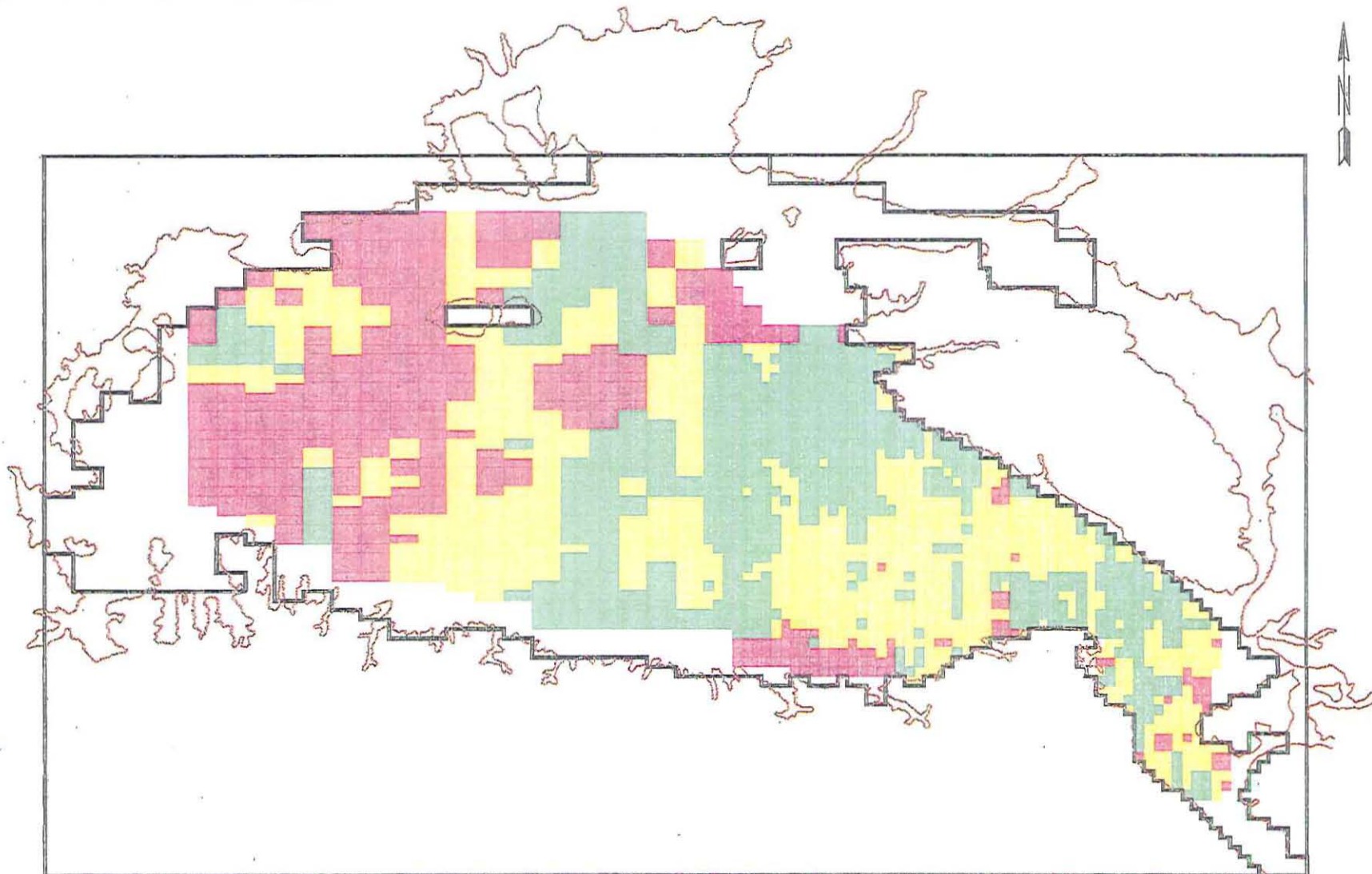
- 15%-20%
- 10%-15%
- 5%-10%
- 0-5%

0 1 2 3  
MILE

REMEDIAL INVESTIGATION  
of Groundwater Contamination  
in the San Fernando Valley

FIGURE 6-32  
LAYER 1 CALIBRATED SPECIFIC YIELD

MOD4 FIG6-33 REV. 9/08/92 1=15840



REMEDIAL INVESTIGATION  
of Groundwater Contamination  
in the San Fernando Valley

FIGURE 6-33  
LAYER 2 CALIBRATED SPECIFIC YIELD

LEGEND:  
UNITLESS  
5%-10%  
2.5%-5%  
0-2.5%



MOD4 FIG6-34 REV. 9/02/92 1=15840



REMEDIAL INVESTIGATION  
of Groundwater Contamination  
in the San Fernando Valley

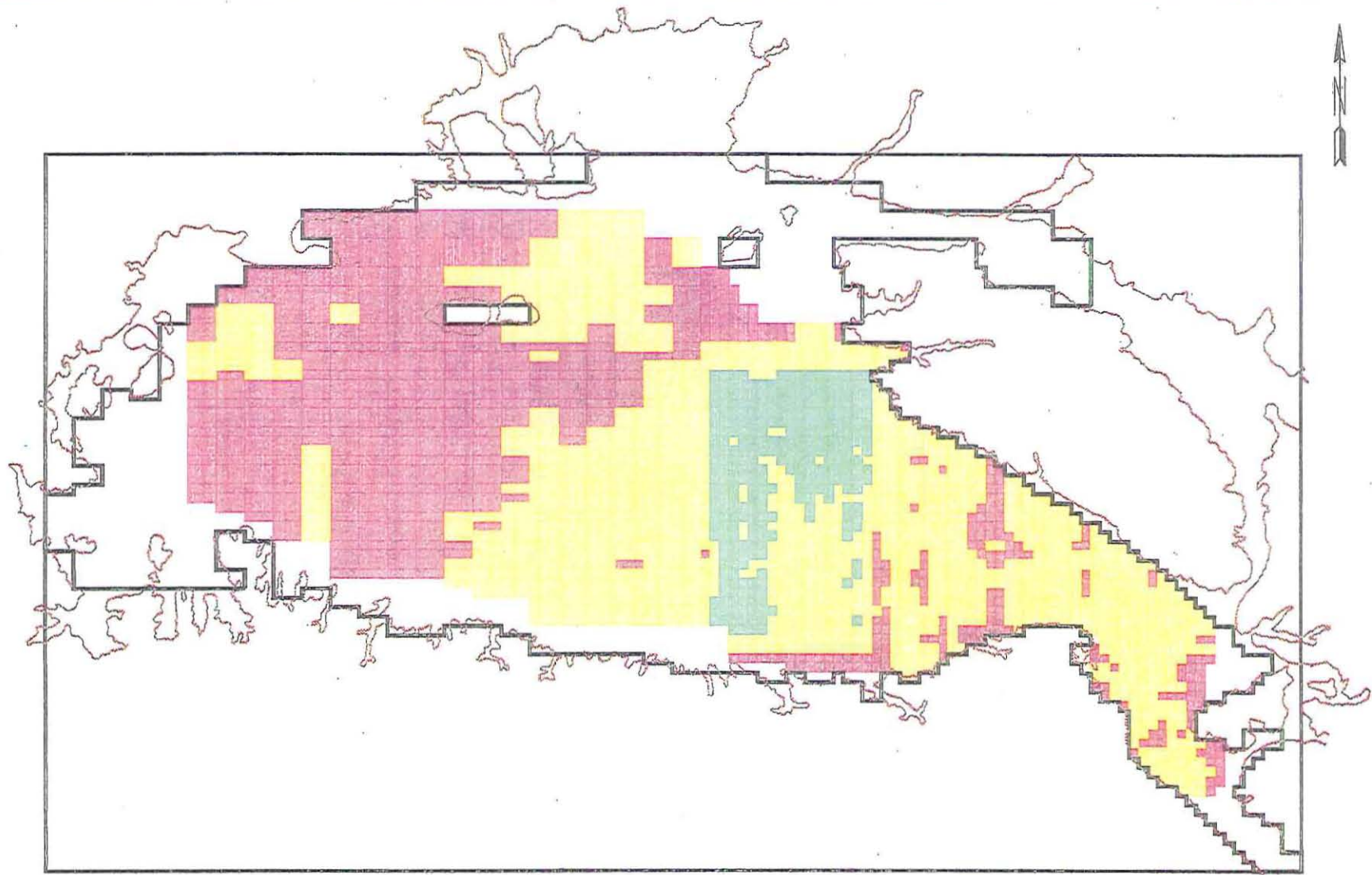
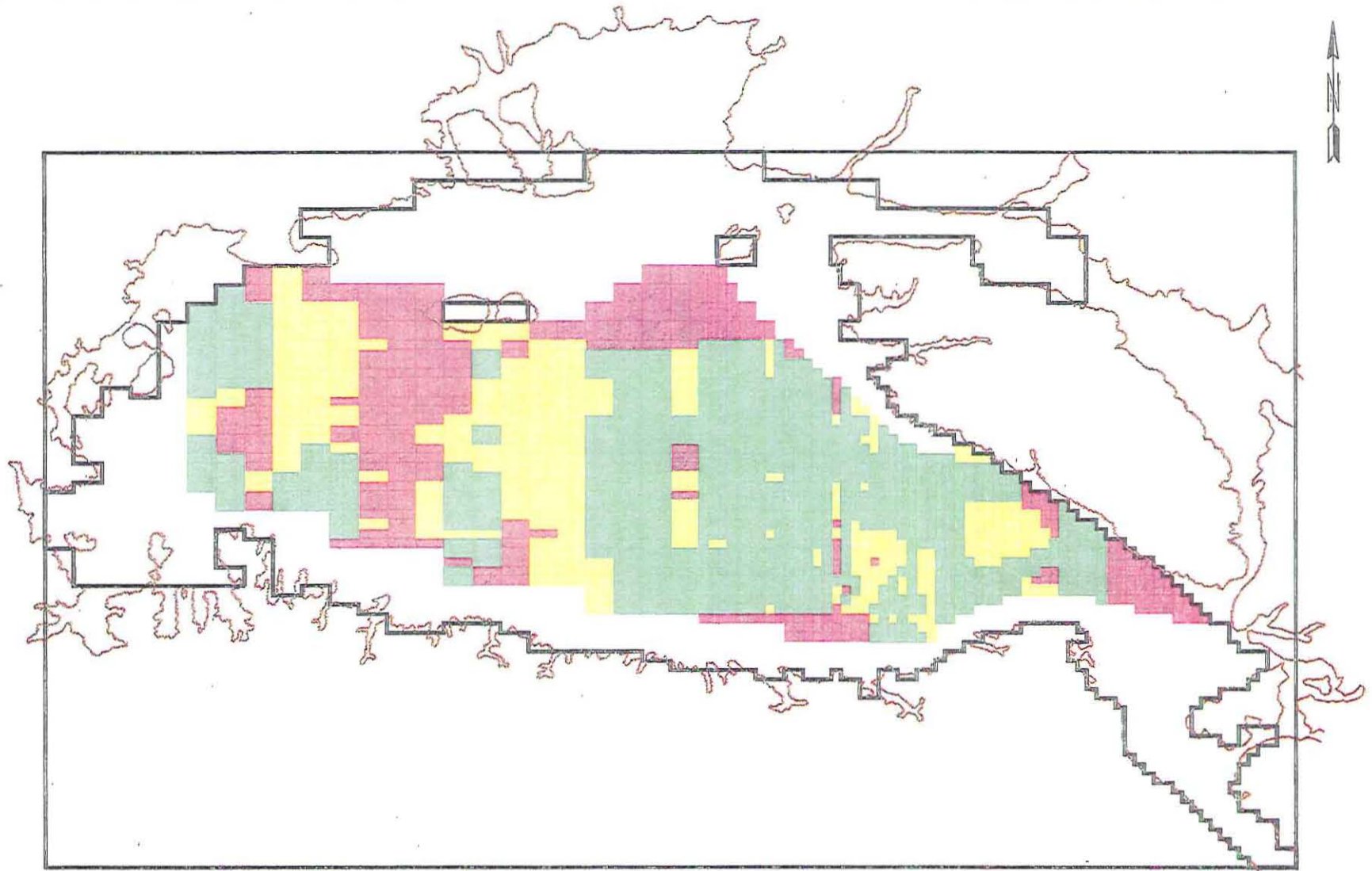


FIGURE 6-34  
LAYER 2 CALIBRATED STORAGE COEFFICIENT

LEGEND:  
UNITLESS  
ALL VALUES X  $10^{-6}$

Green	50-100
Yellow	10-50
Red	0-10

MOD4 FIG6-35 REV. 9/08/92 1=15840



LEGEND:  
UNITLESS  
ALL VALUES X  $10^{-5}$

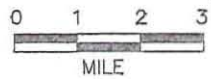
- 10-25
- 5-10
- 0-5

REMEDIAL INVESTIGATION  
of Groundwater Contamination  
in the San Fernando Valley

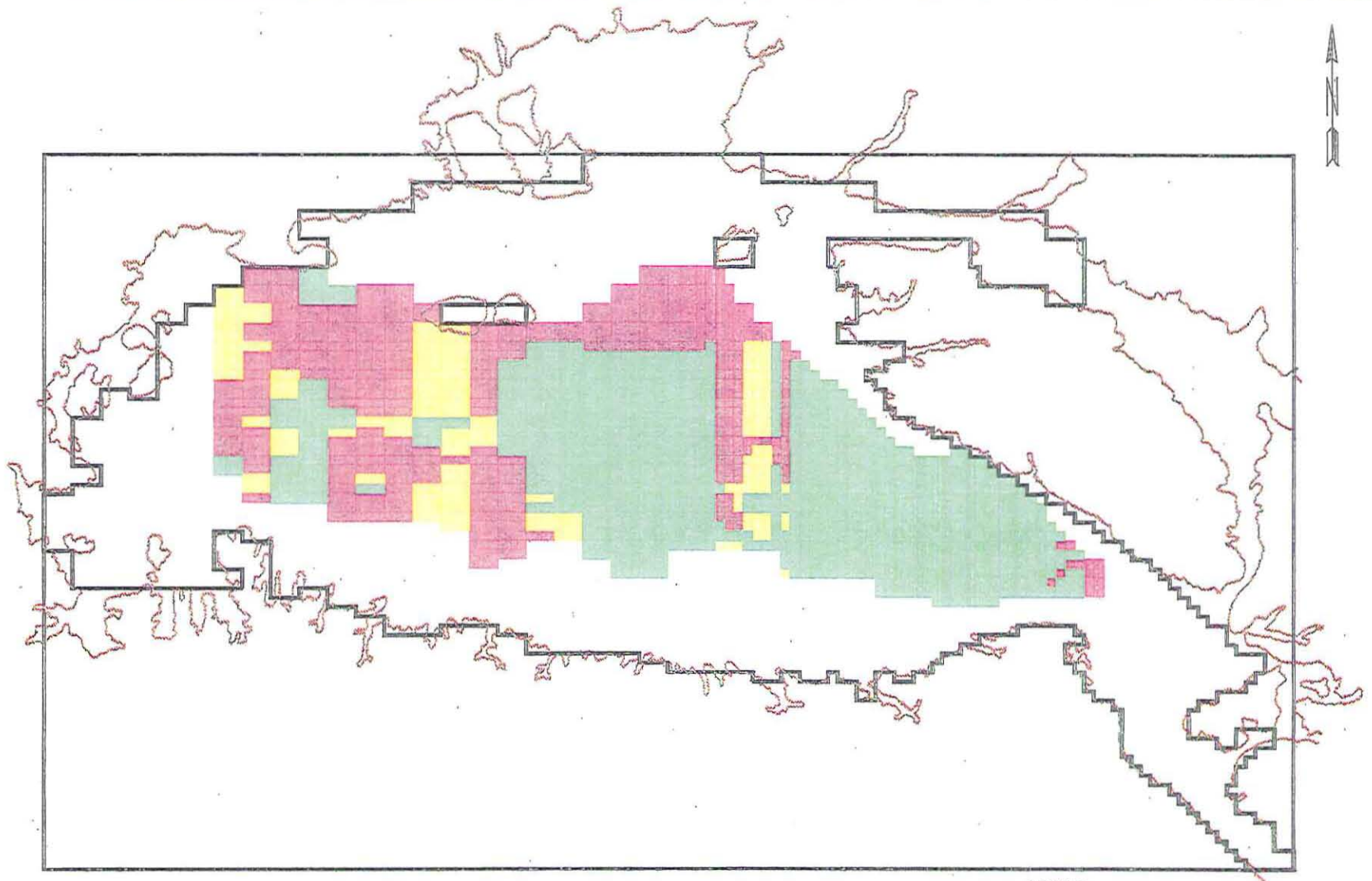
FIGURE 6-35  
LAYER 3 CALIBRATED STORAGE COEFFICIENT



MOD4 FIG6-36 REV. 9/08/92 1=15840



REMEDIAL INVESTIGATION  
of Groundwater Contamination  
in the San Fernando Valley



LEGEND:  
UNITLESS  
ALL VALUES X  $10^{-5}$

Green	10-25
Yellow	5-10
Red	0-5

FIGURE 6-36  
LAYER 4 CALIBRATED STORAGE COEFFICIENT

may be several reasons for the discrepancy between the measured and simulated groundwater elevations at these wells. First, the complexity of the aquifer and its dynamics in this area are greater than can be simulated by the grid size established in the model. For example, between 1982 and 1991 the measured water levels at wells 4897A and 4915A fluctuated up to 120 feet. The maximum change in water level in all other key wells was 40 feet or less by comparison. These large fluctuations at well 4897A are a result of its proximity to the North Hollywood wellfield and the Tujunga spreading grounds. Although well 4915A is not located near an active wellfield, it is in the Hansen Subarea and upgradient of the Verdugo Fault, which acts as a flow boundary at depth and thus increases the effect of local aquifer stresses.

Another reason for the discrepancy between measured and simulated groundwater elevations is that the model-calculated water level at a node is an average value for the entire cell area. The grid size at well 4915A, for example, which is located outside the calibration-criteria area, is 1,000 feet by 2,000 feet. The water-table gradient in this area is particularly steep and water levels may change 80 feet or more over the length of a cell. Thus, a key well located inside a 2,000-foot-long grid could be predicted by the model as having a water level as much as 40 feet above or below measured levels at the well and still be within the values observed within the cell area. This uncertainty is inherent in grids as large as those used for the San Fernando Basin model, especially in areas of steep gradients. For example, in the vicinity of well 4897A, the vertical hydraulic gradients are high because of the adjacent spreading at the Tujunga spreading grounds. Figures 6-37 and 6-38 illustrate the effect of the model grid size in predictions by showing the water level elevations predicted at two adjacent nodes to the south and to the north of well 3753B. The node to the north has water levels as much as 10 feet below measured values, and the node to the south has water levels as much as 30 feet above measured water levels. The correct water levels lie somewhere between the node selected for well 3753B and the node to the north.

For wells located close to variable components of recharge or discharge, as is the case with 4897A and to some extent 4915A, the stress period selected for the transient simulation is another important factor in the transient calibration. While the rate of recharge and discharge



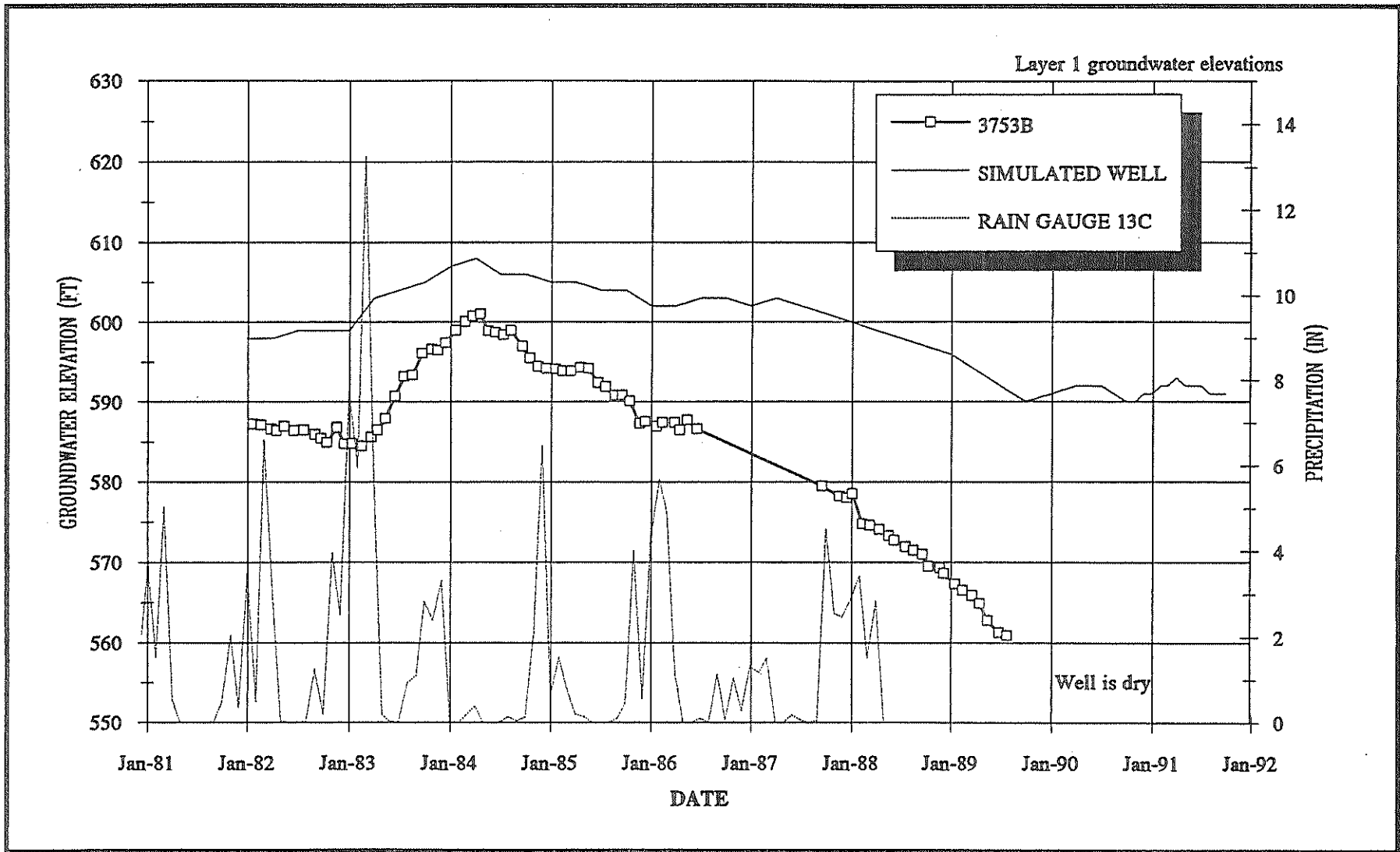
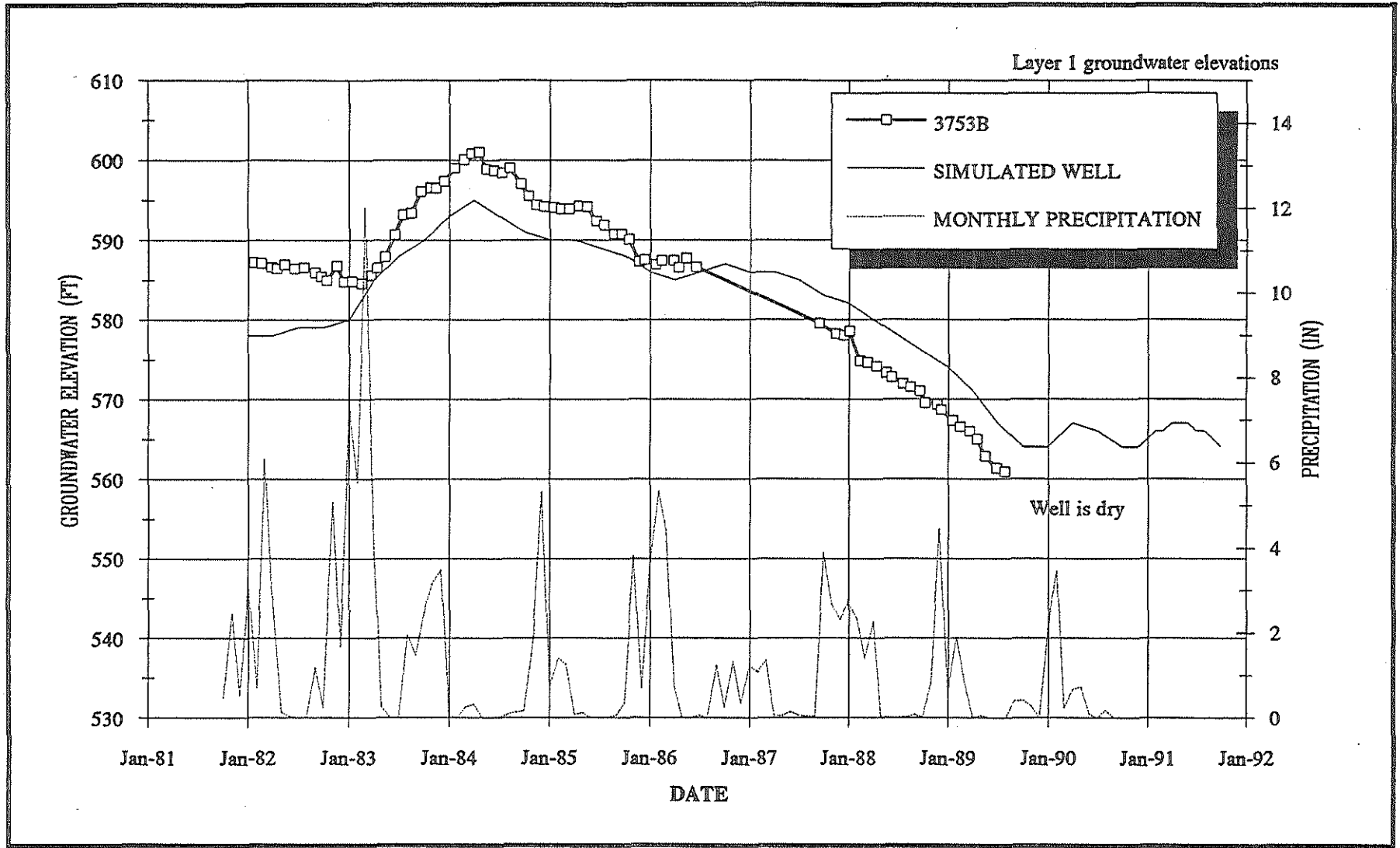


FIGURE 6-37  
 MODEL-SIMULATED WATER LEVEL 1,000 FEET SOUTH  
 OF WELL 3753B (NODE 37,21) WITH MEASURED WATER LEVEL AT WELL 3753B



**FIGURE 6-38**  
**MODEL-SIMULATED WATER LEVEL 1,000 FEET NORTH**  
**OF WELL 3753B (NODE 35,21) WITH MEASURED WATER LEVEL AT WELL 3753B**

may fluctuate on a daily basis, the model assumes only four stress periods for each year although monthly data is used to generate inputs for the quarterly stress periods. A large amount of pumping during one stress period could actually have occurred at a high rate for only a short period of time. The model however is given average discharge rates for the total duration of the stress period. Thus, these type of short-term effects will be simulated differently by the model.

In all but two of the remaining key wells (3841H and 3934B), the simulated water levels compared very favorably with measured water-level elevations. The simulated water-level elevations also compared well at 3841H and 3934B but with slightly larger deviations, within the calibration criteria, from measured water levels. In particular, water-level fluctuations were matched in both highly fluctuating wells and wells with relatively flat water levels. Water levels in well 3810H, for example, were simulated by the model to within 5 feet or less over the entire transient period. The measured water levels in well 3949A, which fluctuated 10 feet at the most, also were matched within 5 feet or less.

At key well 3841H, in which the measured water levels fluctuated considerably over the 10-year period, the model was successful in matching those fluctuations. The simulated water level ranged from about 20 feet to 0 feet below measured water levels with the discrepancy decreasing towards the end of the simulation. At key well 3934B, the measured water-level fluctuations were small in comparison, with the water level increasing with time. The model was also successful in matching the smaller fluctuations at well 3934B with a deviation in head of generally less than 10 feet.

Another example of the model's successful basin-wide calibration is the match to water levels in key wells 3600H and 3753B. The model simulation produced good matches at both wells, which are each located outside of the calibration-criteria area. The model-simulated water levels at key well 3600H are generally within about 6 feet of measured water levels, and the trend of only slight short-term fluctuations with no long-term change in water level is particularly well simulated. At key well 3753, the simulated water levels are generally within 5 feet during most

of the transient period. Both short-term and long-term aquifer responses are evident in this well and both are successfully simulated by the model.

**Groundwater Flow Contours.** As indicated before, an additional method was used to evaluate the transient calibration by comparing contoured water-level elevations with simulated water levels. Contoured composite heads after the fourth stress period of the water year (representing October 1) were prepared for each year and are included in Appendix L. These heads were compared to the fall groundwater contour maps available annually in the ULARA Watermaster Service reports to check simulated flow patterns throughout the basin.

In general, groundwater-flow patterns generated by the model compared favorably with those from annual Watermaster Service reports. Simulated horizontal gradients were steeper in the west than in the east, matching gradient patterns evident in the maps produced from measured water levels. The model predicted correct regional flow directions with groundwater moving eastward across the basin, towards the pumping centers within the study area and then southward through the Los Angeles River Narrows. In the west, the model predicted flow towards the southern boundary of the basin, which also is evident in regional groundwater maps. The flow direction north of the Verdugo fault was simulated by the model as towards the south, similar to the flow direction indicated by the regional maps.

In the study area, the model generally matched both steep cones of depression caused by pumping and relatively flat gradients produced by recovering water levels. The simulated groundwater levels were up to 35 feet higher than measured groundwater levels near the Tujunga spreading grounds, however, immediately downgradient of this location the simulated gradients matched the measured gradients, thus depicting the effects of the pumping operations on groundwater-flow directions. The groundwater-level elevations generated for the fall of 1988 and 1989 are good examples of the effects of the pumping operations matched by the model for the central portion of the Study Area.

The model was not as successful in simulating the pumping depression near the Crystal Springs Study Area for certain years. This pattern is evident in maps generated for the fall of 1984, 1985, and 1986. The inability of the model to duplicate this depression may be attributed to several causes. First, the complexity of the groundwater-flow patterns in this area of the basin in which groundwater flows change direction from eastward and south-eastward to southward through the Los Angeles River Narrows, is influenced by the cross-sectional area of the alluvium which is constricted in this area by the geometry of the basin. Consequently, the density of model nodes is not adequate to represent these conditions. Second, several faults located in this area also control the flow patterns. The addition of the Benedict Canyon faults and another possible fault to the north significantly improved the calibration of the water levels in this area. However, it is difficult for the model to adequately simulate the effects of faults with a 1,000-foot grid when the actual fault width may be on the order of a few feet. Third, the stress periods selected for the model also are a factor in matching the field data. The field data may have been collected close to operating extraction wells and close in time to periods of operation such that they indicate lower water levels than are simulated by the model at the end of a stress period for a given year.

**Water Balance.** For the San Fernando Basin flow model, all of the water balance components are known or have been estimated. These components are listed in Table 6-3 with both 8- and 10-year averages. Those components which are not input to the model are shown in italics. One method by which the transient calibration was evaluated was to compare the model-simulated flows with the estimated values for subsurface flow out of the basin (simulated by a general-head boundary condition), rising water in the Los Angeles River, and change in groundwater storage.

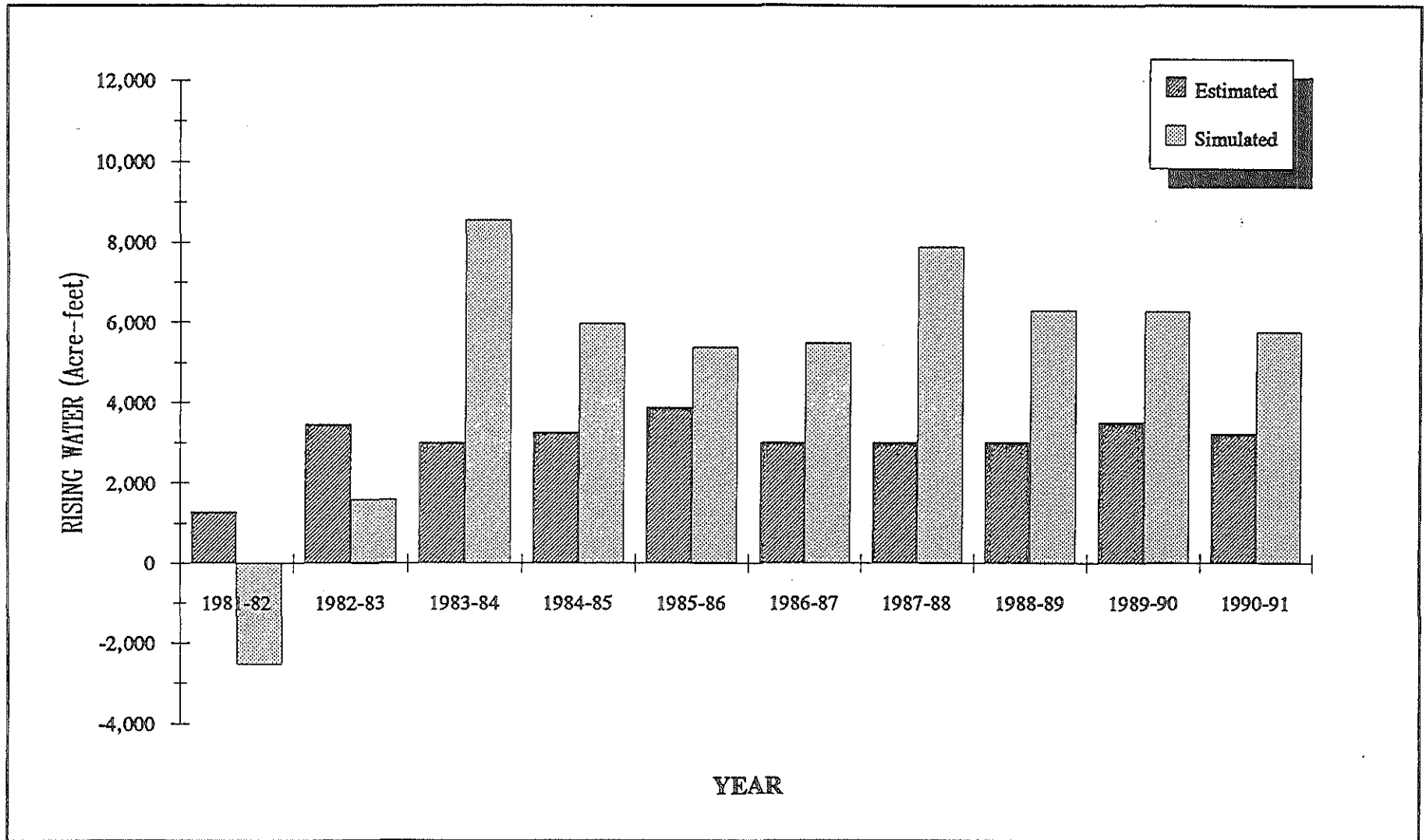
The model-simulated subsurface flow out of the basin at the southernmost basin boundary for the 10-year period was similar in magnitude to reported values (Table 6-3). The average annual simulated subsurface flow from the basin boundary of 351 acre-feet (Table 6-6) compared well with the estimated annual underflow of 422 acre-feet (Table 6-3). The model-simulated values

fluctuated somewhat more from year to year than reported values. This is probably a result of the time lag between model-prediction period and period of calculation.

Figure 6-39 shows that the model-simulated rising water in the Los Angeles River agreed well with the estimated value for the 10-year transient calibration period. The model-predicted values are within the same order of magnitude as those calculated. Rising water predicted by the model averaged about 5,057 acre-feet annually (Table 6-6). Although this is somewhat higher than the average reported value of 3,058 acre-feet (Table 6-3), the rising water values reported for 1987 through 1990 are under re-evaluation by the ULARA Watermaster (ULARA Watermaster, 1992a), and the average is based on interim estimated values (ULARA Watermaster, 1992b). Reported values of rising are based on separation of flow out of the basin past gage F-57C-R. Data from this gage have been incomplete in the past, with suspected discrepancies of 3,000 acre-feet or more. Given the uncertainties in the measured data, the simulated values of rising water are considered to be within the range of estimated values.

The cumulative change in storage for the model is illustrated in Figure 6-40. The annual change in groundwater storage simulated by the model followed the same general pattern as that from values estimated by the Specific Yield Method (reported annually in the ULARA Watermaster Service reports) (Section 5.2.1.3). With a total storage loss of 74,750 acre-feet simulated by the model compared to 82,120 acre-feet estimated by the Specific Yield Method, the simulated change in storage indicates that the basin is losing slightly less groundwater over the 10-year period than indicated by these estimated values.

Figure 6-40 shows also the estimated annual change in storage by the Inflow-Outflow Method. The model-generated change in storage is somewhat larger than the 53,010 acre-feet change in storage estimated by the Inflow-Outflow Method. However, the yearly model-generated values and the Inflow-Outflow Method values track closely. Although there are annual differences between the model-generated change-in-storage values and the values derived from the two methods of estimation, the long-term results from the model reflect the same trend of groundwater storage change as illustrated from the two change in storage estimates.



**FIGURE 6-39**  
**ESTIMATED AND SIMULATED RISING WATER IN THE LOS ANGELES RIVER**



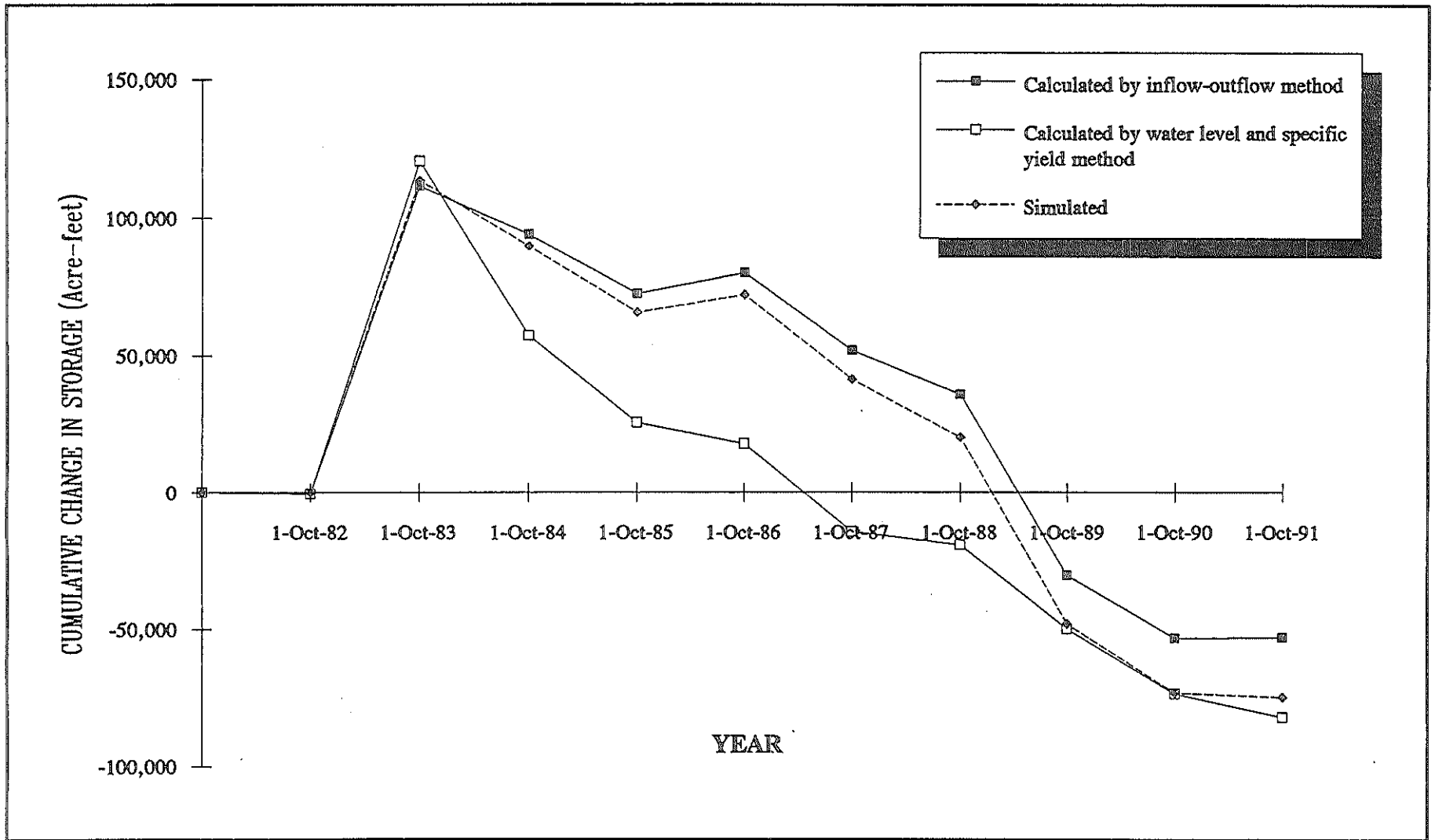


FIGURE 6-40  
ESTIMATED AND SIMULATED CUMULATIVE CHANGE IN GROUNDWATER STORAGE

### **6.5.3 Transient Calibration to Remedial Investigation Data**

The RI data transient calibration followed the completion of the 8-year transient calibration. As indicated before, the objective of the transient calibration was to match both the short-term and long-term responses of hydraulic heads to the time-variant changes in recharge to and discharge from the aquifer. To accomplish this, model-predicted composite hydraulic heads were compared with measured water levels at key wells with multiple screen intervals intercepting typically more than one aquifer zone. Data available from the installation and monitoring of RI cluster wells (screened in single aquifer zones) allowed the model's transient response to be further calibrated by matching gradients between individual layers. This calibration is important to evaluate the model's ability to predict the effects of pumping and nonpumping on individual aquifer zones.

**6.5.3.1 Objectives and Approach.** The primary objective of the RI data transient calibration was to simulate vertical flow directions within the San Fernando Basin Study Area. Of particular importance are the gradient directions between the Upper Zone and the Lower Zone, which are represented in the model by layer 1 (Upper Zone and Middle Zone combined) and layer 2 (upper portion of Lower Zone, called the L1 Zone). Because there are gradients within the Lower Zone (Appendix L, Figure L-27), it is beyond the capability of the model to correctly match gradients between the L1 Zone and depth-specific intervals within the lower portions of the Lower Zone. Therefore, the focus of the RI data transient calibration was to simulate vertical gradients between the Upper Zone and the L1 Zone.

The RI data calibration was accomplished by extending the 8-year transient calibration period 2 additional years to include the water year 1990-91, during which the water-level data from the RI cluster wells were measured. The quarterly stress periods were extended through 1989-90 but monthly stress periods were used for 1990-91, because the cluster well data period was short relative to the 3-month stress periods used for the first 9-year calibration period.

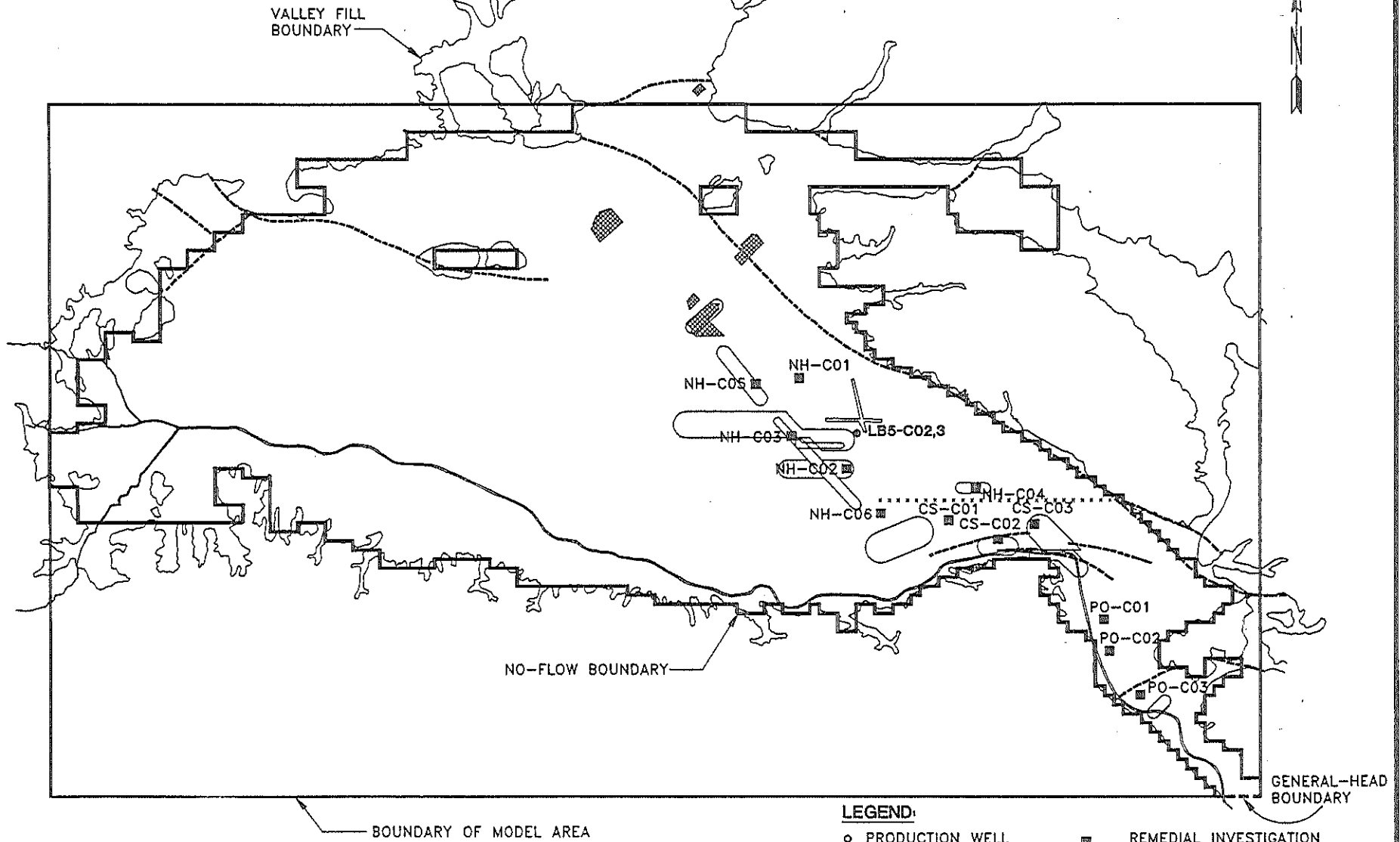
Twelve RI cluster wells and two Lockheed Engineering and Science Company (LESC) cluster wells were used to compare the vertical gradients. The measured water levels in the cluster wells were matched to simulated water levels based on their aquifer zone classification as discussed above. These wells, shown on Figure 6-41 and listed in Table 6-7, were selected based on their locations and completeness of data collected during 1990-91 to represent conditions both near to and far from pumping centers.

All of the North Hollywood cluster wells were used to provide coverage of that portion of the basin. Three Crystal Springs wells (CS-C01, CS-C02, and CS-C03) were selected near the Headworks and Crystal Springs wellfields to simulate impacts from these wellfields. All of the Pollock cluster wells were selected to calibrate vertical gradients both upgradient and downgradient of the Raymond Fault in the Los Angeles River Narrows. The two LESC cluster wells were selected to provide calibration in an area where RI cluster wells were not installed.

The parameters adjusted during the RI calibration included vertical leakance between layers 1 and 2 and layers 2 and 3, specific yield, storativity, hydraulic conductivity, and transmissivity. For this part of the transient calibration, adjustments were aimed primarily at matching vertical gradient directions and not water levels. The parameters were adjusted by local groups of nodes to match the vertical gradients observed in the cluster wells. Local adjustments were made because the vertical gradient distribution appeared to be quite site-specific and large-scale changes did not make significant changes. The 8-year transient period was also simulated again to assure that the changes made to the model would not adversely impact the 8-year calibration results.

**6.5.3.2 Results.** The vertical gradients observed between the Upper and Lower zones and within the Lower Zone vary with both time and location (Section 5.0). Table 6-8 shows the simulated and observed gradient directions for the selected cluster wells. The graphs showing the measured and model-simulated water-level elevations at the cluster wells are provided in Appendix L.

MOD6 FIG6-41 REV. 9/04/92 1=15840



**FIGURE 6-41**  
**WELLS USED FOR TRANSIENT**  
**CALIBRATION TO REMEDIAL INVESTIGATION DATA**

REMEDIAL INVESTIGATION  
of Groundwater Contamination  
in the San Fernando Valley



- LEGEND:**
- PRODUCTION WELL
  - ◐ MONITORING WELL
  - ◊ UNKNOWN WELL TYPE
  - REMEDIAL INVESTIGATION MONITORING WELL
  - ▨ SPREADING GROUND
  - - - FAULT, GROUNDWATER CASCADE OR IMPEDIMENT TO FLOW
  - ..... POSSIBLE FAULT
  - MAJOR WELLFIELD AREA

## REMEDIAL INVESTIGATION CALIBRATION WELLS

Well Site	Well Name	Model Cell Location (row, col)	Approximate Distance to Nearest Pumping Well* (ft)	Perforated Interval (ft msl)	Aquifer Zone	Model Layer	Extraction Wells in Same Cell (1990-91)
NH-C01	NH-C01-325	18,36	5,150 (3810R)	507.8-457.8	U	1	No
	NH-C01-450			381.9-331.9	L1	2	No
	NH-C01-660			152-122	L	3	No
	NH-C01-780			42-2	L	3	No
NH-C02	NH-C02-220	29,42	300 (3831F)	488.5-438.5	U	1	No
	NH-C02-325			383.7-333.7	L1	2	No
	NH-C02-520			188.9-138.9	L	3	No
	NH-C02-680			18-(-22)	L	3	No
NH-C03	NHE-04	25,35	250 (3810K)	530.7-430.7	U	1	Yes
	NHE-380			370.3-330.3	L1	2	Yes
	NHE-580			170.4-130.4	L	3	Yes
	NHE-680			70.5-30.5	L	3	Yes
	NHE-800			(-49.4)-(-89.4)	L	3	Yes
NH-C04	NH-VPB-14	30,55	20 (3882P)	474.4-454.4	U	1	No
	NH-VPB-240			350-320	U	1	No
	NH-VPB-375			234.9-184.9	L1	2	No
	NH-VPB-560			49.6-(-0.4)	L	3	No
NH-C05	NH-C05-320	19,32	1,150 (4909K)	504.3-454.3	U	1	No
	NH-C05-460			384.2-314.2	L1	2	No
NH-C06	NH-C06-160	33,45	2,550 (3853G)	480.8-430.8	U	1	No
	NH-C06-285			355.9-305.9	L1	2	No
	NH-C06-425			225-165	L	3	No
CS-C01	CS-C01-105	34,53	3,100 (3863L)	468.8-438.8	U	1	No
	CS-C01-285			278.7-258.7	L1	2	No
	CS-C01-558			6.1-(-13.9)	L	3	No
CS-C02	CS-C02-62	37,58	450 (3893K)	445.9-415.9	U	1	No
	CS-C02-180			337.9-297.9	U	1	No
	CS-C02-250			247.9-227.9	L1	2	No

TABLE 6-7 (Continued)

## REMEDIAL INVESTIGATION CALIBRATION WELLS

Well Site	Well Name	Model Cell Location (row, col)	Approximate Distance to Nearest Pumping Well <sup>a</sup> (ft)	Perforated Interval (ft msl)	Aquifer Zone	Model Layer	Extraction Wells in Same Cell (1990-91)
CS-C03	CS-C03-100	35,62	3,050 (3904J)	429.4-389.4	U	1	No
	CS-C03-325			194.6-164.6	L1	2	No
	CS-C03-465			64.5-24.5	L	3	No
PO-C01	PO-VPB-02	45,69	6,050 (3945)	393.4-373.4	U	1	No
	PO-VPB-195			269.5-249.5	L1	2	No
	PO-VPB-354			120.7-90.7	D	2 <sup>b</sup>	No
PO-C02	PO-C02-52	48,70	4,600 (3947B)	405.8-375.8	U	1	No
	PO-C02-205			253-223	L1	2	No
PO-C03	PO-VPB-03	53,74	2,500 (3959E)	336.3-316.3	U	1	No
	PO-VPB-182			224.2-204.2	L1	2	No
	PO-VPB-235			181.1-151.1	L	2 <sup>b</sup>	No
LB5-CW03	LB5-CW03	25,43	1,000 (3840K)	484.27-464.27	U	1	No
	LB5-CW02			355.34-345.34	L1	2	No
3862C	3862C	31,49	3,000 (3863J)	495.42-455.42	U	1	No
	3862E			329.37-309.37	L1	2	No

<sup>a</sup> Includes only production and some private wells that were in operation anytime between October 1, 1981 and September 1, 1991. Distances are generally approximated to the nearest 50 feet and the well name is included in parentheses.

<sup>b</sup> There are only two model layers in the Los Angeles River Narrows where The Pollock cluster wells are located.

**TABLE 6-8**  
**MEASURED AND SIMULATED**  
**DOMINANT VERTICAL GRADIENT DIRECTIONS**  
**IN CALIBRATION CLUSTER WELLS**

Cluster Well	Upper Zone to L1 Lower Zone		L1 Lower Zone to Lower Zone	
	10/90-4/91	4/91-9/91	10/90-4/91	4/91-9/91
PO-C01	ND	— ↑	ND	—
Simulated PO-C01	↑	↑	NA	NA
PO-C02	↑	↑	NA	NA
Simulated PO-C02	↑	↑	NA	NA
PO-C03	↓	↓	—	—
Simulated PO-C03	↓	↓	NA	NA
CS-C01	↓ ↑	↓	↓	↓
Simulated CS-C01	↑	— ↑	—	—
CS-C02	—	—	NA	NA
Simulated CS-C02	—	—	NA	NA
CS-C03	↓	↓	↓	↓
Simulated CS-C03	↑	↑	—	—
NH-C01	↑	— ↑	↑	↑
Simulated NH-C01	↑	↓	↑	↓
NH-C02	ND	↓	ND	↓
Simulated NH-C02	↑	↓	—	—
NH-C03	ND	↓	↑ ↓	↑ ↓
Simulated NH-C03	↑	↓	↑ —	—
NH-C04	↑	↑	↑	↑
Simulated NH-C04	↑	↑	— ↑	—
NH-C05	ND	↑	NA	NA
Simulated NH-C05	↑ ↓	↓	↑ ↓	↑
NH-C06	ND	↓	ND	↓
Simulated NH-C06	↑ ↓	↓	—	—
3862C,E	↑	↑	NA	NA
Simulated 3862C,E	↑	— ↑	NA	NA
LB-5-CW02,3	— ↑	— ↑ ↓	NA	NA
Simulated LB-5-CW02,3	↑	↓	NA	NA

↑ = Dominant upward gradient      ND = Not enough data  
↓ = Dominant downward gradient      NA = Not applicable  
— = No gradient dominant      — ↑, ↑ ↓ multiple symbols indicate no dominant gradient direction



On Table 6-8 the vertical gradients are given for two time periods, October 1990 to April 1991 and April to September 1991. Often, observed gradients changed direction more than once during these two time periods and typically reversals occurred near April, when groundwater extractions often began to increase for the summer months. The gradients given are the predominant gradient direction during the specified time. Of the cluster wells that have data for the entire year, one of nine cluster well sets (LB-5-CW02,3) shows a reversal in the predominant direction of vertical gradient between the Upper Zone and the L1 Lower Zone. About six of the nine groups (CS-C01, NH-C01, NH-C02, NH-C03, NH-C04, and LB-CW02,3) show some evidence of reversals in gradient direction over time.

The model simulated the correct vertical gradient direction between the Upper Zone and L1 Lower Zone in 10 of the 14 cluster well sets (Table 6-8). At NH-C01, the model matched observed gradient correctly for half of the year-long period. There were eight cluster well sets in which the vertical gradient between the L1 Lower Zone and deeper could be compared. Of these, the model correctly matched the gradient direction for at least half of the period in three cluster sets.

In cluster wells CS-C01, CS-C03, and NH-C05, the model did not correctly match the vertical gradient direction between the Upper and L1 Lower zones for at least half of the year-long period. The Crystal Springs wells are located above the Benedict Canyon faults and below another suspected fault zone that was simulated in the model. Water-level measurements from both cluster wells indicate downward vertical gradients from the Upper Zone to the L1 Lower Zone. Downward gradients would be expected below a fault zone and upward gradients would be expected above a fault zone. Because the model can only simulate faults using an entire cell, the resolution of the grid in this area adversely impacts the ability of the model to match the measured gradients. Model cells located closer to the upgradient fault have downward vertical gradients as expected. This is illustrated by the simulated water levels at a node located two cells to the north and one cell to the east of CS-C03 (Appendix L, Figure L-24). There could also be additional faults in the area that have not been discovered. At other fault locations the

vertical gradients were correctly matched, south of the Raymond fault at PO-C03 and near the Benedict Canyon faults at CS-C02.

NH-C05 is located in the northern portion of the study area. After April 1991 this well showed an upward vertical gradient from the L1 Lower Zone to the Upper Zone. No data were available at this site prior to April 1991. In comparison, the model matched the vertical gradients in most of the North Hollywood cluster wells. For example, the model was able to match gradients prior to April 1991 among all three zones (Upper, L1 Lower, and Lower) at NH-C01, which is located approximately 5,000 feet to the east of NH-C05. At NH-C03, which is located approximately 7,000 feet to the southeast of NH-C05, gradients were matched by the model from the Upper Zone to the L1 Lower Zone.

In summary, the model simulations of vertical gradient directions between the Upper Zone and the L1 Lower Zone compared well with gradients from water-level measurements. In particular, gradients observed in all of the cluster wells in the central portion of the basin were matched by the model for layers 1 and 2. Although calibration was not focused on the vertical gradient directions within the Lower Zone, three cluster wells with available data (CS-C01, NH-C01, and NH-C04) were matched favorably for at least half of the year-long period. As mentioned previously, this part of the transient calibration was focussed towards matching vertical gradient directions. However, the simulated water levels at all of the cluster well nodes also matched measured water levels within the 20-foot calibration criteria set for the key well calibration.

## 6.6 SENSITIVITY ANALYSIS

A sensitivity analysis provides important information to the modeler during both the model development and application. A sensitivity analysis is one method to assess the model's uncertainty by analyzing the model's sensitivity to changes in input variables that are estimated from field data and then calibrated. For example, if the model is not sensitive to a particular parameter, then there is less certainty in the accuracy of that parameter value. In other words,

the model will produce similar results with differing input values, within a particular range, for the nonsensitive parameter. To improve the estimate of the nonsensitive parameters, additional field data and an improved conceptual model would be necessary.

After the preliminary calibration of the San Fernando Basin steady-state model, a sensitivity analysis was conducted to determine the sensitivity of the model results to the parameters that were adjusted during the calibration. The following parameters were included in the preliminary sensitivity analysis.

- Hydraulic conductivity of layer 1
- Transmissivity of layers 2, 3, and 4
- Vertical leakance between layers 1, 2, 3, and 4
- Anisotropy of layers 1, 2, 3, and 4

This preliminary sensitivity analysis helped guide the selection and modification of input parameters during the steady-state and transient calibrations that followed.

Numerous modifications to the steady-state parameters followed the preliminary calibration, including the Phase I changes that resulted from interpretation of the RI field data. Thus, after the final calibration, a more rigorous and final sensitivity analysis was conducted on both steady-state and transient parameters. The objectives and approach and the results of this sensitivity analysis are discussed below in Sections 6.6.1 and 6.6.2, respectively.

#### **6.6.1 Objectives and Approach**

The objective of this sensitivity analysis is twofold. The first objective is to assess the uncertainty in the model parameters. The second objective is to identify the model input parameters that have the most influence on model results. This identification is important to the selection of data for input to the model for simulations of future situations.

The parameters analyzed are listed in Table 6-9. Generally, a parameter was modified globally while all other conditions were held the same. The amount by which a parameter was increased or decreased depended on its effect on the model system as well as its relation to a range of expected values for an alluvial aquifer such as the San Fernando Basin aquifer. The parameter modifications and their results are described further in Section 6.6.2. All parameters were tested using the steady-state calibrated model except for the storage coefficients which were tested using a transient calibrated model.

As a means of comparison, the simulated heads in the 10 key wells for each steady-state run were compared to the measured heads reported for September 1982, the end of the steady-state year. Other results that were reviewed include the flows to and from the Los Angeles River and across the general-head boundary located at the southern end of the Los Angeles River Narrows. For the transient analysis, the cumulative change in storage over the 10-year period from 1981-82 to 1990-91 was also compared. For all runs, the discrepancy in the volumetric water balance also was compared as an indication of the overall acceptability of the solution. In the MODFLOW program, the water balance is calculated independently of the equation solution process and therefore provides independent evidence of a valid solution (McDonald and Harbaugh, 1988). These results are discussed in the following section.

### 6.6.2 Results

The results of the sensitivity analysis runs are provided in Table 6-9. As noted above, simulated heads were compared to measured heads for the steady-state year. For the transient sensitivity runs, the measured heads, net flow to the Los Angeles River, and the flow across the general-head boundary were compared to the simulated heads at the end of the fourth stress period which corresponds to the end of the 1981-82 water year. Both the average difference and the standard deviation in the difference are given in the table. The first entry in the table presents the steady-state results (except the 10-year change in storage which is from the transient results) of the final calibrated model as a baseline for comparison. The final calibrated model had an average difference from measured heads of 2.8 feet, with a standard deviation of 13.6 feet.

TABLE 6-9  
SUMMARY OF SENSITIVITY ANALYSIS RESULTS<sup>a</sup>  
(page 1 of 3)

Parameter <sup>b</sup>	Parameter Modification	DIFFERENCE FROM MEASURED HEAD <sup>c</sup> (feet)		GROUNDWATER FLOWS (acre-ft)				Comments
		Average	Standard Dev.	10-Year Change in Storage <sup>a</sup>	Net Flow to L.A. River <sup>d</sup>	General Head Boundary	Discrepancy in Water Balance	
Baseline	NA	2.8	13.6	-74,750	-1,588	314	-0.23%	Flow to river is 13,489 AF <sup>f</sup> flow from river is 15,077 AF
K1	×2	0.5	10.9	NA <sup>c</sup>	-1,937	364	0.00%	Nodes in rows 1 through 4 were not increased because of numerical instability. Large head change - sensitive.
	÷2	6.3	36.0	NA	-1,224	278	-0.57%	Heads generally increased - sensitive.
K2	×2	2.9	13.5	NA	-1,543	314	-0.27%	Nodes in rows 1 through 4 were not increased because of numerical stability problems. Very sensitive
	÷2	-1.6	24.8	NA	-1,413	314	-0.40%	Average heads at key wells decreased. Very sensitive.
T3	×2	2.6	11.1	NA	-1,156	314	-0.66%	Heads and flows did not change much.
	÷2	2.4	16.4	NA	-1,719	314	-0.10%	Heads and flows did not change much.
T4	×10	3.0	12.6	NA	-1,198	314	-0.62%	Heads and flows did not change much.
	÷10	2.7	13.7	NA	-1,658	314	-0.16%	Heads and flows did not change much.
Vcont 1	×5	7.2	12.9	NA	-2,396	41	0.69%	Increasing by a factor of 10 caused numerical instability. Very sensitive to a factor of 5.
	÷10	-25.6	27.3	NA	-1,368	314	-0.45%	Average heads decreased significantly. Very sensitive.
Vcont 2	×10	3.2	13.2	NA	-1,390	314	-0.50%	Heads and flows did not change much.
	÷10	2.5	14.4	NA	-1,504	314	-0.31%	Heads and flows did not change much.
Vcont 3	×10	2.9	13.6	NA	-1,543	314	-0.27%	Heads and flows did not change much.
	÷10	2.7	13.7	NA	-1,679	314	-0.14%	Heads and flows did not change much.
Specific Yield layer 1	×2	3.3	13.1	-62,280	-2,344	313	0.03%	Average heads increased slightly, storage change decreased significantly.
	÷2	3.1	12.2	-78,900	-1,312	314	0.07%	Average heads and storage changed only slightly.
Storage Coef. layer 2	×10	3.4	12.6	-73,850	-1,904	314	-0.08%	Average heads and storage changed only slightly.
	÷10	3.2	12.7	-74,060	-1,906	314	0.14%	Average heads and storage changed only slightly.

**TABLE 6-9**  
**SUMMARY OF SENSITIVITY ANALYSIS RESULTS <sup>a</sup>**  
 (page 2 of 3)

Parameter <sup>b</sup>	Parameter Modification	GROUNDWATER FLOWS (acre-ft)						Discrepancy in Water Balance	Comments
		DIFFERENCE FROM MEASURED HEAD <sup>c</sup> (feet)		10-Year Change in Storage <sup>a</sup>	Net Flow to L.A. River <sup>d</sup>	General Head Boundary	Discrepancy		
		Average	Standard Dev.						
Storage Coef. layer 3	×10	3.2	12.6	-73,070	-1,968	314	0.12%	Average heads and storage changed only slightly.	
	÷10	3.2	12.7	-74,200	-1,895	314	0.18%	Average heads and storage changed only slightly.	
Storage Coef. layer 4	×10	3.1	12.7	-72,730	-1,915	314	0.31%	Average heads and storage changed only slightly.	
	÷10	3.2	12.7	-74,100	-1,902	314	0.17%	Average heads and storage changed only slightly.	
Anisotropy 1	1	-6.4	14.4	NA	-5,011	313	-0.63%	Notable change in heads and flows. Very sensitive.	
	2	19.3	45.4	NA	6,268	33	0.23%	Large change in heads and flows. Very sensitive.	
	0.1	8.0	39.8	NA	-1,446	306	-0.37%	Change in heads, large standard dev. Very sensitive.	
Anisotropy 2	1	36.0	57.0	NA	6,751	48	0.79%	Large change in heads and flows. Very sensitive.	
	2	25.9	50.6	NA	6,490	48	1.06%	Large change in heads and flows. Very sensitive.	
	0.1	7.3	29.5	NA	-2,242	314	0.42%	Notable change in heads and river flow.	
Anisotropy 3	1	2.0	11.5	NA	-839	314	-0.98%	Notable change in heads and river flow.	
	2	-0.7	11.0	NA	-1,116	314	-0.78%	Notable change in heads and flows.	
	0.1	4.2	16.9	NA	-2,256	314	0.44%	Notable change in heads and river flow.	
Anisotropy 4	0.5	2.9	13.6	NA	-1,623	314	-0.19%	Not much change in heads and flows.	
	2	2.7	13.3	NA	-1,537	314	-0.28%	Not much change in heads and flows.	
Recharge	10%	9.3	14.2	NA	3,651	318	0.46%	Notable change in heads and river flow. Very sensitive.	
	-10%	-6.2	15.2	NA	-7,230	310	0.64%	Notable change in heads and river flow. Very sensitive.	
Hill & Mtn Runoff Rchg	×5	27.9	30.8	NA	12,583	367	0.52%	Notable change in heads and river flow. Very sensitive.	
Riverbed Conductance	×10	7.5	12.9	NA	-2,289	281	0.44%	Flow to river is 16,846 AF - flow from river is 19,135 AF	
	÷10	-8.2	19.0	NA	5,203	486	-7.79%	Flow to river is 9,666 AF - flow from river is 4,463 AF Balance discrepancy > 1%. Closure criteria increased from 0.05 to 0.20 feet.	

**TABLE 6-9**  
**SUMMARY OF SENSITIVITY ANALYSIS RESULTS <sup>a</sup>**  
 (page 3 of 3)

Parameter <sup>b</sup>	Modification	DIFFERENCE FROM		GROUNDWATER FLOWS (acre-ft)				Comments
		MEASURED HEAD <sup>c</sup> (feet)		10-Year	Net Flow	General	Discrepancy	
		Average	Standard Dev.	Change in Storage <sup>a</sup>	to L.A. River <sup>d</sup>	Head Boundary	in Water Balance	
Riverbed Conductance lined portion	0	10.1	36.2	NA	94	314	-2.41 %	Lined portion of river only. Change in heads and river flow. Large balance discrepancy, very sensitive. Flow to river is 6,743 AF - flow from river is 6,649 AF
General Head Boundary Conductance	×10 ÷10	2.9 2.9	13.6 13.6	NA NA	-2,468 -1,315	1,290 41	-0.23 % -2.30 %	Change in boundary flow only. Change in boundary flow, balance discrepancy > 1%.

<sup>a</sup> All results are reported for the 1981-82 steady-state period except the 10-year change in storage.

<sup>b</sup> K is hydraulic conductivity, T is transmissivity, Vcont is vertical conductance, Sy is specific yield, and Sf is storage coefficient.

<sup>c</sup> Heads measured in September 1982 at the key wells were used to calculate head difference; a negative difference indicates simulated water levels that are below measured levels.

<sup>d</sup> A negative flow to the river indicates net flow from the river to the aquifer.

<sup>e</sup> NA means Not Applicable because steady-state simulation assume no storage change.

<sup>f</sup> AF is acre-feet.



In general, the hydraulic heads simulated by the model were most sensitive to changes in the parameters listed below.

- Hydraulic conductivity of layer 1 (K1)
- Hydraulic conductivity of layer 2 (K2)
- Vertical conductance from layer 1 to layer 2 (Vcont 1)
- Anisotropy of layers 1 and 2
- Areal recharge
- Recharge from hill and mountain runoff
- Riverbed conductance

The model results were less sensitive to changes made to the following parameters.

- Transmissivity of layers 3 and 4 (T3, T4)
- Vertical conductance from layer 2 to layer 3 (Vcont 2)
- Vertical conductance from layer 3 to layer 4 (Vcont 3)
- Storage coefficients for layers 2, 3, and 4
- Anisotropy of layer 4
- General-head boundary conductance

Groundwater flows to the Los Angeles River and across the general head boundary were not affected by most of the changes made to the model parameters during the sensitivity analysis. However, the direction of anisotropy in layers 1, 2, and 3; areal recharge; hill and mountain recharge; and the riverbed conductance did have a significant impact on these flows. The conductance of the general-head boundary also had a significant effect on the total flow out of the basin at that boundary. The percentage change was large when the general-head boundary conductance changed, but the volume of flow remained small compared to the total outflow from the basin.

The model results were also somewhat sensitive to changes in the anisotropy of layer 3 and the specific yield of layer 1. The lists above are provided for general reference; the degree of sensitivity may vary depending on what model results are considered. To refine the calibration of the less sensitive parameters, additional field data should be used to increase the confidence in the calibrated values in site-specific areas.

The last item by which the sensitivity runs were compared is the discrepancy in the volumetric water balance. This discrepancy was less than one percent in all runs except four, indicating generally valid solutions. The few sensitivity runs that had larger discrepancies may be an indication of a problem with the solution convergence stability. The parameters that produced runs with discrepancies in the water balance greater than one percent are listed below.

- Anisotropy of layer 2 - reversed direction.
- Riverbed conductance - decreased by a factor of 10.
- Riverbed conductance - decreased to 0 for lined portion of river.
- General head boundary conductance - decreased by factor of 10.

Sections 6.6.2.1 through 6.6.2.7 describe the results of the model simulations with the parameter modifications noted above. These results are presented in Table 6-9. The sections are organized by parameter beginning with Section 6.6.2.1, Hydraulic Conductivity and Transmissivity, and ending with Section 6.6.2.7, General Head Boundary.

**6.6.2.1 Hydraulic Conductivity and Transmissivity.** The hydraulic conductivity values for layers 1 and 2 were modified by increasing and decreasing the model matrices by a factor of 2. In both layers, the model experienced numerical instability problems when the hydraulic conductivity in the northernmost nodes were multiplied by a factor of 2. However, when layer 1 hydraulic conductivity values were increased south of row 4 only, the model was stable and the average difference from the measured heads and the standard deviation were lower than the results of the final calibrated model. Additionally, contoured values of the steady-state deviation from initial conditions for this run were improved compared to the baseline results. The transient conditions were also simulated with this modification. The results indicated an improved match between simulated and measured heads in the key wells. However, this parameter change involved layer 1, for which few depth-specific field tests of transmissivity are available. The improvement achieved in matching observed water levels was small enough that the modification was not incorporated into the final version of the model. Instead, additional field-test data with which to further verify the values of hydraulic conductivity for layer 1 and thus improve the physical definition of the layer are recommended. Additional characterization

in the northern portion of the model area, which caused numerical stability problems for the sensitivity run, would also be beneficial before implementing large-scale parameter modifications. Decreasing the hydraulic conductivity of layer 1 by a factor of 2 caused no numerical stability problems and resulted in a larger average difference from measured heads than did many of the sensitivity runs.

For layer 2, the model was not as sensitive to a factor of 2 increase in hydraulic conductivity (south of row 4 only) as it was to a factor of 2 decrease in values. When hydraulic conductivity was increased, the average head difference was 2.9 feet with a standard deviation of 13.5 feet. In comparison, the average head difference was only -1.6 feet, while the standard deviation was higher than the baseline value at 24.8 feet for a decrease in hydraulic conductivity. These sensitivity analyses for layer 2 indicate that although the calibrated hydraulic conductivities for layer 2 are somewhat lower than field-data estimates, the field-data estimates are within the range of values that produce similar hydraulic heads in the model.

The model was not sensitive to the changes made to the transmissivity of layers 3 and 4. The transmissivity of layer 3 was increased and decreased by a factor of 2 with little effect (less than 0.5 feet) in the average head difference. The transmissivity of layer 4, from which the least amount of data was available, was increased and decreased by a factor of 10 with little change (less than 0.3 feet) from the baseline average head difference. Thus, transmissivities from individual field tests may vary considerably from the model values. Because little information was available during model development about the true depth of the valley fill and the lithologic characteristics of the deeper portions, the representation in the model of layers 3 and 4 should be recalibrated as more field data become available.

**6.6.2.2 Vertical Conductance.** Sensitivity to the vertical conductance values was tested by increasing and decreasing these values by a factor of 10. The conductance between layers 1 and 2 was the most sensitive to changes, and the model experienced stability problems when the conductance was increased. However, a stable run was accomplished by increasing the vertical conductivity between layers 1 and 2 by a factor of 5 instead, to which the model was

significantly sensitive. The average head difference increased by 4.4 feet and flows across the general-head boundary decreased to only 41 acre-feet compared to a baseline value of 314 acre-feet. Decreasing the vertical conductance between layers 1 and 2 affected the resulting heads even more, producing an average head difference of -25.6 feet (a negative value indicates an average head below measured heads), but did not change the flows at the general-head boundary. Changes to the vertical conductance between the remaining layers appeared to have little effect on the average head difference or the measured flows.

**6.6.2.3 Storage Coefficient.** The storage coefficient of layer 1, the specific yield, was increased and decreased by a factor of 2. In the final calibrated model this value averaged about 8 percent, thus an average range of specific-yield values of 4 to 16 percent was tested. As expected, the model storage was more sensitive to changes in specific yield in layer 1 than it was to changes in the storage coefficient values of the remaining layers, which are several orders of magnitude smaller. The sensitivity was mainly indicated by the cumulative change in storage over the 10-year transient period; the change in storage increased by about 6 percent (more water was removed from the basin) when the specific yield was decreased, and total change decreased by about 17 percent when the specific yield was increased. Average head differences increased slightly (less than 0.5 feet) in both cases.

The storage coefficient values for layers 2, 3, and 4 were increased and decreased by a factor of 10 for the sensitivity analysis. These changes produced similar effects in the average head difference as did the changes to the specific yield. The 10-year change in storage remained within about 3 percent of the final calibrated-model value. Additional field data in the form of long-term aquifer tests would be desirable to enhance the calibration of storage coefficients.

**6.6.2.4 Anisotropy.** The model was somewhat sensitive to changes in the anisotropy of the transmissivity (hydraulic conductivity) values. For layers 1, 2, and 3, which have been assigned an anisotropy of 0.5 in the model, three cases were tested: no anisotropy (anisotropy = 1), reversed anisotropy (anisotropy = 2), and increased anisotropy (anisotropy = 0.1). The resulting hydraulic heads as well as flows to the Los Angeles River and at the general head

boundary were all impacted by these changes. No anisotropy in layer 1 produced an average head difference of -6.4 feet and a net flow from the Los Angeles River of 5,011 acre-feet (compared to the baseline flow from the river of 1,588). Reversing the direction of anisotropy resulted in an even greater average head difference of 19.3 feet, a net flow to the river of 6,268 acre-feet, and a greatly reduced underflow of only 33 acre-feet at the general-head boundary. Reducing the anisotropy also resulted in a larger average head difference (8.0 feet), compared to the baseline, but did not affect the river flow to the extent of the first two changes in anisotropy noted above. The effects of changes to the anisotropy of layer 2 were similar, with the smallest effect on the results from reducing the anisotropy.

The results of the sensitivity runs on the anisotropy of layer 3, however, were different from those described above. By both removing and reversing the anisotropy, the average head difference and the standard deviation decreased from the baseline values. Reducing the anisotropy, however, produced an increased average head difference and standard deviation. The effect on river and general-head boundary flows was not as great as the changes noted above. Layer 4, which has no anisotropy assigned to it in the model, was tested with anisotropies of 0.5 and 2. In both cases, the average head difference, standard deviation, and groundwater flows showed little sensitivity to the parameter. Generally the model results were sensitive to the occurrence and magnitude of anisotropy in layers 1, 2, and 3. Thus, the calibrated anisotropic characteristics in the Upper and Lower Zones of the aquifer are believed to be valid.

**6.6.2.5 Recharge.** Two components of recharge were tested in the sensitivity analysis; areal recharge from a combination of precipitation and delivered water return flow (simulated by the RECHARGE package), and recharge from hill and mountain runoff that is not diverted to the spreading grounds (simulated by the WELL package). First, areal recharge was increased and decreased by 10 percent. This 10 percent could represent a potential error in the estimates of rainfall recharge or of delivered water recharge or both. Next, the total quantity of hill and mountain runoff recharge was increased by a factor of 5. Sensitivity runs were not made with

decreased hill and mountain runoff because those values were already relatively low compared to other components of the water balance.

Compared to the other sensitivity runs, except those for anisotropy, the model was fairly sensitive to changes in recharge. When recharge was increased, the average head difference increased by 6.5 feet and net flow from the aquifer to the Los Angeles River became positive. On the other hand, when recharge was decreased, the average head difference increased by 9.0 feet to -6.2 feet, and 7,230 acre-feet of water flowed from the river to the aquifer.

The model was more sensitive to an increase in the hill and mountain runoff recharge. The average head difference increased to 27.9 feet and 12,583 acre-feet of groundwater flowed to the river. Flow across the general-head boundary increased slightly as a result of increased recharge.

These components of groundwater recharge are estimated elements of the water balance rather than measured ones. The sensitivity analysis indicates that changes in these estimates affect the model results, thus new data that may improve the estimates of some of the components of recharge would help to refine the model calibration. A better understanding of both the quantity and distribution of these recharge components would benefit future model updates.

**6.6.2.6 Riverbed Conductance.** The Los Angeles River was simulated in the model with the river package that allows flow to and from the river anywhere along its reach. The flow is controlled by the hydraulic head in layer 1, the stage in the river, and the riverbed conductance. Three sensitivity runs were conducted to test the effect of the riverbed conductance and the river itself. The calibrated values of riverbed conductance vary by several orders of magnitude along the river's length. While a node-by-node sensitivity analysis was not feasible, it was very beneficial to know the model's response to global changes in this parameter. The riverbed conductance was both increased and decreased by a factor of 10. Additionally, the riverbed conductance was set to 0 for all nodes representing the lined portions of the river, (the entire

river with the exception of the 7-mile unlined stretch through the Los Angeles River Narrows), simulating no connection between the river and the aquifer.

Increasing the riverbed conductance increased the average head difference by 4.7 feet and had a slight effect on the net flow to the river. Decreasing the riverbed conductance had a greater effect on the model results, increasing the average head difference to -8.2 feet and producing significantly reduced flows both to and from the river for a positive net flow to the river of 5,203 acre-feet. The individual flows to and from the river are noted in the comments column of Table 6-7. Flow out of the model area at the general head boundary also increased. Decreasing the riverbed conductance by a factor of 10 caused instabilities resulting in the use of a larger closure criteria for convergence (0.20 feet) and a larger water balance discrepancy.

A riverbed conductance of 0 for the lined portions of the river also had a notable effect on the model results. The average head difference increased to 10.1 feet with a large standard deviation of 36.2 feet. The net flow to the river was positive at 5,522 acre-feet, but had low flows to and from the river compared to the baseline values.

The model was very sensitive to the riverbed conductance which controls flow between the river and the aquifer. As indicated by its effect on the general-head boundary, the river's influence was more noticeable through the Los Angeles River Narrows as expected. Because this parameter is adjustable on a node-by-node basis, future additional groundwater-level and stream-flow data at various points along the river would be valuable in refining the calibration of heads and flows near the river.

**6.6.2.7 General-Head Boundary.** The general-head boundary, which is located at the southern end of the Los Angeles River Narrows, allows flow into or out of the model area. It is expected, because the volume of water that flows out of the basin at this boundary is believed to be only about 420 acre-feet, that changes in the conductance at the general-head boundary would have little effect on the overall model. As was predicted, this parameter had almost no effect on the hydraulic heads in the greater portion of the basin where the key wells are located.

Changes to the boundary conductance, however, did influence the flow at the boundary. Flow at the boundary increased to 1,290 acre-feet when the conductance was increased by a factor of 10, and decreased to 41 acre-feet when the conductance was decreased by a factor of 10.

## **6.7 LIMITATIONS AND UNCERTAINTIES**

As described in Section 6.5, the San Fernando Basin Model has been calibrated against steady-state and transient conditions representing a match to a 10-year hydrologic period during which the aquifer has been stressed by both natural and manmade stresses. The model is calibrated against areally distributed composite water levels (combined multiple-layer heads matched to observed data) as well as against fluctuations in individual monitoring wells. It is calibrated for magnitude and direction of horizontal gradients and direction of vertical gradients.

Certain limitations and uncertainties exist with the calibrated model. One of the primary limitations of the model is the accurate prediction of aquifer conditions in areas where the density and quality of available data was lacking. As shown in Sections 6.5.1, 6.5.2, and 6.5.3, the model predictions almost always matched the observed data within the criteria established, particularly in the eastern portion of the basin where the most data was available. Thus, confidence in the model predictions in this area is high for the period calibrated. For example, the model matched the observed data for steady-state conditions within most of the San Fernando Basin Study Area both in gradient and flow direction. However, in areas where there was a lack of observed data, in the Burbank Piedmont Slope area or in the western portion of the basin and at the edges of the basin, the confidence in model predictions is lower than elsewhere because there are uncertainties in the estimated conditions against which the model is calibrated. It should, however, be mentioned that the objectives of the model did not include calibration in those areas. Areas with minimal data were included in the model area to enable the model boundaries to be set to physical boundary features of the groundwater basin, thus incorporating regional flow and minimal assumptions about boundary conditions.



Another important limitation results from the spatial discretization grid and the length of time steps. This discretization is particularly important when comparing measurements from specific wells to model-simulated values. Not only is the numerical approximation from the model an average groundwater elevation for the entire cell area, it is also averaged for the entire cell thickness. The cluster-well measurements, on the other hand, are very depth specific based on screen length within a model layer. In some cases, measured water levels within the same aquifer zone varied considerably; Figures L-25 and L-28 in Appendix L show examples of this in the Upper and Lower zones. Only gradient directions, not magnitude, can be effectively matched for the RI data because details of flow behavior below the scale of discretization of layers are lost.

Likewise, limitations result from the selection of horizontal grid size. The model has a variable grid to allow finer grid density in the San Fernando Basin Study Area where more data were available and more accuracy was desired. The confidence in model predictions are higher in the fine-grid area (1,000-square-foot grid) than in coarser grid areas. For example, the grid size near well 4915A, where horizontal gradients are particularly steep, limits the accuracy of predicted water levels to about  $\pm 40$  feet because water levels are estimated to change about 80 feet or more across the cell area where the well is located. The model was successful in matching water levels at this well within about 30 to 40 feet.

Additional model limitations and uncertainties occur within the Crystal Springs Study Area at and immediately upgradient of the southern bend in the Los Angeles River. Complex structural geology made the calibration in this area difficult. Difficulty in identifying all the faults influencing the groundwater flow in the area was accentuated by the model's limitation in representing the faults within the 1,000-foot-wide cell. The model grid size was not an issue in other fault areas, such as Raymond and Verdugo faults, primarily because those were the only natural features that influenced the groundwater flow in a large area. In contrast, for example, the Benedict Canyon fault system is comprised of various faults located 2,000 to 3,000 feet apart, allowing only one to two grid cells to represent unrestricted groundwater flow within the

saturated alluvium. Site-specific modeling activities should include a denser grid pattern in this area to improve aquifer representation.

The calibration process of the model during RI field activities was invaluable to the understanding of the San Fernando Basin groundwater flow behavior. Numerous changes were made to the model from the initial conceptualization in order to either incorporate the observed physical features (e.g., layer thicknesses) or to match depth-specific water level data (e.g. incorporation of a possible fault zone immediately north of the Crystal Springs Study Area). Although some of these changes were made based on observed physical data, RI data was not always sufficient to define the characteristics of the change. For example, the aquifer zone representation (Section 3.0) was incorporated into the model; however, the interconnection between each zone, was established only by model calibration because of a lack of actual field data, such as those resulting from long-term aquifer tests. Similarly, the combination of the Upper and Middle zones incorporated into model layer 1 was calibrated against extensive depth-specific water level data, but without any real aquifer-test data available from those zones. The model-calibrated hydraulic conductivity and specific yield values for layer 1 should be field verified to assure that the estimates from the model are within the same order of magnitude as those obtained from the field. Although the model was calibrated against long-term (8 to 10 years) transient water level data, much of that data was not depth specific; and the depth-specific RI data was representative of only a short part of the transient period. As the water levels in the RI wells continue to be monitored, they will provide better depth-specific field data with which to verify and fine tune the San Fernando Basin model.

In summary, the numerical model provides a description of the groundwater system in approximate terms. With any model, certain limitations exist in applying data gathered at discrete locations to estimations over a large area. The extent of these limitations are further influenced by the vertical and horizontal grid selected and the amount of data available. For the San Fernando Basin model, the conceptual model provided a good basin-wide geologic and hydrogeologic framework upon which to design the model, and the grid was selected to maximize the use of the available data to produce the best results in the study area given the data

coverage. The combination of existing data and RI data was sufficient to characterize the hydrogeology on a regional scale, but uncertainty will still exist at the local scale. Consider that the model area covers approximately 104,200 acres of the alluvial fill which is represented by about 7,050 active nodes in four vertical layers at which the aquifer properties are assigned based on hydrogeologic characteristics generated from the RI (87 wells, supplemented by data from existing wells). Given these limitations, the model results indicate that the model provides a good approximation of the groundwater flow system and can be used simulate three-dimensional groundwater flow throughout the basin and to provide boundary conditions for site-specific models.

Finally, the future user of the model should clearly understand the objectives, calibration process, sensitivity, and limitations of the model as described above. Inappropriate use of the model could severely limit the future credibility of the model. For example, the model with the smallest grid size of 1,000 square feet was not intended to evaluate individual supply well pump-down tests (short-term or specific capacity tests), nor transport velocities beneath individual small potential contributors to groundwater contamination. Rather, the model was developed to define regional flow fields by incorporating regional physical features of the San Fernando Basin. Thus, to study small areas or features, site-specific models should be developed to study individual sites using the basin-wide model to define fluxes across model boundaries.

## **Attachment B**

### **Hydrogeologic Cross Sections & Hydrogeologic Fence Diagrams**

# Hydrogeologic Cross Sections

Table A-1 provides a summary of the fourteen cross sections prepared for the GSIS area that are included in Attachment B.

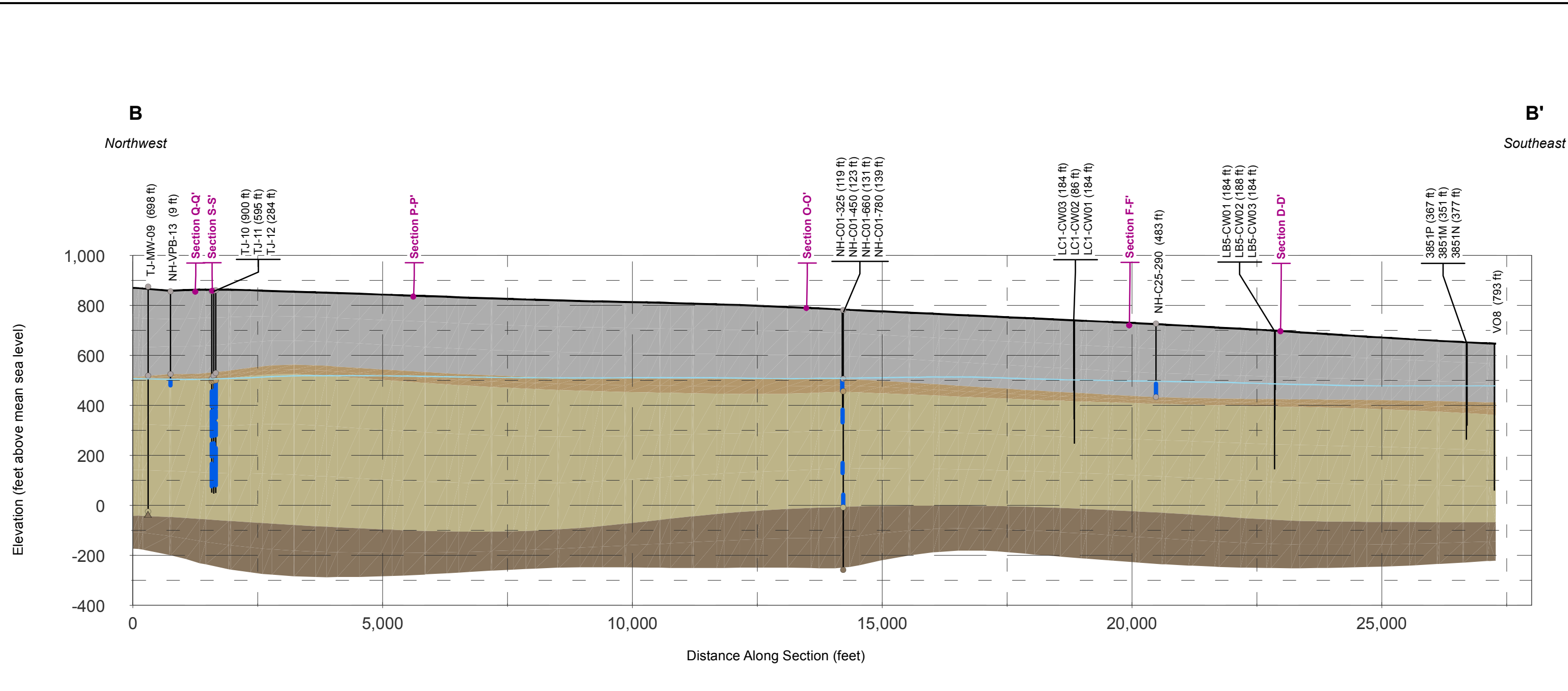
<b>Table A-1. Summary of GSIS Area Cross Sections</b>			
<b>Cross Section</b>	<b>SFB RI</b>	<b>LADWP GSIS</b>	<b>Description</b>
B - B'	X		NW-SE through Burbank Airport to Tujunga Wellfield
C - C'	X		NW-SE through Whitnall and Rinaldi-Toluca wellfields
D - D'	X		W-E across BOU to NH-C03 area
F - F'	X		SW-NE through Burbank Airport (BOU and NHOU) NH east and west wellfields
K - K'		X	NW-SE along eastern edge of GSIS area on SFB side of VFZ
L - L'		X	NW of B-B' through Tujunga wellfield toward Pacoima Spreading Grounds
M - M'		X	NW of C-C' through Tujunga wellfield toward Pacoima Spreading Grounds
N - N'		X	NE from LADWP NHOU Barcad wells through NH west wellfield toward NH-C06
O - O'		X	W-E from LADWP NHOU Barcad wells through RT wellfield to new MWH wells
P - P'		X	NE from LADWP NHOU Barcad wells through RT09 to Bradley landfill area
Q - Q'		X	SW-NE from proposed NHOU monitoring wells along TJ wellfield to VFZ
R - R'		X	SW-NW from new monitoring well TJ-MW08 to VFZ
S - S'		X	N-S from Price Pfister area to TJ-MW04 to TJ-12 to RT-08
T - T'		X	N-S from Price Pfister area south to NHOU Barcad monitoring wells

Note: See Plate 1 for section locations.









**Explanation**

**Hydrostratigraphic Units**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Geologic Contacts**

**Geophysical Logs**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Control points from borehole depth**

- Deep Zone

**Other Features**

- Borehole
- Screen Interval
- Water Table (2010-2013)
- Cross Section Intersection

**Notes**

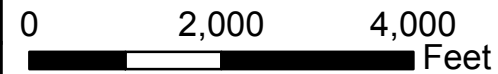
1. Distance from the section line is appended to well names.



Date: September 2013

Project: 144160.13

Horizontal Scale: 1 inch = 2,000 feet

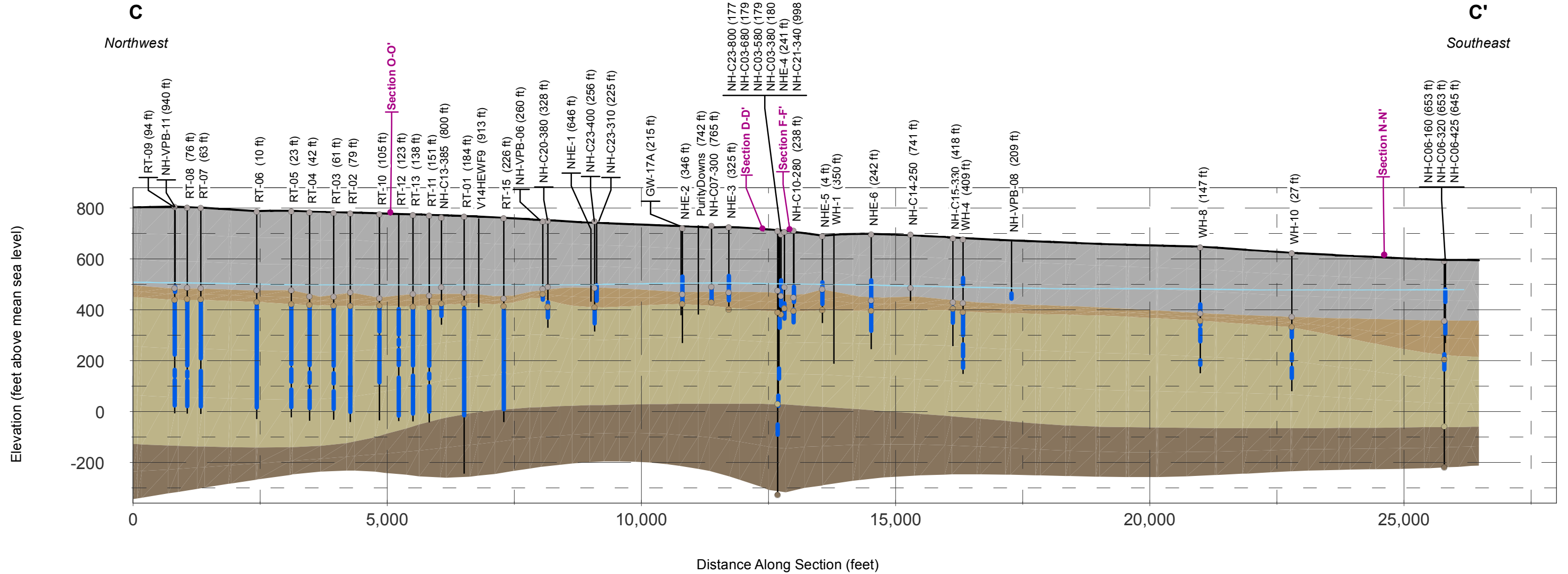


Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-2**  
 Geologic Cross Section B-B'





### Explanation

- |   |   |   |
|---|---|---|
| <b>Hydrostratigraphic Units</b>   | <b>Geologic Contacts</b>  | <b>Other Features</b>   |
| <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: grey; border: 1px solid black;"></span> Upper Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: tan; border: 1px solid black;"></span> Middle Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: olive; border: 1px solid black;"></span> Lower Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: darkbrown; border: 1px solid black;"></span> Deep Zone</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: grey; border: 1px solid black; border-radius: 50%;"></span> Upper Zone</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: tan; border: 1px solid black; border-radius: 50%;"></span> Middle Zone</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: olive; border: 1px solid black; border-radius: 50%;"></span> Lower Zone</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: darkbrown; border: 1px solid black; border-radius: 50%;"></span> Deep Zone</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 20px; border-bottom: 1px solid black;"></span> Borehole</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid blue;"></span> Screen Interval</li> <li><span style="display: inline-block; width: 20px; border-bottom: 1px solid lightblue;"></span> Water Table (2010-2013)</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: magenta; border: 1px solid black; border-radius: 50%;"></span> Cross Section Intersection</li> </ul> |

- Notes**  
1. Distance from the section line is appended to well names.



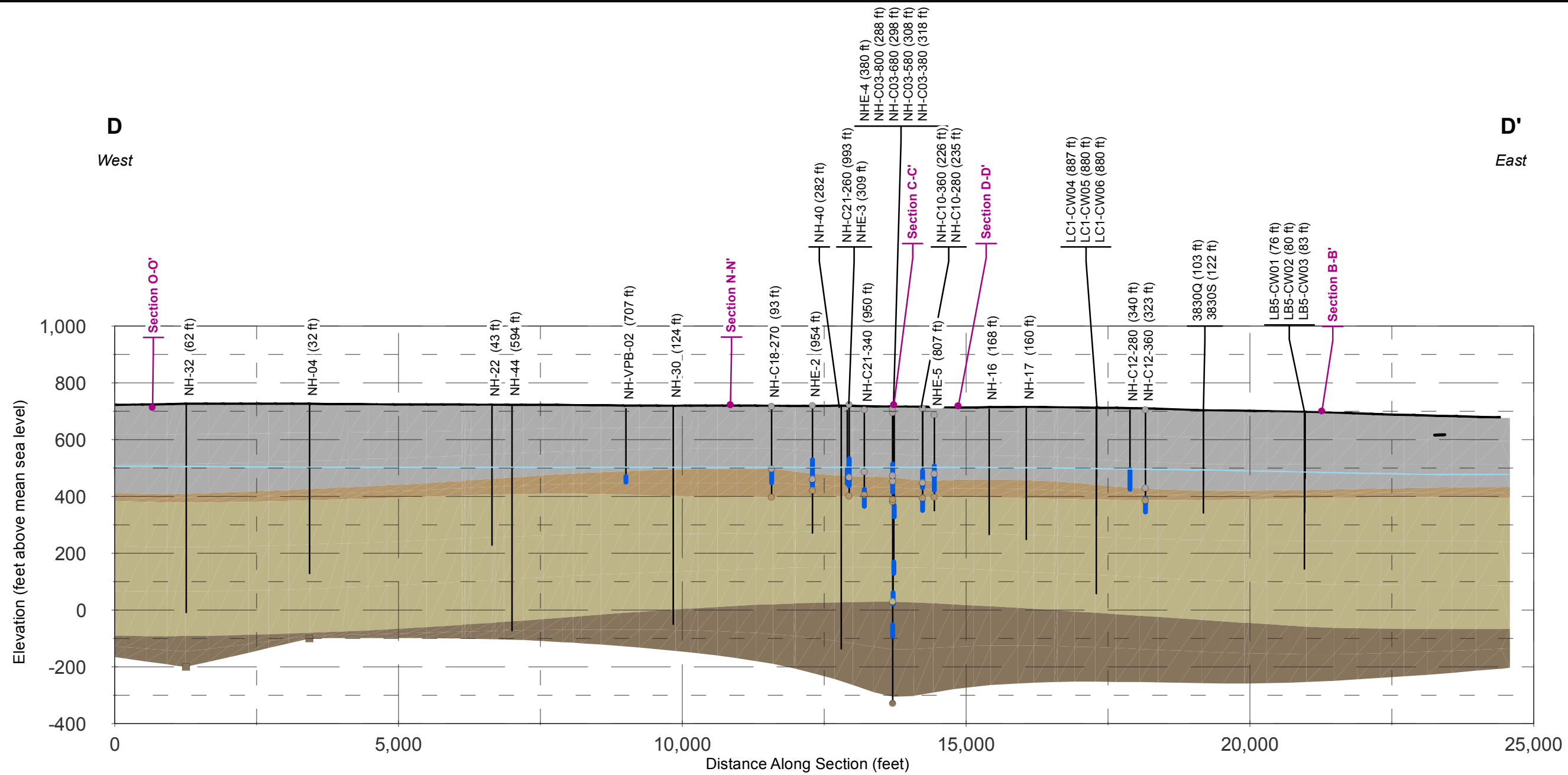
Date: September 2013

Project: 144160.13

Horizontal Scale: 1 inch = 2,000 feet  
 0 2,000 4,000 Feet  
 Vertical Exaggeration = 5x

San Fernando Valley,  
Los Angeles County,  
California

**FIGURE A-3**  
Geologic Cross Section from C-C'



**Explanation**

**Hydrostratigraphic Units**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Geologic Contacts**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Other Features**

- Borehole
- Screen Interval
- Water Table (2010-2013)
- Cross Section Intersection

**Control points from Report of Referee**

- Deep Zone

**Notes**

1. Distance from the section line is appended to well names.
2. Control points from Report of Referee (ROR) represent the minimum base of valley fill of the Deep Zone at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.



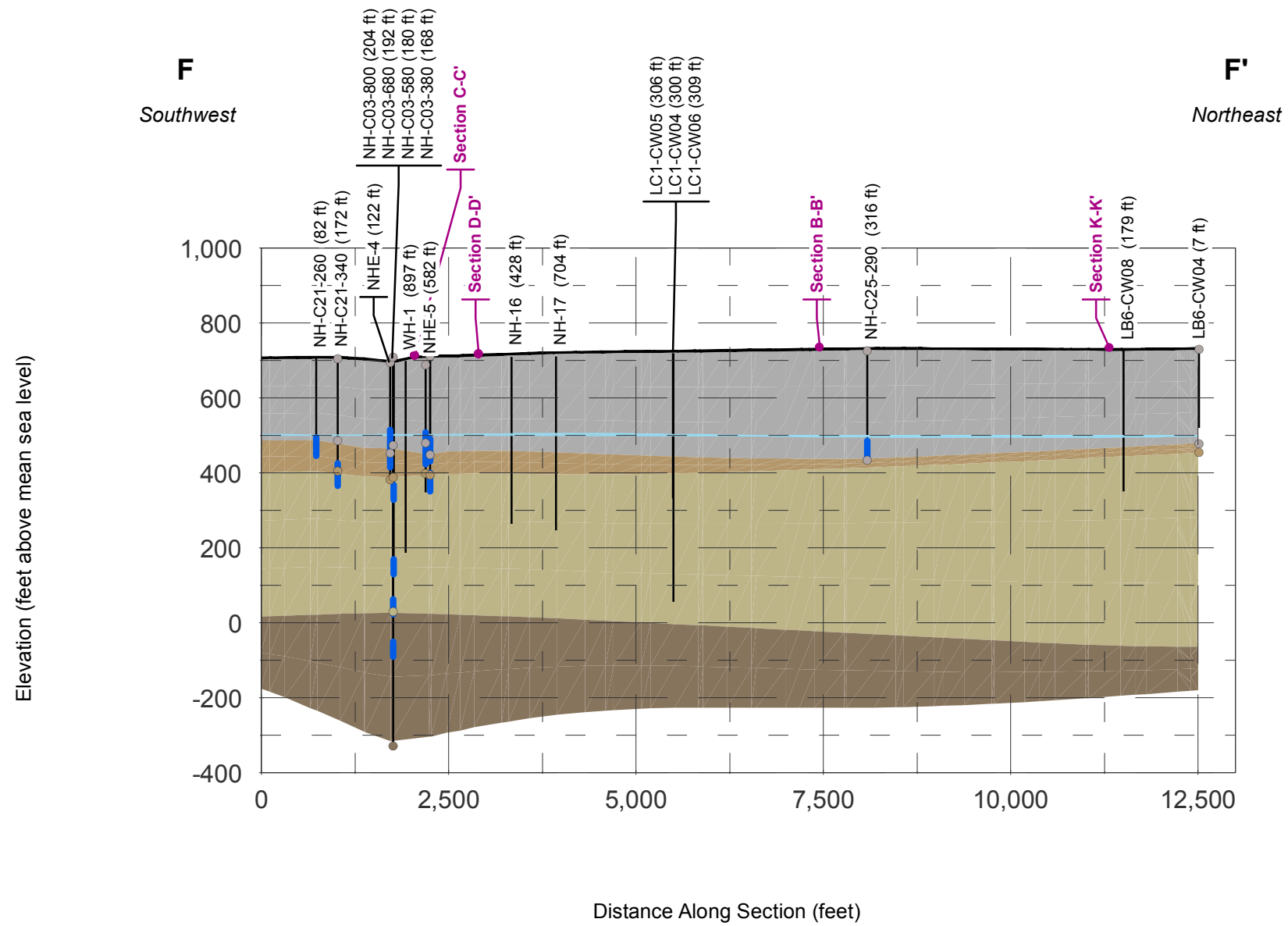
Date: September 2013

Project: 144160.13

Horizontal Scale: 1 inch = 2,000 feet  
 0      2,000      4,000  
 Feet  
 Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-4**  
 Geologic Cross Section from D-D'



**Explanation**

**Hydrostratigraphic Units**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Geologic Contacts**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Other Features**

- Borehole
- Screen Interval
- Water Table (2010-2013)
- Cross Section Intersection

**Notes**

1. Distance from the section line is appended to well names.



Date: September 2013

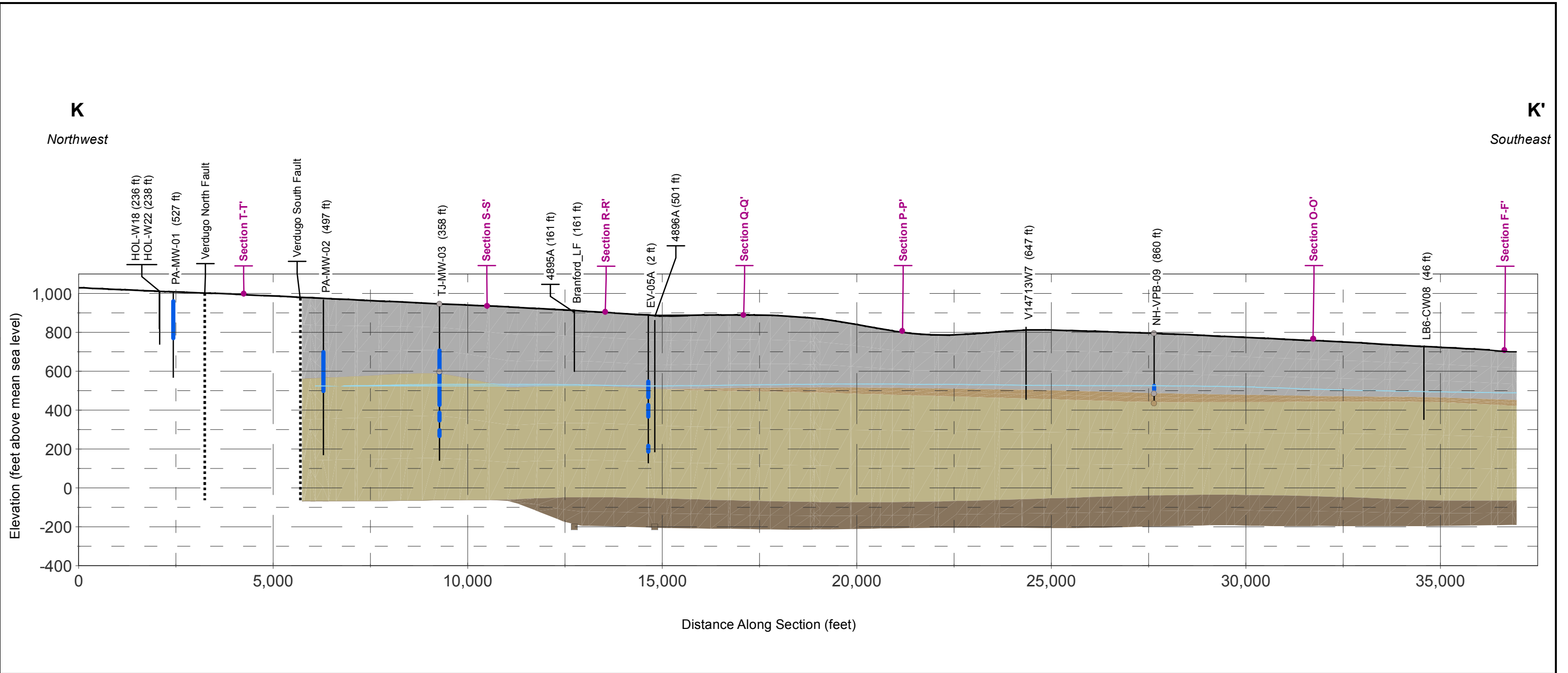
Project: 144160.13

Horizontal Scale: 1 inch = 2,000 feet  
 0      2,000      4,000  
 Feet  
 Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-5**  
**Geologic Cross Section from F-F'**

User Name: ibush  
 Date: 9/10/2013  
 Contract: 477866  
 Services: BC  
 LAX/LADWP/GIS  
 Shapefiles/GIS  
 Cross Sections/Line KX/SectionK\_SF\_V05c.mxd



**Explanation**

Hydrostratigraphic Units	Geologic Contacts	Control points from Report of Referee	Other Features
Upper Zone	Upper Zone	Deep Zone	Borehole
Middle Zone	Middle Zone		Screen Interval
Lower Zone	Lower Zone		Water Table (2010-2013)
Deep Zone	Deep Zone		Cross Section Intersection

- Notes**
1. Distance from the section line is appended to well names.
  2. Control points from the Report of Referee (ROR) represent the minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
  3. Geologic model does not extend north of the Verdugo fault. Ground surface and wells only are shown north of the fault.



Date: September 2013

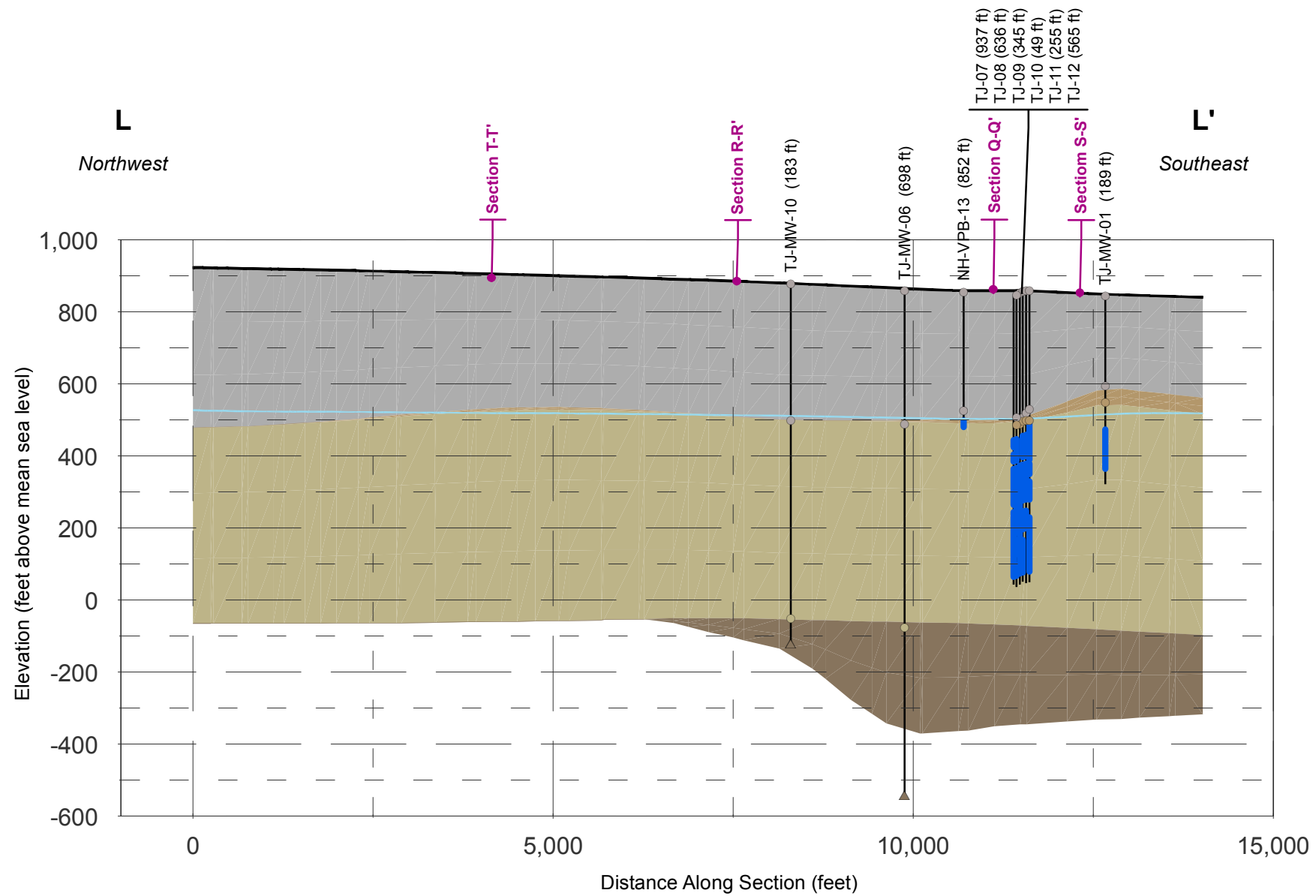
Project: 144160.13

Horizontal Scale: 1 inch = 2,500 feet  
 0 2,500 5,000 Feet  
 Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-6**  
 Geologic Cross Section K-K'

Document Path: O:\Hydrogeology Services\BC\_LAX\LA\DW\GIS\Contract\_47786\GIS\EV\Output\_Shapefiles\GIS\_Cross\_Sections\Line\_L\XSectionL\_SFV05c.mxd Date: 9/10/2013 User Name: lbush



**Explanation**

- |  |  |   |  |
|--|--|---|--|
| <b>Hydrostratigraphic Units</b>  | <b>Geologic Contacts</b>   | <b>Control points from borehole depth</b>   | <b>Other Features</b>  |
| <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #cccccc; border: 1px solid black;"></span> Upper Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #d2b48c; border: 1px solid black;"></span> Middle Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #a0a060; border: 1px solid black;"></span> Lower Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #654321; border: 1px solid black;"></span> Deep Zone</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #cccccc; border-radius: 50%;"></span> Upper Zone</li> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #d2b48c; border-radius: 50%;"></span> Middle Zone</li> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #a0a060; border-radius: 50%;"></span> Lower Zone</li> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #654321; border-radius: 50%;"></span> Deep Zone</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 0; height: 0; border-left: 5px solid transparent; border-right: 5px solid transparent; border-bottom: 10px solid black;"></span> Deep Zone</li> </ul> | <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; border-bottom: 1px solid black;"></span> Borehole</li> <li><span style="display: inline-block; width: 15px; height: 5px; background-color: #0070c0; border: 1px solid black;"></span> Screen Interval</li> <li><span style="display: inline-block; width: 15px; border-bottom: 1px solid #00a0e3;"></span> Water Table (2010-2013)</li> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #cc0066; border-radius: 50%;"></span> Cross Section Intersection</li> </ul> |

**Notes**  
1. Distance from the section line is appended to well names.



Date: September 2013  
Project: 144160.13

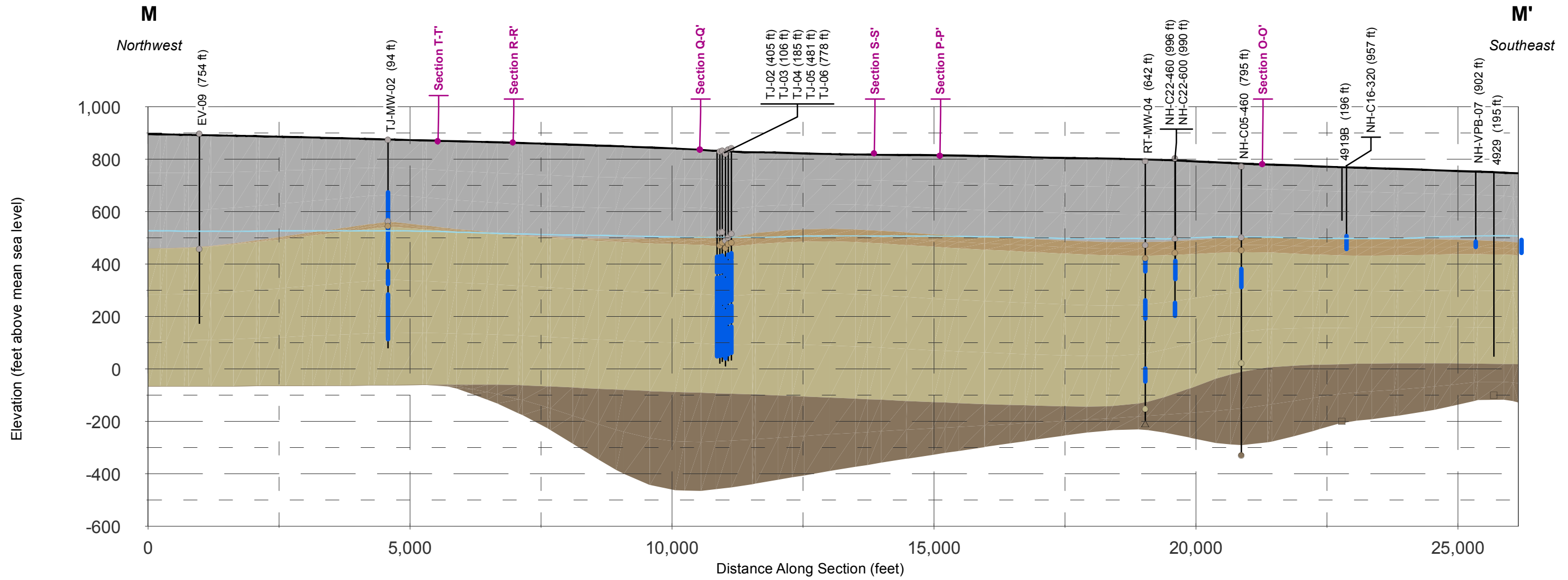
Horizontal Scale: 1 inch = 2,000 feet  
0 2,000 4,000 Feet  
Vertical Exaggeration = 5x

San Fernando Valley,  
Los Angeles County,  
California

**FIGURE A-7**  
Geologic Cross Section L-L'



User Name: ibush  
 Date: 9/10/2013  
 Document Path: O:\Hydrogeology Services\BC\_LAX\LA\DW\GIS\Contract\_47786\GIS\Output\_Shapefiles\GIS\_Cross\_Sections\Line\_MX\SectionM\_SFV05c.mxd



**Explanation**

**Hydrostratigraphic Units**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Geologic Contacts**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Control points from Report of Referee**

- Deep Zone
- Control points from borehole depth**
- Deep Zone

**Other Features**

- Borehole
- Screen Interval
- Water Table (2010-2013)
- Cross Section Intersection

**Notes**

1. Distance from the section line is appended to well names.
2. Control points from the Report of Referee are not necessarily associated with nearby boreholes.

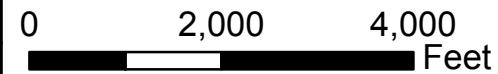
**Brown AND Caldwell**



Date: September 2013

Project: 144160.13

Horizontal Scale: 1 inch = 2,000 feet

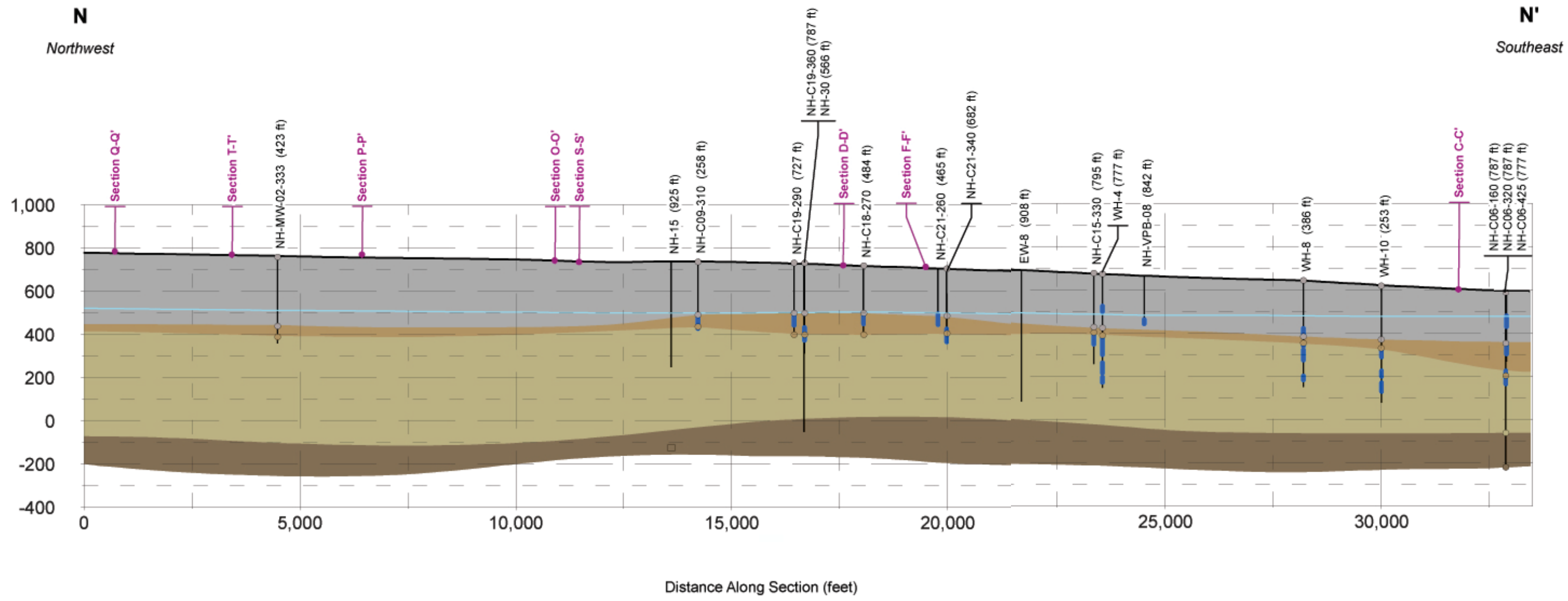


Vertical Exaggeration = 5x

San Fernando Valley,  
Los Angeles County,  
California

**FIGURE A-8**  
Geologic Cross Section M-M'

User Name: ibush  
 Date: 9/9/2013  
 Section Line N-N Section N-SFYV05c.mxd  
 Path: C:\Hydrology Services\BC\_LAX\LA\DWPGIS\Contrat\_47789\GIS\EV\Output\_Shapfiles\GSS\_Cross\_Section\Line N-N\Section N-SFYV05c.mxd



**Explanation**

- | Hydrostratigraphic Units   | Geologic Contacts  | Other Features  |
|--|--|---|
| <span style="display: inline-block; width: 15px; height: 15px; background-color: grey; border: 1px solid black;"></span> Upper Zone  | <span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; border-radius: 50%;"></span> Upper Zone  | <span style="display: inline-block; width: 20px; border-bottom: 1px solid black;"></span> Borehole  |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: tan; border: 1px solid black;"></span> Middle Zone  | <span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; border-radius: 50%;"></span> Middle Zone | <span style="display: inline-block; width: 20px; border-bottom: 2px solid blue;"></span> Screen Interval  |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: olive; border: 1px solid black;"></span> Lower Zone | <span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; border-radius: 50%;"></span> Lower Zone  | <span style="display: inline-block; width: 20px; border-bottom: 1px solid lightblue;"></span> Water Table (2010-2013)   |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: brown; border: 1px solid black;"></span> Deep Zone  | <span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; border-radius: 50%;"></span> Deep Zone   | <span style="display: inline-block; width: 10px; height: 10px; background-color: pink; border: 1px solid black; border-radius: 50%;"></span> Cross Section Intersection |

**Notes**  
 1. Distance from the section line is appended to well names.



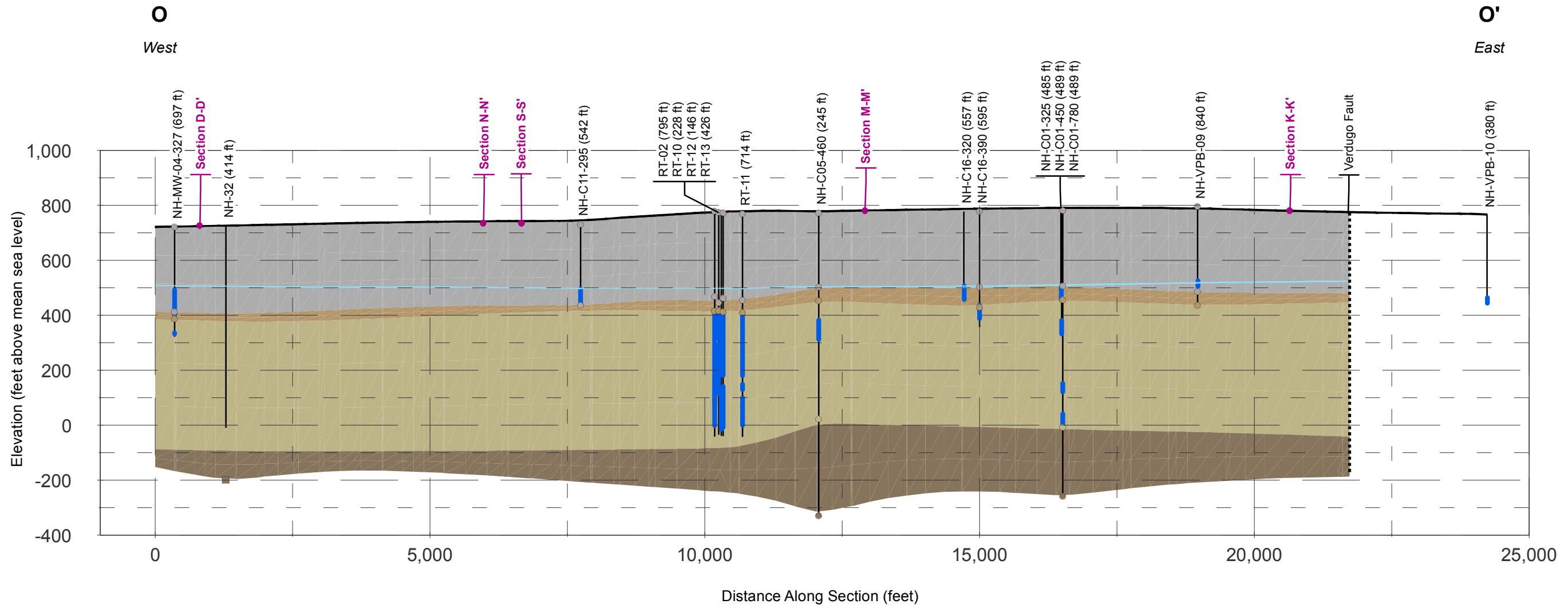
Date: September 2013  
 Project: 144160.13

Horizontal Scale: 1 inch = 2,500 feet  
 0 2,500 5,000 Feet  
 Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-8**  
 Geologic Cross Section N-N'





**Explanation**

- |  |  |   |  |
|--|--|---|--|
| <b>Hydrostratigraphic Units</b>  | <b>Geologic Contacts</b>   | <b>Control points from Report of Referee</b>                | <b>Other Features</b>  |
| <ul style="list-style-type: none"> <li>Upper Zone</li> <li>Middle Zone</li> <li>Lower Zone</li> <li>Deep Zone</li> </ul> | <ul style="list-style-type: none"> <li>Upper Zone</li> <li>Middle Zone</li> <li>Lower Zone</li> <li>Deep Zone</li> </ul> | <ul style="list-style-type: none"> <li>Deep Zone</li> </ul> | <ul style="list-style-type: none"> <li>Borehole</li> <li>Screen Interval</li> <li>Water Table (2010-2013)</li> <li>Cross Section Intersection</li> </ul> |

- Notes**
- Distance from the section line is appended to well names.
  - Control points from the Report of Referee (ROR) represent the minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
  - Geologic model does not extend north of the Verdugo fault. Ground surface and boreholes only are shown north of the fault.



Date: September 2013

Project: 144160.13

Horizontal Scale: 1 inch = 2,000 feet

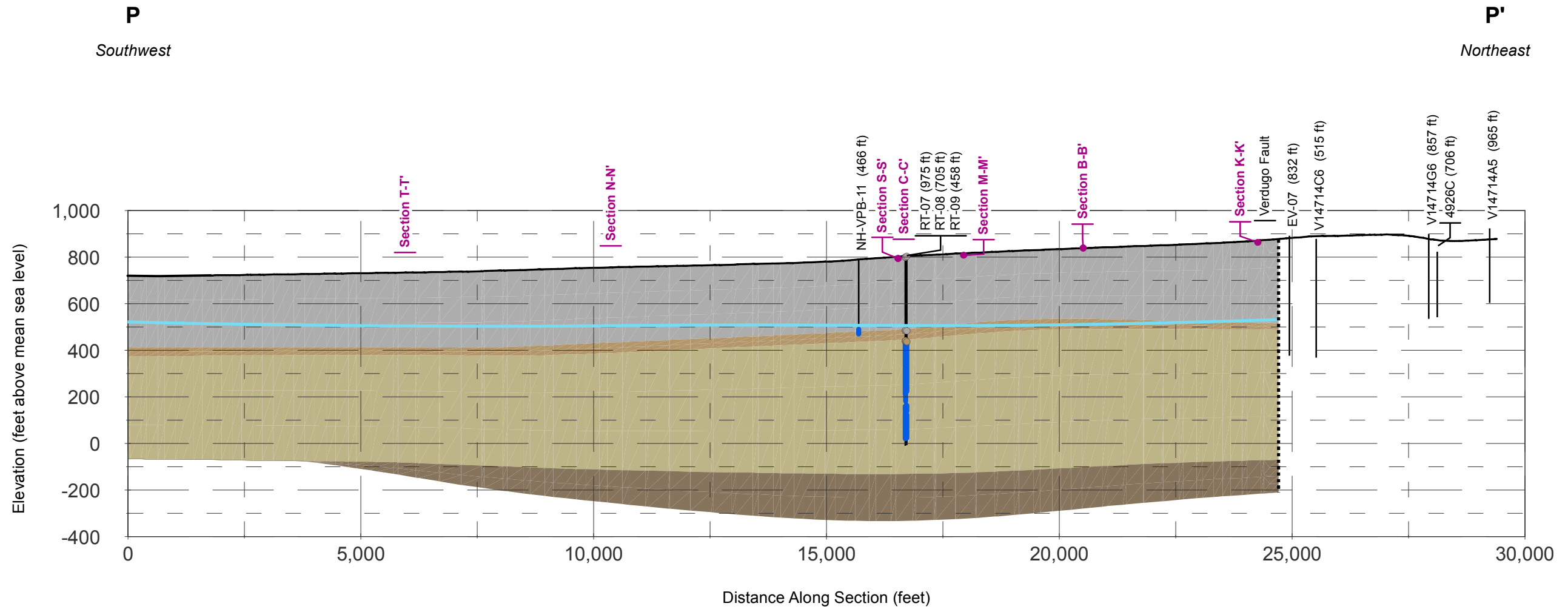
0      2,000      4,000  
 Feet

Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-9**  
 Geologic Cross Section O-O'

User Name: lbush Date: 9/10/2013 Section: P-SFW05c.mxd



**Explanation**

**Hydrostratigraphic Units**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Geologic Contacts**

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

**Other Features**

- Borehole
- Screen Interval
- Water Table (2010-2013)
- Cross Section Intersection

**Notes**

1. Distance from the section line is appended to well names.
2. Geologic model does not extend north of the Verdugo fault. Ground surface and boreholes north of the fault shown without geology.



Date: September 2013

Project: 144160.13

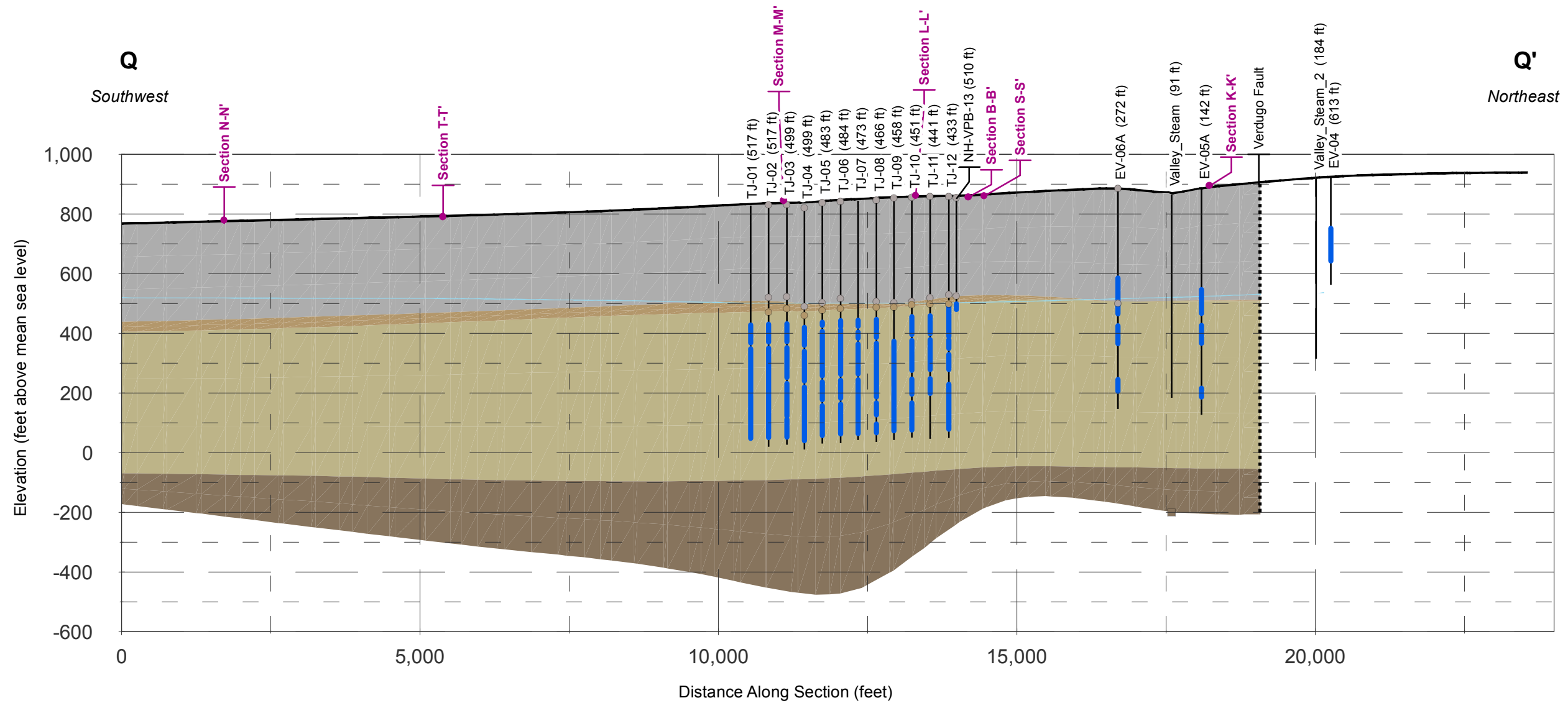
Horizontal Scale: 1 inch = 2,500 feet



Vertical Exaggeration = 5x

San Fernando Valley,  
Los Angeles County,  
California

**FIGURE A-10**  
Geologic Cross Section P-P'



### Explanation

Hydrostratigraphic Units	Geologic Contacts	Control points from Report of Referee	Other Features
<span style="display: inline-block; width: 15px; height: 15px; background-color: #cccccc; border: 1px solid black;"></span> Upper Zone	<span style="display: inline-block; width: 10px; height: 10px; background-color: #cccccc; border: 1px solid black;"></span> Upper Zone	<span style="display: inline-block; width: 10px; height: 10px; background-color: #808080; border: 1px solid black;"></span> Deep Zone	<span style="display: inline-block; width: 20px; border-bottom: 1px solid black;"></span> Borehole
<span style="display: inline-block; width: 15px; height: 15px; background-color: #d2b48c; border: 1px solid black;"></span> Middle Zone	<span style="display: inline-block; width: 10px; height: 10px; background-color: #d2b48c; border: 1px solid black;"></span> Middle Zone		<span style="display: inline-block; width: 20px; border-bottom: 2px solid blue;"></span> Screen Interval
<span style="display: inline-block; width: 15px; height: 15px; background-color: #a0a080; border: 1px solid black;"></span> Lower Zone	<span style="display: inline-block; width: 10px; height: 10px; background-color: #a0a080; border: 1px solid black;"></span> Lower Zone		<span style="display: inline-block; width: 20px; border-bottom: 1px solid lightblue;"></span> Water Table (2010-2013)
<span style="display: inline-block; width: 15px; height: 15px; background-color: #808080; border: 1px solid black;"></span> Deep Zone	<span style="display: inline-block; width: 10px; height: 10px; background-color: #808080; border: 1px solid black;"></span> Deep Zone		<span style="display: inline-block; width: 10px; height: 10px; background-color: #ff00ff; border: 1px solid black; border-radius: 50%;"></span> Cross Section Intersection

- Notes**
- Distance from the section line is appended to well names.
  - Control points from the Report of Referee (ROR) represent minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
  - Geologic model does not extend north of the Verdugo fault. Ground surface and boreholes north of the fault are shown without geology.



Date: September 2013

Project: 144160.13

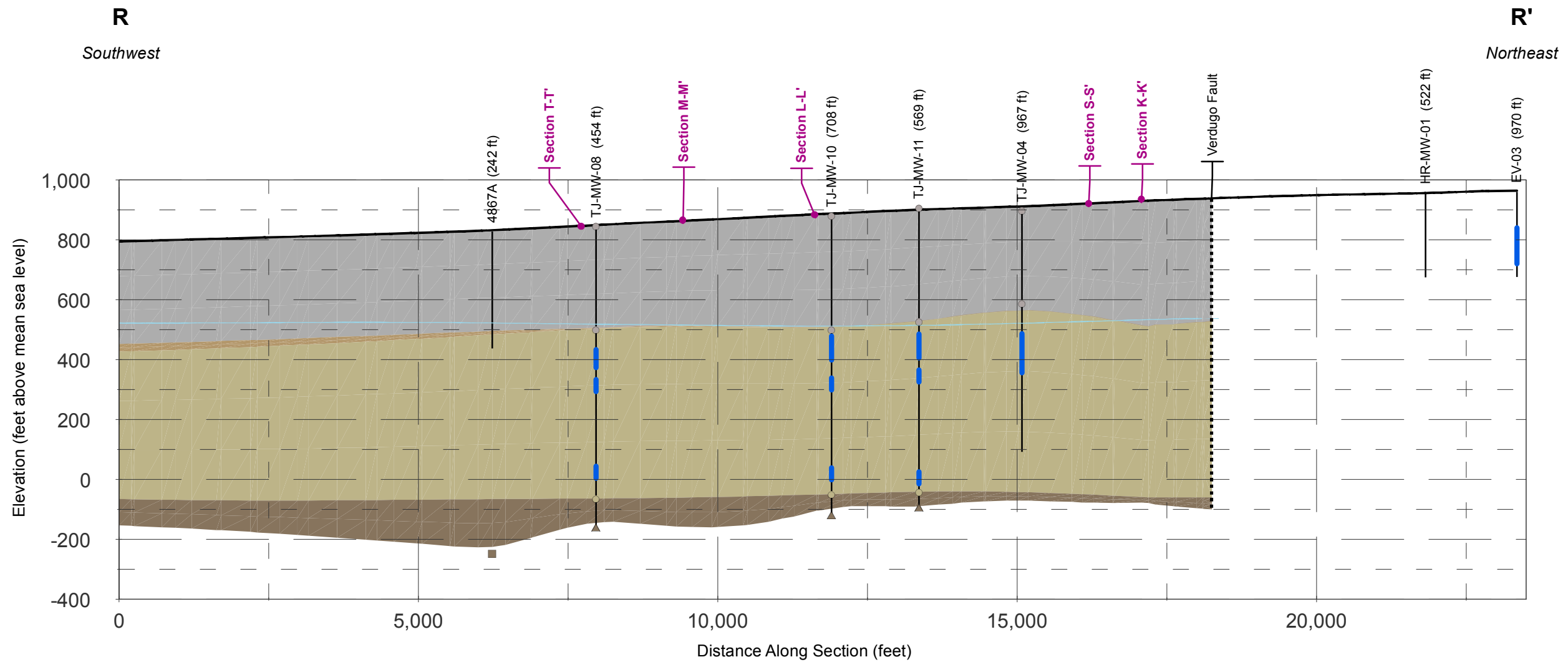
Horizontal Scale: 1 inch = 2,000 feet

0 2,000 4,000 Feet

Vertical Exaggeration = 5x

San Fernando Valley,  
Los Angeles County,  
California

**FIGURE A-11**  
Geologic Cross Section Q-Q'



### Explanation

Hydrostratigraphic Units	Geologic Contacts	Control points from Report of Referee	Other Features
<span style="display:inline-block; width:10px; height:10px; background-color:grey; border:1px solid black;"></span> Upper Zone	<span style="display:inline-block; width:5px; height:5px; background-color:grey; border:1px solid black;"></span> Upper Zone	<span style="display:inline-block; width:10px; height:10px; background-color:grey; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:20px; border-bottom:1px solid black;"></span> Borehole
<span style="display:inline-block; width:10px; height:10px; background-color:tan; border:1px solid black;"></span> Middle Zone	<span style="display:inline-block; width:5px; height:5px; background-color:tan; border:1px solid black;"></span> Middle Zone	<b>Control points from borehole depth</b>	<span style="display:inline-block; width:20px; border-bottom:2px solid blue;"></span> Screen Interval
<span style="display:inline-block; width:10px; height:10px; background-color:olive; border:1px solid black;"></span> Lower Zone	<span style="display:inline-block; width:5px; height:5px; background-color:olive; border:1px solid black;"></span> Lower Zone	<span style="display:inline-block; width:10px; height:10px; background-color:olive; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:20px; border-bottom:1px solid lightblue;"></span> Water Table (2010-2013)
<span style="display:inline-block; width:10px; height:10px; background-color:brown; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:5px; height:5px; background-color:brown; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:10px; height:10px; background-color:brown; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:10px; height:10px; background-color:purple; border:1px solid black;"></span> Cross Section Intersection

- Notes**
1. Distance from the section line is appended to well names.
  2. Control points from the Report of Referee (ROR) represent the minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
  3. Geologic model does not extend north of the Verdugo fault. Ground surface and boreholes only are shown north of the fault.

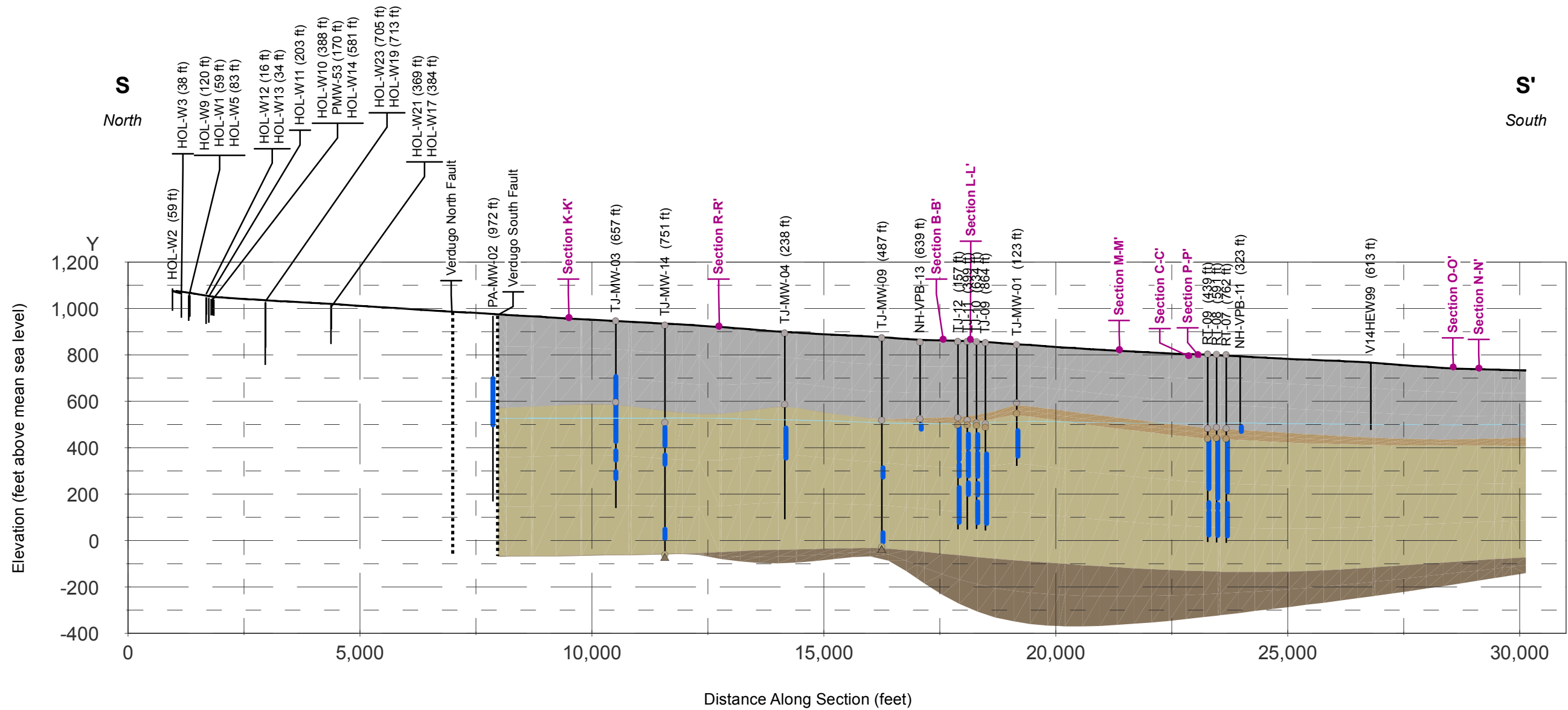


Date: September 2013  
 Project: 144160.13

Horizontal Scale: 1 inch = 2,000 feet  
 0 2,000 4,000 Feet  
 Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-12**  
 Geologic Cross Section R-R'



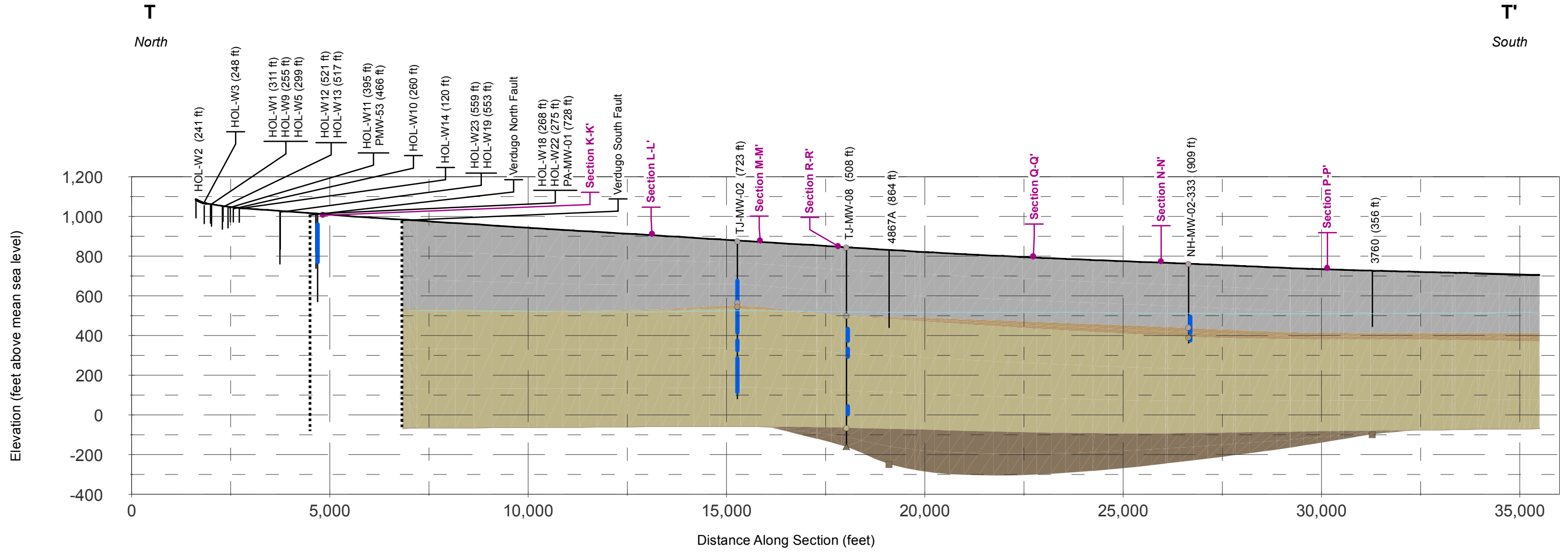
### Explanation

Hydrostratigraphic Units	Geologic Contacts	Control points from borehole depth	Other Features
<span style="display:inline-block; width:15px; height:15px; background-color:grey; border:1px solid black;"></span> Upper Zone	<span style="display:inline-block; width:10px; height:10px; background-color:grey; border:1px solid black;"></span> Upper Zone	<span style="display:inline-block; width:10px; height:10px; background-color:grey; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:20px; border-bottom:1px solid black;"></span> Borehole
<span style="display:inline-block; width:15px; height:15px; background-color:tan; border:1px solid black;"></span> Middle Zone	<span style="display:inline-block; width:10px; height:10px; background-color:tan; border:1px solid black;"></span> Middle Zone		<span style="display:inline-block; width:20px; border-bottom:3px solid blue;"></span> Screen Interval
<span style="display:inline-block; width:15px; height:15px; background-color:olive; border:1px solid black;"></span> Lower Zone	<span style="display:inline-block; width:10px; height:10px; background-color:olive; border:1px solid black;"></span> Lower Zone		<span style="display:inline-block; width:20px; border-bottom:1px solid lightblue;"></span> Water Table (2010-2013)
<span style="display:inline-block; width:15px; height:15px; background-color:brown; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:10px; height:10px; background-color:brown; border:1px solid black;"></span> Deep Zone		<span style="display:inline-block; width:10px; height:10px; background-color:purple; border:1px solid black;"></span> Cross Section Intersection

### Notes

1. Distance from the section line is appended to well names.
2. Geologic model does not extend north of the Verdugo South fault. Ground surface and boreholes north of the fault are shown without geology.





**Explanation**

Hydrostratigraphic Units	Geologic Contacts	Control points from Report of Referee	Other Features
<span style="display:inline-block; width:15px; height:15px; background-color:grey; border:1px solid black;"></span> Upper Zone	<span style="display:inline-block; width:10px; height:10px; background-color:grey; border:1px solid black;"></span> Upper Zone	<span style="display:inline-block; width:15px; height:15px; background-color:grey; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:20px; border-bottom:1px solid black;"></span> Borehole
<span style="display:inline-block; width:15px; height:15px; background-color:tan; border:1px solid black;"></span> Middle Zone	<span style="display:inline-block; width:10px; height:10px; background-color:tan; border:1px solid black;"></span> Middle Zone	<b>Control points from borehole depth</b>	<span style="display:inline-block; width:20px; border-bottom:2px solid blue;"></span> Screen Interval
<span style="display:inline-block; width:15px; height:15px; background-color:olive; border:1px solid black;"></span> Lower Zone	<span style="display:inline-block; width:10px; height:10px; background-color:olive; border:1px solid black;"></span> Lower Zone	<span style="display:inline-block; width:15px; height:15px; background-color:olive; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:20px; border-bottom:1px solid lightblue;"></span> Water Table (2010-2013)
<span style="display:inline-block; width:15px; height:15px; background-color:brown; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:10px; height:10px; background-color:brown; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:15px; height:15px; background-color:brown; border:1px solid black;"></span> Deep Zone	<span style="display:inline-block; width:10px; height:10px; background-color:purple; border-radius:50%;"></span> Cross Section Intersection

**Notes**

1. Distance from the section line is appended to well names.
2. Control points from the Report of Referee (ROR) represent the minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
3. Geologic model does not extend north of the Verdugo South Fault. Ground surface and boreholes north of the fault are shown without geology.



Date: September 2013

Project: 144160.13

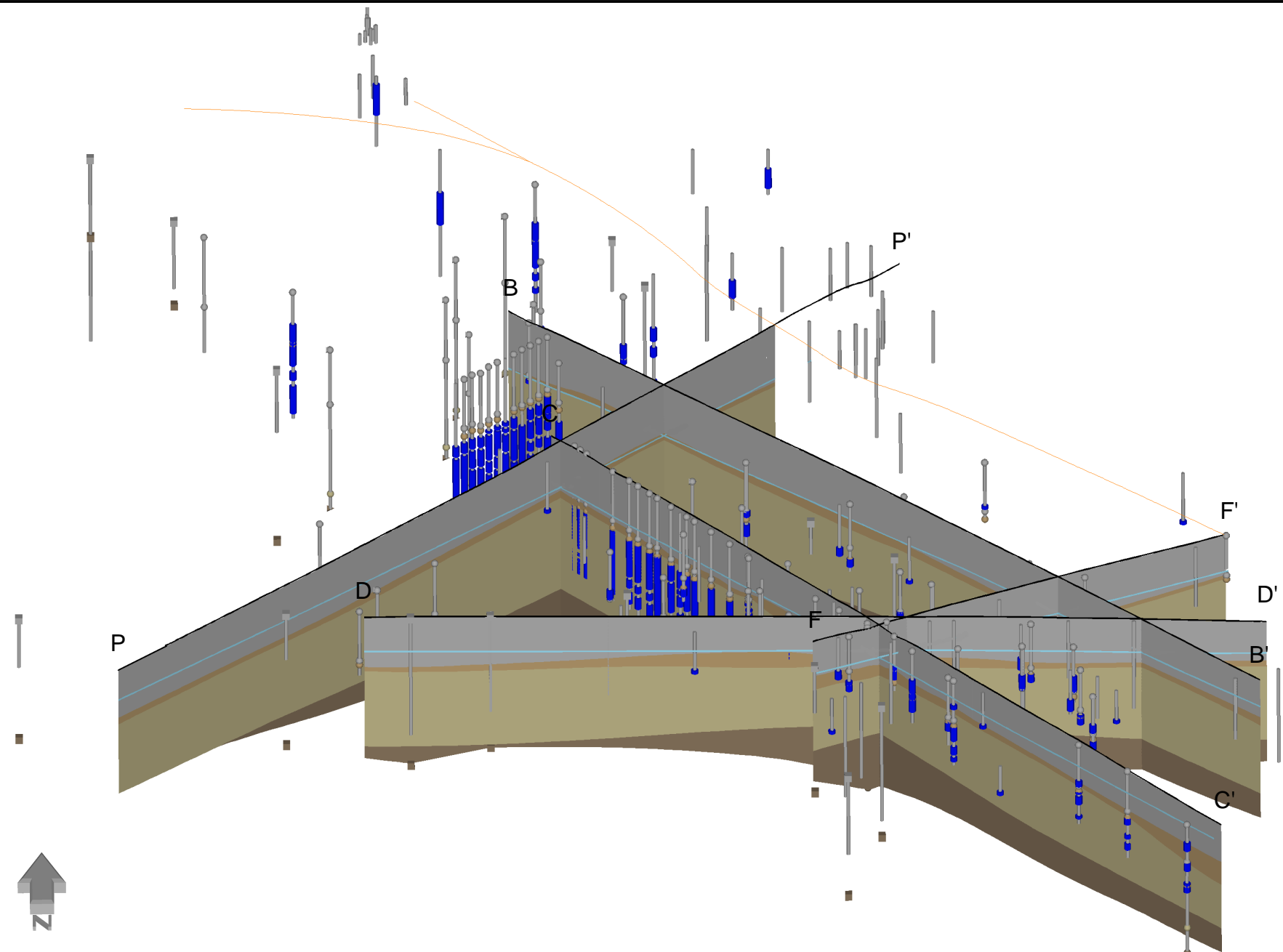
Horizontal Scale: 1 inch = 2,500 feet  
 0      2,500      5,000  
 Feet  
 Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-14**  
**Geologic Cross Section T-T'**

# Hydrogeologic Fence Diagrams





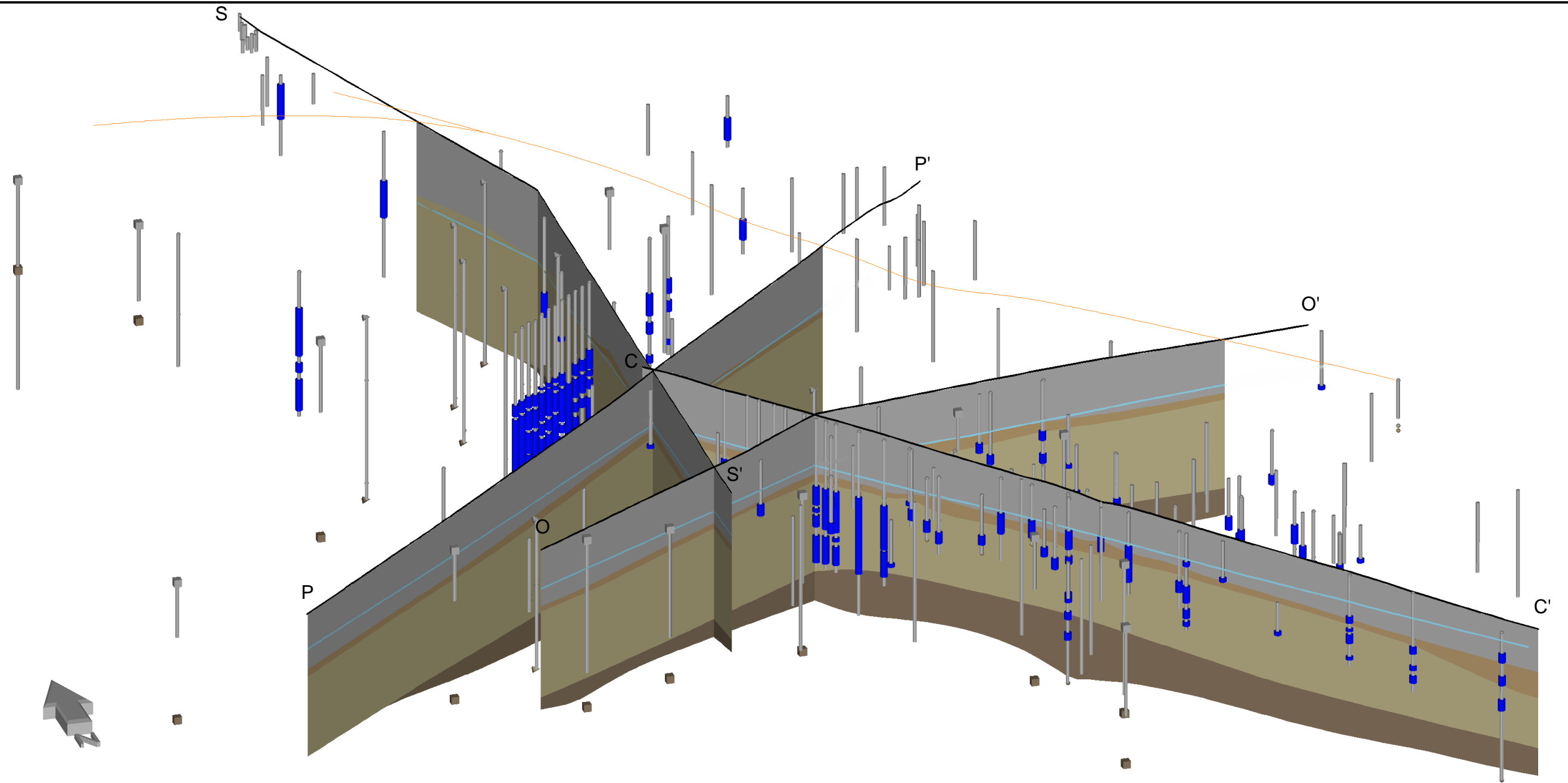
**Explanation**

Hydrostratigraphic Units	Geologic Contacts	Control points from Report of Referee	Other Features
<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></span> Upper Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #808080; border: 1px solid black; margin-right: 5px;"></span> Middle Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #666666; border: 1px solid black; margin-right: 5px;"></span> Lower Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #444444; border: 1px solid black; margin-right: 5px;"></span> Deep Zone</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 0; height: 0; border-left: 5px solid transparent; border-right: 5px solid transparent; border-bottom: 10px solid black; margin-right: 5px;"></span> Upper Zone</li> <li><span style="display: inline-block; width: 0; height: 0; border-left: 5px solid transparent; border-right: 5px solid transparent; border-bottom: 10px solid black; margin-right: 5px;"></span> Middle Zone</li> <li><span style="display: inline-block; width: 0; height: 0; border-left: 5px solid transparent; border-right: 5px solid transparent; border-bottom: 10px solid black; margin-right: 5px;"></span> Lower Zone</li> <li><span style="display: inline-block; width: 0; height: 0; border-left: 5px solid transparent; border-right: 5px solid transparent; border-bottom: 10px solid black; margin-right: 5px;"></span> Deep Zone</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #808080; border: 1px solid black; margin-right: 5px;"></span> Deep Zone</li> <li><span style="display: inline-block; width: 0; height: 0; border-left: 5px solid transparent; border-right: 5px solid transparent; border-bottom: 10px solid black; margin-right: 5px;"></span> Control points from borehole depth</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #444444; border: 1px solid black; margin-right: 5px;"></span> Deep Zone</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid black; margin-right: 5px;"></span> Ground Surface</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid gray; margin-right: 5px;"></span> Borehole</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid blue; margin-right: 5px;"></span> Screen Interval</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid lightblue; margin-right: 5px;"></span> Water Table (2010-2013)</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid orange; margin-right: 5px;"></span> Verdugo Fault</li> </ul>

**Notes**

1. Distance from the section line is appended to well names.
2. Control points from the Report of Referee (ROR) represent the minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
3. Geologic model does not extend north of the Verdugo South Fault. Ground surface and boreholes north of the fault are shown without geology.

User Name: ibush  
 Date: 9/12/2013  
 Document Path: O:\Hydrogeology Services\BC\_LAX\LA\DW\GIS\Contract 47786\GIS\Output\Shapefiles\GIS\_Cross\_Sections\FenceSP\_SFV05c.mxd



### Explanation

#### Hydrostratigraphic Units

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

#### Geologic Contacts

- Upper Zone
- Middle Zone
- Lower Zone
- Deep Zone

#### Control points from Report of Referee

- Deep Zone
- Control points from borehole depth**
- Deep Zone

#### Other Features

- Ground Surface
- Borehole
- Screen Interval
- Water Table (2010-2013)
- Verdugo Fault

#### Notes

1. Distance from the section line is appended to well names.
2. Control points from the Report of Referee (ROR) represent the minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
3. Geologic model does not extend north of the Verdugo South Fault. Ground surface and boreholes north of the fault are shown without geology.

**Brown AND Caldwell**



Date: September 2013

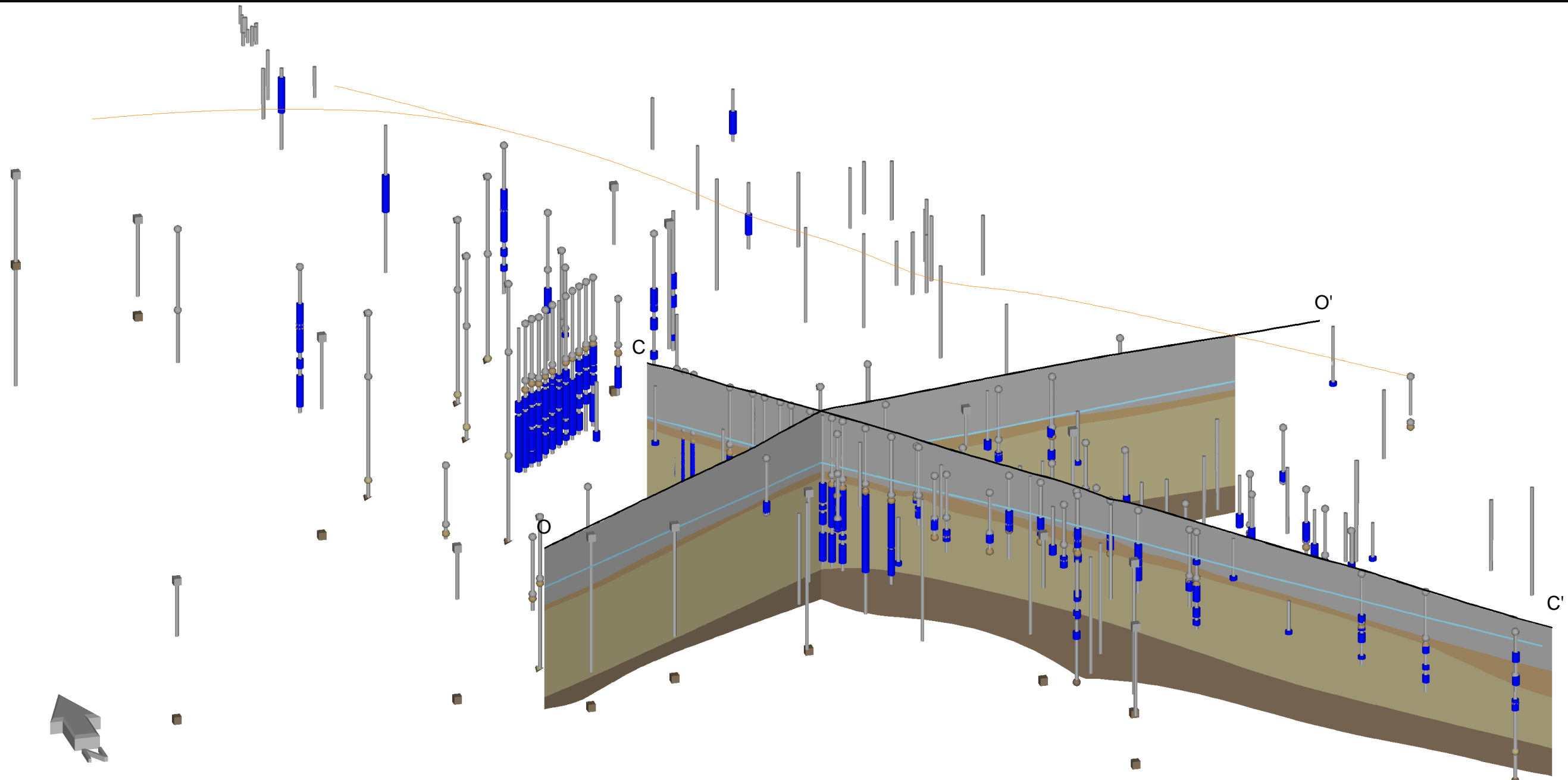
Project: 144160.13

Refer to individual sections in Attachment B for scales.

Vertical Exaggeration = 5x

San Fernando Valley,  
Los Angeles County,  
California

**FIGURE A-16**  
Fence Diagram of Cross Sections  
C-C', O-O', P-P', and S-S'



**Explanation**

Hydrostratigraphic Units	Geologic Contacts	Control points from Report of Referee	Other Features
<span style="display: inline-block; width: 15px; height: 10px; background-color: #cccccc; border: 1px solid black;"></span> Upper Zone	<span style="display: inline-block; width: 5px; height: 5px; background-color: #cccccc; border: 1px solid black; border-radius: 50%;"></span> Upper Zone	<span style="display: inline-block; width: 10px; height: 10px; background-color: #808080; border: 1px solid black;"></span> Deep Zone	<span style="display: inline-block; width: 20px; border-bottom: 1px solid black;"></span> Ground Surface
<span style="display: inline-block; width: 15px; height: 10px; background-color: #d2b48c; border: 1px solid black;"></span> Middle Zone	<span style="display: inline-block; width: 5px; height: 5px; background-color: #d2b48c; border: 1px solid black; border-radius: 50%;"></span> Middle Zone	<b>Control points from borehole depth</b>	<span style="display: inline-block; width: 20px; border-bottom: 1px solid grey;"></span> Borehole
<span style="display: inline-block; width: 15px; height: 10px; background-color: #a0a0a0; border: 1px solid black;"></span> Lower Zone	<span style="display: inline-block; width: 5px; height: 5px; background-color: #a0a0a0; border: 1px solid black; border-radius: 50%;"></span> Lower Zone	<span style="display: inline-block; width: 10px; height: 10px; background-color: #808080; border: 1px solid black; clip-path: polygon(50% 0%, 61% 35%, 98% 35%, 68% 57%, 98% 57%, 79% 91%, 50% 70%, 21% 91%, 29% 57%, 68% 57%);"></span> Deep Zone	<span style="display: inline-block; width: 20px; border-bottom: 2px solid blue;"></span> Screen Interval
<span style="display: inline-block; width: 15px; height: 10px; background-color: #654321; border: 1px solid black;"></span> Deep Zone	<span style="display: inline-block; width: 5px; height: 5px; background-color: #654321; border: 1px solid black; border-radius: 50%;"></span> Deep Zone		<span style="display: inline-block; width: 20px; border-bottom: 1px solid lightblue;"></span> Water Table (2010-2013)
			<span style="display: inline-block; width: 20px; border-bottom: 1px solid orange;"></span> Verdugo Fault

- Notes**
1. Distance from the section line is appended to well names.
  2. Control points from the Report of Referee (ROR) represent the minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
  3. Geologic model does not extend north of the Verdugo South Fault. Ground surface and boreholes north of the fault are shown without geology.

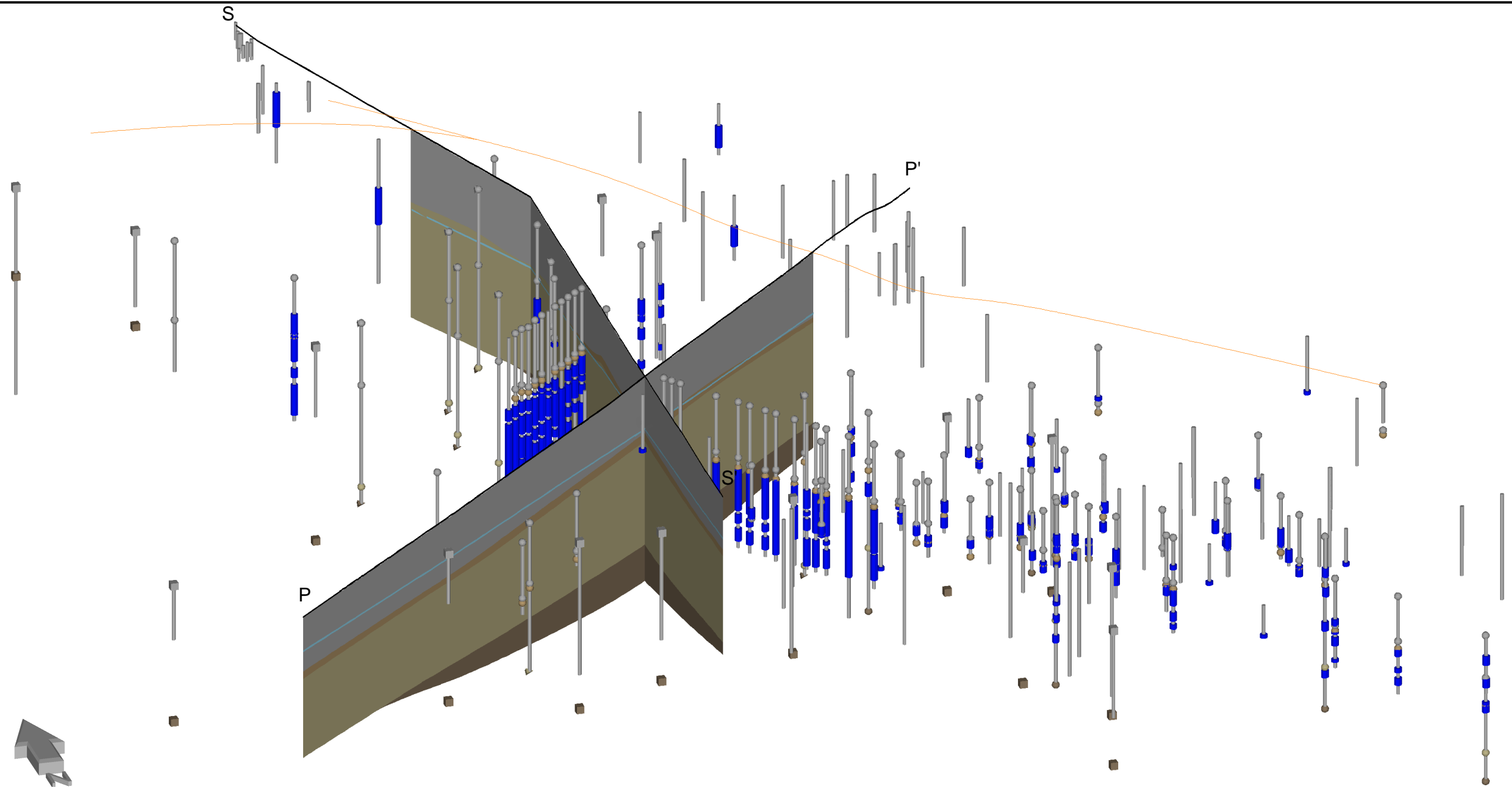


Date: September 2013  
 Project: 144160.13

Refer to individual sections in Attachment B for scales.  
 Vertical Exaggeration = 5x

San Fernando Valley,  
 Los Angeles County,  
 California

**FIGURE A-17**  
**Fence Diagram of Cross Sections**  
**C-C' and O-O'**



**Explanation**

Hydrostratigraphic Units	Geologic Contacts	Control points from Report of Referee	Other Features
<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></span> Upper Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #808080; border: 1px solid black; margin-right: 5px;"></span> Middle Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #666666; border: 1px solid black; margin-right: 5px;"></span> Lower Zone</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #444444; border: 1px solid black; margin-right: 5px;"></span> Deep Zone</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #cccccc; border: 1px solid black; margin-right: 5px;"></span> Upper Zone</li> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #808080; border: 1px solid black; margin-right: 5px;"></span> Middle Zone</li> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #666666; border: 1px solid black; margin-right: 5px;"></span> Lower Zone</li> <li><span style="display: inline-block; width: 5px; height: 5px; background-color: #444444; border: 1px solid black; margin-right: 5px;"></span> Deep Zone</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #808080; border: 1px solid black; margin-right: 5px;"></span> Deep Zone</li> <li><span style="display: inline-block; width: 10px; height: 10px; background-color: #444444; border: 1px solid black; margin-right: 5px;"></span> Deep Zone</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid black; margin-right: 5px;"></span> Ground Surface</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid gray; margin-right: 5px;"></span> Borehole</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid blue; margin-right: 5px;"></span> Screen Interval</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid lightblue; margin-right: 5px;"></span> Water Table (2010-2013)</li> <li><span style="display: inline-block; width: 20px; border-bottom: 2px solid orange; margin-right: 5px;"></span> Verdugo Fault</li> </ul>

**Notes**

1. Distance from the section line is appended to well names.
2. Control points from the Report of Referee (ROR) represent the minimum base of valley fill at that location as reported in that publication. Control points from the ROR are not necessarily associated with nearby boreholes.
3. Geologic model does not extend north of the Verdugo South Fault. Ground surface and boreholes north of the fault are shown without geology.



Date: September 2013

Project: 144160.13

Refer to individual sections in Attachment B for scales.

Vertical Exaggeration = 5x

San Fernando Valley,  
Los Angeles County,  
California

**FIGURE A-18**  
Fence Diagram of Cross Sections  
P-P' and S-S'

# **Attachment C**

**NHW, RT and TJ Wellfields Historical Water Quality Data**

(January 1, 2000 to April 30, 2016)

# San Fernando Basin Historical & Current Water Quality Data (January 1, 2000 to April 30, 2016)



Department of Water and Power

City of Los Angeles

June 2016

# Historical & Current Water Quality Data from January 1, 2000 to April 30, 2016

## Well Fields

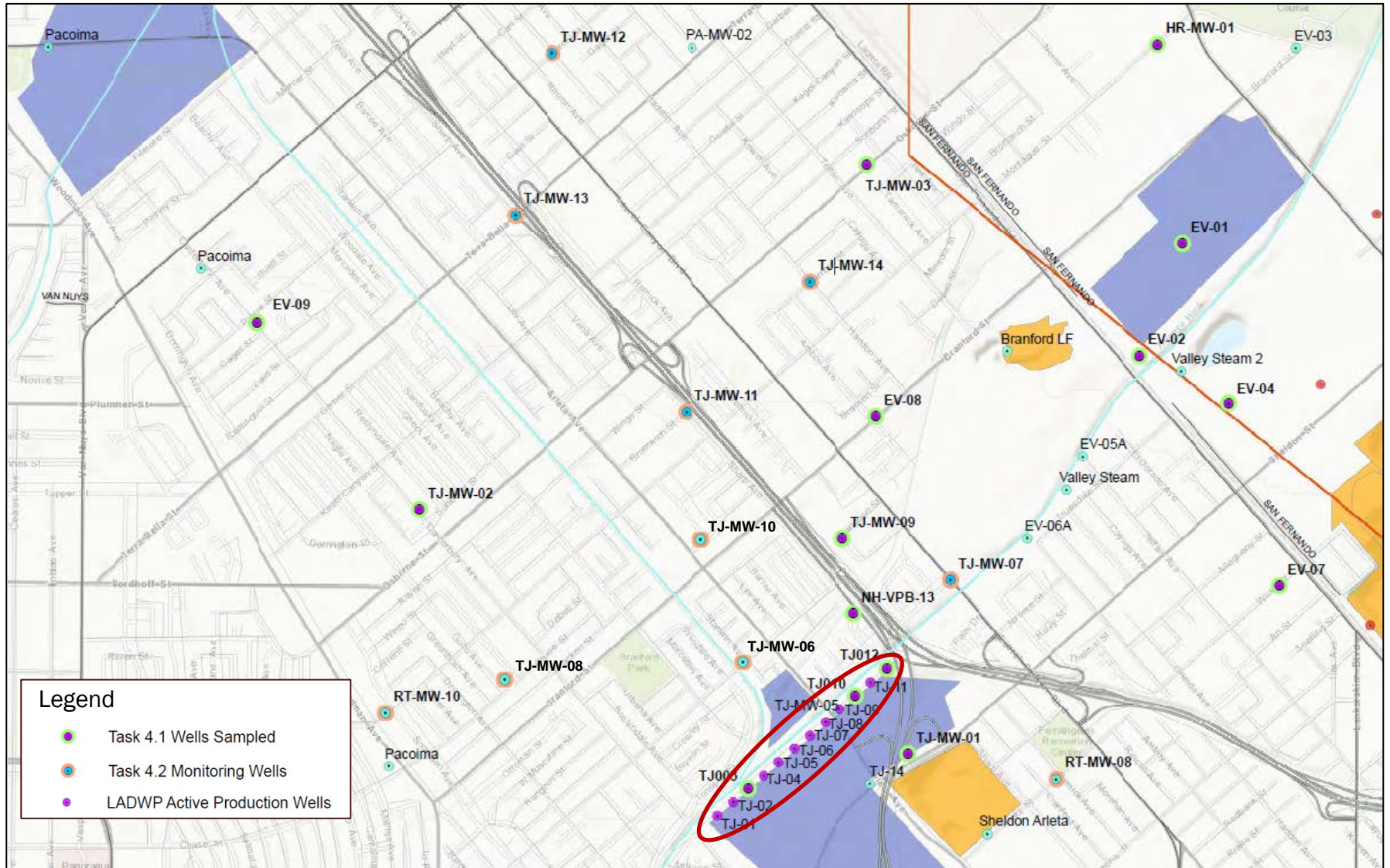
- Tujunga
- Rinaldi Toluca
- North Hollywood West

## Well Field Data

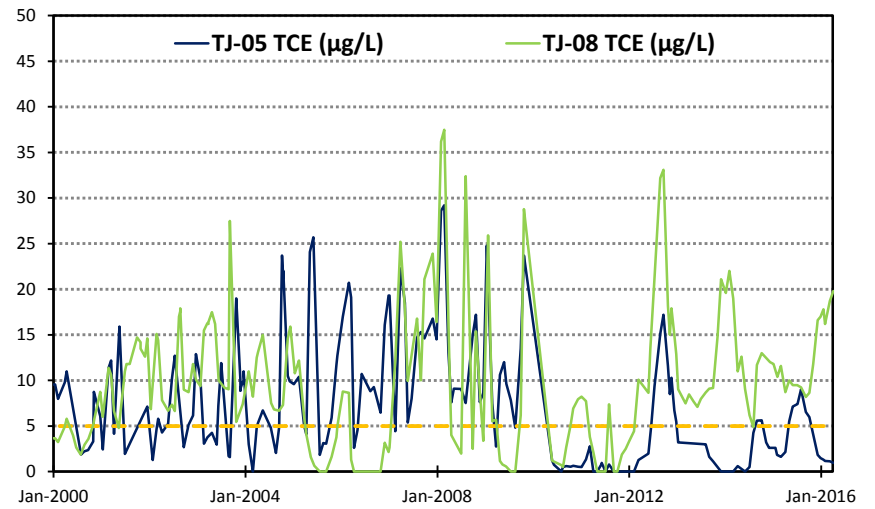
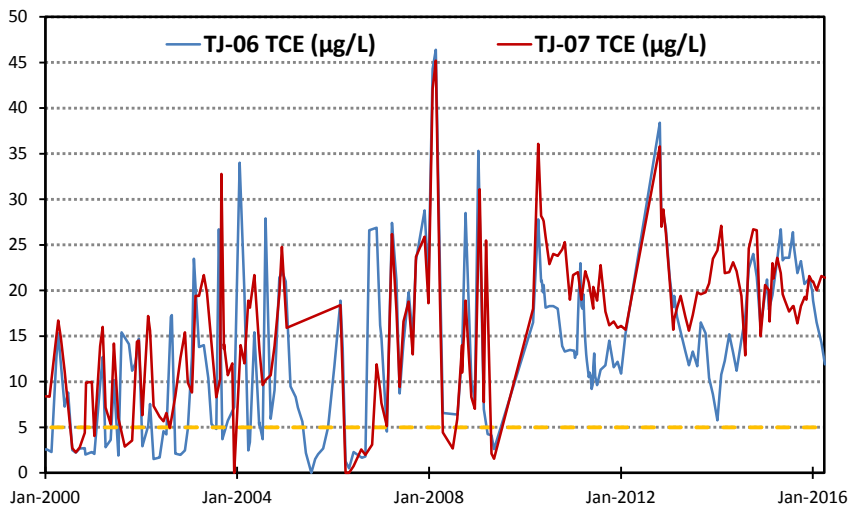
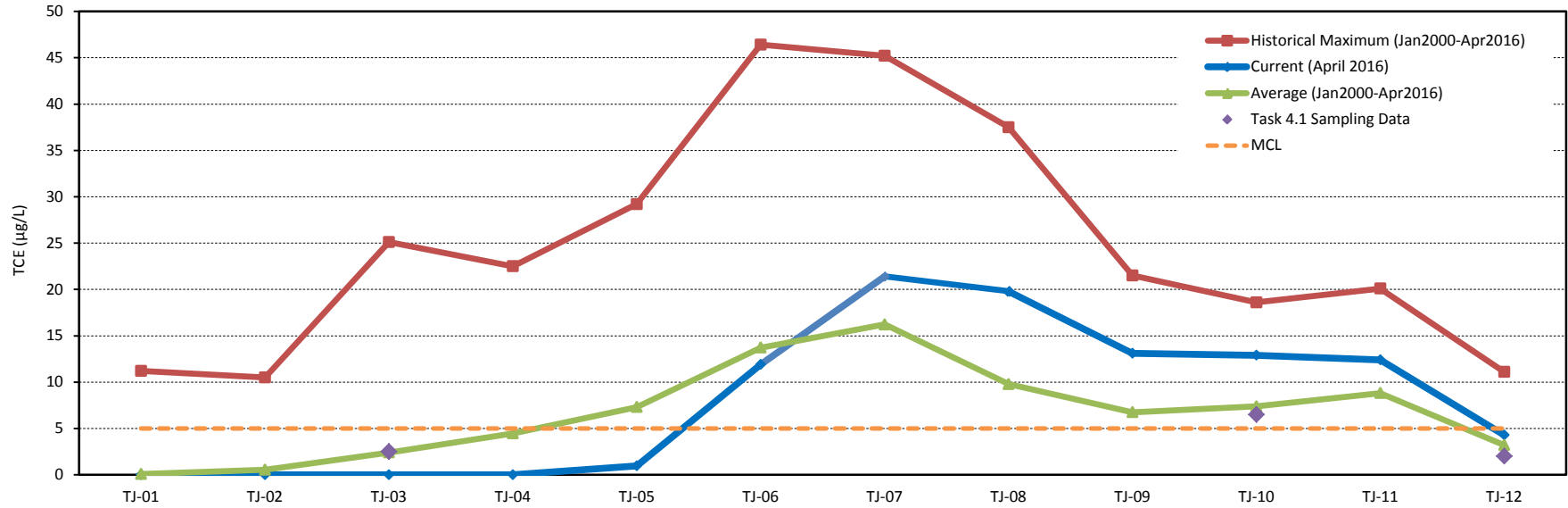
- 17 Chemical Constituents
  - TCE
  - PCE
  - 1,1-DCE
  - 1,2,3-TCP
  - MTBE
  - Carbon Tetrachloride
  - Hexavalent Chromium
  - Total Chromium
  - Perchlorate
  - NDMA
  - 1,4-Dioxane
  - Nitrate
  - TDS
  - Iron
  - Manganese
  - Trichlorofluoromethane (Freon 11)
  - Uranium
- Data Presentation:
  - Max, Average, and Current Concentrations
  - Highly Contaminated Wells: Concentration vs. Time



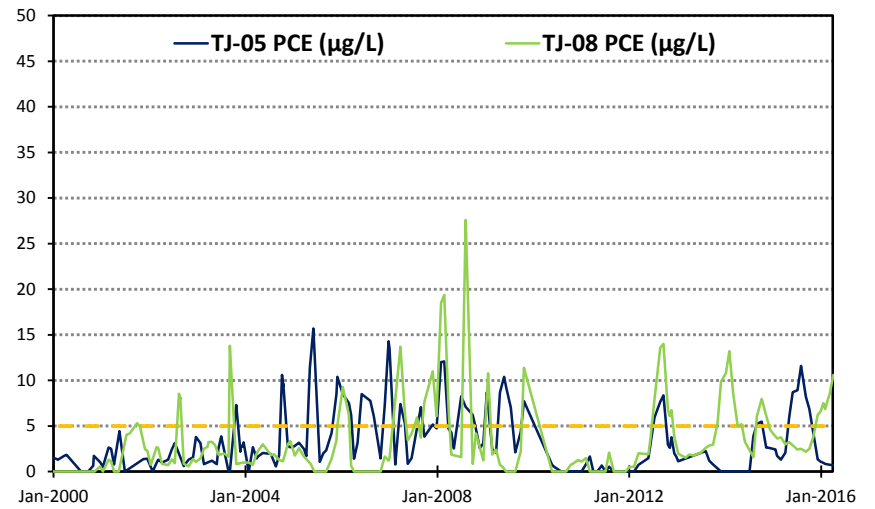
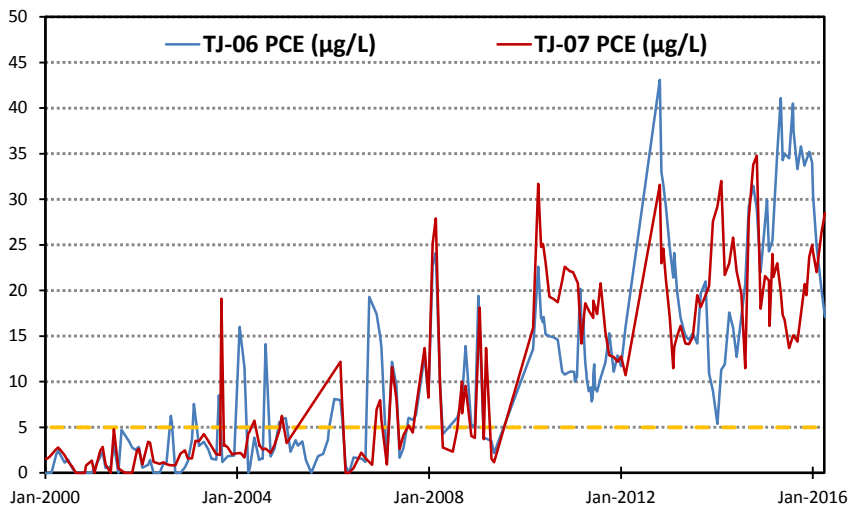
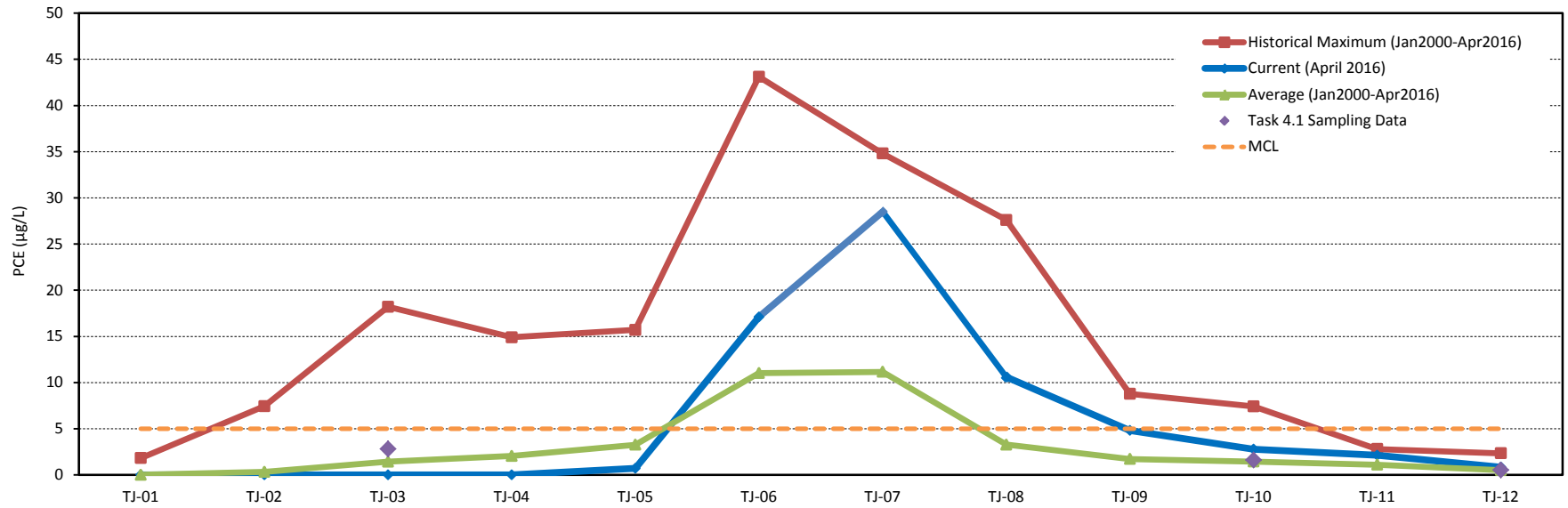
# Tujunga



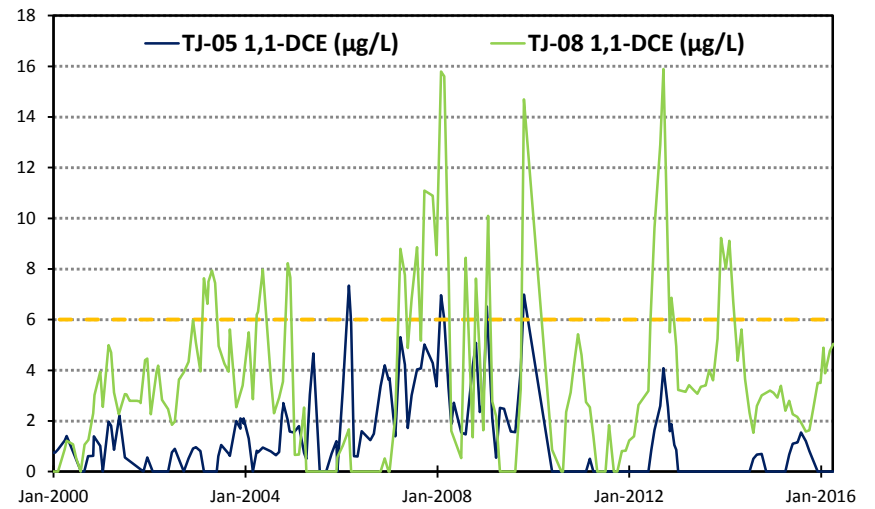
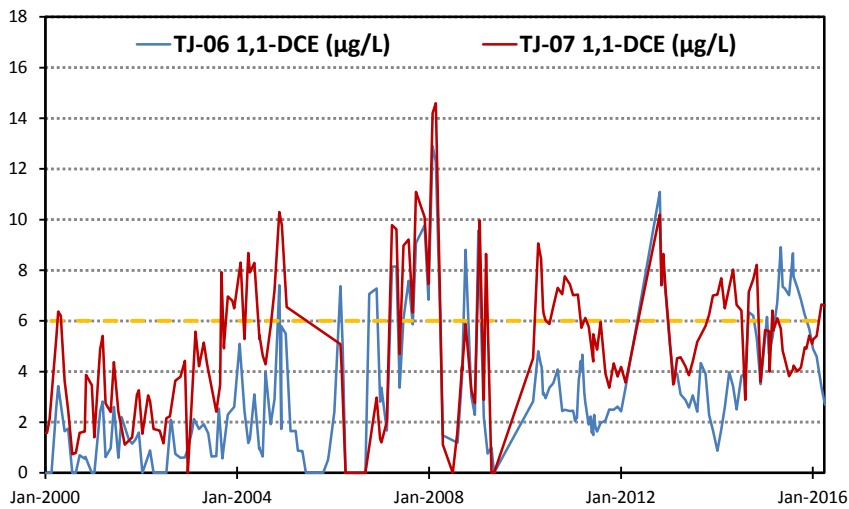
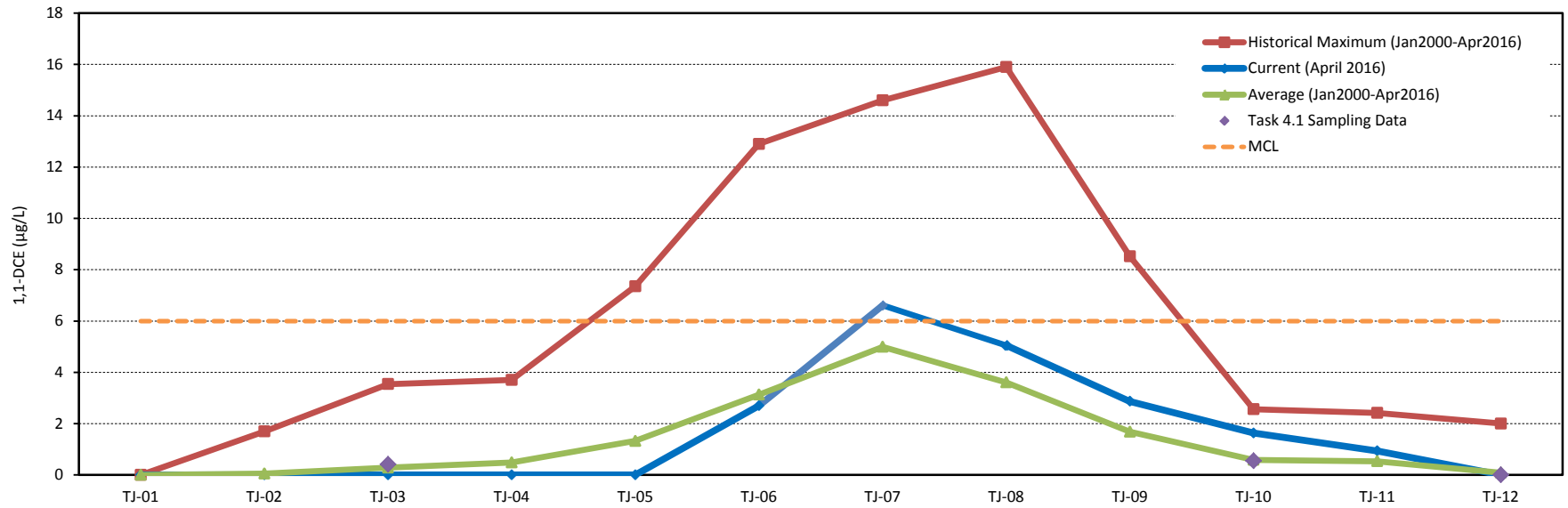
# Tujunga TCE



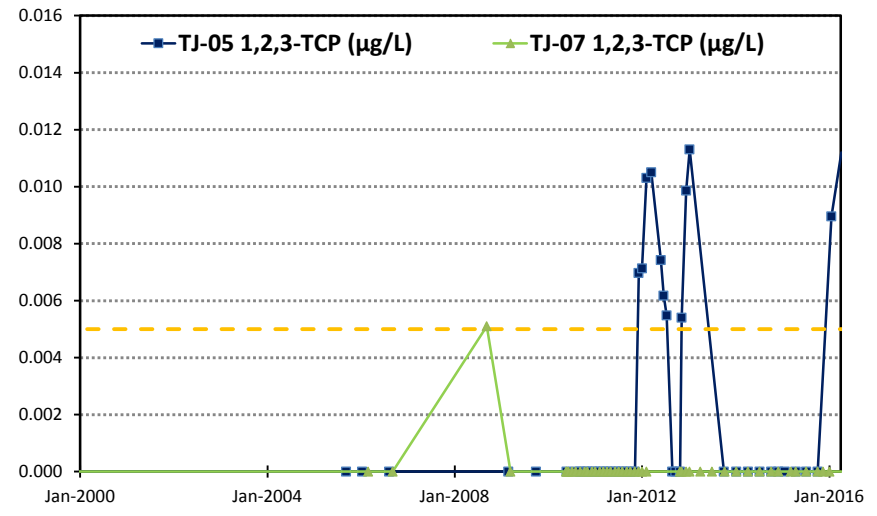
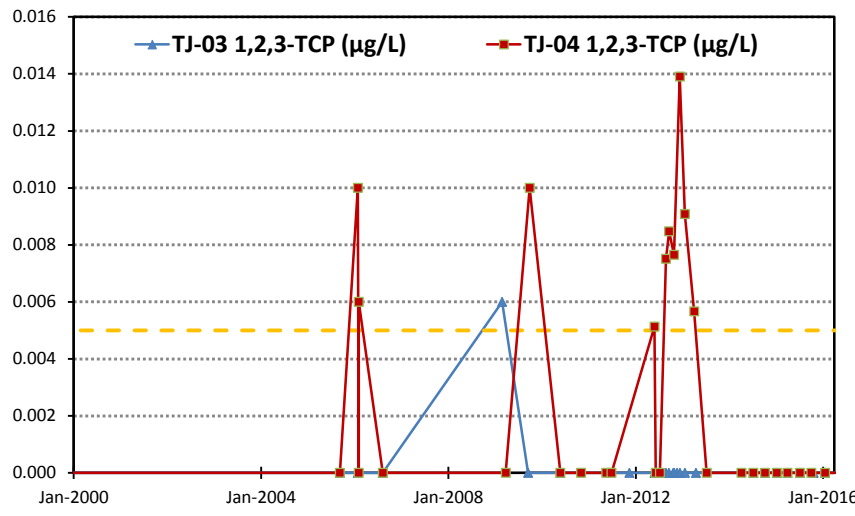
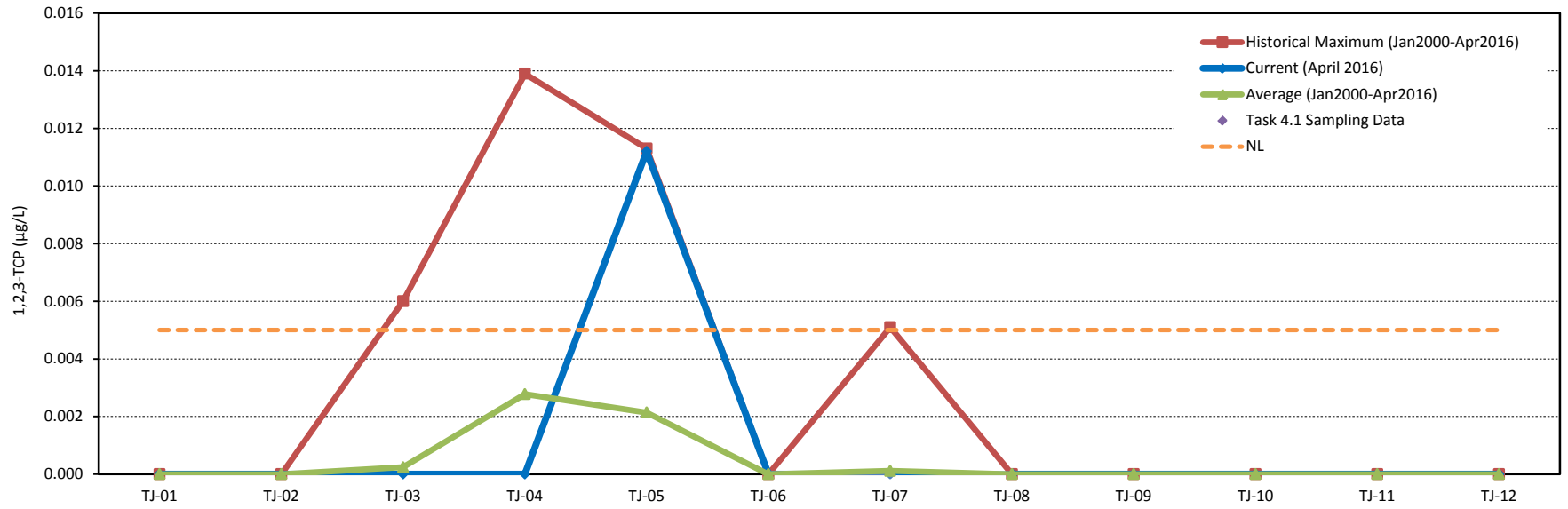
# Tujunganga PCE



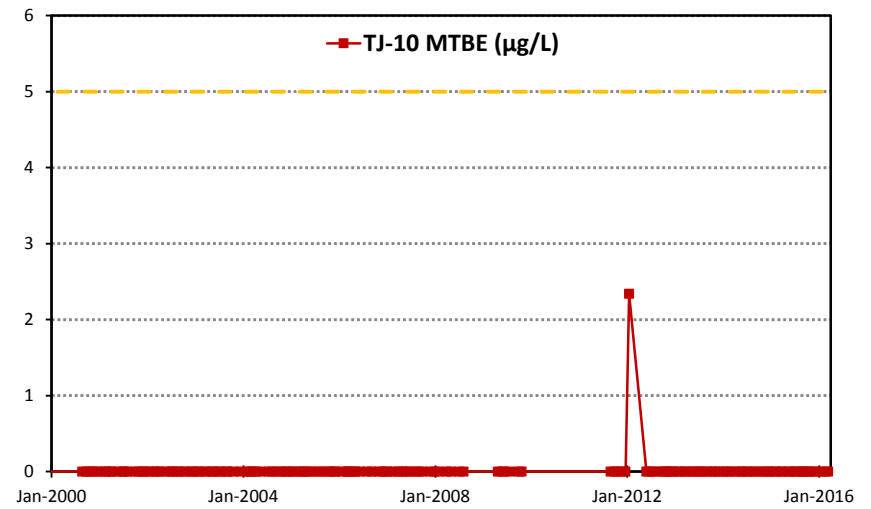
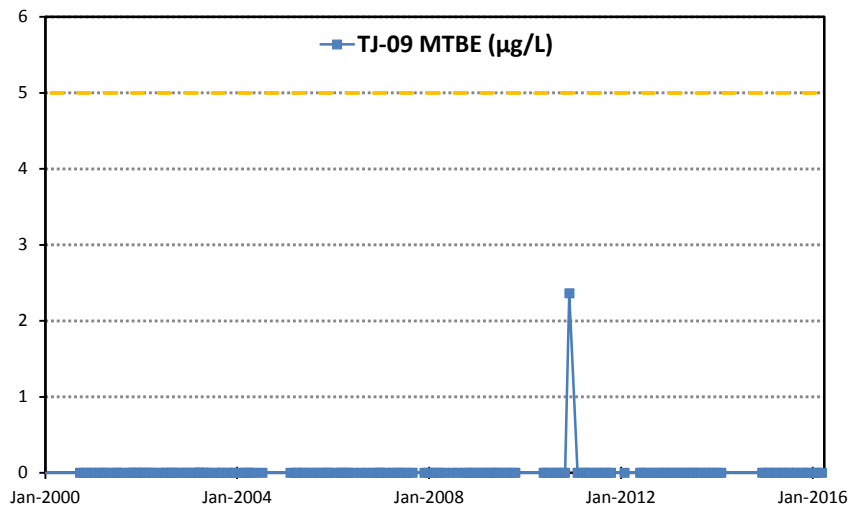
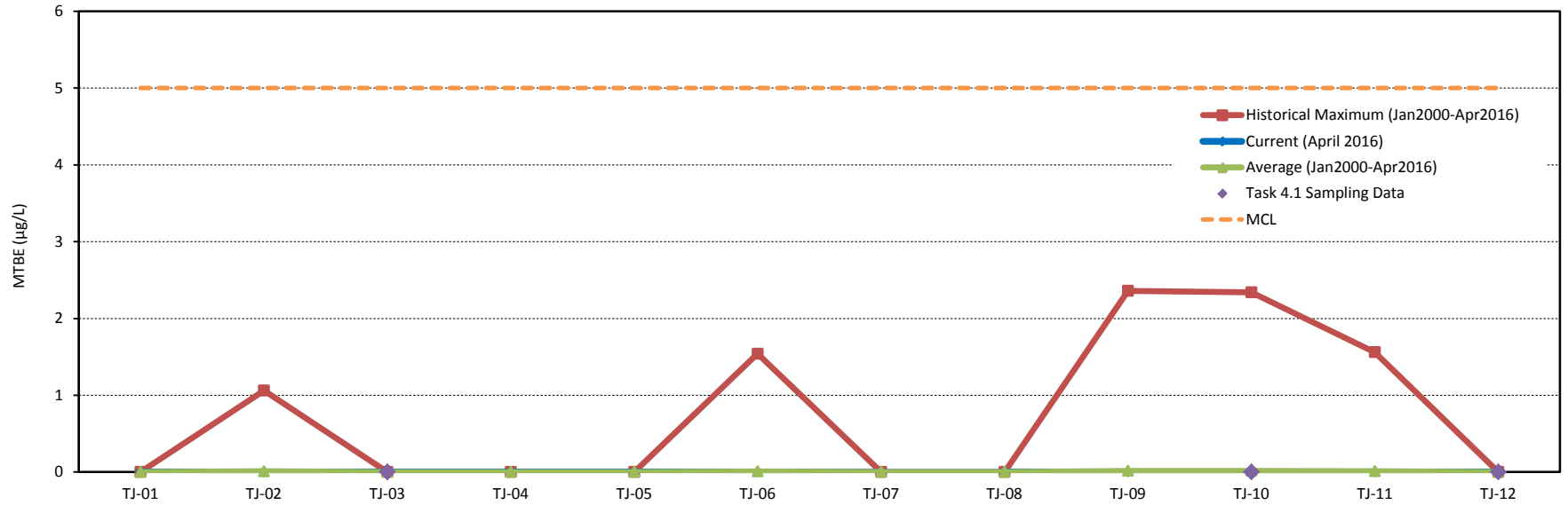
# Tujunganga 1,1-DCE



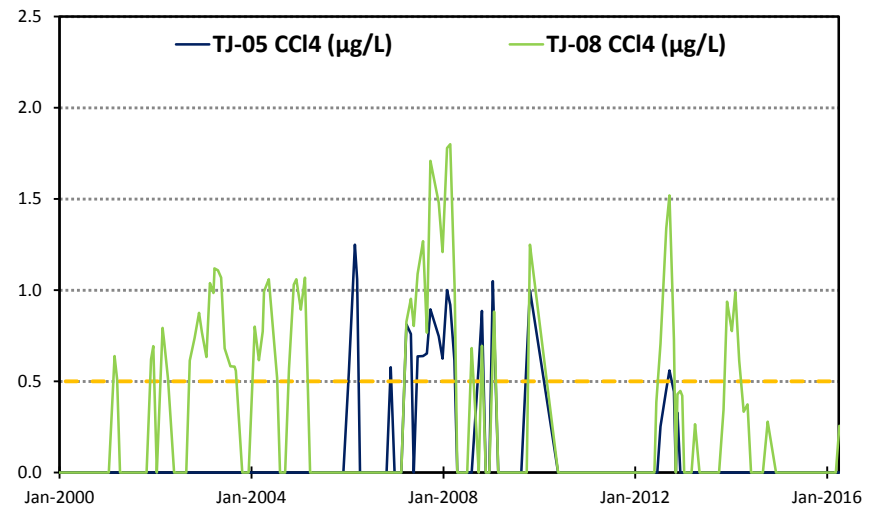
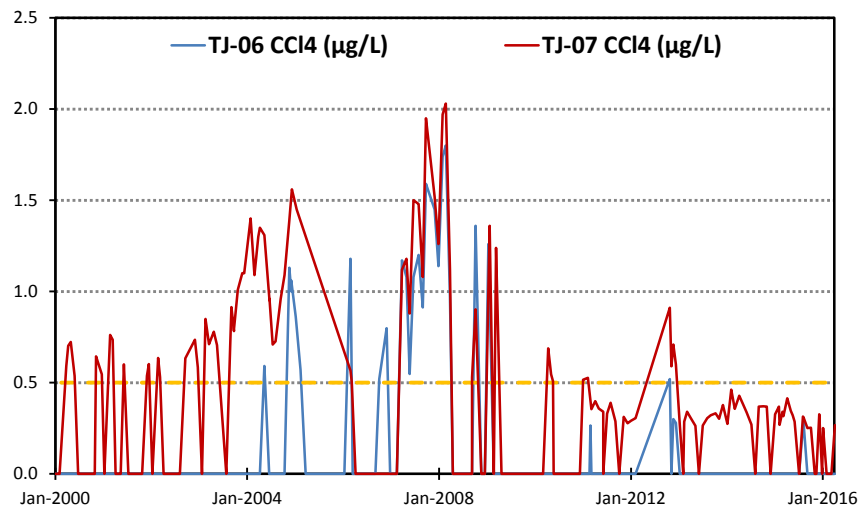
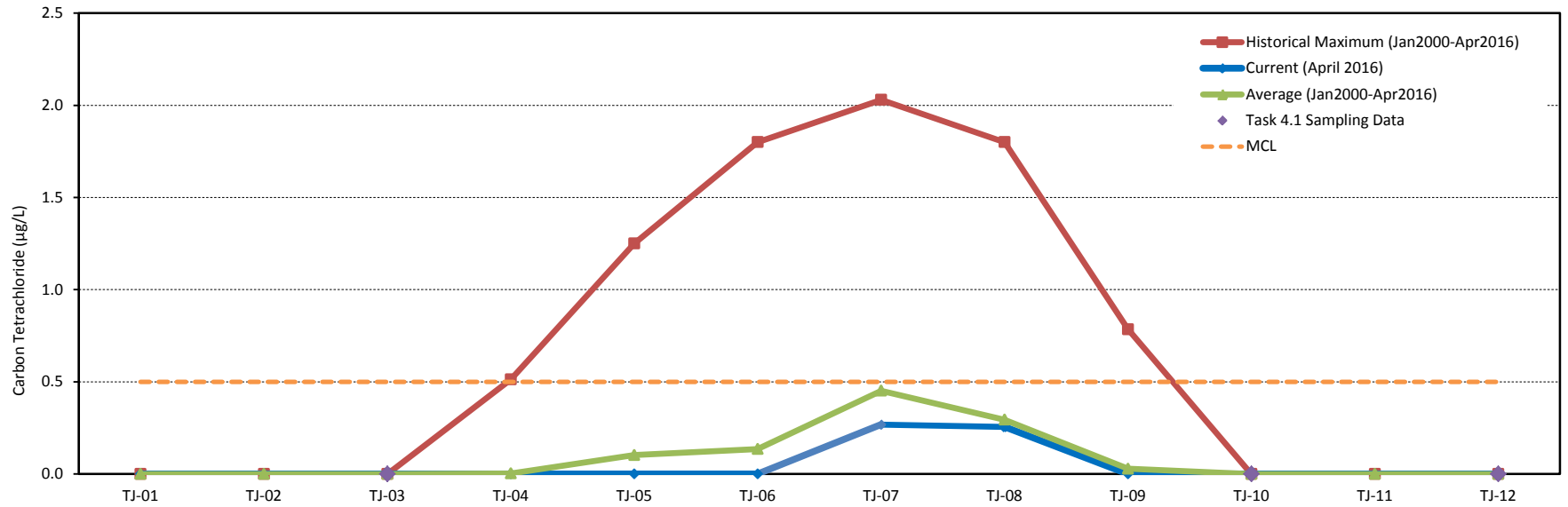
# Tujunganga 1,2,3-TCP



# Tujungung MTBE

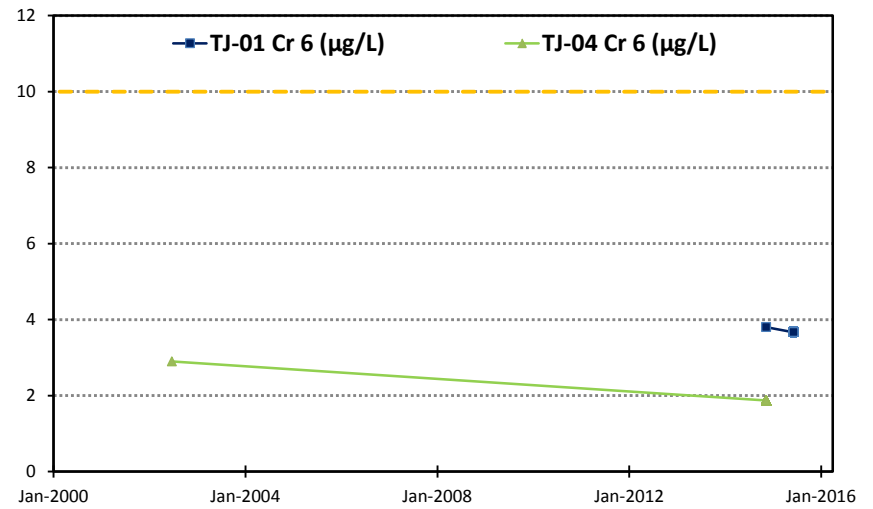
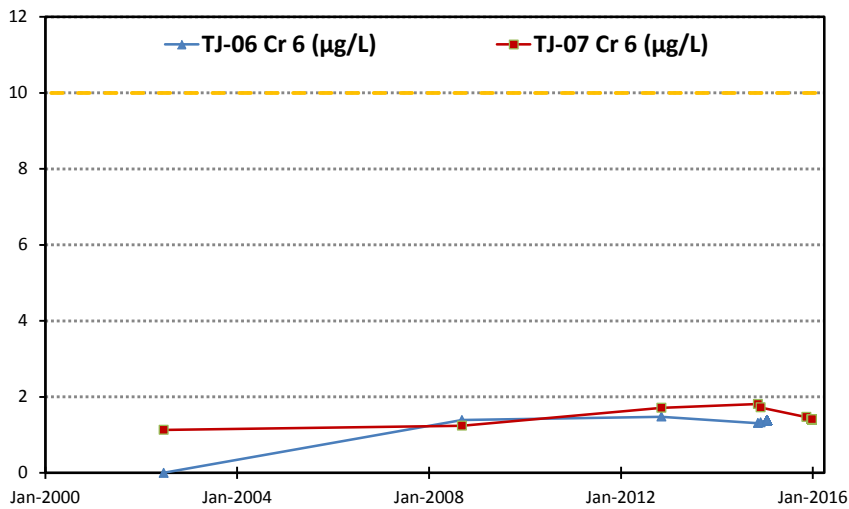
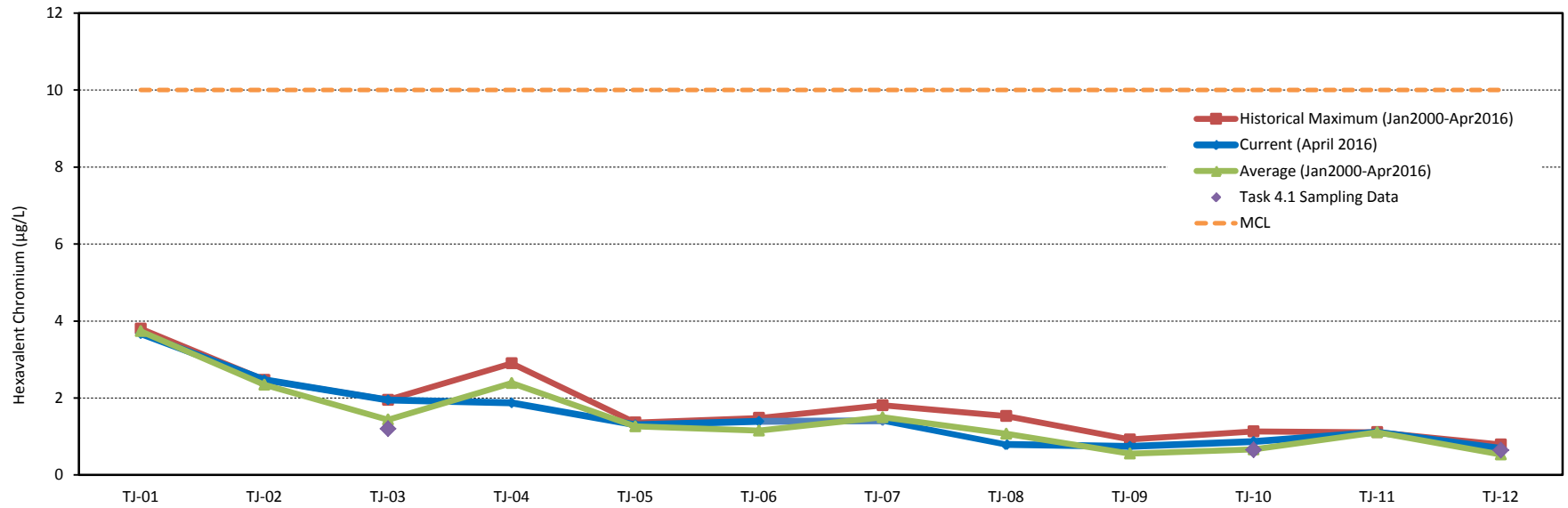


# Tujunga Carbon Tetrachloride

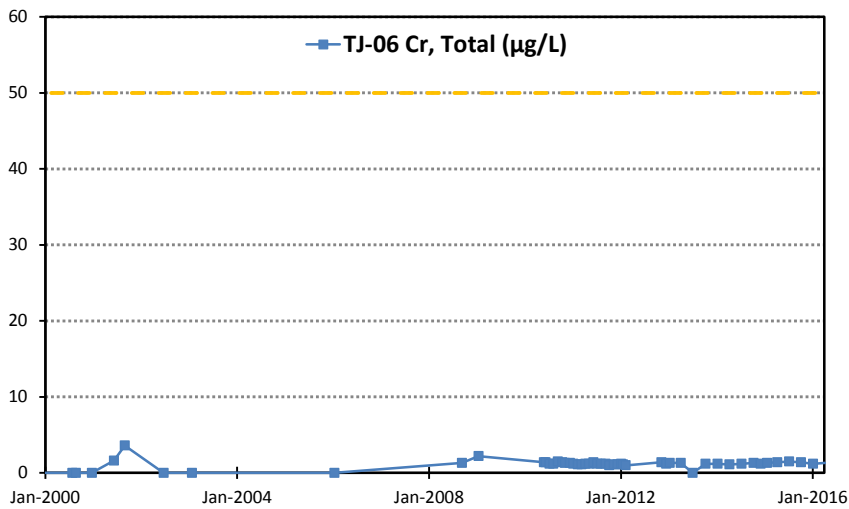
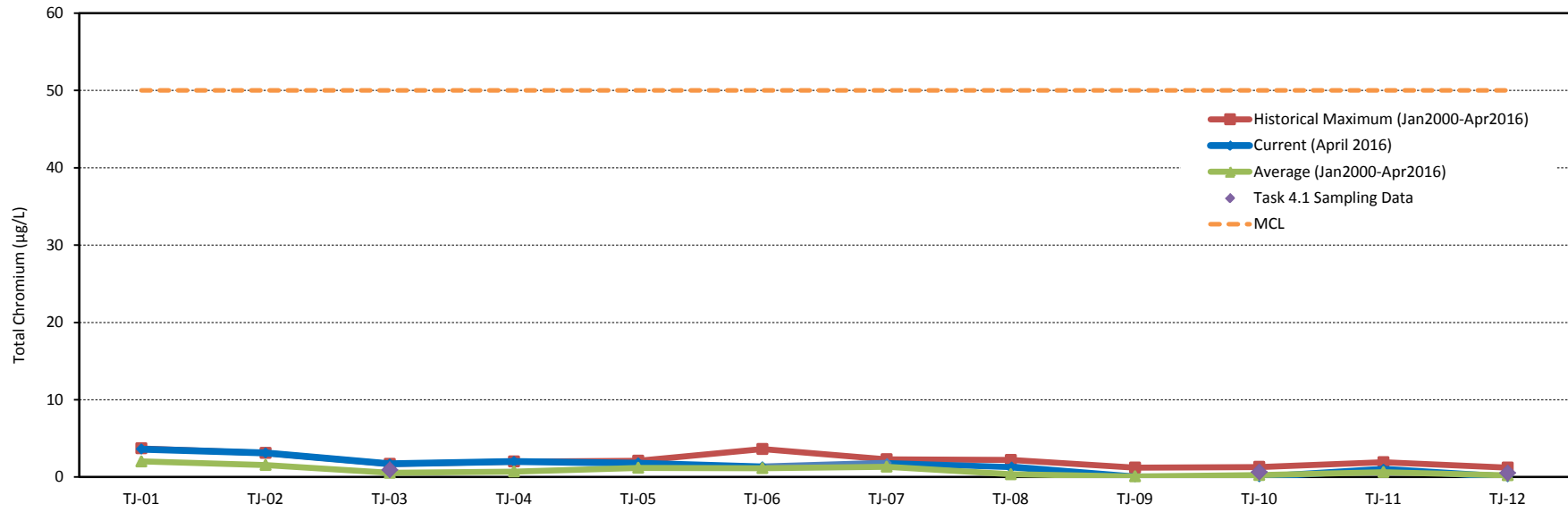




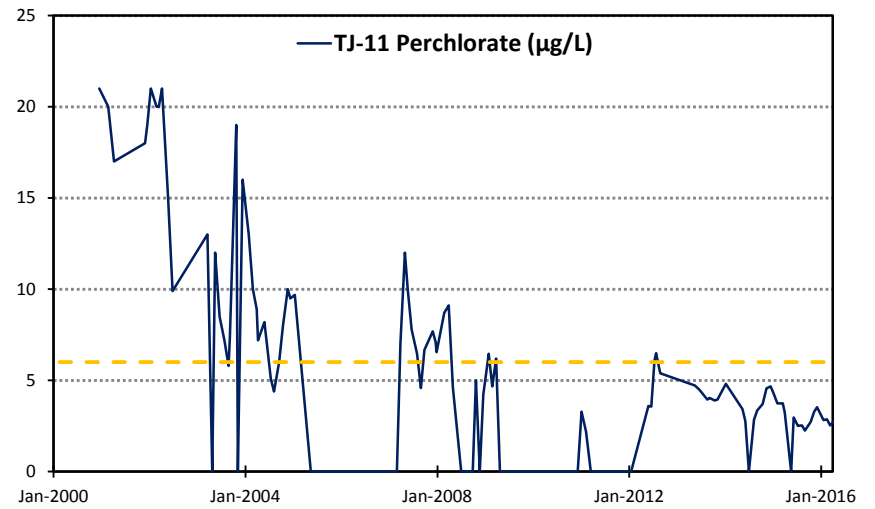
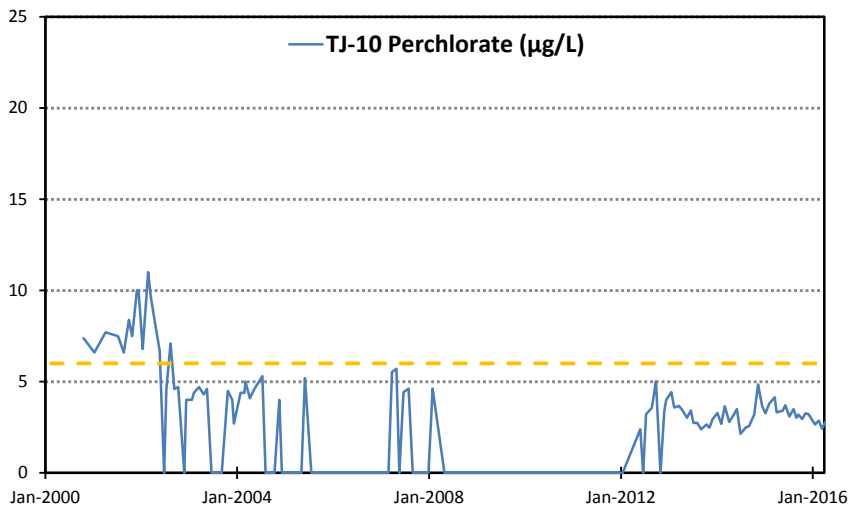
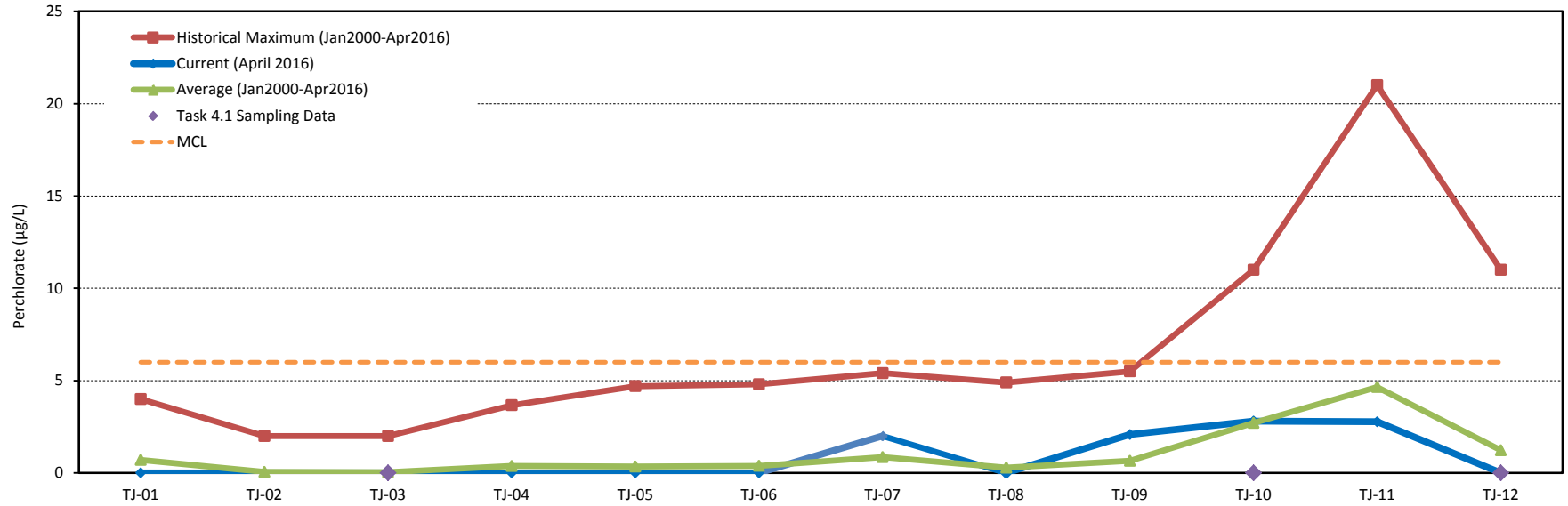
# Tujunga Hexavalent Chromium



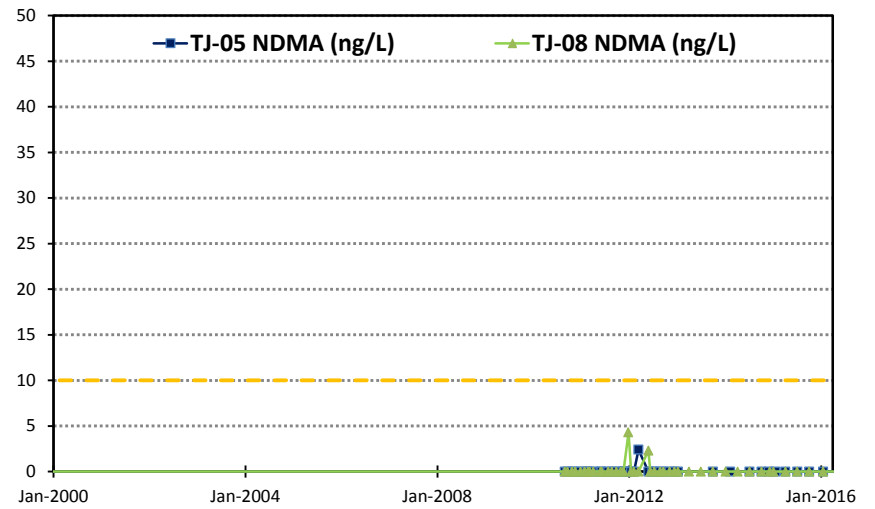
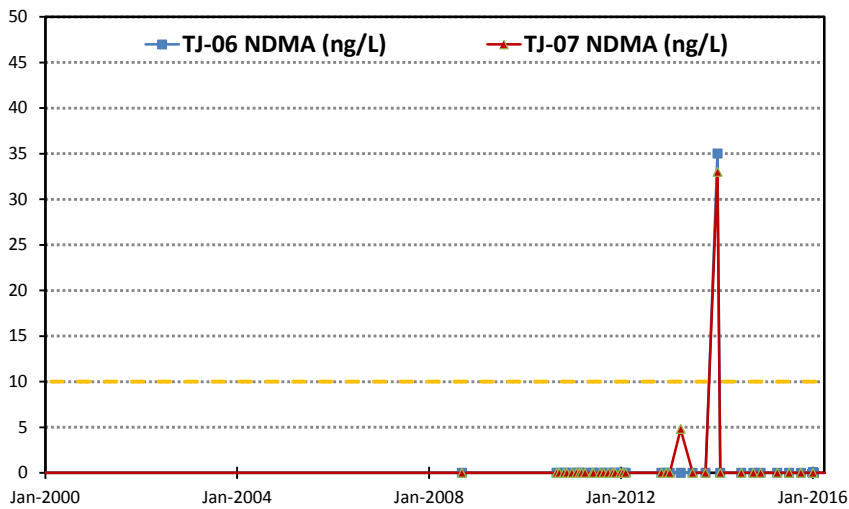
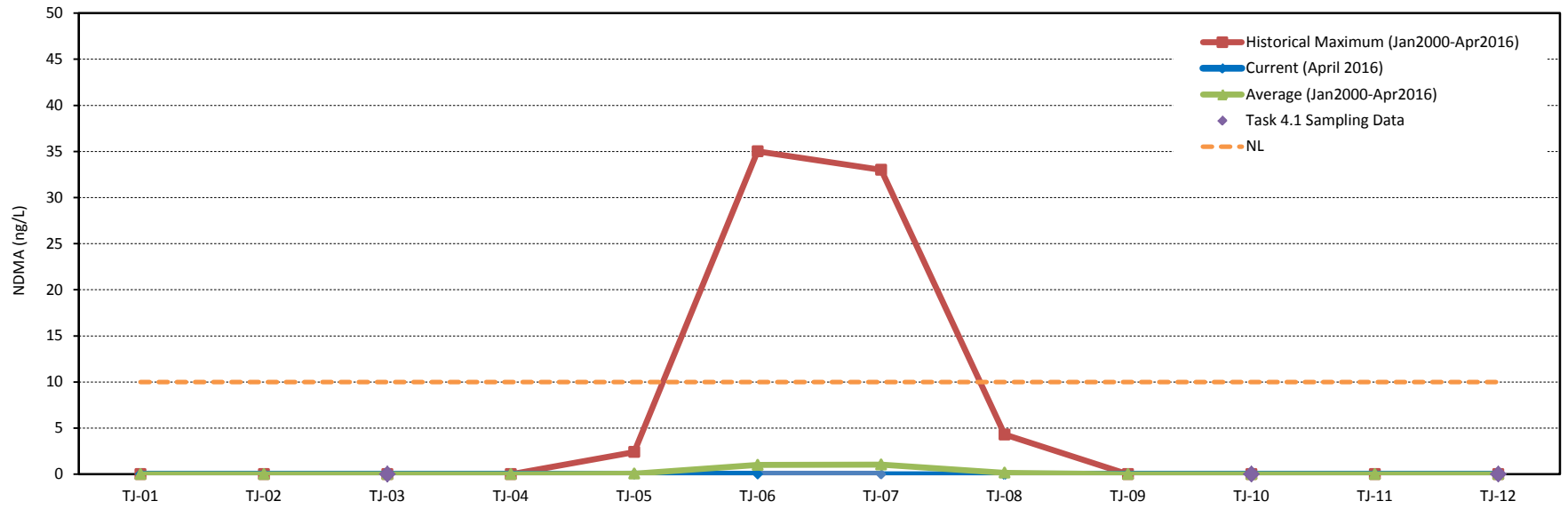
# Tujunga Total Chromium



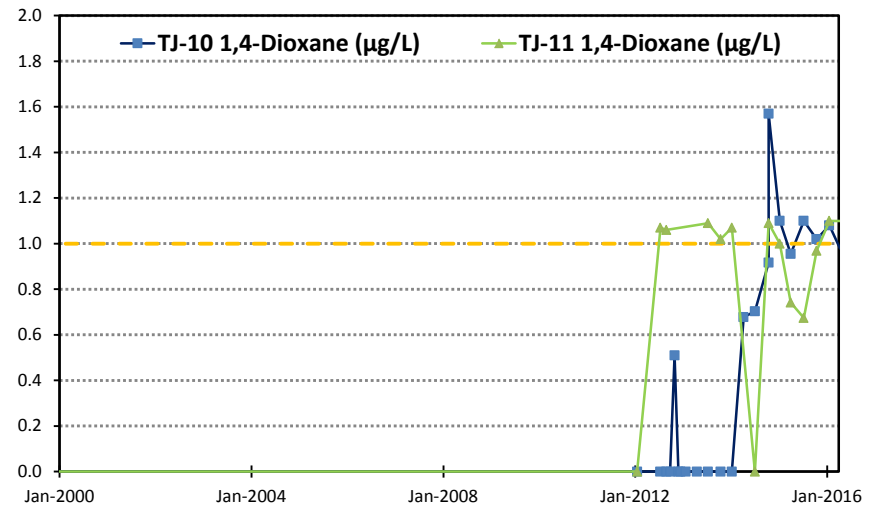
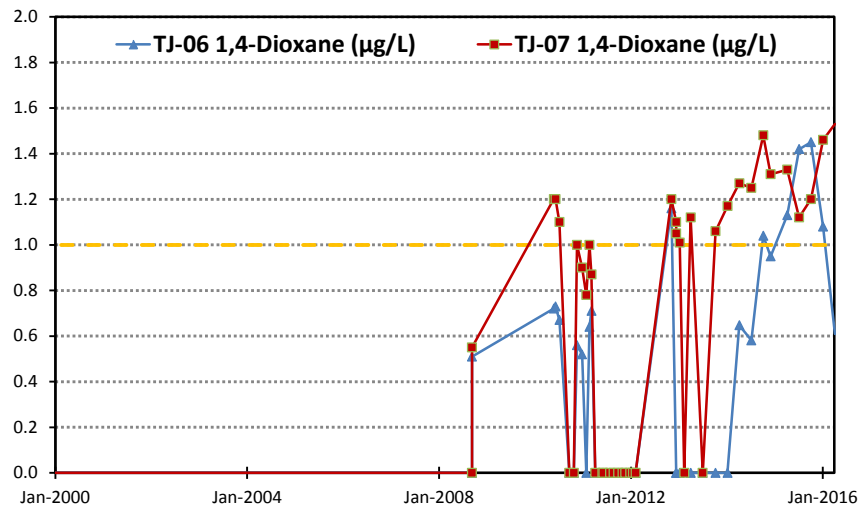
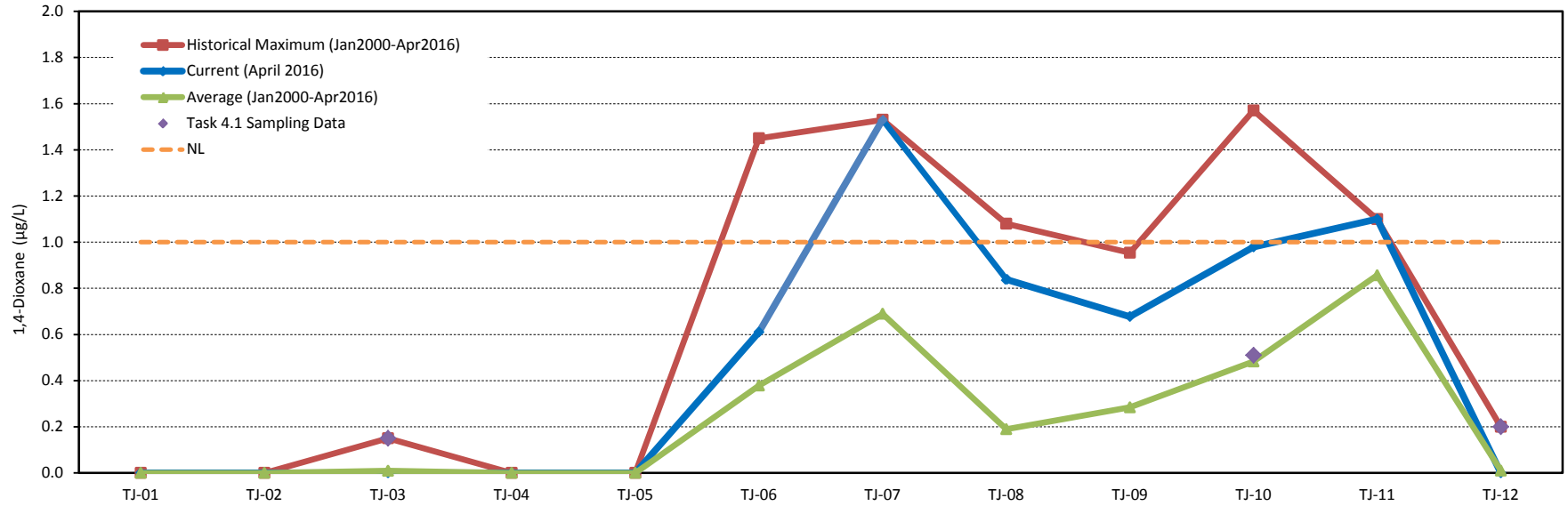
# Tujunga Perchlorate



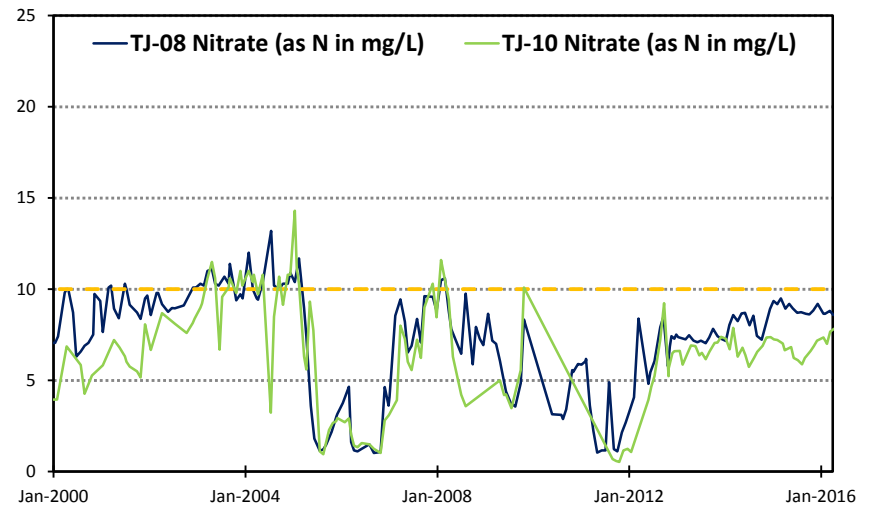
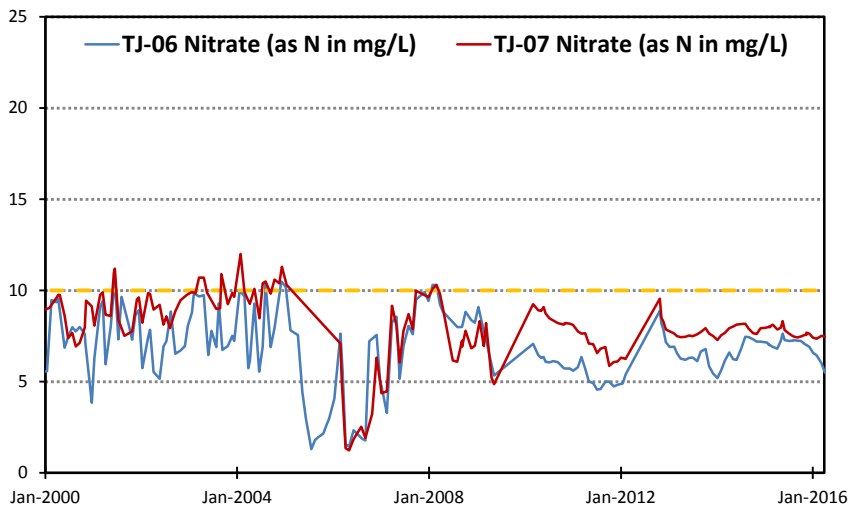
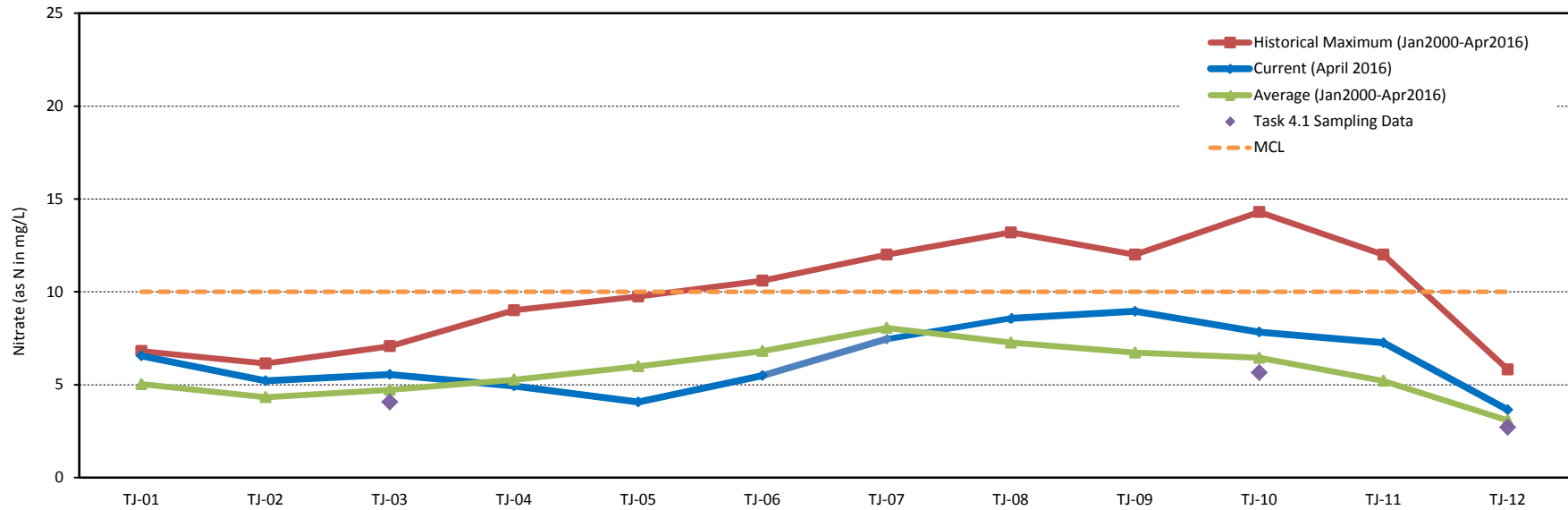
# Tujunga NDMA



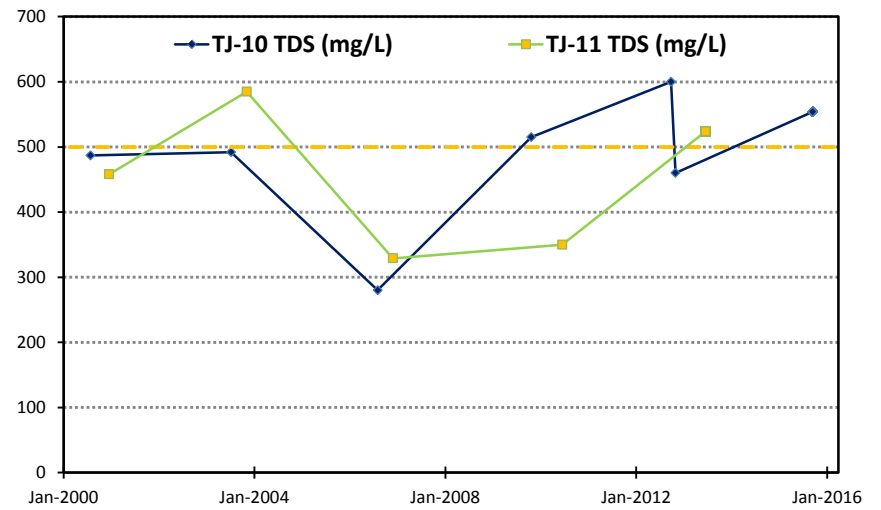
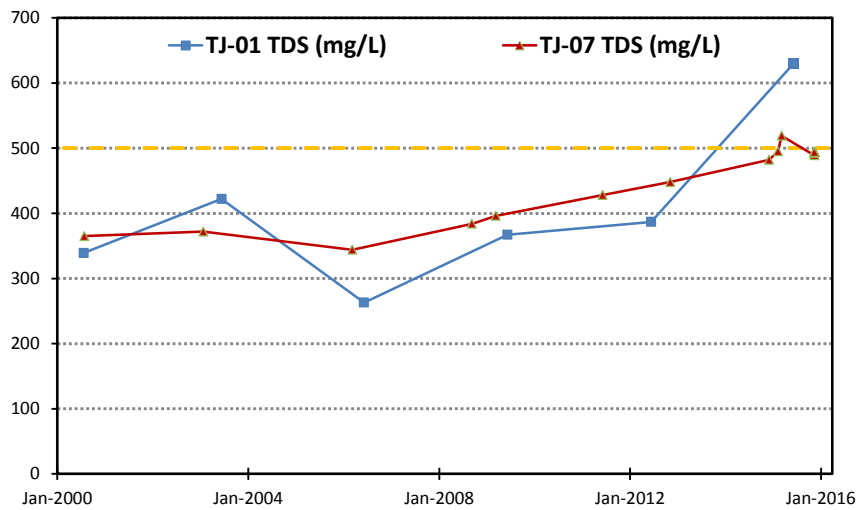
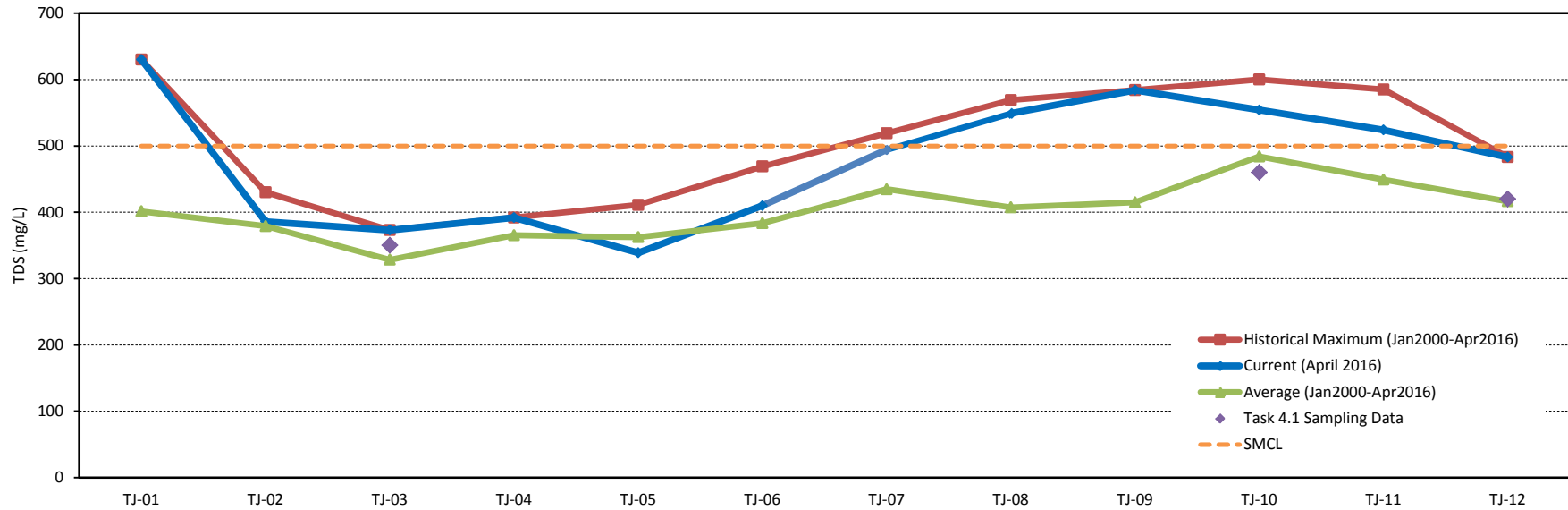
# Tujunga 1,4-Dioxane



# Tujunga Nitrate

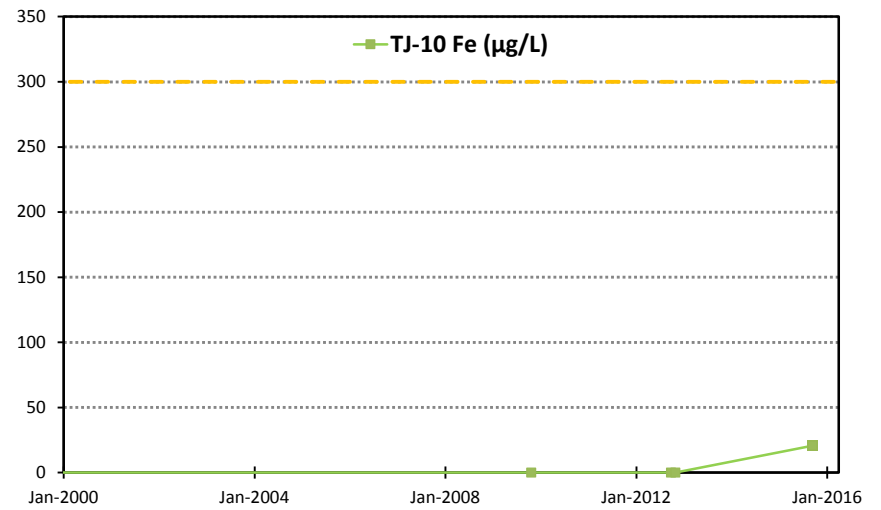
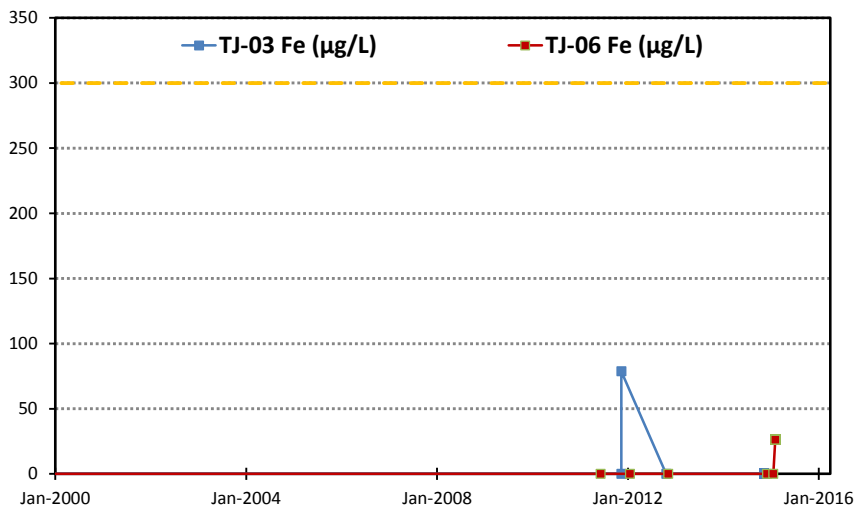
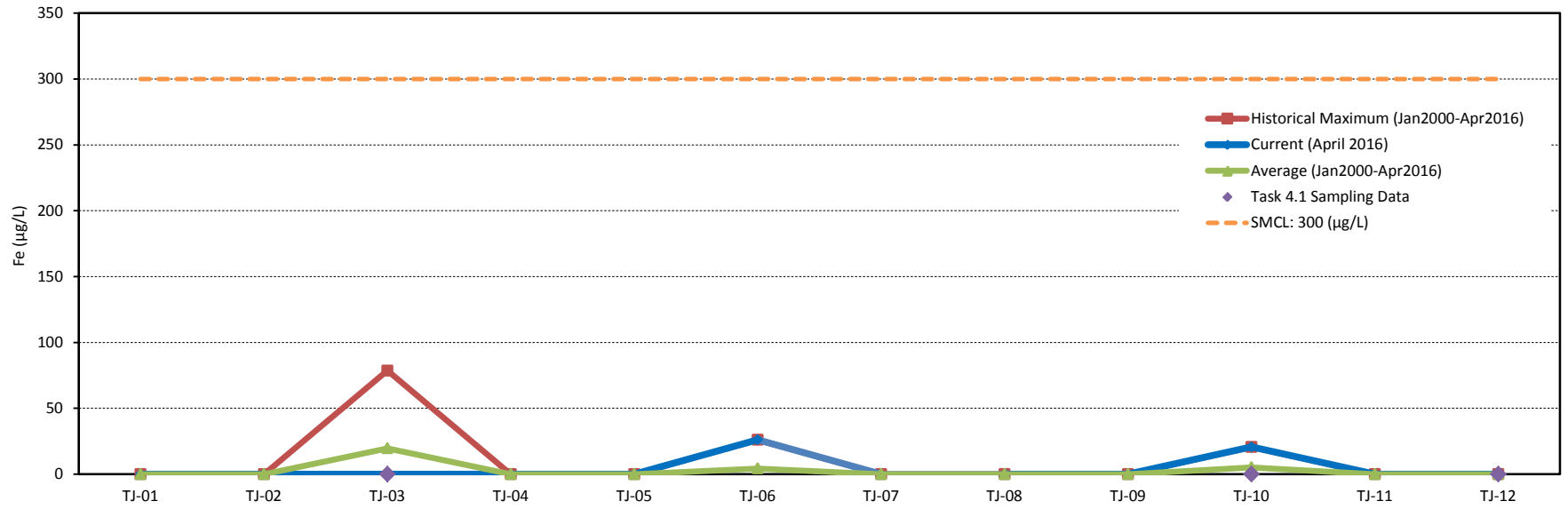


# Tujunga TDS

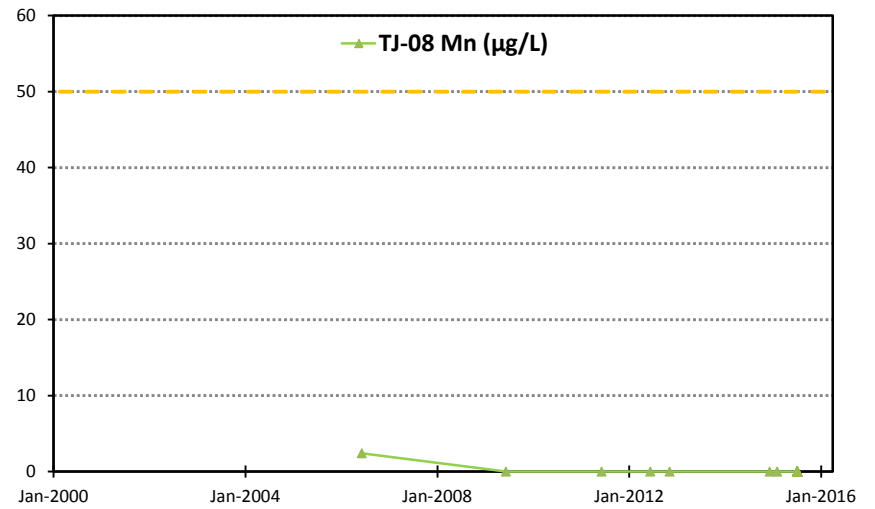
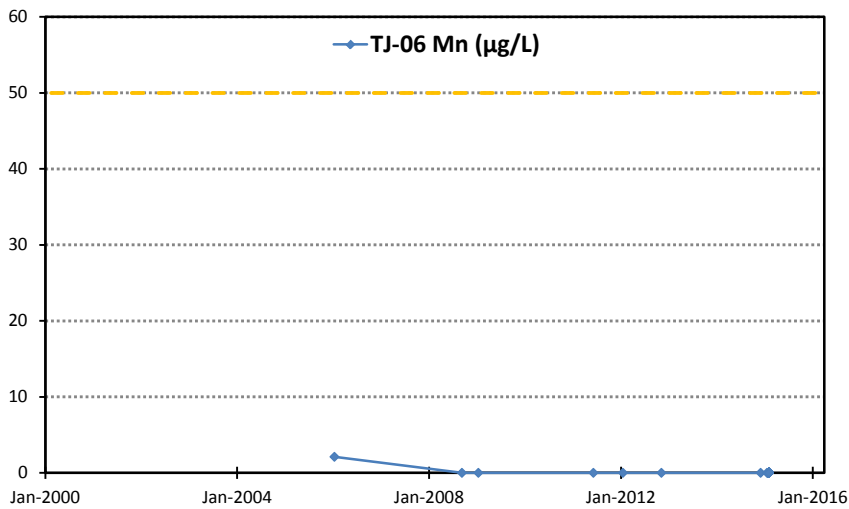
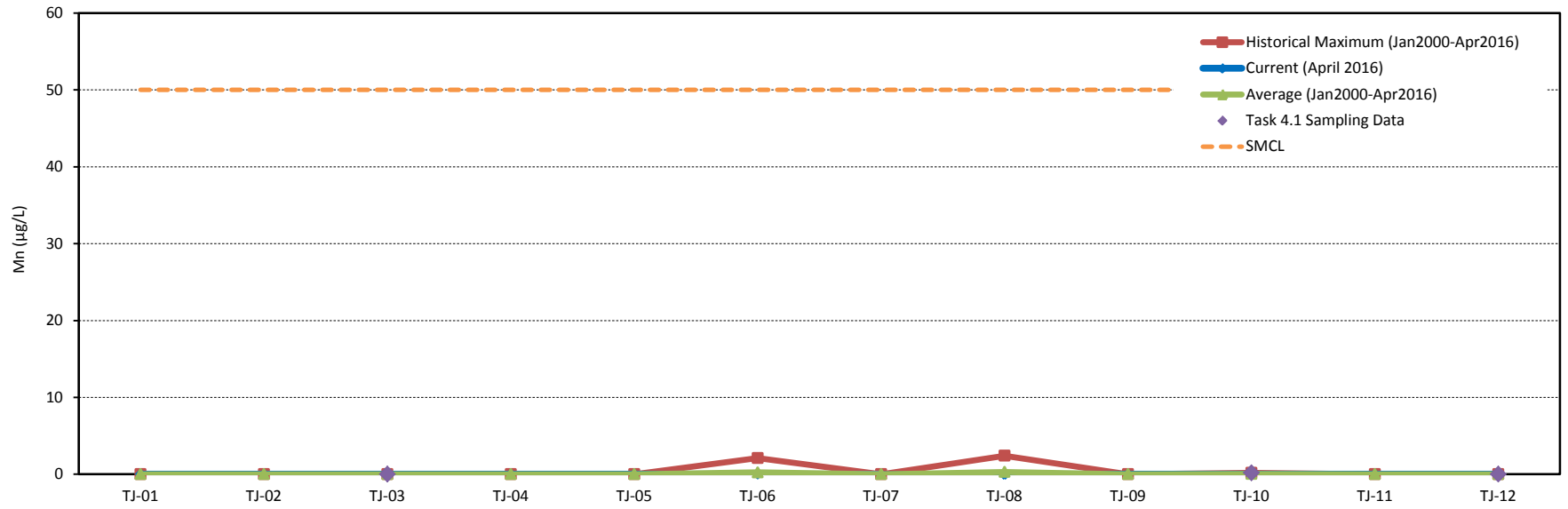




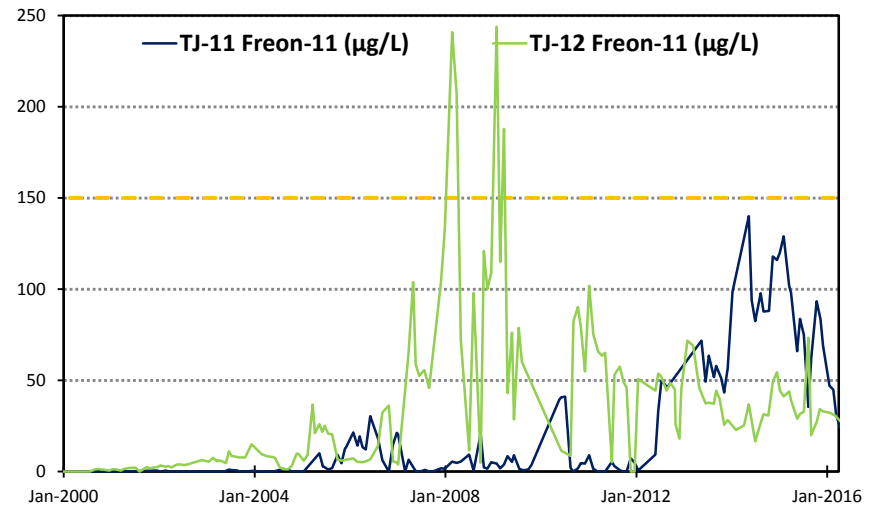
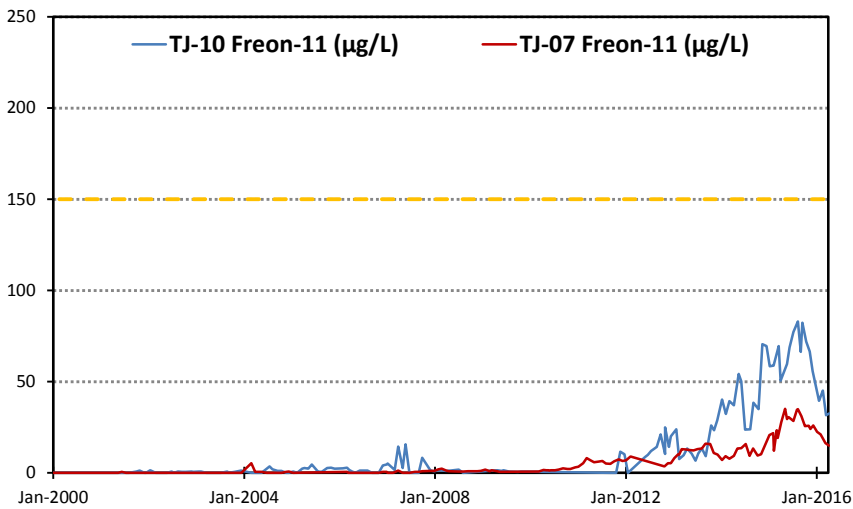
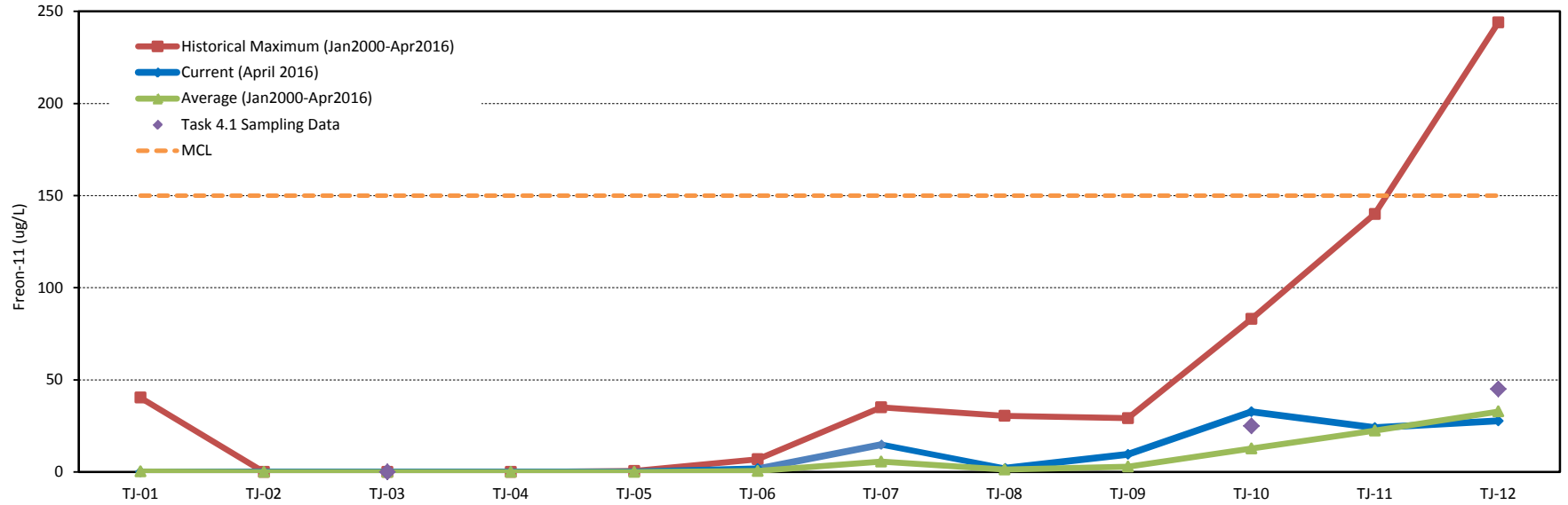
# Tujunganga Iron



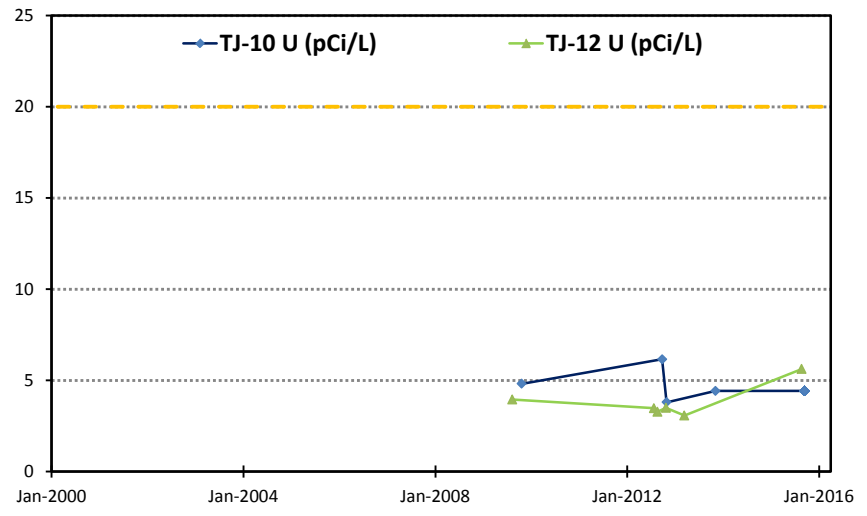
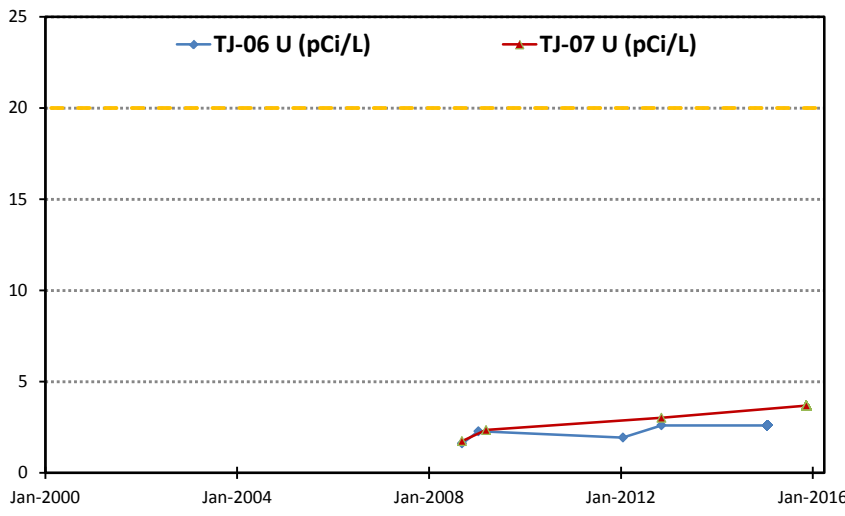
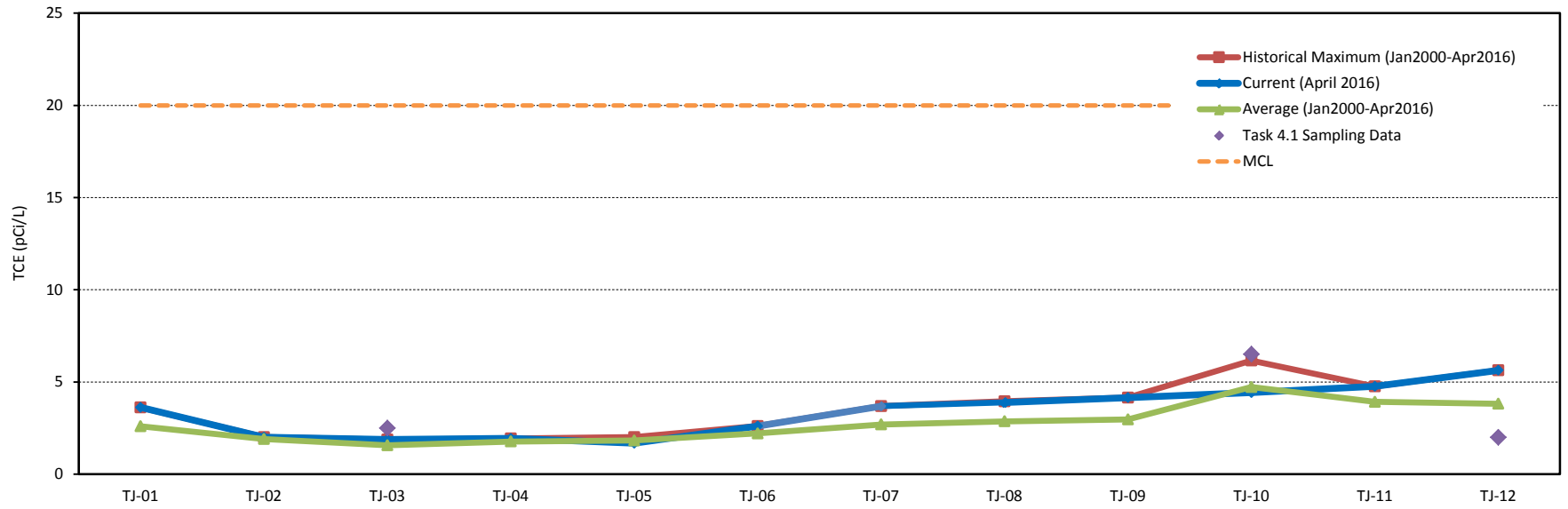
# Tujunganga Manganese



# Tujunga Trichlorofluoromethane (Freon 11)

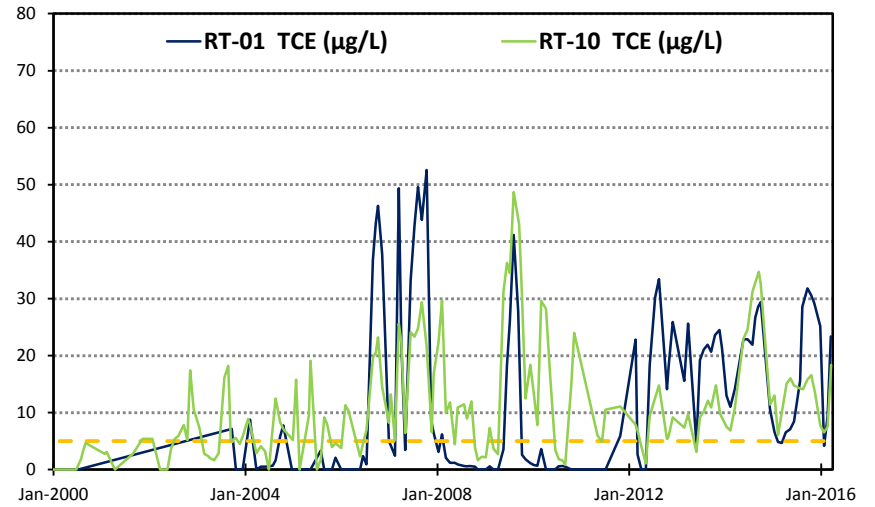
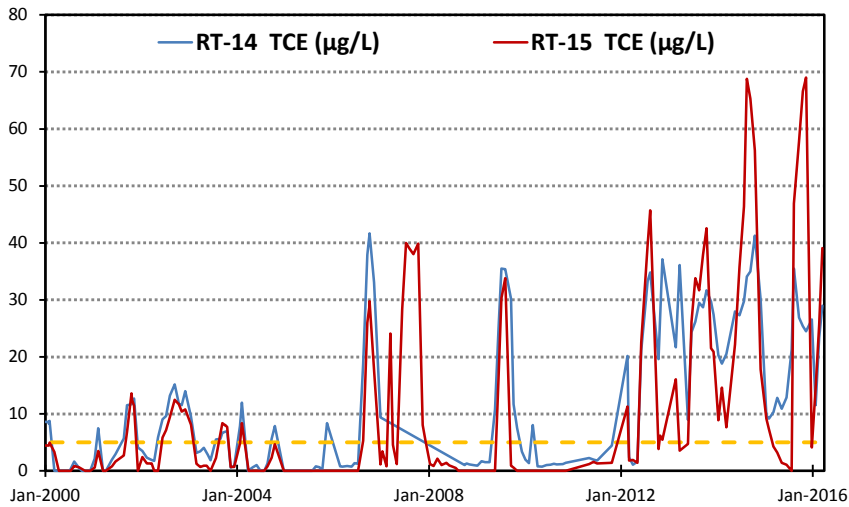
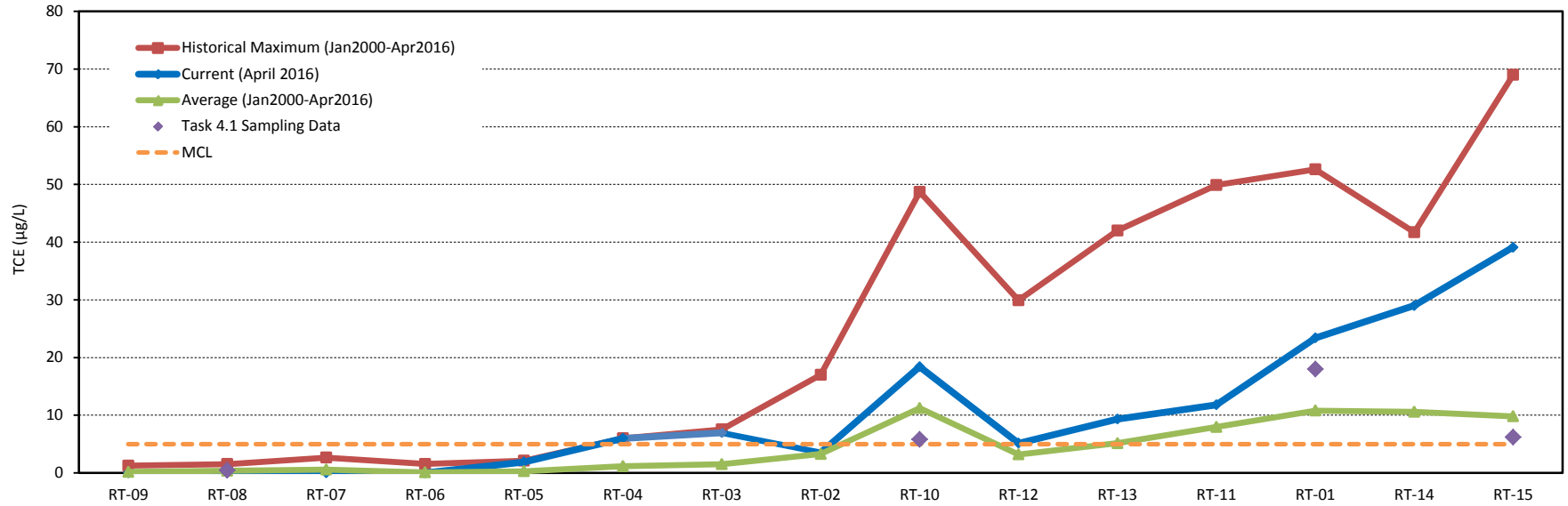


# Tujunga Uranium

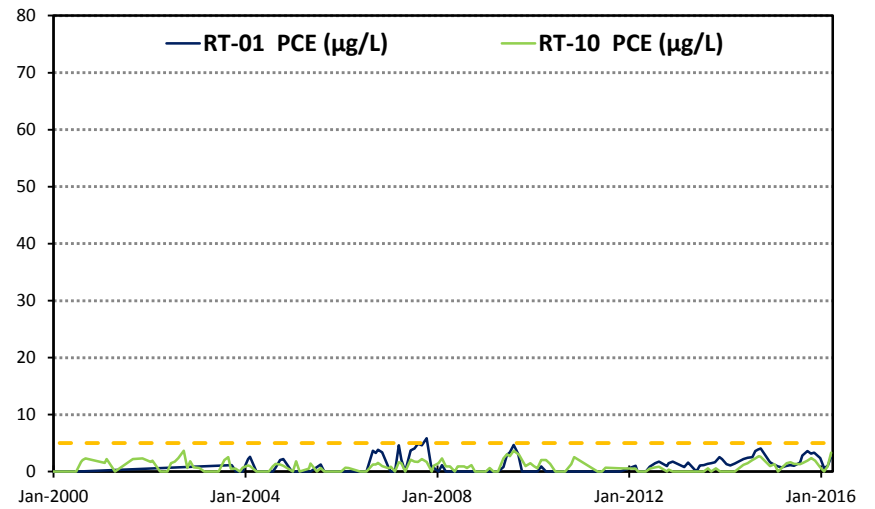
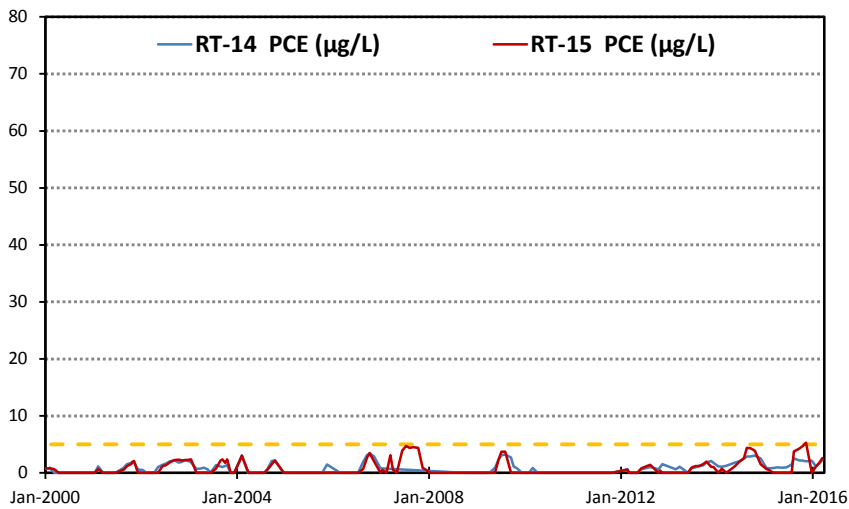
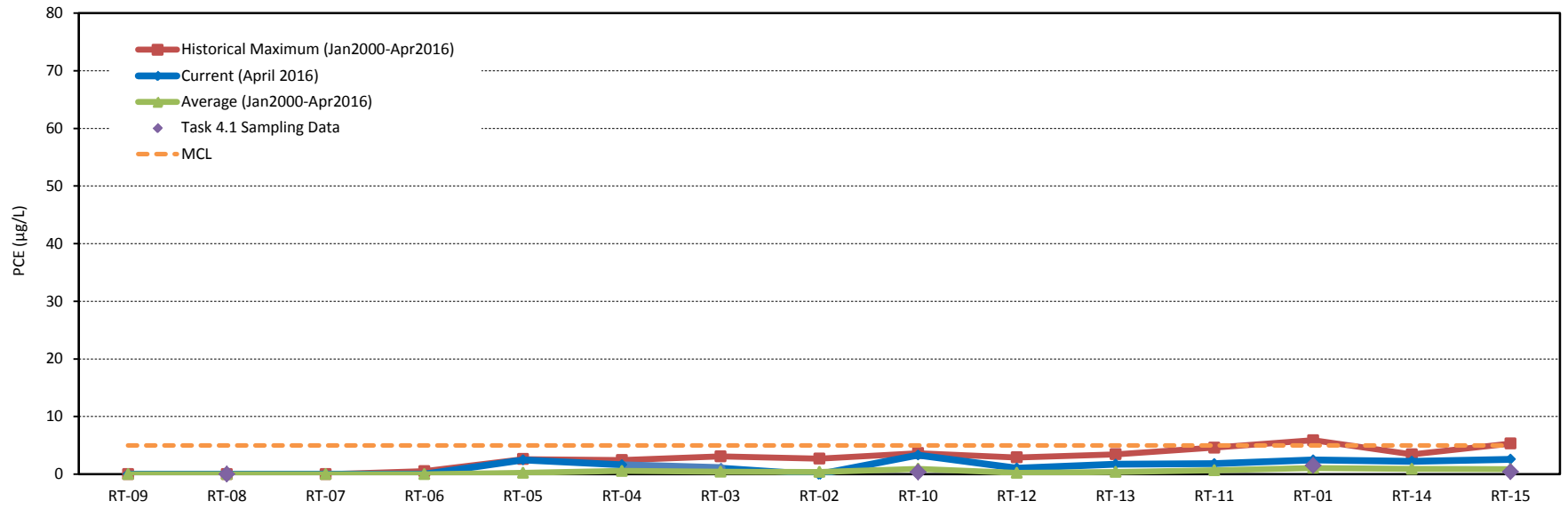




# Rinaldi Toluca TCE

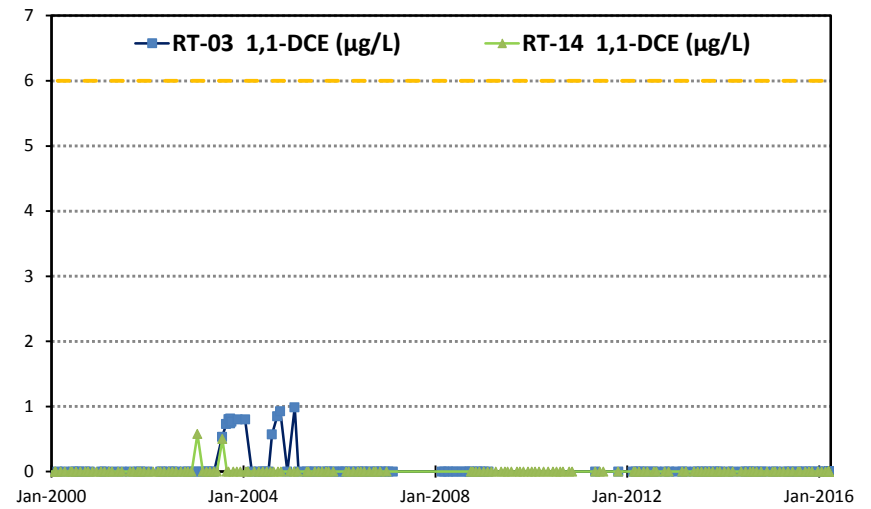
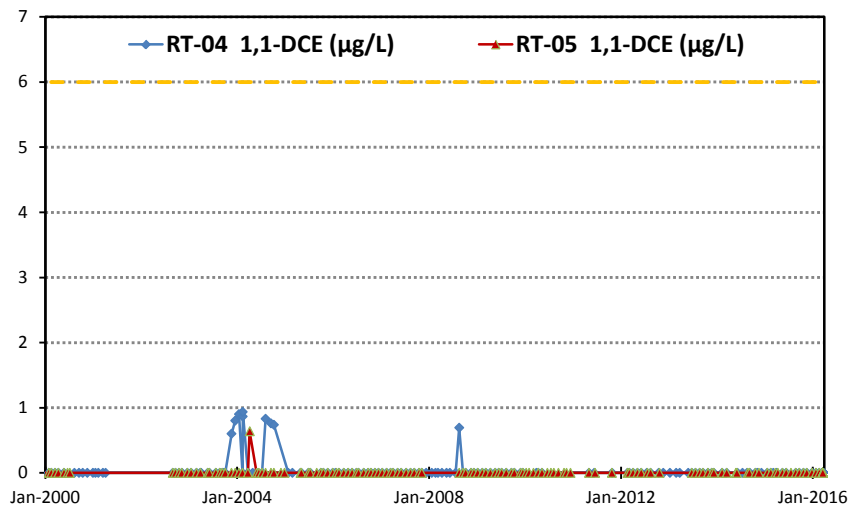
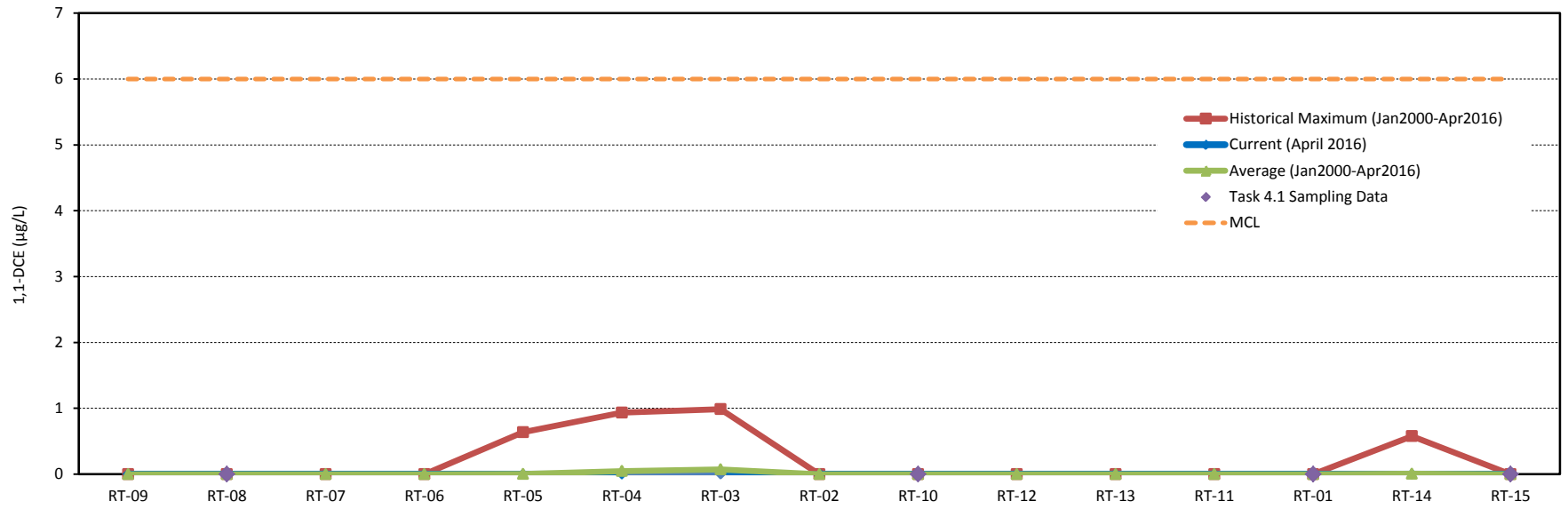


# Rinaldi Toluca PCE

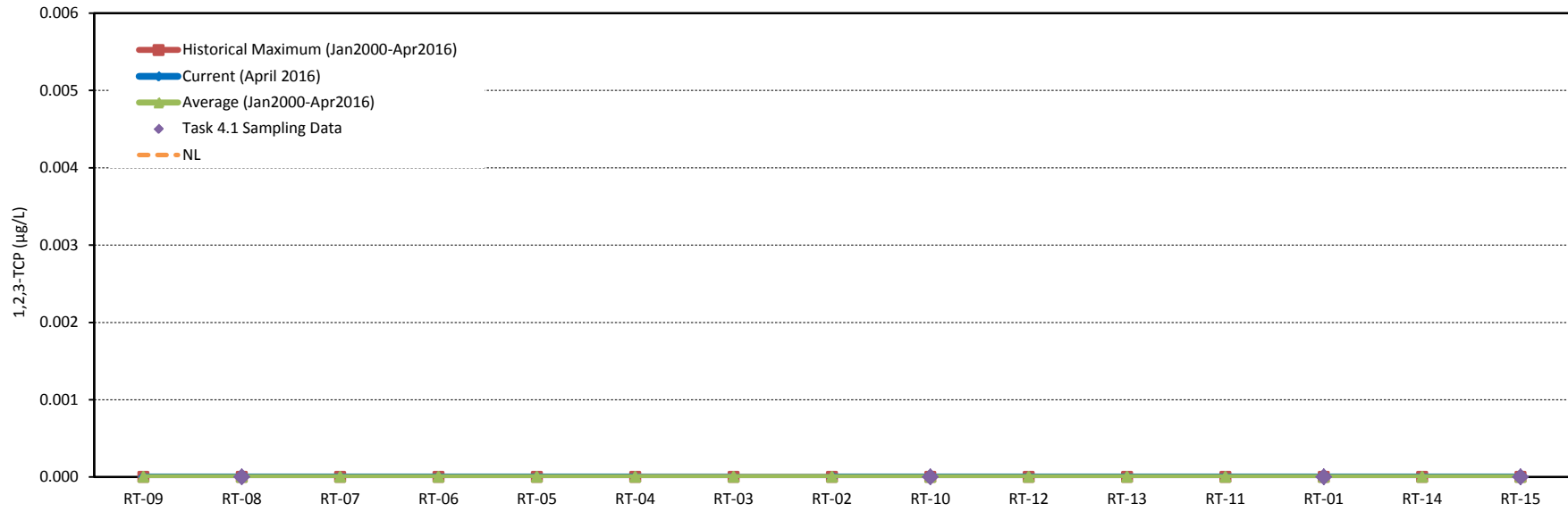




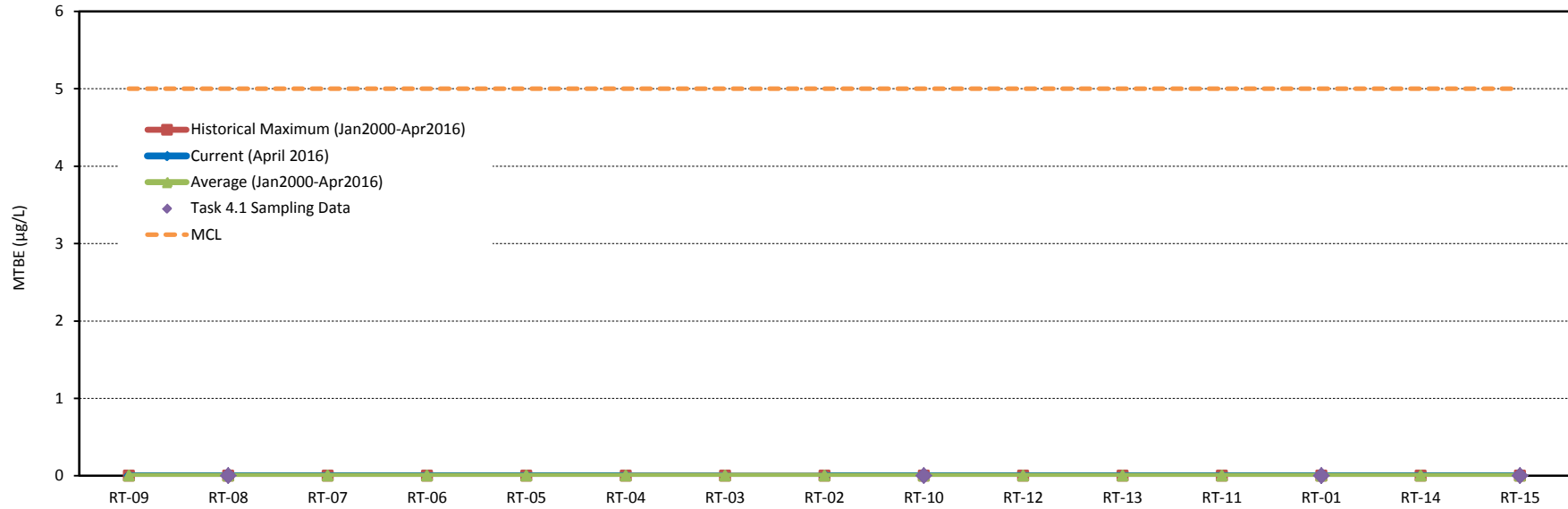
# Rinaldi Toluca 1,1-DCE



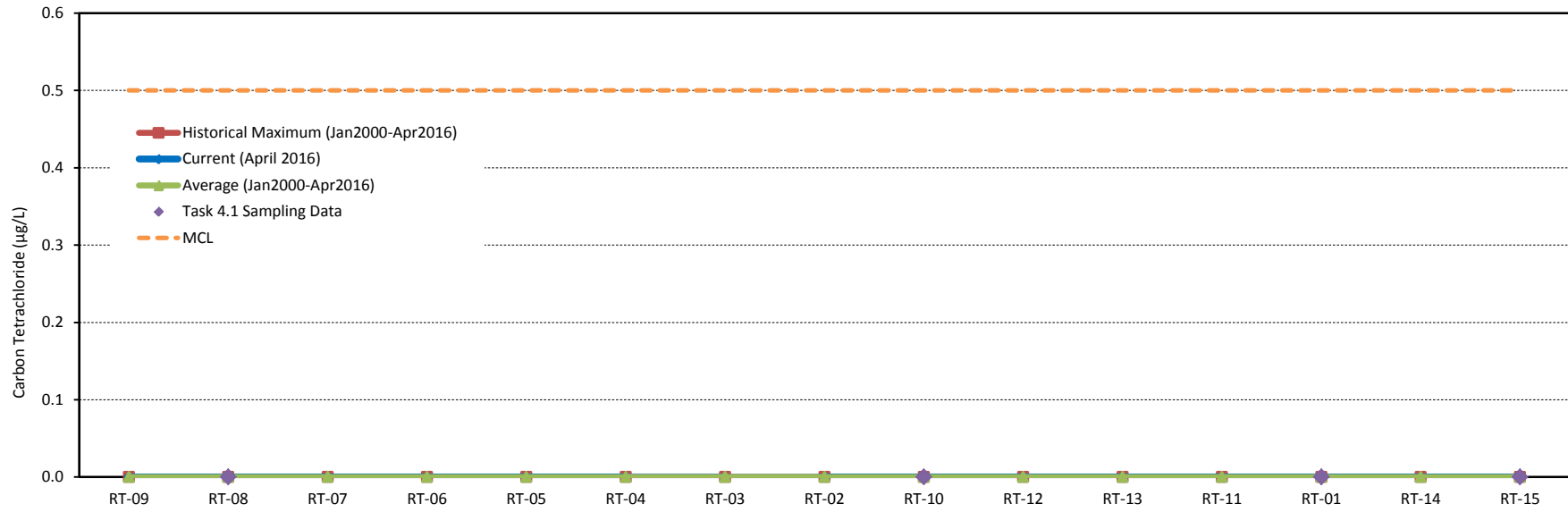
# Rinaldi Toluca 1,2,3-TCP



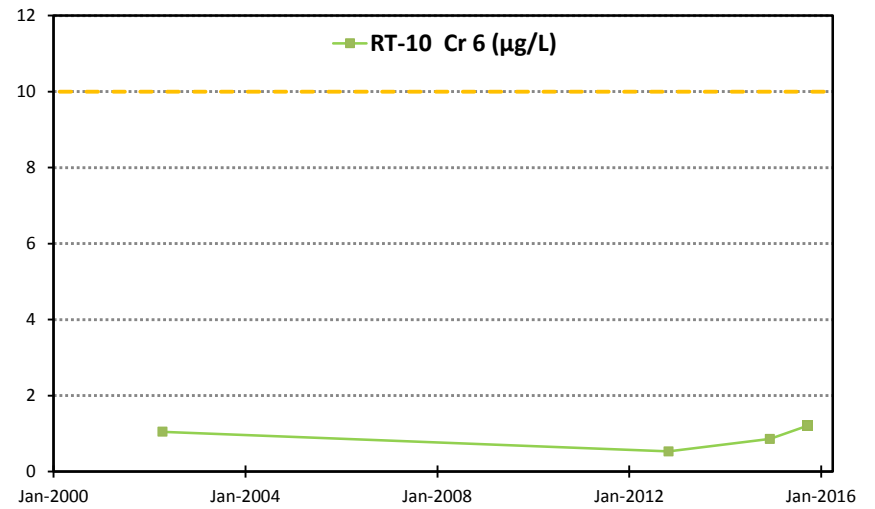
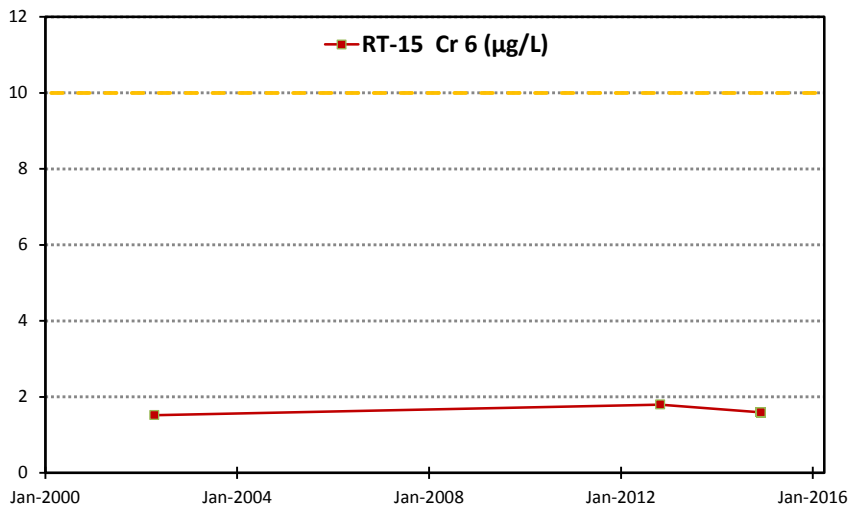
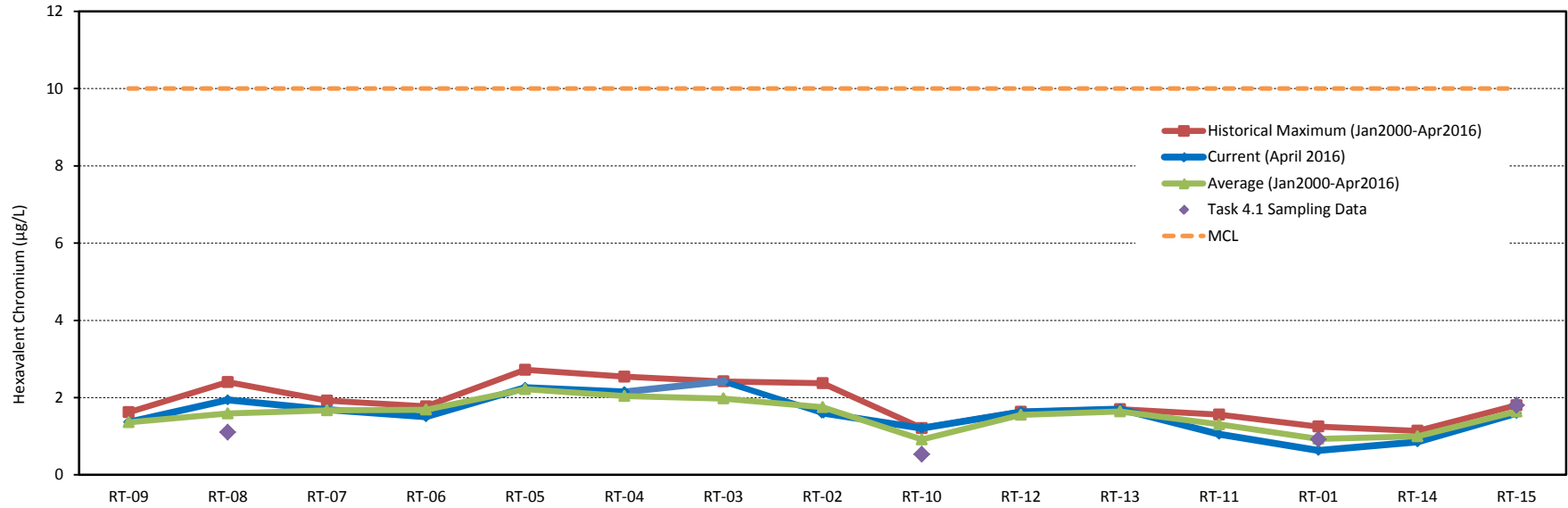
# Rinaldi Toluca MTBE



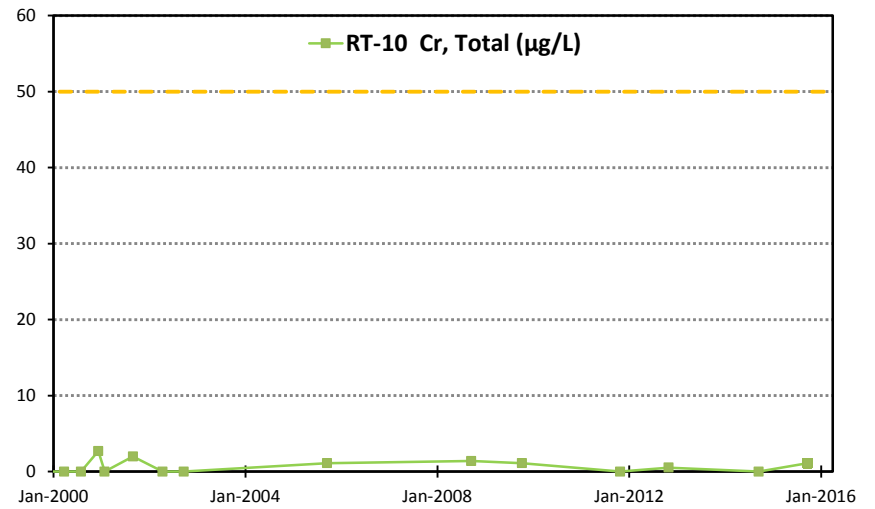
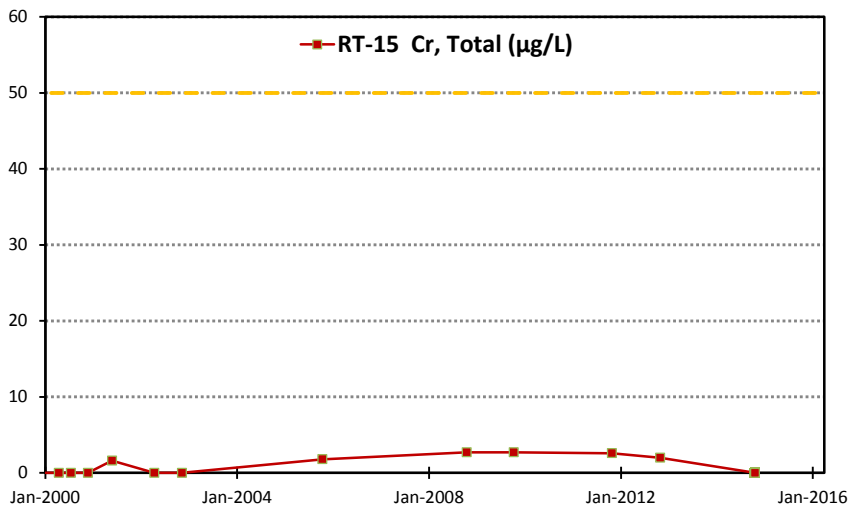
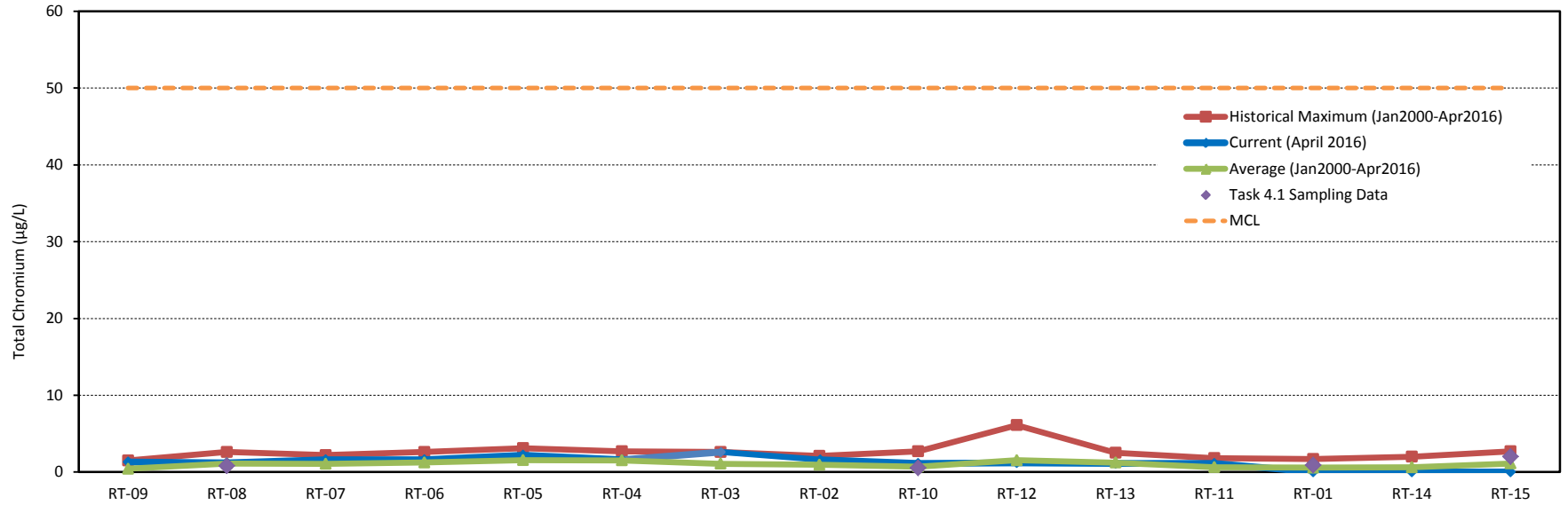
# Rinaldi Toluca Carbon Tetrachloride



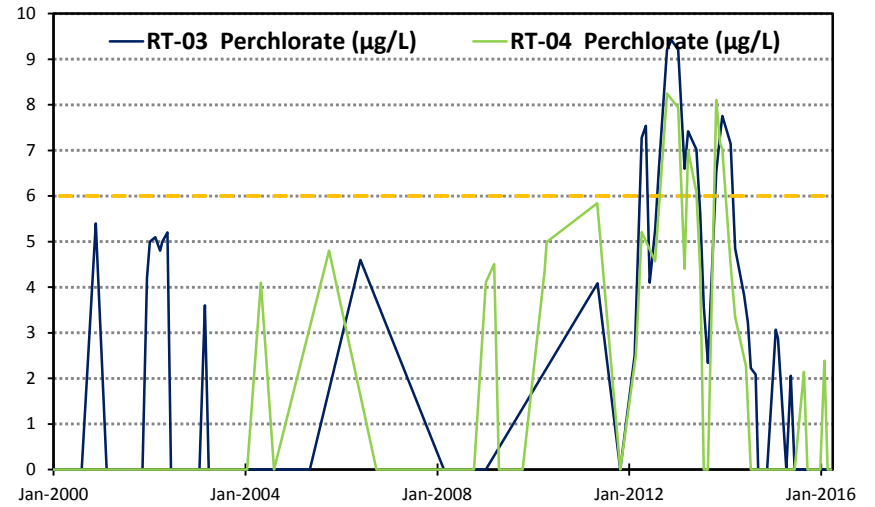
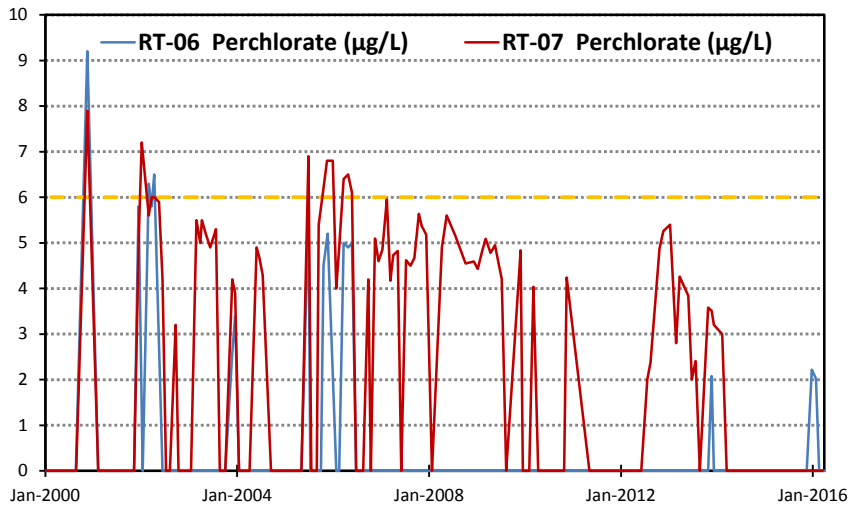
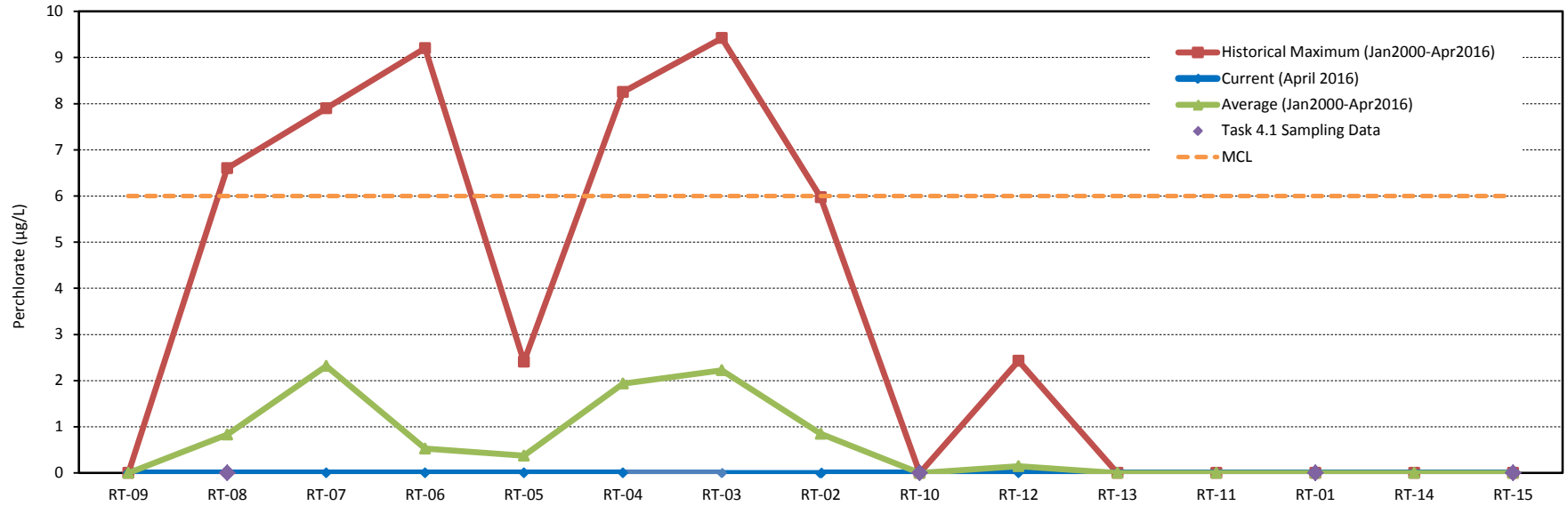
# Rinaldi Toluca Hexavalent Chromium



# Rinaldi Toluca Total Chromium

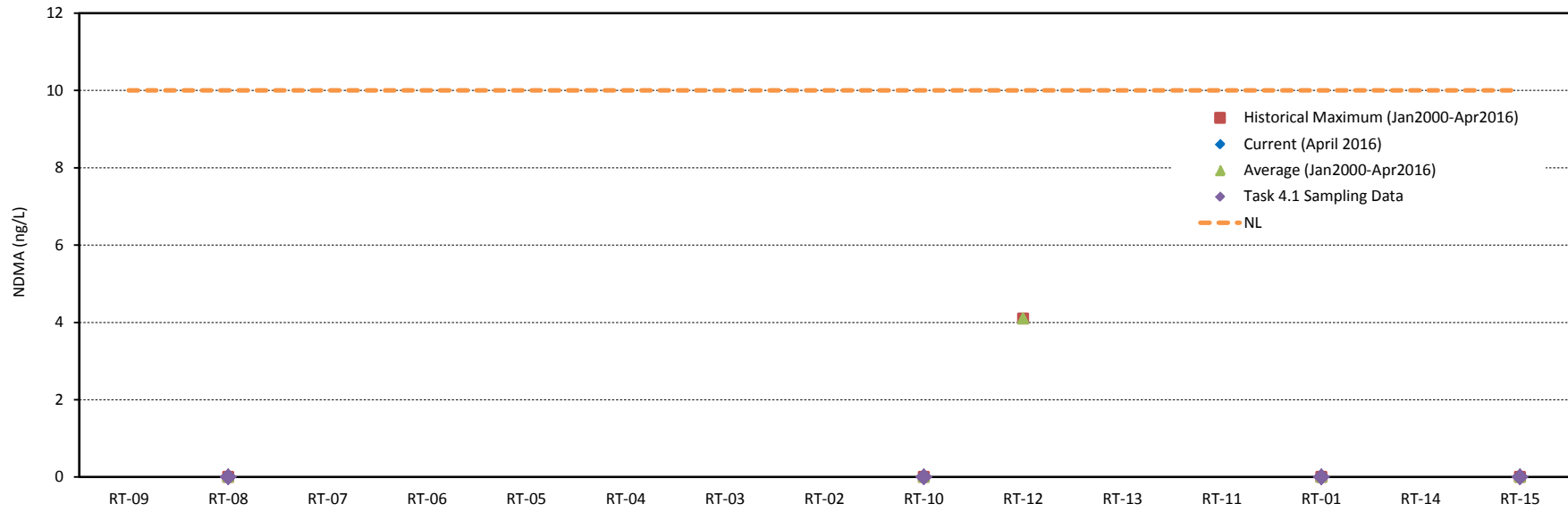


# Rinaldi Toluca Perchlorate

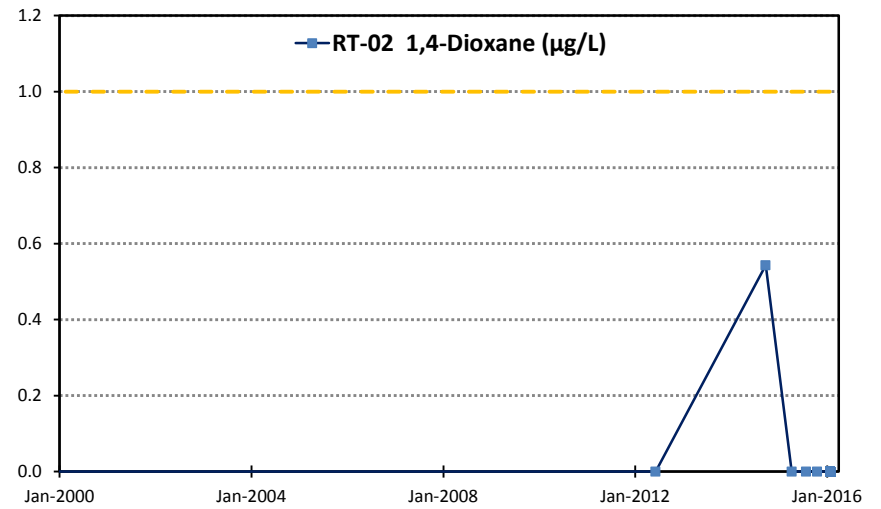
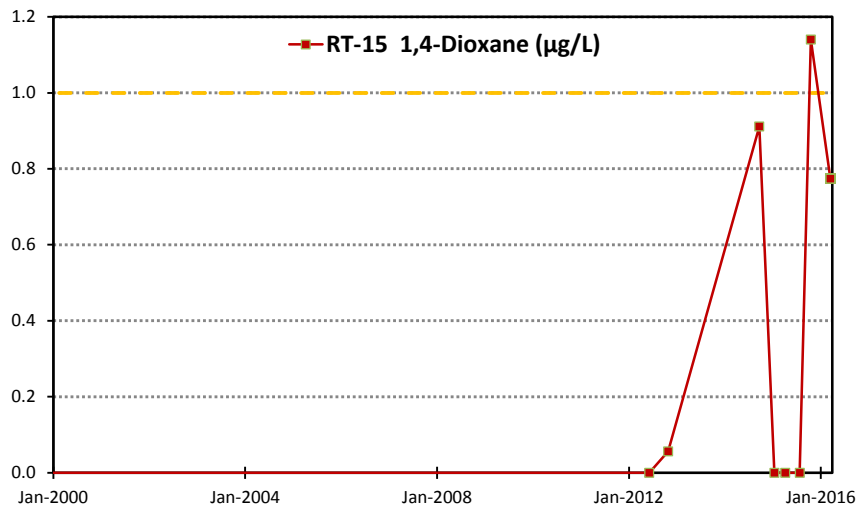
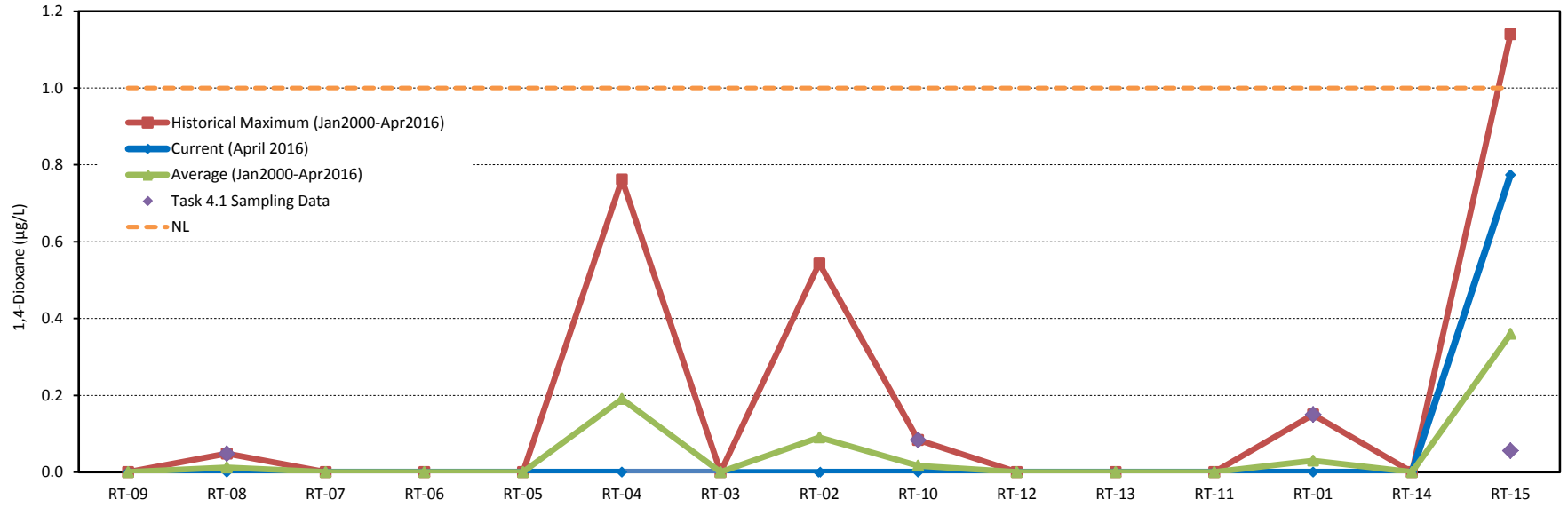




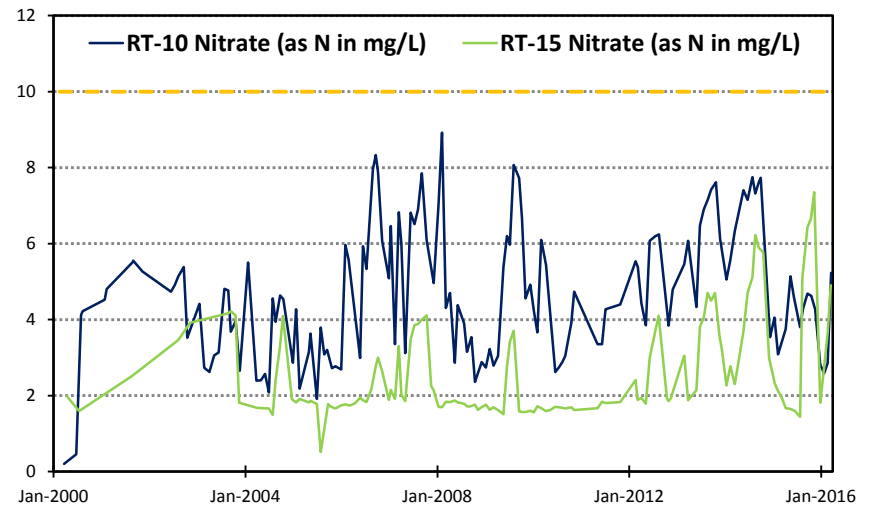
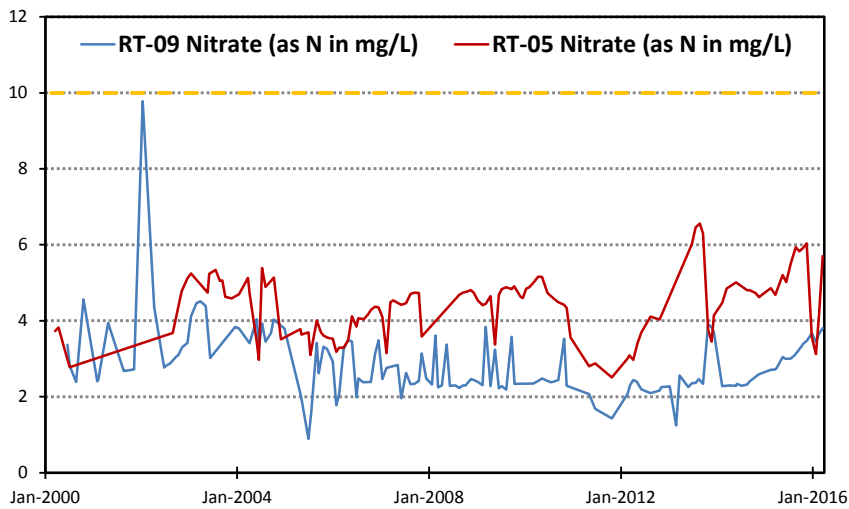
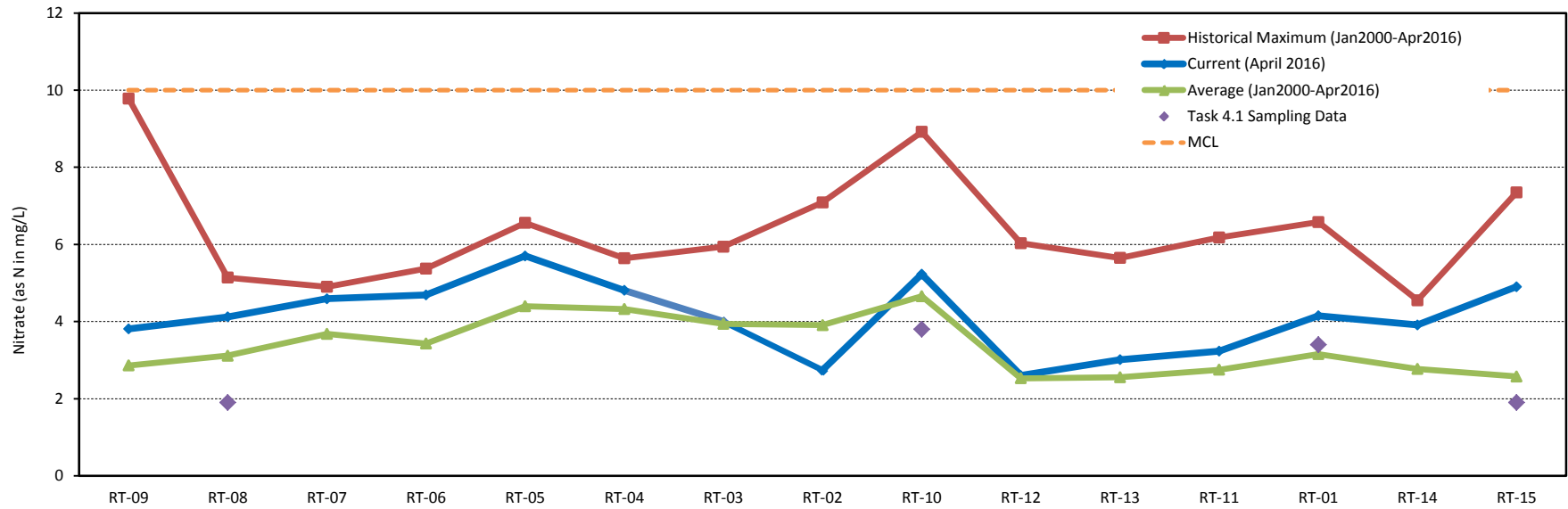
# Rinaldi Toluca NDMA



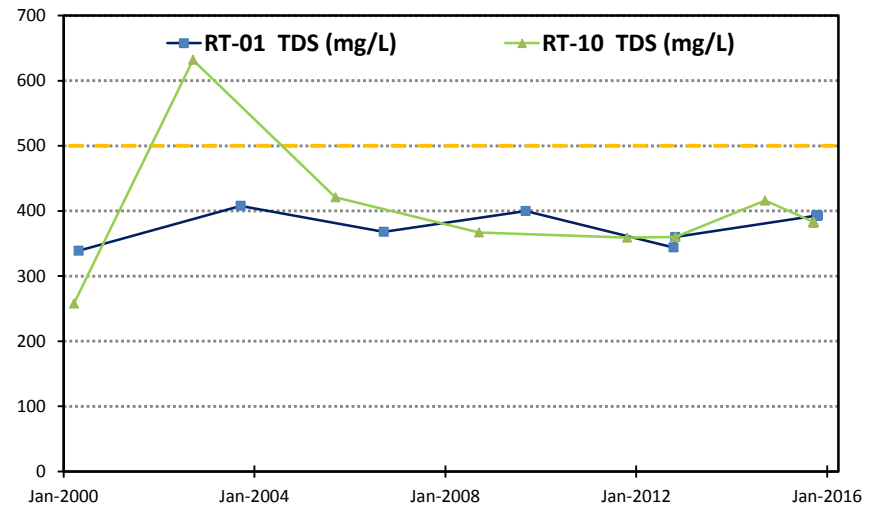
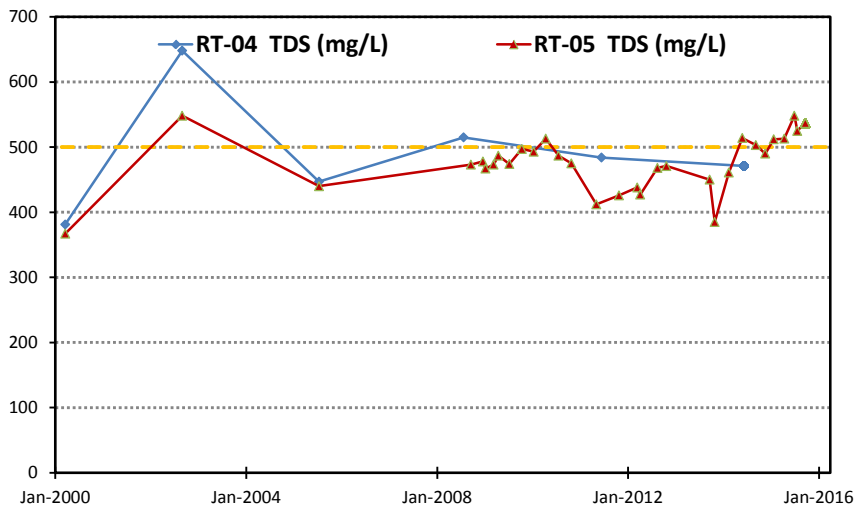
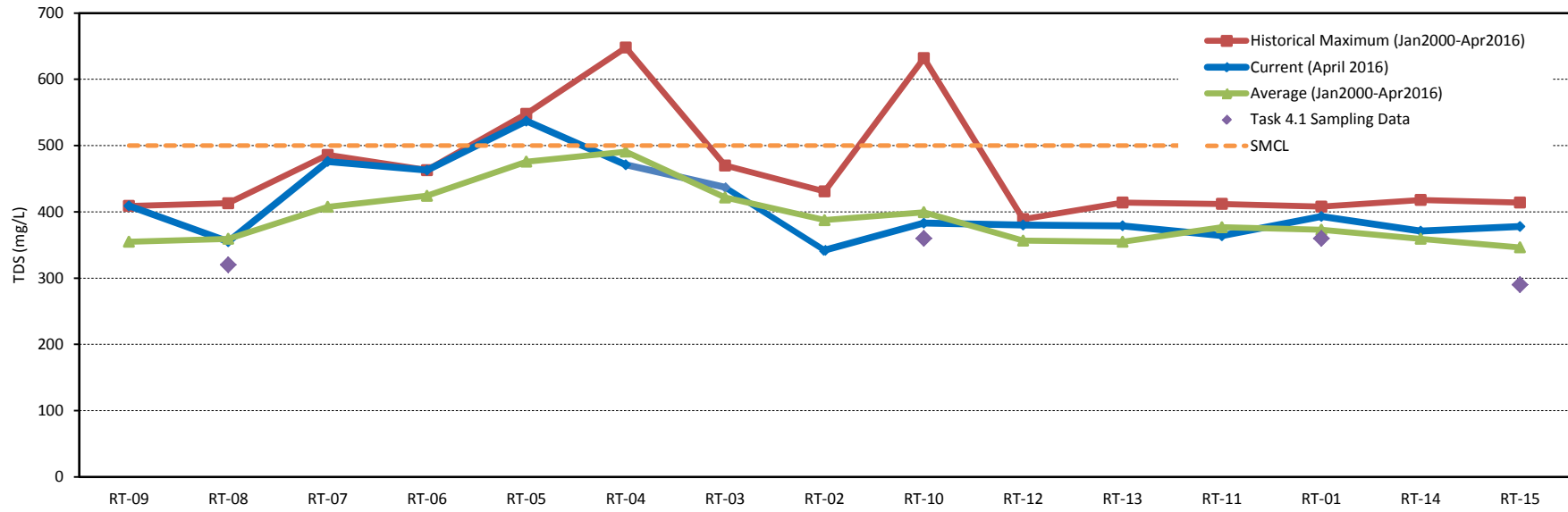
# Rinaldi Toluca 1,4-Dioxane



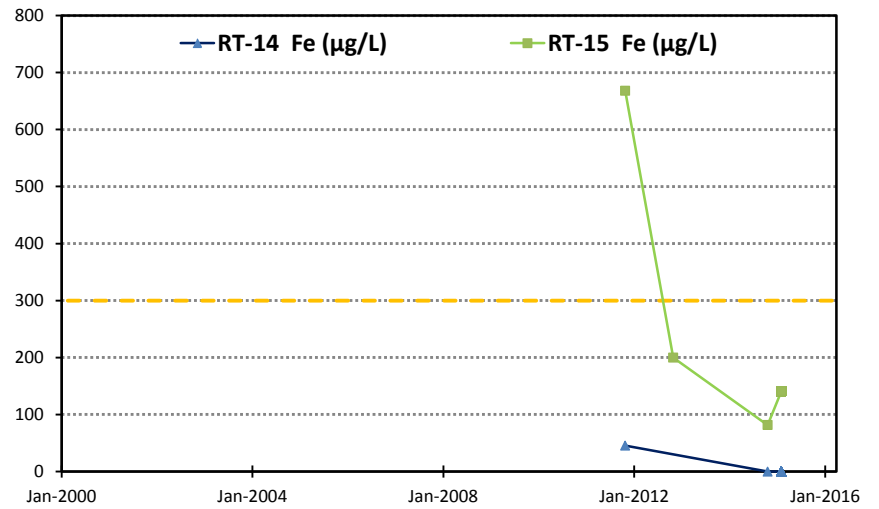
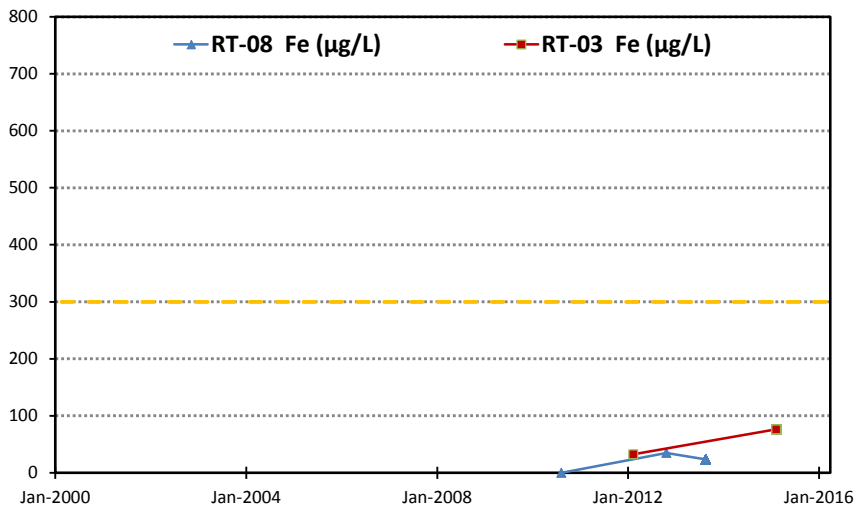
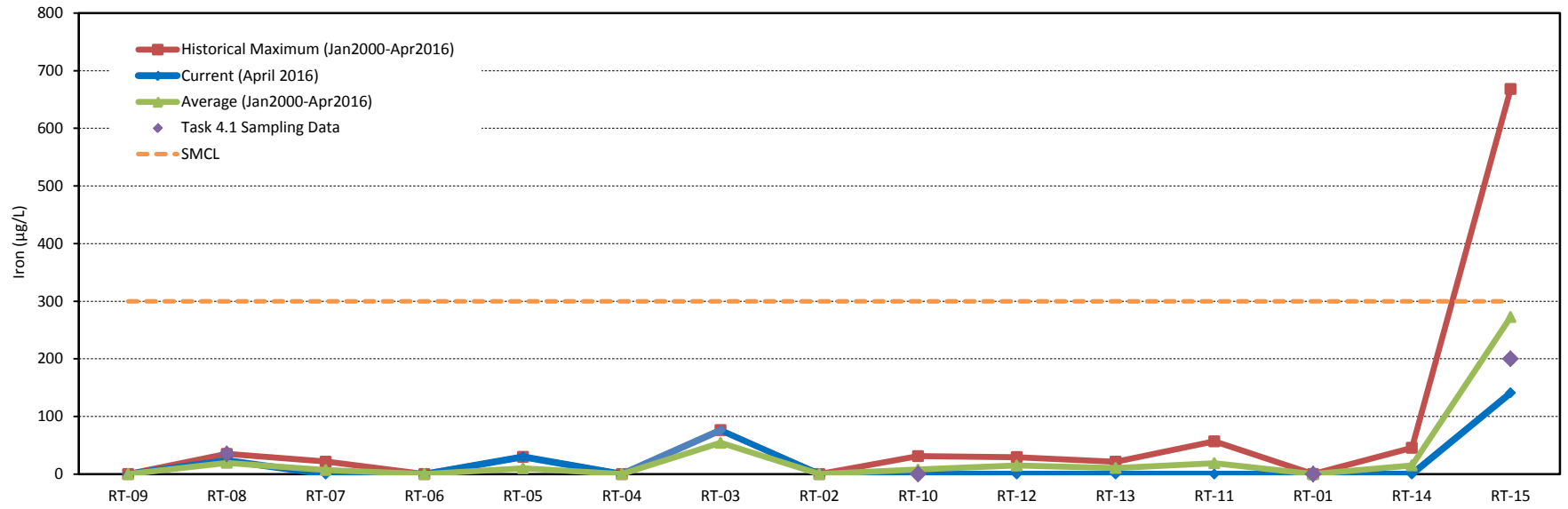
# Rinaldi Toluca Nitrate



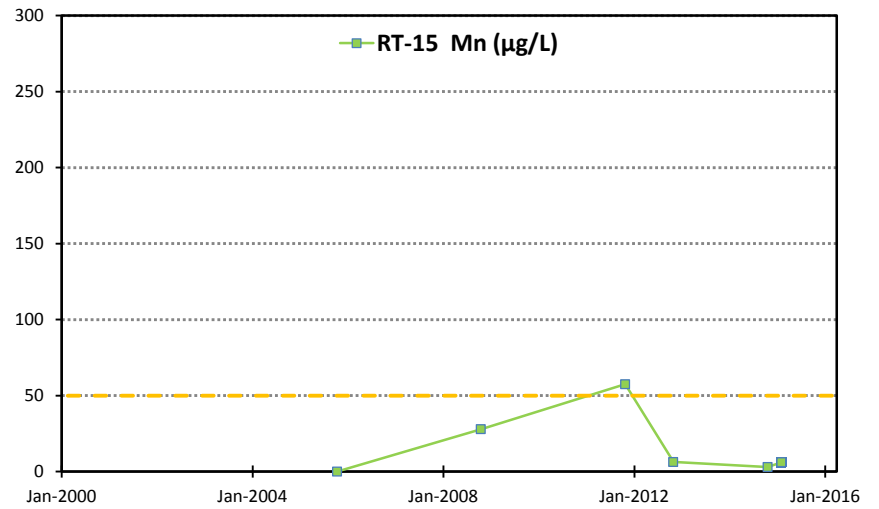
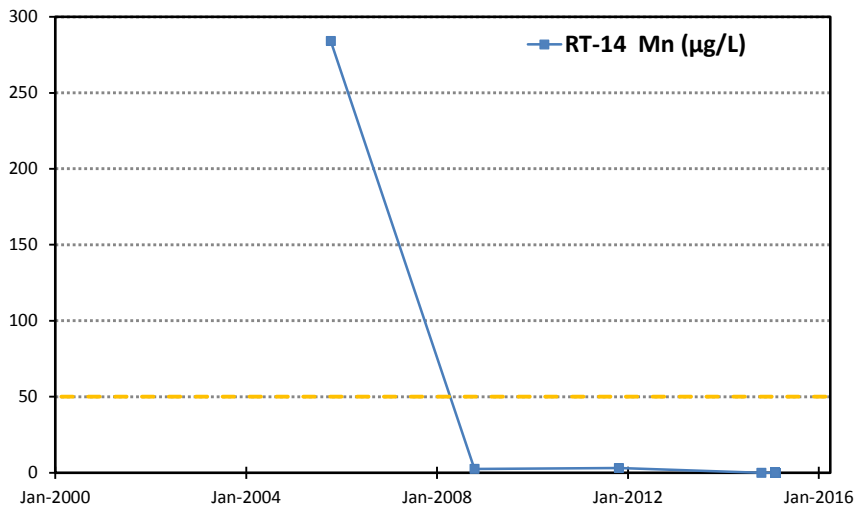
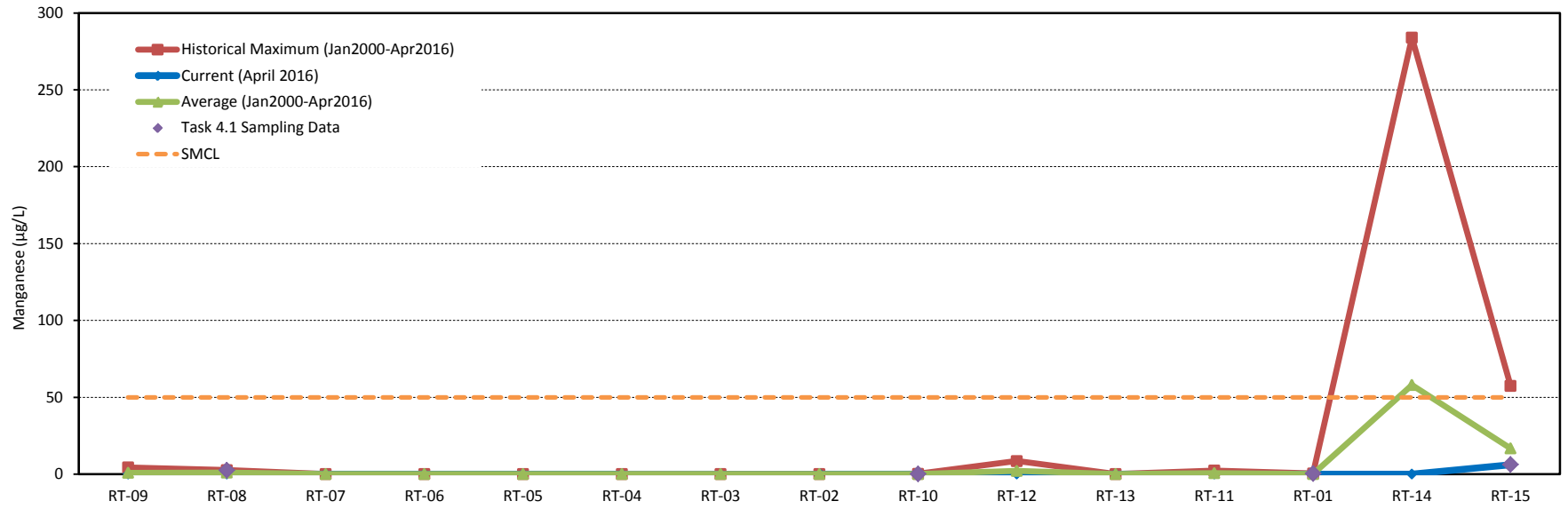
# Rinaldi Toluca TDS



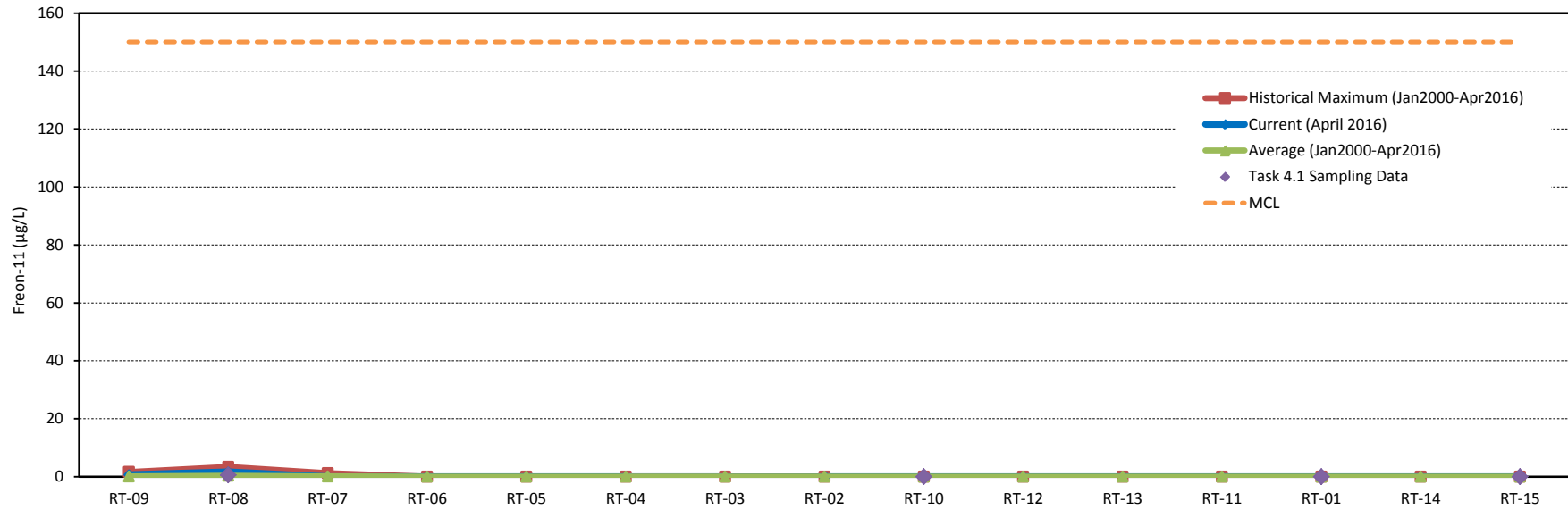
# Rinaldi Toluca Iron



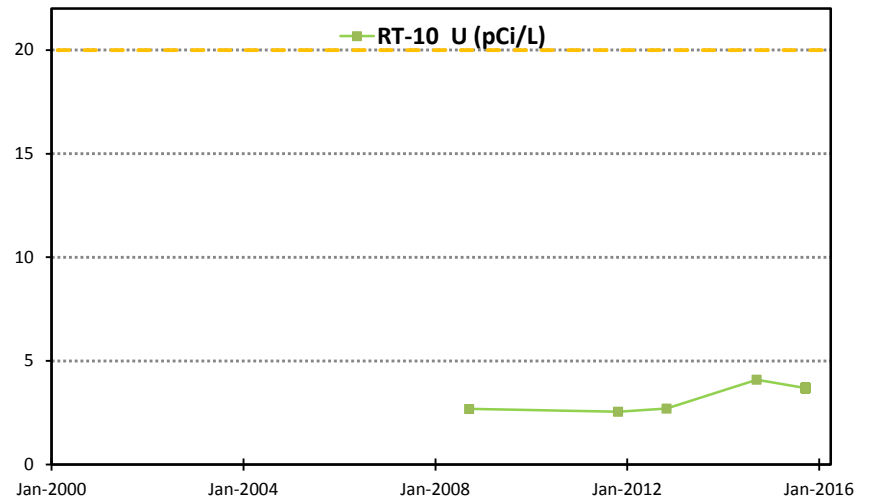
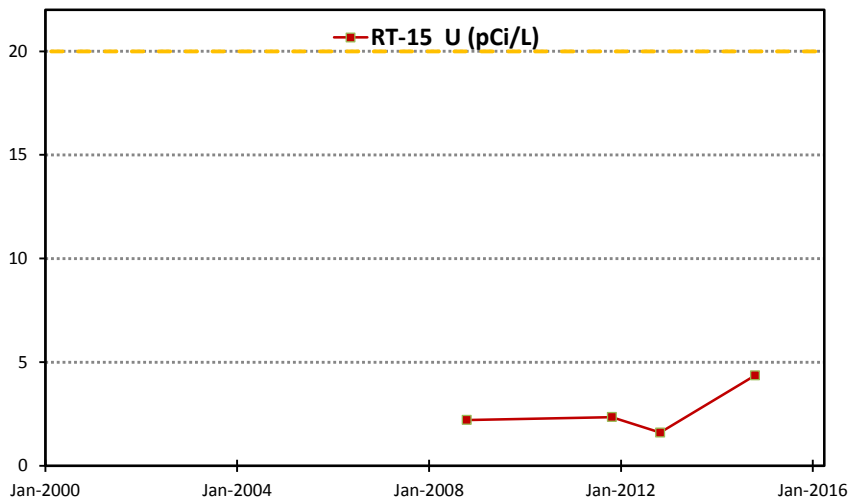
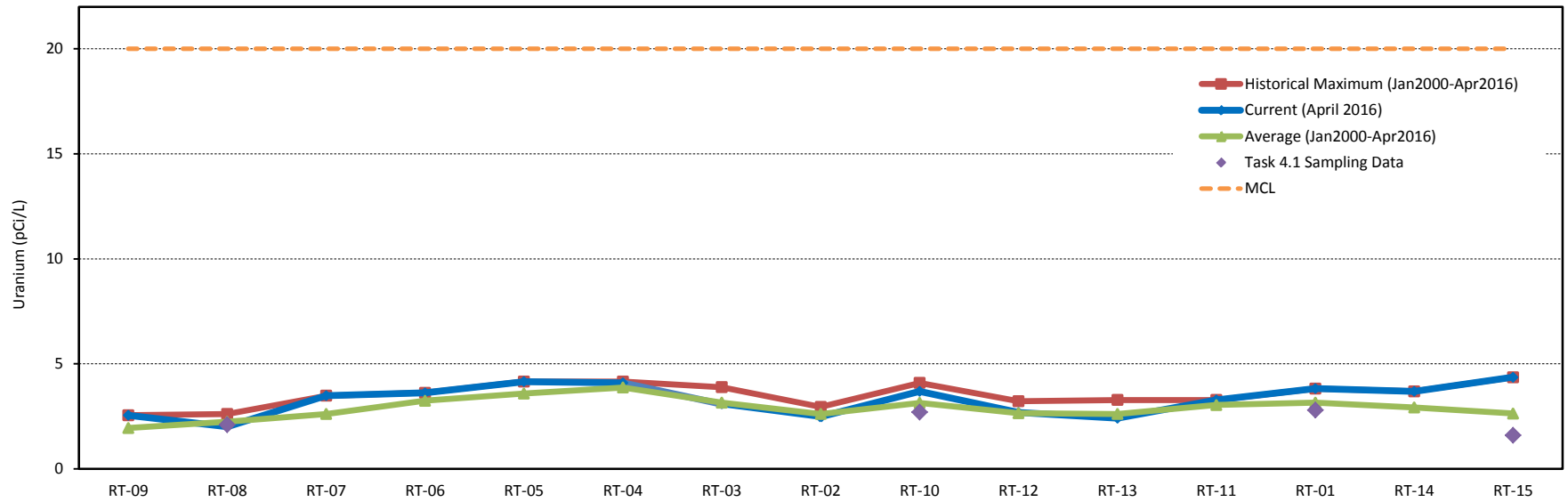
# Rinaldi Toluca Manganese



# Rinaldi Toluca Trichlorofluoromethane

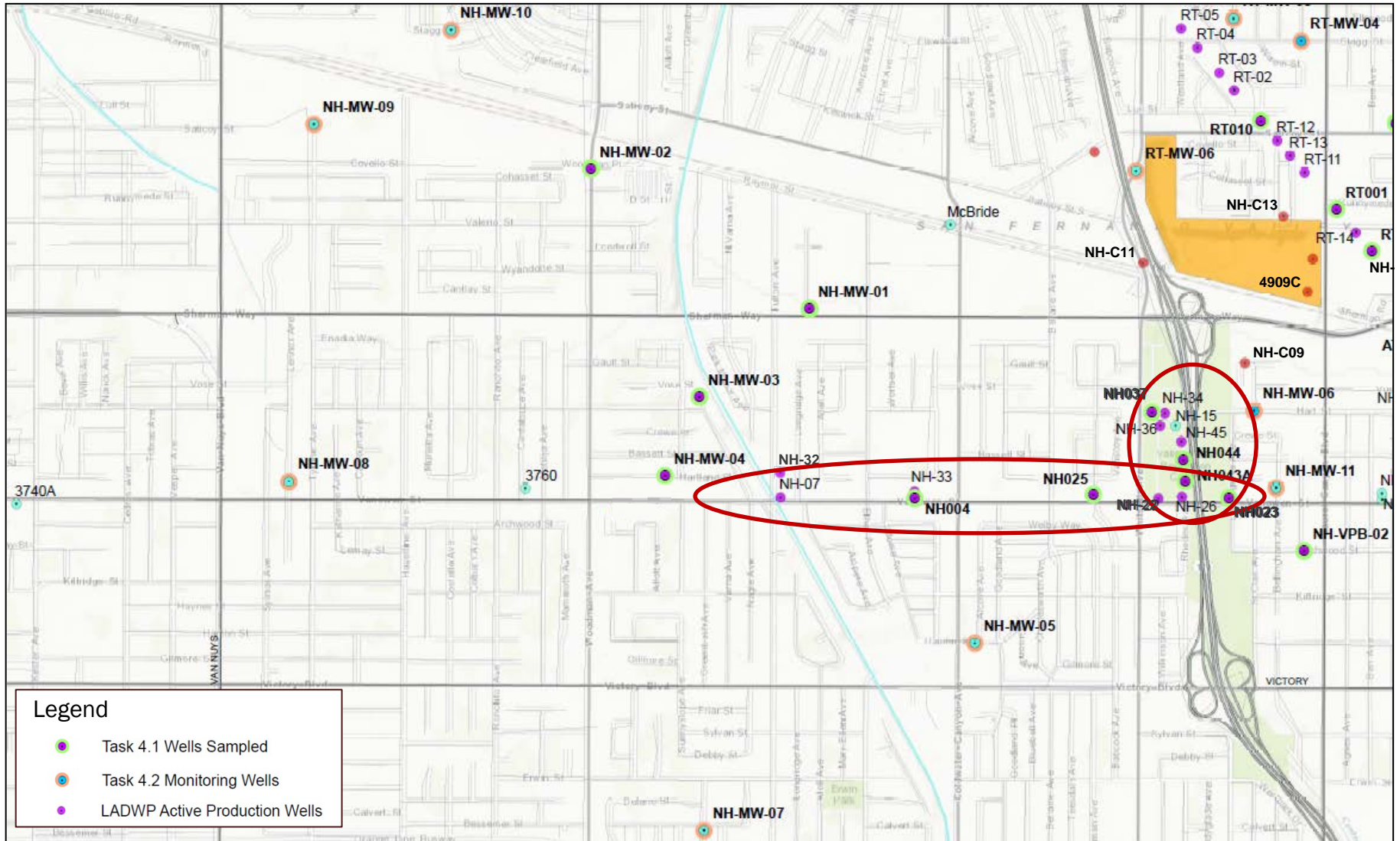


# Rinaldi Toluca Uranium

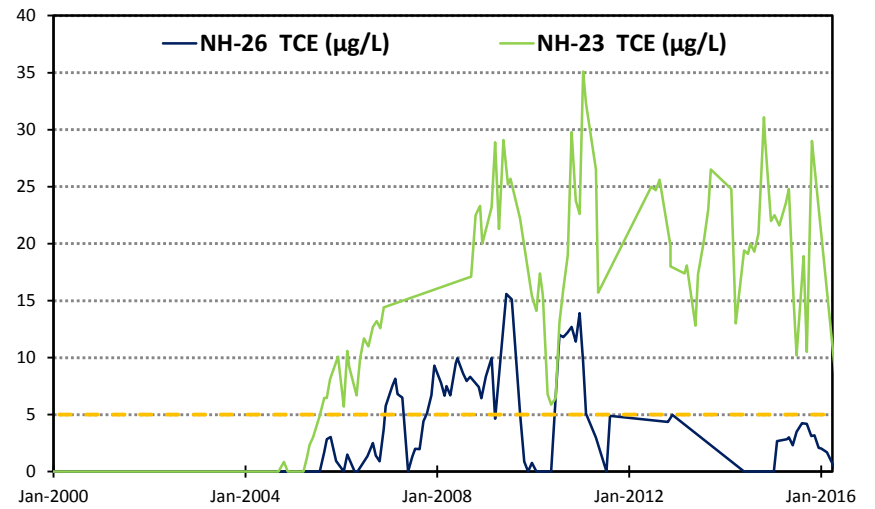
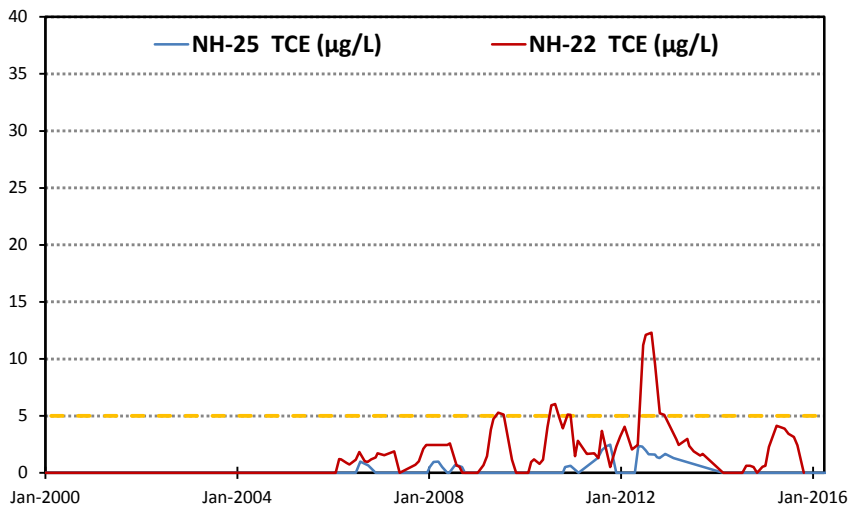
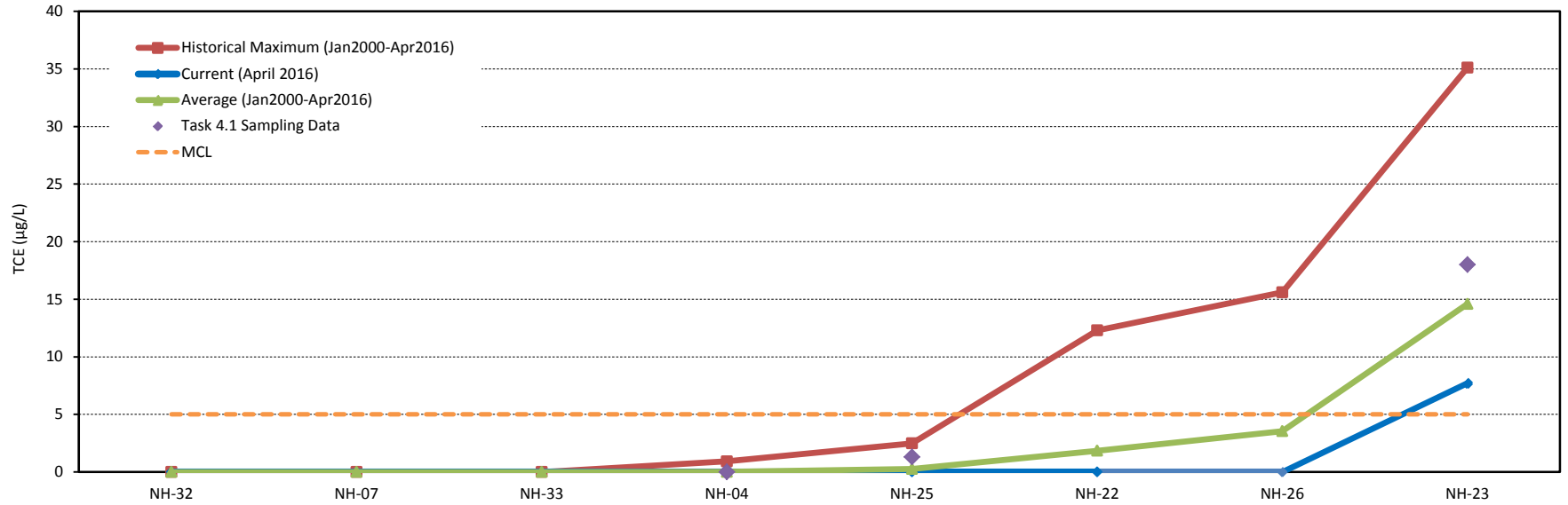




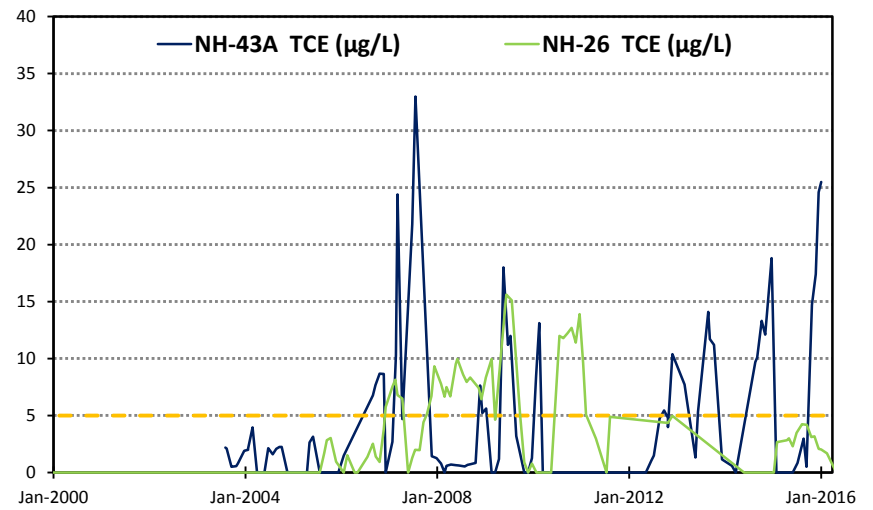
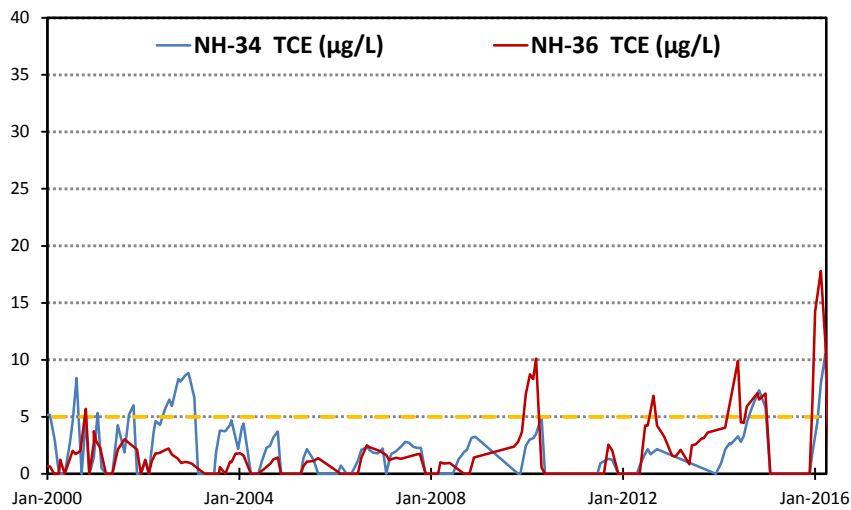
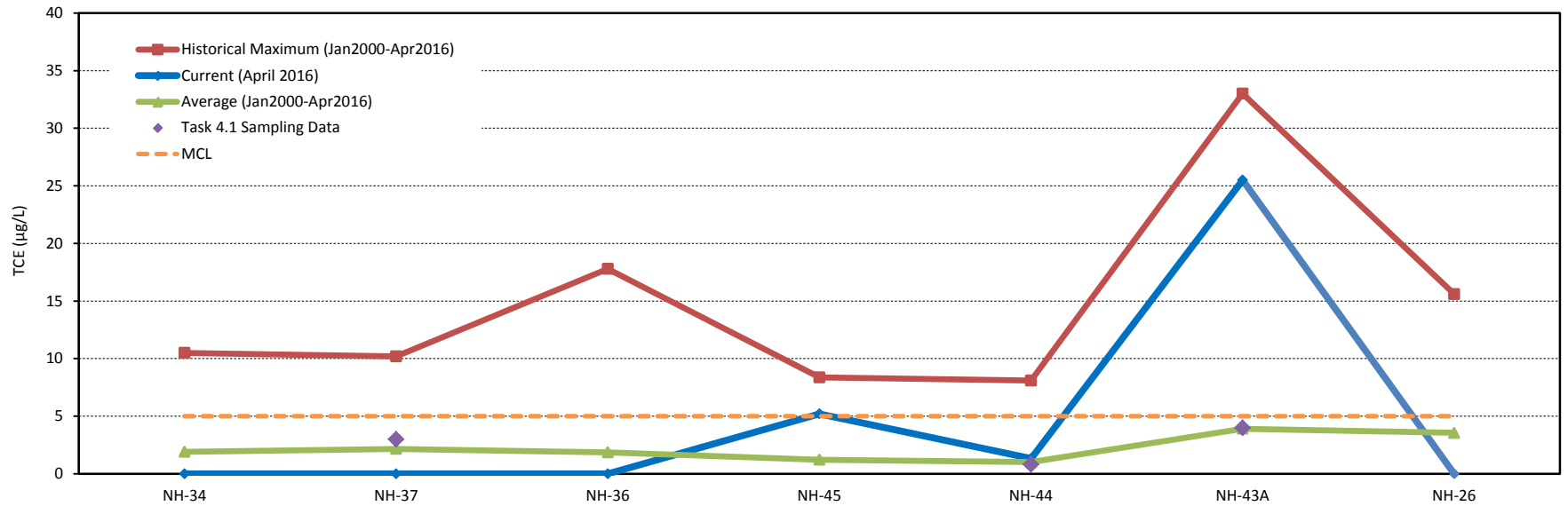
# North Hollywood West



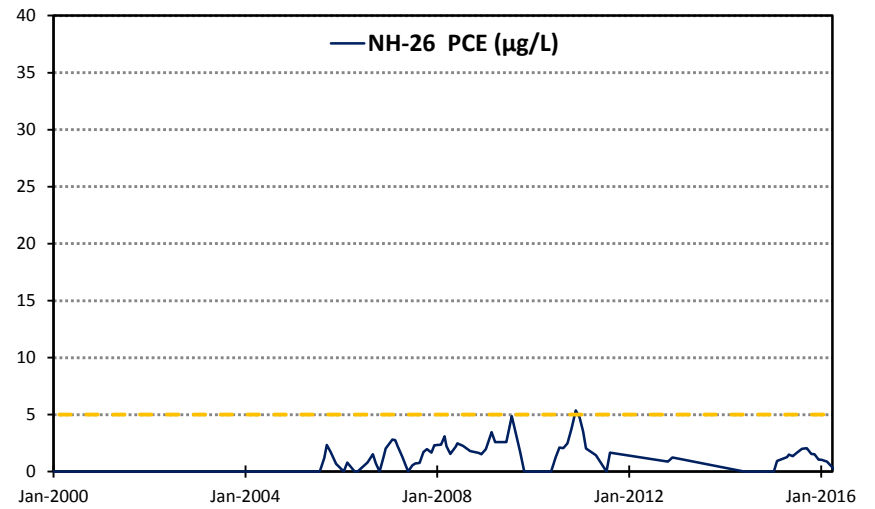
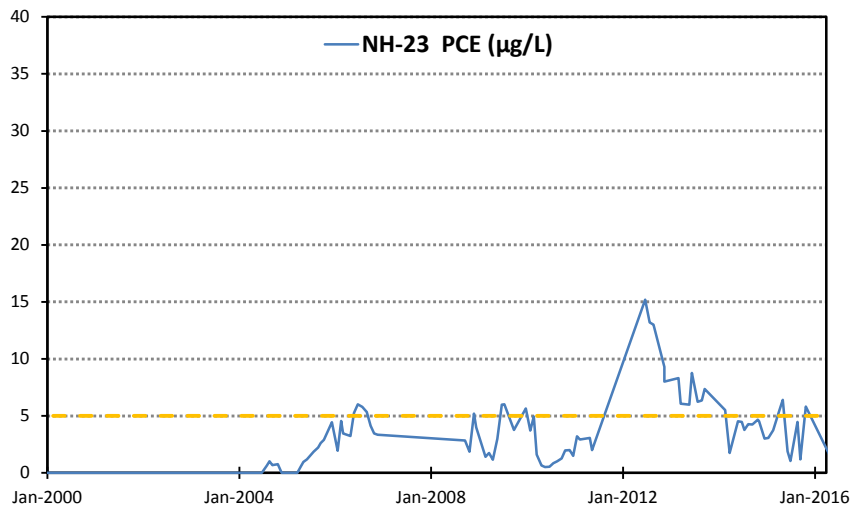
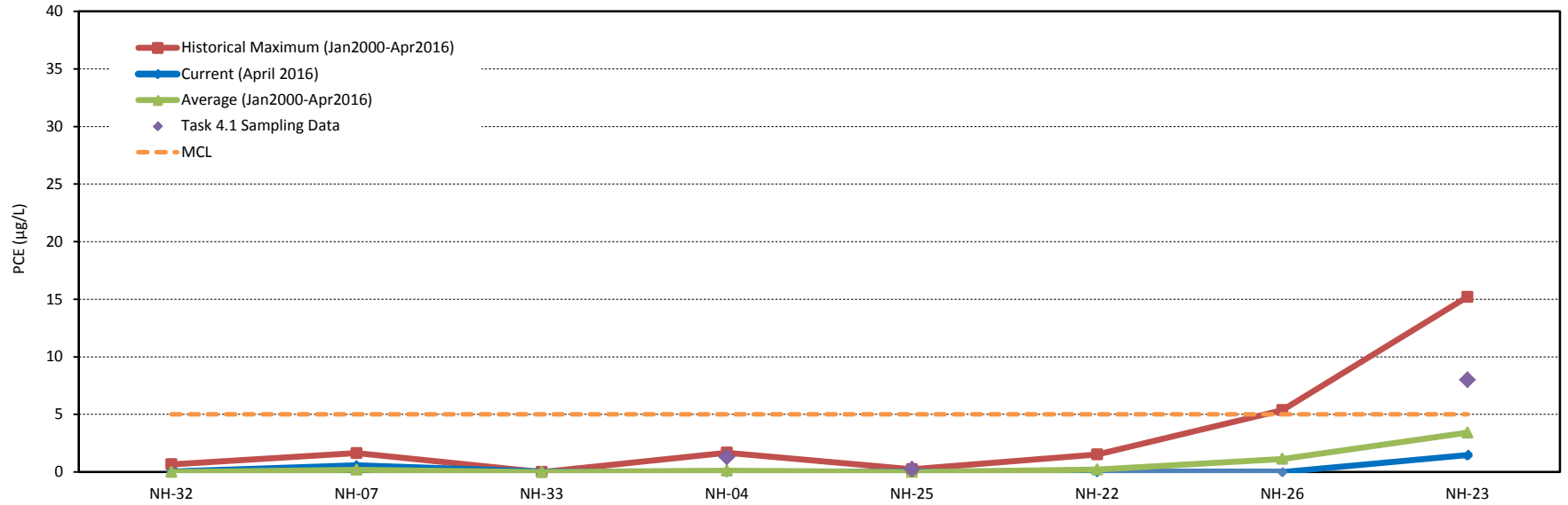
# North Hollywood West TCE



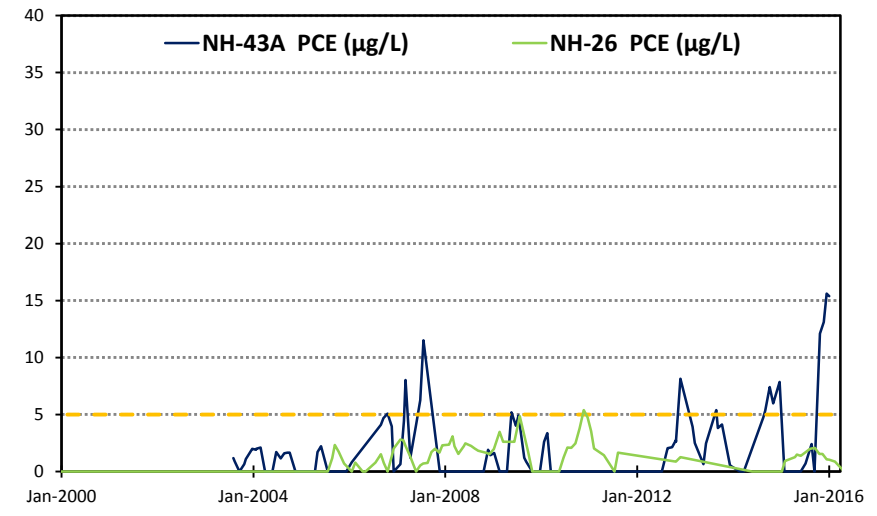
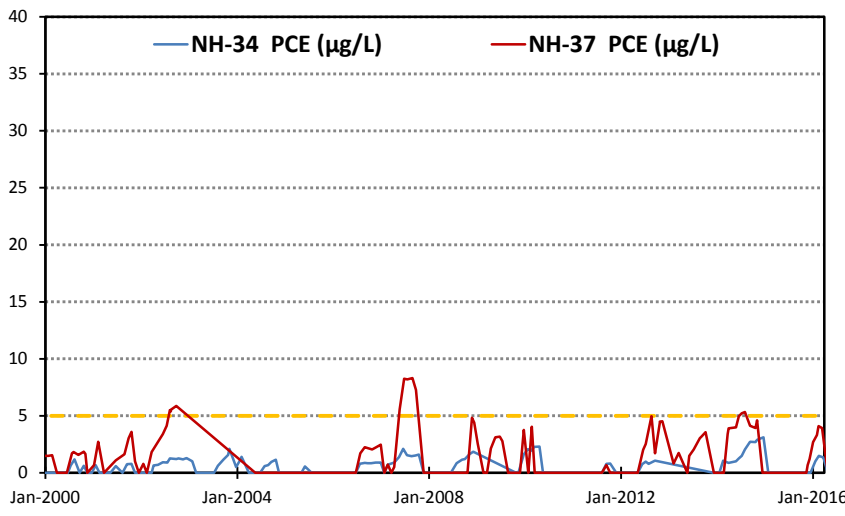
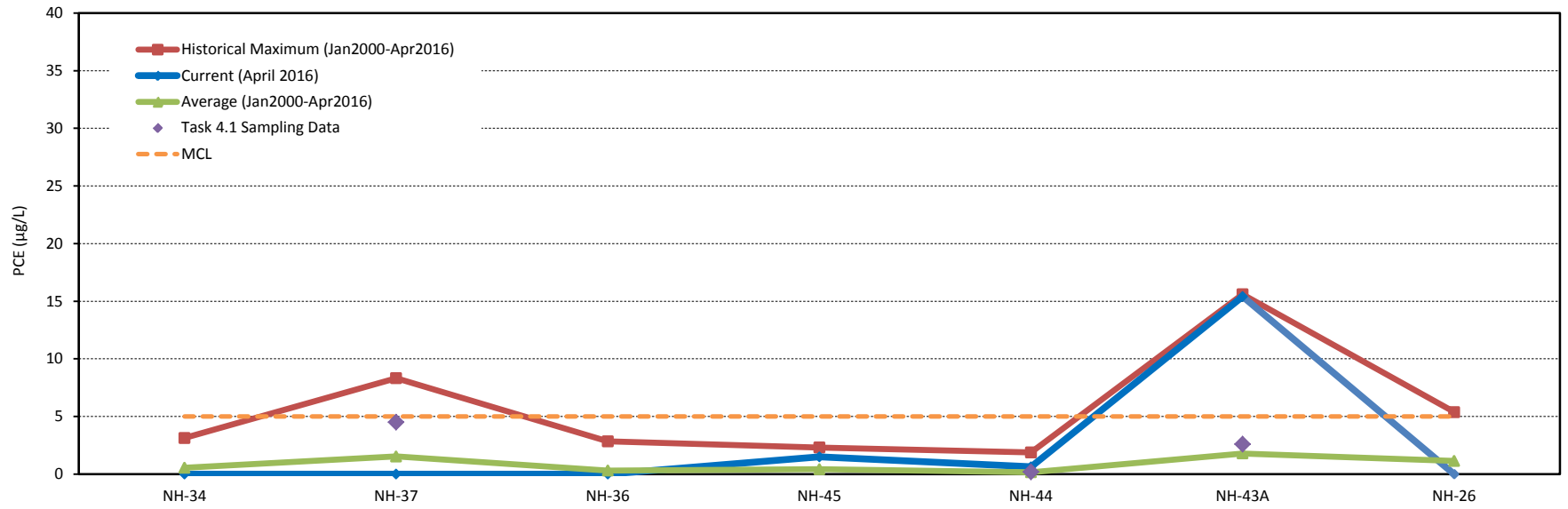
# North Hollywood West TCE



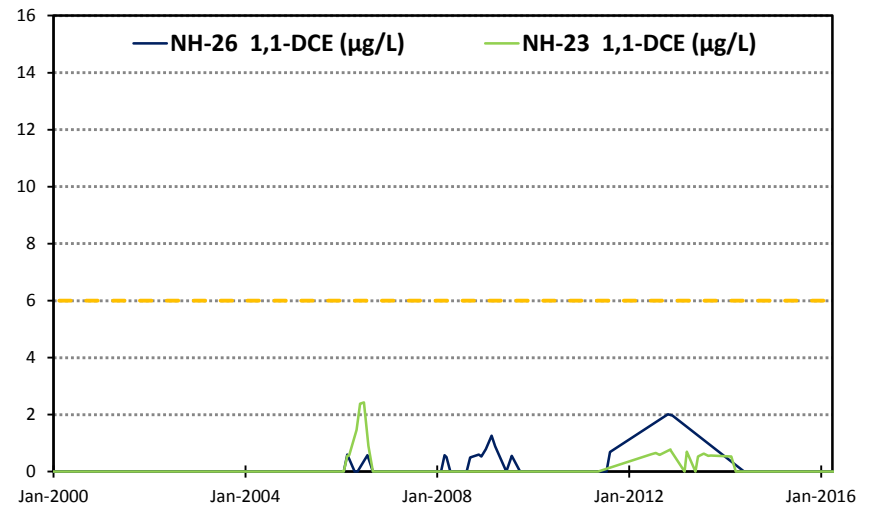
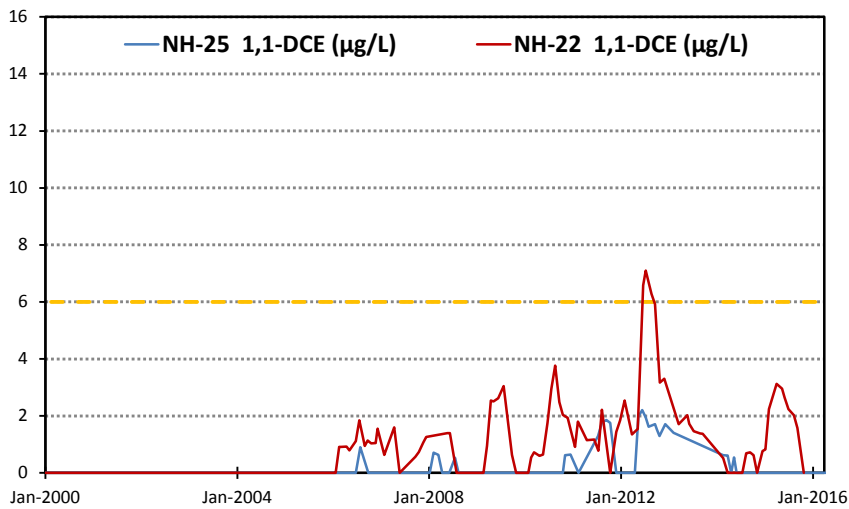
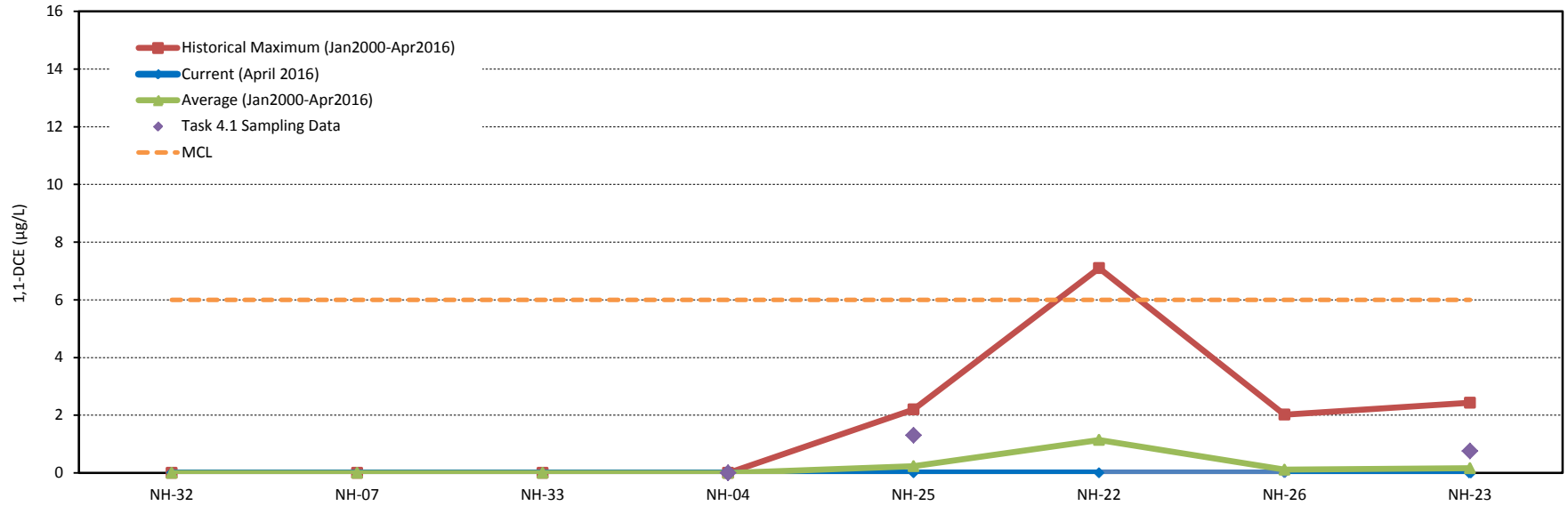
# North Hollywood West PCE



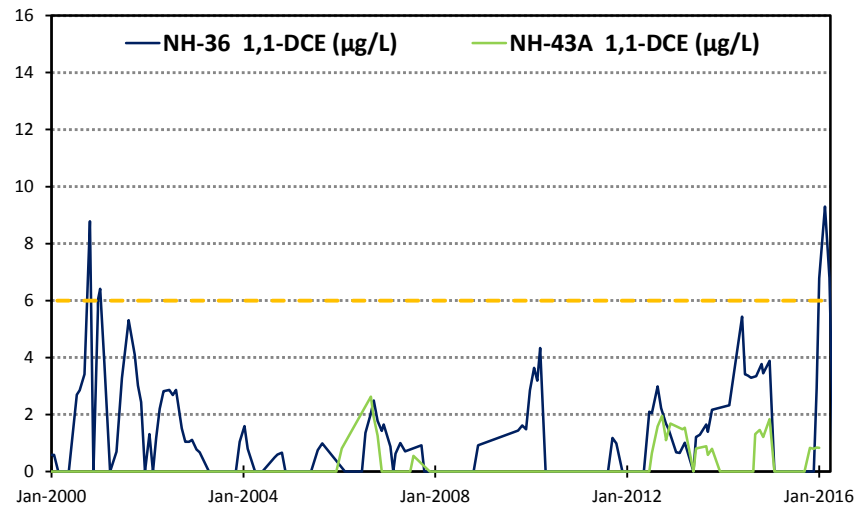
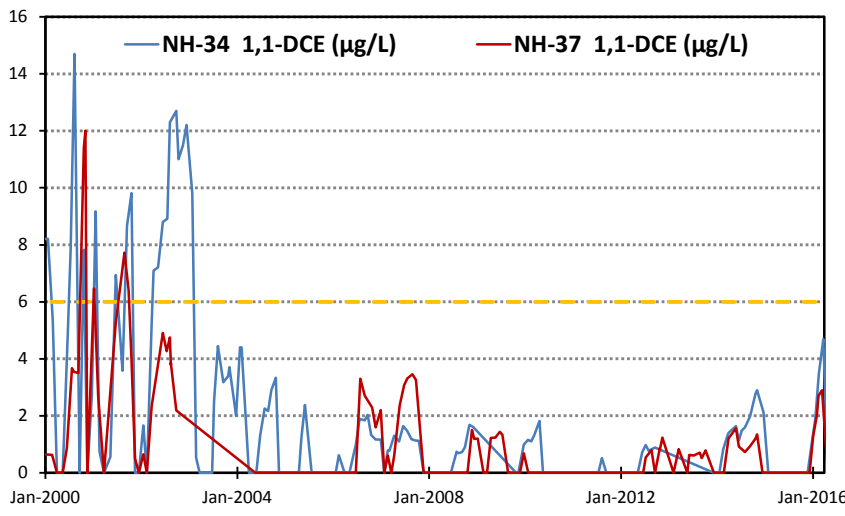
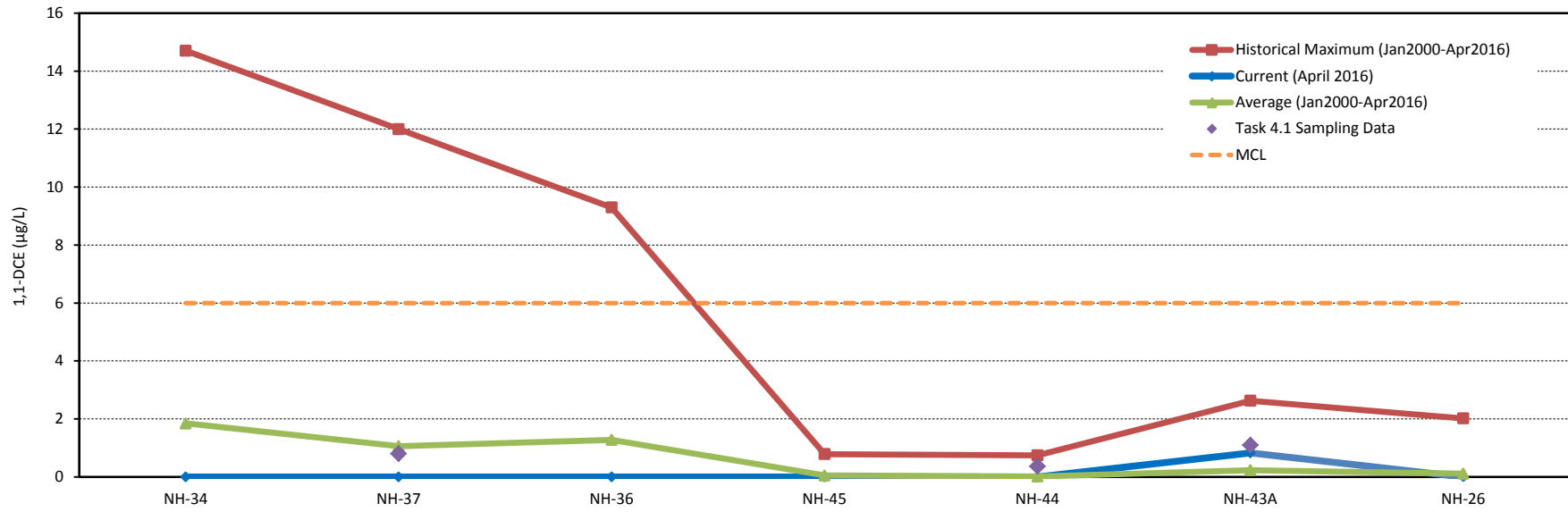
# North Hollywood West PCE



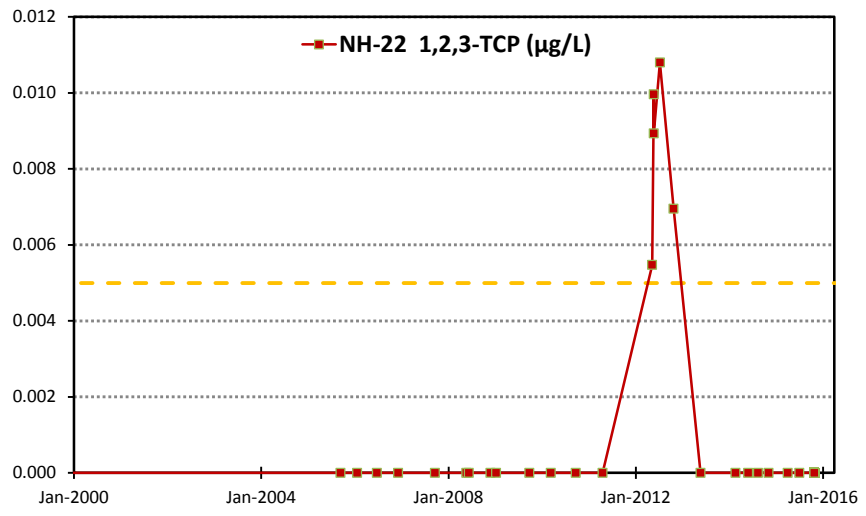
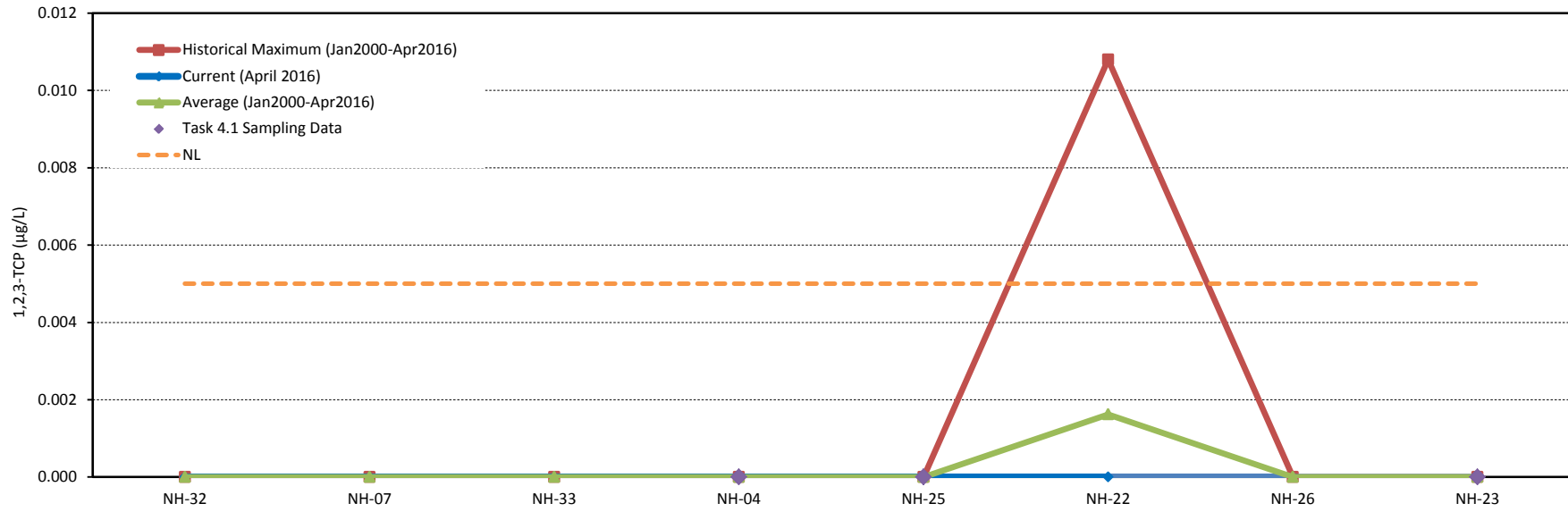
# North Hollywood West 1,1-DCE



# North Hollywood West 1,1-DCE

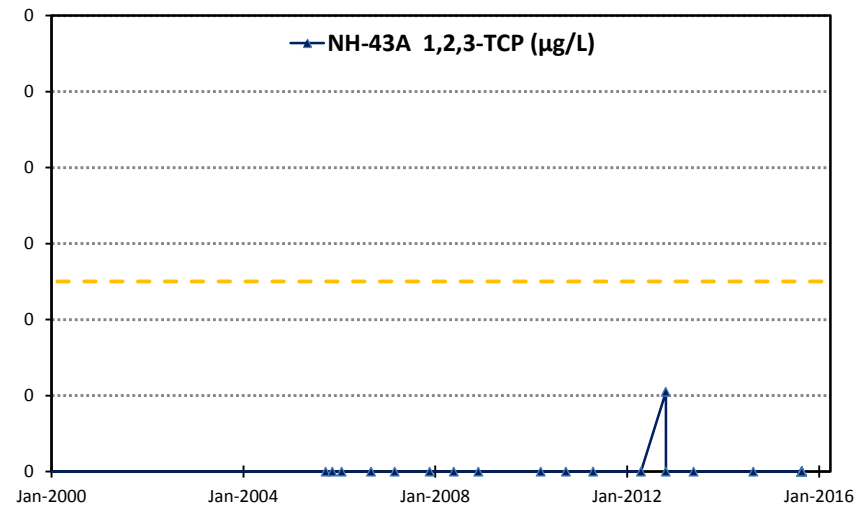
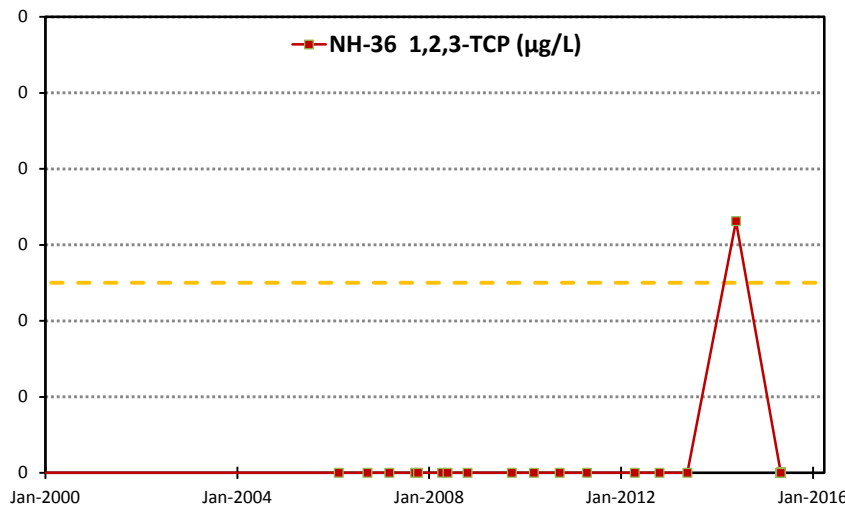
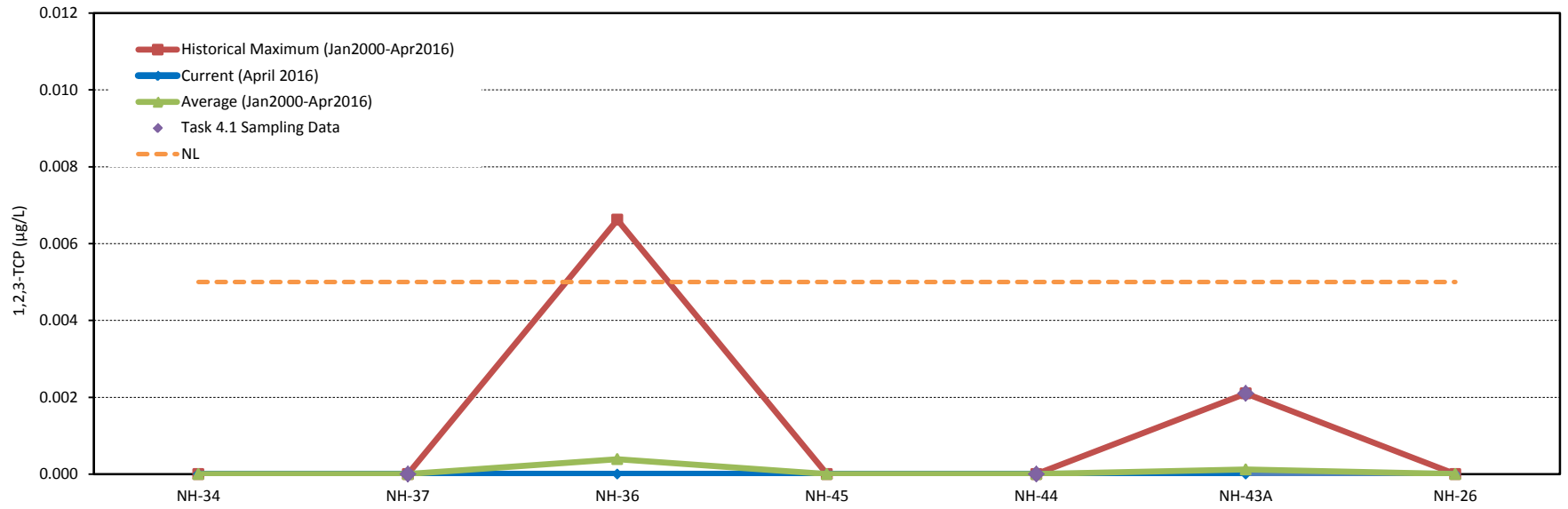


# North Hollywood West 1,2,3-TCP

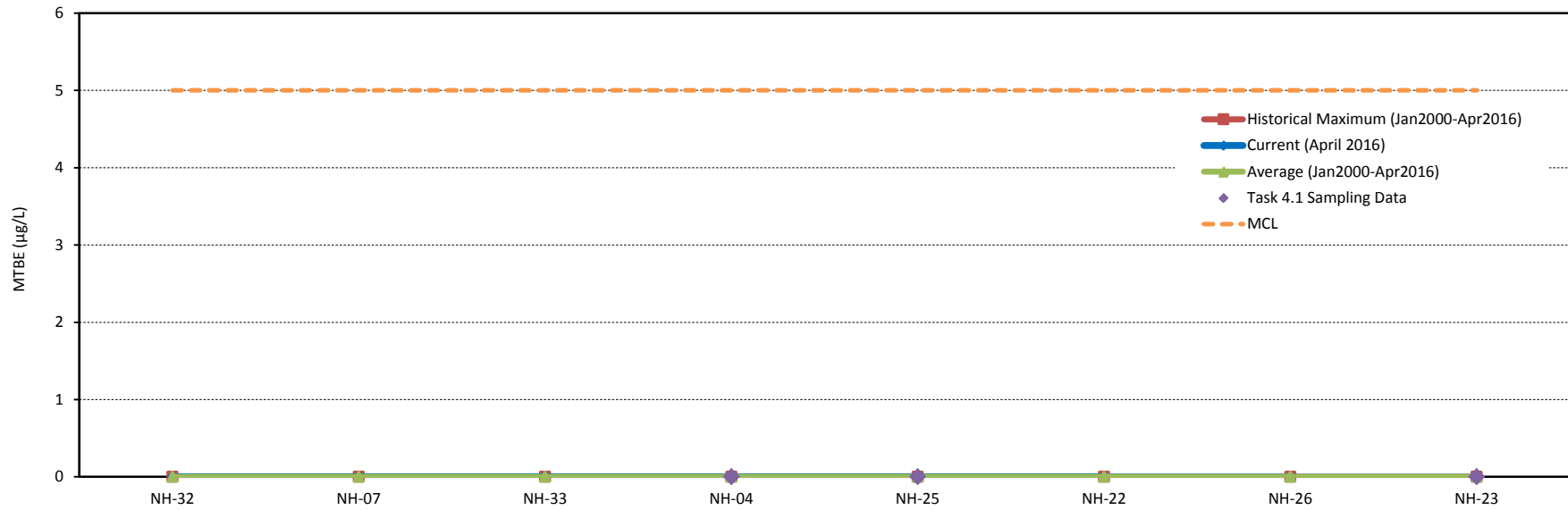




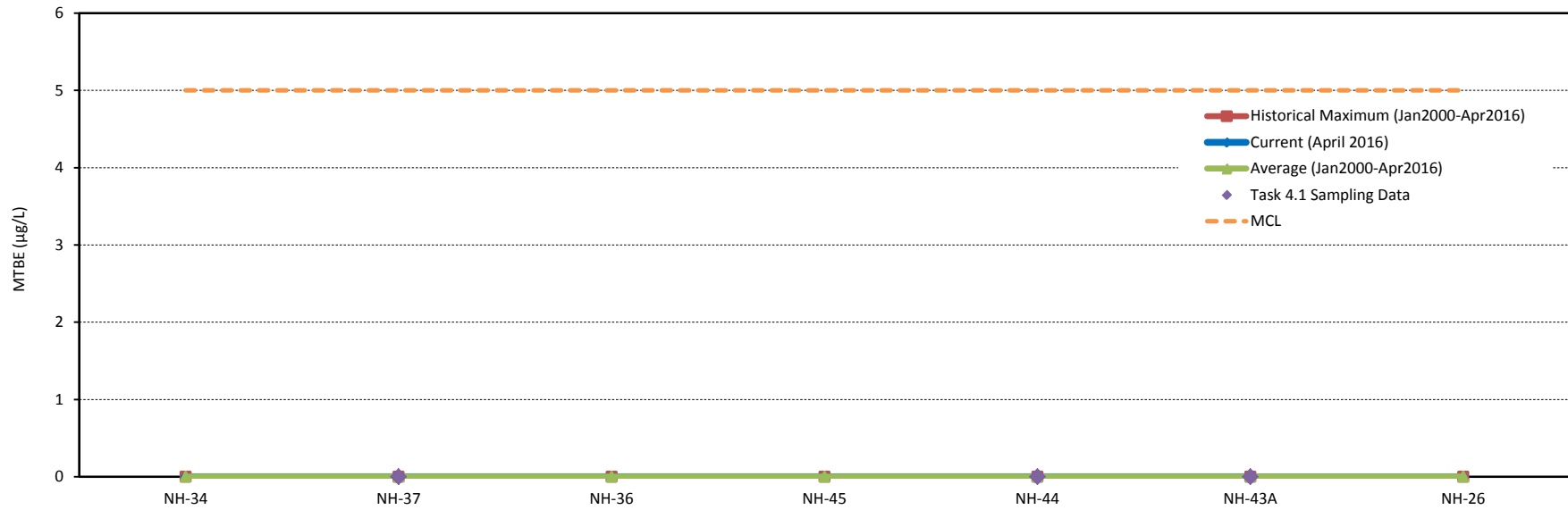
# North Hollywood West 1,2,3-TCP



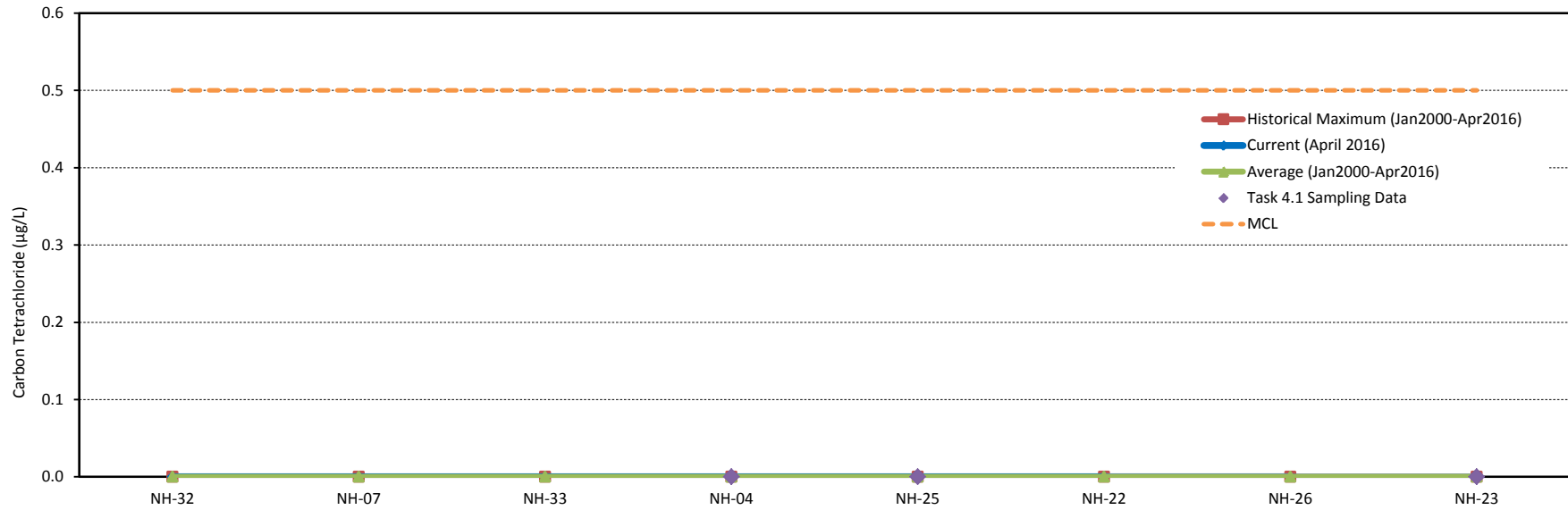
# North Hollywood West MTBE



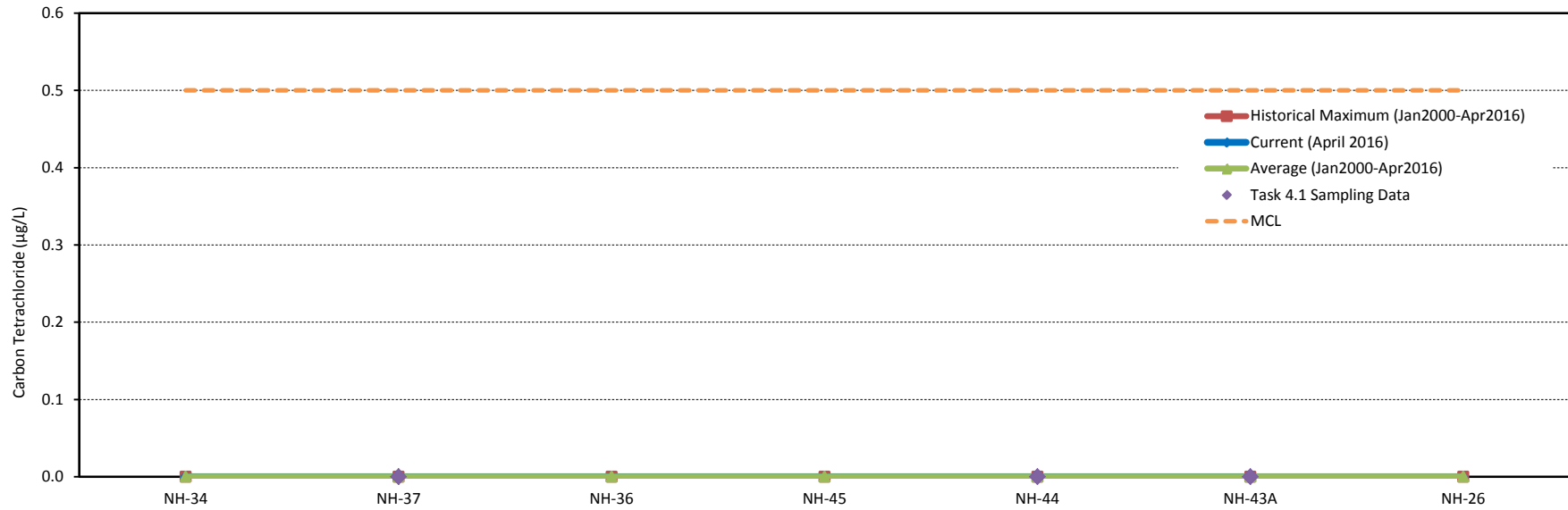
# North Hollywood West MTBE



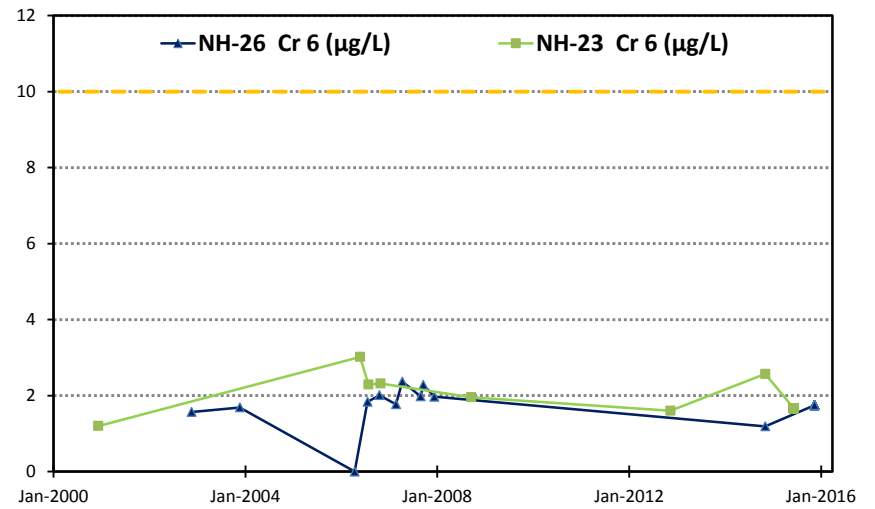
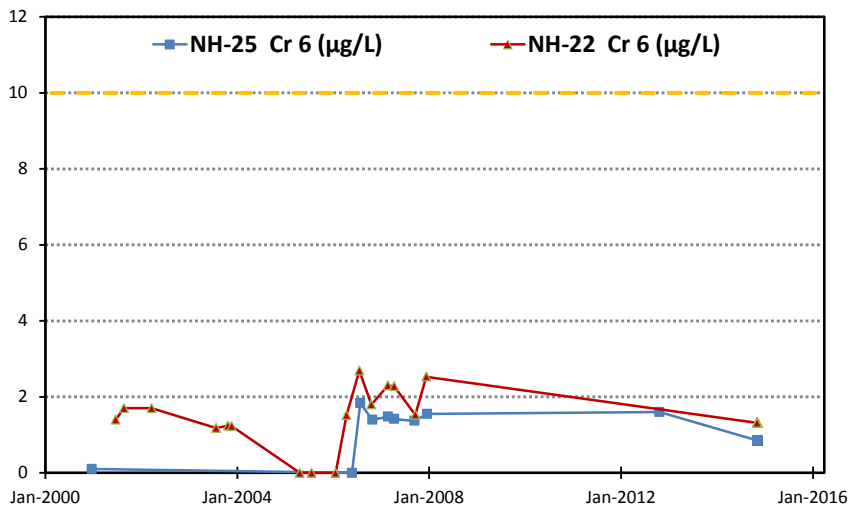
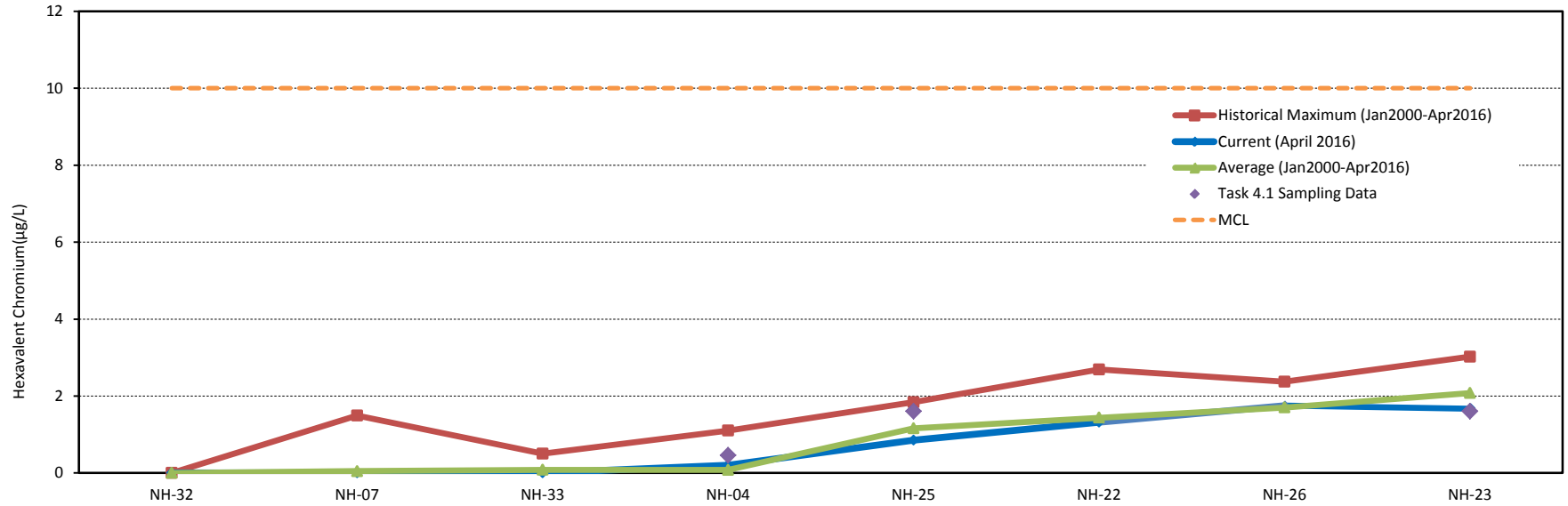
# North Hollywood West Carbon Tetrachloride



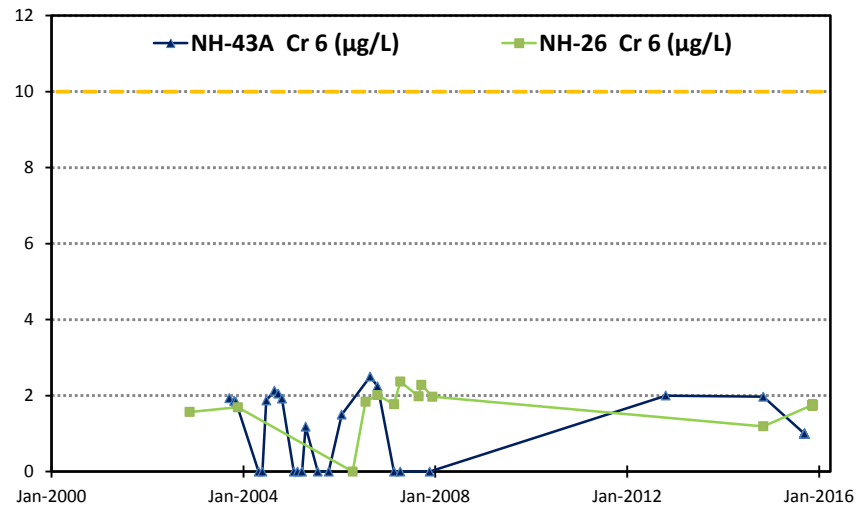
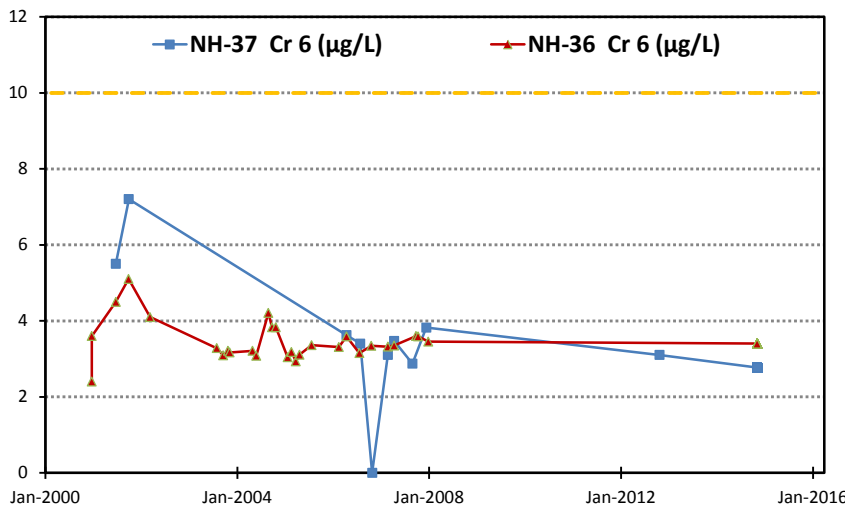
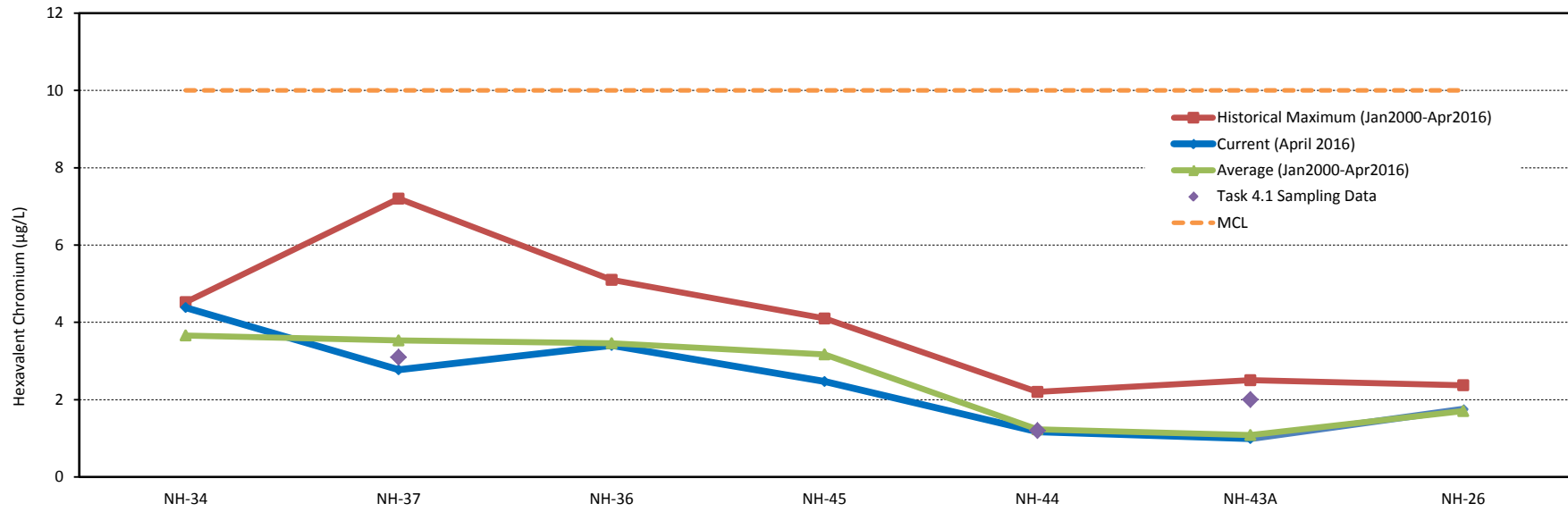
# North Hollywood West Carbon Tetrachloride



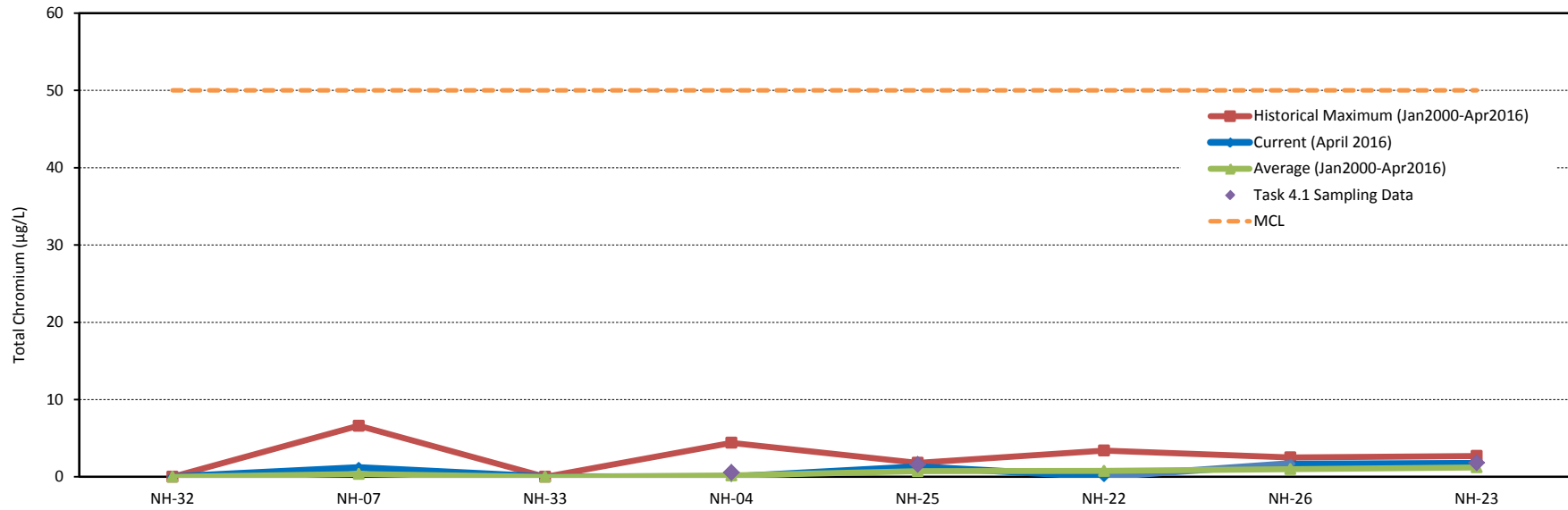
# North Hollywood West Hexavalent Chromium



# North Hollywood West Hexavalent Chromium

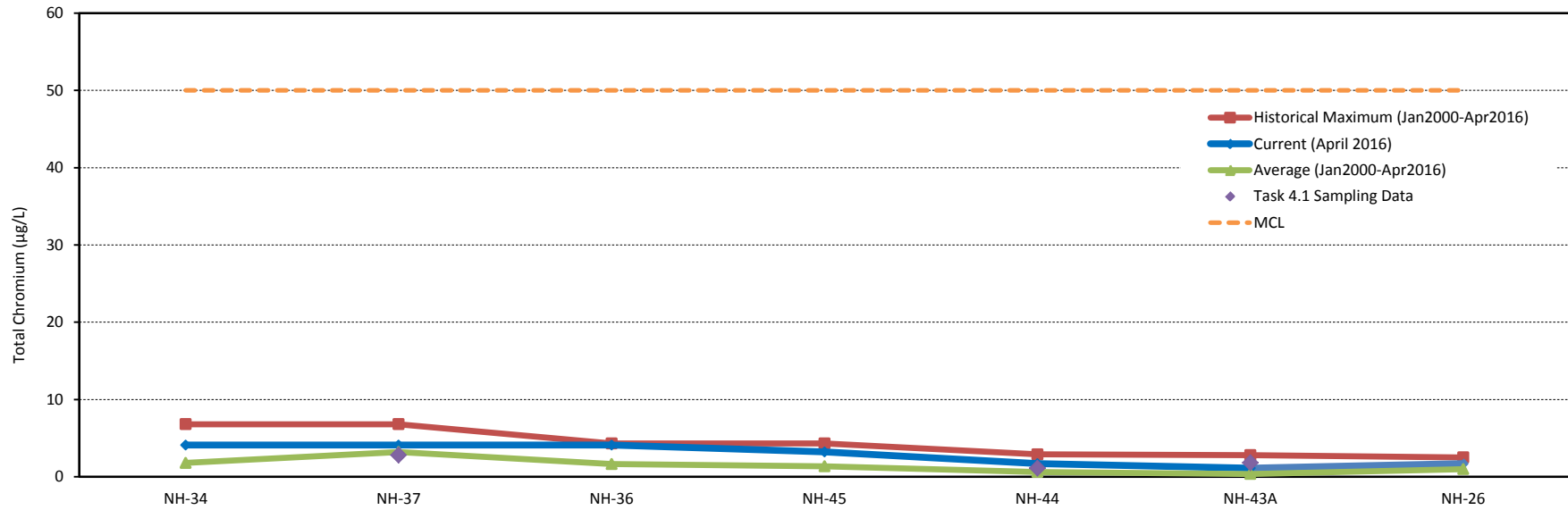


# North Hollywood West Total Chromium

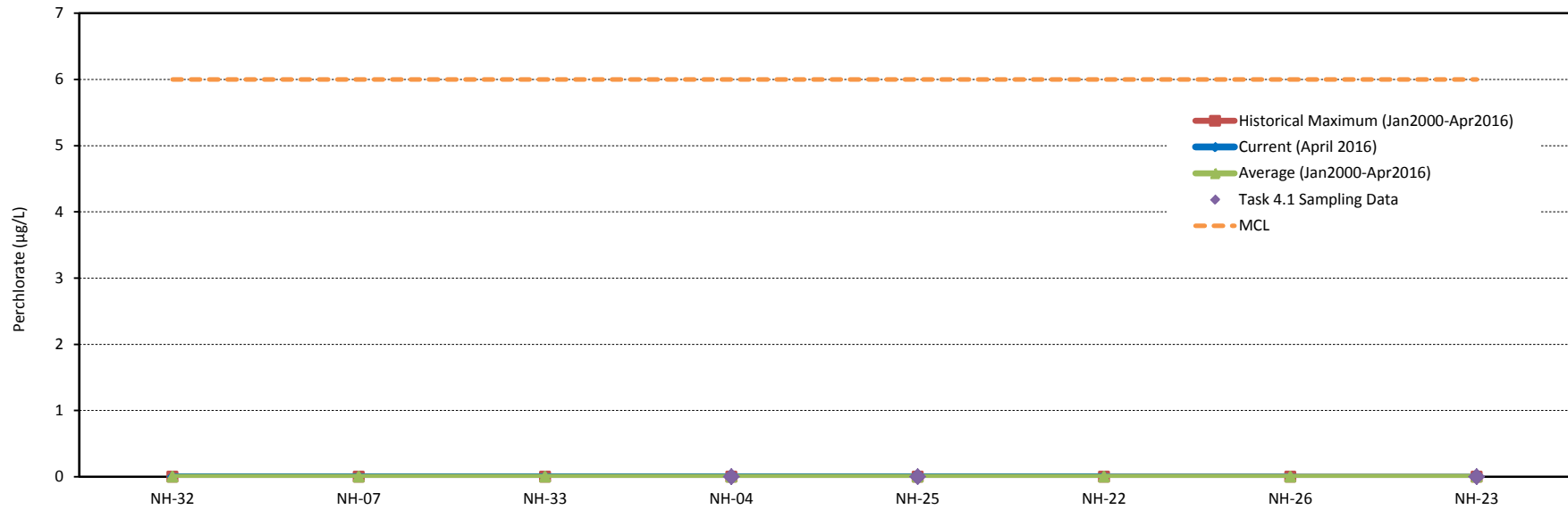




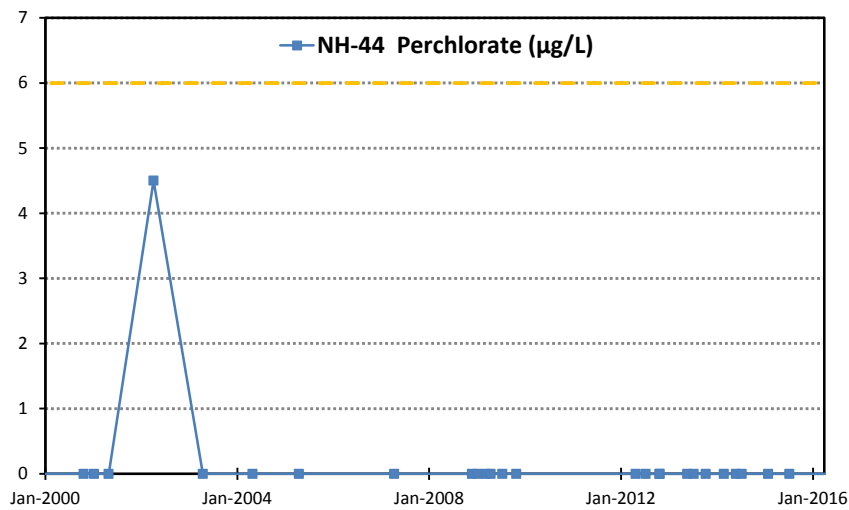
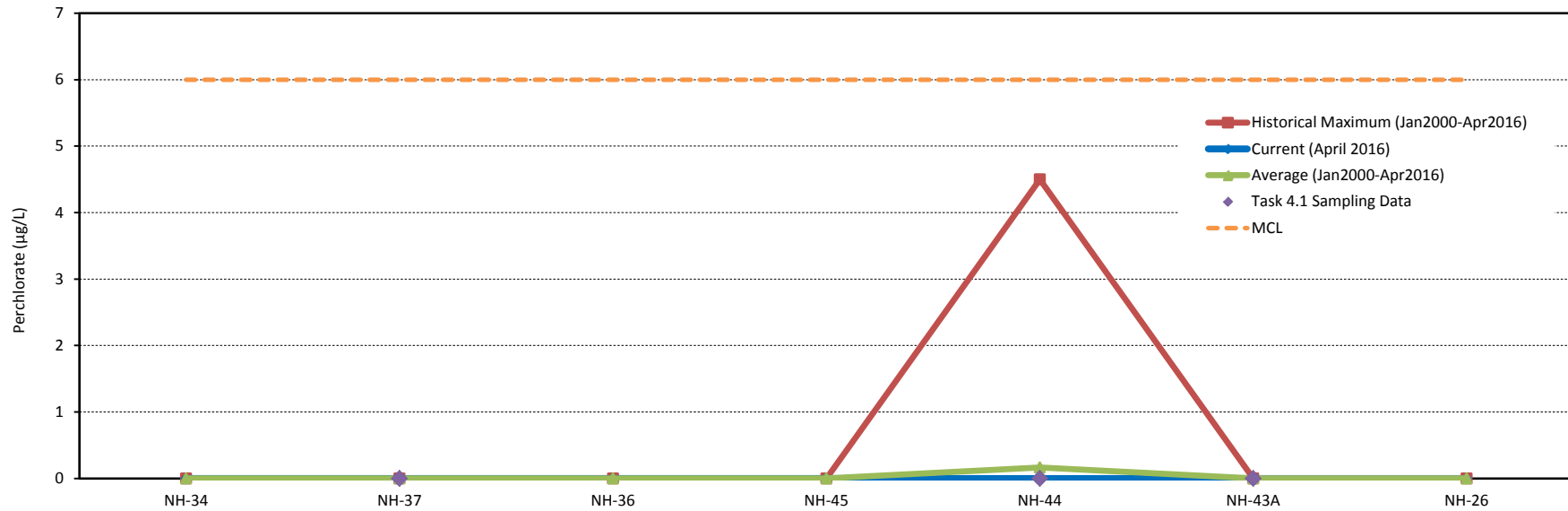
# North Hollywood West Total Chromium



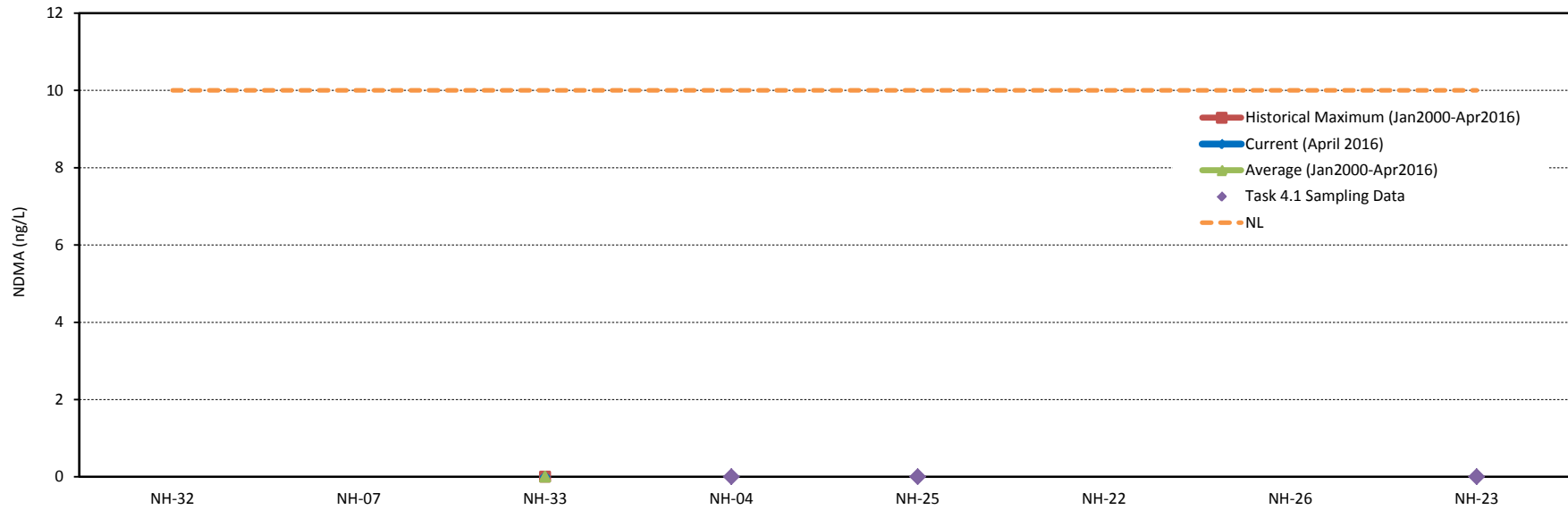
# North Hollywood West Perchlorate



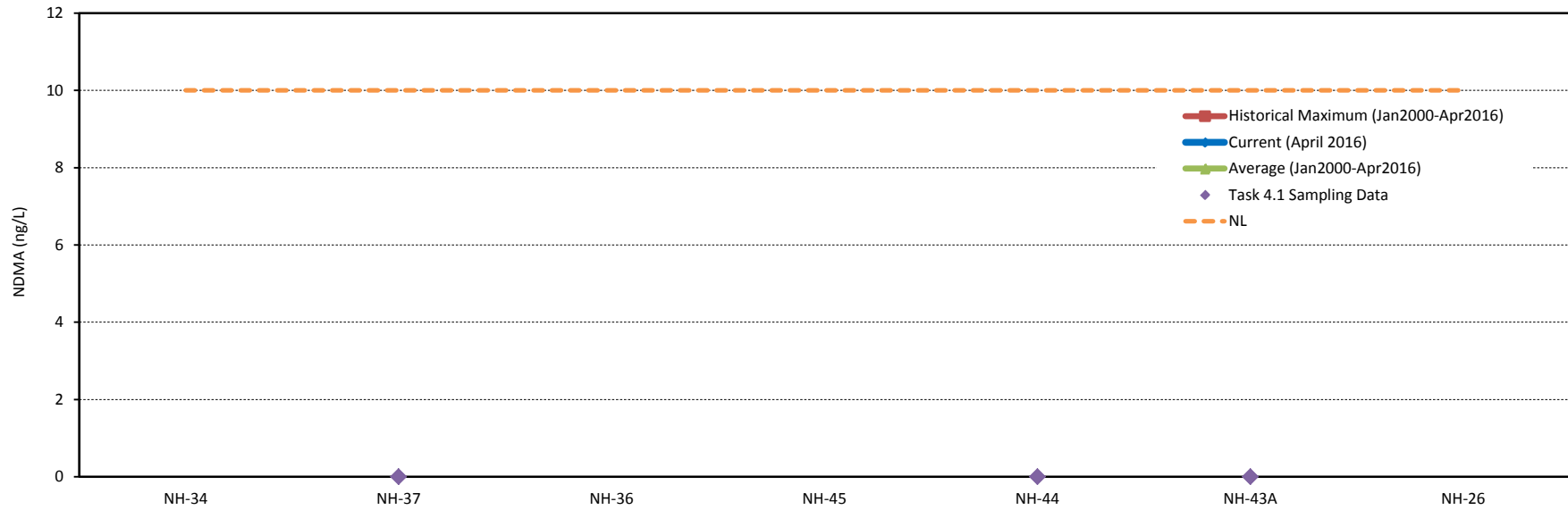
# North Hollywood West Perchlorate



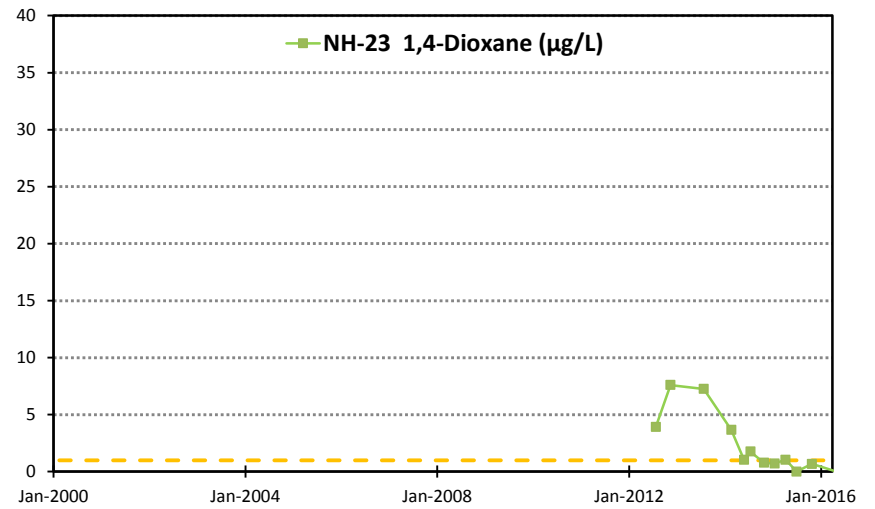
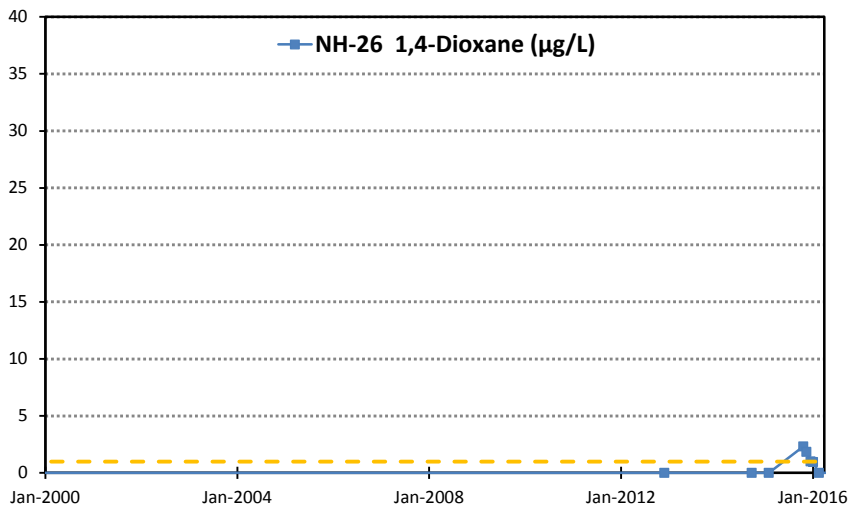
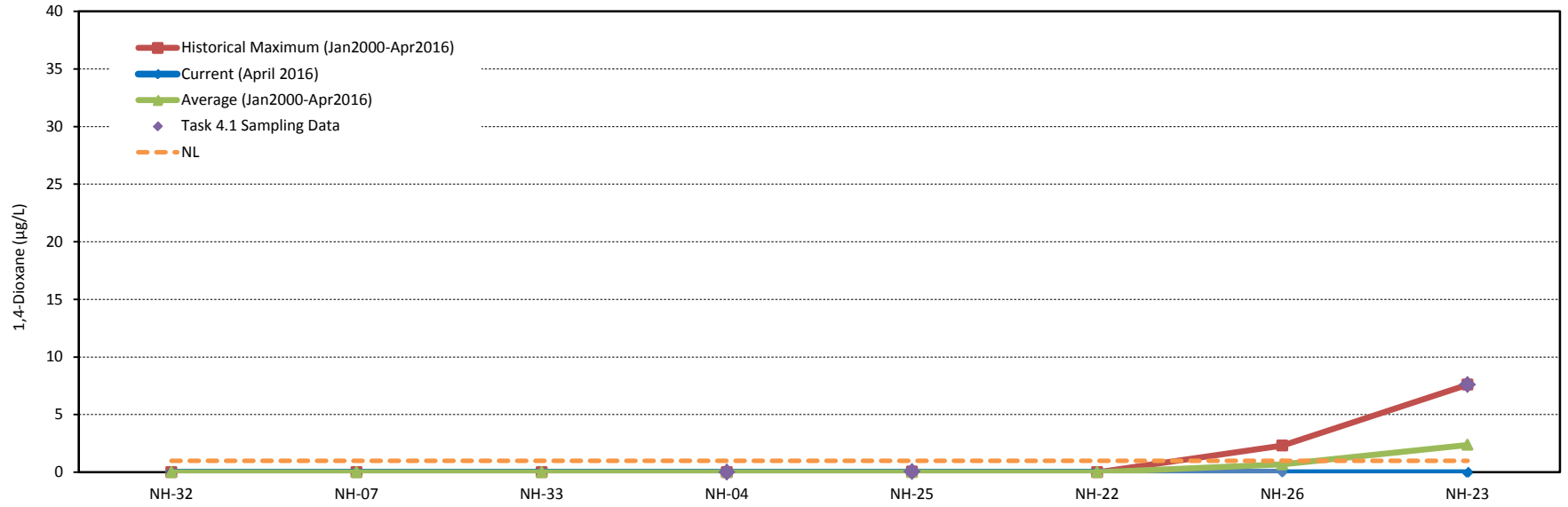
# North Hollywood West NDMA



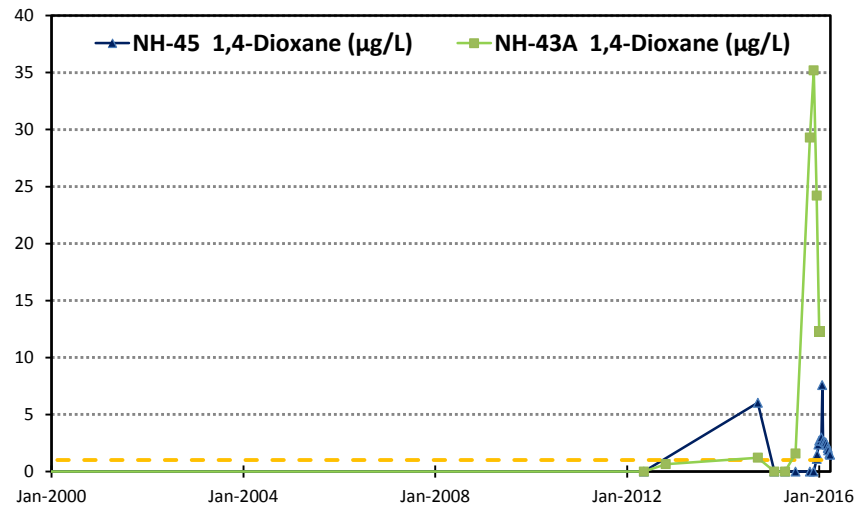
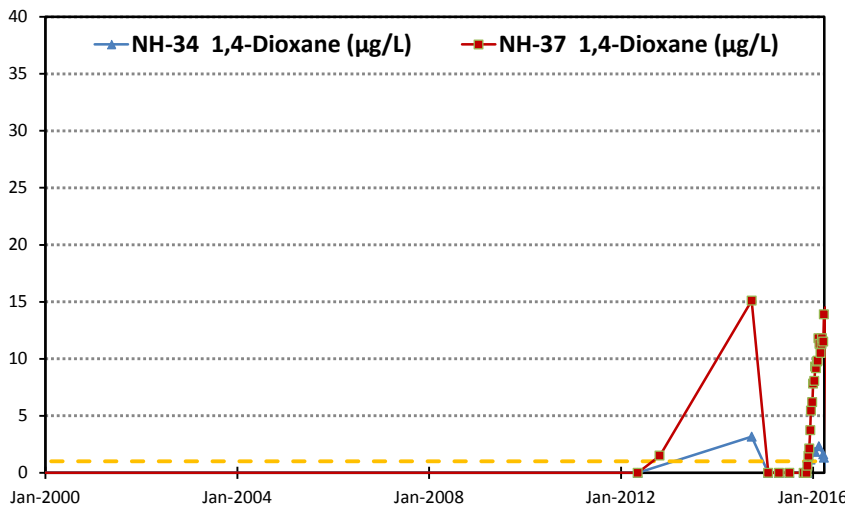
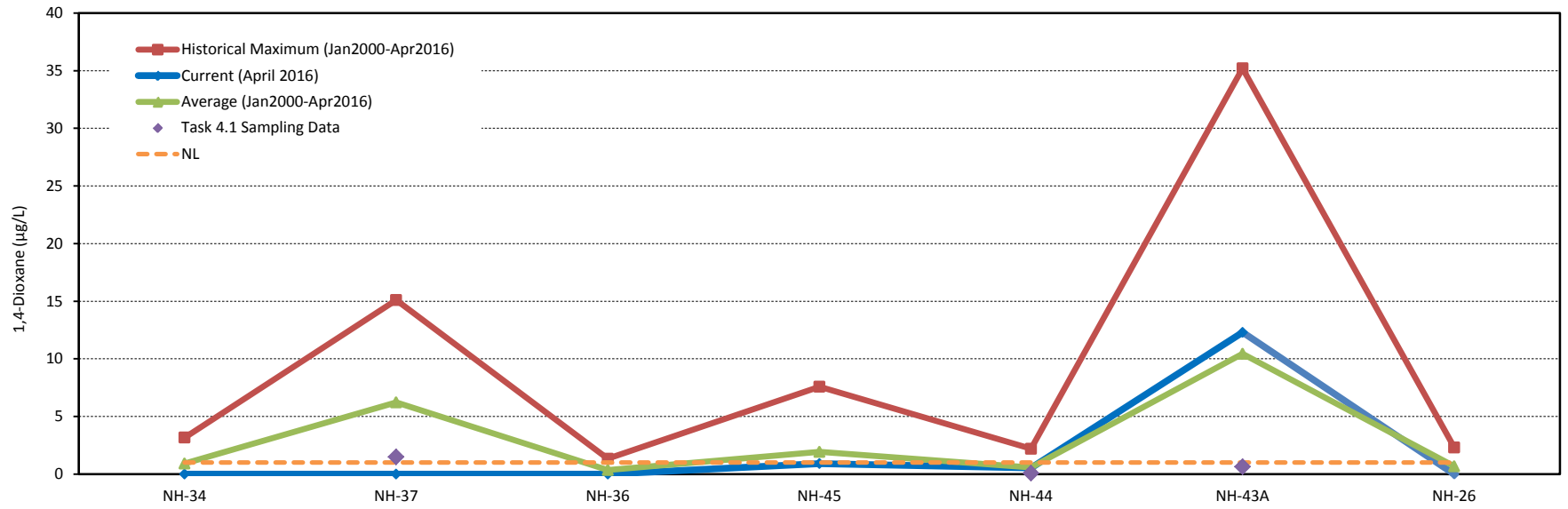
# North Hollywood West NDMA



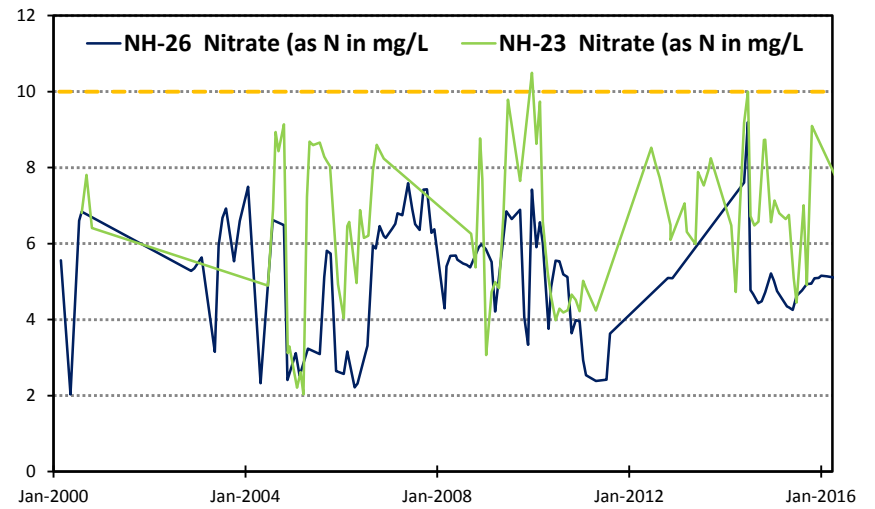
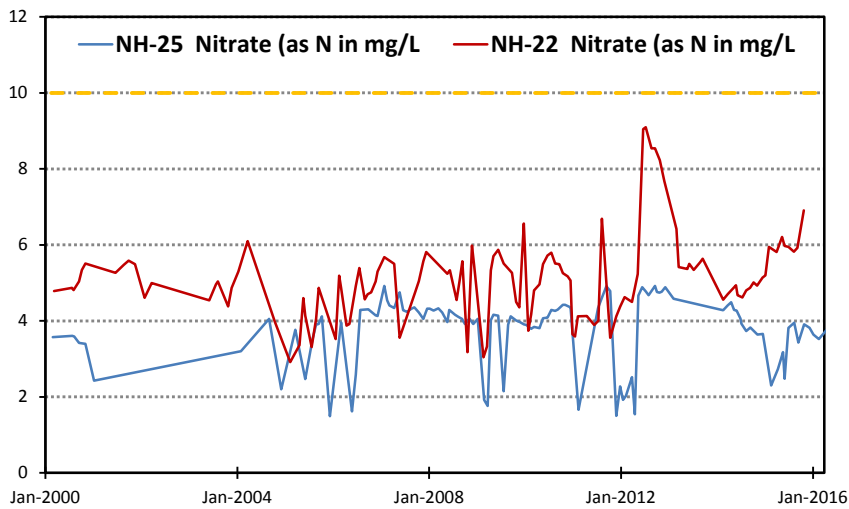
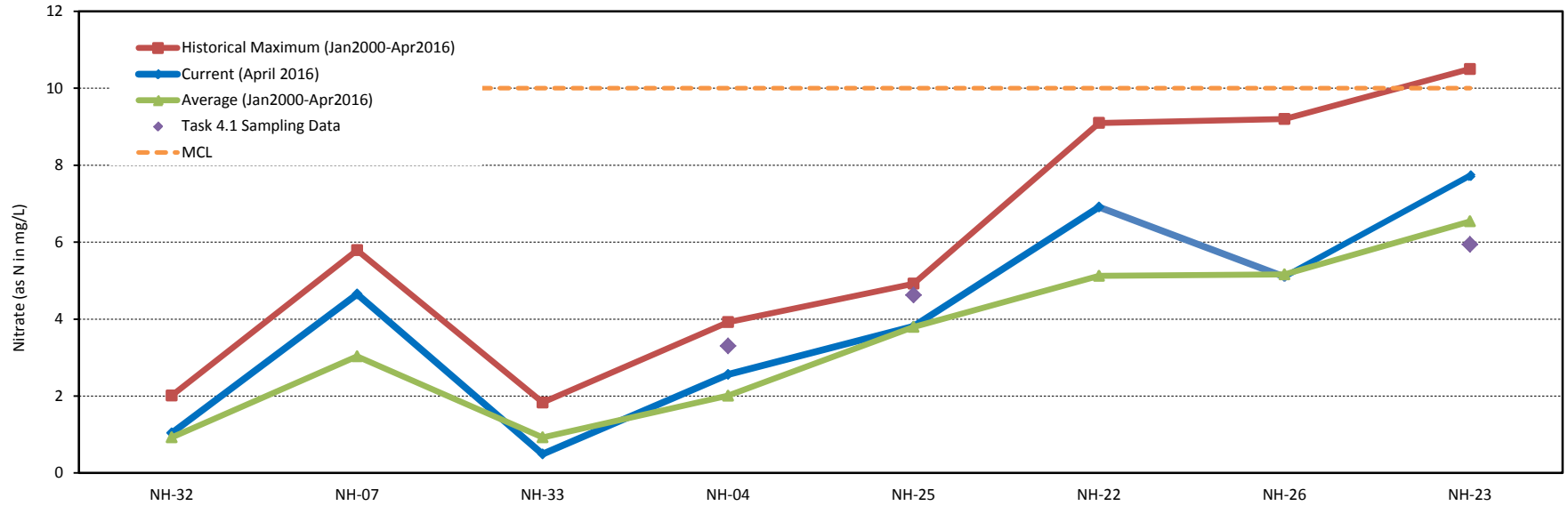
# North Hollywood West 1,4-Dioxane



# North Hollywood West 1,4-Dioxane

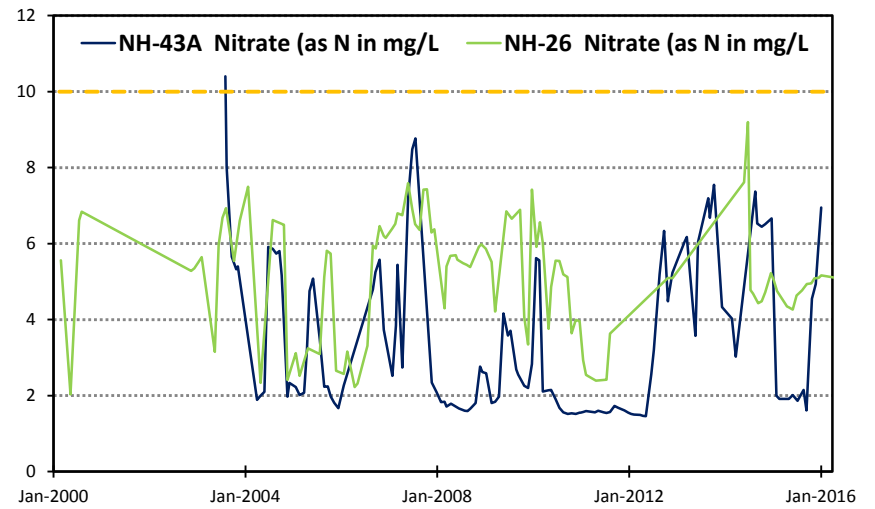
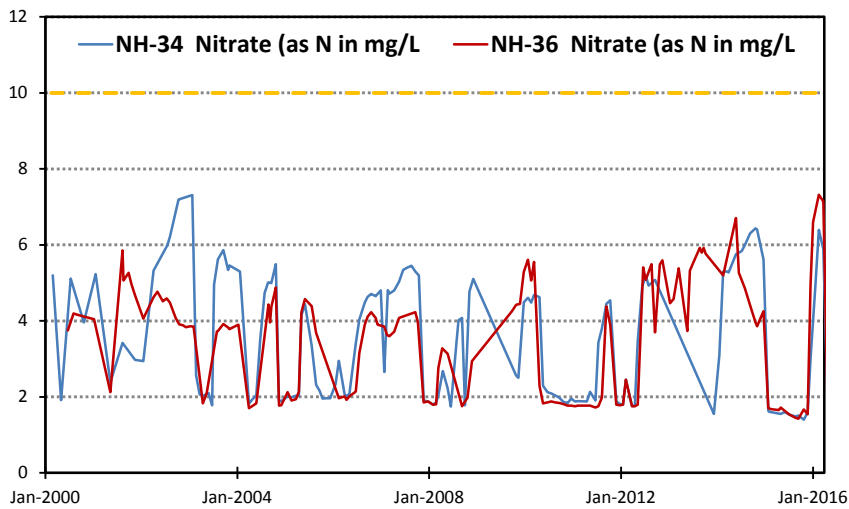
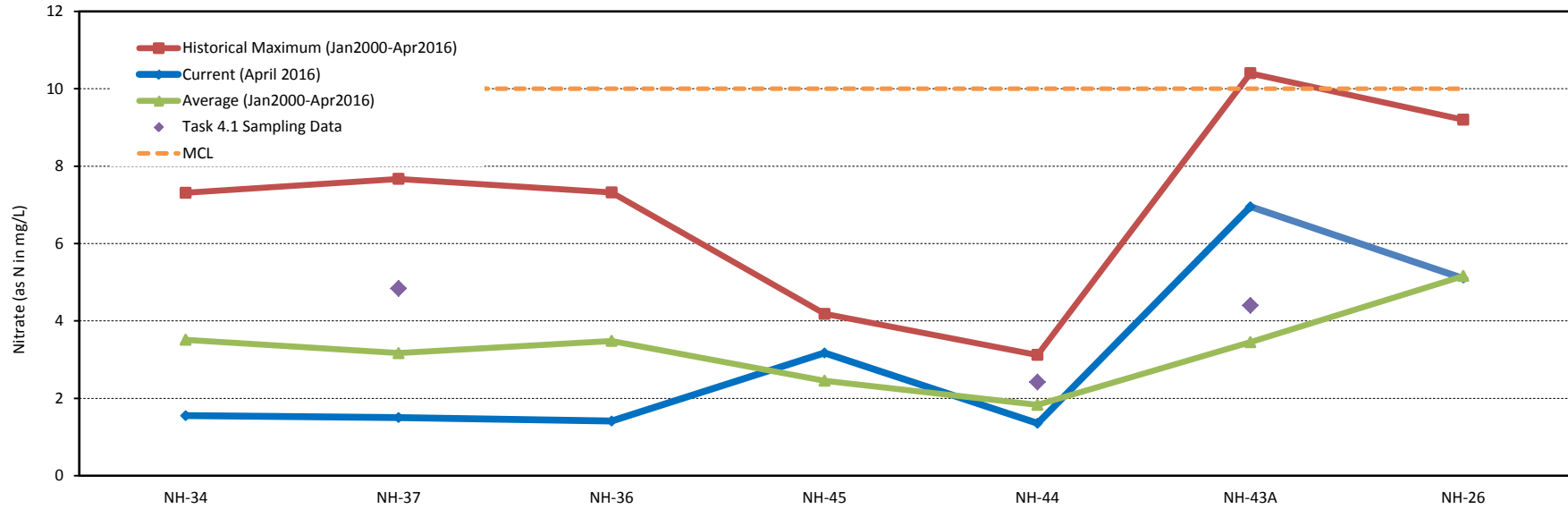


# North Hollywood West Nitrate

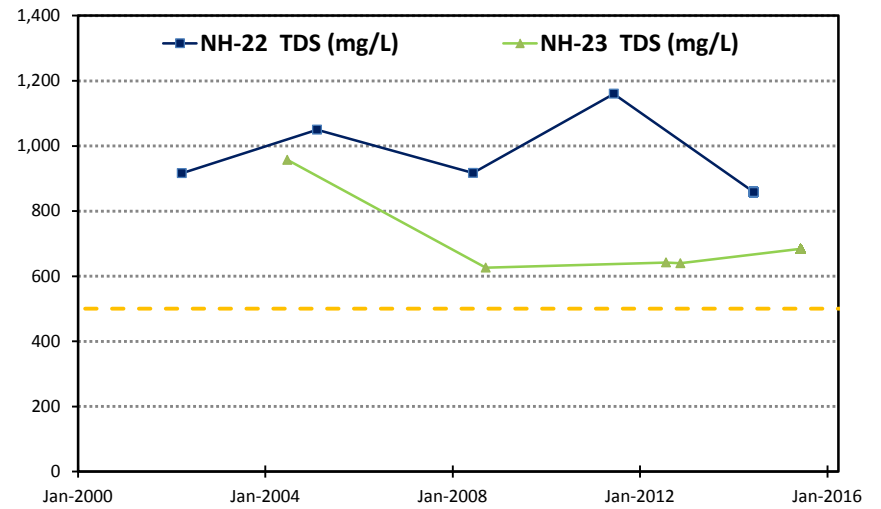
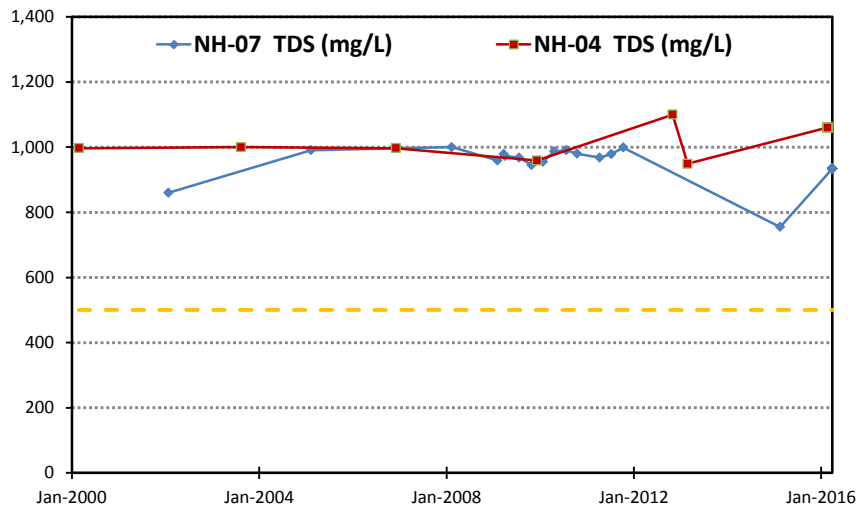
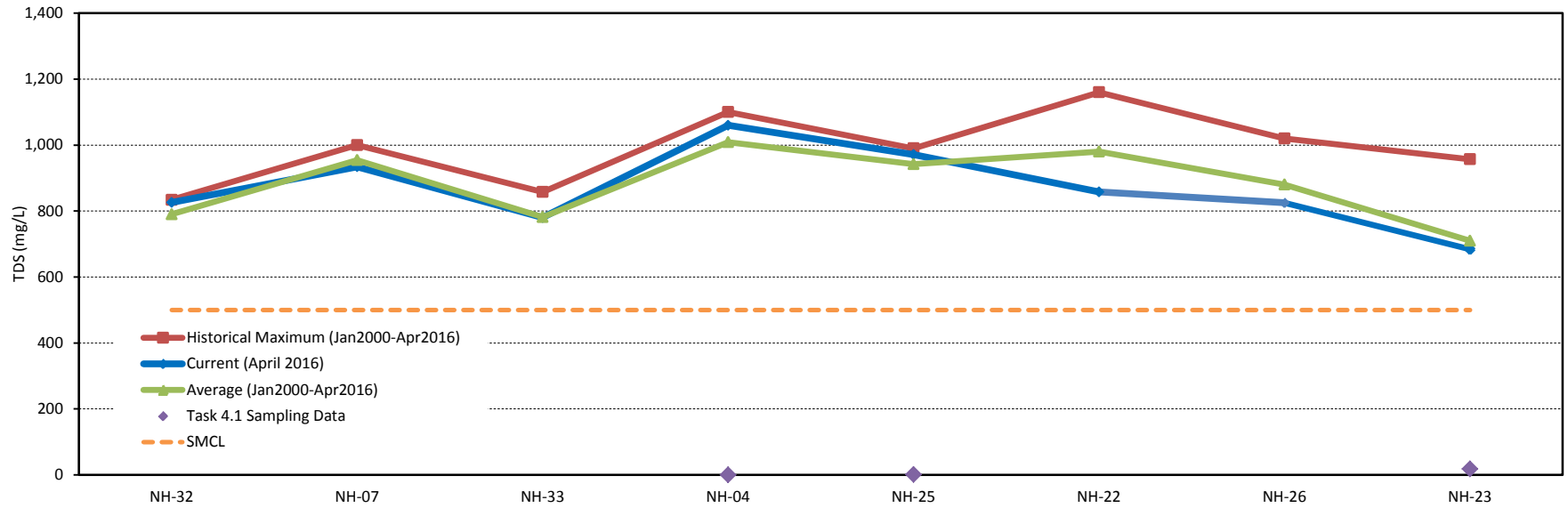




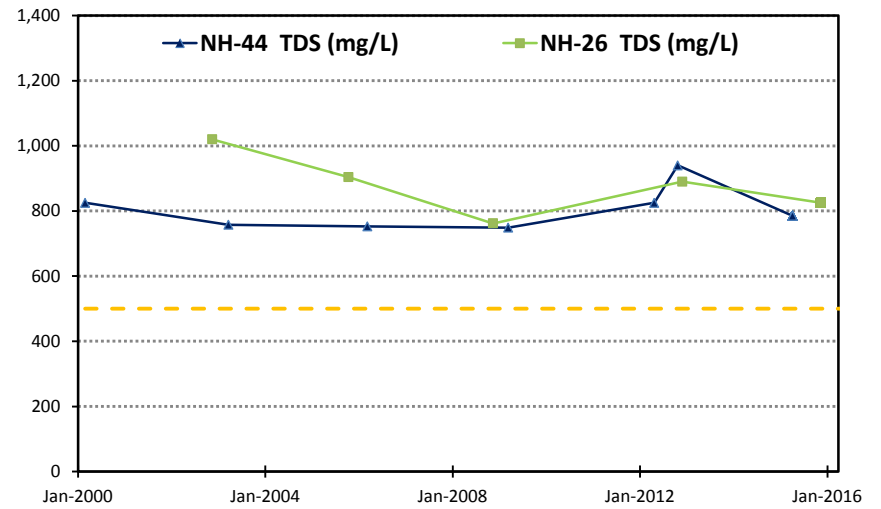
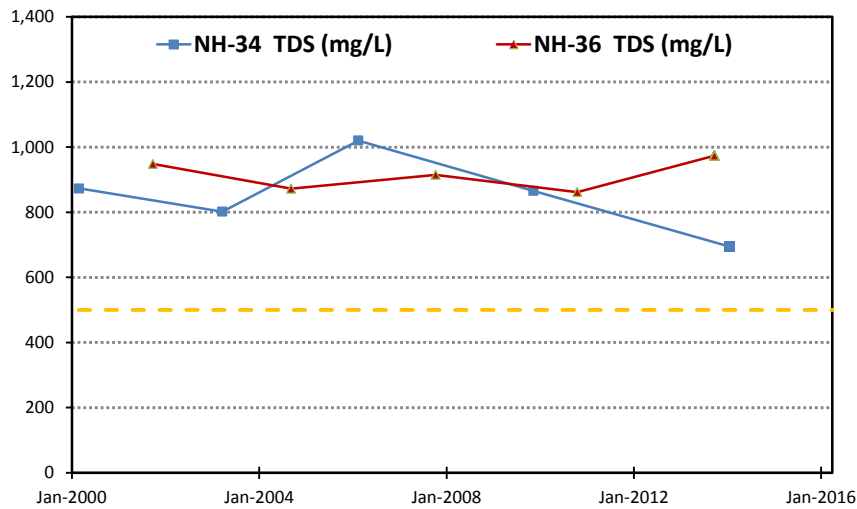
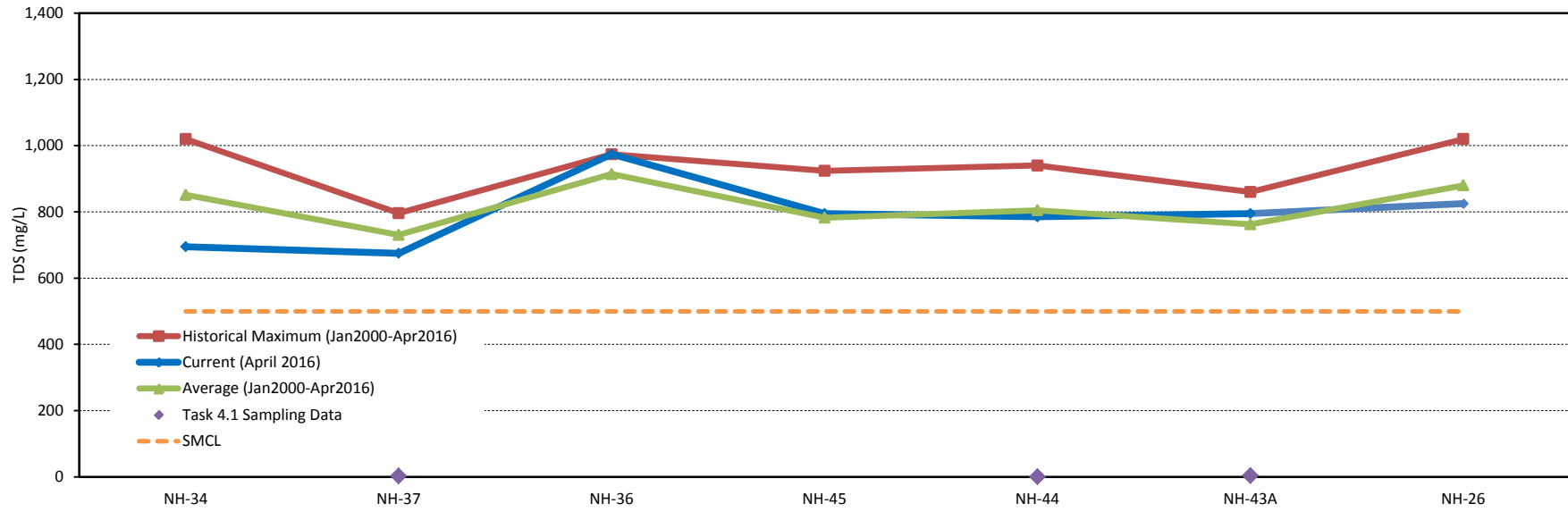
# North Hollywood West Nitrate



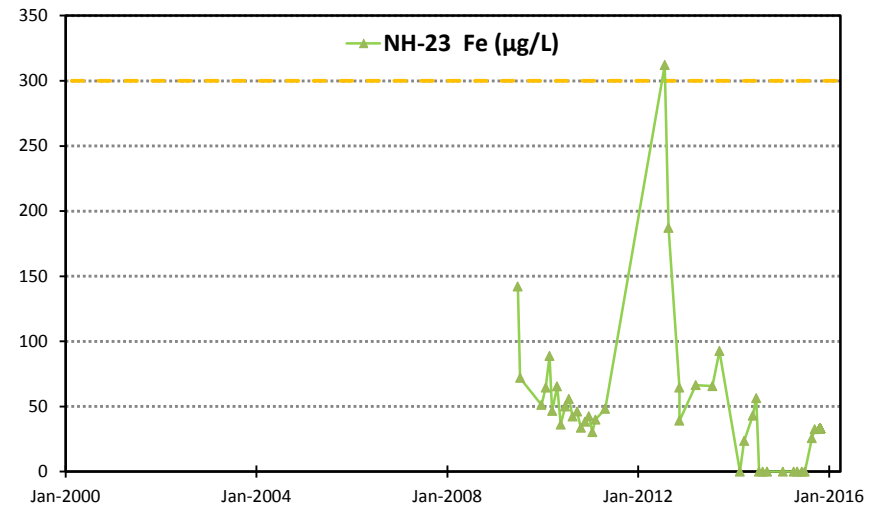
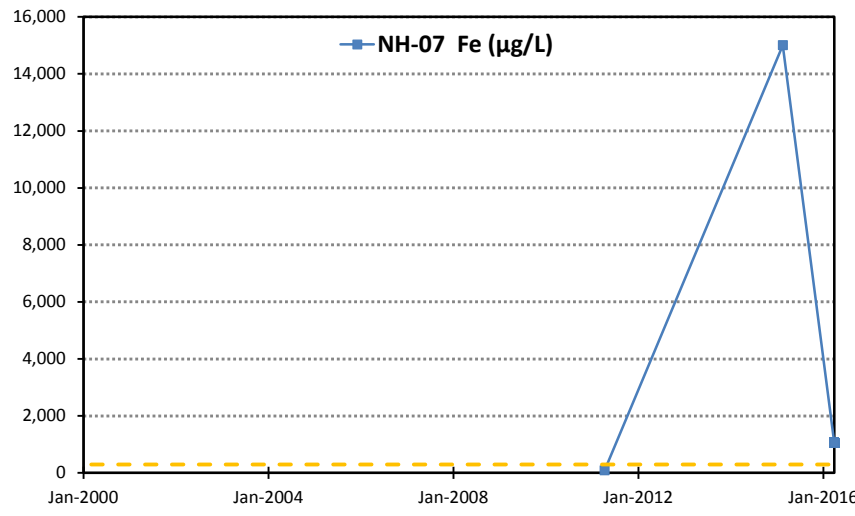
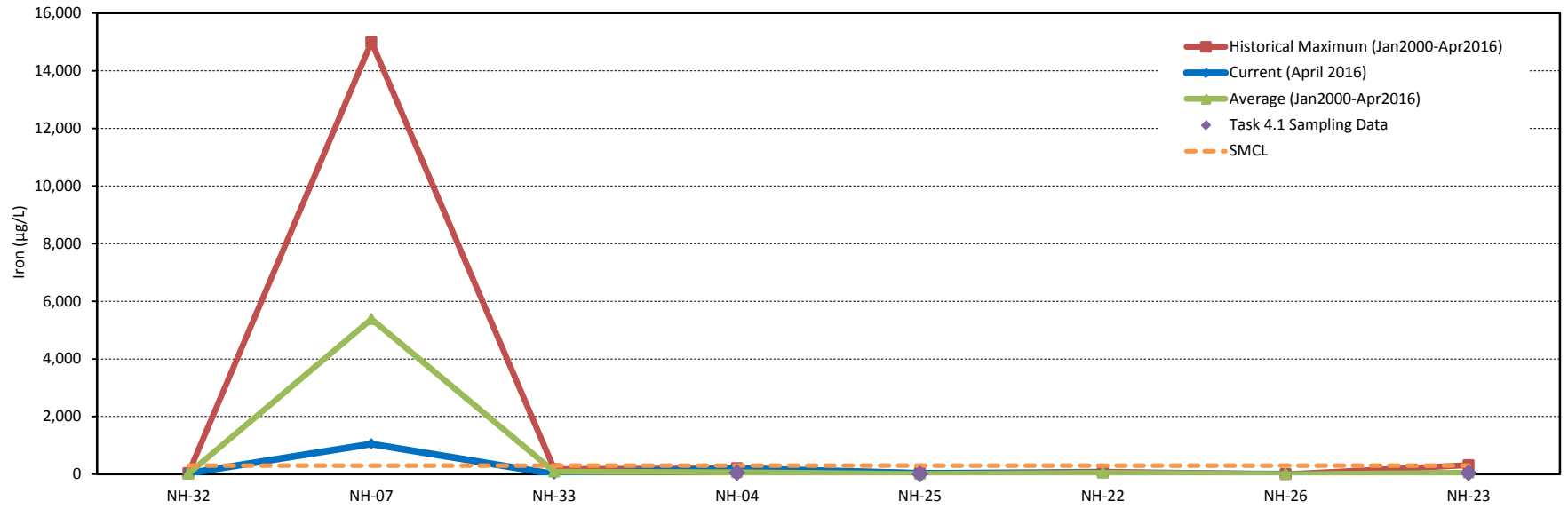
# North Hollywood West TDS



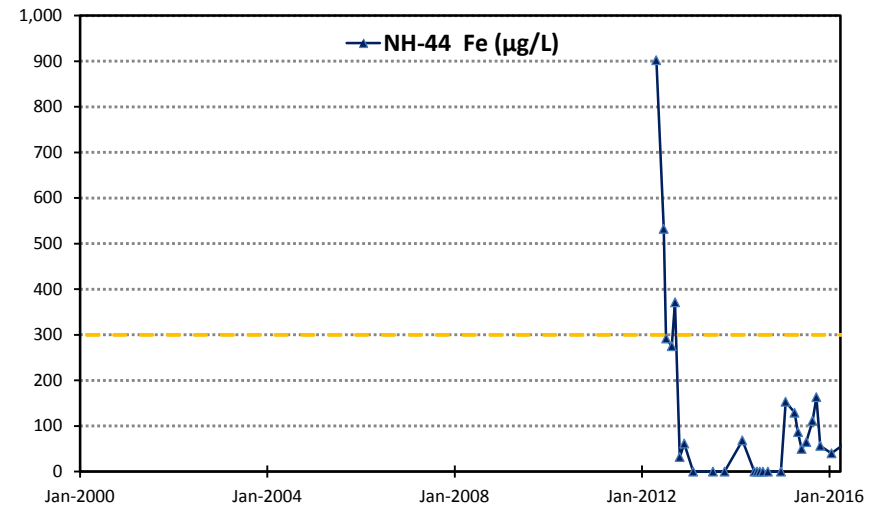
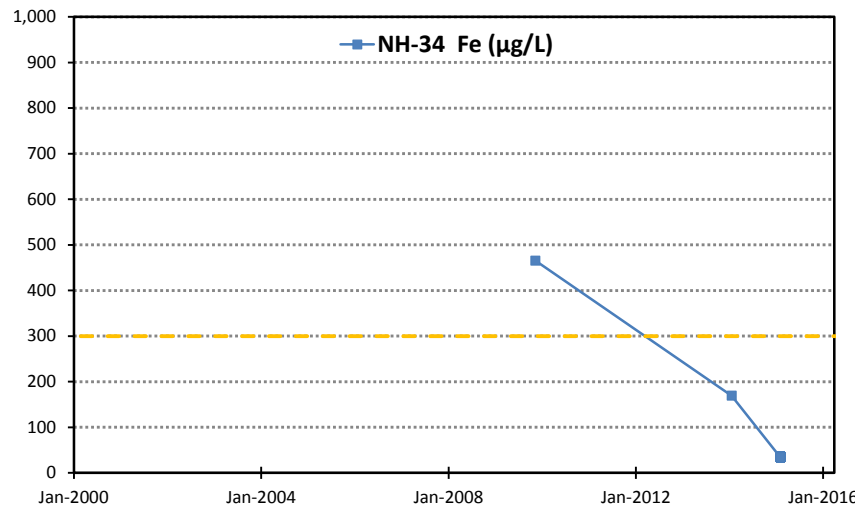
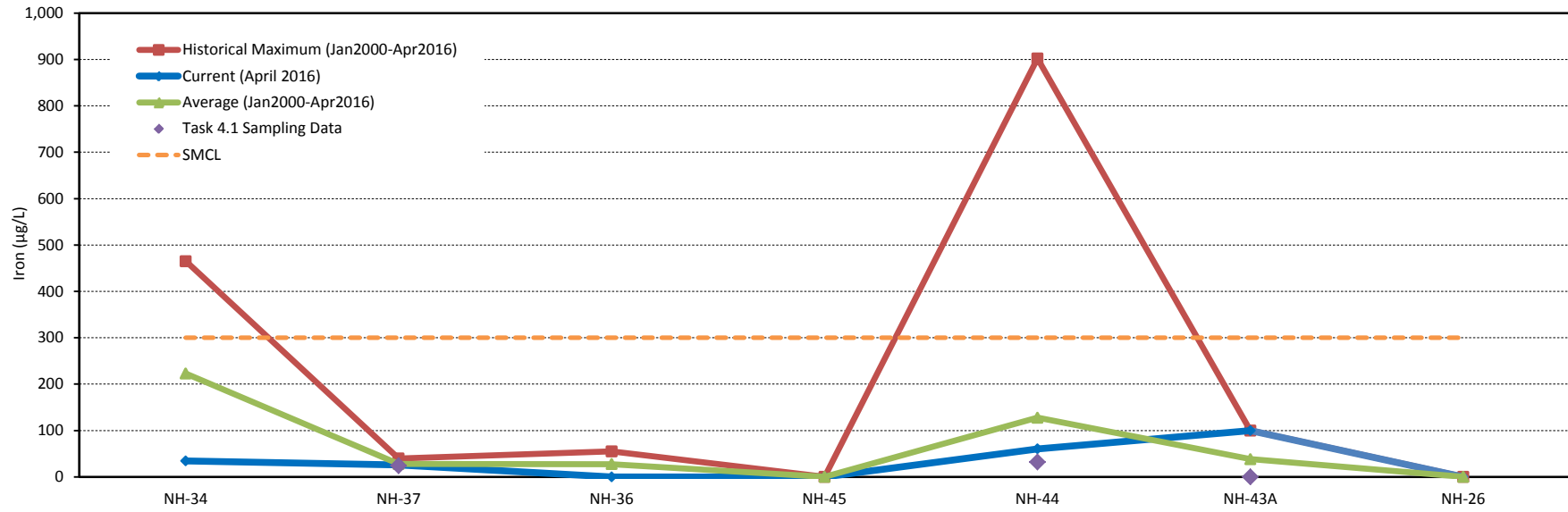
# North Hollywood West TDS



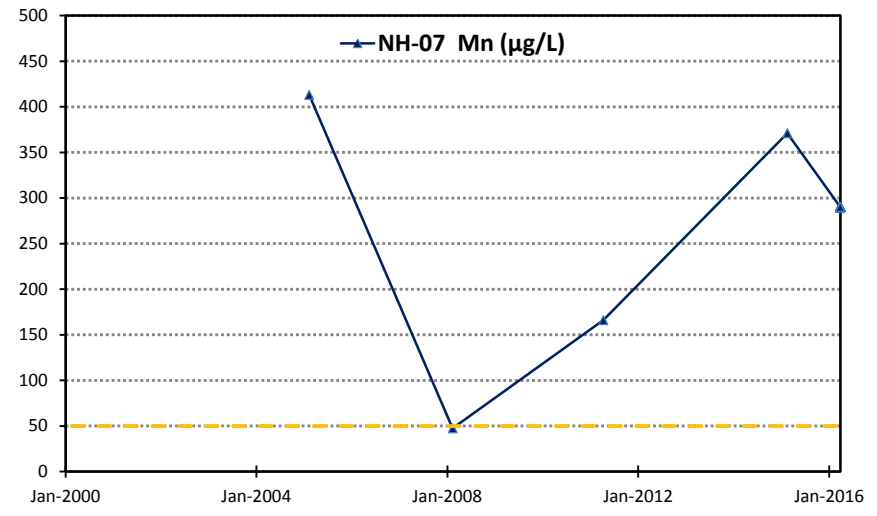
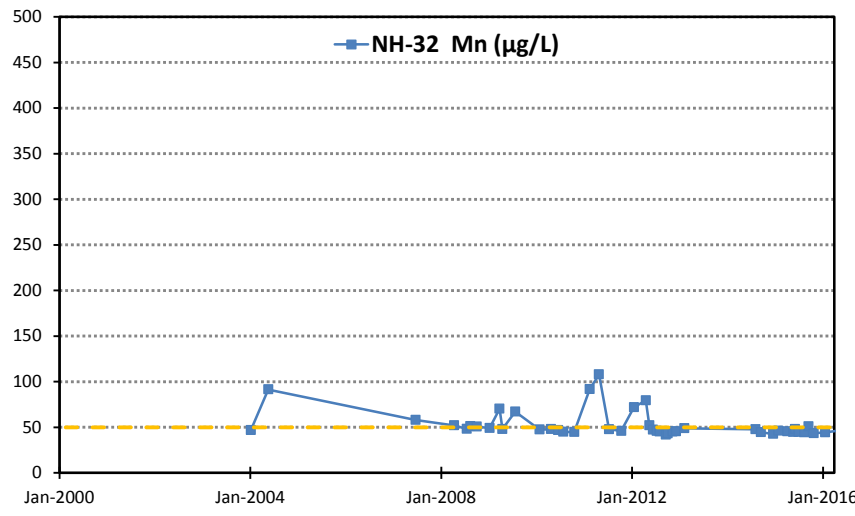
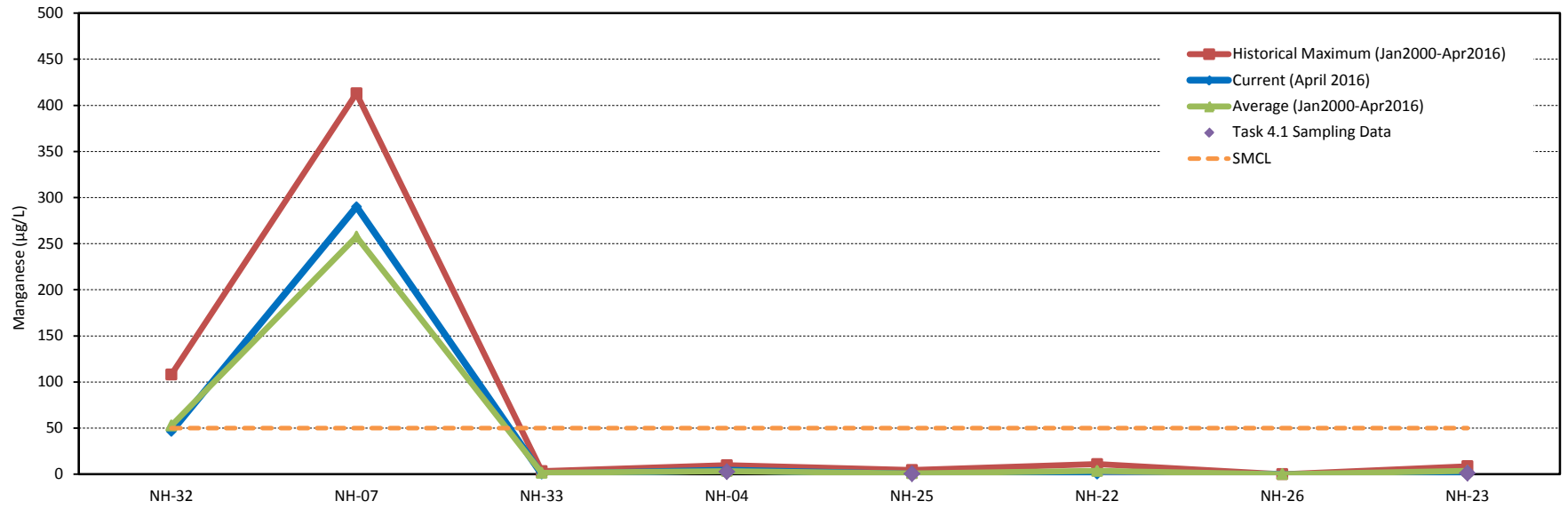
# North Hollywood West Iron



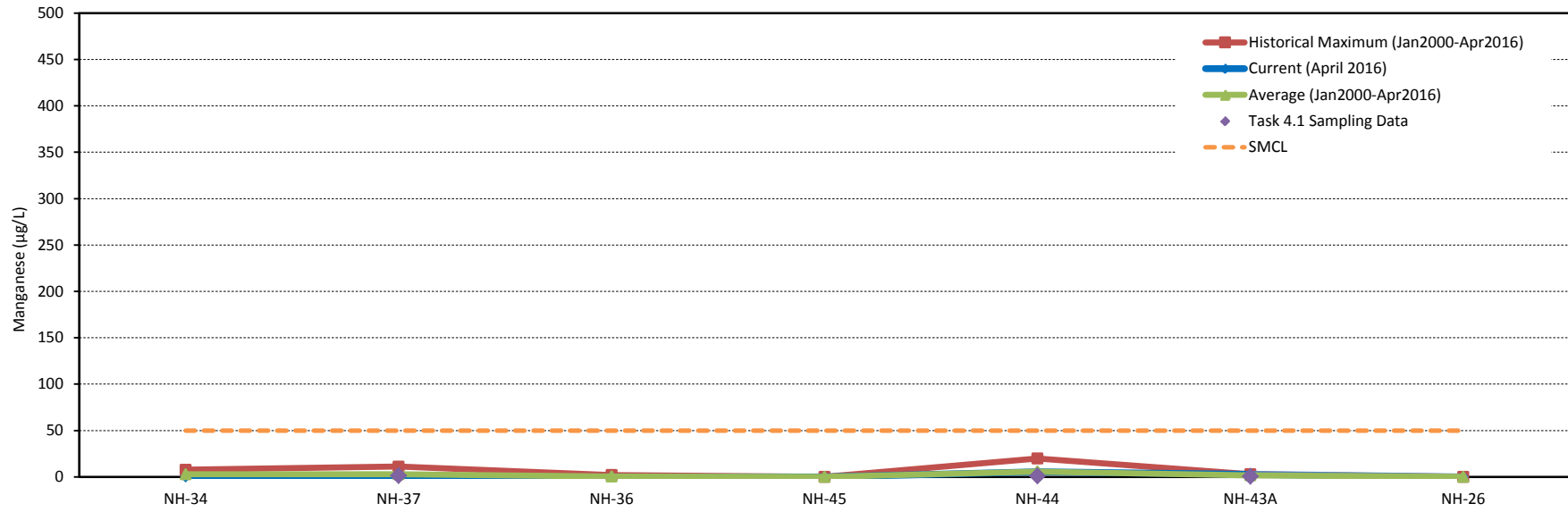
# North Hollywood West Iron



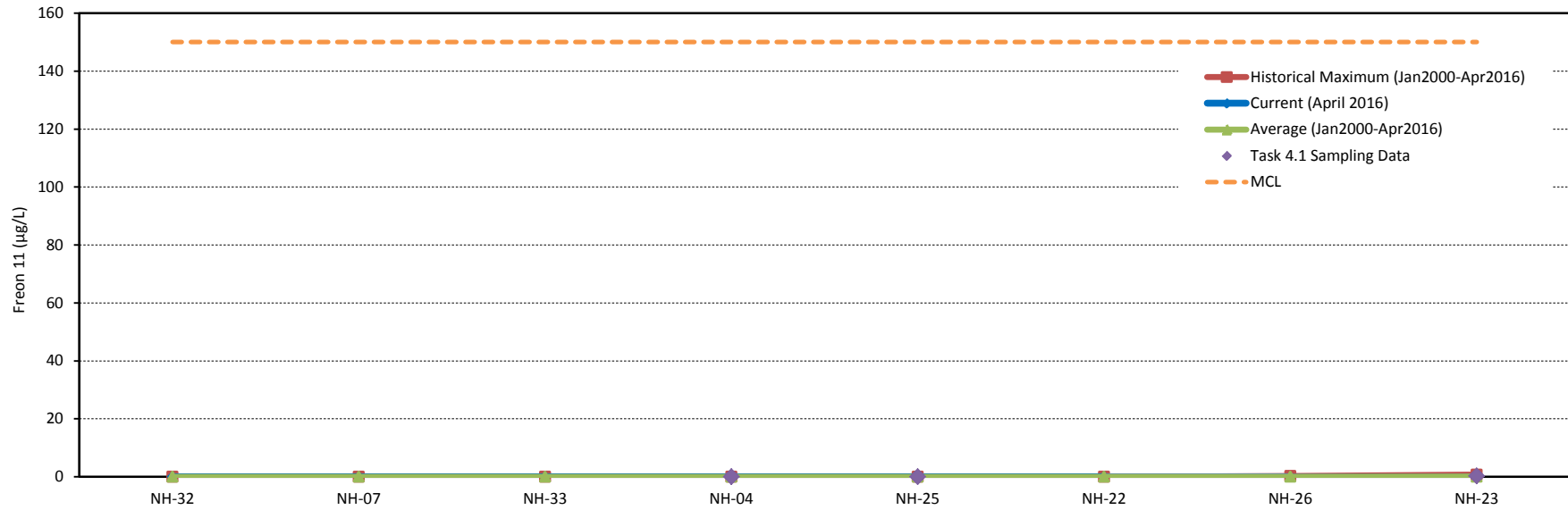
# North Hollywood West Manganese



# North Hollywood West Manganese

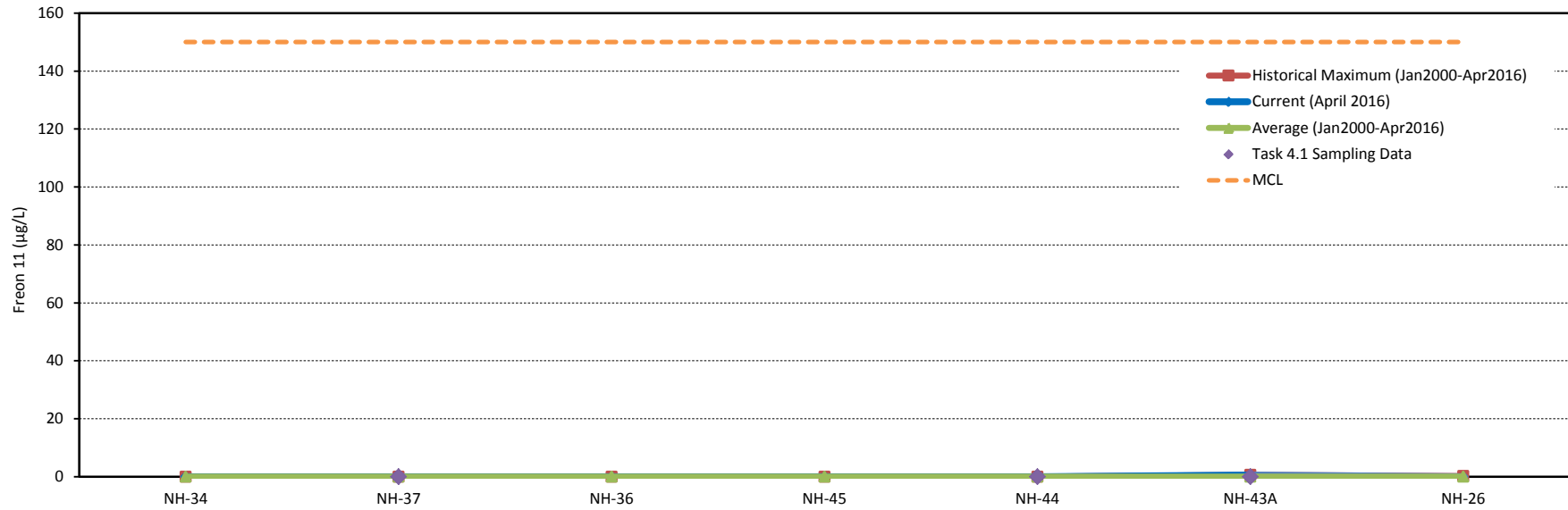


# North Hollywood West Trichlorofluoromethane

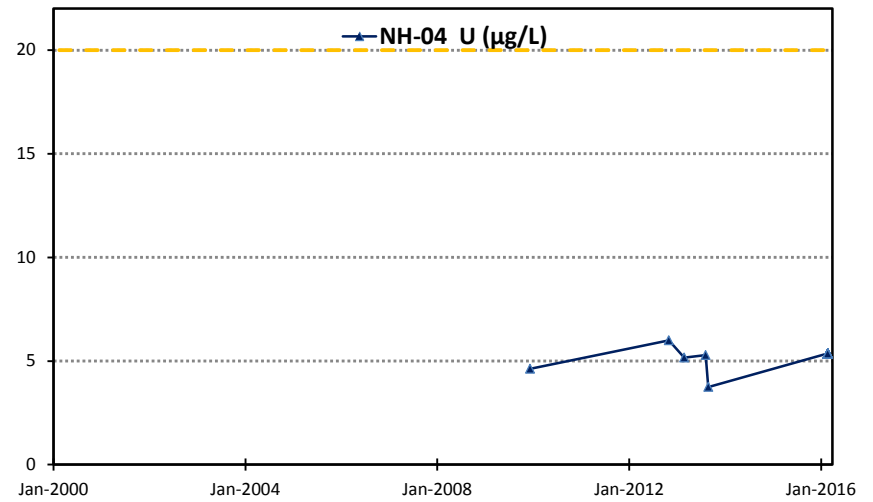
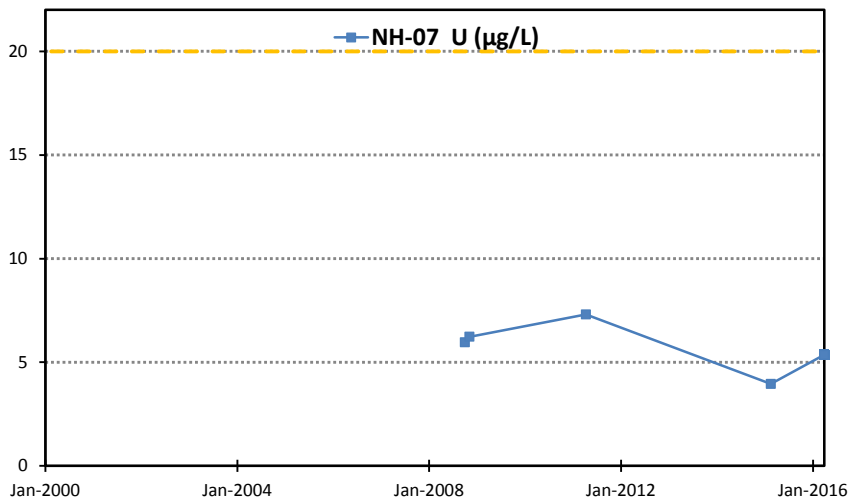
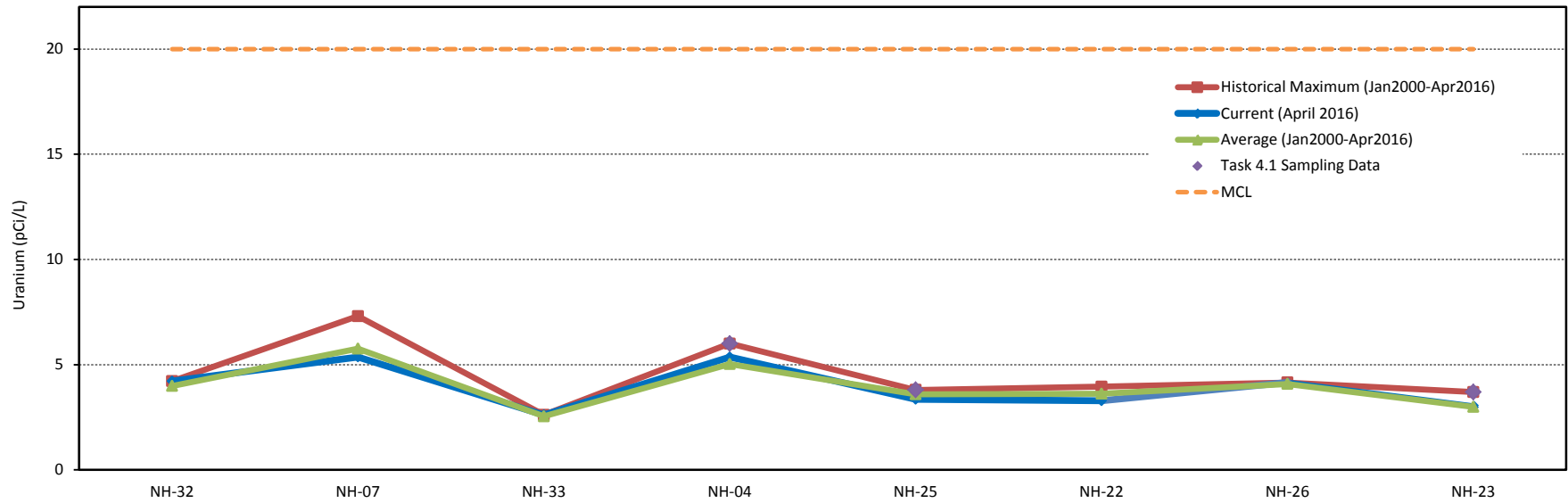




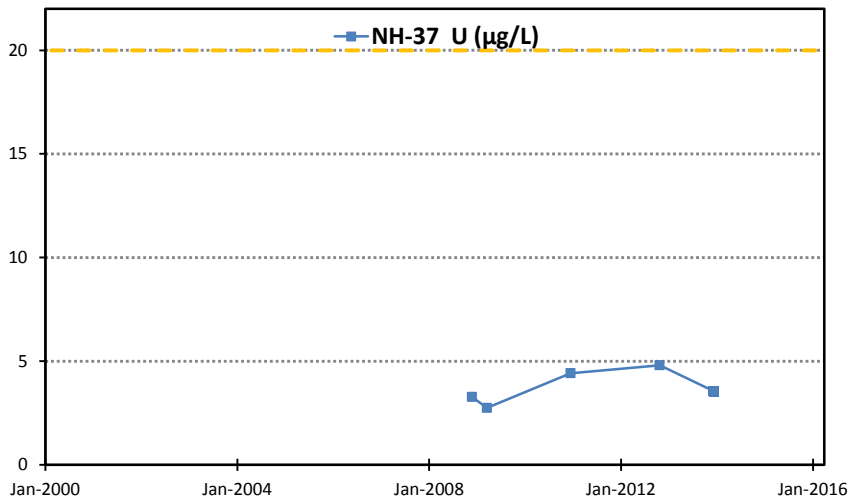
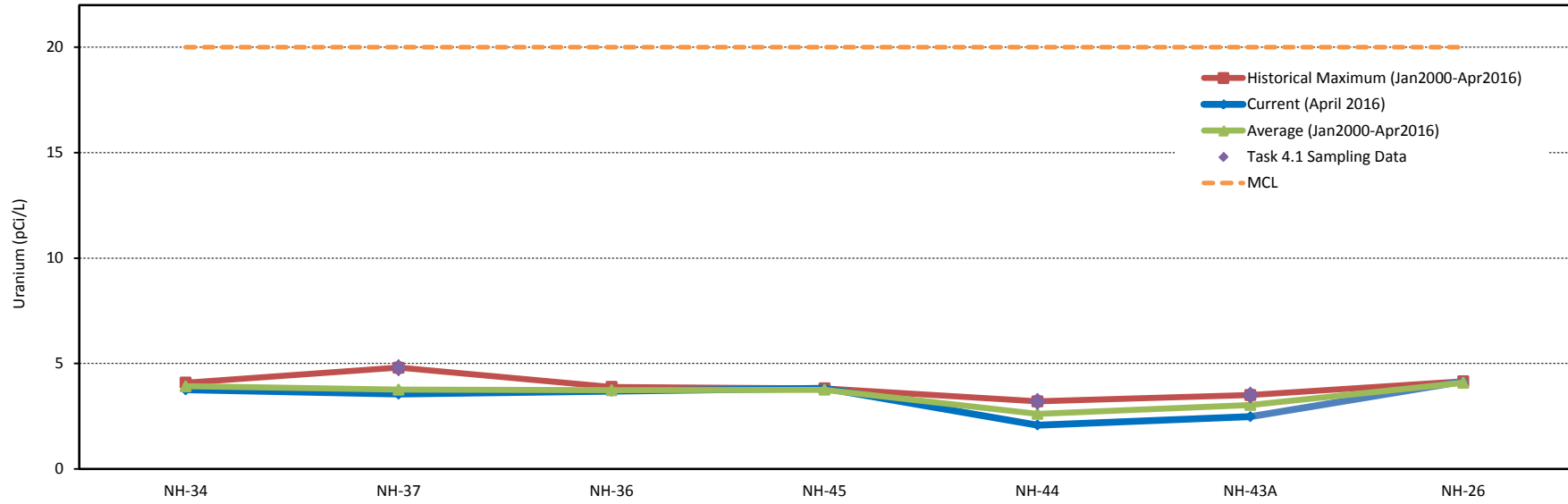
# North Hollywood West Trichlorofluoromethane



# North Hollywood West Uranium



# North Hollywood West Uranium




**Attachment D**  
**LADWP Plume Maps**




D-1  
**NORTH HOLLYWOOD  
 WEST WELLFIELD AND  
 NITRATE (AS NO<sub>3</sub>) PLUME**

Source: LADWP, 2014

Legend



 North Hollywood West Wells

Capture Zones

 2-Year  
 5-Year  
 10-Year

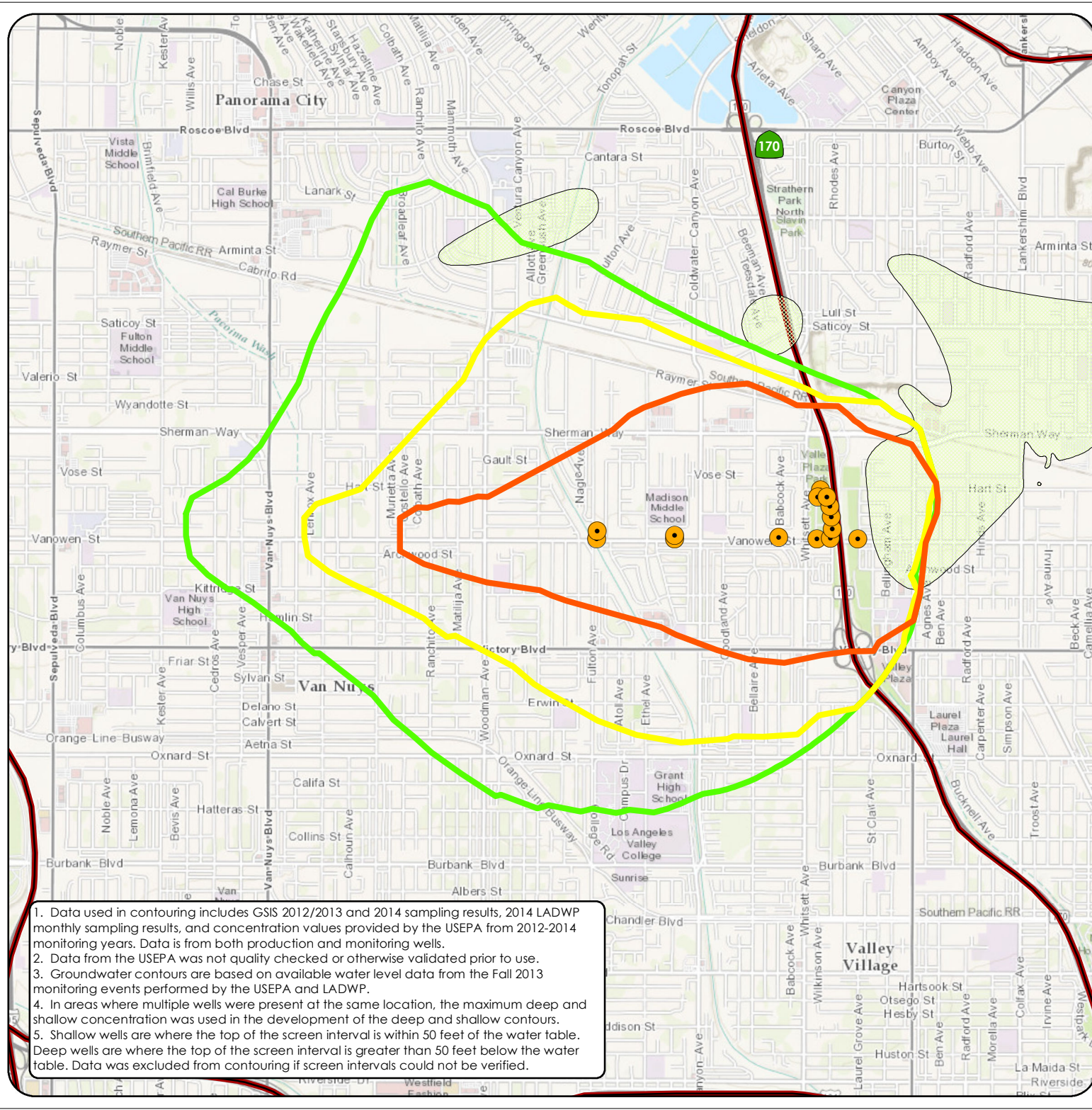
Nitrate (as NO<sub>3</sub>)  
 Plume - Shallow

Source: LADWP, 2014

 45 (MCL) - 100 mg/L  
 >100 mg/L



0 1/2 1  
 Miles



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.  
 2. Data from the USEPA was not quality checked or otherwise validated prior to use.  
 3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.  
 4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.  
 5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# NORTH HOLLYWOOD WEST WELLFIELD AND PERCHLORATE PLUME

Source: LADWP, 2014

### Legend

● North Hollywood West Wells

### Capture Zones

○ 2-Year

○ 5-Year

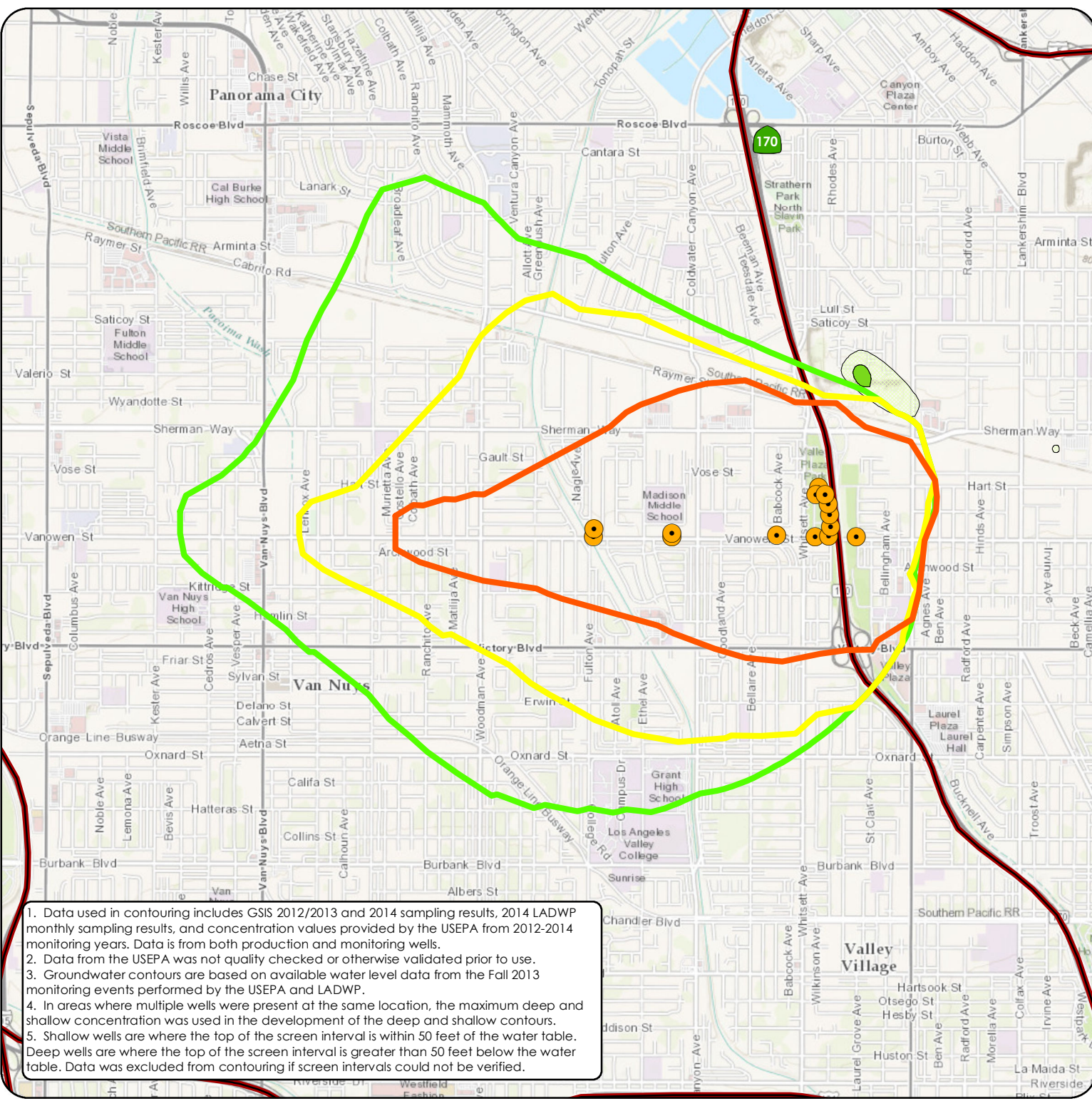
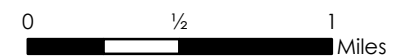
○ 10-Year

### Perchlorate Plume - Shallow

Source: LADWP, 2014

□ 2 - 6 µg/L (MCL)

□ >6 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# NORTH HOLLYWOOD WEST WELLFIELD AND 1,1-DICHLOROETHYLENE (1,1-DCE) PLUME

Source: LADWP, 2014

### Legend

● North Hollywood West Wells

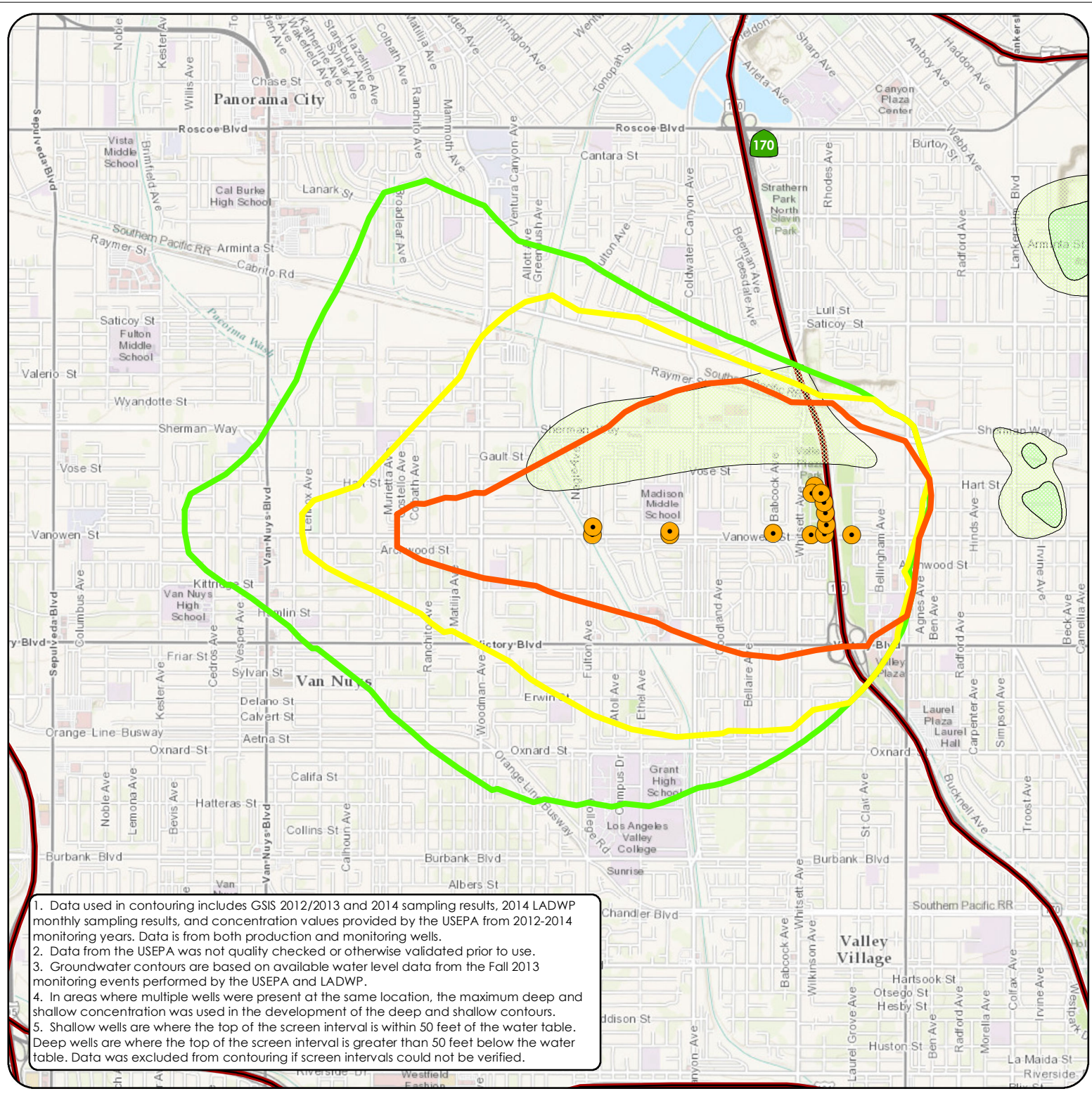
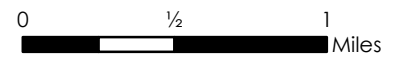
### Capture Zones

- 2-Year
- 5-Year
- 10-Year

### 1,1-DCE Plume - Shallow

Source: LADWP, 2014

- 0.5 - 7 µg/L (MCL: 6 µg/L)
- 7.01 - 50 µg/L
- 50.01 - 100 µg/L
- >100 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.






# NORTH HOLLYWOOD WEST WELLFIELD AND CIS-1,2- DICHLORO-ETHYLENE (CIS-1,2-DCE) PLUME

Source: LADWP, 2014

### Legend





● North Hollywood West Wells

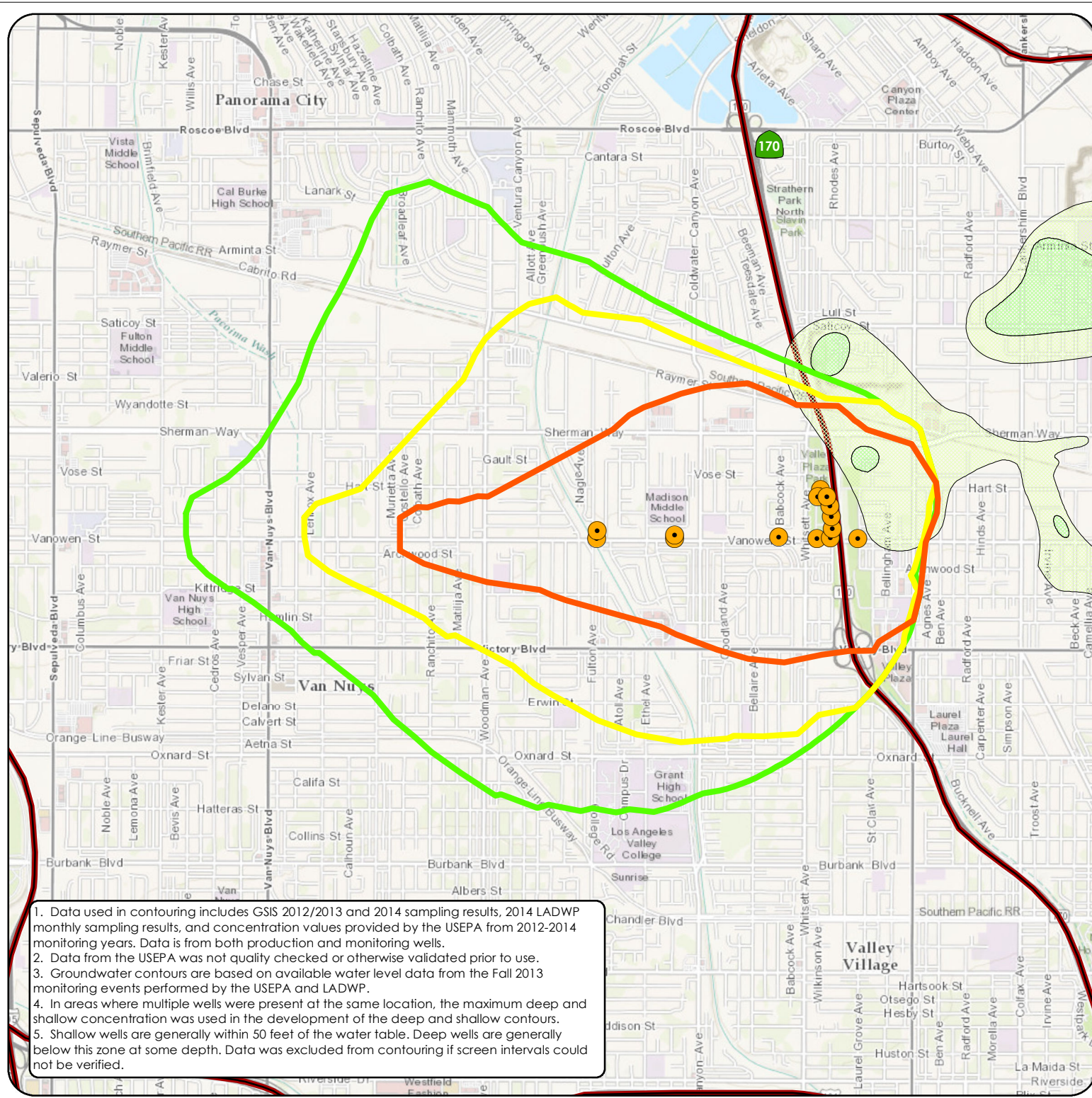
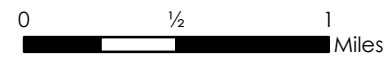
### Capture Zones

-  2-Year
-  5-Year
-  10-Year

### cis-1,2-DCE Plume - Shallow

Source: LADWP, 2014

-  0.5 - 7 µg/L (MCL: 6 µg/L)
-  7.01 - 50 µg/L
-  50.01 - 100 µg/L
-  >100 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are generally within 50 feet of the water table. Deep wells are generally below this zone at some depth. Data was excluded from contouring if screen intervals could not be verified.



# NORTH HOLLYWOOD WEST WELLFIELD AND TOTAL DISSOLVED SOLIDS (TDS) PLUME

Source: LADWP, 2014

## Legend

● North Hollywood West Wells

## Capture Zones

○ 2-Year

○ 5-Year

○ 10-Year

## TDS Plume - Shallow

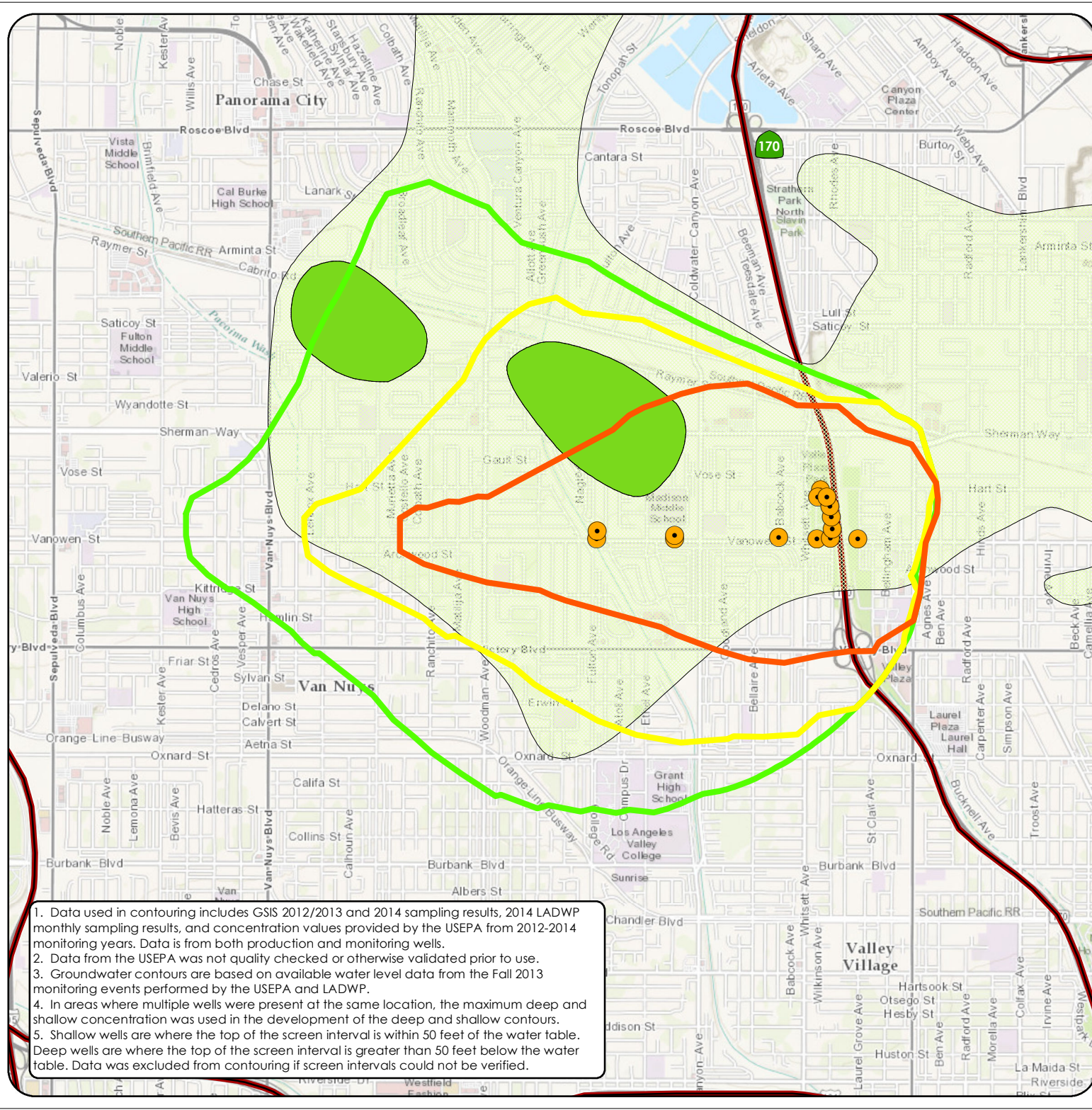
Source: LADWP, 2014

□ 500 (SMCL) - 1,000 mg/L

□ >1,000 mg/L



0 1/2 1 Miles



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.

2. Data from the USEPA was not quality checked or otherwise validated prior to use.

3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.

4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.

5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# NORTH HOLLYWOOD WEST WELLFIELD AND PERCHLORATE PLUME

Source: LADWP, 2014

### Legend

● North Hollywood West Wells

### Capture Zones

○ 2-Year

○ 5-Year

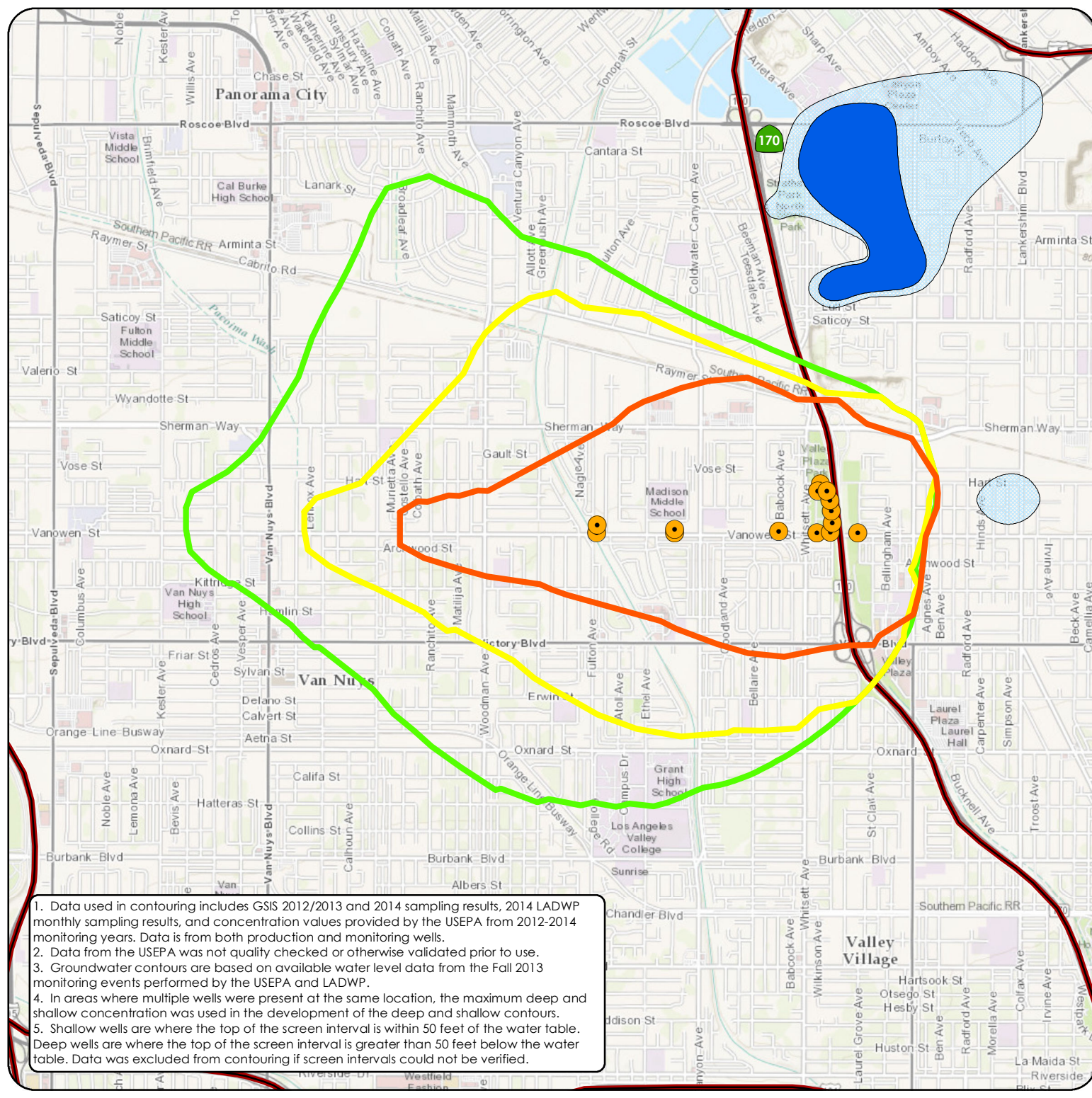
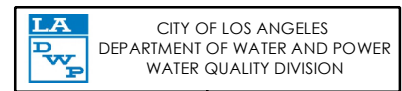
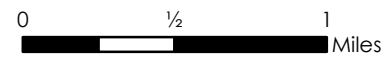
○ 10-Year

### Perchlorate Plume - Deep

Source: LADWP, 2014

▨ 2 - 6 µg/L (MCL)

■ >6 µg/L




1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# NORTH HOLLYWOOD WEST WELLFIELD AND 1,1-DICHLOROETHYLENE (1,1-DCE) PLUME

Source: LADWP, 2014

### Legend

 North Hollywood West Wells

### Capture Zones


 2-Year


 5-Year

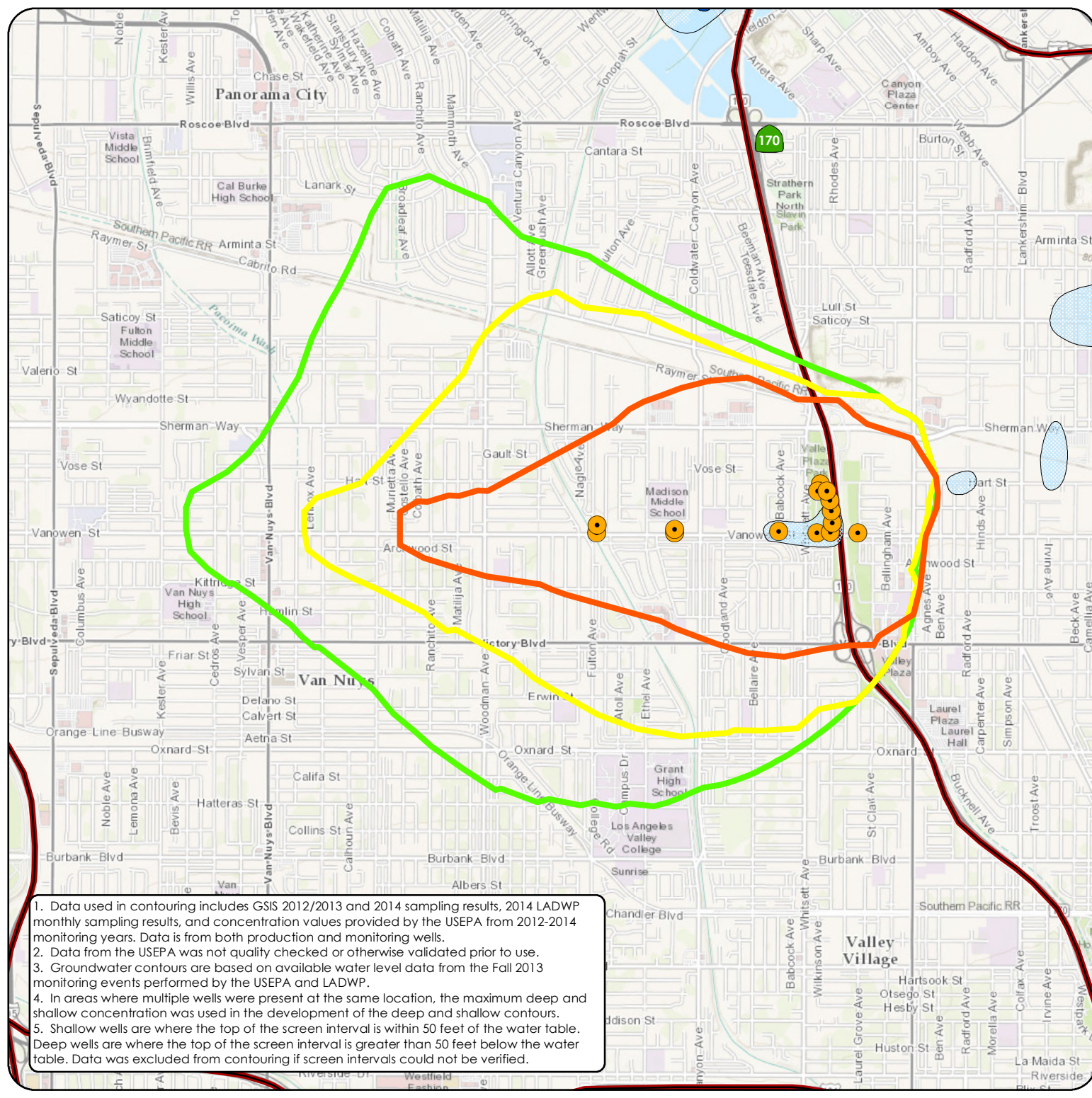
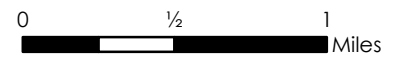
 10-Year

### 1,1-DCE Plume - Deep

Source: LADWP, 2014

 0.5 - 7 µg/L (MCL: 6 µg/L)

 >7 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.  
2. Data from the USEPA was not quality checked or otherwise validated prior to use.  
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.  
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.  
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# NORTH HOLLYWOOD WEST WELLFIELD AND CIS-1,2-DICHLOROETHYLENE (CIS-1,2-DCE) PLUME

Source: LADWP, 2014

### Legend

● North Hollywood West Wells

### Capture Zones

□ 2-Year

□ 5-Year

□ 10-Year

### cis-1,2-DCE Plume - Deep

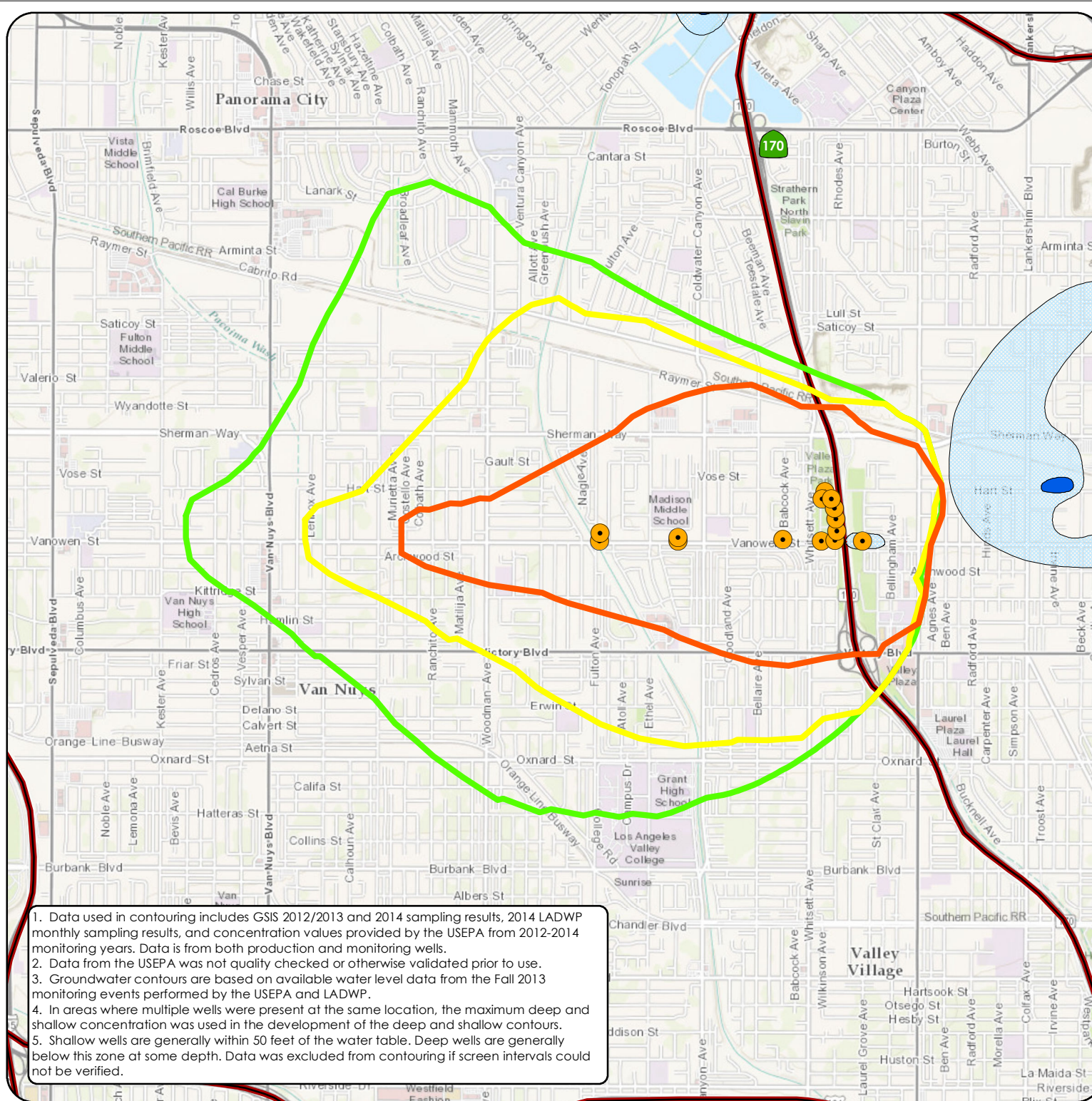
Source: LADWP, 2014

□ 0.5 - 7 µg/L (MCL: 6 µg/L)

□ >7 µg/L



0 1/2 1 Miles



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.  
2. Data from the USEPA was not quality checked or otherwise validated prior to use.  
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.  
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.  
5. Shallow wells are generally within 50 feet of the water table. Deep wells are generally below this zone at some depth. Data was excluded from contouring if screen intervals could not be verified.



# NORTH HOLLYWOOD WEST WELLFIELD AND TOTAL DISSOLVED SOLIDS (TDS) PLUME

Source: LADWP, 2014

### Legend

● North Hollywood West Wells

### Capture Zones

○ 2-Year

○ 5-Year

○ 10-Year

### TDS Plume - Deep

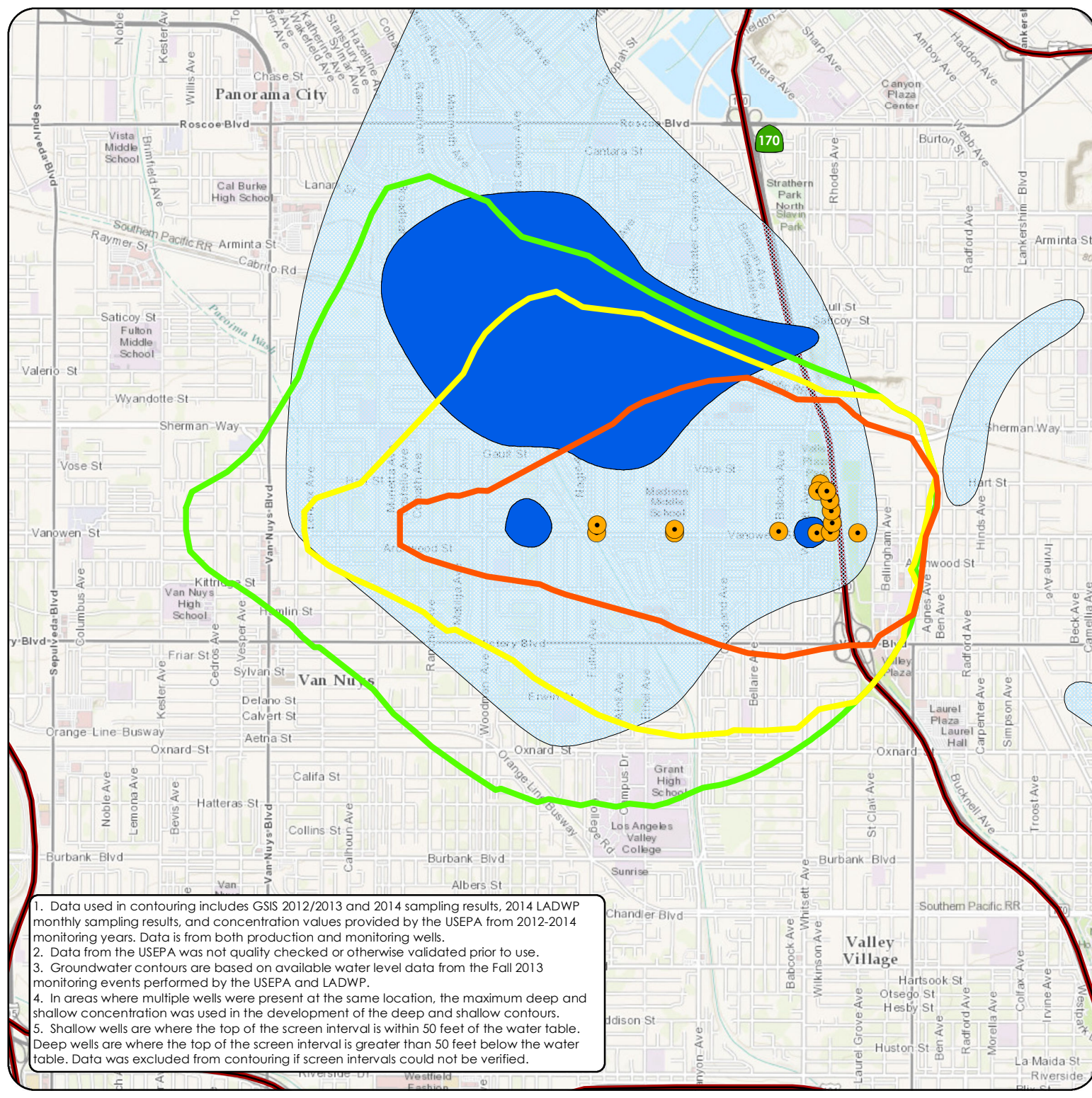
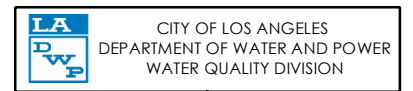
Source: LADWP, 2014

□ 500 (SMCL) - 1,000 mg/L

□ >1,000 mg/L



0 1/2 1 Miles



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.






D-10  
**RINALDI-TOLUCA  
 WELLFIELD AND  
 NITRATE (AS NO<sub>3</sub>) PLUME**

Source: LADWP, 2014

Legend



 Rinaldi-Toluca Wells

Capture Zones

 2-Year  
 5-Year  
 10-Year

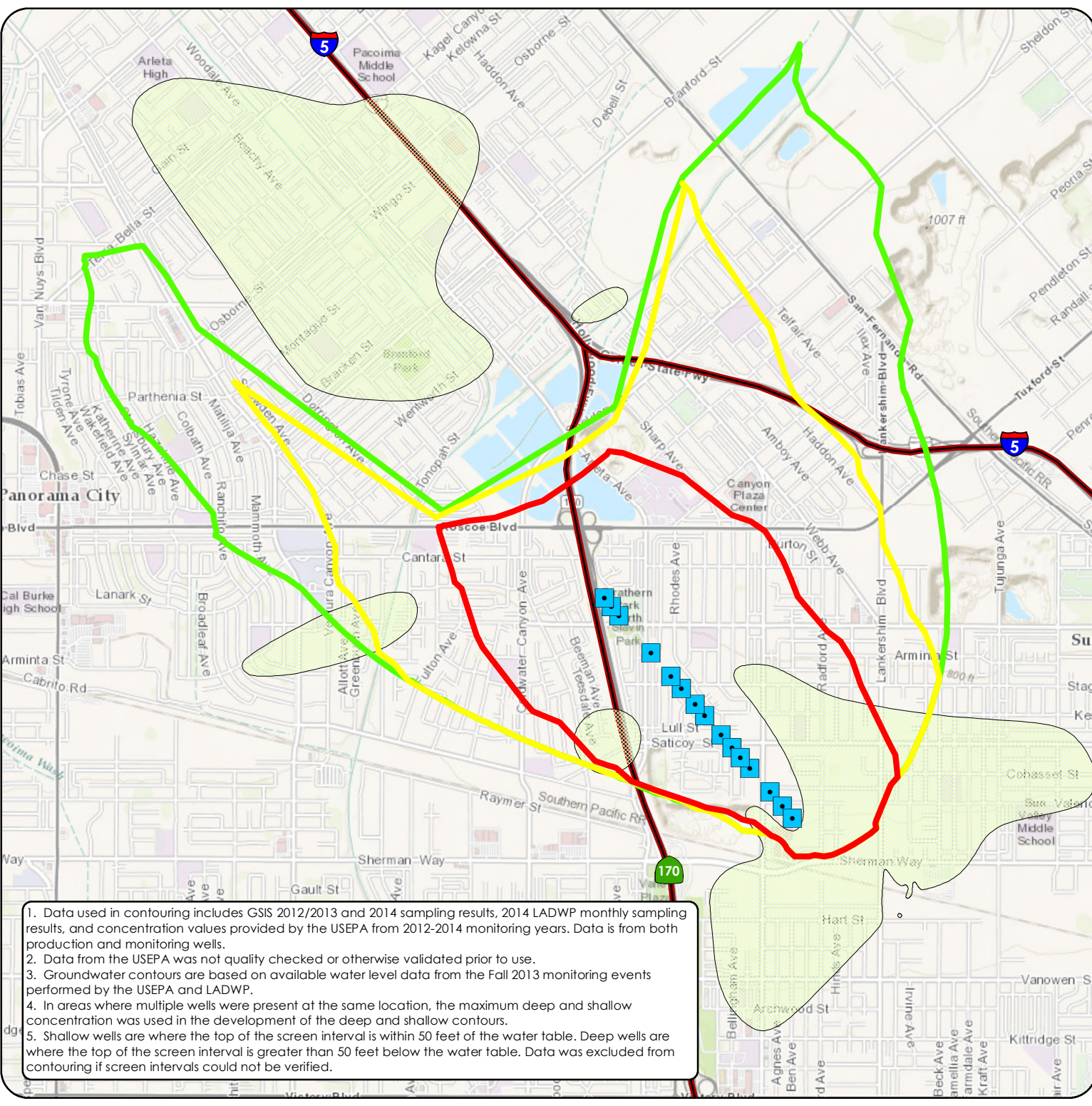
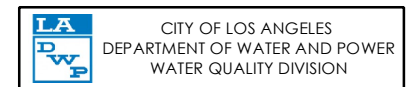
Nitrate (as NO<sub>3</sub>)  
 Plume - Shallow

Source: LADWP, 2014

 45 (MCL) - 100 mg/L  
 >100 mg/L



0      1/2      1  
 Miles



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# RINALDI-TOLUCA WELLFIELD AND PERCHLORATE PLUME

Source: LADWP, 2014

## Legend

 Rinaldi-Toluca Wells

## Capture Zones


 2-Year

 5-Year

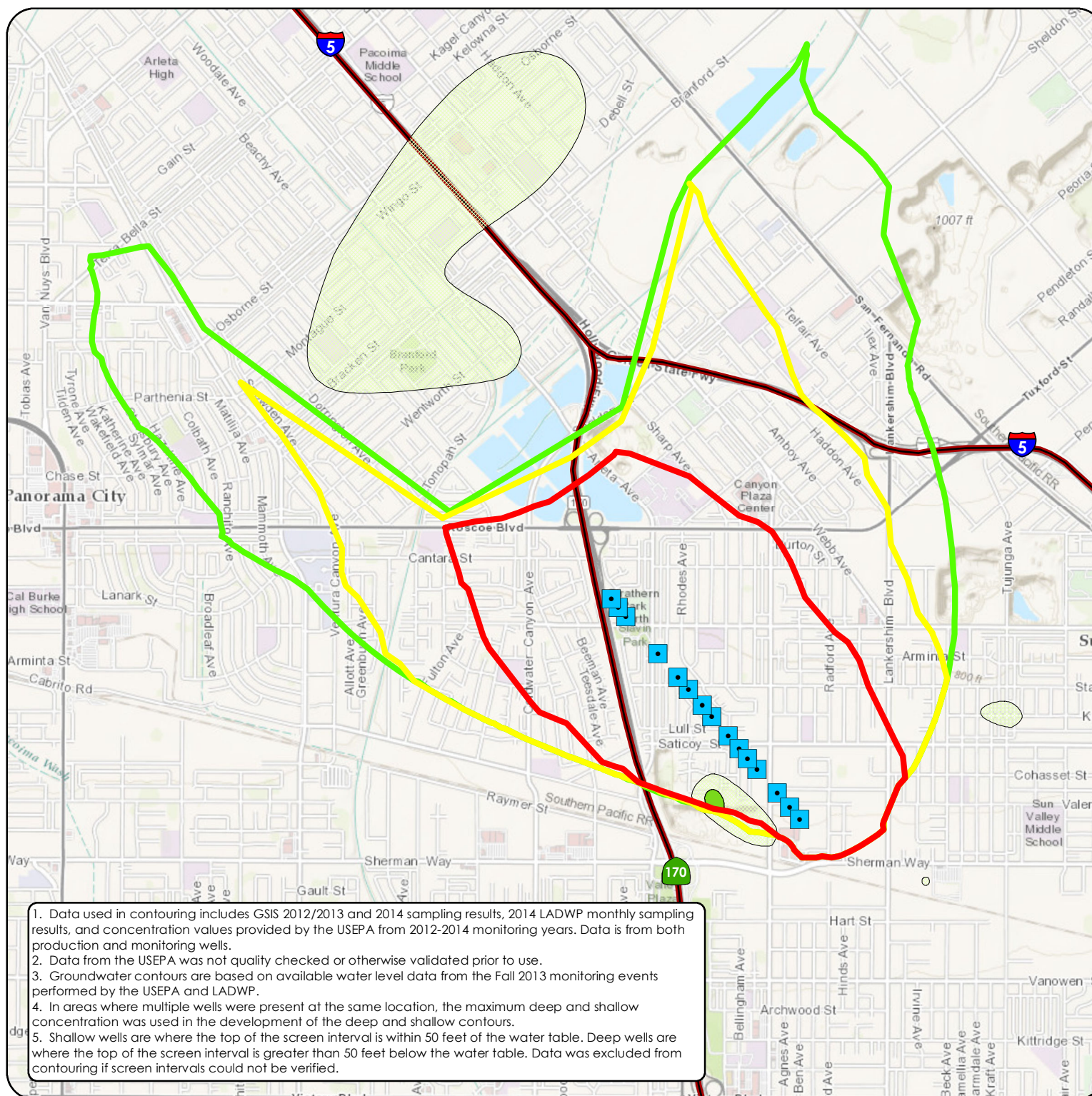
 10-Year

## Perchlorate Plume - Shallow

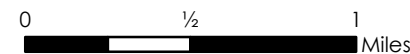
Source: LADWP, 2014

 2 - 6 µg/L (MCL)

 >6 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.








D-12  
**RINALDI-TOLUCA  
 WELLFIELD AND  
 1,1-DICHLOROETHYLENE  
 (1,1-DCE) PLUME**

Source: LADWP, 2014

Legend





 Rinaldi-Toluca Wells

Capture Zones

 2-Year  
 5-Year  
 10-Year

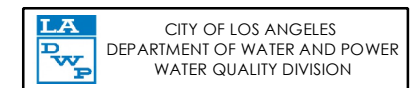
1,1-DCE Plume - Shallow

Source: LADWP, 2014

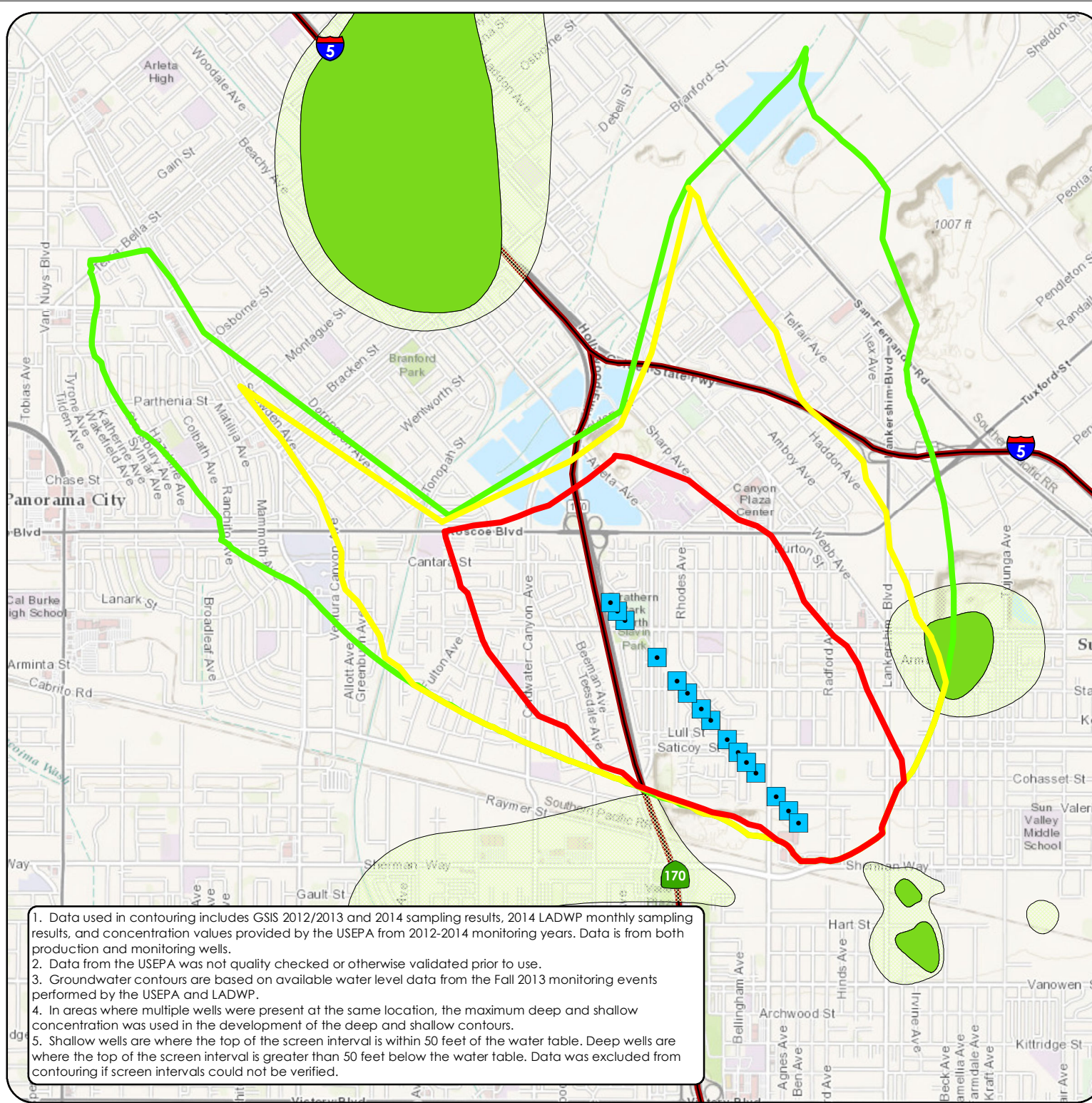
 0.5 - 7 µg/L (MCL: 6 µg/L)  
 >100 µg/L  
 50.01 - 100 µg/L  
 7.01 - 50 µg/L



0      1/2      1  
 Miles



1. Data used in contouring includes GSI 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.





# RINALDI-TOLUCA WELLFIELD AND CIS-1,2-DICHLORO- ETHYLENE (CIS-1,2-DCE) PLUME

Source: LADWP, 2014

### Legend

 Rinaldi-Toluca Wells

### Capture Zones


 2-Year

 5-Year

 10-Year


### cis-1,2-DCE Plume - Shallow

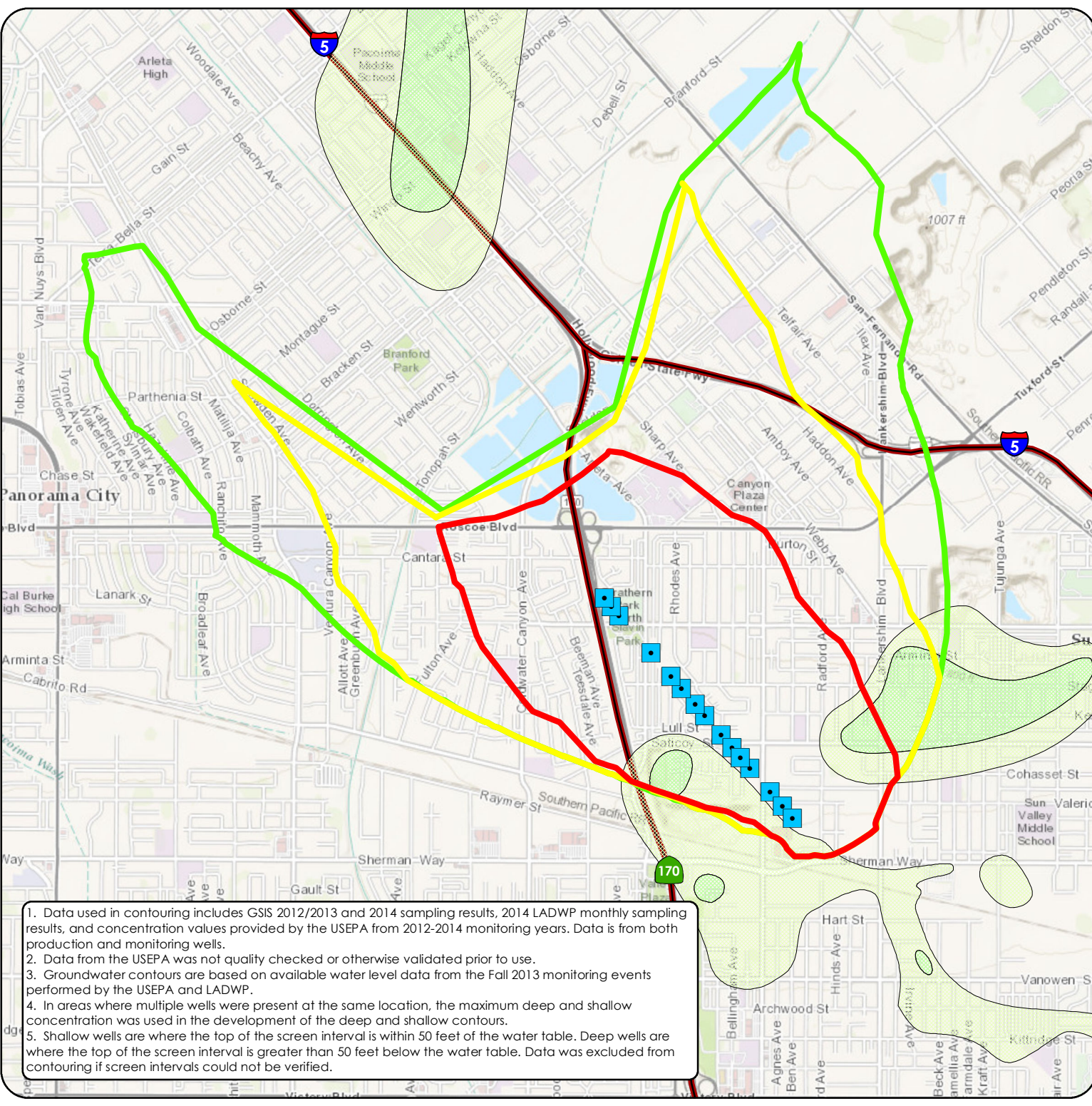
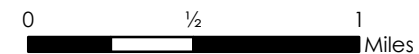
Source: LADWP, 2014

 0.5 - 7 µg/L (MCL: 6 µg/L)

 7.01 - 50 µg/L

 50.01 - 100 µg/L

 >100 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# RINALDI-TOLUCA WELLFIELD AND TOTAL DISSOLVED SOLIDS (TDS) PLUME

Source: LADWP, 2014

### Legend

 Rinaldi-Toluca Wells

### Capture Zones


 2-Year


 5-Year

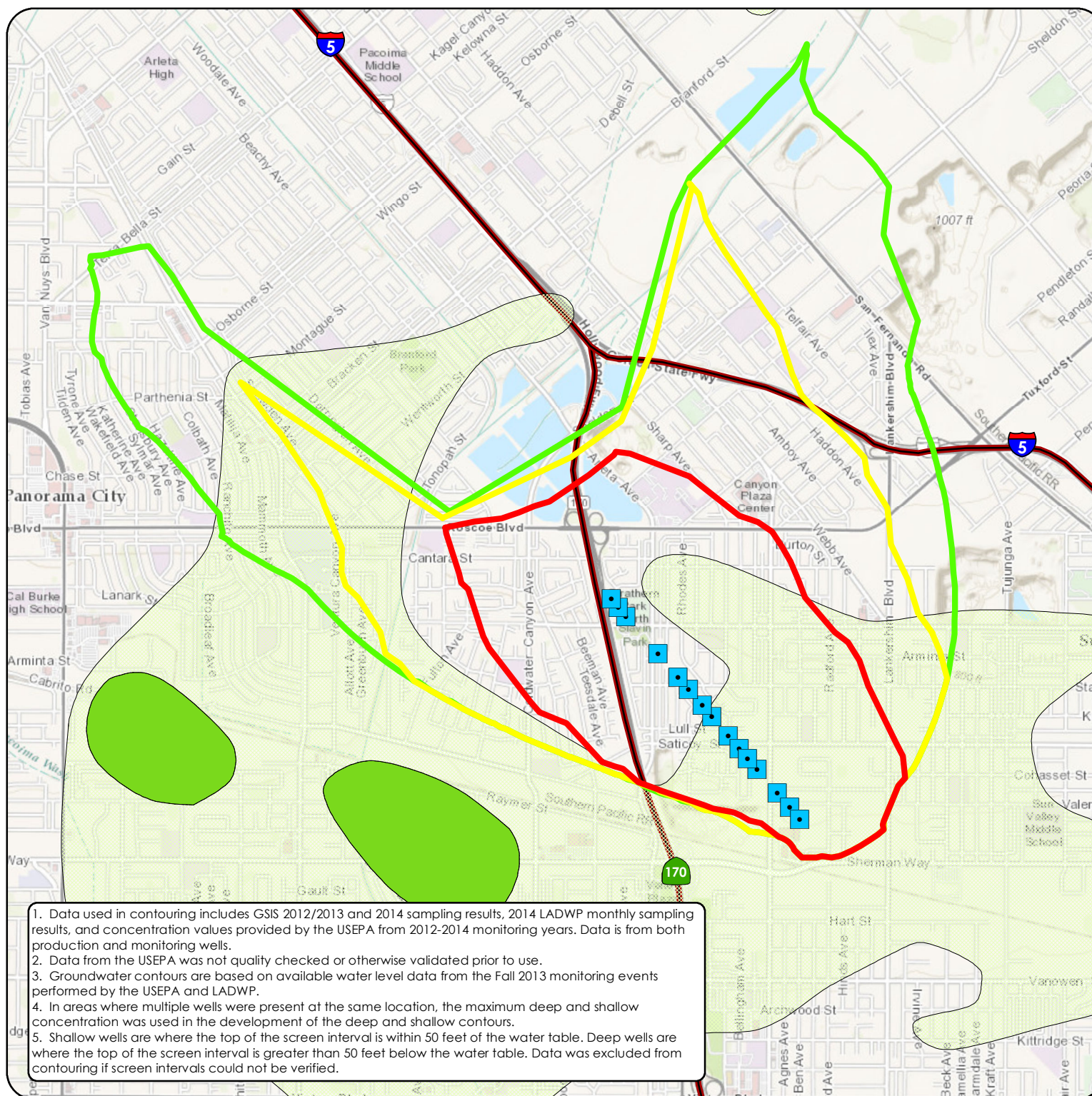
 10-Year

### TDS Plume - Shallow

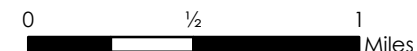
Source: LADWP, 2014

 500 (SMCL) - 1,000 mg/L

 >1,000 mg/L



1. Data used in contouring includes GSI 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.





# RINALDI-TOLUCA WELLFIELD AND PERCHLORATE PLUME

Source: LADWP, 2014

## Legend

■ Rinaldi-Toluca Wells

## Capture Zones

□ 2-Year

□ 5-Year

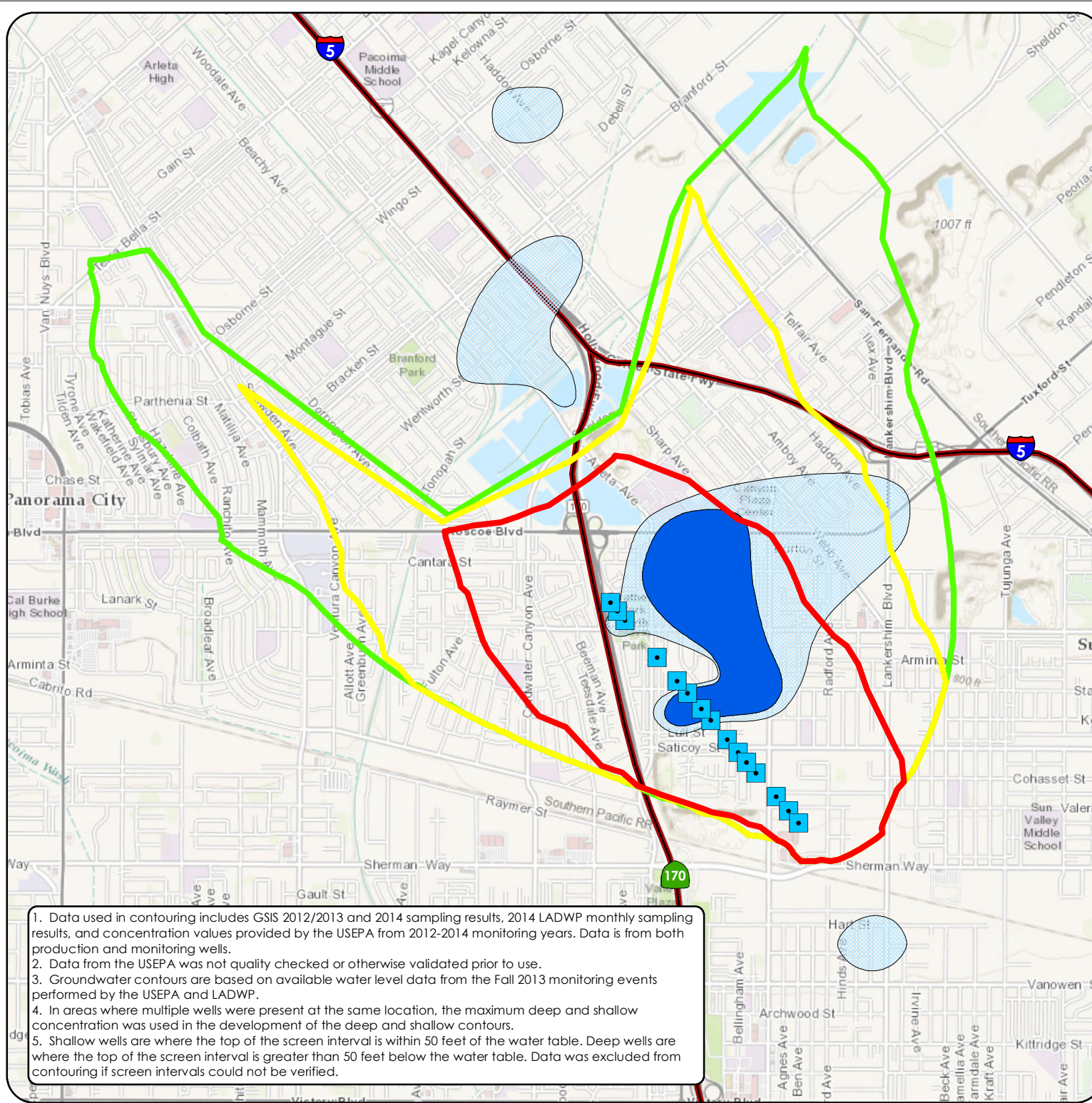
□ 10-Year

## Perchlorate Plume - Deep

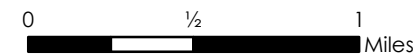
Source: LADWP, 2014

□ 2 - 6 µg/L (MCL)

■ >6 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.





D-16  
**RINALDI-TOLUCA  
 WELLFIELD AND  
 1,1-DICHLOROETHYLENE  
 (1,1-DCE) PLUME**

Source: LADWP, 2014

Legend

 Rinaldi-Toluca Wells

Capture Zones


 2-Year

 5-Year

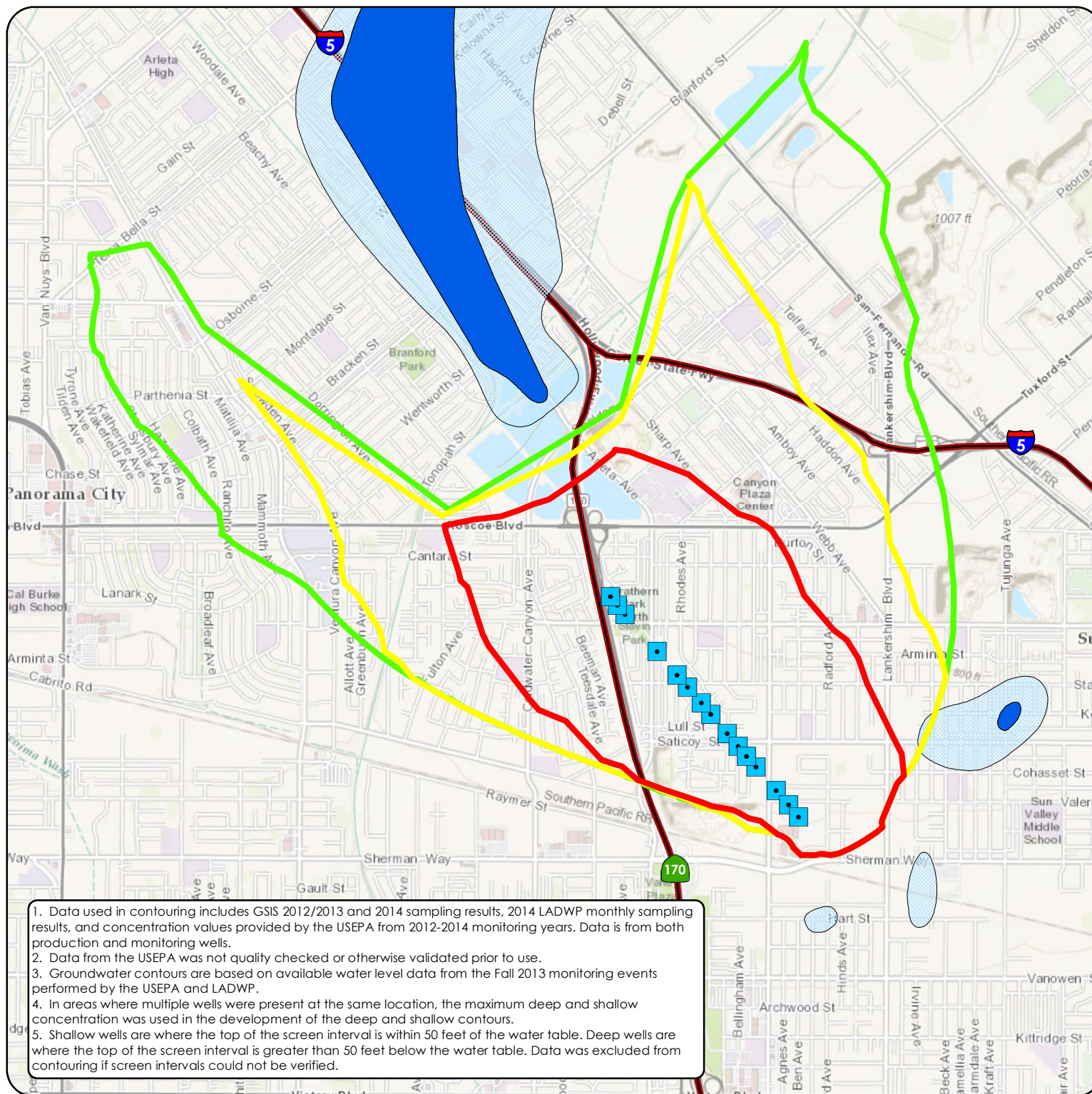
 10-Year

1,1-DCE Plume - Deep

Source: LADWP, 2014


 0.5 - 7  $\mu\text{g/L}$  (MCL: 6  $\mu\text{g/L}$ )

 >7  $\mu\text{g/L}$

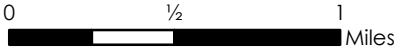



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.

N



0      1/2      1  
Miles





CITY OF LOS ANGELES  
DEPARTMENT OF WATER AND POWER  
WATER QUALITY DIVISION



D-17  
**RINALDI-TOLUCA  
 WELLFIELD AND  
 CIS-1,2-DICHLORO-  
 ETHYLENE  
 (CIS-1,2-DCE) PLUME**

Source: LADWP, 2014

Legend

■ Rinaldi-Toluca Wells

Capture Zones

□ 2-Year  
 □ 5-Year  
 □ 10-Year

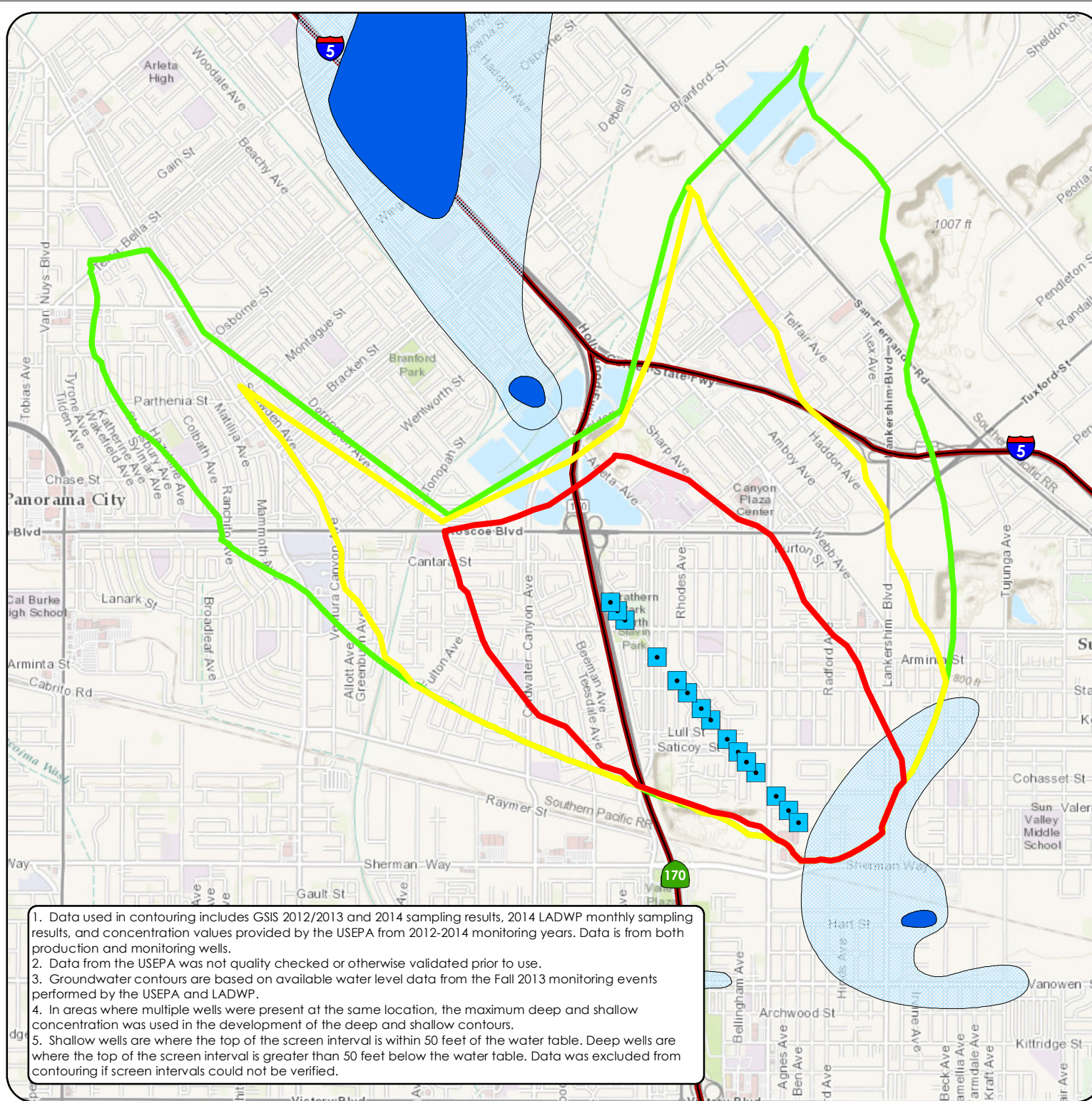
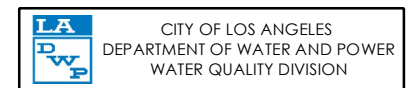
cis-1,2-DCE Plume -  
 Deep

Source: LADWP, 2014

□ 0.5 - 7 µg/L (MCL: 6 µg/L)  
 ■ >7 µg/L



0 1/2 1 Miles



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# RINALDI-TOLUCA WELLFIELD AND TOTAL DISSOLVED SOLIDS (TDS) PLUME

Source: LADWP, 2014

### Legend

 Rinaldi-Toluca Wells

### Capture Zones


 2-Year


 5-Year

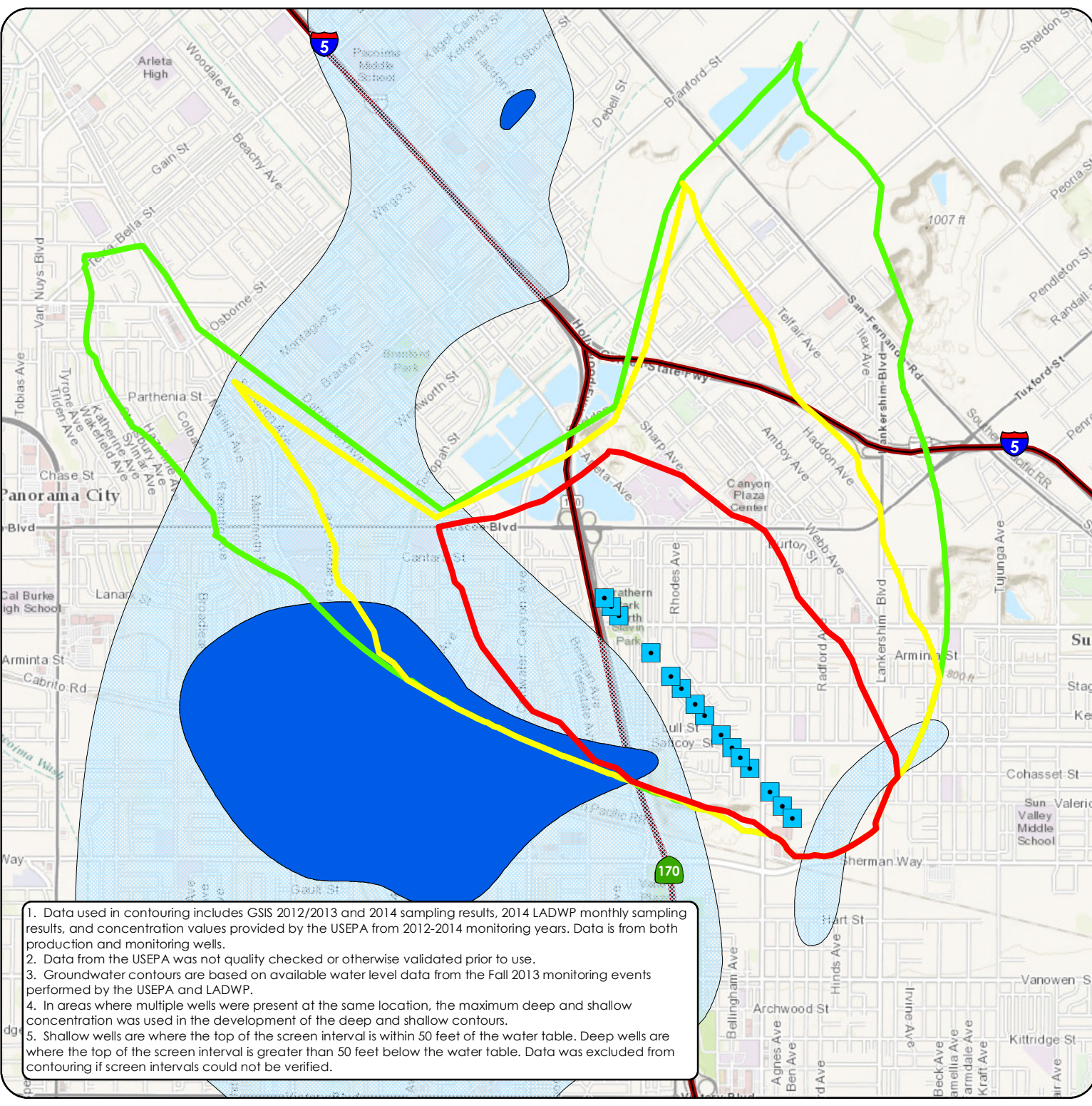
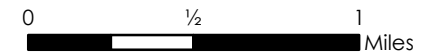
 10-Year

### TDS Plume - Deep

Source: LADWP, 2014

 500 (SMCL) - 1,000 mg/L

 >1,000 mg/L



1. Data used in contouring includes GSI 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND LADWP NITRATE (AS NO<sub>3</sub>) PLUME

Source: LADWP, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

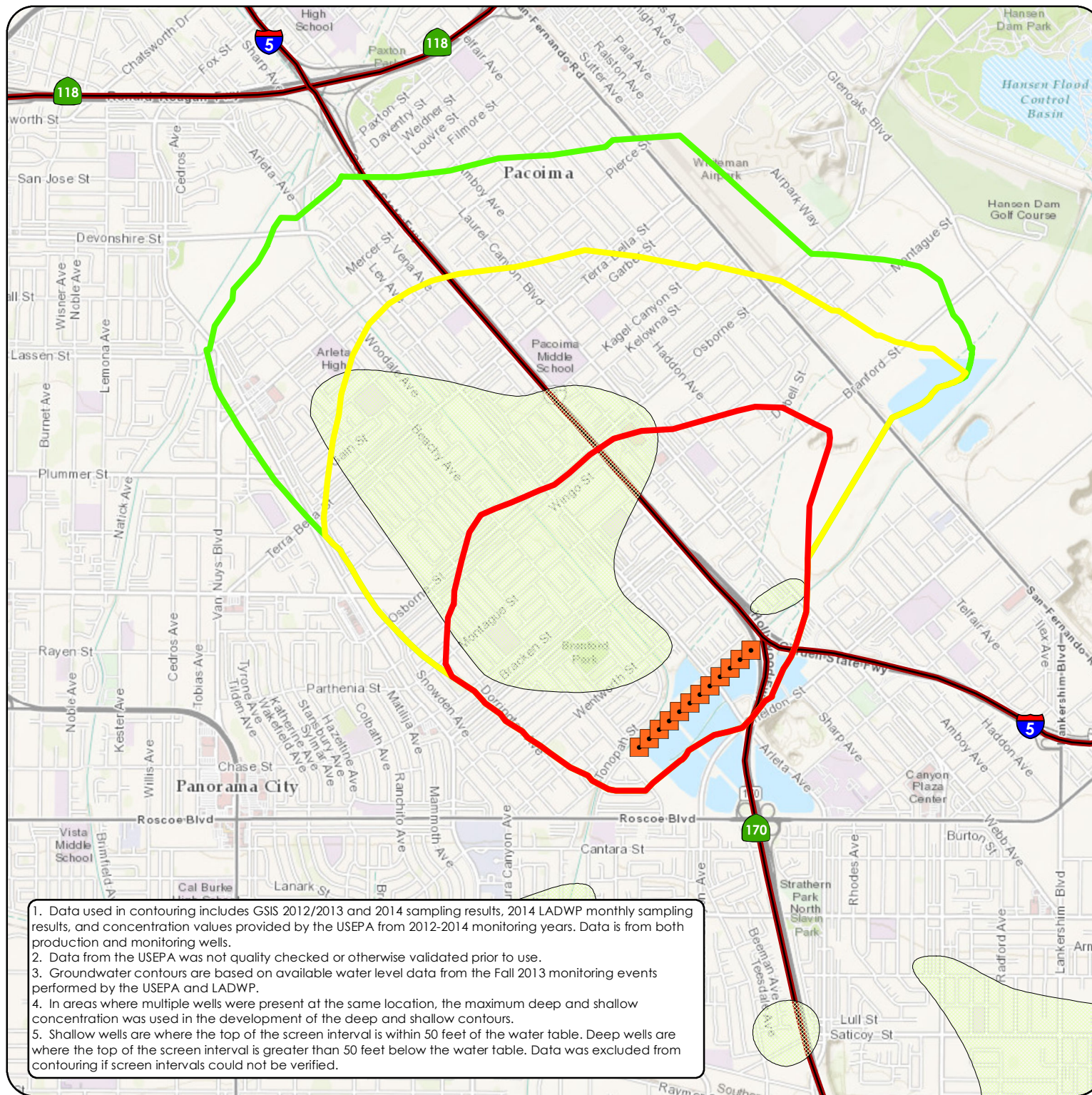
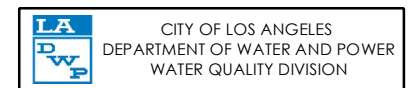
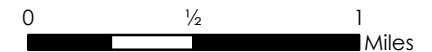
□ 10-Year

### Nitrate (as NO<sub>3</sub>) Plume - Shallow

Source: LADWP, 2014

□ 45 (MCL) - 100 mg/L

□ >100 mg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND PERCHLORATE PLUME

Source: LADWP, 2014

## Legend

■ Tujunga Wells

## Capture Zones

□ 2-Year

□ 5-Year

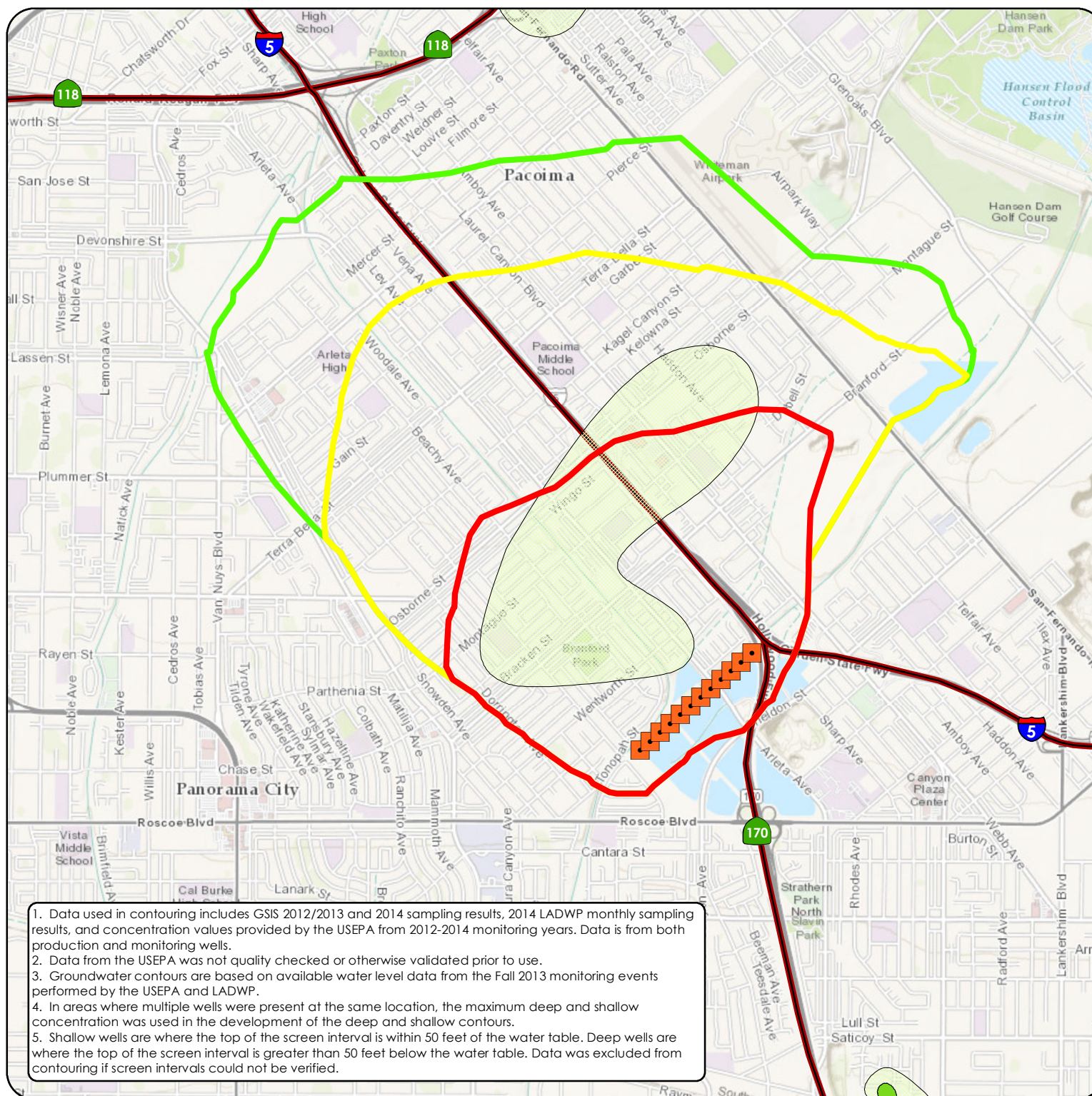
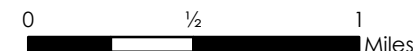
□ 10-Year

## Perchlorate Plume - Shallow

Source: LADWP, 2014

□ 2 - 6 µg/L (MCL)

□ >6 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND 1,1-DICHLOROETHYLENE (1,1-DCE) PLUME

Source: LADWP, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

□ 10-Year

### 1,1-DCE Plume - Shallow

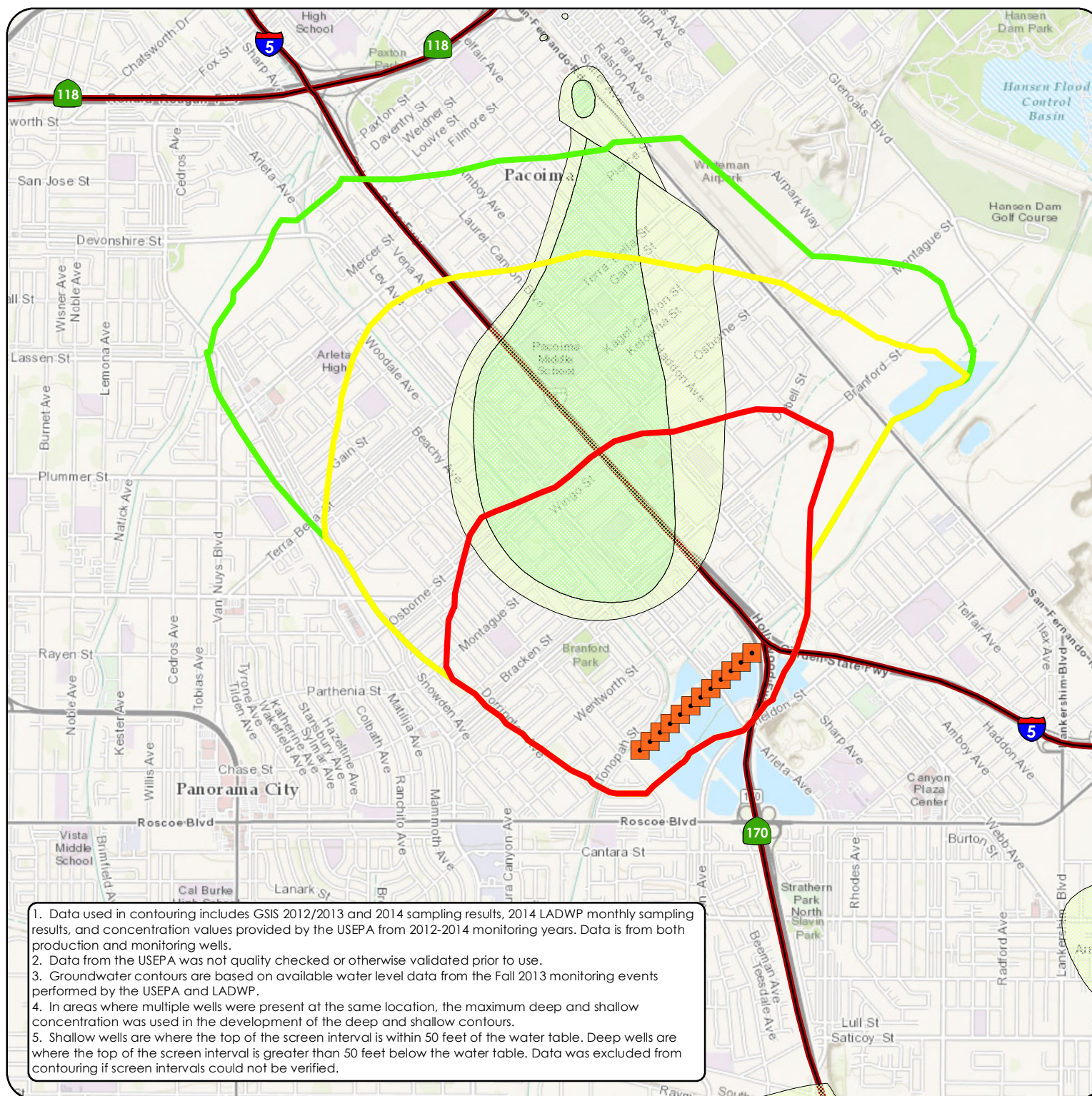
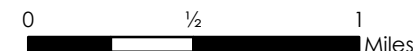
Source: LADWP, 2014

□ 0.5 - 7 µg/L (MCL: 6 µg/L)

□ 7.01 - 50 µg/L

□ 50.01 - 100 µg/L

□ >100 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND CIS-1,2-DICHLORO- ETHYLENE (CIS-1,2-DCE) PLUME

Source: LADWP, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

□ 10-Year

### cis-1,2-DCE Plume - Shallow

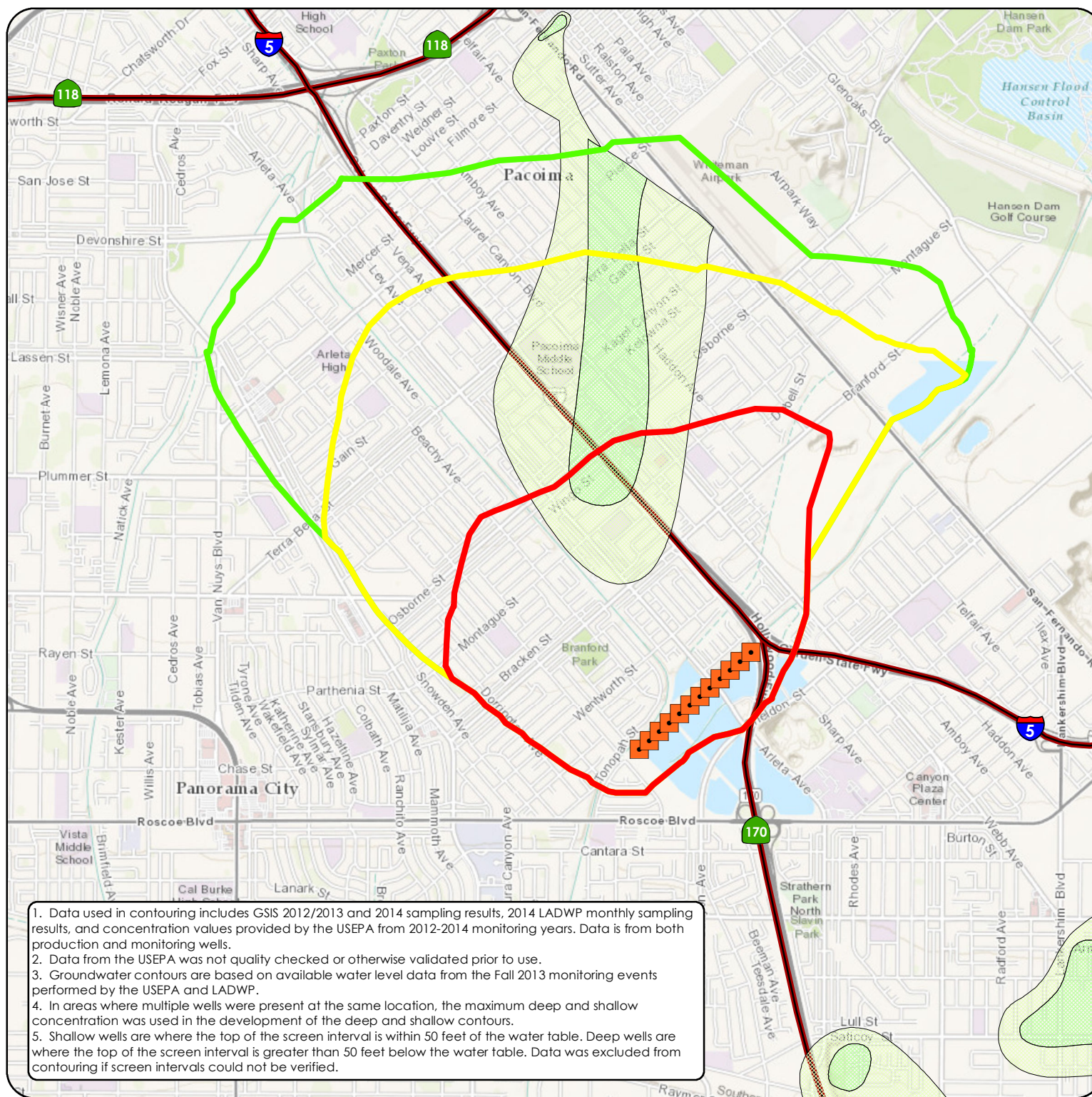
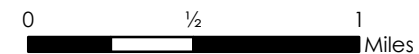
Source: LADWP, 2014

□ 0.5 - 7 µg/L (MCL: 6 µg/L)

□ 7.01 - 50 µg/L

□ 50.01 - 100 µg/L

□ >100 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND TOTAL DISSOLVED SOLIDS (TDS) PLUME

Source: LADWP, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

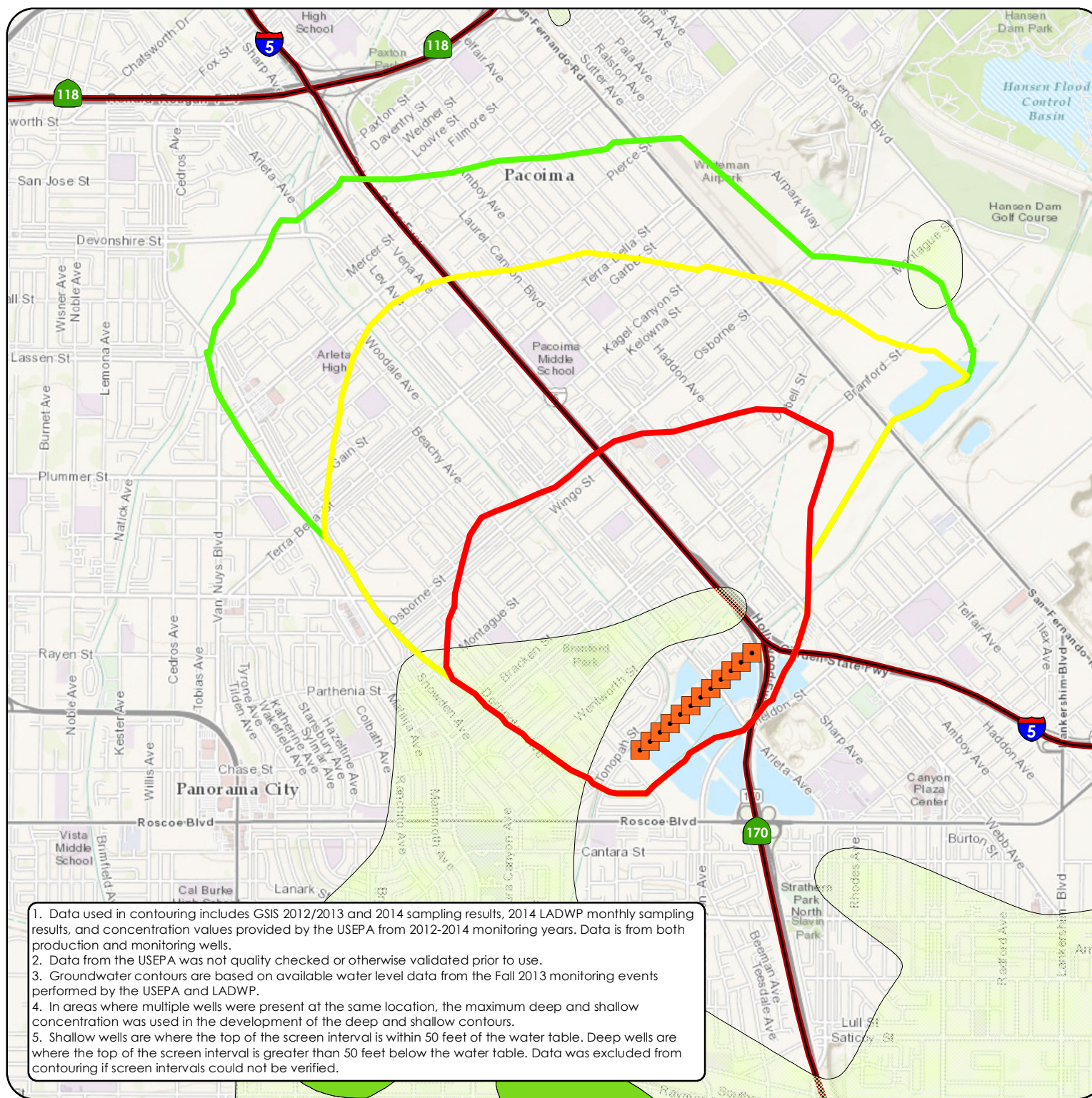
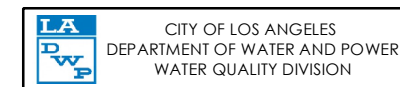
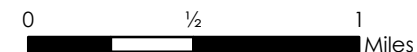
□ 10-Year

### TDS Plume - Shallow

Source: LADWP, 2014

□ 500 (SMCL) - 1,000 mg/L

■ >1,000 mg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND LADWP PERCHLORATE PLUME

Source: LADWP, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

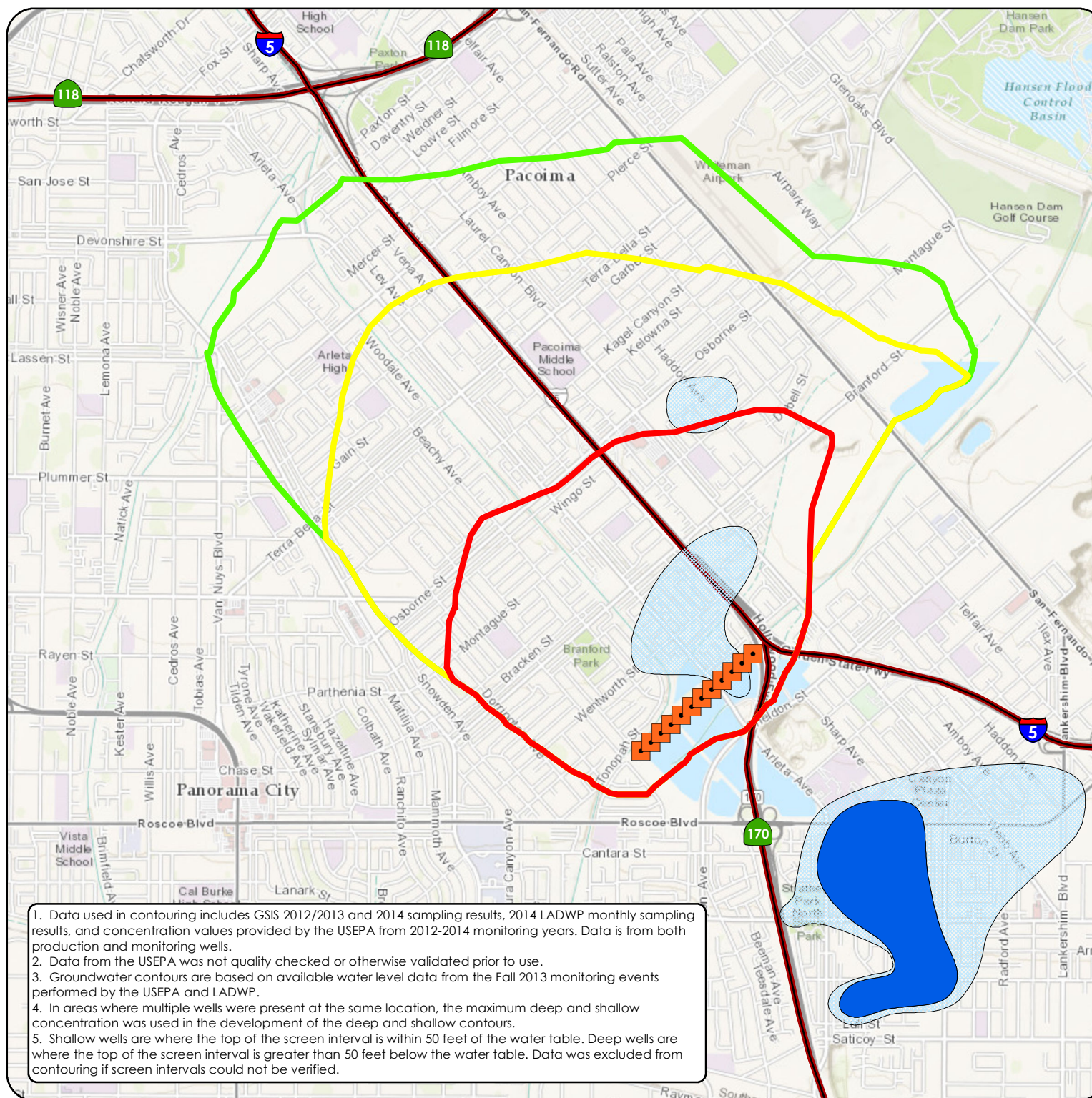
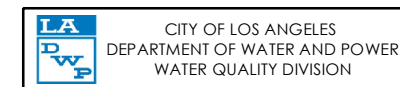
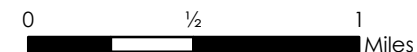
□ 10-Year

### Perchlorate Plume - Deep

Source: LADWP, 2014

□ 2 - 6 µg/L (MCL)

■ >6 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND 1,1-DICHLOROETHYLENE (1,1-DCE) PLUME

Source: LADWP, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

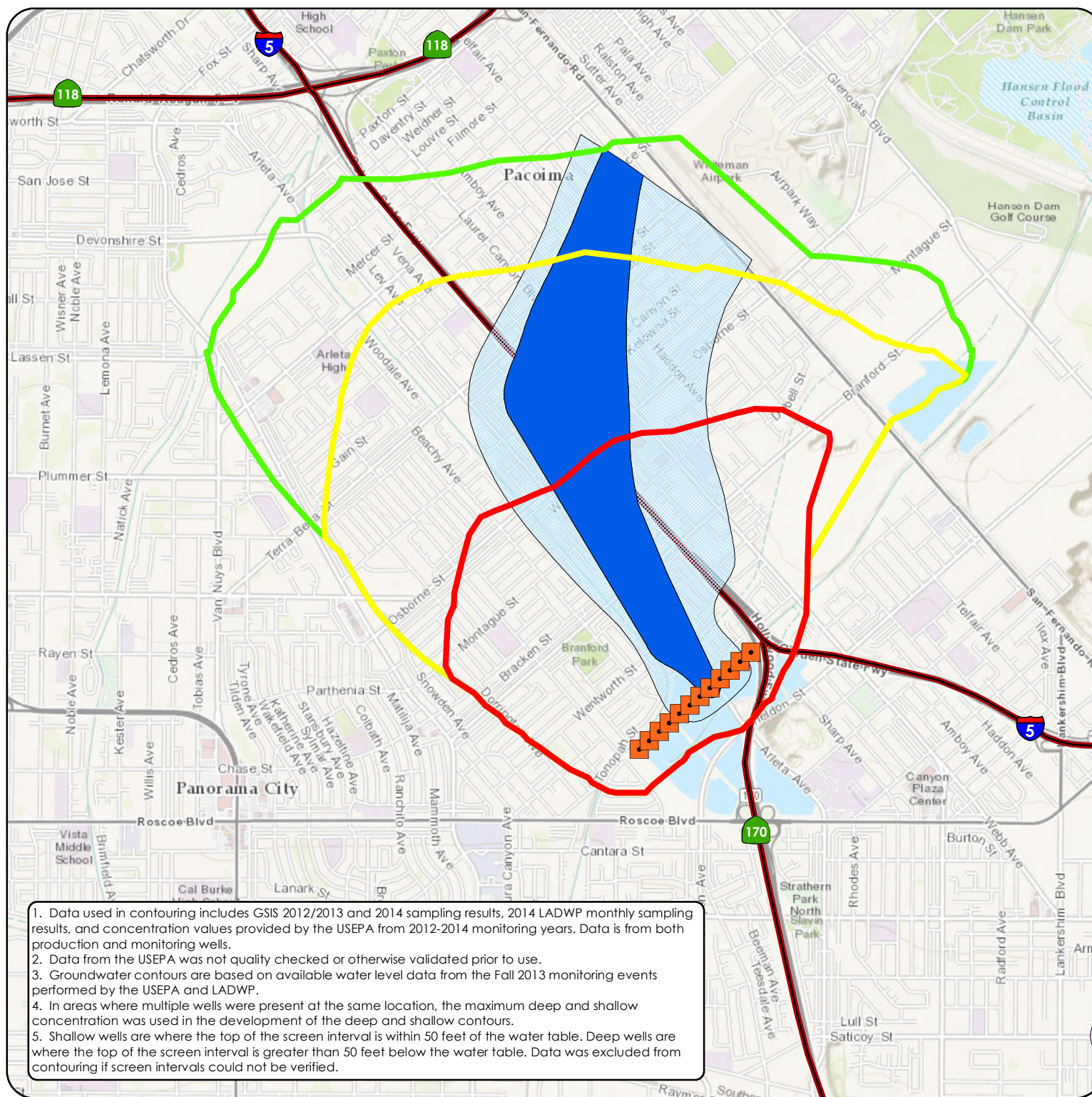
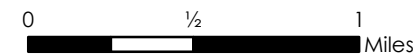
□ 10-Year

### 1,1-DCE Plume - Deep

Source: LADWP, 2014

□ 0.5 - 7 µg/L (MCL: 6 µg/L)

■ >7 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND CIS-1,2-DICHLORO- ETHYLENE (CIS-1,2-DCE) PLUME

Source: LADWP, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

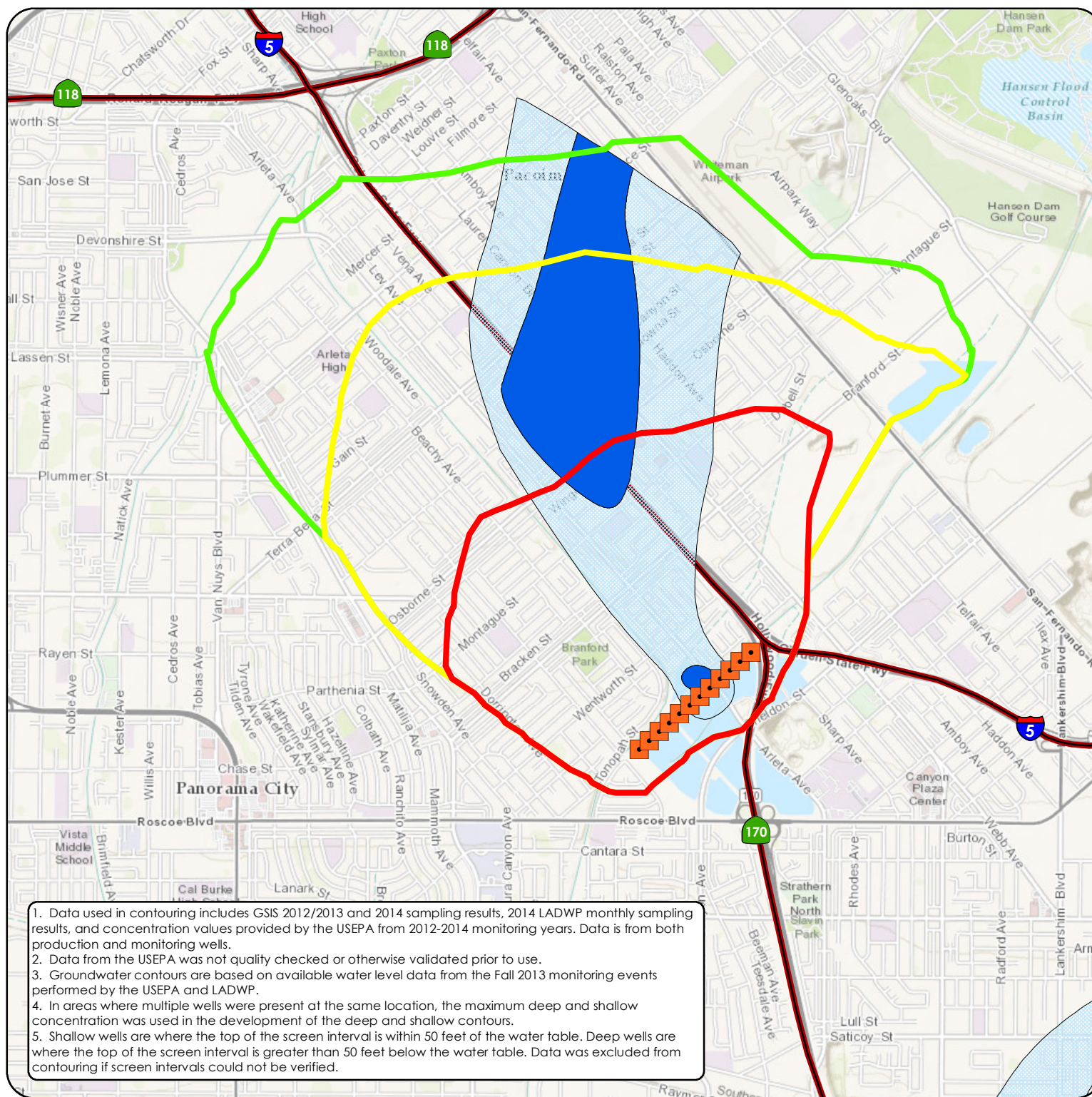
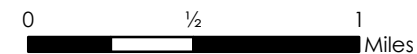
□ 10-Year

### cis-1,2-DCE Plume - Deep

Source: LADWP, 2014

□ 0.5 - 7 µg/L (MCL: 6 µg/L)

■ >7 µg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.



# TUJUNGA WELLFIELD AND TOTAL DISSOLVED SOLIDS (TDS) PLUME

Source: LADWP, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

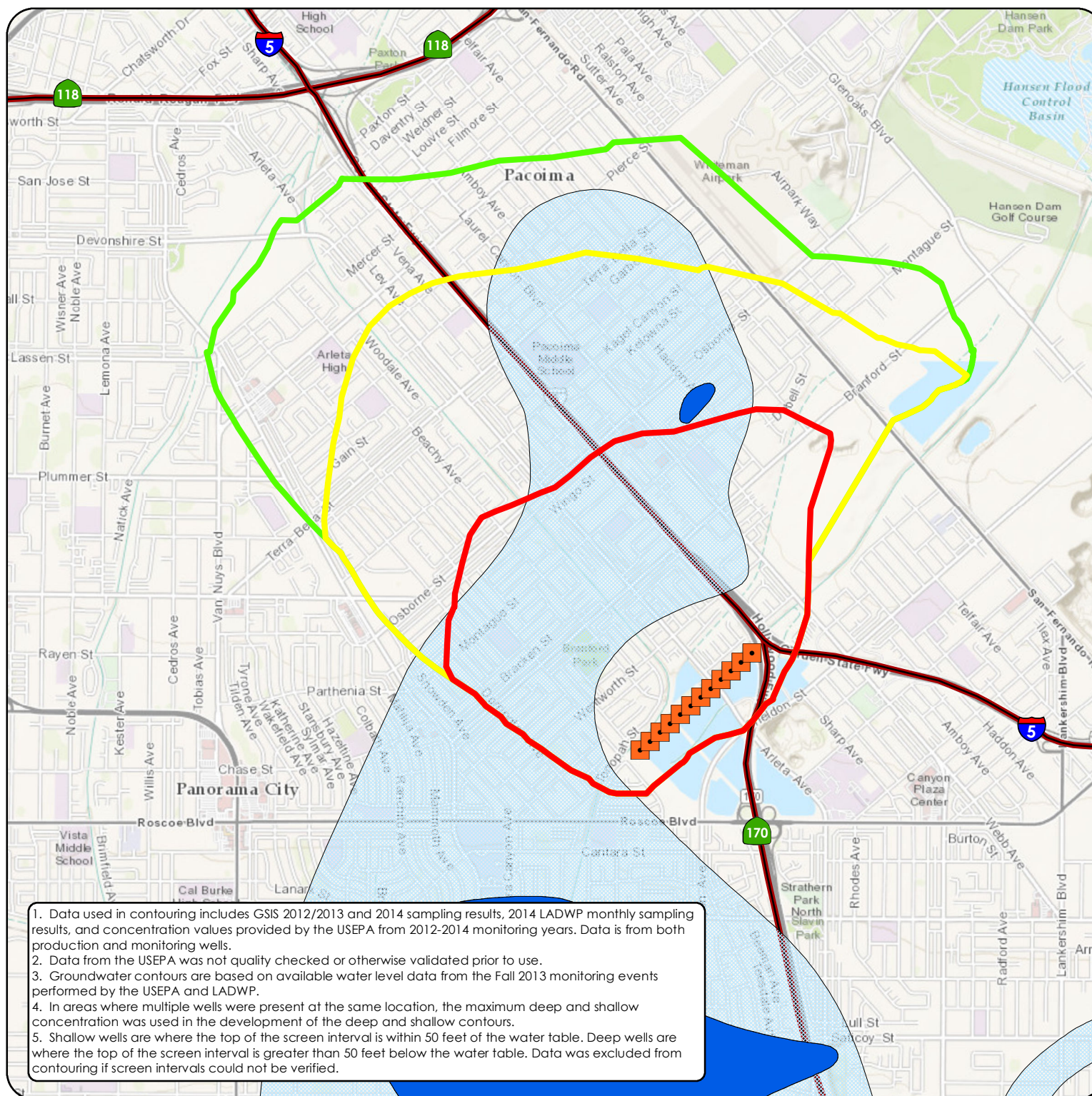
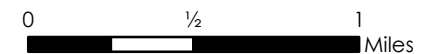
□ 10-Year

### TDS Plume - Deep

Source: LADWP, 2014

□ 500 (SMCL) - 1,000 mg/L

□ >1,000 mg/L



1. Data used in contouring includes GIS 2012/2013 and 2014 sampling results, 2014 LADWP monthly sampling results, and concentration values provided by the USEPA from 2012-2014 monitoring years. Data is from both production and monitoring wells.
2. Data from the USEPA was not quality checked or otherwise validated prior to use.
3. Groundwater contours are based on available water level data from the Fall 2013 monitoring events performed by the USEPA and LADWP.
4. In areas where multiple wells were present at the same location, the maximum deep and shallow concentration was used in the development of the deep and shallow contours.
5. Shallow wells are where the top of the screen interval is within 50 feet of the water table. Deep wells are where the top of the screen interval is greater than 50 feet below the water table. Data was excluded from contouring if screen intervals could not be verified.

**Attachment E**  
**EPA Plume Maps**






# NORTH HOLLYWOOD WEST WELLFIELD AND TRICHLOROETHYLENE (TCE) PLUME

Source: EPA, 2014

### Legend








● North Hollywood West Wells

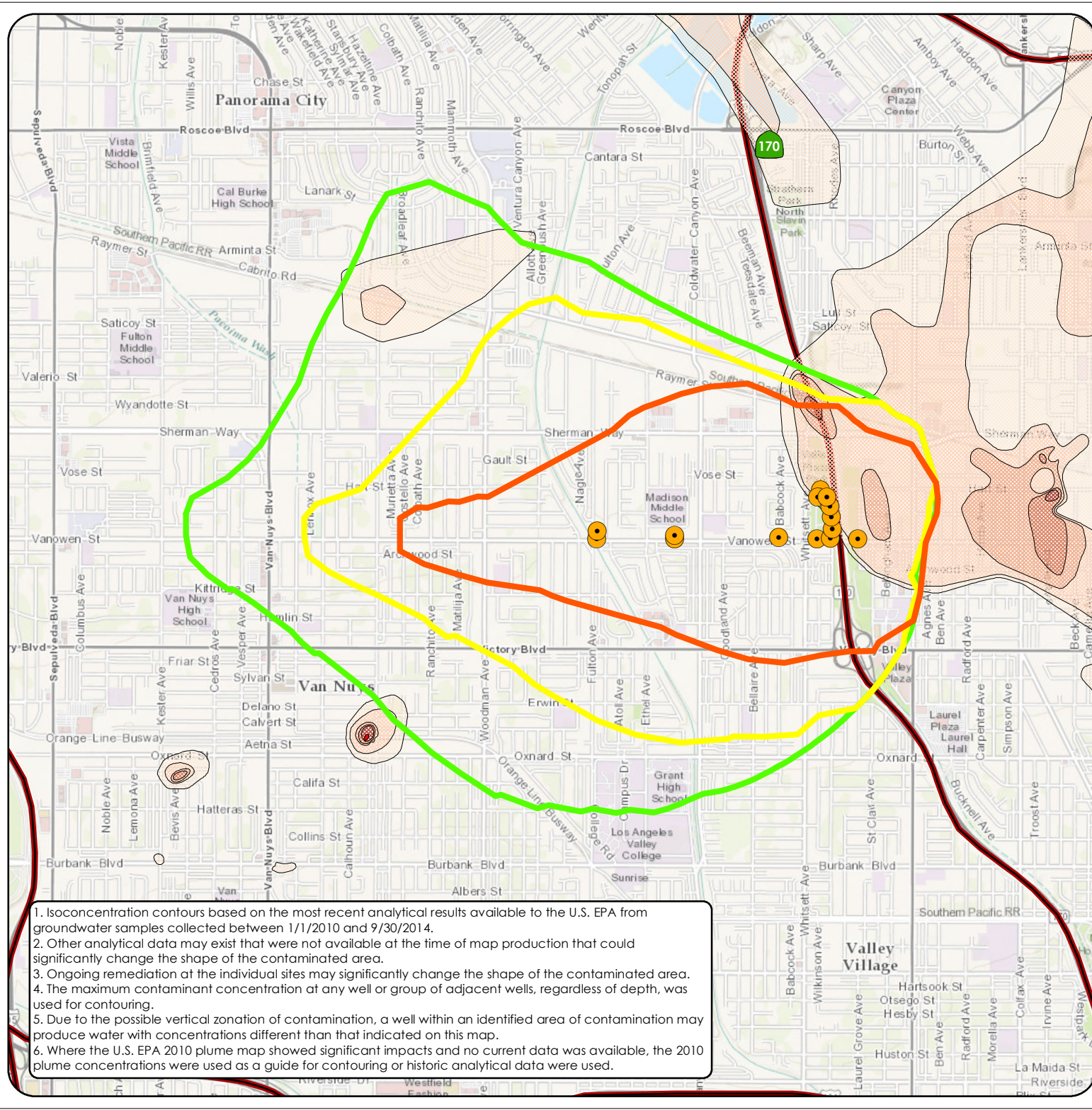
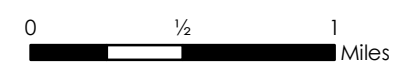
### Capture Zones

-  2-Year
-  5-Year
-  10-Year

### TCE Plume

Source: EPA, 2014

-  0.5 - 5 µg/L (MCL)
-  5.01 - 50 µg/L
-  50.01 - 100 µg/L
-  100.01 - 500 µg/L
-  500.01 - 1,000 µg/L
-  1,000 - 10,000 µg/L
-  >10,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.






# NORTH HOLLYWOOD WEST WELLFIELDS AND EPA TETRACHLOROETHYLENE (PCE) PLUME

Source: EPA, 2014

### Legend







● North Hollywood West Wells

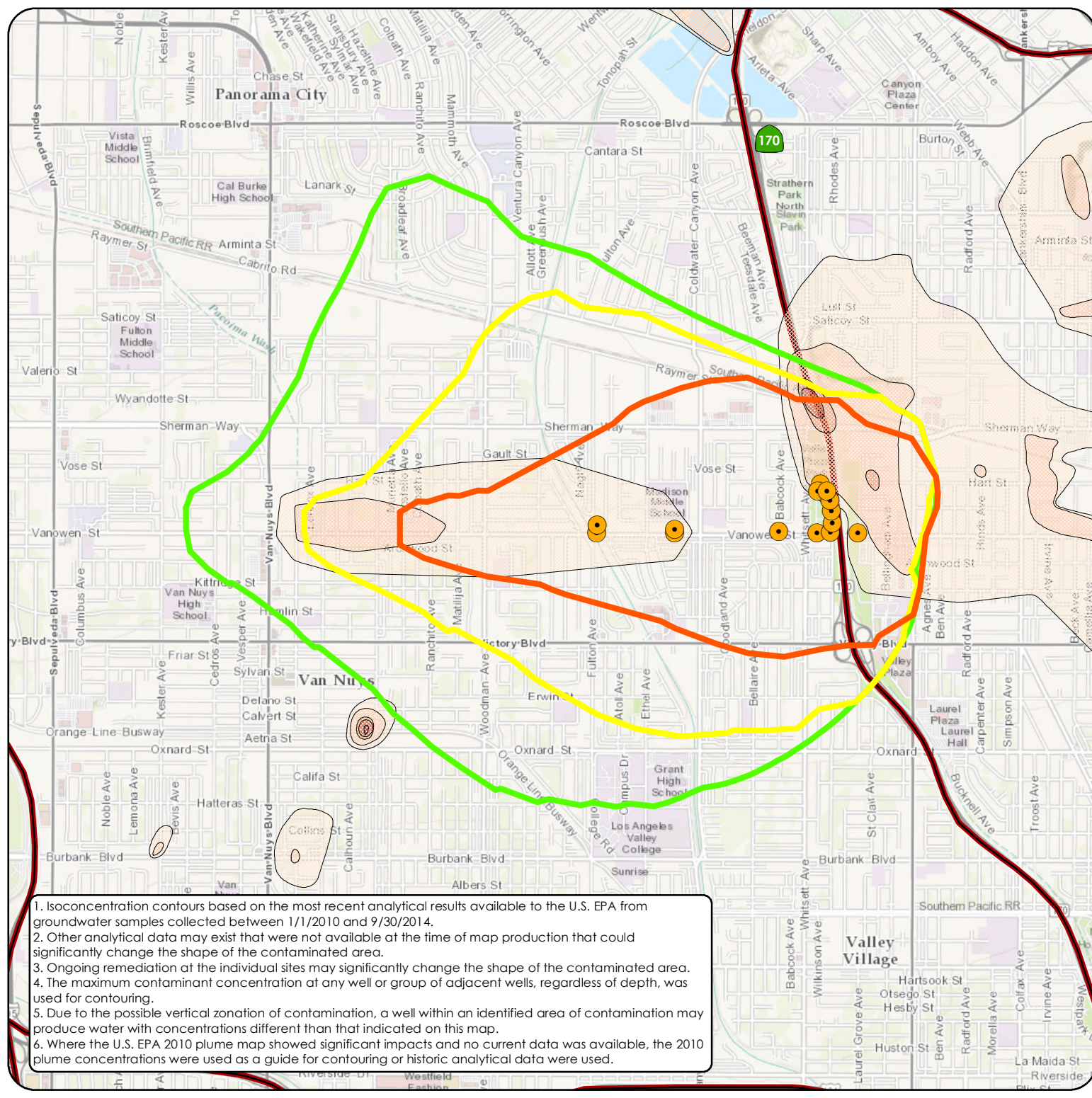
### Capture Zones

-  2-Year
-  5-Year
-  10-Year

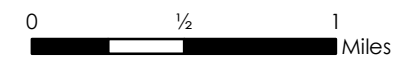
### PCE Plume

Source: EPA, 2014

-  0.5 - 5 µg/L (MCL)
-  5.01 - 50 µg/L
-  50.01 - 100 µg/L
-  100.01 - 500 µg/L
-  500.01 - 1,000 µg/L
-  >1,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.





# NORTH HOLLYWOOD WEST WELLFIELD AND HEXAVALENT CHROMIUM PLUME

Source: EPA, 2014

### Legend

● North Hollywood West Wells

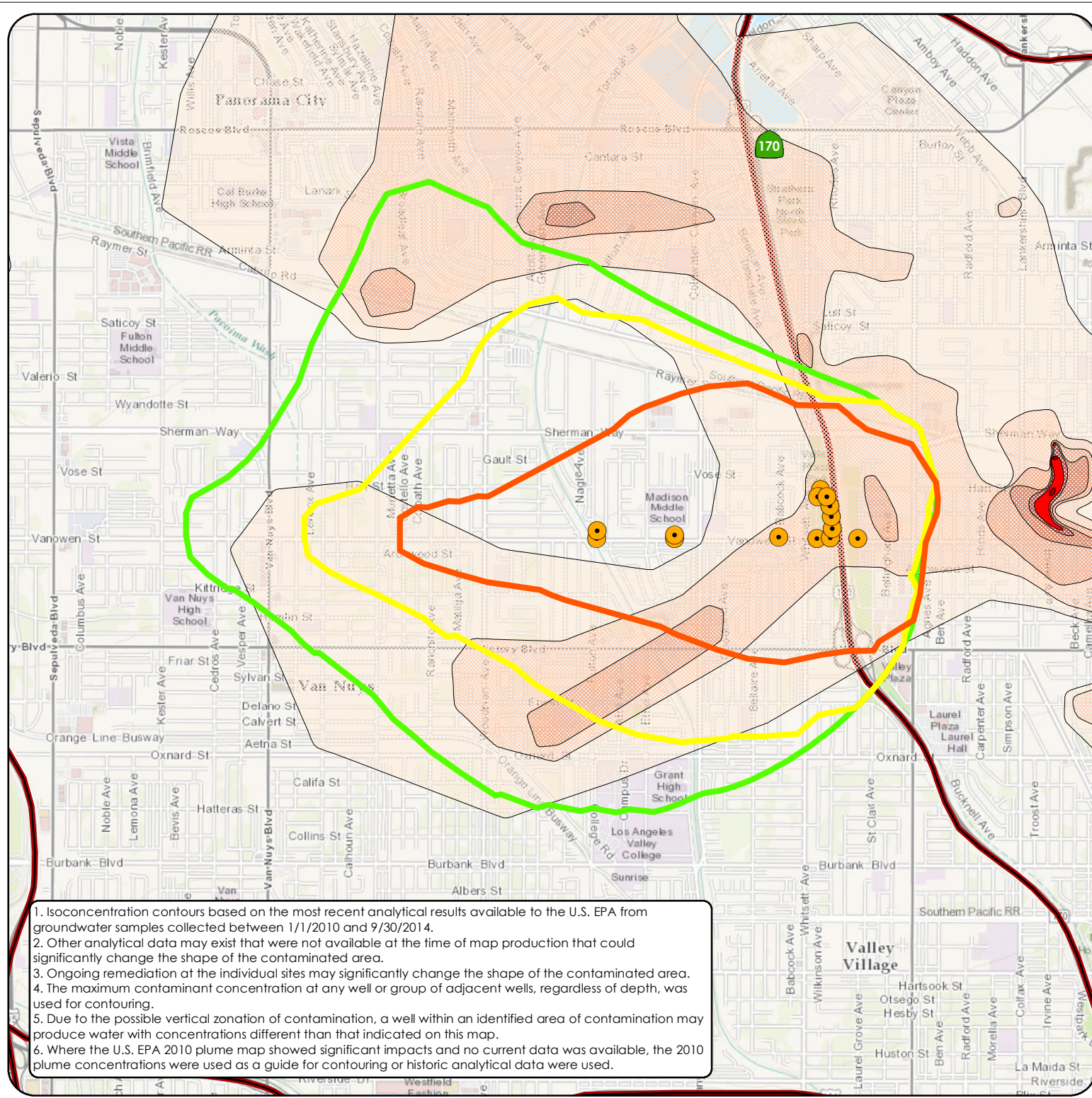
### Capture Zones

- 2-Year
- 5-Year
- 10-Year

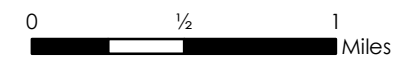
### Hexavalent Chromium Plume

Source: EPA, 2014

- 0.5 - 1 µg/L
- 1.01 - 5 µg/L
- 5.01 - 10 µg/L (MCL)
- 10.01 - 50 µg/L
- 50.01 - 100 µg/L
- 100.01 - 1,000 µg/L
- >1,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.









E-4  
**NORTH HOLLYWOOD  
 WEST WELLFIELD AND  
 EPA TOTAL  
 CHROMIUM PLUME**

Source: EPA, 2014

Legend








 North Hollywood West Wells

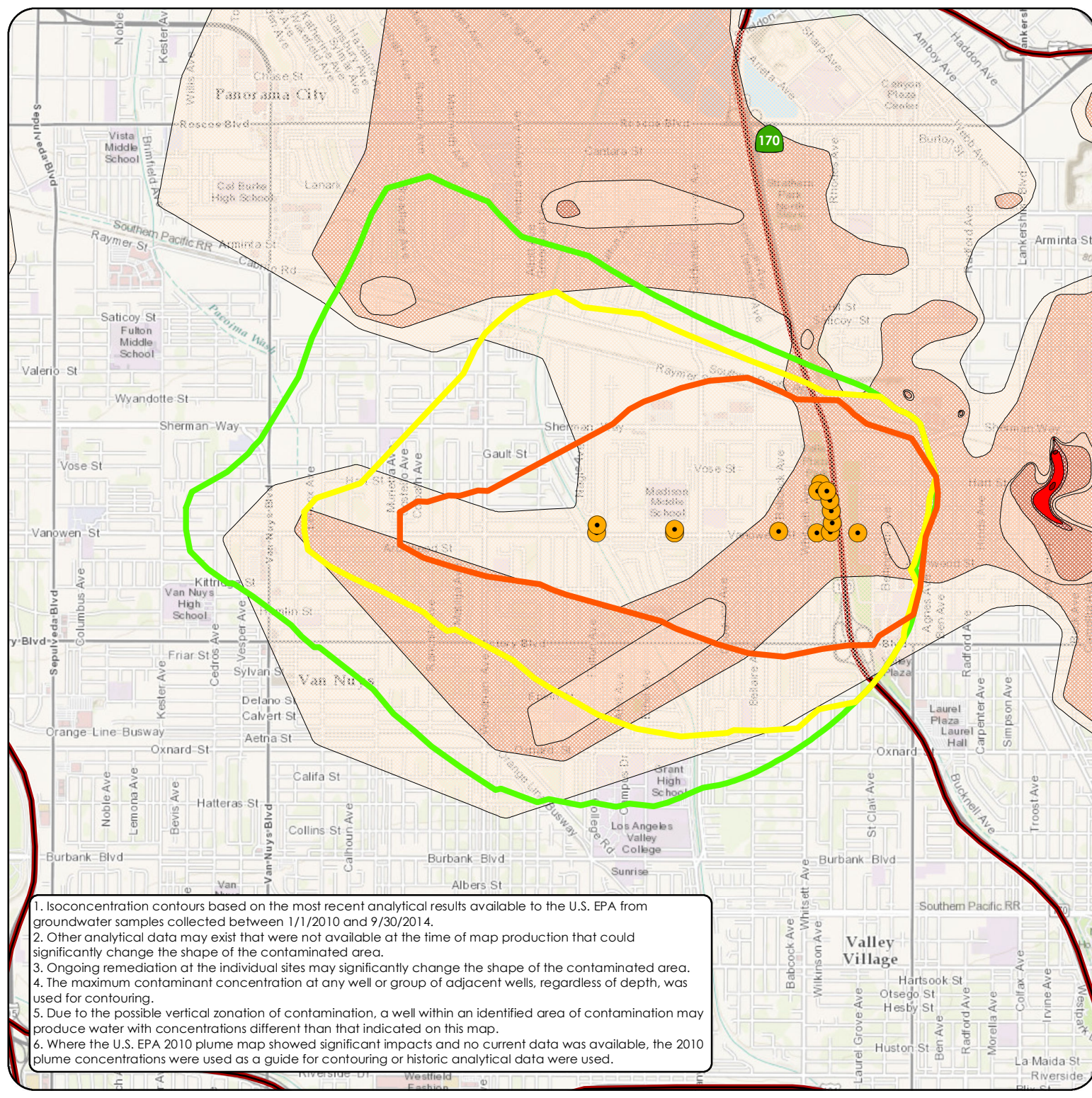
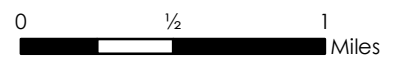
Capture Zones

 2-Year  
 5-Year  
 10-Year

Total Chromium Plume

Source: EPA, 2014

 0.5 - 1 µg/L  
 1.01 - 5 µg/L  
 5.01 - 10 µg/L  
 10.01 - 50 µg/L (MCLL)  
 50.01 - 100 µg/L  
 100.01 - 1,000 µg/L  
 >1,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



E-5  
**NORTH HOLLYWOOD  
 WEST WELLFIELD AND  
 1,4-DIOXANE  
 PLUME**

Source: EPA, 2014

Legend

 North Hollywood West Wells

Capture Zones


 2-Year

 5-Year

 10-Year

Dioxane Plume


Source: EPA, 2014


 0.5 - 1 µg/L (NL)

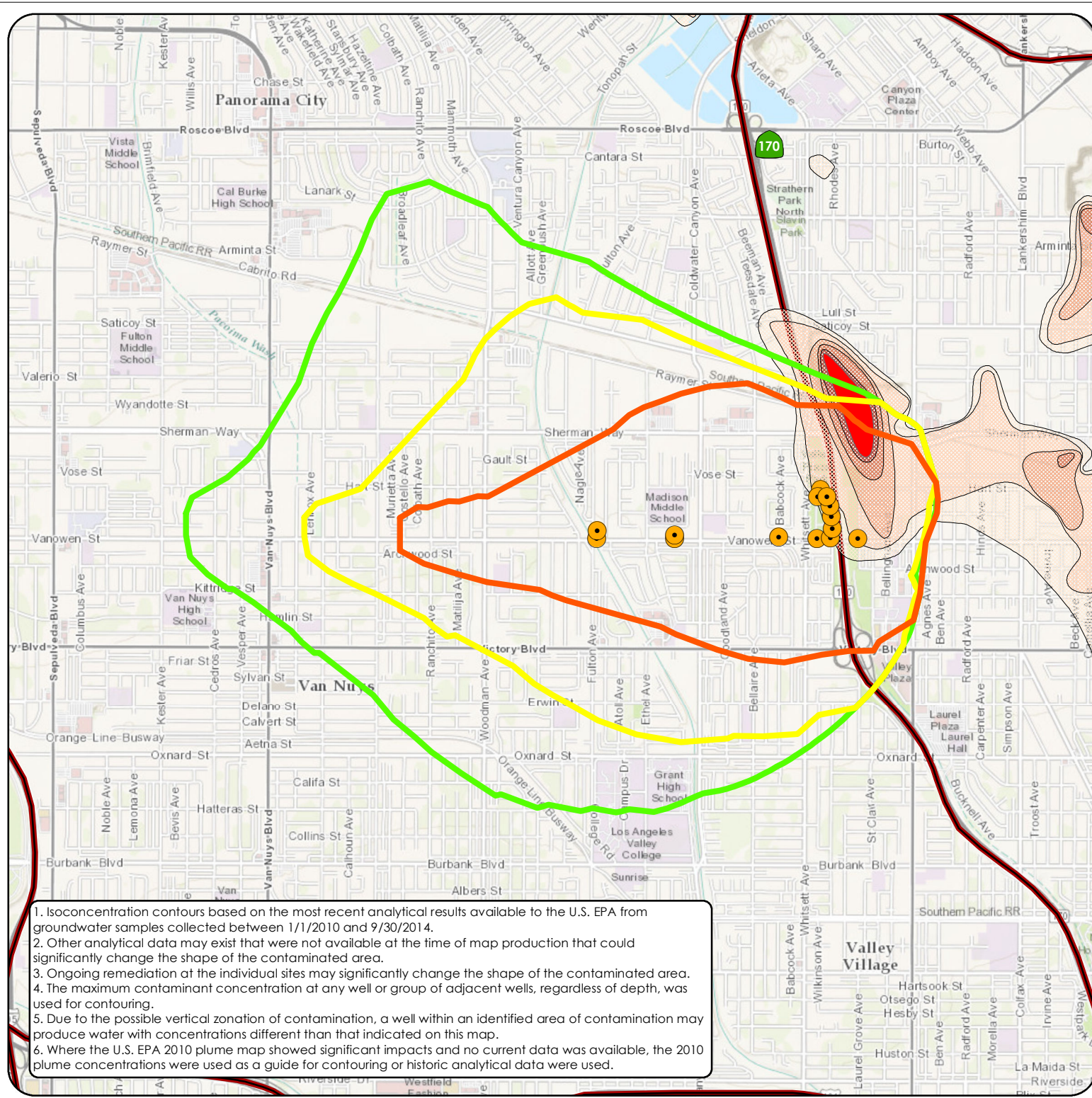
 1.01 - 3 µg/L

 3.01 - 10 µg/L

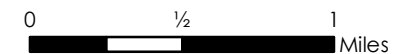
 10.01 - 50 µg/L

 50.01 - 100 µg/L

 >100 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.









# NORTH HOLLYWOOD WEST WELLFIELD AND 1,2,3-TRICHLORO-PROPANE (1,2,3-TCP) PLUME

Source: EPA, 2014

## Legend






 North Hollywood West Wells

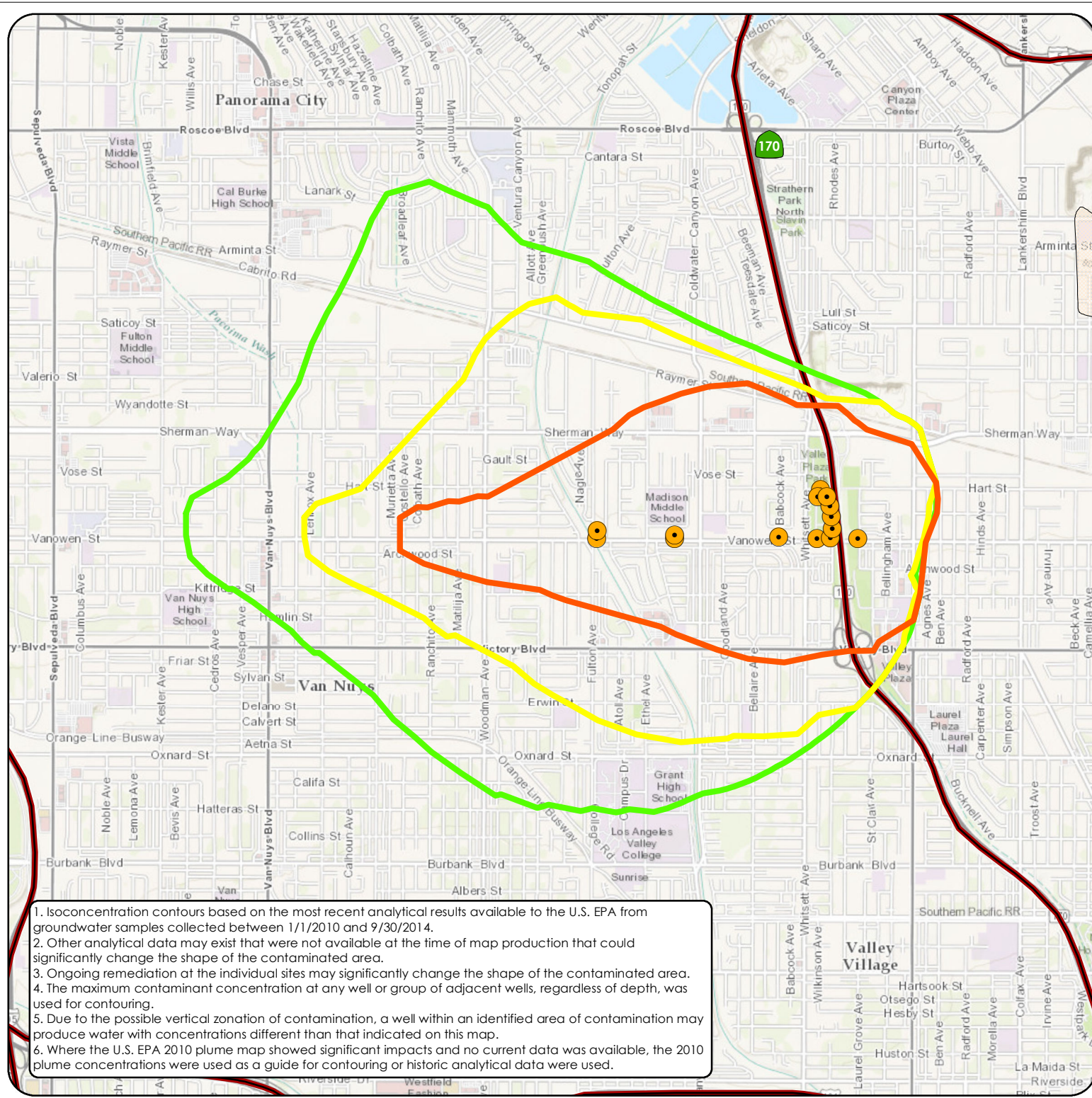
## Capture Zones

 2-Year  
 5-Year  
 10-Year

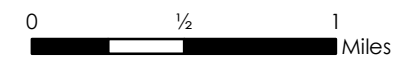
## 1,2,3-TCP Plume

Source: EPA, 2014

 0.005 (NL) - 0.05 µg/L  
 0.051 - 0.5 µg/L  
 0.51 µg/L - 5 µg/L  
 5.01 µg/L - 50 µg/L  
 >50 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.





# RINALDI-TOLUCA WELLFIELD AND TRICHLOROETHYLENE (TCE) PLUME

Source: EPA, 2014

### Legend

■ Rinaldi-Toluca Wells

### Capture Zones

□ 2-Year

□ 5-Year

□ 10-Year

### TCE Plume

Source: EPA, 2014

□ 0.5 - 5 µg/L (MCL)

□ 5.01 - 50 µg/L

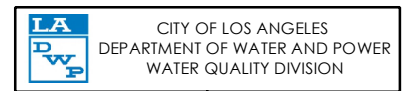
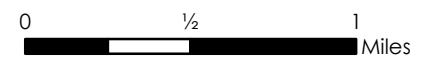
□ 50.01 - 100 µg/L

□ 100.01 - 500 µg/L

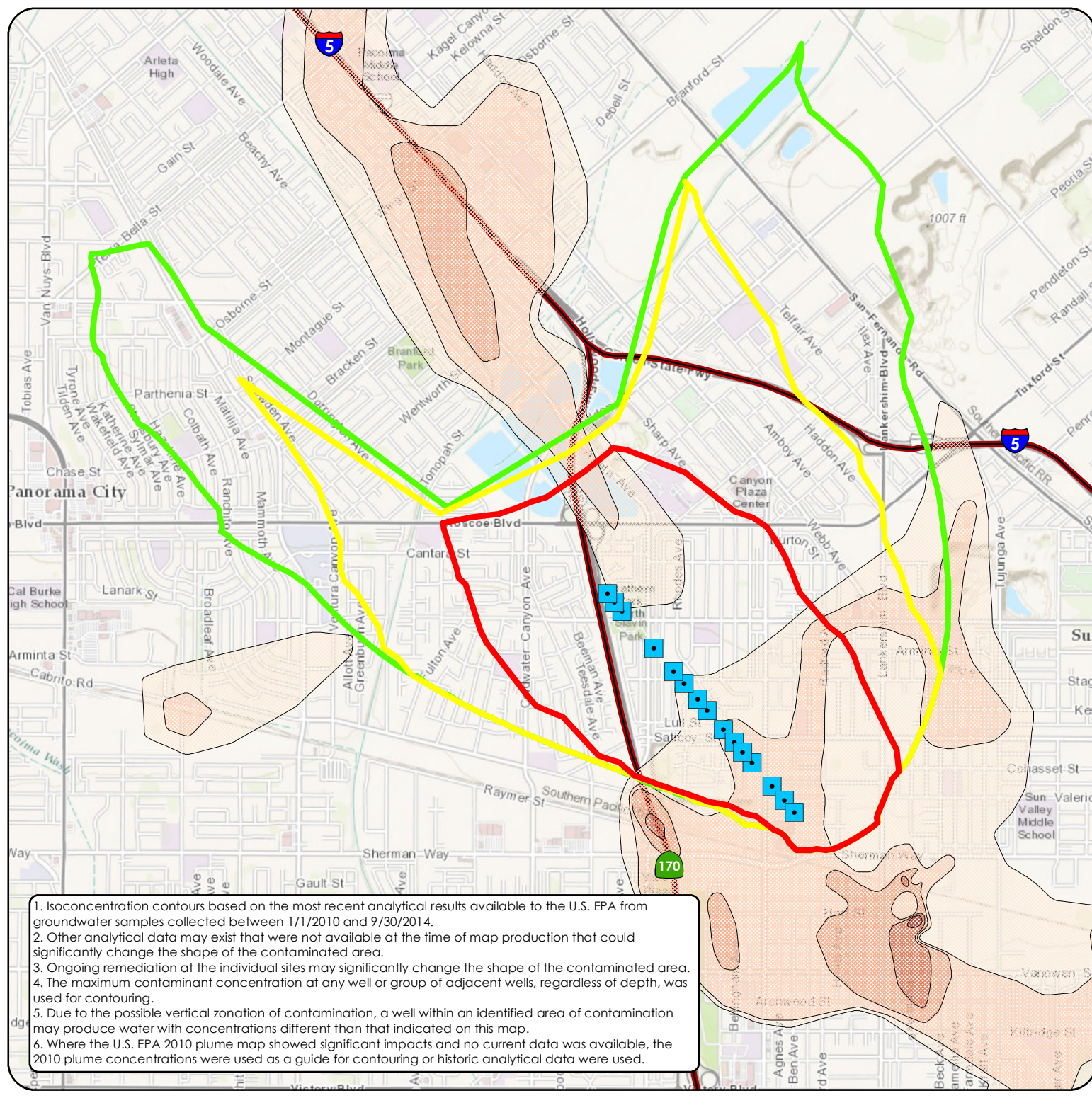
□ 500.01 - 1,000 µg/L

□ 1,000 - 10,000 µg/L

□ >10,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.





# RINALDI-TOLUCA WELLFIELD AND TETRACHLOROETHYLENE (PCE) PLUME

Source: EPA, 2014

### Legend

 Rinaldi-Toluca Wells

### Capture Zones


 2-Year

 5-Year

 10-Year

### PCE Plume

Source: EPA, 2014


 0.5 - 5 µg/L (MCL)

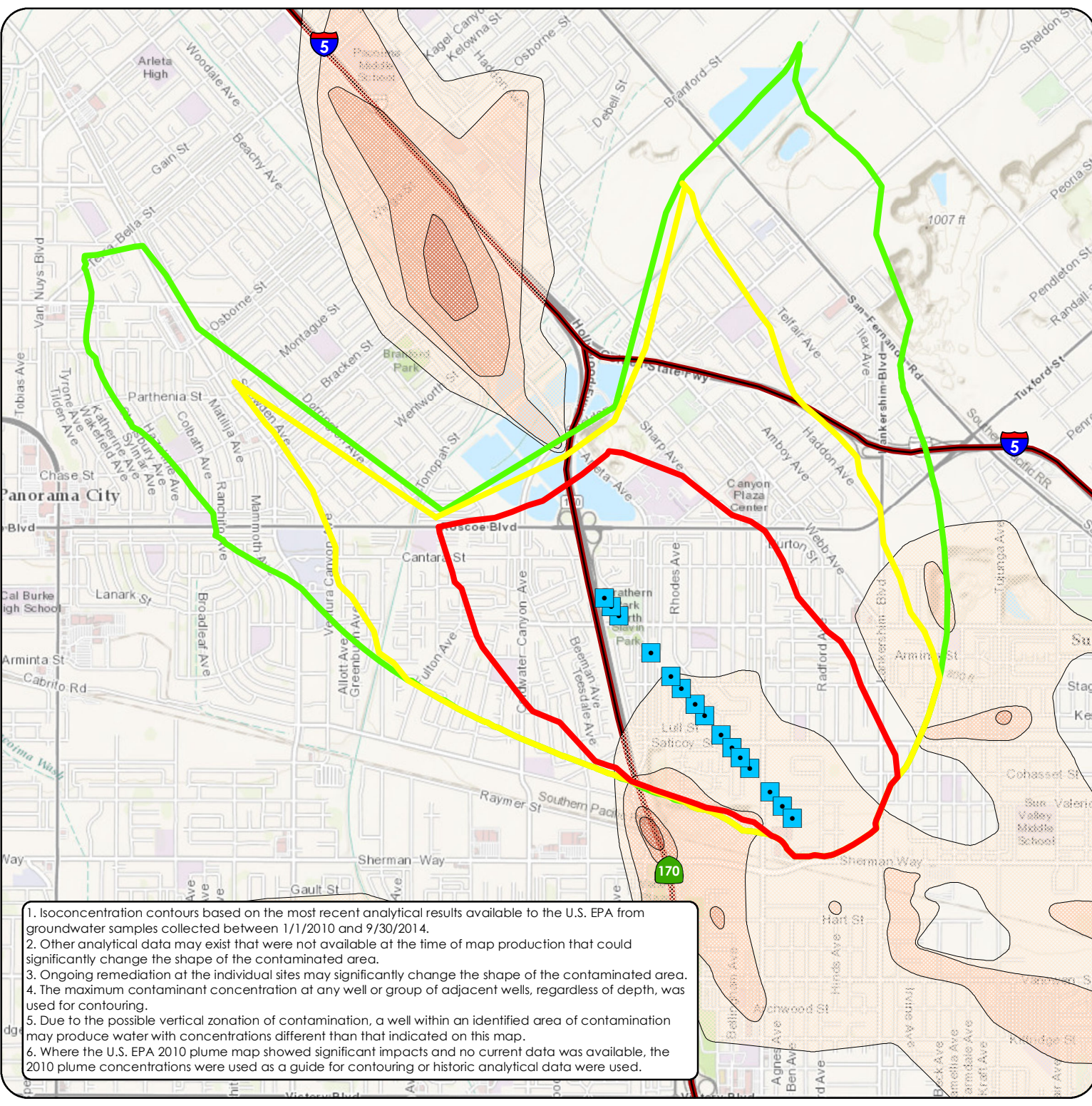
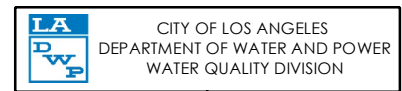
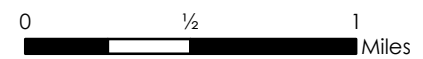
 5.01 - 50 µg/L

 50.01 - 100 µg/L

 100.01 - 500 µg/L

 500.01 - 1,000 µg/L

 >1,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



# RINALDI-TOLUCA WELLFIELD AND HEXAVALENT CHROMIUM PLUME

Source: EPA, 2014

## Legend

■ Rinaldi-Toluca Wells

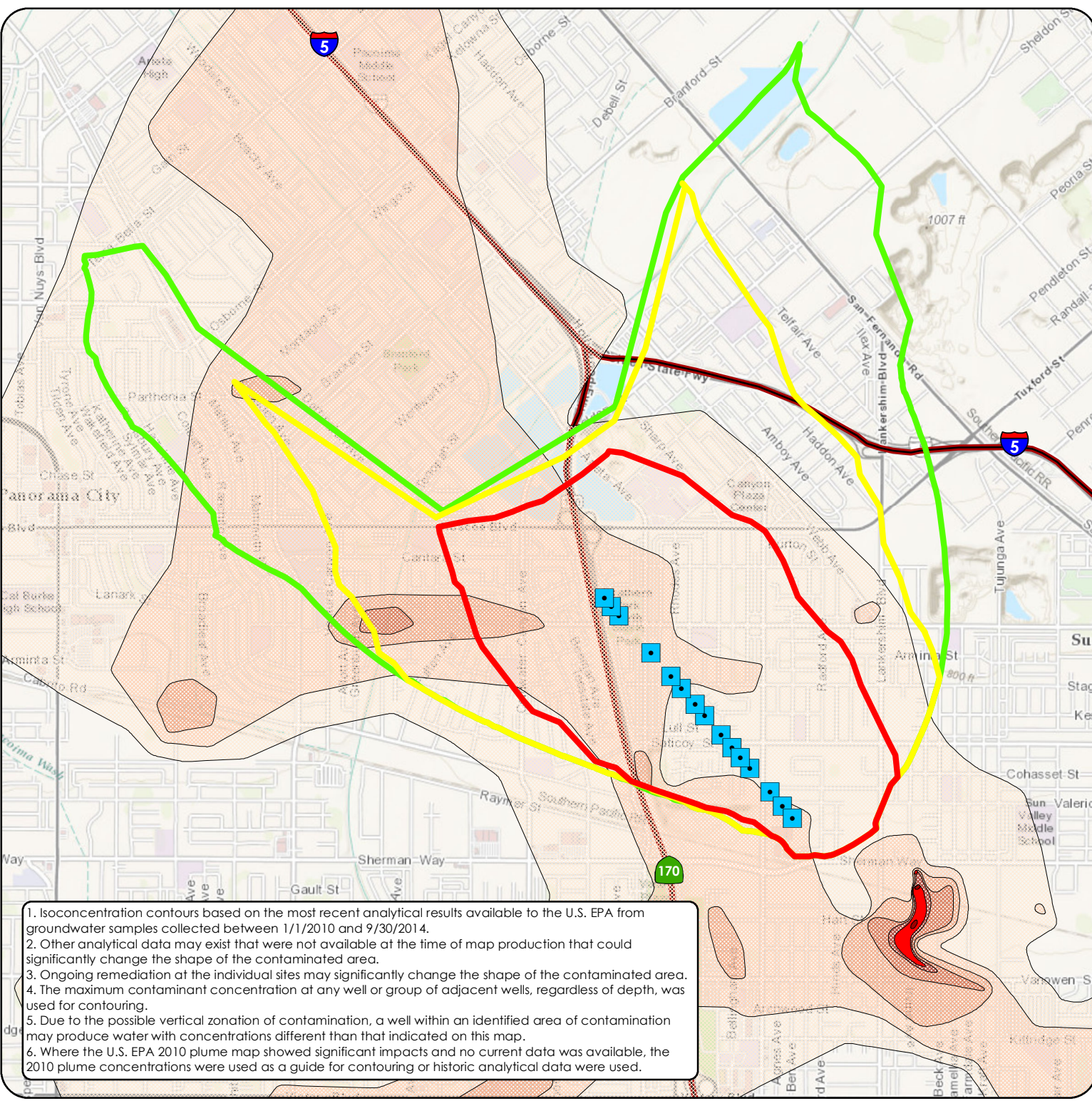
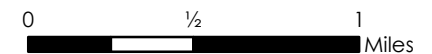
## Capture Zones

- 2-Year
- 5-Year
- 10-Year

## Hexavalent Chromium Plume

Source: EPA, 2014

- 0.5 - 1 µg/L
- 1.01 - 5 µg/L
- 5.01 - 10 µg/L (MCL)
- 10.01 - 50 µg/L
- 50.01 - 100 µg/L
- 100.01 - 1,000 µg/L
- >1,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



E-10  
**RINALDI-TOLUCA  
 WELLFIELD AND  
 TOTAL CHROMIUM  
 PLUME**

Source: EPA, 2014

Legend

■ Rinaldi-Toluca Wells

Capture Zones

□ 2-Year  
 □ 5-Year  
 □ 10-Year

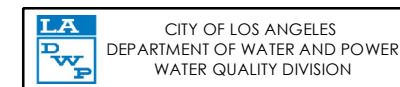
Total Chromium Plume

Source: EPA, 2014

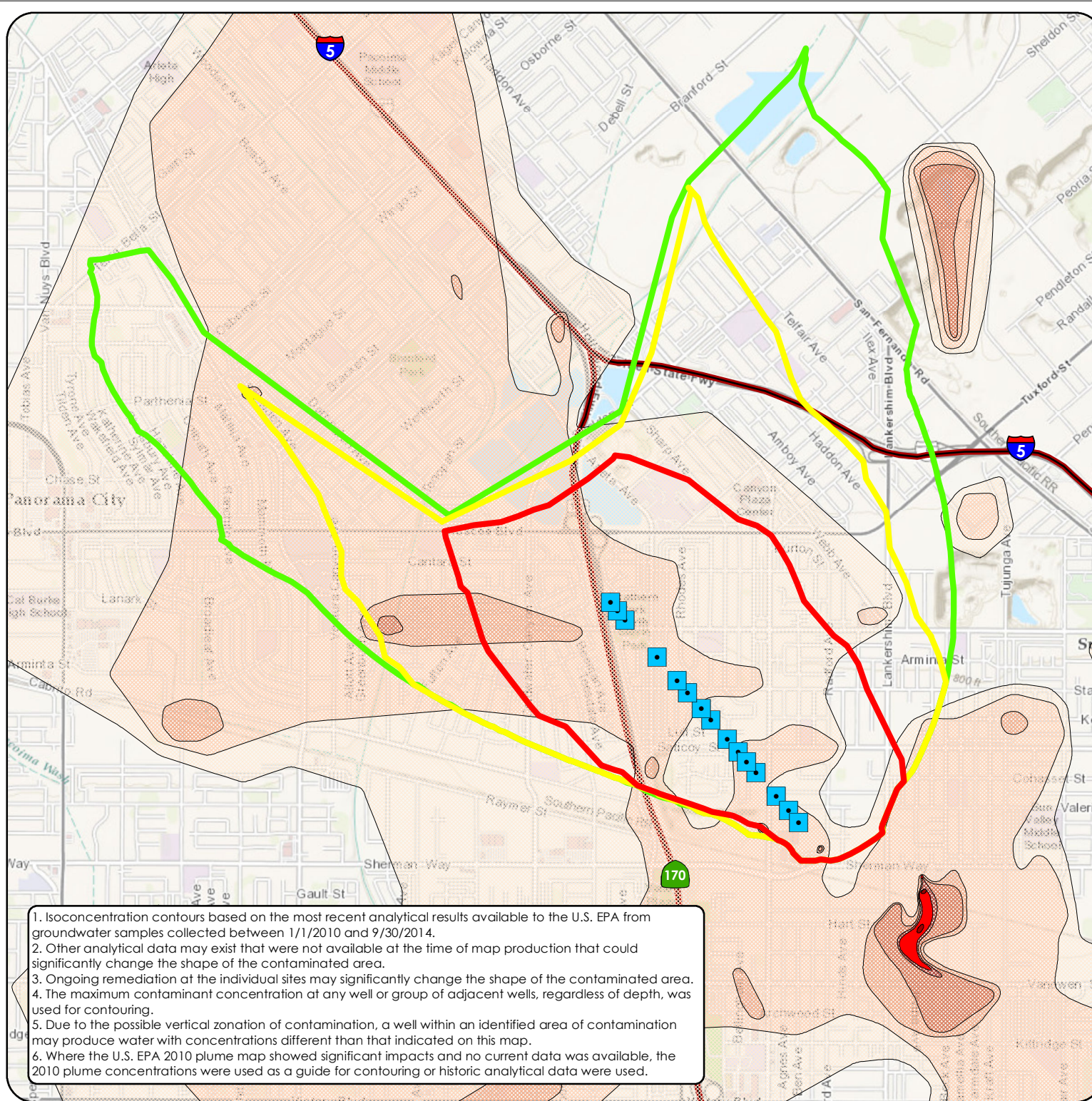
□ 0.5 - 1 µg/L  
 □ 1.01 - 5 µg/L  
 □ 5.01 - 10 µg/L  
 □ 10.01 - 50 µg/L (MCL)  
 □ 50.01 - 100 µg/L  
 □ 100.01 - 1,000 µg/L  
 □ >1,000 µg/L



0 1/2 1 Miles



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.





E-11  
**RINALDI-TOLUCA  
 WELLFIELD AND  
 1,4-DIOXANE PLUME**

Source: EPA, 2014

Legend

■ Rinaldi-Toluca Wells

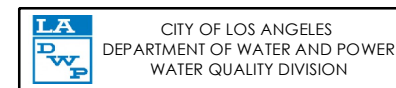
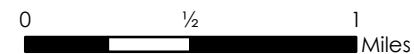
Capture Zones

□ 2-Year  
 □ 5-Year  
 □ 10-Year

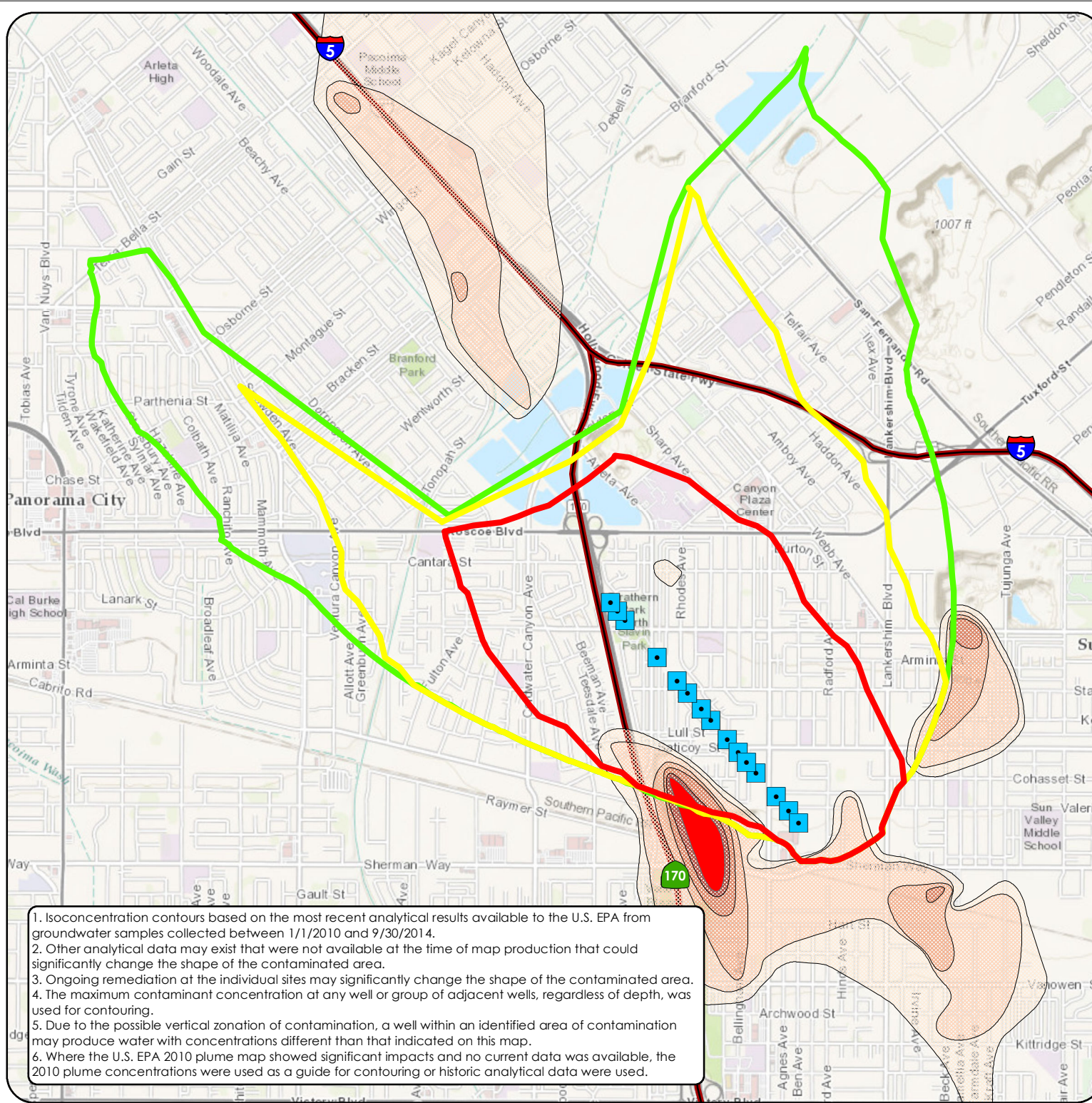
Dioxane Plume

Source: EPA, 2014

□ 0.5 - 1 µg/L (NL)  
 □ 1.01 - 3 µg/L  
 □ 3.01 - 10 µg/L  
 □ 10.01 - 50 µg/L  
 □ 50.01 - 100 µg/L  
 □ >100 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.





E-12  
**RINALDI-TOLUCA  
 WELLFIELD AND  
 1,2,3-TRICHLORO-  
 PROPANE (1,2,3-TCP)  
 PLUME**

Source: EPA, 2014

Legend

■ Rinaldi-Toluca Wells

Capture Zones

□ 2-Year  
 □ 5-Year  
 □ 10-Year

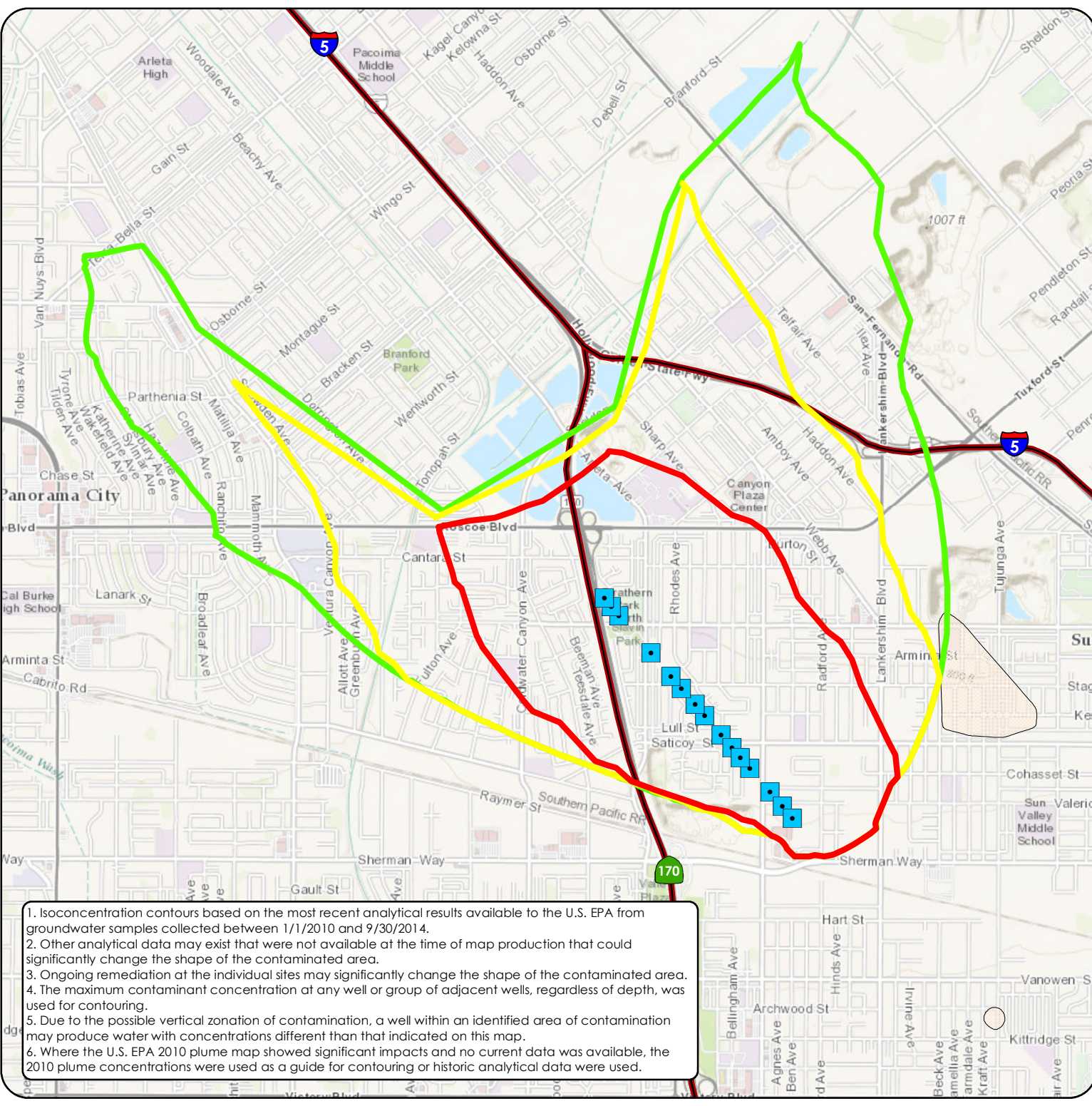
1,2,3-TCP Plume

Source: EPA, 2014

□ 0.005 (NL) - 0.05 µg/L  
 □ 0.051 - 0.5 µg/L  
 □ 0.51 µg/L - 5 µg/L  
 □ 5.01 µg/L - 50 µg/L  
 □ >50 µg/L



0 1/2 1 Miles



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



# TUJUNGA WELLFIELD AND TRICHLOROETHYLENE (TCE) PLUME

Source: EPA, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

□ 10-Year

### TCE Plume

Source: EPA, 2014

□ 0.5 - 5 µg/L (MCL)

□ 5.01 - 50 µg/L

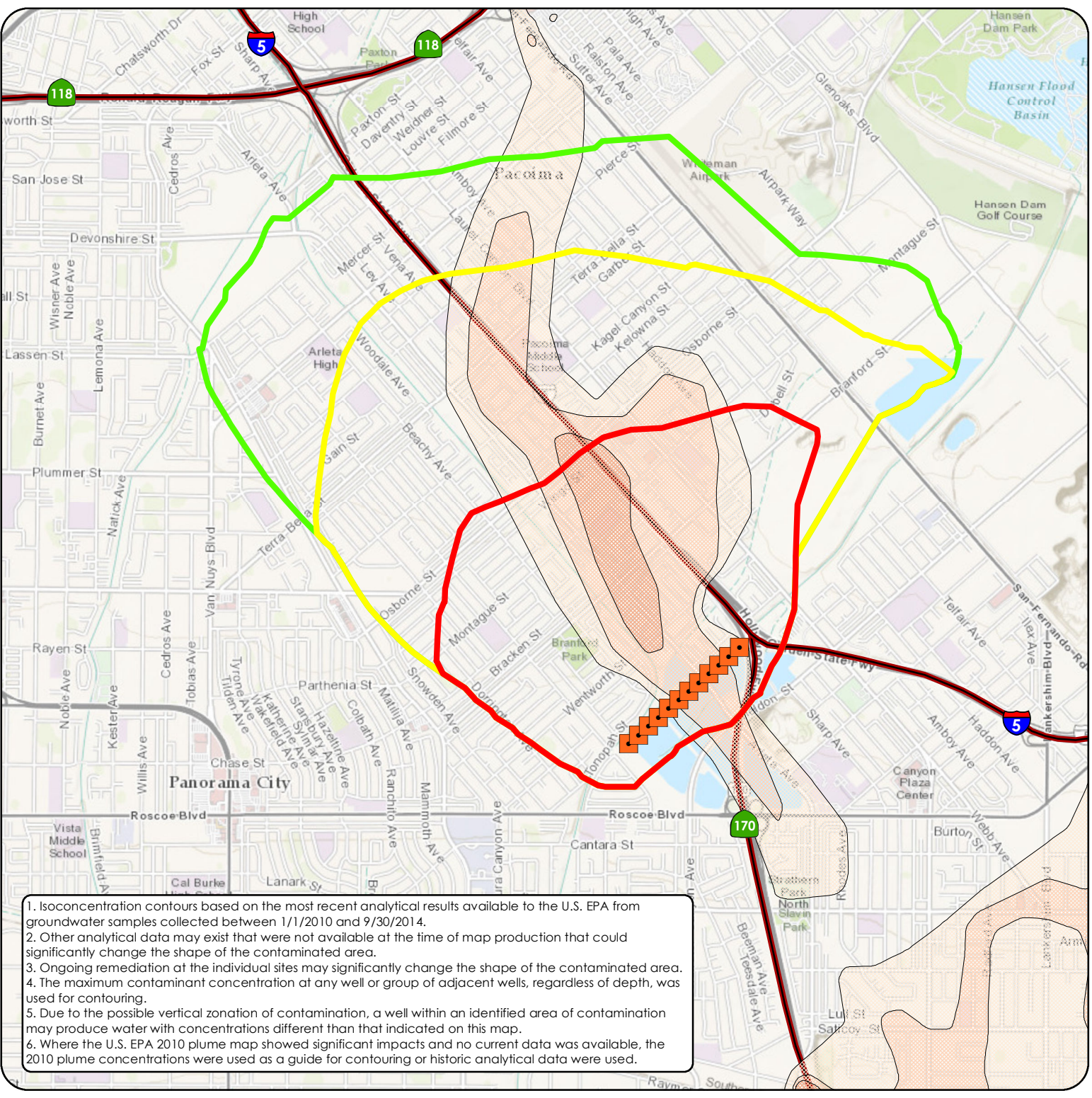
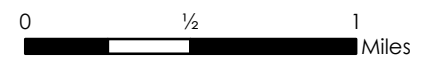
□ 50.01 - 100 µg/L

□ 100.01 - 500 µg/L

□ 500.01 - 1,000 µg/L

□ 1,000 - 10,000 µg/L

□ >10,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
4. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
5. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



# TUJUNGA WELLFIELD AND TETRACHLOROETHYLENE (PCE) PLUME

Source: EPA, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

□ 10-Year

### PCE Plume

Source: EPA, 2014

□ 0.5 - 5 µg/L (MCL)

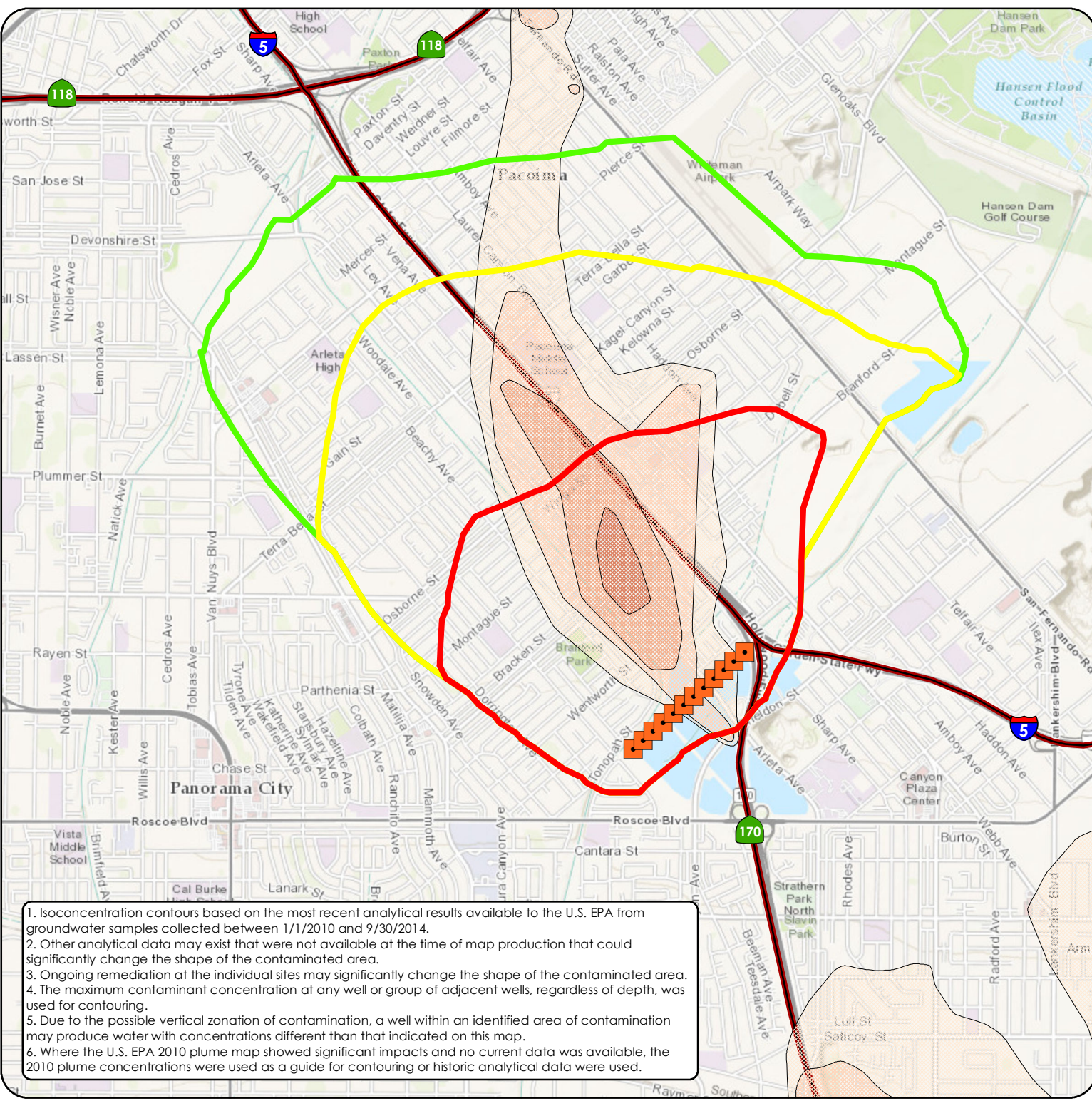
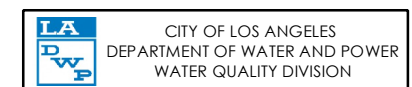
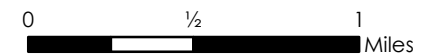
□ 5.01 - 50 µg/L

□ 50.01 - 100 µg/L

□ 100.01 - 500 µg/L

□ 500.01 - 1,000 µg/L

□ >1,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



# TUJUNGA WELLFIELD AND HEXAVALENT CHROMIUM PLUME

Source: EPA, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

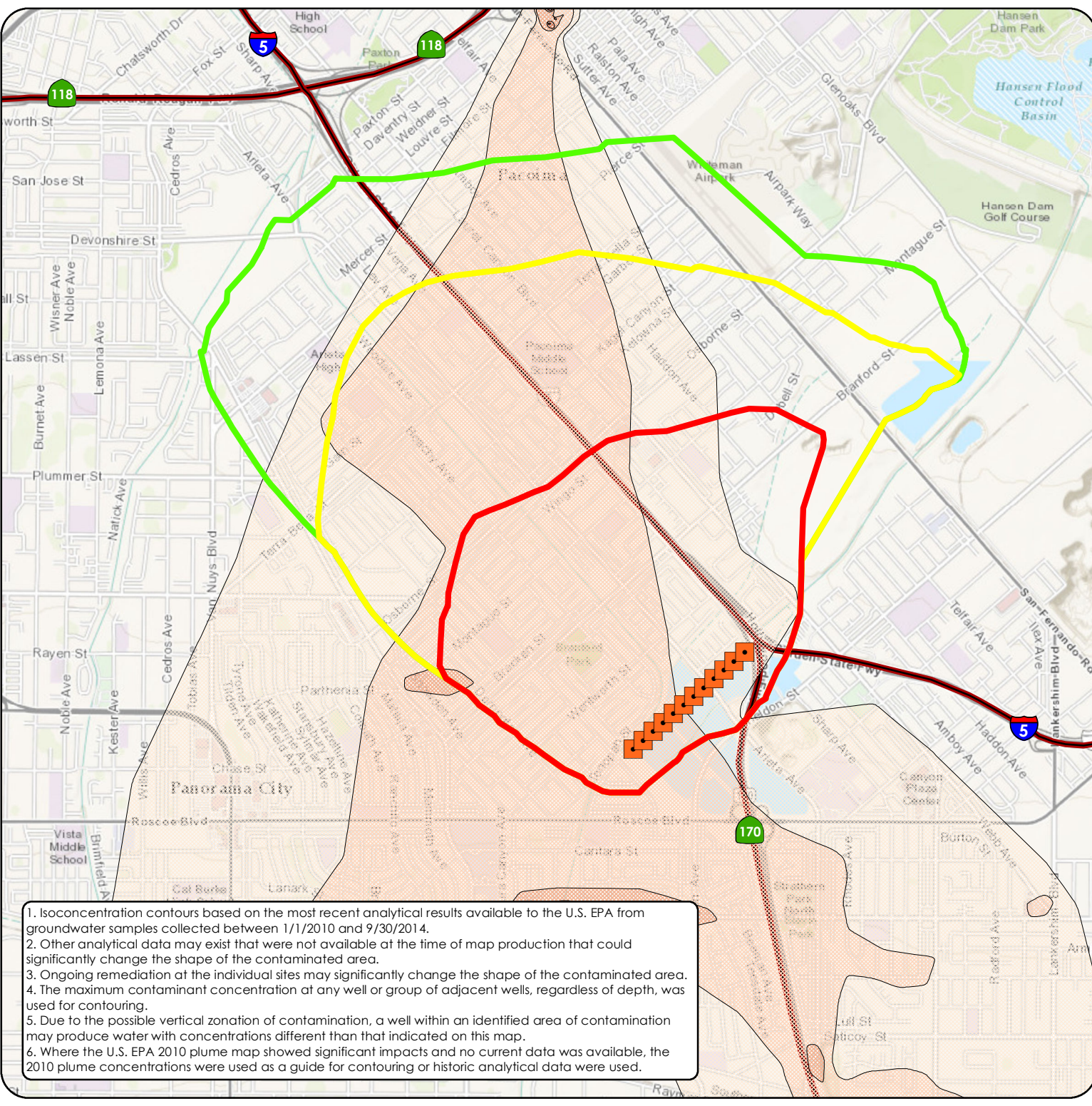
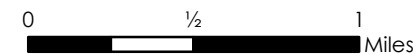
□ 5-Year

□ 10-Year

### Hexavalent Chromium Plume

Source: EPA, 2014

- 0.5 - 1 µg/L
- 1.01 - 5 µg/L
- 5.01 - 10 µg/L (MCL)
- 10.01 - 50 µg/L
- 50.01 - 100 µg/L
- 100.01 - 1,000 µg/L
- >1,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



# TUJUNGA WELLFIELD AND TOTAL CHROMIUM PLUME

Source: EPA, 2014

### Legend

■ Tujunga Wells

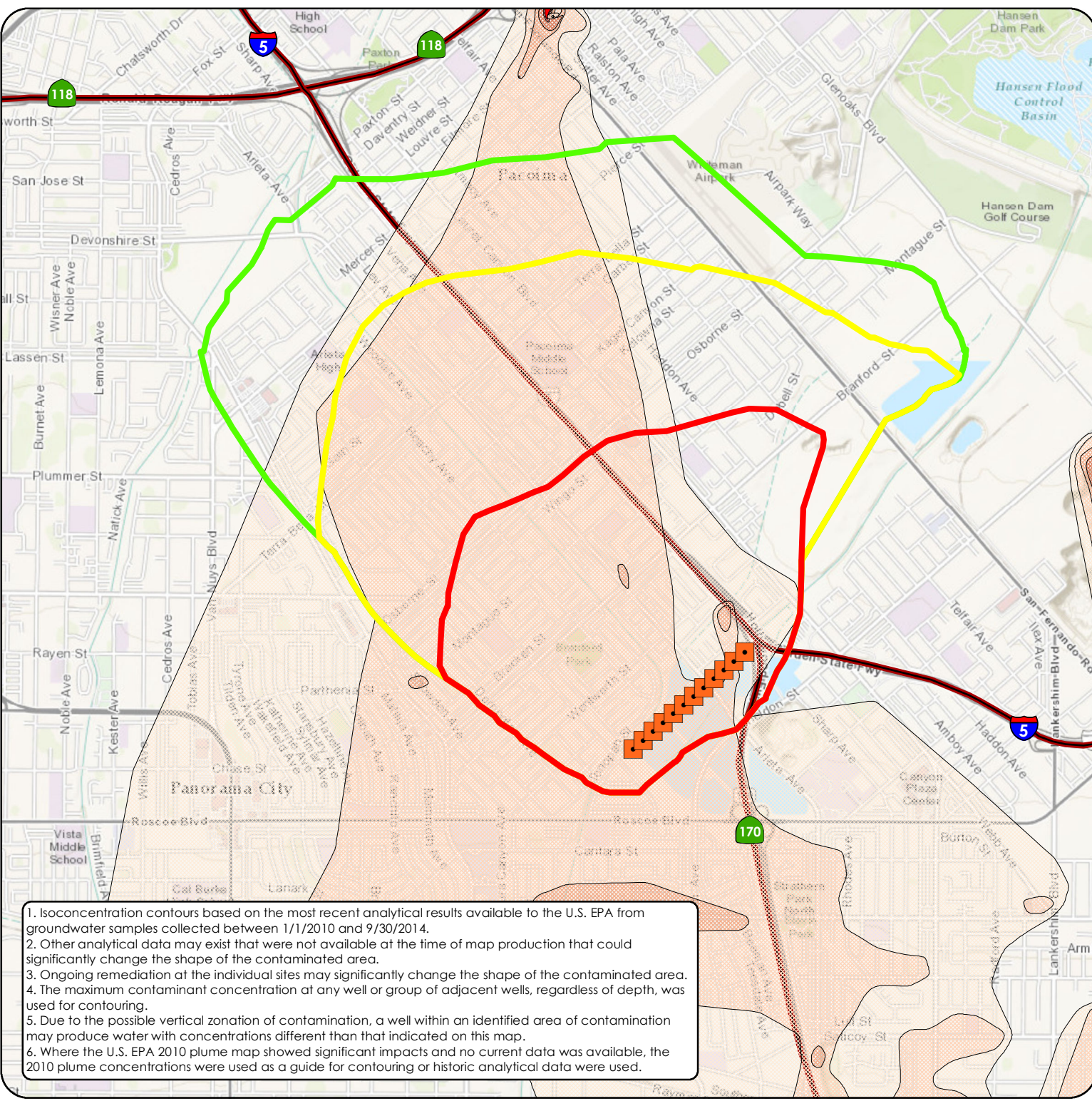
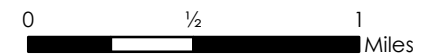
### Capture Zones

- 2-Year
- 5-Year
- 10-Year

### Total Chromium Plume

Source: EPA, 2014

- 0.5 - 1 µg/L
- 1.01 - 5 µg/L
- 5.01 - 10 µg/L
- 10.01 - 50 µg/L (MCL)
- 50.01 - 100 µg/L
- 100.01 - 1,000 µg/L
- >1,000 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
4. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
5. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



# TUJUNGA WELLFIELD AND 1,4-DIOXANE PLUME

Source: EPA, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

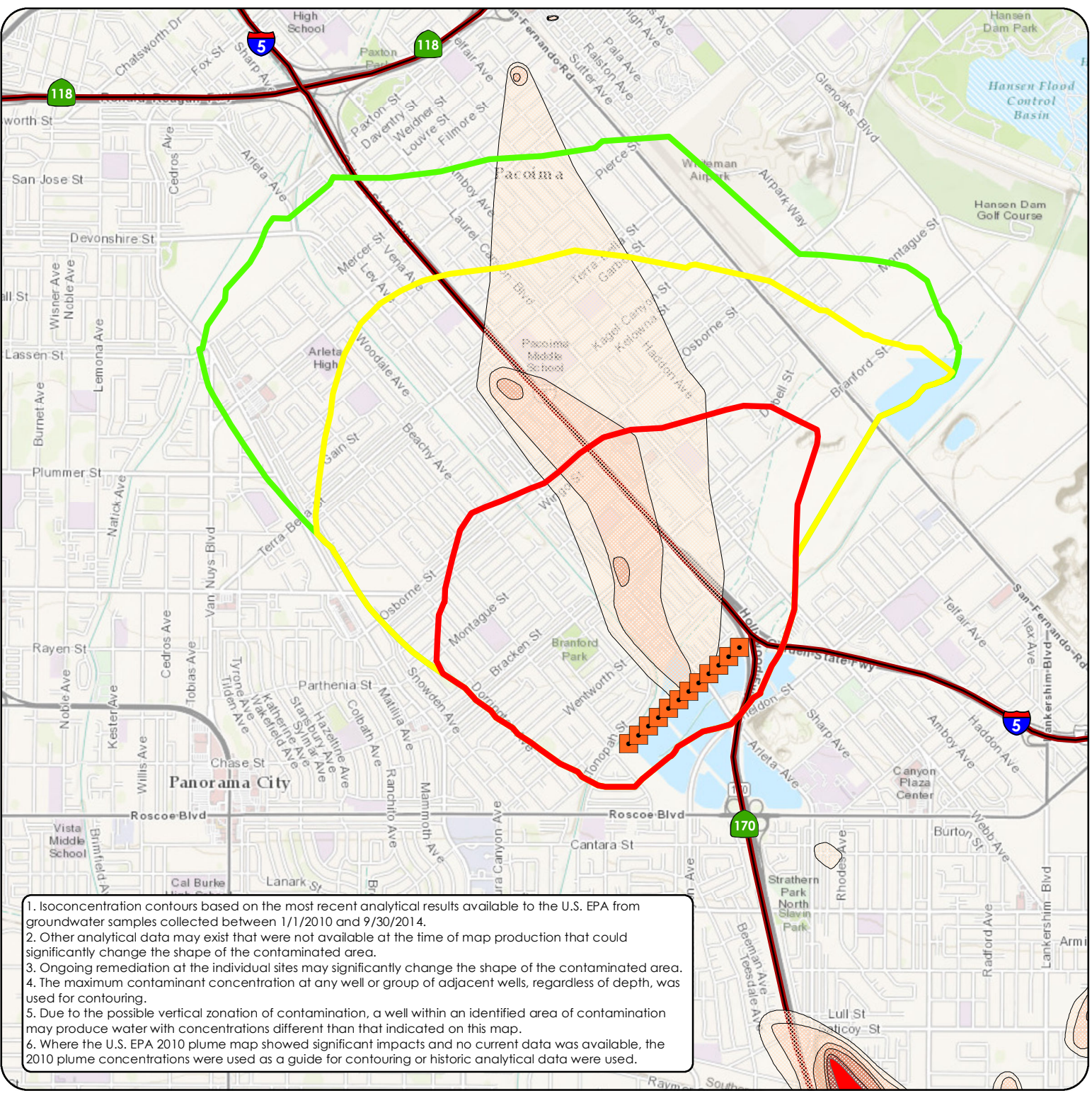
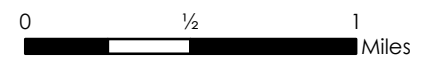
□ 5-Year

□ 10-Year

### Dioxane Plume

Source: EPA, 2014

- 0.5 - 1 µg/L (NL)
- 1.01 - 3 µg/L
- 3.01 - 10 µg/L
- 10.01 - 50 µg/L
- 50.01 - 100 µg/L
- >100 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.



# TUJUNGA WELLFIELD AND 1,2,3-TRICHLORO- PROPANE (1,2,3-TCP) PLUME

Source: EPA, 2014

### Legend

■ Tujunga Wells

### Capture Zones

□ 2-Year

□ 5-Year

□ 10-Year

### 1,2,3-TCP Plume

Source: EPA, 2014

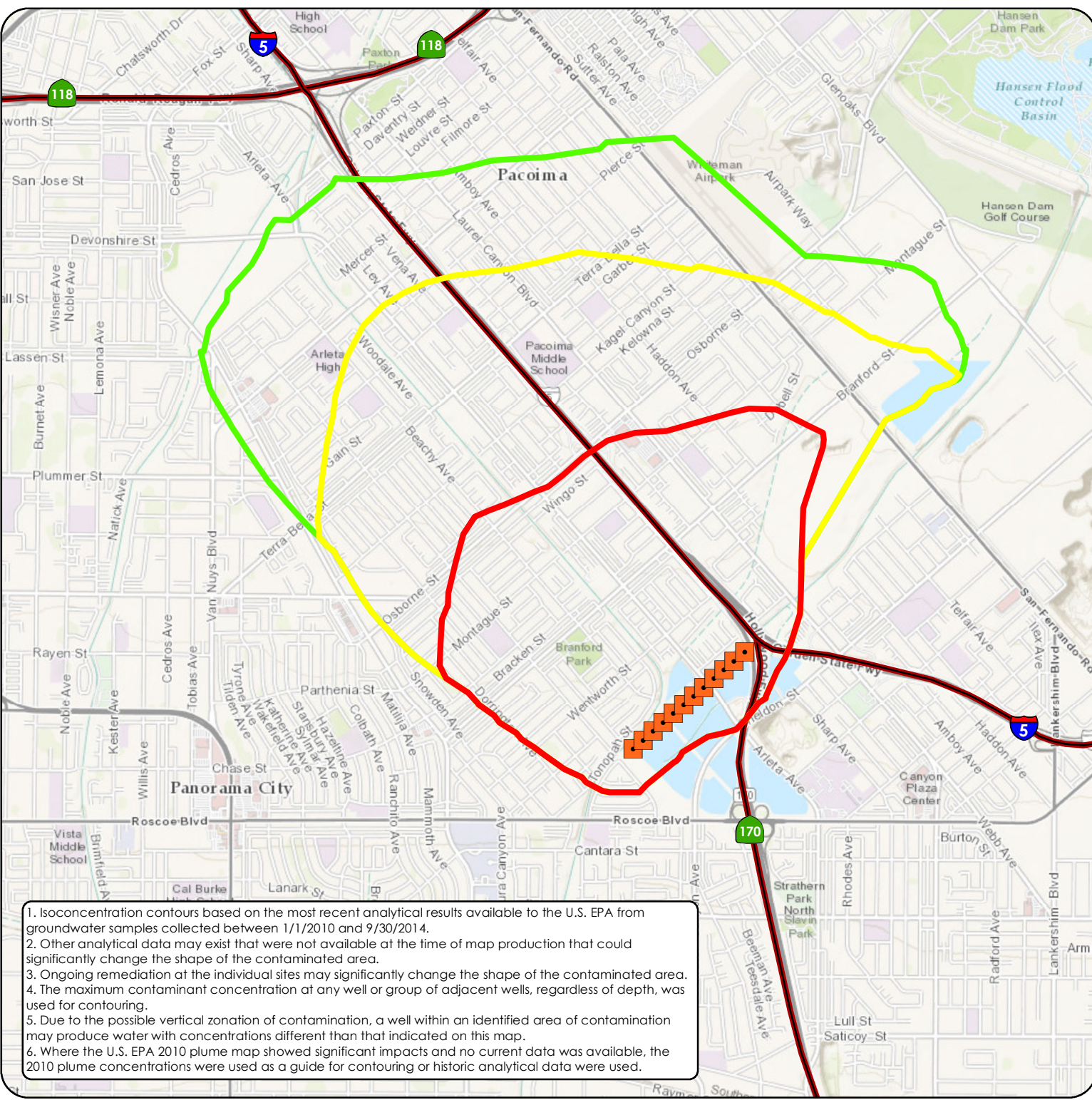
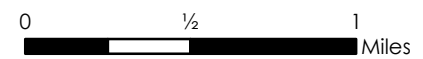
□ 0.005 (NL) - 0.05 µg/L

□ 0.051 - 0.5 µg/L

□ 0.51 µg/L - 5 µg/L

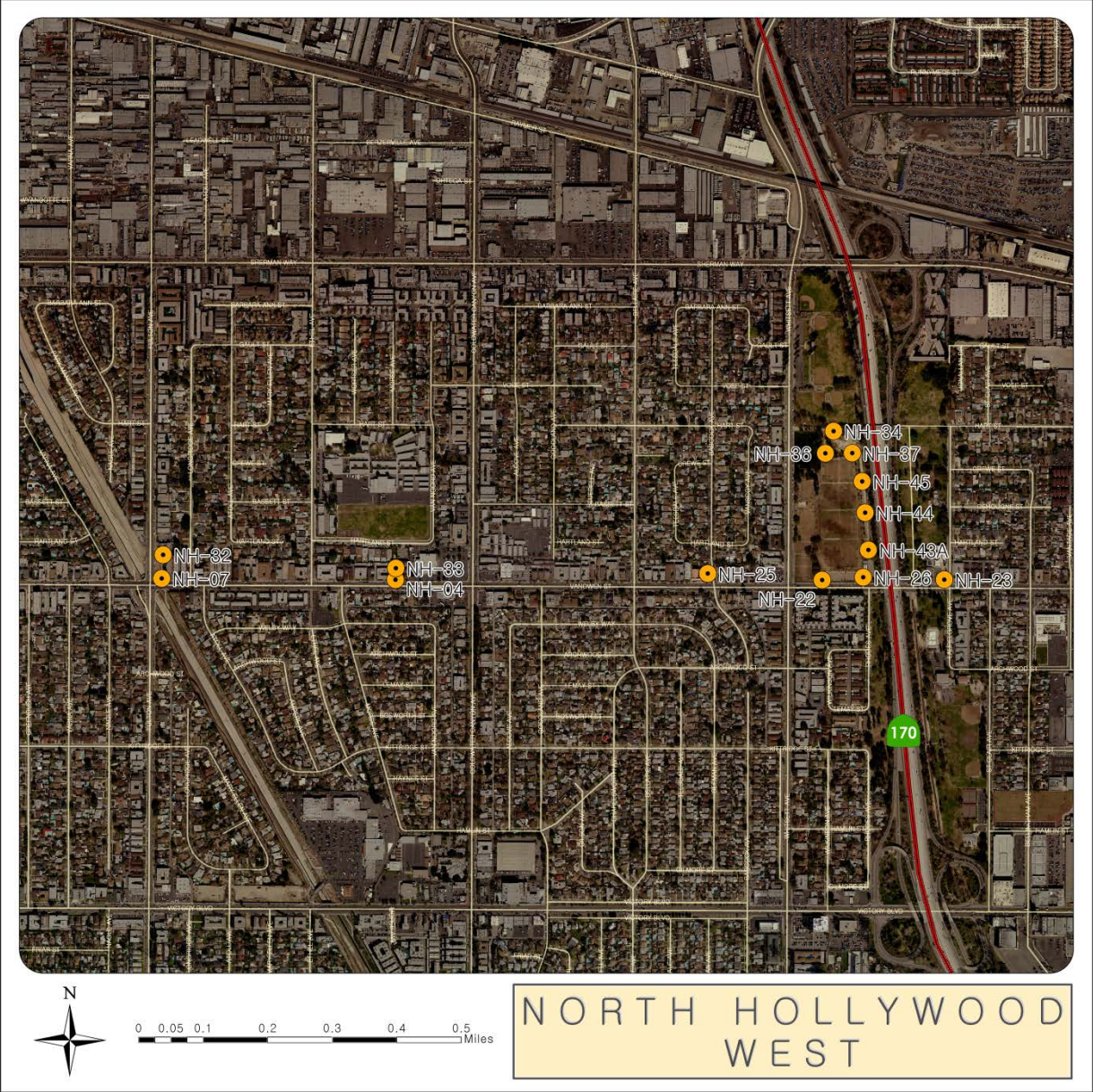
□ 5.01 µg/L - 50 µg/L

□ >50 µg/L



1. Isoconcentration contours based on the most recent analytical results available to the U.S. EPA from groundwater samples collected between 1/1/2010 and 9/30/2014.
2. Other analytical data may exist that were not available at the time of map production that could significantly change the shape of the contaminated area.
3. Ongoing remediation at the individual sites may significantly change the shape of the contaminated area. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
4. The maximum contaminant concentration at any well or group of adjacent wells, regardless of depth, was used for contouring.
5. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with concentrations different than that indicated on this map.
6. Where the U.S. EPA 2010 plume map showed significant impacts and no current data was available, the 2010 plume concentrations were used as a guide for contouring or historic analytical data were used.













# **Attachment F**

**Design Parameters and Historical  
Extractions for NHW, RT and TJ Wellfields**

**NORTH HOLLYWOOD WELL FIELD STATUS**

LADWP WELL NO.	LACDPW WELL NO.	DATE DRILLED	AGE OF WELL	DRILLING METHOD	WELL SEAL (FT)	WELL STATUS	WELL CAPACITY (CFS)	GROUND SURFACE ELEVATION (FT)	TOTAL DEPTH (FT)	COMPLETED DEPTH (FT)	CASING DIAMETER (IN)	NO. OF PERFORATION	TOP PERFORATION DEPTH (FT)	BOTTOM PERFORATION DEPTH (FT)
NH-4	3780A	1924	77	CABLE	-	Active	2.7	726	597	597	20	4	195	210
													234	244
													279	312
													360	578
NH-7	3770	1924	77	CABLE	-	Active	0.4	714	595	595	20	11	151	170
													170	201
													201	216
													216	260
													260	310
													310	398
													398	427
													427	448
													468	496
													496	510
													510	535
NH-22	3790C	1948	53	CABLE	0-12	Active	3.7	722.6	494	-99	20	1	166	460
NH-23	3790D	1951	50	CABLE	-	Active	5.7	721	481	481	20	3	222	298
													298	367
													432	460
NH-25	3790F	1958	43	CABLE	-	Active	2.5	719.9	570	570	20	5	160	187
													198	340
													348	376
													412	445
													465	540
NH-26	3790E	1959	42	CABLE	-	Active	3.6	719.9	596	596	20	4	220	262
													275	370
													418	452
													507	555
NH-32	3770C	1963	38	CABLE	-	Active	3.0	715	734	734	20	7	264	272
													280	310
													385	415
													485	497
													510	520
													575	590
													623	672
NH-33	3780C	1963	38	CABLE	-	Active	3.0	725	787	787	20	11	130	210
													274	310
													335	350
													450	466
													470	490
													490	510

LADWP WELL NO.	LACDPW WELL NO.	DATE DRILLED	AGE OF WELL	DRILLING METHOD	WELL SEAL (FT)	WELL STATUS	WELL CAPACITY (CFS)	GROUND SURFACE ELEVATION (FT)	TOTAL DEPTH (FT)	COMPLETED DEPTH (FT)	CASING DIAMETER (IN)	NO. OF PERFORATION	TOP PERFORATION DEPTH (FT)	BOTTOM PERFORATION DEPTH (FT)
													520	568
													572	594
													630	642
													645	655
													672	732
NH-34	3790G	1964	37	CABLE	-	Active	6.3	732.7	760	760	20	9	202	263
													280	290
													308	398
													430	462
													494	505
													510	561
													563	574
													608	642
													675	720
NH-36	3790H	1967	34	CABLE	0-4	Active	2.3	-	806	802	20	4	265	370
													432	462
													502	648
													700	720
NH-37	3790J	1968	33	CABLE	0-4	Active	4.2	-	944	940	20	8	230	260
													278	390
													430	460
													505	550
													620	640
													700	720
													850	860
													875	910
NH-43A	3790K	1982	19	CABLE	0-12	Active	5.5	-	650	638	20	6	280	370
													380	390
													420	460
													475	496
													506	565
													590	630
NH-44	3790L	1984	17	REVERSE	0-100	Active	5.4	-	800	800	36/20	1	340	780
NH-45	3790M	1984	17	REVERSE	0-100	Active	7.7	-	810	800	36/20	1	340	780
<b>INACTIVE WELLS</b>														
NH-2	3800	1924	77	CABLE	-	Standby	5.5	718.5	393	393	20	4	105	135
													172	276
													282	309
													318	374
NH-24	3800C	1954	47	CABLE	-	Standby	-	733.1	555	555	20	6	206	246
													260	283
													318	338



LADWP WELL NO.	LACDPW WELL NO.	DATE DRILLED	AGE OF WELL	DRILLING METHOD	WELL SEAL (FT)	WELL STATUS	WELL CAPACITY (CFS)	GROUND SURFACE ELEVATION (FT)	TOTAL DEPTH (FT)	COMPLETED DEPTH (FT)	CASING DIAMETER (IN)	NO. OF PERFORATION	TOP PERFORATION DEPTH (FT)	BOTTON PERFORATION DEPTH (FT)
													338	410
													464	508
													514	534
NH-30	3800D	1962	39	CABLE	-	Standby	-	718.6	770	770	20	4	255	275
													318	390
													573	583
													645	676
<b>DESTROYED WELLS</b>														
NH-15	3790B	1926	75	CABLE	-	Destroyed	-	734.6	467	467	20	5		
<b>CAPPED WELLS</b>														
NH-9	3700A	1925	76	CABLE	-	Capped	-		423	225	16	1	205	220

**RINALDI-TOLUCA WELL FIELD STATUS**

LADWP WELL NO.	LACDPW WELL NO.	DATE DRILLED	AGE OF WELL	DRILLING METHOD	WELL SEAL (FT)	WELL STATUS	WELL CAPACITY (CFS)	GROUND SURFACE ELEVATION (FT)	TOTAL DEPTH (FT)	COMPLETED DEPTH (FT)	CASING DIAMETER (IN)	NO. OF PERFORATION	TOP PERFORATION DEPTH (FT)	BOTTOM PERFORATION DEPTH (FT)
RT-1	4909E	1985	16	REVERSE	0-200	ACTIVE	6.8	762	1000	800	36/20	1	360	780
RT-2	4898A	1986	15	REVERSE	0-200	ACTIVE	6.9	775	820	800	36/20	2	370	600
													640	780
RT-3	4898B	1987	14	REVERSE	0-200	ACTIVE	7.9	780	820	800	20	3	370	600
													630	670
													700	770
RT-4	4898C	1986	15	REVERSE	-	ACTIVE	7.5	780	820	800	20	3	370	600
													630	670
													700	770
RT-5	4898D	1986	15	REVERSE	0-200	ACTIVE	7.3	782	820	800	20	3	370	600
													620	670
													700	770
RT-6	4898E	1986	15	REVERSE	0-200	ACTIVE	7.8	785	820	800	20	1	370	770
RT-7	4898F	1988	13	REVERSE	0-330	ACTIVE	6.5	799.4	800	800	20	2	370	590
													640	780
RT-8	4898G	1988	13	REVERSE	0-55	ACTIVE	8.3	801.33	800	800	20	3	360	620
													645	665
													680	780
RT-9	4898H	1988	13	REVERSE	0-55	ACTIVE	7.7	803.32	810	800	20	3	370	580
													640	665
													680	780
RT-10	4909G	1987	14	REVERSE	0-200	ACTIVE	8.1	774.72	810	680	20	2	360	460
													480	660
RT-11	4909K	1987	14	REVERSE	0-330	ACTIVE	7.4	769.25	811	800	20	3	370	590
													620	640
													670	770
RT-12	4909H	1988	13	REVERSE	0-330	ACTIVE	8.3	772.43	811	800	20	4	370	470
													490	510
													530	590
													640	789
RT-13	4909J	1987	14	REVERSE	0-330	ACTIVE	7.4	771.15	811	800	20	2	370	590
													630	780
RT-14	4909L	1988	13	REVERSE	0-55	ACTIVE	7	760.36	800	800	20	3	360	540
													550	670
													700	770

LADWP WELL NO.	LACDPW WELL NO.	DATE DRILLED	AGE OF WELL	DRILLING METHOD	WELL SEAL (FT)	WELL STATUS	WELL CAPACITY (CFS)	GROUND SURFACE ELEVATION (FT)	TOTAL DEPTH (FT)	COMPLETED DEPTH (FT)	CASING DIAMETER (IN)	NO. OF PERFORATION	TOP PERFORATION DEPTH (FT)	BOTTON PERFORATION DEPTH (FT)
RT-15	4909M	1988	13	REVERSE	0-55	ACTIVE	6.7	758.11	800	800	20	2	360	600
													610	750

**TUJUNGA WELL FIELD STATUS**

LADWP WELL NO.	LACDPW WELL NO.	DATE DRILLED	AGE OF WELL	DRILLING METHOD	WELL SEAL (FT)	WELL STATUS	WELL CAPACITY (CFS)	GROUND SURFACE ELEVATION (FT)	TOTAL DEPTH (FT)	COMPLETED DEPTH (FT)	CASING DIAMETER (IN)	NO. OF PERFORATION	TOP PERFORATION DEPTH (FT)	BOTTON PERFORATION DEPTH (FT)
TJ-01	4887C	1990	11	ROTARY	360	ACTIVE	9.1	841.1	800	800	20	2	400	460
													480	780
TJ-02	4887D	1990	11	ROTARY	UNK.	ACTIVE	8	841.1	800	800	20	2	400	460
													480	780
TJ-03	4887E	1990	11	ROTARY	N.A.	ACTIVE	9	826.6	810	800	20	4	400	460
													480	580
													600	710
													720	780
TJ-04	4887F	1990	11	ROTARY	UNK.	ACTIVE	8.5	829.1	800	800	20	3	400	460
													480	580
													600	780
TJ-05	4887G	1990	11	ROTARY	50	ACTIVE	8.8	832.7	800	800	20	5	400	410
													430	460
													480	580
													600	660
													680	780
TJ-06	4887H	1990	11	ROTARY	50	ACTIVE	8.3	836.5	810	800	20	4	400	420
													430	580
													600	660
													680	780
TJ-07	4887J	1990	11	ROTARY	UNK.	ACTIVE	8.5	841.3	800	800	20	5	400	420
													440	460
													480	580
													600	680
													690	780
TJ-08	4887K	1991	10	ROTARY	50	ACTIVE	9	846.4	810	800	20	4	400	460
													480	670
													690	740
													750	780
TJ-09	4886B	1991	10	ROTARY	360	ACTIVE	9.3	849.5	810	800	20	1	400	780
TJ-10	4886C	1991	10	ROTARY	50	ACTIVE	9	851.8	800	800	20	3	400	460
													480	580
													610	670
TJ-11	4886D	1991	10	ROTARY	UNK.	ACTIVE	8.4	854	800	800	20	4	400	460
													480	580



LADWP WELL NO.	LACDPW WELL NO.	DATE DRILLED	AGE OF WELL	DRILLING METHOD	WELL SEAL (FT)	WELL STATUS	WELL CAPACITY (CFS)	GROUND SURFACE ELEVATION (FT)	TOTAL DEPTH (FT)	COMPLETED DEPTH (FT)	CASING DIAMETER (IN)	NO. OF PERFORATIO N	TOP PERFORATION DEPTH (FT)	BOTTON PERFORATION DEPTH (FT)
													600	610
													630	780
TJ-12	4886E	1988	13	ROTARY	50	ACTIVE	9.5	854.9	811	800	20	3	400	590
													600	680
													700	780

**North Hollywood West Branch Historical Extraction  
(Acre-ft)**

<b>Water Year</b>	<b>NH-2</b>	<b>NH-4</b>	<b>NH-7</b>	<b>NH-22</b>	<b>NH-23</b>	<b>NH-25</b>	<b>NH-26</b>	<b>NH-32</b>	<b>NH-33</b>	<b>NH-34</b>	<b>NH-36</b>	<b>NH-37</b>	<b>NH-43A</b>	<b>NH-44</b>	<b>NH-45</b>	<b>TOTAL</b>
2012-13	0.00	861.14	0.00	1,056.34	4.06	392.22	529.30	514.74	938.20	0.00	1,819.00	1,488.07	30.59	1,844.70	3,753.97	13,232.33
2011-12	0.00	0.00	1,072.54	1,356.26	0.90	0.00	1,225.83	1,802.56	933.96	1,816.96	315.22	1,189.66	478.55	3,083.29	3,800.28	17,076.01
2010-11	0.00	0.00	122.15	1,480.75	2,392.01	1,570.20	2,082.92	1,985.33	1,108.87	2,687.45	1,549.62	4,662.07	1,109.93	4,715.64	5,604.75	31,071.69
2009-10	0.00	1,518.35	281.20	809.64	2.82	1,386.65	1,097.24	1,450.59	820.03	936.94	146.07	67.77	5.10	4.01	3,745.59	12,272.00
2008-09	0.00	1,322.29	282.45	1,481.99	0.52	1,620.90	2,214.41	1,870.49	2,001.63	1,499.94	870.86	4.48	3.72	335.27	586.94	14,095.89
2007-08	0.00	1,214.56	163.55	2,171.35	1.14	1,623.35	2,245.42	893.09	2,229.65	3,576.34	2,159.20	2.31	743.38	3,457.84	3,577.90	24,059.08
2006-07	0.00	0.14	25.93	1,049.02	510.22	1,158.68	887.95	158.87	787.65	1,877.19	726.24	1.84	461.66	1,912.05	817.17	10,374.61
2005-06	0.00	1,080.32	377.65	424.12	2,024.32	426.67	723.28	527.11	736.52	1,233.01	1,727.18	0.34	1,361.04	1,997.44	2,330.01	14,969.01
2004-05	0.00	869.37	816.32	1,720.14	278.17	1.42	1,429.72	1,531.53	1,693.30	1,878.30	1,318.86	0.18	2,894.43	1,653.99	3,580.92	19,666.65
2003-04	0.00	466.97	881.28	1,151.66	0.00	0.79	2,136.56	1,660.64	962.41	622.25	1,160.52	0.13	273.66	2,722.85	4,210.19	16,249.91
2002-03	0.00	189.82	795.22	519.27	0.00	0.00	0.00	1,494.33	2,137.46	3.47	2,259.58	32.95	0.00	3,448.13	4,158.18	15,038.41
2001-02	0.00	1,170.71	576.69	788.90	44.95	577.57	9.80	1,178.50	992.74	1.96	499.75	286.72	435.49	2,612.32	2,248.83	11,424.93
2000-01	0.16	705.67	691.83	2,101.97	1,713.62	862.87	1,120.00	1,470.18	595.04	1,132.05	1,666.14	3,085.16	0.00	1,906.21	3,961.26	21,012.16
1999-00	867.24	0.00	1,278.38	1,686.64	271.55	0.00	2,223.96	2,115.72	1,499.66	2,068.88	1,236.25	1,775.87	0.00	3,562.31	4,888.07	23,474.53
1998-99	1,187.50	0.00	610.72	953.88	972.04	1,079.15	1,546.85	2,289.10	1,103.81	2,125.56	1,043.97	3,391.78	830.93	3,802.18	4,718.88	25,656.35
1997-98	0.00	0.02	214.95	1,920.30	2,325.54	937.06	1,357.70	1,097.75	607.64	2,120.28	1,319.01	3,770.44	1,366.40	3,963.19	3,519.45	24,519.73
1996-97	0.00	0.00	568.45	1,590.35	1,958.77	1,037.17	281.94	1,161.17	623.30	1,368.05	9.57	1,713.52	1,244.14	2,363.63	1,520.87	15,440.93
1995-96	0.00	10.74	332.35	314.50	1,025.83	694.28	780.01	772.37	0.00	776.29	1.56	1,307.56	1,114.95	1,980.78	2,131.51	11,242.73
1994-95	0.00	0.00	0.00	332.02	0.00	0.00	419.31	0.00	0.00	630.47	5.56	903.98	296.46	672.85	701.95	3,962.60
1993-94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.90	0.00	0.00	0.00	1,014.35	384.78	1,432.03
1992-93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.29	0.00	3.10	360.77	1,704.82	979.09	3,086.07
1991-92	0.00	3.35	3.42	6.41	0.00	4.27	0.00	6.80	3.81	1,572.31	1,027.04	2,014.78	2,688.23	2,204.42	2,692.89	12,227.73
1990-91	260.08	388.19	404.67	1,134.81	0.00	603.33	399.72	1,252.01	658.29	924.48	356.89	1,627.29	1,416.26	1,734.05	2,130.26	13,290.33
1989-90	0.00	1,624.89	1,550.09	2,819.81	0.00	1,754.27	522.41	3,128.11	1,905.45	2,307.66	1,982.92	4,259.48	4,118.32	4,127.87	4,985.96	35,087.24
1988-89	0.00	1,826.65	1,538.27	2,922.24	1,361.39	2,192.25	2,556.77	3,394.02	2,100.25	2,613.20	2,298.49	4,397.77	4,803.22	4,377.75	4,297.64	40,679.91
1987-88	181.20	1,086.72	1,428.57	2,339.97	1,814.23	2,562.97	1,598.48	1,648.26	169.32	2,824.06	2,903.50	4,275.11	5,103.76	4,583.13	2,644.03	35,163.31
1986-87	1,779.20	1,014.16	1,163.25	2,458.16	605.97	1,428.44	1,395.33	1,776.92	649.87	2,559.69	3,292.48	3,954.01	4,668.33	4,280.14	2,286.84	33,312.79
1985-86	2,384.65	933.40	416.85	2,439.77	0.00	1,101.82	2,278.87	1,363.39	1,481.25	2,609.90	4,152.66	4,065.02	4,444.29	2,761.38	0.00	30,433.25
1984-85	3,006.10	1,744.17	1,688.37	3,027.36	309.97	2,884.43	2,826.76	836.02	2,119.54	2,971.14	4,235.12	4,499.36	4,151.88	0.00	0.00	34,300.22
1983-84	1,643.39	1,049.31	1,142.23	1,254.45	704.03	1,779.28	1,515.18	1,118.32	1,573.88	920.99	2,417.52	2,423.71	0.53	0.00	0.00	17,542.82
1982-83	1,346.64	737.51	688.61	679.65	0.28	2,439.72	1,888.93	627.46	919.69	1,113.99	3,012.80	2,386.01	0.00	0.00	0.00	15,841.29
1981-82	2,198.24	0.00	1,144.20	1,004.98	114.96	2,268.49	1,449.03	1,112.84	1,520.79	2,517.17	3,227.30	3,107.13	0.00	0.00	0.00	19,665.13
1980-81	1,307.95	105.41	445.26	1,065.36	1,229.60	1,539.49	820.33	511.25	726.29	1,356.20	445.48	1,086.34	0.00	0.00	0.00	10,638.96
1979-80	1,110.38	39.99	135.33	783.69	1,270.03	1,090.05	24.27	225.14	90.40	207.97	791.88	1,325.62	0.00	0.00	0.00	7,094.75
1978-79	947.94	150.67	521.93	483.51	380.11	699.58	47.82	110.72	447.20	703.18	860.53	1,507.56	0.00	0.00	0.00	6,860.75
1977-78	2,407.30	546.60	2,027.74	3,067.58	3,360.52	1,872.23	2,697.33	140.86	1,686.02	1,643.57	1,903.02	3,067.05	0.00	0.00	0.00	24,419.82
1976-77	1,647.91	267.19	1,177.15	2,278.01	2,207.02	106.24	1,772.65	338.75	787.19	1,987.11	2,005.90	1,659.38	0.00	0.00	0.00	16,234.50
1975-76	820.01	120.11	51.02	507.42	176.40	0.00	0.21	362.93	258.72	311.39	1,346.82	1,290.07	0.00	0.00	0.00	5,245.10
1974-75	482.14	444.85	620.18	735.02	270.28	475.14	315.28	790.56	752.94	199.35	1,579.02	966.79	0.00	0.00	0.00	7,631.55
1973-74	346.91	119.95	212.38	343.89	299.24	822.03	215.98	264.23	343.89	114.74	240.35	475.67	400.41	0.00	0.00	3,855.78
1972-73	26.26	155.30	50.58	56.68	37.13	149.94	37.28	847.61	167.68	306.69	620.48	590.95	0.00	0.00	0.00	3,046.58
1971-72	404.32	299.89	173.95	243.80	362.05	631.28	275.18	377.94	315.11	158.66	408.49	239.00	0.00	0.00	0.00	3,889.67

Water Year	NH-2	NH-4	NH-7	NH-22	NH-23	NH-25	NH-26	NH-32	NH-33	NH-34	NH-36	NH-37	NH-43A	NH-44	NH-45	TOTAL
1970-71	296.51	125.67	5.26	445.29	841.74	511.66	831.77	482.39	157.32	334.73	382.37	410.71	0.00	0.00	0.00	4,825.42
1969-70	199.04	197.68	75.13	367.05	617.36	922.68	277.73	11.80	256.28	145.64	71.90	372.73	0.00	0.00	0.00	3,515.02
1968-69	1,035.34	1,035.34	1,035.34	1,035.34	1,035.34	1,035.34	1,035.34	1,035.34	1,035.34	1,035.34	887.76	887.76	0.00	0.00	0.00	12,128.96
1967-68	1,168.74	1,168.74	1,168.74	1,168.74	1,168.74	1,168.74	1,168.74	1,168.74	1,168.74	1,168.74	0.00	0.00	0.00	0.00	0.00	11,687.35
1966-67	1,406.44	1,406.44	1,406.44	1,406.44	1,406.44	1,406.44	1,406.44	1,406.44	1,406.44	1,406.44	0.00	0.00	0.00	0.00	0.00	14,064.41
1965-66	1,169.50	1,169.50	1,169.50	1,169.50	1,169.50	1,169.50	1,169.50	1,169.50	1,169.50	1,169.50	0.00	0.00	0.00	0.00	0.00	11,695.05
1964-65	901.19	901.19	901.19	901.19	901.19	901.19	901.19	901.19	901.19	880.87	0.00	0.00	0.00	0.00	0.00	8,991.60
1963-64	886.10	886.10	886.10	886.10	886.10	886.10	886.10	886.10	639.91	639.91	0.00	0.00	0.00	0.00	0.00	7,482.53
1962-63	604.15	604.15	604.15	604.15	604.15	604.15	604.15	604.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,229.07
1961-62	1,088.83	1,088.83	1,088.83	1,088.83	1,088.83	1,088.83	1,088.83	1,088.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7,621.78
1960-61	785.99	785.99	785.99	785.99	785.99	785.99	785.99	785.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5,501.94
1959-60	737.61	737.61	737.61	737.61	737.61	737.61	737.61	583.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5,009.48
1958-59	909.47	909.47	909.47	909.47	909.47	885.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5,432.80
1957-58	1,023.70	1,023.70	1,023.70	1,023.70	1,023.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5,118.51
1956-57	854.96	854.96	854.96	854.96	854.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,274.78
1955-56	848.52	848.52	848.52	848.52	848.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,242.58
1954-55	975.63	975.63	975.63	975.63	975.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,878.15
1953-54	1,166.21	1,166.21	1,166.21	1,166.21	1,166.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5,831.03
1952-53	980.18	980.18	980.18	980.18	980.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,900.90
1951-52	1,299.19	1,299.19	1,299.19	1,299.19	1,299.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6,495.78
1950-51	1,307.61	1,307.61	1,307.61	1,307.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5,230.44
1949-50	1,508.79	1,508.79	1,508.79	1,508.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6,035.15
1948-49	1,068.27	1,068.27	1,068.27	1,068.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,273.08
1947-48	1,095.44	1,095.44	1,095.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,286.33
1946-47	828.54	828.54	828.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,485.63
1945-46	665.29	665.29	665.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,995.87
1944-45	260.35	260.35	260.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	781.05
1943-44	256.51	256.51	256.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	769.52
1942-43	211.71	211.71	211.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	635.14
1941-42	403.50	403.50	403.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,210.49
1940-41	81.58	81.58	81.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	244.73
1939-40	103.69	103.69	103.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	311.06
1938-39	58.44	58.44	58.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	175.32
1937-38	59.52	59.52	59.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	178.55
1936-37	344.83	344.83	344.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,034.49
1935-36	71.19	71.19	71.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	213.58
1934-35	592.07	592.07	592.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,776.22
1933-34	0.88	0.88	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.65
1932-33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1931-32	475.20	475.20	475.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,425.60
1930-31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1929-30	143.59	143.59	143.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	430.78
1928-29	91.88	91.88	91.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	275.63
1927-28	498.70	498.70	498.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,496.09

Water Year	NH-2	NH-4	NH-7	NH-22	NH-23	NH-25	NH-26	NH-32	NH-33	NH-34	NH-36	NH-37	NH-43A	NH-44	NH-45	TOTAL
1926-27	887.49	887.49	887.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,662.46
1925-26	406.94	406.94	406.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,220.81
1924-25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1923-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1922-23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1921-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1920-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1919-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1918-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1917-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1916-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1915-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>NORTH HOLLYWOOD WEST GRAND TOTAL</b>																<b>881,896.96</b>

**Tujung Historical Extraction**  
(Acre-ft)

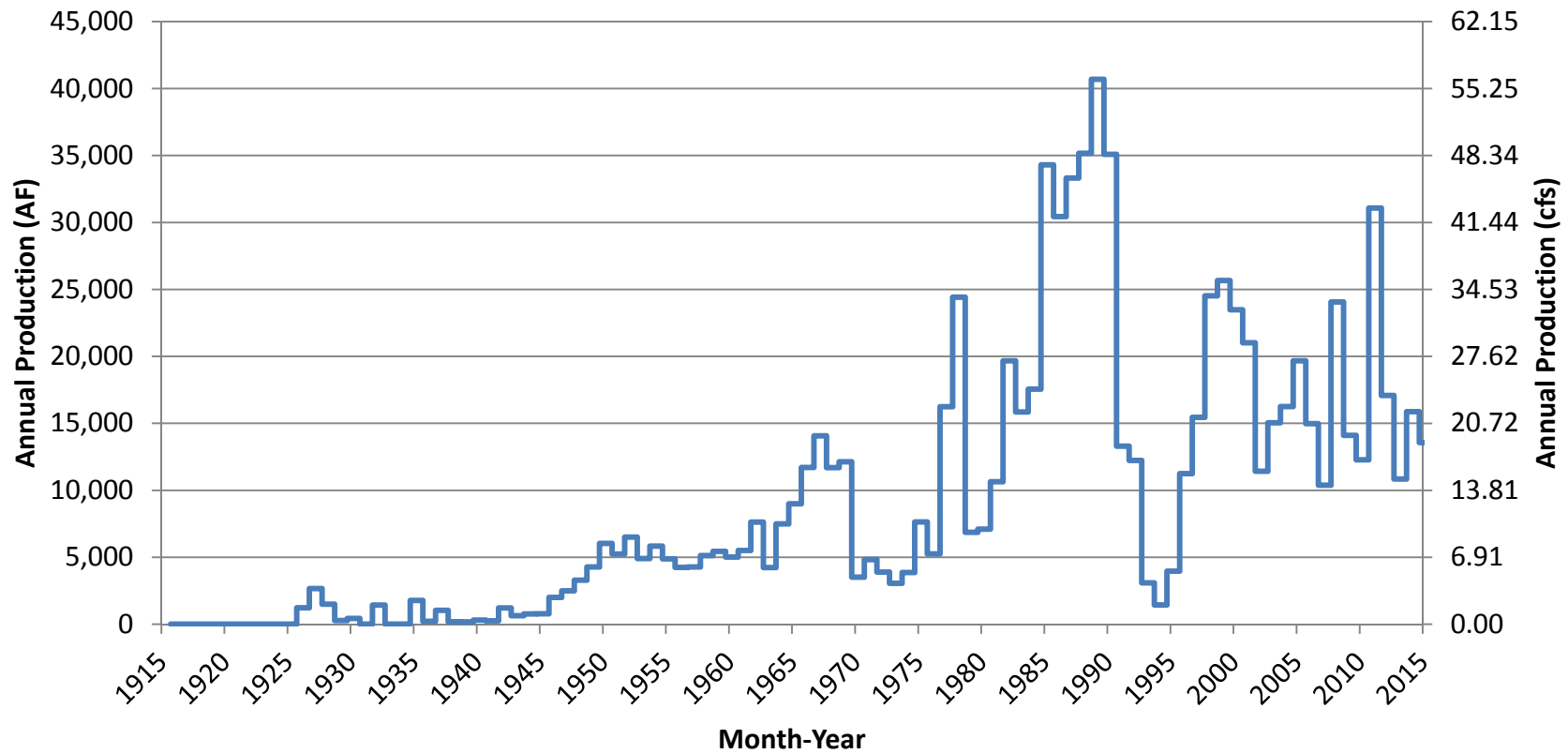
<b>Water Year</b>	<b>TJ-1</b>	<b>TJ-2</b>	<b>TJ-3</b>	<b>TJ-4</b>	<b>TJ-5</b>	<b>TJ-6</b>	<b>TJ-7</b>	<b>TJ-8</b>	<b>TJ-9</b>	<b>TJ-10</b>	<b>TJ-11</b>	<b>TJ-12</b>	<b>TOTAL</b>
2012-13	4,970.35	0.00	3,669.47	1,337.57	1,330.18	6,406.49	5,823.44	13.60	10.84	14.82	4.12	4,481.38	28,062.26
2011-12	2,901.32	3,381.48	3,244.67	1,682.39	103.69	2,389.73	2,290.11	92.80	966.26	10.73	5.69	3,579.05	20,647.92
2010-11	2,729.64	1,303.70	1,128.60	614.47	1,526.40	6,488.79	5,699.36	880.71	112.60	2.32	6.64	4,440.17	24,933.40
2009-10	2,242.43	0.69	201.67	3.03	4.16	6,844.65	6,096.09	4.11	319.97	0.78	4.09	824.98	16,546.65
2008-09	3,550.92	2,993.06	1,138.81	9.46	7.49	5.77	4.88	10.00	12.72	2.46	8.07	2,229.22	9,972.86
2007-08	2,155.58	2,798.31	1,071.06	9.29	6.43	7.47	8.51	159.54	9.83	28.22	6.07	345.66	6,605.97
2006-07	1,811.92	3,635.75	1,592.18	1,447.60	7.09	644.16	7.31	543.20	1,830.50	1,028.43	7.22	4,130.59	16,685.95
2005-06	2,245.20	1,736.52	1,451.45	615.94	260.30	380.96	3.44	4.75	8.11	8.79	5.49	1,140.23	7,861.18
2004-05	3,668.34	1,866.22	2,563.26	2,643.02	1,080.73	5.29	1.42	6.71	1,146.46	1,290.63	4.62	1,530.37	15,807.07
2003-04	228.48	3,852.85	4,604.64	3,292.88	615.24	1,400.30	4.91	3.87	191.18	1,125.07	4.32	1,986.76	17,310.50
2002-03	220.38	2,804.15	4,337.51	3,587.98	2,143.47	766.25	432.84	301.57	68.36	2,463.10	114.35	3,319.48	20,559.44
2001-02	1,955.17	4,149.00	3,078.82	1,886.32	1,306.46	1,769.35	6.22	1,132.29	1,747.12	2,255.78	3.61	3,929.81	23,219.95
2000-01	4,681.53	4,494.63	5,275.53	2,505.12	1,042.81	1,492.94	272.47	1,831.71	2,975.29	3,823.11	2.11	4,697.95	33,095.20
1999-00	4,082.44	3,794.21	4,201.14	3,143.11	2,433.72	4.41	2,496.91	2,650.17	826.80	2,818.14	0.00	3,850.72	30,301.77
1998-99	4,759.93	5,286.29	4,566.86	5,449.67	4,354.10	4,697.27	4,873.95	3,511.42	2,375.66	6.23	0.00	283.35	40,164.73
1997-98	3,568.31	4,080.63	2,920.01	2,644.78	743.52	1,211.83	1,203.25	2,597.37	2,215.23	993.42	306.78	664.40	23,149.53
1996-97	1,936.07	1,494.01	1,554.51	1,669.67	1,142.22	796.81	1,291.81	1,359.51	1,164.69	721.52	1,033.01	1,218.02	15,381.85
1995-96	1,022.83	1,732.27	1,655.41	1,803.41	1,282.29	800.11	1,354.64	1,130.37	840.49	672.96	42.47	309.73	12,646.98
1994-95	764.93	794.56	814.54	699.05	683.61	722.95	650.02	640.13	872.95	809.31	466.90	69.62	7,988.57
1993-94	2,277.35	2,462.85	1,941.92	2,110.49	2,363.22	2,564.09	2,391.31	2,465.83	2,298.07	2,095.82	1,807.93	1,062.27	25,841.15
1992-93	1,004.80	1,030.60	1,003.41	1,003.84	835.89	965.29	958.11	957.65	1,012.81	960.13	963.18	978.08	11,673.79
1991-92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990-91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1989-90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1988-89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1987-88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1986-87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1985-86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1984-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1983-84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1982-83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1981-82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>TUJUNGA GRAND TOTAL</b>													<b>408,456.72</b>



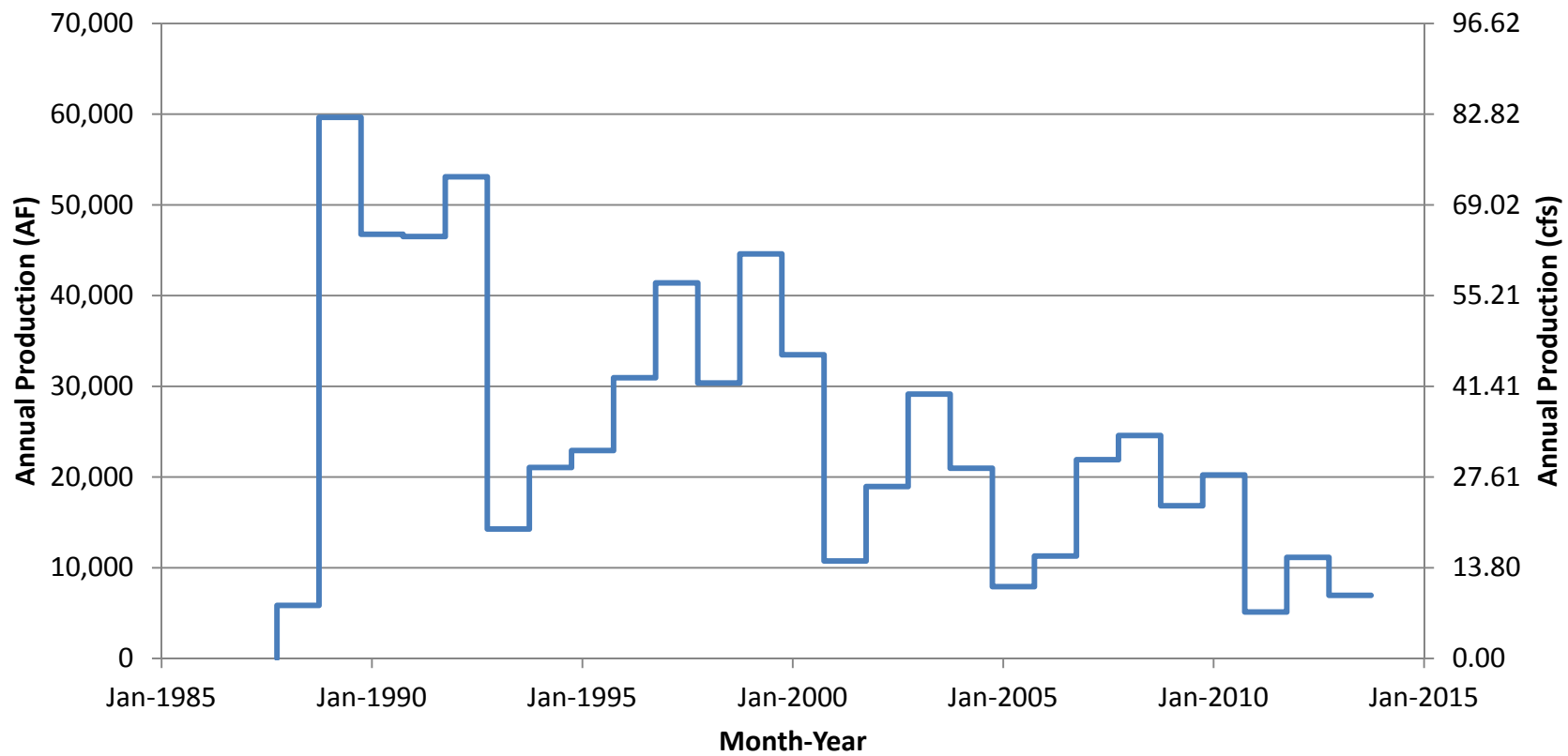
**Rinaldi-Toluca Historical Extraction**  
(Acre-ft)

Water Year	RT-1	RT-2	RT-3	RT-4	RT-5	RT-6	RT-7	RT-8	RT-9	RT-10	RT-11	RT-12	RT-13	RT-14	RT-15	TOTAL
2012-13	6.23	30.98	10.22	9.75	474.74	3,637.93	9.08	8.89	2,724.66	10.44	6.33	6.48	5.72	4.64	0.63	6,946.72
2011-12	6.23	30.98	10.22	9.75	474.74	3,637.93	9.08	8.89	2,724.66	10.44	6.33	6.48	5.72	4.64	0.63	6,946.72
2010-11	5.01	6.04	6.91	6.75	2,495.89	3,201.46	6.85	2,047.31	3,339.61	6.74	4.02	5.92	5.05	3.79	0.44	11,141.79
2009-10	2.62	933.84	95.06	891.14	1,293.04	666.65	2.41	504.54	720.51	2.99	2.77	2.36	2.78	2.55	0.32	5,123.58
2008-09	4.87	1,361.27	0.00	1,345.85	4,630.82	2,700.04	982.06	4,588.45	4,399.25	5.73	5.39	189.10	5.61	4.91	0.42	20,223.77
2007-08	5.72	0.00	3.63	2,707.02	4,172.39	3,267.96	476.22	871.66	4,458.35	6.29	5.94	835.22	5.35	6.68	0.50	16,822.93
2006-07	34.96	0.96	2,322.12	4,685.56	1,739.14	5,379.04	790.22	4,051.43	4,754.63	8.34	5.15	790.54	5.36	0.23	0.53	24,568.21
2005-06	6.76	1,769.38	379.72	5,135.75	4,423.07	5,682.05	10.57	2,924.98	1,304.45	22.79	7.96	225.13	7.02	2.48	1.51	21,903.62
2004-05	4.83	4.77	6.62	2,390.80	1,846.88	2,077.40	864.02	3,097.68	685.10	4.83	4.32	7.15	4.60	292.78	4.39	11,296.17
2003-04	42.33	126.78	896.05	893.96	985.99	1,734.26	794.56	1,146.02	1,019.91	251.63	3.43	5.27	4.84	3.08	2.04	7,910.15
2002-03	3.77	1,674.99	3,661.46	3,432.81	3,328.39	2,672.47	799.13	1,560.89	3,231.17	576.76	4.08	4.01	3.00	4.67	2.71	20,960.31
2001-02	1.50	3,885.99	3,550.01	3,835.94	3,756.14	3,218.83	3,779.37	3,037.04	2,256.59	1,547.00	1.03	257.41	3.68	3.24	3.51	29,137.28
2000-01	538.72	474.33	2,510.39	741.98	808.80	2,682.51	2,594.58	2,710.04	2,038.17	2,729.20	2.26	707.11	3.07	2.36	403.22	18,946.74
1999-00	846.16	3.44	1,052.84	828.82	185.43	1,859.00	1,905.18	922.69	1,036.42	1,498.74	1.65	558.87	47.02	1.30	2.73	10,750.29
1998-99	1,055.92	3,624.02	3,880.76	2,135.10	3,190.55	2,785.22	2,274.86	644.62	1,404.77	3,893.89	2,050.84	2,202.31	2,353.45	1,965.94	3.61	33,465.86
1997-98	2,430.03	3,987.63	1,142.14	1,443.51	4,240.45	4,068.04	1,962.19	4,263.56	798.72	4,483.43	2,730.85	4,112.45	4,171.87	2,278.48	2,478.40	44,591.75
1996-97	2,139.71	3,246.59	987.27	2,684.18	3,181.82	0.00	2,461.68	1,804.37	2,402.78	3,620.60	2,288.97	2,323.74	2,247.39	755.13	211.57	30,355.80
1995-96	2,521.10	3,572.58	611.60	3,011.44	4,171.15	37.13	3,561.78	0.00	2,706.25	4,233.36	2,901.41	4,127.98	4,583.20	3,279.91	2,083.24	41,402.13
1994-95	763.97	2,511.60	262.82	3,840.56	3,063.86	1,517.20	2,231.87	97.19	2,107.95	2,736.20	3,025.32	3,444.09	3,063.13	1,214.91	1,063.99	30,944.66
1993-94	1,480.63	1,741.62	1,268.37	1,348.51	1,578.94	1,276.61	1,225.38	1,002.40	1,325.84	1,870.50	2,089.77	2,007.89	2,012.17	632.62	2,050.14	22,911.39
1992-93	1,176.52	1,750.51	1,373.46	1,313.00	1,477.74	1,376.34	1,307.10	1,037.52	1,207.03	1,746.10	1,656.40	1,648.80	1,294.83	1,530.26	1,151.80	21,047.41
1991-92	796.52	921.35	1,081.04	1,058.69	1,154.50	1,104.60	1,106.81	0.00	1,050.26	1,070.15	923.56	1,015.66	963.03	1,009.21	1,015.12	14,270.50
1990-91	2,788.72	3,700.13	4,141.82	4,338.44	3,802.31	3,783.26	4,030.64	3,249.00	3,748.45	2,947.95	3,353.50	3,676.11	3,863.71	2,713.35	2,954.89	53,092.28
1989-90	2,807.38	3,301.13	3,562.79	3,852.43	4,272.79	4,305.60	3,459.74	3,483.00	578.67	3,378.69	3,260.01	3,480.91	3,351.74	3,413.62	0.00	46,508.50
1988-89	1,737.22	4,327.92	4,470.95	2,730.27	4,758.51	2,331.83	4,478.58	2,650.82	1,961.05	4,508.73	2,412.53	2,460.83	4,205.56	2,525.16	1,187.06	46,747.02
1987-88	5,102.43	5,896.44	2,750.70	2,626.61	2,023.19	2,377.67	2,726.13	1,832.83	2,235.00	5,592.85	5,537.05	5,976.19	5,867.31	4,475.44	4,626.41	59,646.25
1986-87	1,014.15	996.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	971.10	906.55	965.20	987.86	0.00	0.00	5,841.33
1985-86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1984-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1983-84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1982-83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1981-82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>RINALDI-TOLUCA GRAND TOTAL</b>																<b>663,503.16</b>

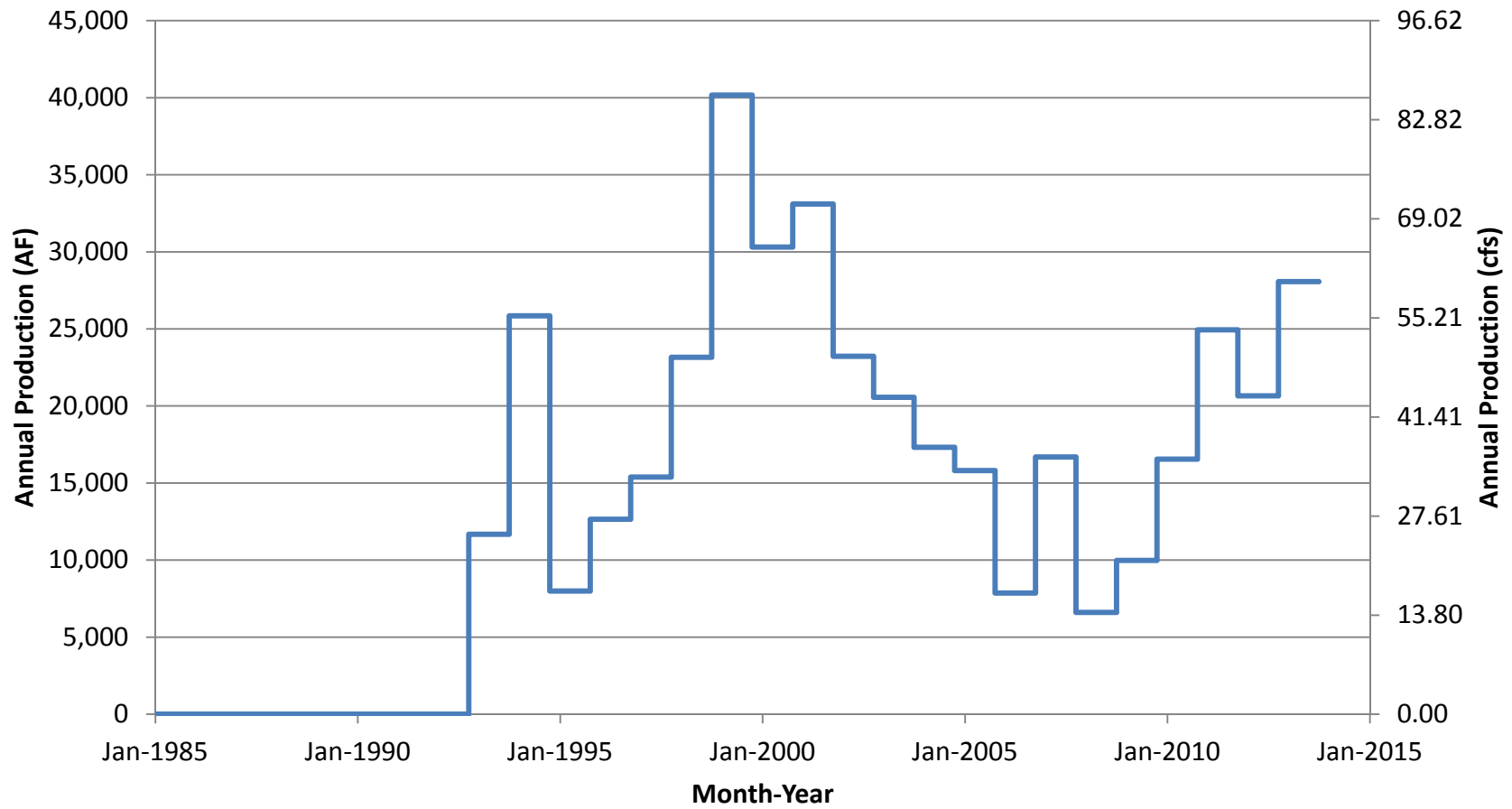
# North Hollywood West Branch Historical Extractions



# Rinaldi-Toluca Wellfield Historical Extractions



# Tujunga Wellfield Historical Extractions



## **Attachment G**

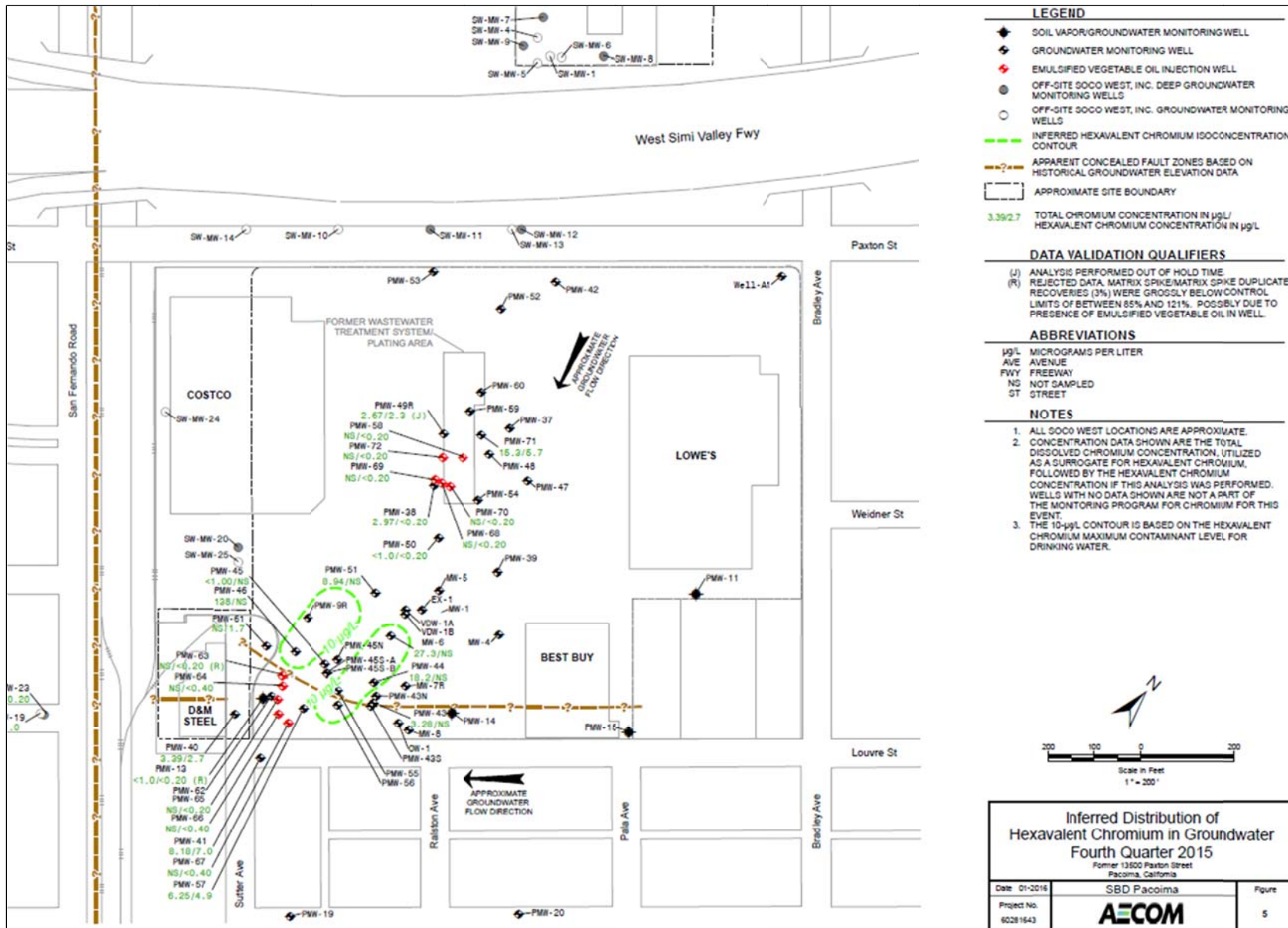
### **Summary of Major Cleanup Sites**



# **Price Pfister Site**

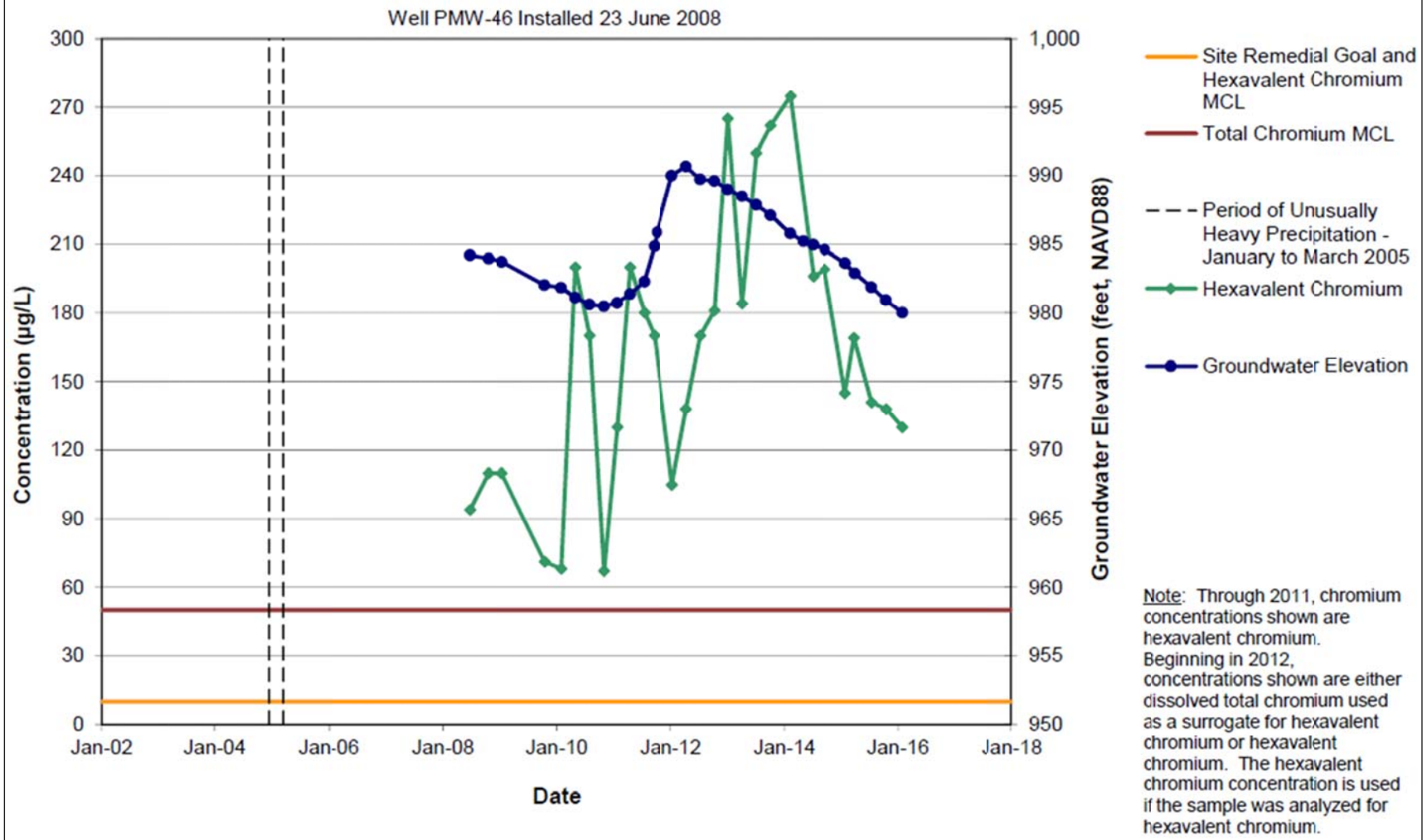
## Price Pfister Site Summary

Price Pfister, and subsequently Black and Decker, operated at the site from approximately 1960 to 2002, manufacturing faucet components and plumbing fixtures. The operations involved the use of petroleum hydrocarbons, chlorinated VOCs, and metals-containing compounds. Environmental assessment of the site began in 1984. In 2005, 3,400 cubic yards of contaminated soil was excavated from the top 3 feet. Remediation for VOCs at the site has included recovery of over 6,000 gallons of oil from groundwater by skimming, extraction of over 50 pounds of VOCs by multiple SVE systems, and degradation of over 250,000 pounds of hydrocarbons from the vadose zone by bioventing. The groundwater beneath the site is contaminated with chlorinated VOCs, 1,4-dioxane, and hexavalent chromium. From 2007 to the present, the site has utilized a waste discharge requirements (WDR) permit for the injection of emulsified vegetable oil solution into the groundwater to reduce CrVI. The responsible party's consultant has most recently conducted laboratory-scale testing of [biodegradation of 1,4-dioxane](#) in groundwater samples from the site. A quarterly groundwater monitoring program began in 2004 and there are currently 30 wells.



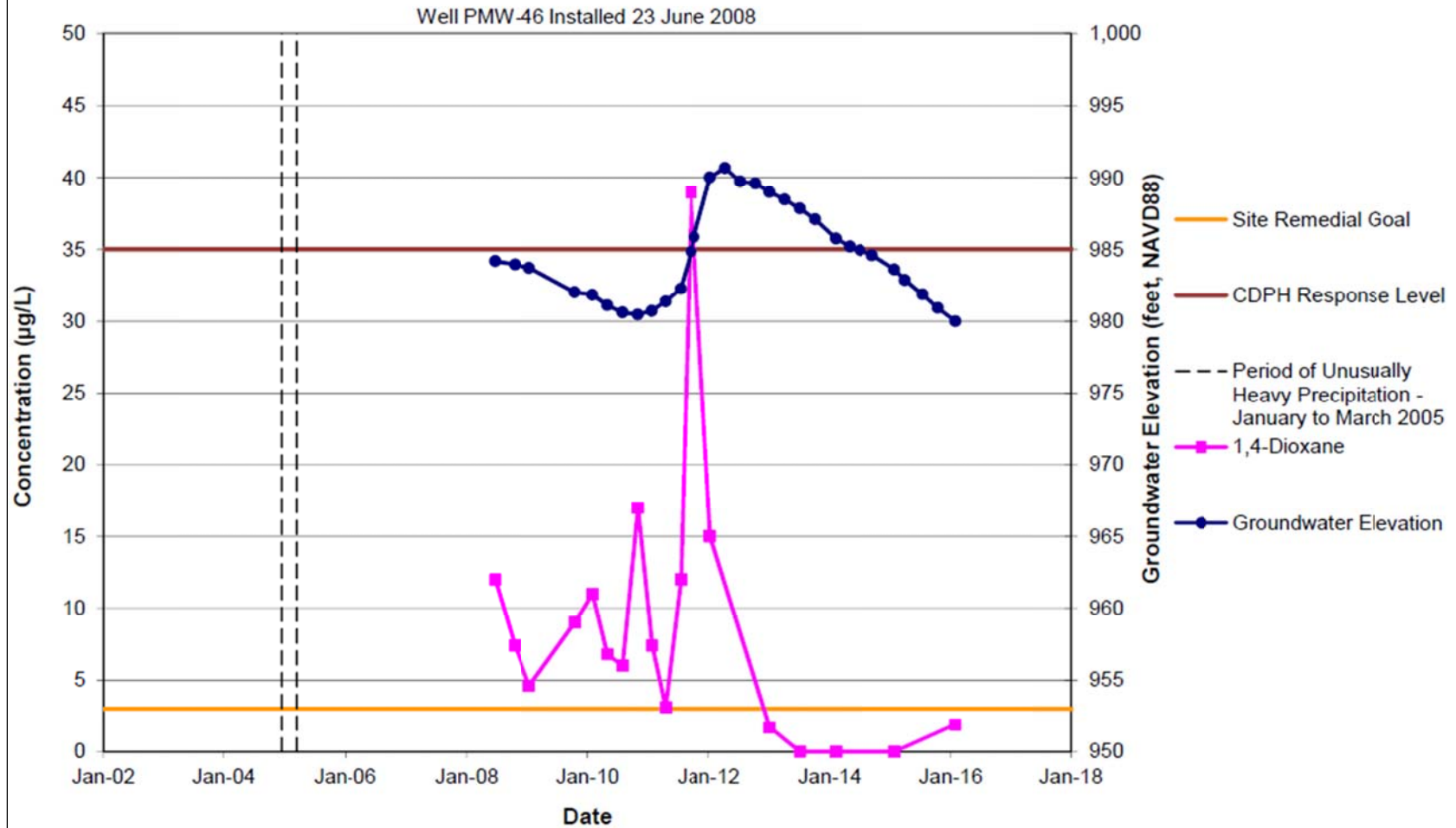
Source: [Fourth Quarter 2015 Groundwater Monitoring Report](#), AECOM, January 2016

## Groundwater Elevation and Chromium Concentration Trends in Well PMW-46



Source: [First Quarter 2016 Groundwater Monitoring Report](#), AECOM, April 2016

# Groundwater Elevation and 1,4-Dioxane Concentration Trends in Well PMW-46



Source: [First Quarter 2016 Groundwater Monitoring Report](#), AECOM, April 2016



**Most Recent Groundwater Analytical Data (February 2016):**

Well	Date	Note	VOCs (µg/L) <sup>(1)(2)</sup>													
			acetone	benzene	BDCME	MEK	chloroform	DBCM	1,1-DCA	cis-1,2-DCE	2-hexanone	PCE	TCE	vinyl chloride		
MW-4	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	4.1	<1.0	<0.50	
MW-5	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	50	<10	1.8	2.0	<0.50
MW-6	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	5.3	<1.0	<0.50	
MW-7R	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	1.1	8.8	<10	2.0	<1.0	<1.0	<0.50	
MW-8	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	3.5	<1.0	<0.50	
PMW-9R	2/19/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	6.4	<1.0	<0.50	
PMW-13	2/16/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	2.8	<1.0	<0.50	
		DUP	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	2.8	<1.0	<0.50
PMW-14	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	1.1	<10	3.0	<1.0	<1.0	<0.50	
PMW-19	2/17/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	1.4	<1.0	<0.50	
PMW-37	2/16/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	1.2	<1.0	<0.50	
PMW-38	2/17/2016	N	<20	3.3	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
PMW-40	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	2.6	<1.0	<0.50	
PMW-41	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
		DUP	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50
PMW-43	2/16/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
PMW-49R	2/16/2016	N	<20	<0.50	1.6	<10	1.7	1.9	<1.0	<1.0	<1.0	<10	1.5	<1.0	<0.50	
PMW-50	2/16/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
		DUP	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50
PMW-53	2/17/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	2.8	1.5	<0.50	
PMW-57	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	5.4	<10	3.7	<1.0	<0.50	
PMW-61	2/17/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	7.4	<10	5.1	1.2	<1.0	<0.50	
PMW-63	2/15/2016	N	500	0.7j	<1.0	98	<1.0	<1.0	<1.0	<1.0	<1.0	23	<1.0	<1.0	<0.50	
PMW-64	2/17/2016	N	260	<1.0	<2.0	140	<2.0	<2.0	<2.0	<2.0	57	<2.0	<2.0	<1.0	<1.0	
PMW-65	2/17/2016	N	24	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	3.7	1.6	<0.50	
PMW-66	2/18/2016	N	510	<0.50	<1.0	150	<1.0	<1.0	<1.0	2.4	280	1.1	<1.0	<1.0	<0.50	
PMW-67	2/18/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	19	<10	<1.0	1.1	0.65	<0.50	
PMW-71	2/16/2016	N	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
<b>Blank</b>																
TB	2/15/2016	TB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
EB	2/15/2016	EB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
TB	2/16/2016	TB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
EB	2/16/2016	EB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
TB	2/17/2016	TB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
EB	2/17/2016	EB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
TB	2/18/2016	TB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
EB	2/18/2016	EB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
TB	2/19/2016	TB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	
EB	2/19/2016	EB	<20	<0.50	<1.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0	<0.50	

**Abbreviations:**

- < compound not detected at or above indicated laboratory
- µg/L micrograms per liter
- 1,1-DCA 1,1-dichloroethane
- BDCME bromodichloromethane
- cis-1,2-DCE cis-1,2-dichloroethene
- DBCM dibromochloromethane
- DUP duplicate sample
- EB equipment blank
- MEK methyl ethyl ketone (2-butanone)
- N normal sample
- PCE tetrachloroethene
- TB trip blank
- TCE trichloroethene
- U.S. EPA United States Environmental Protection Agency
- VOC volatile organic compound

**Notes:**

<sup>(1)</sup> Dedicated bladder pumps and tubing installed in Site wells were used to collect samples in accordance with low flow purging and sampling procedures described in U.S. EPA Groundwater Issue: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, dated December 1995, and U.S. EPA Region 9 Quick Reference Advisory - Use of Low-Flow Methods for Groundwater Purging and Sampling: An Overview, dated December 1995.

<sup>(2)</sup> These samples were analyzed for VOCs using U.S. EPA Method 8260B. Analytes not shown were not detected at or above laboratory reporting limits.

Well	Date	Note	Inorganic Compounds (µg/L) <sup>(1)(2)</sup>		
			Total Chromium	Hexavalent Chromium	1,4-Dioxane
<b>Site Wells</b>					
MW-4	2/18/2016	N	-	-	<1.0
MW-5	2/18/2016	N	-	-	2.3
MW-6	2/18/2016	N	66.8	-	<1.0
MW-7R	2/18/2016	N	1.47	-	<1.0
		DUP	-	-	<1.0
PMW-9R	2/19/2016	N	6.46	-	2.2
PMW-13	2/16/2016	N	<1.00	<0.20	<1.0
		DUP	<1.00	<0.20	<1.0
PMW-15	2/19/2016	N	-	-	<1.0
PMW-19	2/17/2016	N	<1.00	-	<1.0
PMW-37	2/16/2016	N	-	-	<1.0
PMW-38	2/17/2016	N	<1.00	<0.20 (UJ)	8.9
PMW-39	2/18/2016	N	-	-	<1.0
PMW-40	2/18/2016	N	2.60	2.3	<1.0
PMW-41	2/18/2016	N	7.09	7.1	<1.0
		DUP	7.56	7.2	<1.0
PMW-43	2/16/2016	N	14.2	-	<1.0
PMW-44	2/17/2016	N	4.78	5.3	<1.0
PMW-45	2/17/2016	N	<1.00	<0.20	<1.0
PMW-46	2/15/2016	N	125	130	1.9
PMW-47	2/16/2016	N	-	-	<1.0
PMW-48	2/16/2016	N	-	-	2.6
PMW-49R	2/16/2016	N	24.2	26	<1.0
PMW-50	2/16/2016	N	<1.00	<0.20	1.2
		DUP	-	<0.20	1.2
PMW-51	2/18/2016	N	23.8	19	<1.0
		DUP	-	16	-
PMW-52	2/19/2016	N	-	-	<1.0
PMW-53	2/17/2016	N	-	-	<1.0
PMW-54	2/16/2016	N	1.54	-	6.7
PMW-55	2/17/2016	N	-	17	-
PMW-56	2/17/2016	N	-	2.9	-
PMW-57	2/18/2016	N	4.83	4.4	<1.0
PMW-58	2/18/2016	N	-	<0.20	-
PMW-61	2/17/2016	N	-	1.0	1.1
PMW-63	2/15/2016	N	-	<1.0	-
PMW-64	2/17/2016	N	-	<0.20	-
PMW-65	2/17/2016	N	-	<0.20	-
PMW-66	2/18/2016	N	-	<1.0	-
PMW-67	2/18/2016	N	-	<1.0	-
PMW-68	2/17/2016	N	-	<0.20	-
PMW-69	2/18/2016	N	-	<0.20	-
PMW-70	2/18/2016	N	-	<0.20	-
PMW-71	2/16/2016	N	146	1.4	<1.0
PMW-72	2/16/2016	N	-	<0.20	-

**Abbreviations:**

<	compound not detected at or above indicated laboratory detection limit
-	not analyzed
µg/L	micrograms per liter
DUP	duplicate sample
ICP/MS	inductively coupled plasma mass spectrometry
MS/MSD	matrix spike/matrix spike duplicate
N	normal sample
U.S. EPA	United States Environmental Protection Agency

**Notes:**

<sup>(1)</sup> Dedicated bladder pumps and tubing installed in Site wells were used to collect samples in accordance with low flow purging and sampling procedures described in U.S. EPA Groundwater Issue: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, dated December 1995, and U.S. EPA Region 9 Quick Reference Advisory - User of Low-Flow Methods for Groundwater Purging and Sampling: An Overview, dated December 1995.

<sup>(2)</sup> These samples were analyzed for chromium by ICP/MS using EPA Method 200.8, for hexavalent chromium using EPA Method 218.6, and for 1,4-Dioxane using EPA Method 8270C with isotope dilution. Samples for total chromium were filtered in the field using a 0.45-micron filter. Sample filtering for hexavalent chromium is performed by the laboratory as part of the analytical method.

**Data Validation Qualifier:**

(UJ) The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

**AlliedSignal / Bendix Corporation / Honeywell**

The facility was used for the production of hydraulic and pneumatic valves between 1941 and 1992; first by Bendix Corporation which then purchased by AlliedSignal in 1983, which was purchased in 1999 by Honeywell. The operations involved degreasing with chlorinated solvents and chrome plating. The storage and use of chemicals at the site resulted in contamination of the soil and groundwater beneath the site. Site assessment began in the late 1980s and groundwater monitoring began in 1991.

An SVE system operated from 2001 to 2013 to remove VOCs from on-site soil. Soil contaminated with hexavalent chromium (CrVI) was excavated between 1994 and 2000. The next phase of remediation was a groundwater extraction, treatment, and re-injection system. The Regional Board approved a waste discharge permit (WDR) in 2007 for the reinjection of treated water and the system began operating in January of 2009. Groundwater is extracted, treated via ion-exchange to remove CrVI, advanced oxidation process (AOP), and carbon adsorption to remove VOCs, and then reinjected into the ground. In January of 2016, the Regional Board approved a WDR for injection of 5.2 million gallons of 1.5% calcium polysulfide solution and 10.4 million gallons of chase water into two injection wells over the course of nine months.

Thirteen monitoring wells were installed between 1991 and 2004 and the groundwater monitoring program has expanded since then. There are currently 27 on-site wells and 14 off-site (south and southwest) wells. All 41 monitoring wells are sampled quarterly. The maximum concentration of TCE ever detected in groundwater at the site was 17,000 ug/L in 1996 and the maximum concentration of TCE detected during the most recent reported sampling event in February 2016 was 1,100 ug/L. The maximum concentration of PCE ever detected was 1,200 ug/L in 2007 and the maximum concentration of PCE detected during the February 2016 sampling event was 22 ug/L. The groundwater monitoring program began including analysis for CrVI in 2001 and the maximum concentration of CrVI ever detected was 53,100 ug/L in 2007. The maximum concentration of CrVI detected in the February 2016 sampling event was 1,500 ug/L. The groundwater monitoring program began including analysis for chemicals of emerging concern in 2003. The maximum concentration of 1,4-dioxane ever detected was 1,300 ug/L in 2010 and the maximum concentration detected during the February 2016 sampling event was 190 ug/L.

[Most Recent Available Groundwater Data \(February 2016\):](#)

Well/ Barcad ID	Sample Date	Groundwater Concentration (µg/L)	
		Total Dissolved Chromium	Hexavalent Chromium
GW-01	2/26/2016	55.5	51
GW-01 DUP	2/26/2016	49.6	51
GW-02	2/26/2016	52.7	51
GW-03	2/24/2016	<0.402	<0.067
GW-04	2/25/2016	22.4	20
GW-05	2/25/2016	20.7	20
GW-06	2/24/2016	2.12	1.8
GW-07	2/26/2016	16.2	13
GW-08	2/25/2016	2.27	1.5
GW-09	2/25/2016	2.36	2.2
GW-10	2/25/2016	8.34	8.3
GW-11-273	2/23/2016	3.36	3.3
GW-11-287	2/23/2016	3.63	3.7
GW-11-316	2/23/2016	8.1	10
GW-11-352	2/23/2016	16.6	17
GW-11-407	2/23/2016	18.3	17
GW-12A-319	2/24/2016	15.9	16
GW-12B	2/26/2016	362	350
GW-14A	2/23/2016	18.5	<0.067
GW-14B	2/23/2016	1.34	0.84 J
GW-15	2/25/2016	8.88	9.2
GW-16-277	2/24/2016	4.57	2.1
GW-16-317	2/24/2016	28.6	<0.067
GW-16-347	2/24/2016	13.2	14
GW-16-417	2/24/2016	6.76	<0.067
GW-17-282	2/24/2016	647	650
GW-17A	2/26/2016	265	270
GW-18A	2/24/2016	3.0	2.9
GW-19A	2/26/2016	3.88	3.4
GW-19A DUP	2/26/2016	3.63	3.4
GW-19C	2/24/2016	1.65	1.5
GW-20	2/25/2016	18.5	17
GW-21	2/25/2016	16.2	15
GW-22	2/25/2016	64.5	59
GW-22 DUP	2/25/2016	60.6	60
GW-23	2/24/2016	2.2	2.0
GW-25A	2/23/2016	10.5	<0.067
GW-25B	2/23/2016	5.38	0.22 J
GW-29	2/24/2016	0.891 J	<0.067
GW-30	2/25/2016	15.9	16
GW-31	2/25/2016	23.1	22
GW-32	2/25/2016	36.2	38
GW-33A	2/26/2016	79	64
GW-33A DUP	2/26/2016	70.1	63
GW-33B	2/25/2016	1.48	0.46 J
GW-34	2/25/2016	15.2	15
GW-35	2/26/2016	1,490	1,400
GW-35 DUP	2/26/2016	1,510	1,500
NH-C07	2/25/2016	22.3	22
NHE-2	2/24/2016	105	110

Notes:

Samples analyzed using USEPA Method 6020 for total chromium and USEPA Method 7199 for hexavalent chromium. USEPA = United States Environmental Protection Agency

DUP = Duplicate sample

J = Analyte was detected; the listed result is estimated.

µg/L = micrograms per liter

< = Not detected above listed method detection limit



Well/ Barcad ID	Sample Date	Groundwater Concentration (µg/L)													
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	Bromodichloromethane	Carbon Disulfide	Carbon Tetrachloride	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Tetrachloroethene	Toluene	Trichloroethene
GW-01	2/26/2016	<0.30	<0.38	0.80 J	1.2	0.25 J	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	<0.39	<0.24	3.9
GW-01 DUP	2/26/2016	<0.30	<0.38	0.77 J	1.1	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	0.41 J	<0.24	3.9
GW-02	2/26/2016	<0.30	<0.38	0.63 J	0.55 J	<0.24	<0.21	<0.41	<0.23	<0.46	2.2	<0.46	1.7	<0.24	2.2
GW-03	2/24/2016	<0.30	<0.38	1.5	1.9	<0.24	<0.21	<0.41	<0.23	<0.46	0.87 J	<0.46	1.1	<0.24	5.9
GW-04	2/25/2016	<0.30	<0.38	1.1	1.0 J	0.30 J	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	0.50 J	<0.24	2.3
GW-05	2/25/2016	<0.30	<0.38	0.45 J	<0.43	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	<0.39	<0.24	0.47 J
GW-06	2/24/2016	<0.30	<0.38	0.53 J	<0.43	<0.24	<0.21	<0.41	<0.23	0.73 J	1.5	<0.46	1.4	<0.24	1.7
GW-07	2/26/2016	1.1 J	<0.77	0.79 J	4.4	<0.48	<0.41	<0.82	0.85 J	3.6	2.0	<0.91	9.3	<0.47	260
GW-08	2/25/2016	<0.30	<0.38	<0.28	1.1	<0.24	<0.21	<0.41	<0.23	2.0	0.97 J	<0.46	2.5	<0.24	12
GW-09	2/25/2016	0.94 J	<0.38	<0.28	9.1	<0.24	0.21 J	<0.41	0.74 J	0.90 J	<0.48	<0.46	14	<0.24	34
GW-10	2/25/2016	<0.30	<0.38	0.38 J	0.57 J	0.28 J	<0.21	<0.41	<0.23	5.7	<0.48	<0.46	0.82 J	<0.24	2.3
GW-11-273	2/23/2016	0.95 J	<0.38	<0.28	9.7	<0.24	0.30 J	<0.41	0.81 J	1.0	<0.48	<0.46	19	<0.24	48
GW-11-287	2/23/2016	1.1	<0.38	<0.28	10	<0.24	0.21 J	<0.41	1.1	1.0	<0.48	<0.46	22	<0.24	54
GW-11-316	2/23/2016	0.69 J	<0.38	<0.28	7.2	<0.24	<0.21	<0.41	0.67 J	0.75 J	0.57 J	0.48 J	14	<0.24	38
GW-11-352	2/23/2016	<0.30	<0.38	0.83 J	0.85 J	0.40 J	<0.21	<0.41	<0.23	<0.46	5.6	1.2	4.5	<0.24	22
GW-11-407	2/23/2016	<0.30	<0.38	<0.28	<0.43	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	0.77 J	<0.24	6.0
GW-12A-319	2/24/2016	0.52 J	<0.38	1.9	3.4	0.37 J	<0.21	<0.41	0.58 J	3.0	9.6	1.7	8.5	<0.24	160
GW-12B	2/26/2016	2.5 J	<1.9	4.4 J	19	<1.2	<1.0	<2.0	2.8 J	10	15	<2.3	21	<1.2	1,100
GW-14A	2/23/2016	<0.30	<0.38	0.90 J	1.4	<0.24	<0.21	<0.41	<0.23	<0.46	0.52 J	<0.46	0.70 J	<0.24	3.0
GW-14B	2/23/2016	<0.30	<0.38	1.1	<0.43	0.35 J	<0.21	<0.41	<0.23	<0.46	4.6	1.5	2.9	<0.24	2.2
GW-15	2/25/2016	<0.30	<0.38	0.51 J	<0.43	0.27 J	<0.21	<0.41	<0.23	3.0	<0.48	<0.46	1.3	<0.24	11
GW-16-277	2/24/2016	<0.30	<0.38	<0.28	1.4	<0.24	<0.21	<0.41	<0.23	<0.46	0.63 J	<0.46	4.8	<0.24	39
GW-16-317	2/24/2016	4.7	1.3	1.3	25	1.9	<0.21	<0.41	1.4	2.5	4.5	<0.46	45	0.25 J	230
GW-16-347	2/24/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GW-16-417	2/24/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GW-17-282	2/24/2016	<0.61	<0.77	0.86 J	3.4	<0.48	<0.41	<0.82	0.79 J	3.8	4.9	<0.91	4.3	<0.47	230
GW-17A	2/26/2016	<0.30	<0.38	0.87 J	2.8	0.25 J	<0.21	<0.41	<0.23	0.60 J	1.1	0.67 J	1.1	<0.24	13
GW-18A	2/24/2016	<0.30	<0.38	<0.28	1.4	<0.24	0.39 J	<0.41	<0.23	2.5	<0.48	<0.46	1.7	<0.24	47
GW-19A	2/26/2016	<0.30	<0.38	<0.28	<0.43	<0.24	0.21 J	<0.41	<0.23	6.8	<0.48	<0.46	0.49 J	<0.24	13
GW-19A DUP	2/26/2016	<0.30	<0.38	<0.28	0.44 J	<0.24	<0.21	<0.41	<0.23	6.8	<0.48	<0.46	0.45 J	<0.24	13
GW-19C	2/24/2016	<0.30	<0.38	<0.28	<0.43	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	<0.39	<0.24	0.69 J

Well/ Barcad ID	Sample Date	Groundwater Concentration (µg/L)													
		1,1,1,-Trichloroethane	1,1,2,-Trichloroethane	1,1,-Dichloroethane	1,1,-Dichloroethene	1,2,-Dichloroethane	Bromodichloromethane	Carbon Disulfide	Carbon Tetrachloride	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Tetrachloroethene	Toluene	Trichloroethene
GW-20	2/25/2016	<0.30	<0.38	0.45 J	0.70 J	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	<0.39	<0.24	1.6
GW-21	2/25/2016	<0.30	<0.38	0.50 J	0.46 J	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	<0.39	<0.24	0.38 J
GW-22	2/25/2016	0.34 J	<0.38	1.3	1.6	0.29 J	<0.21	<0.41	<0.23	<0.46	0.52 J	<0.46	0.94 J	<0.24	3.6
GW-22 DUP	2/25/2016	0.34 J	<0.38	1.3	1.5	<0.24	<0.21	<0.41	<0.23	<0.46	0.60 J	<0.46	0.72 J	<0.24	3.3
GW-23	2/24/2016	<0.30	<0.38	0.50 J	<0.43	<0.24	<0.21	<0.41	<0.23	0.83 J	1.6	<0.46	1.8	<0.24	3.6
GW-25A	2/23/2016	<0.30	<0.38	1.1	1.4	<0.24	<0.21	<0.41	<0.23	<0.46	0.62 J	<0.46	0.86 J	<0.24	3.0
GW-25B	2/23/2016	<0.30	<0.38	<0.28	<0.43	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	0.57 J	<0.24	5.1
GW-29	2/24/2016	<0.30	<0.38	0.40 J	0.62 J	<0.24	<0.21	0.85 J	<0.23	<0.46	0.88 J	<0.46	0.99 J	<0.24	2.8
GW-30	2/25/2016	<0.30	<0.38	0.59 J	<0.43	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	<0.39	<0.24	<0.37
GW-31	2/25/2016	<0.30	<0.38	0.49 J	0.99 J	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	<0.39	<0.24	2.5
GW-32	2/25/2016	0.32 J	<0.38	0.67 J	2.0	<0.24	<0.21	<0.41	<0.23	0.56 J	0.54 J	<0.46	0.84 J	<0.24	29
GW-33A	2/26/2016	1.6 J	<1.9	1.9 J	10	<1.2	<1.0	<2.0	2.2 J	6.6	5.5	<2.3	12	<1.2	550
GW-33A DUP	2/26/2016	<1.5	<1.9	1.9 J	9.2	<1.2	<1.0	<2.0	2.0 J	6.5	5.6	<2.3	12	<1.2	550
GW-33B	2/25/2016	<0.30	<0.38	<0.28	<0.43	<0.24	<0.21	<0.41	<0.23	<0.46	0.48 J	<0.46	2.2	<0.24	19
GW-34	2/25/2016	<0.30	<0.38	0.54 J	0.61 J	<0.24	<0.21	<0.41	<0.23	0.49 J	<0.48	0.50 J	0.46 J	<0.24	2.1
GW-35	2/26/2016	<0.30	<0.38	0.71 J	0.89 J	<0.24	<0.21	<0.41	<0.23	<0.46	1.8	0.55 J	1.6	<0.24	4.4
GW-35 DUP	2/26/2016	<0.30	<0.38	0.68 J	0.89 J	<0.24	<0.21	<0.41	<0.23	<0.46	1.7	0.59 J	1.7	<0.24	4.4
NH-C07	2/25/2016	<0.30	<0.38	0.45 J	<0.43	<0.24	<0.21	<0.41	<0.23	<0.46	<0.48	<0.46	0.63 J	<0.24	3.1
NHE-2	2/24/2016	0.72 J	<0.38	0.69 J	6.6	0.25 J	<0.21	<0.41	0.69 J	7.8	3.0	<0.46	10	<0.24	160

**Notes:**

Samples analyzed using USEPA Method 8260. Only analytes detected above the detection limit are shown. estimated. USEPA = United States Environmental Protection Agency detection limit.

µg/L = micrograms per liter

DUP = Duplicate sample

J = Analyte was detected; the listed result is

< = Not detected above listed method

NA = Not analyzed this quarter

Well/ Barcad ID	Sample Date	Groundwater Concentration (µg/L)	
		1,4-Dioxane (USEPA 8270C SIM)	1,2,3-TCP (SRL 524M-TCP)
GW-01	02/26/16	5.1	--
GW-01 DUP	02/26/16	4.7	--
GW-02	02/26/16	4.1	--
GW-03	02/24/16	7.1	--
GW-04	02/25/16	11	--
GW-05	02/25/16	13	--
GW-06	02/24/16	5.0	NA
GW-07	02/26/16	1.2	NA
GW-08	02/25/16	1.4	--
GW-09	02/25/16	<0.28	--
GW-10	02/25/16	<0.28	--
GW-11-273	02/23/16	<0.28	--
GW-11-287	02/23/16	1.5	--
GW-11-316	02/23/16	1.4	--
GW-11-352	02/23/16	6.4	--
GW-11-407	02/23/16	<0.28	--
GW-12A-319	02/24/16	6.1	NA
GW-12B	02/26/16	4.6	NA
GW-14A	02/23/16	9.3	--
GW-14B	02/23/16	5.0	--
GW-15	02/25/16	<0.28	--
GW-16-277	02/24/16	190	--
GW-16-317	02/24/16	72	--
GW-16-347	02/24/16	NA	--
GW-16-417	02/24/16	NA	--
GW-17-282	02/24/16	4.3	NA
GW-17A	02/26/16	9.8	NA
GW-18A	02/24/16	<0.28	NA
GW-19A	02/26/16	0.71 J	--
GW-19A DUP	02/26/16	0.84 J	--
GW-19C	02/24/16	<0.28	--
GW-20	02/25/16	1.5	--
GW-21	02/25/16	4.0	--
GW-22	02/25/16	16	--
GW-22 DUP	02/25/16	14	--
GW-23	02/24/16	4.3	--
GW-25A	02/23/16	11	--
GW-25B	02/23/16	1.7	--
GW-29	02/24/16	2.3	--
GW-30	02/25/16	3.7	--
GW-31	02/25/16	1.6	--
GW-32	02/25/16	2.0	--
GW-33A	02/26/16	2.0	--
GW-33A DUP	02/26/16	1.4	--
GW-33B	02/25/16	1.1	--
GW-34	02/25/16	0.82 J	--
GW-35	02/26/16	8.6	--
GW-35 DUP	02/26/16	9.2	--
NH-C07	02/25/16	2.8	NA
NHE-2	02/24/16	7.6	NA

Notes:

Samples analyzed using the method shown in parentheses.

SRL = California Department of Public Health, Sanitation and Radiation Laboratories

USEPA = United States Environmental Protection Agency

µg/L = micrograms per liter

J = Analyte was detected; the listed result is estimated

TCP = Trichloropropane

< = Not detected above listed method detection limit.

DUP = Duplicate sample

NA = Not analyzed this quarter

-- = No longer analyzed

### Historical Groundwater Analytical Data – Chromium

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-1	02/08/01	NF	Pump	174	151
	03/25/03	NF	Bailer	85.0	81
	06/16/03	NF	Bailer	260	220
	09/17/03	NF	Bailer	250	220
	12/09/03	NF	Bailer	21.0	19
	03/17/04	FFVI	Bailer	13.0	<1.0
	06/15/04	FFVI	Bailer	13.0	3.5
	09/14/04	FF	Pump	260	230
	11/09/04	FF	Pump	<5.00	3.5
	02/23/05	FFTC	Pump	<5.00	1.8
	05/24/05	LF	Pump	<5.00	2.0
	08/31/05	LF	Pump	<5.00	1.4
	11/29/05	LF	Pump	<5.00	4.2
	03/01/06	LF	Pump	1.50	1.6
	05/24/06	LF	Pump	3.06	1.8
	08/15/06	LF	Pump	3,170	3,100
	10/12/06	LF	Pump	--	23,000
	10/25/06	LF	Pump	41,900	29,000
	01/24/07	LF	Pump	46,200	53,100
	04/18/07	LF	Pump	34,000	34,000
	07/26/07	LF	Pump	22,200	22,000
	10/25/07	LF	Pump	13,400	13,000
	01/23/08	LF	Pump	9,910	12,000
	04/17/08	LF	Pump	8,080	7,700
	07/17/08	LF	Pump	332	300
	10/16/08	LF	Pump	5,630	9,000
	01/15/09	LF	Pump	117	130
	04/09/09	LF	Pump	104	120
	07/17/09	LF	Pump	3,940	4,200
	10/15/09	LF	Pump	2,380	2,400
	02/12/10	LF	Pump	5,250 J-	5600
	05/14/10	LF	Pump	1,200	1,400 J-
	05/14/10	LF	Pump	1,180	1,400 J-
	08/13/10	LF	Pump	1120	1100
	08/13/10	LF	Pump	1160	1100
	12/09/10	LF	Pump	813	850
	02/03/11	LF	Pump	1,170	1,200
	04/07/11	LF	Pump	508 J-	620
	04/07/11	LF	Pump	518 J-	620
	08/05/11	LF	Pump	1720	1500
08/05/11	LF	Pump	1920	1500	
10/14/11	LF	Pump	4510	4500	
10/14/11	LF	Pump	4940	4600	
02/03/12	LF	Pump	18,400	14,000	
02/03/12	LF	Pump	18,000	15,000	
04/06/12	LF	Pump	18,400	16,000	
04/06/12	LF	Pump	14,500	16,000	
08/17/12	LF	Pump	3,760	3,800	
08/17/12	LF	Pump	3,540	3,500	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-1	10/12/12	LF	Pump	10,400	9,200
	10/12/12	LF	Pump	9,900	10,000
	02/15/13	LF	Pump	2,610	3,100
	02/15/13	LF	Pump	2,630	2,900
	04/05/13	LF	Pump	3,020	3,200
	04/05/13	LF	Pump	3,000	3,200
	08/02/13	LF	Pump	164	160
	08/02/13	LF	Pump	166	170
	10/17/13	LF	Pump	147	160
	10/17/13	LF	Pump	151	150
	02/13/14	LF	Pump	78.4	78
	02/13/14	LF	Pump	80.2	76
	04/03/14	LF	Pump	230	200
	04/03/14	LF	Pump	223	210
	08/01/14	LF	Pump	104	95
	08/01/14	LF	Pump	109	90
	10/16/14	LF	Pump	102	95
	02/20/15	LF	Pump	64	57
	02/20/15	LF	Pump	65	54
	04/09/15	LF	Pump	62.3	61
	07/31/15	LF	Pump	54.1	56
	07/31/15	LF	Pump	57.3	56
	10/09/15	LF	Pump	59.9	56
	10/09/15	LF	Pump	60.7	55
	02/26/16	LF	Pump	55.5	51
	02/26/16	LF	Pump	49.6	51
12/09/03	NF	Pump	5.00	3.2	
12/09/03	NF	Pump	<5.00	2.3	
12/09/03	NF	Pump	5.40	3.7	
GW-1-D*	08/01/93	NF	NS	<10.0	--
	02/08/01	NF	Pump	12.9	<1.0
	03/25/03	NF	Bailer	6.30	<1.0
	06/10/03	NF	Bailer	29.0	26
	09/16/03	NF	Bailer	<5.00	<1.0
	12/08/03	NF	Bailer	6.30	<1.0
	03/16/04	FFVI	Bailer	18.0	<1.0
	06/14/04	FFVI	Bailer	<5.00	<1.0
	09/16/04	FF	Pump	<5.00	<1.0
	11/08/04	FF	Pump	<5.00	1.1
	02/22/05	FFTC	Pump	<5.00	<1.0
	05/23/05	LF	Pump	<5.00	1.2
	08/30/05	LF	Pump	<5.00	0.50
	11/28/05	LF	Pump	<5.00	0.40
	02/28/06	LF	Pump	1.60	0.90
	05/23/06	LF	Pump	1.29 UJ	0.78 J
	08/16/06	LF	Pump	5.16	4.5
	10/24/06	LF	Pump	3.00	2.7
	01/23/07	LF	Pump	2.72 UJ	1.6
	04/17/07	LF	Pump	1.51	1.4
GW-2	08/01/93	NF	NS	<10.0	--
	02/08/01	NF	Pump	12.9	<1.0
	03/25/03	NF	Bailer	6.30	<1.0
	06/10/03	NF	Bailer	29.0	26
	09/16/03	NF	Bailer	<5.00	<1.0
	12/08/03	NF	Bailer	6.30	<1.0
	03/16/04	FFVI	Bailer	18.0	<1.0
	06/14/04	FFVI	Bailer	<5.00	<1.0
	09/16/04	FF	Pump	<5.00	<1.0
	11/08/04	FF	Pump	<5.00	1.1
	02/22/05	FFTC	Pump	<5.00	<1.0
	05/23/05	LF	Pump	<5.00	1.2
	08/30/05	LF	Pump	<5.00	0.50
	11/28/05	LF	Pump	<5.00	0.40
	02/28/06	LF	Pump	1.60	0.90
	05/23/06	LF	Pump	1.29 UJ	0.78 J
08/16/06	LF	Pump	5.16	4.5	
10/24/06	LF	Pump	3.00	2.7	
01/23/07	LF	Pump	2.72 UJ	1.6	
04/17/07	LF	Pump	1.51	1.4	



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-2	07/24/07	LF	Pump	1.64	1.6
	10/23/07	LF	Pump	1.30	1.1
	01/22/08	LF	Pump	1.81	1.1
	04/17/08	LF	Pump	1.97	1.3
	07/15/08	LF	Pump	1.51 UJ	0.68 J
	10/14/08	LF	Pump	4.67	1.4
	01/13/09	LF	Pump	2.33	1.0
	04/08/09	LF	Pump	1.00 UJ	0.92 J
	07/16/09	LF	Pump	1.63	1.3
	10/13/09	LF	Pump	1.81	1.1
	02/11/10	LF	Pump	1640	1700
	02/11/10	LF	Pump	1680	1700
	05/13/10	LF	Pump	5,730	6,700
	08/13/10	LF	Pump	25400	27000
	08/13/10	LF	Pump	25500	30000
	12/09/10	LF	Pump	14,300	13,000
	12/09/10	LF	Pump	14,000	14,000
	02/03/11	LF	Pump	117	120
	02/03/11	LF	Pump	115	120
	04/07/11	LF	Pump	63.8 J-	62
	08/04/11	LF	Pump	15.5	15
	10/13/11	LF	Pump	8.77	5.9
	02/01/12	LF	Pump	3.70	3.6
	04/03/12	LF	Pump	3.18	3.0
	08/16/12	LF	Pump	214	220
	10/12/12	LF	Pump	34	33
	02/14/13	LF	Pump	16	16
	04/04/13	LF	Pump	43.8	46
	08/02/13	LF	Pump	227	220
	10/17/13	LF	Pump	153	170
	02/13/14	LF	Pump	37.6	38
	04/03/14	LF	Pump	46.4	39
	07/31/14	LF	Pump	141	140
10/16/14	LF	Pump	262	240	
02/20/15	LF	Pump	409	360	
04/09/15	LF	Pump	378	390	
04/09/15	LF	Pump	372	390	
07/31/15	LF	Pump	225	250	
10/09/15	LF	Pump	129	120	
10/09/15	LF	Pump	127	120	
02/26/16	LF	Pump	52.7	51	
GW-3	08/01/93	NF	NS	12.0	--
	07/30/97	NF	Bailer	1,400	<2,000
	07/28/98	FF	Bailer	1,100	1,400
	07/28/98	NF	Bailer	980	990
	07/28/98	LF	Pump	170	170
	07/28/98	NF	Pump	170	180
	07/23/99	FF	Bailer	1,900	1,800
02/08/01	NF	Pump	5,810	4,610	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-3	03/26/03	NF	Bailer	850	830
	06/11/03	NF	Bailer	3,800	3,800
	09/17/03	NF	Bailer	8,600	7,700
	12/10/03	NF	Bailer	3,700	3,400
	03/18/04	FFVI	Bailer	230	190
	06/15/04	FFVI	Bailer	120	120
	09/14/04	FF	Pump	2,500	2,400
	11/10/04	FF	Pump	600	630 J
	02/23/05	FFTC	Pump	180	170
	05/24/05	LF	Pump	310	330
	08/31/05	LF	Pump	268	270
	11/29/05	LF	Pump	<5.00	220
	03/01/06	LF	Pump	99.0	100
	05/24/06	LF	Pump	33.5	32
	08/16/06	LF	Pump	2,180	2,000
	10/12/06	LF	Pump	--	2,500
	10/25/06	LF	Pump	3,390	2,800
	01/24/07	LF	Pump	2,860	3,300
	04/18/07	LF	Pump	5,950	5,800
	07/26/07	LF	Pump	31,000	32,000
	10/25/07	LF	Pump	12,000	13,000
	01/22/08	LF	Pump	11,200	11,000
	04/17/08	LF	Pump	4,960	5,000
	07/17/08	LF	Pump	555	550
	10/15/08	LF	Pump	5,430	12,000
	01/15/09	LF	Pump	246	240
	04/09/09	NF	Pump	802	830
	07/17/09	LF	Pump	7,100	7,400
	10/15/09	LF	Pump	40,700	35,000
	02/12/10	LF	Pump	4,880 J-	5300
	05/14/10	LF	Pump	227	270 J-
	08/12/10	LF	Pump	678	710
	12/09/10	LF	Pump	337	340
	12/09/10	LF	Pump	357	370
	02/03/11	LF	Pump	2,100	2,100
	02/03/11	LF	Pump	2,080	2,100
	04/08/11	LF	Pump	137	140
	04/08/11	LF	Pump	130	140
	08/05/11	LF	Pump	32.1	34
	08/05/11	LF	Pump	33.4	35
10/13/11	LF	Pump	252	200	
10/13/11	LF	Pump	286	240	
02/02/12	LF	Pump	6.93	6.3	
02/02/12	LF	Pump	6.74	6.8	
04/05/12	LF	Pump	174	160	
04/05/12	LF	Pump	161	160	
08/17/12	LF	Pump	22.8	24	
08/17/12	LF	Pump	24	24	
10/11/12	LF	Pump	606	480	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-3	10/11/12	LF	Pump	614	520
	02/15/13	LF	Pump	<0.402	<0.33
	02/15/13	LF	Pump	<0.402	<0.33
	04/04/13	LF	Pump	1.78	<0.067
	07/31/13	LF	Pump	6.54	<0.067
	10/16/13	LF	Pump	<0.402	<0.067
	02/11/14	LF	Pump	<0.402	0.067 R
	04/02/14	LF	Pump	<0.402	<0.067 R
	07/30/14	LF	Pump	<0.402	<0.067 J
	10/14/14	LF	Pump	484	460
	02/20/15	LF	Pump	1.44	<0.067
	04/09/15	LF	Pump	0.454 J	<0.067
	07/31/15	LF	Pump	6.65	<0.067
	10/06/15	LF	Pump	<0.402	<0.067 R
	02/24/16	LF	Pump	<0.402	<0.067
GW-3-D*	06/11/03	NF	Pump	2,700	2,700
	12/10/03	NF	Pump	480	440
GW-3-M*	12/10/03	NF	Pump	260	220
GW-3-S*	12/10/03	NF	Pump	630	580
GW-4	02/27/98	NF	Bailer	43.0	48
	02/27/98	FF	Bailer	21.0	19
	03/27/03	NF	Bailer	8.00	1.1
	06/13/03	NF	Bailer	<5.00	<1.0
	09/19/03	NF	Bailer	5.20	3.1
	12/12/03	NF	Bailer	5.60	<1.0
	03/19/04	FFVI	Bailer	<5.00	1.3
	06/18/04	FFVI	Bailer	<5.00	2.4
	09/16/04	FF	Pump	<5.00	1.2
	11/12/04	FF	Pump	<5.00	1.3
	02/25/05	FFTC	Pump	<5.00	1.2
	05/26/05	NF	Pump	<5.00	<1.0
	09/01/05	LF	Pump	<5.00	1.0
	11/30/05	LF	Pump	<5.00	1.1
	03/03/06	LF	Pump	1.30	1.0
	05/26/06	LF	Pump	0.830	0.99 J
	08/18/06	LF	Pump	10,000	10,000
	10/12/06	LF	Pump	--	2,700
	10/26/06	LF	Pump	2,070	2,100
	01/26/07	LF	Pump	233	510
	04/20/07	LF	Pump	42.1	46
	07/27/07	LF	Pump	16.1	18
	10/26/07	LF	Pump	4.46 UJ	2.0
	01/24/08	LF	Pump	4.00	3.6
	04/18/08	LF	Pump	5.27	4.7
	07/17/08	LF	Pump	3.35 UJ	2.1
10/16/08	LF	Pump	7.38	10	
01/15/09	LF	Pump	1.03 UJ	1.7	
04/09/09	NF	Pump	2.86	4.2 UJ	
07/16/09	LF	Pump	2.38	2.1	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-4	10/14/09	LF	Pump	20.3	22
	02/10/10	LF	Pump	26.6	27
	05/12/10	LF	Pump	53.1	51
	08/11/10	LF	Pump	35.6	38
	12/08/10	LF	Pump	76.1	72
	02/02/11	LF	Pump	51.2	52
	04/06/11	LF	Pump	8.51	6.3
	08/03/11	LF	Pump	8.79	9.4
	10/12/11	LF	Pump	33.1	32
	02/02/12	LF	Pump	9.33	9.2
	04/04/12	LF	Pump	13.9	14
	08/15/12	LF	Pump	21.3	20
	10/10/12	LF	Pump	34.4	31
	02/13/13	LF	Pump	16.7	16
	04/03/13	LF	Pump	16.3	14
	07/31/13	LF	Pump	20.4	20
	10/16/13	LF	Pump	22.6	22
	02/12/14	LF	Pump	18.1	19
	04/03/14	LF	Pump	21.6	19
	07/31/14	LF	Pump	14.2	13
	10/15/14	LF	Pump	32.8	26
	02/19/15	LF	Pump	19.7	16
	04/08/15	LF	Pump	18.4	17
	07/30/15	LF	Pump	17.2	17
10/06/15	LF	Pump	23.6	22 J-	
02/25/16	LF	Pump	22.4	20	
GW-5	03/24/03	NF	Bailer	9.00	<1.0
	06/13/03	NF	Bailer	27.0	22
	09/19/03	NF	Bailer	7.70	1.2
	12/12/03	NF	Bailer	7.20	<1.0
	03/19/04	FFVI	Bailer	<5.00	<1.0
	06/18/04	FFVI	Bailer	<5.00	<1.0
	09/16/04	FF	Pump	<5.00	1.0
	11/12/04	FF	Pump	<5.00	1.2
	02/25/05	FFTC	Pump	<5.00	<1.0
	05/25/05	LF	Pump	<5.00	<1.0
	09/01/05	LF	Pump	<5.00	0.60
	11/30/05	LF	Pump	<5.00	0.60
	03/03/06	LF	Pump	0.890	0.60
	05/26/06	LF	Pump	0.790	0.65 J
	08/18/06	LF	Pump	4.21	0.73 UJ
	10/26/06	LF	Pump	1.50	1.1
	01/26/07	LF	Pump	1.13 UJ	0.90
	04/20/07	LF	Pump	1.83 UJ	1.3 J
	07/26/07	LF	Pump	1.48	1.4
	10/25/07	LF	Pump	3.38 UJ	1.4
01/24/08	LF	Pump	2.16	0.92	
04/17/08	LF	Pump	1.77	0.84	
07/17/08	LF	Pump	1.00 UJ	<1.0	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-5	10/16/08	LF	Pump	2.54	1.3
	01/15/09	LF	Pump	0.317 UJ	0.63 J
	04/09/09	NF	Pump	1.71	0.77 UJ
	07/16/09	LF	Pump	1.93	1.7
	10/14/09	LF	Pump	2.54	2.2
	02/10/10	LF	Pump	2.63	2.3
	05/12/10	LF	Pump	2.52	1.9
	05/12/10	LF	Pump	2.35	1.9
	08/11/10	LF	Pump	1.78	1.7
	08/11/10	LF	Pump	1.88	1.7
	12/08/10	LF	Pump	4.89	4.3
	12/08/10	LF	Pump	5.22	4.4
	02/02/11	LF	Pump	6.01	5.2
	02/02/11	LF	Pump	6.10	5.2
	04/06/11	LF	Pump	17.7	16
	08/03/11	LF	Pump	8.58	8.7
	10/12/11	LF	Pump	6.61	5.5
	02/02/12	LF	Pump	9.16	9.0
	04/04/12	LF	Pump	7.18	7.4
	08/15/12	LF	Pump	8.47	8.1
	10/10/12	LF	Pump	9.93	9
	02/13/13	LF	Pump	17.3	17
	04/03/13	LF	Pump	20.4	19
	07/31/13	LF	Pump	27.5	24
	10/16/13	LF	Pump	27.3	29
	02/12/14	LF	Pump	36.0	38
	04/03/14	LF	Pump	49.0	42
	07/31/14	LF	Pump	31	30
	10/15/14	LF	Pump	18.4	17
	02/19/15	LF	Pump	19.2	16
04/08/15	LF	Pump	19.1	17	
07/30/15	LF	Pump	12.1	12	
10/06/15	LF	Pump	18.2	15 J-	
02/25/16	LF	Pump	20.7	20	
GW-6	08/01/93	NF	NS	<10.0	--
	02/09/01	NF	Pump	15.7	1.0
	03/25/03	NF	Bailer	13.0	1.2
	06/10/03	NF	Bailer	<5.00	<1.0
	09/16/03	NF	Bailer	6.30	1.3
	12/08/03	NF	Bailer	8.20	<1.0
	03/16/04	FFVI	Bailer	<5.00	1.1
	06/14/04	FFVI	Bailer	<5.00	<1.0
	09/16/04	FF	Pump	<5.00	1.0
	11/08/04	FF	Pump	<5.00	1.3
	02/22/05	FFTC	Pump	<5.00	<1.0
	05/23/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	0.80
	11/28/05	LF	Pump	<5.00	0.70
02/28/06	LF	Pump	1.20	0.70	



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-6	05/23/06	LF	Pump	1.38 UJ	0.72 J
	08/15/06	LF	Pump	1.35	1.0 UJ
	10/24/06	LF	Pump	1.80 J	1.1
	01/23/07	LF	Pump	2.73 UJ	1.2 J
	04/17/07	LF	Pump	1.42	1.2
	07/24/07	LF	Pump	1.49	1.5
	10/23/07	LF	Pump	1.48	1.2
	01/22/08	LF	Pump	1.76	1.2
	04/16/08	LF	Pump	1.55	1.1
	07/15/08	LF	Pump	0.561 J	0.74 J
	10/14/08	LF	Pump	5.22	1.5 UJ
	01/13/09	LF	Pump	1.98	0.80 J
	04/07/09	LF	Pump	<0.0184	1.2
	07/15/09	LF	Pump	1.55	1.1
	10/15/09	LF	Pump	1.51	1.2
	02/09/10	LF	Pump	1.83	1.1
	05/11/10	LF	Pump	2.68	<0.057
	08/09/10	LF	Pump	4.18	2.5
	12/07/10	LF	Pump	3.80	2.0
	02/01/11	LF	Pump	3.72	2.6
	04/05/11	LF	Pump	3.17 U	1.5
	08/02/11	LF	Pump	1.62	1.5
	10/11/11	LF	Pump	2.42 U	1.5
	01/31/12	LF	Pump	1.41	1.4
	04/03/12	LF	Pump	2.08	1.3
	08/15/12	LF	Pump	1.62	1.3
	10/09/12	LF	Pump	2.05	1.2
	02/13/13	LF	Pump	1.58	1.3
	04/02/13	LF	Pump	1.54	1.4
	08/01/13	LF	Pump	2.18	1.5
10/16/13	LF	Pump	1.99	1.0	
02/12/14	LF	Pump	5.15	3.1	
04/04/14	LF	Pump	2.47	1.1	
07/30/14	LF	Pump	3.37	3.2 J-	
10/16/14	LF	Pump	3.16 J	2.5	
02/18/15	LF	Pump	4.41	3.1	
04/07/15	LF	Pump	2.87	2.2	
07/29/15	LF	Pump	7.81	2.5	
10/07/15	LF	Pump	<0.402	2.2	
02/24/16	LF	Pump	2.12	1.8	
GW-7	02/09/01	NF	Pump	360	311
	03/26/03	NF	Bailer	440	170
	06/11/03	NF	Bailer	530	310
	09/17/03	NF	Bailer	2,600	2,400
	12/09/03	NF	Bailer	3,100	3,100
	03/17/04	FFVI	Bailer	330	270
	06/16/04	FFVI	Bailer	310	310
	09/14/04	FF	Pump	1,400	1,300
11/11/04	FF	Pump	260	280	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-7	02/24/05	FFTC	Pump	140	91 J
	05/25/05	LF	Pump	380	320 J
	08/31/05	LF	Pump	370	360
	11/29/05	LF	Pump	290	280
	03/01/06	LF	Pump	170	180
	05/24/06	LF	Pump	222	200
	08/16/06	LF	Pump	1,860	1,900
	10/25/06	LF	Pump	988	1,000
	01/24/07	LF	Pump	177	200
	04/18/07	LF	Pump	1,160	1,200
	07/25/07	LF	Pump	1,570	1,700
	10/24/07	LF	Pump	4,510	5,300
	01/23/08	LF	Pump	4,570	5,300
	04/18/08	LF	Pump	2,720	2,500
	07/17/08	LF	Pump	3,750	3,500
	10/15/08	LF	Pump	7,180	13,000
	01/15/09	LF	Pump	2,900	3,700
	04/09/09	LF	Pump	902	1,500
	07/17/09	LF	Pump	1,770	1,800
	10/15/09	LF	Pump	5,320	5,500
	02/12/10	LF	Pump	5,910 J-	6,600
	05/14/10	LF	Pump	587	770 J-
	08/12/10	LF	Pump	289	300
	08/12/10	LF	Pump	302	310
	12/09/10	LF	Pump	31.9	33
	12/09/10	LF	Pump	31.2	32
	02/02/11	LF	Pump	18.9	18
	02/02/11	LF	Pump	18.3	18
	04/07/11	LF	Pump	95.3 J-	98
	04/07/11	LF	Pump	98.8 J-	99
	08/04/11	LF	Pump	20.3	17
	08/04/11	LF	Pump	20.6	17
	10/13/11	LF	Pump	15	11
	10/13/11	LF	Pump	17.8	12
	02/01/12	LF	Pump	4.05	4.0
	02/01/12	LF	Pump	4.10	3.7
	04/04/12	LF	Pump	3.43	3.2
	08/15/12	LF	Pump	2.49	2.4
	10/09/12	LF	Pump	7.56	5.9
	02/14/13	LF	Pump	3.48	2.9
04/03/13	LF	Pump	4.55	4.0	
08/01/13	LF	Pump	2.71	2.1	
10/16/13	LF	Pump	4.19	1.5	
02/12/14	LF	Pump	3.32	3.5	
04/04/14	LF	Pump	4.94	3.5	
07/31/14	LF	Pump	5.29	4.4	
10/16/14	LF	Pump	134	120	
02/20/15	LF	Pump	837	730	
04/10/15	LF	Pump	229	170	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-7	07/31/15	LF	Pump	47.9	50
	10/08/15	LF	Pump	13.1	12 J-
	10/08/15	LF	Pump	12.7	12 J-
GW-7-D*	02/26/16	LF	Pump	16.2	13
	06/11/03	NF	Pump	340	280
	12/09/03	NF	Pump	2,100	2,000
GW-7-M*	05/24/06	NF	Pump	--	290
	12/09/03	NF	Pump	2,200	2,200
GW-7-S*	05/24/06	NF	Pump	--	220
	12/09/03	NF	Pump	2,700	2,700
GW-8	02/09/01	NF	Pump	6.14	1.0
	03/24/03	NF	Bailer	29.0	<1.0
	06/10/03	NF	Bailer	32.0	<1.0
	09/16/03	NF	Bailer	36.0	<1.0
	12/08/03	NF	Bailer	150	1.0
	03/16/04	FFVI	Bailer	33.0	<1.0
	03/16/04	FFVI	Bailer	28.0	<1.0
	06/14/04	FFVI	Bailer	13.0	1.3
	09/14/04	FF	Pump	<5.00	1.0
	11/08/04	FF	Pump	<5.00	1.4
	02/22/05	FFTC	Pump	<5.00	<1.0
	05/23/05	LF	Pump	<5.00	<1.0
	08/31/05	LF	Pump	<5.00	0.80
	11/28/05	LF	Pump	<5.00	0.70
	03/01/06	LF	Pump	0.700	0.70
	05/23/06	LF	Pump	1.49 UJ	0.73 J
	08/15/06	LF	Pump	1.08 J	1.0 UJ
	10/24/06	LF	Pump	1.50	1.2
	01/24/07	LF	Pump	1.40	1.2
	04/17/07	LF	Pump	1.43	1.3
	07/25/07	LF	Pump	3.08	1.5
	10/23/07	LF	Pump	1.38	1.1
	01/22/08	LF	Pump	1.70	1.1
	04/17/08	LF	Pump	1.51	1.3
	07/15/08	LF	Pump	2.12 UJ	0.84 J
	10/14/08	LF	Pump	1.99	1.3
	01/13/09	LF	Pump	1.02	0.87 J
	04/07/09	LF	Pump	0.180 J	1.0
	07/16/09	LF	Pump	1.70	1.2
	10/14/09	LF	Pump	1.89	1.2
	02/09/10	LF	Pump	1.65	0.058 J
	05/10/10	LF	Pump	2.23 U	1.2 U
08/10/10	LF	Pump	1.03	0.86 J	
12/06/10	LF	Pump	1.43	0.79 J	
02/01/11	LF	Pump	1.50	0.99 J	
04/05/11	LF	Pump	2.17	0.86 J	
08/02/11	LF	Pump	2.42	1.4	
10/12/11	LF	Pump	2.04 U	0.97 J	
01/31/12	LF	Pump	1.10	0.90 J	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-8	04/03/12	LF	Pump	1.62	0.58 J
	08/14/12	LF	Pump	1.96	1.3
	10/09/12	LF	Pump	1.86	0.95 J
	02/13/13	LF	Pump	1.31	1.1
	04/01/13	LF	Pump	1.25	0.99 J
	07/31/13	LF	Pump	1.78	1.3
	10/17/13	LF	Pump	1.80	1.4
	02/12/14	LF	Pump	1.26	1.4
	04/03/14	LF	Pump	2.40	1.3
	07/31/14	LF	Pump	2.28	1.6
	10/14/14	LF	Pump	2.23 J	1.2
	02/19/15	LF	Pump	1.94	1.3
	04/09/15	LF	Pump	1.62	1.2
	07/30/15	LF	Pump	1.78	1.3
	10/07/15	LF	Pump	<0.402	<0.067
02/25/16	LF	Pump	2.27	1.5	
GW-9	02/09/01	NF	Pump	<5.00	1.0
	03/24/03	NF	Bailer	77.0	<1.0
	06/16/03	NF	Bailer	14.0	1.3
	09/17/03	NF	Bailer	18.0	<1.0
	12/08/03	NF	Bailer	240	1.1
	03/16/04	FFVI	Bailer	150	1.1
	06/15/04	FFVI	Bailer	5.10	1.0
	09/14/04	FF	Pump	<5.00	1.0
	11/08/04	FF	Pump	<5.00	<1.0
	02/22/05	FFTC	Pump	<5.00	<1.0
	05/24/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	0.60
	11/29/05	LF	Pump	<5.00	0.60
	03/01/06	LF	Pump	0.700	0.60
	05/23/06	LF	Pump	1.17 UJ	0.57 J
	08/15/06	LF	Pump	1.08	0.73 UJ
	10/24/06	LF	Pump	1.40	1.0
	01/23/07	LF	Pump	1.80 UJ	1.7
	04/17/07	LF	Pump	1.51	1.2
	07/25/07	LF	Pump	1.74	1.5
	10/23/07	LF	Pump	1.53	1.1
	01/22/08	LF	Pump	1.95	1.1
	04/17/08	LF	Pump	1.73	1.4
	07/15/08	LF	Pump	1.46 UJ	0.87 J
	10/14/08	LF	Pump	1.69	1.5
	01/13/09	LF	Pump	1.04	0.91 J
	04/08/09	LF	Pump	1.00 UJ	0.70 J
	07/16/09	LF	Pump	1.67	1.3
10/14/09	LF	Pump	1.77	1.1	
02/09/10	LF	Pump	1.77	0.088 J	
05/10/10	LF	Pump	1.68 U	1.3	
08/10/10	LF	Pump	1.14	0.89 J	
12/06/10	LF	Pump	1.95	0.67 J	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-9	02/01/11	LF	Pump	1.25	0.96 J
	04/04/11	LF	Pump	1.97 U	0.82 J
	08/03/11	LF	Pump	3.31	1.0
	10/12/11	LF	Pump	3.58	0.75 J
	01/30/12	LF	Pump	1.20	0.71 J
	04/03/12	LF	Pump	0.782 J	0.61 J
	08/14/12	LF	Pump	2.15	0.76 J
	10/11/12	LF	Pump	1.24	0.64 J
	02/13/13	LF	Pump	1.58	0.92 J
	04/01/13	LF	Pump	1.03	0.76 J
	07/31/13	LF	Pump	1.81	1.1
	10/16/13	LF	Pump	1.56	1.3
	02/12/14	LF	Pump	1.60	1.3
	04/02/14	LF	Pump	1.40	1.2 J-
	07/30/14	LF	Pump	1.79	1.4 J-
	10/14/14	LF	Pump	2.34 J	1.2
	02/19/15	LF	Pump	1.96	1.1
	04/09/15	LF	Pump	1.74	1.3
	07/30/15	LF	Pump	2.82	1.4
	10/08/15	LF	Pump	2.89	1.6 J-
02/25/16	LF	Pump	2.36	2.2	
GW-10	02/09/01	NF	Pump	617	691
	03/26/03	NF	Bailer	170	41
	06/11/03	NF	Bailer	120	85
	09/17/03	NF	Bailer	7,900	7,500
	12/10/03	NF	Bailer	27,000	26,000
	03/17/04	FFVI	Bailer	1,900	1,700
	06/15/04	FFVI	Bailer	1,100	1,100
	09/15/04	FF	Pump	15,000	14,000
	11/11/04	FF	Pump	920	950
	02/25/05	FFTC	Pump	200	170
	05/25/05	LF	Pump	290	340
	09/01/05	LF	Pump	210	220
	11/30/05	LF	Pump	19.0	18
	11/30/05	LF	Pump	22.0	21
	03/02/06	LF	Pump	23.0	23
	05/26/06	LF	Pump	2.22	2.9
	08/16/06	LF	Pump	5.61	5.7
	10/25/06	LF	Pump	9.40 J	1.9 J
	01/24/07	LF	Pump	13.7	15 J a
	04/18/07	LF	Pump	3.44 UJ	3.4 a
	07/25/07	LF	Pump	4.64	5.9
	10/24/07	LF	Pump	5.19	5.3
	01/23/08	LF	Pump	5.28	5.7
	04/17/08	LF	Pump	6.76	6.6
	07/16/08	LF	Pump	6.96	6.6
	10/15/08	LF	Pump	9.67	7.3
01/13/09	LF	Pump	11.4	11	
04/08/09	LF	Pump	5.02	4.6	



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-10	07/17/09	LF	Pump	4.16	4.1
	10/14/09	LF	Pump	6.16	6.0
	02/11/10	LF	Pump	17.5	5.4
	05/13/10	LF	Pump	3.92	3.5
	08/10/10	LF	Pump	3.56	4
	12/08/10	LF	Pump	2.54	1.7
	02/01/11	LF	Pump	2.77	2.0
	04/05/11	LF	Pump	2.53	1.7
	08/03/11	LF	Pump	2.99 U	1.1
	10/12/11	LF	Pump	2.35	0.92 J
	01/31/12	LF	Pump	1.03	0.89 J
	04/04/12	LF	Pump	1.05	0.85 J
	08/14/12	LF	Pump	2.93	2
	10/10/12	LF	Pump	1.08	0.76 J
	02/13/13	LF	Pump	2.14	2
	04/03/13	LF	Pump	1.01	0.72 J
	07/31/13	LF	Pump	3.56	2.3
	10/16/13	LF	Pump	3.74	1.6
	02/12/14	LF	Pump	1.90	1.8
	04/03/14	LF	Pump	3.63	2.0
	07/31/14	LF	Pump	2.77	1.9
	10/15/14	LF	Pump	2.83 J	2.2
	02/19/15	LF	Pump	3.8	2.6
	04/09/15	LF	Pump	4.82	3.8
	07/30/15	LF	Pump	4.9	3.5
	10/08/15	LF	Pump	6.45	5.8
	02/25/16	LF	Pump	8.34	8.3
GW-10-D*	06/11/03	NF	Pump	450	84
	12/10/03	NF	Pump	37,000	35,000
GW-10-M*	12/10/03	NF	Pump	37,000	35,000
GW-10-S*	12/10/03	NF	Pump	36,000	39,000
GW-11-273	05/25/05	LF	Pump	64.0	<1.0
	08/31/05	LF	Pump	<5.00	0.40
	11/30/05	LF	Pump	86.0 J	83
	03/03/06	LF	Pump	26.0 J	30 J
	05/25/06	LF	Pump	57.5	66
	08/15/06	LF	Pump	24.1	23
	10/26/06	LF	Pump	10.0	11 <sup>a</sup>
	01/25/07	LF	Pump	14.9	18 J a
	04/19/07	LF	Pump	6.01	8.1
	07/27/07	LF	Pump	6.30	6.2
	10/25/07	LF	Pump	10.5	11
	01/24/08	LF	Pump	8.18	9.0
	04/17/08	LF	Pump	7.05	7.4
	07/17/08	LF	Pump	5.64	5.1
	10/16/08	LF	Pump	15.7	22
	01/16/09	LF	Pump	60.4	54
	04/09/09	LF	Pump	52.2	53
	07/27/09	LF	Pump	4.63	3.7

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-11-273	10/28/09	LF	Pump	4.52	4.0
	05/10/10	LF	Pump	8.75	7.9
	08/11/10	LF	Pump	126	130
	12/06/10	LF	Pump	96.8	91
	02/01/11	LF	Pump	92.7	97
	04/05/11	LF	Pump	6.05	<0.041
	08/03/11	LF	Pump	42.4	41
	10/11/11	LF	Pump	38.8	37
	02/01/12	LF	Pump	28.0	29
	04/04/12	LF	Pump	21.8	24
	08/14/12	LF	Pump	3.6	3.4
	10/08/12	LF	Pump	19.3	17
	02/11/13	LF	Pump	8.34	8.3
	04/01/13	LF	Pump	9.33	9.0
	07/29/13	LF	Pump	2.81	2.2
	10/14/13	LF	Pump	2.61	2.3 J-
	02/10/14	LF	Pump	9.93	11
	04/01/14	LF	Pump	4.42	4.1
	07/29/14	LF	Pump	2.81	2.4
	10/13/14	LF	Pump	2.25	2.4
	02/17/15	LF	Pump	7	5.7 J-
	04/06/15	LF	Pump	8.6	8.0
	07/28/15	LF	Pump	4.07	3.4
10/07/15	LF	Pump	3.45	3.0	
02/23/16	LF	Pump	3.36	3.3	
GW-11-287	05/25/05	LF	Pump	50.0	<1.0
	08/31/05	LF	Pump	40.0	16
	11/30/05	LF	Pump	80.0 J	84 J
	11/30/05	LF	Pump	130	110
	03/03/06	LF	Pump	46.0	54 J
	05/25/06	LF	Pump	71.6	77
	08/15/06	LF	Pump	31.7	27 <sup>a</sup>
	10/26/06	LF	Pump	14.0	20 <sup>a</sup>
	01/25/07	LF	Pump	18.9	20
	04/19/07	LF	Pump	12.1	12
	07/27/07	LF	Pump	6.92	8.0
	10/25/07	LF	Pump	8.93	9.3
	01/24/08	LF	Pump	12.8	13
	04/17/08	LF	Pump	3.68	2.9
	07/17/08	LF	Pump	10.6	9.8
	10/16/08	LF	Pump	15.0	15
	01/16/09	LF	Pump	21.3	20
	04/09/09	LF	Pump	16.7	17
	07/23/09	LF	Pump	5.23	4.6
	10/28/09	LF	Pump	6.21	5.8
02/10/10	LF	Pump	7.64	7.3	
05/10/10	LF	Pump	2.06	0.22 J	
08/11/10	LF	Pump	10.5	11	
12/06/10	LF	Pump	6.69	5.5	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-11-287	01/31/11	LF	Pump	7.14	6.2
	04/04/11	LF	Pump	8.71	5.4
	08/01/11	LF	Pump	5.15	5.4
	10/10/11	LF	Pump	6.16	4.5
	02/01/12	LF	Pump	6.34	5.9
	04/02/12	LF	Pump	5.47	5.5
	08/15/12	LF	Pump	<0.293	2.8
	10/08/12	LF	Pump	11	10
	02/11/13	LF	Pump	18.7	19
	04/01/13	LF	Pump	7.75	7.9
	07/29/13	LF	Pump	3.59	3.6
	10/14/13	LF	Pump	3.32	3.0 J-
	02/10/14	LF	Pump	13.6	15
	04/01/14	LF	Pump	6.48	5.7
	07/29/14	LF	Pump	4.92	4.2
	10/13/14	LF	Pump	2.02	1.7
	02/17/15	LF	Pump	5.8	4.5 J-
	04/06/15	LF	Pump	5.84	5.8
	07/28/15	LF	Pump	5.31	5.0
	10/07/15	LF	Pump	4.75	3.6
02/23/16	LF	Pump	3.63	3.7	
GW-11-316	05/25/05	LF	Pump	44.0	<1.0
	08/31/05	LF	Pump	<5.00	<0.020
	11/30/05	LF	Pump	<5.00	0.10
	03/03/06	LF	Pump	35.0	8.7 J
	05/25/06	LF	Pump	63.0	54
	08/15/06	LF	Pump	18.0	21
	10/26/06	LF	Pump	8.40	4.9
	01/25/07	LF	Pump	2.02	2.9
	04/19/07	LF	Pump	0.450 UJ	0.90
	07/27/07	LF	Pump	0.660	0.60
	10/25/07	LF	Pump	0.670	0.40
	01/24/08	LF	Pump	0.780	0.46
	04/17/08	LF	Pump	1.21	1.1
	07/17/08	LF	Pump	<1.00	0.36 J
	10/16/08	LF	Pump	2.14 UJ	0.76 J
	01/16/09	LF	Pump	1.66	0.53 J
	04/09/09	LF	Pump	1.05	2.2
	07/23/09	LF	Pump	0.926 J	0.72 J
	10/27/09	LF	Pump	2.48	1.9
	02/09/10	LF	Pump	<0.618	0.79 J
	05/11/10	LF	Pump	1.36	0.64 J
	08/12/10	LF	Pump	2.3	1.8
	12/06/10	LF	Pump	3.15	2.5
	01/31/11	LF	Pump	7.52	7.4
	04/05/11	LF	Pump	10.1	8.9
08/03/11	LF	Pump	14.3	12	
10/11/11	LF	Pump	9.9	8.5	
02/01/12	LF	Pump	6.78	5.4	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-11-316	04/04/12	LF	Pump	0.932 J	0.51 J
	08/13/12	LF	Pump	7.58	6.8
	10/08/12	LF	Pump	1.47	0.64 J
	02/11/13	LF	Pump	3.43	3.4
	04/01/13	LF	Pump	2.70	2.8
	07/29/13	LF	Pump	6.17	5.2
	10/14/13	LF	Pump	9.13	9.1 J-
	02/10/14	LF	Pump	3.50	3.6
	04/01/14	LF	Pump	4.57	4.2
	07/29/14	LF	Pump	5.24	0.54 J
	10/13/14	LF	Pump	4.63	4.7
	02/17/15	LF	Pump	13.6	10 J-
	04/06/15	LF	Pump	8.51	8.5
	07/28/15	LF	Pump	8.99	7.9
	10/07/15	LF	Pump	12.4	11
	02/23/16	LF	Pump	8.1	10
GW-11-352	05/25/05	LF	Pump	<5.00	<1.0
	08/31/05	LF	Pump	<5.00	0.10
	11/30/05	LF	Pump	<5.00	0.70
	03/03/06	LF	Pump	1.40	0.60 J
	05/25/06	LF	Pump	0.930	1.1
	08/15/06	LF	Pump	0.340 UJ	0.079 J
	10/26/06	LF	Pump	<1.00	0.10
	01/25/07	LF	Pump	0.640	0.20
	04/19/07	LF	Pump	0.470 UJ	0.20
	07/27/07	LF	Pump	0.710	0.50
	10/25/07	LF	Pump	0.760	0.60
	01/24/08	LF	Pump	1.00	0.51
	04/17/08	LF	Pump	0.820	0.65
	07/17/08	LF	Pump	<1.00	<1.0
	10/16/08	LF	Pump	3.05 UJ	1.0 UJ
	01/16/09	LF	Pump	1.00 UJ	1.0 UJ
	04/09/09	LF	Pump	5.61	<0.057
	07/23/09	LF	Pump	<0.618	0.12 J
	10/27/09	LF	Pump	2.39	<0.057
	02/09/10	LF	Pump	<0.618	1.1
	05/11/10	LF	Pump	0.839 J	0.37 J
	08/12/10	LF	Pump	2.23	1.6
	12/07/10	LF	Pump	1.67	1.4
	01/31/11	LF	Pump	1.46	0.20 J
	04/04/11	LF	Pump	2.06	1.3
	08/01/11	LF	Pump	1.21	1.3
	10/10/11	LF	Pump	3.47	2
	01/30/12	LF	Pump	6.65	6.5
	04/02/12	LF	Pump	13.3	13
	08/13/12	LF	Pump	17.7	17
10/08/12	LF	Pump	5.76	4.9	
02/12/13	LF	Pump	20.3	20	
04/01/13	LF	Pump	11.4	11	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-11-352	07/29/13	LF	Pump	2.25	2.4
	10/14/13	LF	Pump	19.6	20 J-
	02/10/14	LF	Pump	26.5	29
	04/01/14	LF	Pump	1.55	2.1
	07/29/14	LF	Pump	1.97	1.5
	10/13/14	LF	Pump	14.9	13
	02/17/15	LF	Pump	27.5	24 J-
	04/06/15	LF	Pump	18.4	17
	07/28/15	LF	Pump	23.1	22
	10/07/15	LF	Pump	9.7	7.6
02/23/16	LF	Pump	16.6	17	
GW-11-407	05/25/05	LF	Pump	<5.00	<1.0
	08/31/05	LF	Pump	<5.00	0.070
	11/30/05	LF	Pump	<5.00	0.40
	03/03/06	LF	Pump	<1.00	0.20 J
	05/25/06	LF	Pump	0.450	0.49 J
	08/15/06	LF	Pump	0.450 UJ	0.25 J
	10/26/06	LF	Pump	<1.00	0.050 J
	01/25/07	LF	Pump	0.400	0.30
	04/19/07	LF	Pump	0.620 UJ	0.40
	07/27/07	LF	Pump	0.820	0.40
	10/25/07	LF	Pump	0.610	0.40
	01/24/08	LF	Pump	0.520	0.28 J
	04/17/08	LF	Pump	0.450	0.38
	07/17/08	LF	Pump	<1.00	<1.0
	10/16/08	LF	Pump	2.91 UJ	1.0 UJ
	01/16/09	LF	Pump	1.00 UJ	1.0 UJ
	04/09/09	LF	Pump	<0.0184	<0.057
	07/22/09	LF	Pump	<0.618	<0.057
	10/27/09	LF	Pump	0.654 J	<0.057
	02/09/10	LF	Pump	2.06	<0.057
	02/09/10	LF	Pump	2.04	<0.057
	05/13/10	LF	Pump	0.751 J	<0.057
	08/12/10	LF	Pump	0.998 J	0.22 J
	12/07/10	LF	Pump	0.924 J	0.58 J
	01/31/11	LF	Pump	1.01	0.15 J
	04/04/11	LF	Pump	1.67	0.53 J
	08/01/11	LF	Pump	1.26	1.1
	10/10/11	LF	Pump	2.44	1.1
	01/30/12	LF	Pump	2.07	1.7
	04/02/12	LF	Pump	4.76	4.8
	08/14/12	LF	Pump	13.5	13
	10/08/12	LF	Pump	10.8	10
	02/12/13	LF	Pump	18.4	19
04/01/13	LF	Pump	18.7	15	
07/29/13	LF	Pump	14.0	12	
10/14/13	LF	Pump	13.6	13 J-	
02/10/14	LF	Pump	8.28	6.8	
04/01/14	LF	Pump	7.58	6.4	



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-11-407	07/29/14	LF	Pump	14.3	12
	10/13/14	LF	Pump	11.2	10
	02/17/15	LF	Pump	16.9	14 J-
	04/06/15	LF	Pump	11.8	12
	07/28/15	LF	Pump	16.1	15
	10/07/15	LF	Pump	14.9	15
	02/23/16	LF	Pump	18.3	17
GW-11-438	05/25/05	LF	Pump	<5.00	<1.0
	08/31/05	LF	Pump	<5.00	<0.020
	11/30/05	LF	Pump	<5.00	0.10
	03/03/06	LF	Pump	<1.00	0.060 J
	05/25/06	LF	Pump	0.250 J	0.18 J
	08/15/06	LF	Pump	0.310 UJ	0.17 J
	10/26/06	LF	Pump	<1.00	0.080 J
	01/25/07	LF	Pump	0.340	0.20
	04/19/07	LF	Pump	0.430 UJ	0.10
	07/27/07	LF	Pump	0.770	0.80
	10/25/07	LF	Pump	1.09	0.60
	01/24/08	LF	Pump	0.790	0.59
	04/17/08	LF	Pump	0.570	0.53
	07/17/08	LF	Pump	<1.00	<1.0
	10/16/08	LF	Pump	2.84 UJ	1.0 UJ
	01/16/09	LF	Pump	1.00 UJ	1.0 UJ
	04/09/09	LF	Pump	<0.0184	<0.057
	07/22/09	LF	Pump	<0.618	<0.057
	10/27/09	LF	Pump	<0.618	0.15 J
	02/09/10	LF	Pump	1.71	0.057 UJ
	02/09/10	LF	Pump	1.85	0.057 UJ
	02/12/10	LF	Pump	--	2.2
	02/12/10	LF	Pump	--	1.2
	05/13/10	LF	Pump	0.835 J	<0.057
	05/13/10	LF	Pump	0.987 J	0.069 J
	08/11/10	LF	Pump	2.49	1.9
	12/07/10	LF	Pump	3.23	2.8
	02/01/11	LF	Pump	3.87	3.3
	04/05/11	LF	Pump	2.37	1.3
	08/03/11	LF	Pump	4.8	2.4
	10/11/11	LF	Pump	9.5	8.6
	01/30/12	LF	Pump	5.42	5.3
	04/04/12	LF	Pump	6.38	4.7
08/14/12	LF	Pump	5.67	5.4	
10/08/12	LF	Pump	0.875 J	0.12 J	
02/12/13	LF	Pump	0.558 J	<0.067	
04/01/13	LF	Pump	4.50	4.4	
07/29/13	LF	Pump	13.8	11	
10/14/13	LF	Pump	10.8	13 J-	
02/10/14	LF	Pump	14.5	17	
04/01/14	LF	Pump	6.83	6.4	
10/13/14	LF	Pump	11	10	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-11-438	04/06/15	LF	Pump	11.9	12
	10/07/15	LF	Pump	14	12
GW-12A-284	05/23/05	LF	Pump	5.40	5.5
	09/29/05	LF	Pump	90.0	82
	11/29/05	LF	Pump	120	120 <sup>a</sup>
	03/01/06	LF	Pump	230	250 <sup>a</sup>
	05/24/06	LF	Pump	246	320 J
	08/17/06	LF	Pump	2,080	2,200 J
	10/12/06	LF	Pump	--	2,500
	10/26/06	LF	Pump	2,030	2,100 J
	01/23/07	LF	Pump	425	470
	04/17/07	LF	Pump	1,020	1,200
	07/25/07	LF	Pump	1,320	1,400
	10/23/07	LF	Pump	479	490
	01/22/08	LF	Pump	1,080	1,200
	04/15/08	LF	Pump	1,960	2,100
	07/15/08	LF	Pump	1,620	1,700
	10/14/08	LF	Pump	1,440	2,500
	01/13/09	LF	Pump	1,680	2,100
	04/07/09	LF	Pump	720	950
	07/15/09	LF	Pump	1,390	1,400
	10/14/09	LF	Pump	1,160	1,100
	02/12/10	LF	Pump	1,280 J-	1300
	05/12/10	LF	Pump	4,830	4,500
	08/12/10	LF	Pump	272	300
	12/09/10	LF	Pump	87.5	81
02/03/11	LF	Pump	50.8	49	
04/07/11	LF	Pump	41.3 J-	39	
08/04/11	LF	Pump	36.2	33	
10/11/11	LF	Pump	24.6	23	
	01/30/12	No Longer Accessible			
GW-12A-319	05/23/05	LF	Pump	270	270
	09/29/05	LF	Pump	20.0	21
	11/29/05	LF	Pump	11.0	9.6
	03/01/06	LF	Pump	2.20	2.5
	05/26/06	LF	Pump	0.800	1.0
	08/17/06	LF	Pump	3.71	3.8 J
	10/26/06	LF	Pump	731	770
	01/23/07	LF	Pump	162	160
	04/17/07	LF	Pump	397	420
	07/25/07	LF	Pump	1,330	1,300
	10/23/07	LF	Pump	557	590
	01/22/08	LF	Pump	184	200
	04/15/08	LF	Pump	294	290
	07/15/08	LF	Pump	208	200
	10/14/08	LF	Pump	201	260
	01/13/09	LF	Pump	274	300
04/07/09	LF	Pump	244	270	
07/15/09	LF	Pump	421	450	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-12A-319	10/14/09	LF	Pump	284	270
	02/12/10	LF	Pump	11.5 J-	11
	05/12/10	LF	Pump	35.3	35
	08/12/10	LF	Pump	8.39	8.2
	12/09/10	LF	Pump	13.6	13
	02/01/11	LF	Pump	18.1	17
	04/07/11	LF	Pump	17.1 J-	16
	08/04/11	LF	Pump	13.2	13
	10/11/11	LF	Pump	4.97	3.6
	02/02/12	LF	Pump	3.43	3.0
	04/05/12	LF	Pump	<1.46	2.2
	08/15/12	LF	Pump	2.43	2.2
	10/10/12	LF	Pump	1.66	1.3
	02/13/13	LF	Pump	1.54	0.78 J
	04/03/13	LF	Pump	1.25	1.0
	07/31/13	LF	Pump	2.30	1.4
	10/15/13	LF	Pump	1.57 J	1.2 J-
	02/11/14	LF	Pump	1.52	1.6 J-
	04/02/14	LF	Pump	1.13	1.1 J-
	07/31/14	LF	Pump	1.78	1.5
	10/15/14	LF	Pump	6.88	6.1
	02/18/15	LF	Pump	17.8	16
	04/07/15	LF	Pump	2.17	1.9
	07/29/15	LF	Pump	2.34	2.0
10/07/15	LF	Pump	5.32	4.8	
02/24/16	LF	Pump	15.9	16	
GW-12A-349	05/23/05	LF	Pump	<5.00	<1.0
	09/29/05	LF	Pump	<5.00	0.70
	11/29/05	LF	Pump	<5.00	0.70
	03/01/06	LF	Pump	0.700	0.60
	05/26/06	LF	Pump	0.510	0.58 J
	08/17/06	LF	Pump	0.770 UJ	0.64 J
	10/26/06	LF	Pump	0.500	0.60 J
	01/23/07	LF	Pump	1.91	0.30
	04/17/07	LF	Pump	0.950	0.80
	07/25/07	LF	Pump	1.74	1.6
	10/23/07	LF	Pump	1.41	1.2
	01/22/08	LF	Pump	1.75	1.3
	04/15/08	LF	Pump	--	--
	07/15/08	LF	Pump	1.43 UJ	0.69 J
	10/14/08	LF	Pump	5.49	3.6
	01/13/09	LF	Pump	1.00 UJ	1.7
	04/07/09	LF	Pump	<0.0184	0.84 J
	07/15/09	LF	Pump	1.15	0.64 J
	10/14/09	LF	Pump	1.21	0.64 J
	02/12/10	LF	Pump	0.764 J	0.60 J
05/12/10	LF	Pump	1.34	0.66 J	
08/12/10	LF	Pump	1.39 U	0.68 J	
12/09/10	LF	Pump	1.42	0.90 J	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-12A-349	02/01/11	LF	Pump	0.941 J	0.40 J
	04/07/11	LF	Pump	2.62 J-	0.64 J
	08/04/11	LF	Pump	2.27	0.66 J
	10/11/11	LF	Pump	1.16	0.53 J
	02/01/12	LF	Pump	0.681 J	0.62 J
	04/05/12	LF	Pump	<1.46	0.59 J
	08/15/12	LF	Pump	0.563 J	0.54 J
	10/10/12	LF	Pump	0.666 J	0.50 J
	02/13/13	LF	Pump	0.531 J	0.45 J
	04/03/13	LF	Pump	0.548 J	0.41 J
	07/31/13	LF	Pump	0.617 J	0.41 J
	10/15/13	LF	Pump	0.49 J	0.36 J-
	02/11/14	LF	Pump	0.496 J	0.45 J-
	04/02/14	LF	Pump	0.726 J	0.56 J-
	10/15/14	LF	Pump	<2.01	0.38 J
	04/08/15	LF	Pump	0.784 J	0.77 J
10/07/15	LF	Pump	0.956 J	0.76 J	
GW-12B	02/14/13	LF	Pump	5.71	5.4
	04/04/13	LF	Pump	1.75	1.4
	08/01/13	LF	Pump	4.78	4.3
	10/16/13	LF	Pump	2.74	2.2
	02/13/14	LF	Pump	2.99	2.8
	04/04/14	LF	Pump	2.89	1.5
	07/31/14	LF	Pump	4.62	3.8
	10/16/14	LF	Pump	38.5	33
	02/20/15	LF	Pump	133	110
	04/09/15	LF	Pump	135	130
	04/09/15	LF	Pump	148	130
	07/30/15	LF	Pump	64.7	61
	10/08/15	LF	Pump	99.4	79
02/26/16	LF	Pump	362	350	
GW-14A	01/14/04	NF	Bailer	13.0	1.2
	03/17/04	FFVI	Bailer	100	56
	06/15/04	FFVI	Bailer	290	280
	09/14/04	FF	Pump	830	790
	11/09/04	FF	Pump	220	210
	02/23/05	FFTC	Pump	820	720
	05/24/05	LF	Pump	260	270
	08/31/05	LF	Pump	91.0	110
	11/29/05	LF	Pump	11.0	1.0 J
	03/01/06	LF	Pump	62.0	70
	05/25/06	LF	Pump	71.1	72
	08/16/06	LF	Pump	186	310
	10/12/06	LF	Pump	--	480
	10/25/06	LF	Pump	482 J	530
	01/25/07	LF	Pump	208	250
04/18/07	LF	Pump	179	200	
07/25/07	LF	Pump	177	230	
10/24/07	LF	Pump	128	140	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-14A	01/23/08	LF	Pump	173	190
	04/17/08	LF	Pump	373	300
	07/16/08	LF	Pump	7.43	7.2
	01/14/09	LF	Pump	11.4	10
	04/08/09	LF	Pump	13.0	12
	07/16/09	LF	Pump	1,120	1,100 J
	10/15/09	LF	Pump	264	250
	08/13/10	LF	Pump	411000	440000
	12/09/10	LF	Pump	149,000	140,000
	02/03/11	LF	Pump	138,000	150,000
	04/08/11	LF	Pump	72,300	70,000
	08/05/11	LF	Pump	<0.618	<0.41
	10/11/11	LF	Pump	106	55
	02/02/12	LF	Pump	1.63	<0.041
	04/05/12	LF	Pump	<1.46	0.074 J
	08/16/12	LF	Pump	48.2	<0.067
	10/11/12	LF	Pump	1.43	<0.067
	02/14/13	LF	Pump	<2.01	<6.7
	04/04/13	LF	Pump	<2.01	<13
	08/02/13	LF	Pump	40.9	<0.067
	10/16/13	LF	Pump	5.14	<0.067
	02/13/14	LF	Pump	4.66	<0.067
	04/02/14	LF	Pump	3.43	<0.067 R
	07/29/14	LF	Pump	1.72	<0.067
	10/15/14	LF	Pump	<2.01	<0.067
	02/17/15	LF	Pump	4.57	0.14 J-
04/09/15	LF	Pump	0.947 J	<0.067	
07/29/15	LF	Pump	0.577 J	<0.067	
10/07/15	LF	Pump	<0.402	<0.067	
02/23/16	LF	Pump	18.5	<0.067	
GW-14A-S*	01/13/04	NF	Pump	<5.00	1.1
GW-14B	01/14/04	NF	Pump	<5.00	1.1
	03/17/04	FFVI	Bailer	<5.00	<1.0
	06/15/04	FFVI	Bailer	<5.00	<1.0
	09/14/04	FF	Pump	320	300
	11/09/04	FF	Pump	300	280
	02/24/05	FFTC	Pump	50.0	45
	05/24/05	LF	Pump	<5.00	2.7
	08/31/05	LF	Pump	<5.00	0.70
	11/29/05	LF	Pump	<5.00	0.80
	03/01/06	LF	Pump	0.600	0.40
	05/24/06	LF	Pump	1.04 UJ	0.31 J
	08/16/06	LF	Pump	1.60	1.5
	10/25/06	LF	Pump	412	430
	01/24/07	LF	Pump	162	180
	04/17/07	LF	Pump	340	350
	07/25/07	LF	Pump	183	230
	10/24/07	LF	Pump	164	180
	01/23/08	LF	Pump	145	180



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-14B	04/17/08	LF	Pump	49.2	54
	07/16/08	LF	Pump	2.41	2.9
	01/15/09	LF	Pump	2.25	2.3
	04/08/09	LF	Pump	25.4	22
	07/16/09	LF	Pump	701	690
	10/15/09	LF	Pump	319	310
	08/13/10	LF	Pump	1260	1400
	12/09/10	LF	Pump	8,960	8,800
	02/03/11	LF	Pump	194	180
	04/08/11	LF	Pump	34.1	35
	08/04/11	LF	Pump	10.7	9
	10/11/11	LF	Pump	8.52	7.5
	02/02/12	LF	Pump	3.68	3.3
	04/05/12	LF	Pump	<1.46	0.97 J
	08/16/12	LF	Pump	521	550
	10/11/12	LF	Pump	94.8	74
	02/15/13	LF	Pump	8.14	<1.3
	04/04/13	LF	Pump	6.23	<3.3
	08/02/13	LF	Pump	13.5	16 J
	10/17/13	LF	Pump	33.8	<0.067
	02/13/14	LF	Pump	5.03	<0.067
	04/02/14	LF	Pump	172	<0.067 R
	07/29/14	LF	Pump	141	<0.067
	10/15/14	LF	Pump	<2.01	<0.067
	02/17/15	LF	Pump	1.19	<0.067
	04/09/15	LF	Pump	0.486 J	<0.067
07/29/15	LF	Pump	<0.402	<0.067	
10/08/15	LF	Pump	0.715 J	1.0 J-	
02/23/16	LF	Pump	1.34	0.84 J	
GW-14B-D*	01/13/04	NF	Pump	<5.00	1.2
GW-14B-M*	01/13/04	NF	Pump	8.10	1.1
GW-14B-S*	01/13/04	NF	Pump	<5.00	1.1
GW-15	06/15/04	NF	Bailer	1,800	1,800
	09/15/04	FF	Pump	8,100	8,800
	09/15/04	FF	Pump	7,700	8,600
	11/10/04	FF	Pump	4,500	4,800
	02/25/05	FFTC	Pump	7,000	6,400
	05/24/05	LF	Pump	9,000	9,100
	09/01/05	LF	Pump	830	820
	11/30/05	LF	Pump	100	99
	03/02/06	LF	Pump	12.0	12
	05/25/06	LF	Pump	9.42	11
	08/18/06	LF	Pump	145	130
	10/26/06	LF	Pump	44.0	44
	01/25/07	LF	Pump	6.08	0.70
	04/19/07	LF	Pump	13.3	13
	07/25/07	LF	Pump	19.3	240
	10/24/07	LF	Pump	37.4	38
	01/23/08	LF	Pump	20.8	28

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-15	04/17/08	LF	Pump	13.0	14
	07/16/08	LF	Pump	0.0367 J	0.46 J
	10/15/08	LF	Pump	23.4	23
	01/14/09	LF	Pump	4.52	4.0
	04/08/09	LF	Pump	2.40	2.4
	07/17/09	LF	Pump	8.35	8.2
	10/14/09	LF	Pump	21.8	20
	02/11/10	LF	Pump	25.6	26
	05/13/10	LF	Pump	37.6	40
	08/12/10	LF	Pump	11.5	11
	08/12/10	LF	Pump	11.3	11
	12/08/10	LF	Pump	4.81	3.9
	12/08/10	LF	Pump	4.60	3.8
	02/02/11	LF	Pump	4.91	3.5
	04/06/11	LF	Pump	5.76	3.0
	08/04/11	LF	Pump	2.56	1.4
	10/11/11	LF	Pump	1.94	1.1
	02/01/12	LF	Pump	1.42	1.1
	04/04/12	LF	Pump	1.34	1.0
	08/15/12	LF	Pump	0.605 J	0.46 J
	10/10/12	LF	Pump	2.05	1.5
	02/14/13	LF	Pump	2.86	2.5
	04/03/13	LF	Pump	2.12	1.2
	08/01/13	LF	Pump	2.72	2.2
	10/16/13	LF	Pump	1.67	1.6
	02/12/14	LF	Pump	2.03	2.2 a
	04/03/14	LF	Pump	6.89	4.4 <sup>a</sup>
	07/31/14	LF	Pump	4.16	3.8
	10/15/14	LF	Pump	16.4	12
	02/19/15	LF	Pump	19.6	16
04/09/15	LF	Pump	12.9	13	
07/30/15	LF	Pump	6.19	5.4	
10/08/15	LF	Pump	7.3	6.3 J-	
02/25/16	LF	Pump	8.88	9.2	
GW-16-277	05/24/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	0.10 J
	12/06/05	LF	Pump	<5.00	3.7 J
	12/06/05	LF	Pump	9.00	11
	03/02/06	LF	Pump	8.60	5.8 J
	05/24/06	LF	Pump	12.6 J	12 J
	08/16/06	LF	Pump	7.06 J	17
	10/25/06	LF	Pump	52.0 J	50 J
	01/24/07	LF	Pump	38.5	39
	04/18/07	LF	Pump	502	510
	07/26/07	LF	Pump	718	830 J
	10/24/07	LF	Pump	1,130	1,300
	01/23/08	LF	Pump	335	350 J
	04/16/08	LF	Pump	48.4	95
07/16/08	LF	Pump	272	310	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-16-277	10/15/08	LF	Pump	735	860 J
	01/15/09	LF	Pump	21.1	3.7
	04/08/09	LF	Pump	361	350
	07/21/09	LF	Pump	78.4	94
	10/20/09	LF	Pump	69.9	72
	02/10/10	LF	Pump	2.29	<0.057
	05/11/10	LF	Pump	1.78	<0.057
	08/10/10	LF	Pump	104	100
	12/07/10	LF	Pump	10.4	0.14 J
	02/02/11	LF	Pump	2.45	<0.041
	04/07/11	LF	Pump	11.3 J-	1.0 J
	08/02/11	LF	Pump	19.7	31
	10/11/11	LF	Pump	32.3	29
	01/31/12	LF	Pump	32.7	35
	04/03/12	LF	Pump	19.4	0.11 J
	08/14/12	LF	Pump	29.8	32
	10/09/12	LF	Pump	22.5	21
	02/12/13	LF	Pump	26.9	27
	04/02/13	LF	Pump	26.7	25
	07/30/13	LF	Pump	16.4	15 <sup>a</sup>
	10/15/13	LF	Pump	14.9 J	15 J- <sup>a</sup>
	02/11/14	LF	Pump	20.3	24 J-
	04/02/14	LF	Pump	9.92	9.9 J-
	07/30/14	LF	Pump	7.26	6.0 J-
	10/14/14	LF	Pump	11.5	10
	02/18/15	LF	Pump	15	13
04/07/15	LF	Pump	14	14	
07/29/15	LF	Pump	10.9	9.1	
10/06/15	LF	Pump	19.1	12 R	
02/24/16	LF	Pump	4.57	2.1	
GW-16-317	05/24/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	<0.020
	12/06/05	LF	Pump	<5.00	0.10
	03/02/06	LF	Pump	3.10	1.2
	05/24/06	LF	Pump	3.20	2.2
	08/16/06	LF	Pump	0.710 UJ	1.1
	10/25/06	LF	Pump	5.50	<0.10
	01/24/07	LF	Pump	0.290	3.5
	04/18/07	LF	Pump	232	80
	07/26/07	LF	Pump	522	620 J
	10/24/07	LF	Pump	963	1,100
	01/23/08	LF	Pump	552	620 J
	04/16/08	LF	Pump	57.1	100
	07/16/08	LF	Pump	7.73	14
	10/15/08	LF	Pump	330	350 J
	01/15/09	LF	Pump	7.40 UJ	0.078 J
	04/08/09	LF	Pump	1.00 UJ	3.4
	07/21/09	LF	Pump	77.9	87
10/20/09	LF	Pump	76.5	74	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-16-317	02/10/10	LF	Pump	3.88	<0.057
	05/11/10	LF	Pump	12.8	8.1
	08/10/10	LF	Pump	12.6	3.1
	12/08/10	LF	Pump	3.88	<0.041
	02/02/11	LF	Pump	2.10	0.12 J
	04/07/11	LF	Pump	2.21 J-	0.42 J
	08/02/11	LF	Pump	6.94	<0.041
	10/11/11	LF	Pump	5.73	4.7
	01/31/12	LF	Pump	4.09	0.19 J
	04/03/12	LF	Pump	2.92	<0.067
	08/14/12	LF	Pump	11.2	8.2
	10/09/12	LF	Pump	1.99	0.55 J
	02/12/13	LF	Pump	5.48	5.5
	04/02/13	LF	Pump	5.91	5.4
	07/30/13	LF	Pump	7.93	5.0
	10/15/13	LF	Pump	6.83 J	11 J-
	02/11/14	LF	Pump	16.1	16 J-
	04/02/14	LF	Pump	16.3	16 J-
	07/30/14	LF	Pump	8.38	8.1 J-
	10/14/14	LF	Pump	12.6	11
	02/18/15	LF	Pump	2.08	0.20 J
	04/07/15	LF	Pump	5.01	<0.067
	07/29/15	LF	Pump	3.16	<0.067
10/06/15	LF	Pump	19	17 J-	
02/24/16	LF	Pump	28.6	<0.067	
GW-16-347	05/24/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	<0.020
	12/06/05	LF	Pump	<5.00	0.10
	03/02/06	LF	Pump	<1.00	<0.10
	05/24/06	LF	Pump	0.470 UJ	<1.0
	08/16/06	LF	Pump	0.320 UJ	0.14 J
	10/25/06	LF	Pump	0.620	<0.020
	01/24/07	LF	Pump	0.240	<0.10
	04/18/07	LF	Pump	0.480 UJ	0.30
	07/26/07	LF	Pump	1.14	0.80 J
	10/24/07	LF	Pump	4.51	4.3
	01/23/08	LF	Pump	0.720	0.10 UJ
	04/16/08	LF	Pump	0.740	0.11
	07/16/08	LF	Pump	<1.00	1.0 UJ
	10/15/08	LF	Pump	2.88	0.61 J
	01/15/09	LF	Pump	<0.0184	0.059 J
	04/08/09	LF	Pump	<0.0184	<0.057
	07/22/09	LF	Pump	0.789 J	0.22 J
	10/15/09	LF	Pump	2.31	0.64 J
	02/10/10	LF	Pump	4.51	<0.057
	05/13/10	LF	Pump	1.50	<0.057
	08/09/10	LF	Pump	1.77 U	<0.041
	12/07/10	LF	Pump	2.15	<0.041
02/02/11	LF	Pump	1.29	<0.041	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-16-347	04/06/11	LF	Pump	2.16	0.99 J
	08/02/11	LF	Pump	2.71	<0.041
	10/11/11	LF	Pump	4.00	<0.041
	01/31/12	LF	Pump	2.03	<0.041
	04/03/12	LF	Pump	0.903 J	<0.067
	08/13/12	LF	Pump	0.366 J	<0.067
	10/09/12	LF	Pump	0.929 J	<0.067
	02/12/13	LF	Pump	0.988 J	0.41 J
	04/02/13	LF	Pump	8.69	9.2
	07/30/13	LF	Pump	0.965 J	0.74 J
	10/15/13	LF	Pump	7.69 J	7.4 J-
	02/11/14	LF	Pump	12.4	8.4 J-
	04/02/14	LF	Pump	15.8	16 J-
	07/30/14	LF	Pump	9.36	9.0 J-
	10/14/14	LF	Pump	10.7	8.3
	02/18/15	LF	Pump	20.5	18
	04/07/15	LF	Pump	14.3	12
	07/29/15	LF	Pump	16.8	13
	10/06/15	LF	Pump	13.5	12 J-
	02/24/16	LF	Pump	13.2	14
GW-16-417	05/24/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	<0.020
	12/06/05	LF	Pump	<5.00	0.10
	03/02/06	LF	Pump	<1.00	<0.10
	05/24/06	LF	Pump	0.710 UJ	<1.0
	08/16/06	LF	Pump	0.340 UJ	<1.0
	10/25/06	LF	Pump	0.630	<0.020
	01/24/07	LF	Pump	0.280	<0.10
	04/18/07	LF	Pump	3.20 UJ	0.020
	07/26/07	LF	Pump	1.20	0.10 UJ
	10/24/07	LF	Pump	0.310 J	<0.020
	01/23/08	LF	Pump	0.460	0.10 UJ
	04/16/08	LF	Pump	0.590	<0.020
	07/16/08	LF	Pump	<1.00	1.0 UJ
	10/15/08	LF	Pump	4.53	1.0 UJ
	01/15/09	LF	Pump	<0.0184	<0.057
	04/08/09	LF	Pump	3.55	<0.057
	07/22/09	LF	Pump	0.991 J	<0.057
	10/15/09	LF	Pump	2.45	<0.057
	02/11/10	LF	Pump	<0.618	<0.057
	05/10/10	LF	Pump	0.799 U	<0.057
	08/09/10	LF	Pump	<0.618	<0.041
	12/08/10	LF	Pump	<0.618	<0.041
	02/02/11	LF	Pump	1.69	<0.041
	04/06/11	LF	Pump	3.64	<0.041
	08/02/11	LF	Pump	1.59	<0.041
	10/11/11	LF	Pump	1.18	<0.041
	01/31/12	LF	Pump	<0.293	<0.041
04/03/12	LF	Pump	0.323 J	<0.067	



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-16-417	08/13/12	LF	Pump	0.370 J	<0.067
	10/10/12	LF	Pump	1.65	<0.067
	02/12/13	LF	Pump	1.38	<0.067
	04/02/13	LF	Pump	<0.402	<0.067
	07/30/13	LF	Pump	<0.402	<0.067
	10/15/13	LF	Pump	8.13 J	0.067 UJ
	02/11/14	LF	Pump	2.73	0.067 R
	04/02/14	LF	Pump	5.71	<0.067 R
	07/30/14	LF	Pump	4.08	<0.067 J
	10/14/14	LF	Pump	6.13	<0.067
	02/18/15	LF	Pump	6.78	<0.067
	04/07/15	LF	Pump	1.97	<0.067
	07/29/15	LF	Pump	1.67	<0.067
	10/06/15	LF	Pump	17.9	14 J-
	02/24/16	LF	Pump	6.76	<0.067
GW-16-507	05/24/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	0.90
	12/06/05	LF	Pump	<5.00	0.40
	03/02/06	LF	Pump	<1.00	<0.10
	05/24/06	LF	Pump	1.32 UJ	0.78 J
	08/16/06	LF	Pump	0.740 UJ	0.63 J
	10/25/06	LF	Pump	0.290	<0.020
	01/24/07	LF	Pump	1.55	0.50
	04/18/07	LF	Pump	1.33 UJ	1.1
	07/26/07	LF	Pump	1.59	1.0 J
	10/24/07	LF	Pump	1.77 J	1.8
	01/23/08	LF	Pump	0.800	0.10 UJ
	04/16/08	LF	Pump	1.00	<0.020
	07/16/08	LF	Pump	<1.00	1.0 UJ
	10/15/08	LF	Pump	2.90	1.2
	01/15/09	LF	Pump	3.50 UJ	<0.057
	04/08/09	LF	Pump	4.35	<0.057
	07/21/09	LF	Pump	1.90	<0.057
	10/15/09	LF	Pump	5.37	0.98 J
	02/11/10	LF	Pump	1.89	1.2
	05/10/10	LF	Pump	2.22 U	<0.057
	05/10/10	LF	Pump	1.70 U	<0.057
	08/10/10	LF	Pump	1.41	1.1
	12/08/10	LF	Pump	6.76	0.046 J
	02/02/11	LF	Pump	1.61	0.095 J
	04/06/11	LF	Pump	4.86	0.95 J
	08/02/11	LF	Pump	2.21	0.94 J
	10/11/11	LF	Pump	2.27	1.7
	01/31/12	LF	Pump	2.64	1.9
	04/03/12	LF	Pump	2.67	2.0
	08/13/12	LF	Pump	5.2	4.9
	10/10/12	LF	Pump	3.35	2.8
02/13/13	LF	Pump	3.46	1.3	
04/02/13	LF	Pump	1.66	1.7	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-16-507	07/30/13	LF	Pump	1.84	1.7
	10/15/13	LF	Pump	3.76 J	0.067 UJ
	02/11/14	LF	Pump	6.44	6.8 J-
	04/02/14	LF	Pump	5.84	4.8 J-
	10/14/14	LF	Pump	14.4	11
	04/07/15	LF	Pump	12.2	10
	10/06/15	LF	Pump	6.41	<0.067 R
GW-16-558	05/24/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	0.20
	12/06/05	LF	Pump	<5.00	0.70
	03/02/06	LF	Pump	<1.00	<0.10
	05/24/06	LF	Pump	1.57 UJ	0.87 J
	08/16/06	LF	Pump	0.610 UJ	0.66 J
	10/25/06	LF	Pump	0.420	<0.020
	01/24/07	LF	Pump	0.410	<0.10
	04/18/07	LF	Pump	<3.00	0.030 J
	07/26/07	LF	Pump	0.880	0.60 J
	10/24/07	LF	Pump	1.31 J	1.1
	01/23/08	LF	Pump	0.990	0.82 J
	04/16/08	LF	Pump	6.27	<0.020
	07/16/08	LF	Pump	<1.00	1.0 UJ
	10/20/08	LF	Pump	1.00 UJ	1.0 UJ
	01/15/09	LF	Pump	<0.0184	0.074 J
	04/08/09	LF	Pump	<0.0184	<0.057
	07/21/09	LF	Pump	<0.618	<0.057
	10/15/09	LF	Pump	12.5	<0.057
	02/11/10	LF	Pump	0.627 J	<0.057
	05/11/10	LF	Pump	1.23	<0.057
	05/11/10	LF	Pump	1.14	2.0
	08/10/10	LF	Pump	<0.618	0.16 J
	12/08/10	LF	Pump	1.19	0.72 J
	02/02/11	LF	Pump	1.63	1.1
	04/06/11	LF	Pump	2.17	0.56 J
	08/02/11	LF	Pump	3.44	<0.041
	10/11/11	LF	Pump	1.34	<0.041
	01/31/12	LF	Pump	0.414 J	<0.041
	04/03/12	LF	Pump	2.19	<0.067
	08/14/12	LF	Pump	1.47	0.46 J <sup>a</sup>
	10/10/12	LF	Pump	9.24	<0.067 <sup>a</sup>
	02/13/13	LF	Pump	3.66	<0.067
04/02/13	LF	Pump	1.03	0.84 J	
07/30/13	LF	Pump	1.19	1.2	
10/15/13	LF	Pump	2.73 J	0.067 UJ	
02/11/14	LF	Pump	0.868 J	0.41 J-	
04/02/14	LF	Pump	0.875 J	0.34 J-	
10/14/14	LF	Pump	2.59 J	2.0	
04/07/15	LF	Pump	12.1	<0.067	
10/06/15	LF	Pump	1.76	<0.067 R	
GW-17-282	05/23/05	LF	Pump	<5.00	<1.0

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-17-282	08/30/05	LF	Pump	<5.00	1.2 J
	11/28/05	LF	Pump	<5.00	0.80
	02/28/06	LF	Pump	0.900	0.70
	05/25/06	LF	Pump	0.530	0.63 J
	08/17/06	LF	Pump	0.810 UJ	0.54 J
	10/24/06	LF	Pump	36.0	38
	01/24/07	LF	Pump	1.52	29
	04/17/07	LF	Pump	136	150
	07/26/07	LF	Pump	205	250 J
	10/23/07	LF	Pump	194	200
	01/22/08	LF	Pump	194	160
	04/15/08	LF	Pump	366	360
	07/15/08	LF	Pump	235	240
	10/14/08	LF	Pump	156	200
	01/13/09	LF	Pump	671	690
	04/07/09	LF	Pump	727	730
	07/14/09	LF	Pump	471	550
	10/13/09	LF	Pump	806	1,000
	02/11/10	LF	Pump	1100	960
	05/12/10	LF	Pump	1,450	1,300
	08/11/10	LF	Pump	4830	5300
	12/08/10	LF	Pump	1,410	1,300
	02/01/11	LF	Pump	59.4	56
	04/05/11	LF	Pump	368	350
	08/03/11	LF	Pump	1940	2000
	10/11/11	LF	Pump	875	1100
	02/01/12	LF	Pump	565	470
	04/04/12	LF	Pump	458	450
	08/15/12	LF	Pump	6580	7100
	10/09/12	LF	Pump	2300	230 <sup>a</sup>
	02/13/13	LF	Pump	1040	1100 <sup>a</sup>
	04/03/13	LF	Pump	2,410	2,600
	07/31/13	LF	Pump	5,060	4,900
10/18/13	LF	Pump	3,820	3,700	
02/12/14	LF	Pump	2,980	3,300	
04/03/14	LF	Pump	3,190	3,000	
07/30/14	LF	Pump	1200	1,400 J-	
10/15/14	LF	Pump	311	260	
02/18/15	LF	Pump	380	420	
04/07/15	LF	Pump	317	330	
07/29/15	LF	Pump	786	730	
10/07/15	LF	Pump	677	690	
02/24/16	LF	Pump	647	650	
GW-17-317	05/23/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	0.90
	11/28/05	LF	Pump	<5.00	0.80
	02/28/06	LF	Pump	0.800	0.80
	05/25/06	LF	Pump	0.530	0.71 J
	08/17/06	No Longer Accessible			

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-17-342	05/23/05	LF	Pump	<5.00	<1.0
	08/30/05	LF	Pump	<5.00	0.30
	11/28/05	LF	Pump	<5.00	0.40
	02/28/06	LF	Pump	0.700	0.50
	05/25/06	No Longer Accessible			
GW-17A	10/24/07	LF	Pump	13.5 UJ	15
	01/23/08	LF	Pump	3.65	4.5
	04/18/08	LF	Pump	6.32	6.2
	07/17/08	LF	Pump	2.31 UJ	1.9
	10/15/08	LF	Pump	3.06 UJ	2.3
	01/15/09	LF	Pump	1.51	1.5
	04/08/09	LF	Pump	1.00 UJ	0.97 J
	07/17/09	LF	Pump	3.47	3.3 <sup>a</sup>
	10/14/09	LF	Pump	136	140 <sup>a</sup>
	02/11/10	LF	Pump	177	150
	05/13/10	LF	Pump	245	270
	08/12/10	LF	Pump	77.8	81
	12/08/10	LF	Pump	25.2	23
	02/02/11	LF	Pump	12.5	11
	04/07/11	LF	Pump	8.79 J-	5.9
	08/04/11	LF	Pump	2.01	1.1
	10/11/11	LF	Pump	15.9	14
	02/03/12	LF	Pump	1.27 U	0.97 J
	04/04/12	LF	Pump	1.47	0.83 J
	08/15/12	LF	Pump	5.72	5.2
	10/10/12	LF	Pump	1.39	1.1
	02/14/13	LF	Pump	24.6	26
	04/04/13	LF	Pump	58.3	59
	08/02/13	LF	Pump	271	280
	10/18/13	LF	Pump	182	180
	10/18/13	LF	Pump	194	190
	02/13/14	LF	Pump	124	120 J-
	04/04/14	LF	Pump	18.3	15
07/31/14	LF	Pump	52.7	52	
10/16/14	LF	Pump	429	400	
02/20/15	LF	Pump	411	330	
04/09/15	LF	Pump	221	230	
07/31/15	LF	Pump	277	280	
10/09/15	LF	Pump	241	230	
02/26/16	LF	Pump	265	270	
GW-18A	04/15/08	LF	Pump	2.65	2.6
	07/15/08	LF	Pump	2.08	1.6
	10/14/08	LF	Pump	3.79 UJ	1.7
	01/12/09	LF	Pump	1.90	1.5
	04/06/09	LF	Pump	1.00 UJ	2.0
	07/15/09	LF	Pump	1.29	1.2
	10/13/09	LF	Pump	1.95	1.3
	02/10/10	LF	Pump	1.36	0.91 J
05/12/10	LF	Pump	1.87	<0.057	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-18A	08/09/10	LF	Pump	1.69 U	0.96 J
	12/07/10	LF	Pump	1.34	0.79 J
	01/31/11	LF	Pump	2.08 U	0.85 J
	04/04/11	LF	Pump	1.98 U	0.84 J
	08/02/11	LF	Pump	1.32	0.36 J
	10/11/11	LF	Pump	1.62 U	0.73 J
	01/31/12	LF	Pump	0.927 J	0.75 J
	04/03/12	LF	Pump	1.10	0.78 J
	08/15/12	LF	Pump	1.23	1.1
	10/09/12	LF	Pump	2	0.94 J
	02/13/13	LF	Pump	1.46	1.1
	04/03/13	LF	Pump	1.31	0.97 J
	07/30/13	LF	Pump	1.62	1.1
	10/16/13	LF	Pump	1.66	1.1
	02/11/14	LF	Pump	1.52	1.3 J-
	04/03/14	LF	Pump	3.59	0.74 J
	07/30/14	LF	Pump	1.63	1.1 J-
	10/15/14	LF	Pump	<2.01	1.0
	02/18/15	LF	Pump	2.21	1.3
	04/07/15	LF	Pump	1.66	1.3
	07/29/15	LF	Pump	1.52	1.2
10/07/15	LF	Pump	<0.402	<0.067	
02/24/16	LF	Pump	3.0	2.9	
GW-18B	04/15/08	LF	Pump	0.580	0.45
	07/14/08	LF	Pump	0.556 J	0.53 J
	10/13/08	LF	Pump	0.868 J	0.71 J
	01/14/09	LF	Pump	<0.0184	0.52 J
	04/06/09	LF	Pump	<0.0184	0.63 J
	07/14/09	LF	Pump	<0.618	0.46 J
	10/12/09	LF	Pump	0.667 J	1.0
	02/11/10	LF	Pump	0.695 J	0.36 J
	05/11/10	LF	Pump	0.981 J	0.43 J
	08/11/10	LF	Pump	0.756 J	0.31 J
	12/07/10	LF	Pump	<0.618	0.079 J
	02/01/11	LF	Pump	0.851 J	0.21 J
	04/05/11	LF	Pump	1.22	<0.041
	08/03/11	LF	Pump	<0.618	<0.041
	10/11/11	LF	Pump	<0.618	<0.041
	01/31/12	LF	Pump	2.98	0.47 J
	04/02/12	LF	Pump	0.329 J	<0.067
	08/13/12	LF	Pump	0.408 J	0.36 U
	10/08/12	LF	Pump	<0.402	0.39 J
	02/11/13	LF	Pump	1.2	0.44 J
	04/02/13	LF	Pump	0.560 J	0.36 J
	07/29/13	LF	Pump	0.611 J	0.36 J
	10/14/13	LF	Pump	0.879 U	0.11 J-
02/10/14	LF	Pump	0.467 J	0.43 J	
04/01/14	LF	Pump	<0.402	<0.067	
10/14/14	LF	Pump	<2.01	<0.067	



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-18B	04/06/15	LF	Pump	0.56 J	<0.067
	10/05/15	LF	Pump	0.684 J	0.39 J
GW-18C	04/16/08	LF	Pump	0.560	0.49
	07/14/08	LF	Pump	0.293 J	0.58 J
	10/13/08	LF	Pump	1.98	0.92 J <sup>a</sup>
	01/12/09	LF	Pump	0.440 J	0.64 J <sup>a</sup>
	04/06/09	LF	Pump	<0.0184	0.73 J
	07/14/09	LF	Pump	1.08	0.88 J
	10/12/09	LF	Pump	1.08	0.89 J
	02/11/10	LF	Pump	1.24	0.81 J
	05/11/10	LF	Pump	1.36	0.97 J
	08/10/10	LF	Pump	0.833 J	0.61 J
	12/07/10	LF	Pump	1.02	0.89 J
	02/01/11	LF	Pump	1.16	1.0
	04/05/11	LF	Pump	1.85	0.95 J
	08/03/11	LF	Pump	2.61 U	1.1
	10/11/11	LF	Pump	1.60 U	0.91 J
	01/31/12	LF	Pump	1.18	0.90 J
	04/03/12	LF	Pump	0.925 J	0.92 J
	08/13/12	LF	Pump	0.809 J	0.92 J
	10/08/12	LF	Pump	2.03	0.91 J
	02/11/13	LF	Pump	1.1	0.97 J
	04/02/13	LF	Pump	0.965 J	0.86 J
	07/29/13	LF	Pump	1.07	0.95 J
	10/14/13	LF	Pump	1.43 U	0.92 J-
02/10/14	LF	Pump	0.961 J	0.97 J	
04/01/14	LF	Pump	1.02	1.0 J	
10/13/14	LF	Pump	0.803 J	0.67 J	
04/06/15	LF	Pump	1.1	0.85 J	
10/05/15	LF	Pump	1.15	0.80 J	
GW-19A	04/15/08	LF	Pump	10.0	12
	07/15/08	LF	Pump	8.25	8.0
	10/16/08	LF	Pump	6.92	6.2
	01/14/09	LF	Pump	3.87	4.7
	04/07/09	LF	Pump	241	340
	07/14/09	LF	Pump	2.85	3.2
	10/13/09	LF	Pump	4.26	1.4
	02/10/10	LF	Pump	5.38	4.9
	02/10/10	LF	Pump	5.2	4.3
	05/12/10	LF	Pump	5.44	5.2
	08/12/10	LF	Pump	195	200
	12/08/10	LF	Pump	37.2	34
	02/03/11	LF	Pump	299	280
	04/07/11	LF	Pump	307 J-	300
	08/04/11	LF	Pump	144	130
	10/11/11	LF	Pump	250	230
	02/02/12	LF	Pump	101	100
04/04/12	LF	Pump	165	160	
04/04/12	LF	Pump	163	160	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-19A	08/17/12	LF	Pump	73.1	75
	08/17/12	LF	Pump	72.3	75
	10/11/12	LF	Pump	84.5	66
	10/11/12	LF	Pump	87.8	66
	02/15/13	LF	Pump	12	12
	02/15/13	LF	Pump	10.5	11
	04/04/13	LF	Pump	48.8	52
	08/01/13	LF	Pump	39.9	36
	10/17/13	LF	Pump	25.6	27
	10/17/13	LF	Pump	25.1	27
	02/13/14	LF	Pump	17.2	18
	04/04/14	LF	Pump	19.8	16
	08/01/14	LF	Pump	35	32
	10/16/14	LF	Pump	30.4	27
	10/16/14	LF	Pump	30.4	27
	02/20/15	LF	Pump	15.1	12
	02/20/15	LF	Pump	15.2	12
	04/09/15	LF	Pump	9.41	9.1
	07/31/15	LF	Pump	5.99	5.7
	07/31/15	LF	Pump	5.95	5.7
	10/08/15	LF	Pump	4.92	4.4 J-
02/26/16	LF	Pump	3.88	3.4	
02/26/16	LF	Pump	3.63	3.4	
GW-19B	04/15/08	LF	Pump	0.540	0.49
	07/14/08	LF	Pump	0.107 J	0.47 J
	10/16/08	LF	Pump	3.63	0.91 J
	01/14/09	LF	Pump	<0.0184	0.60 J
	04/07/09	LF	Pump	<0.0184	0.66 J
	07/13/09	LF	Pump	<0.618	0.52 J
	10/12/09	LF	Pump	<0.618	0.43 J
	02/11/10	LF	Pump	1.20	0.68 J
	05/14/10	LF	Pump	1.26	0.50 J
	08/11/10	LF	Pump	0.788 J	0.52 J
	12/06/10	LF	Pump	0.910 J	0.46 J
	01/31/11	LF	Pump	1.34 U	0.57 J
	04/04/11	LF	Pump	1.83 U	0.56 J
	08/01/11	LF	Pump	0.738 J	<0.041
	10/11/11	LF	Pump	0.967 J	0.48 J
	02/01/12	LF	Pump	0.643 J	0.59 J
	04/02/12	LF	Pump	0.602 J	0.62 J
	08/14/12	LF	Pump	0.605 J	0.53 J
	10/09/12	LF	Pump	0.924 J	0.80 J
	02/12/13	LF	Pump	0.775 J	0.60 J
	04/02/13	LF	Pump	0.727 J	0.51 J
07/30/13	LF	Pump	0.621 J	0.55 J	
10/15/13	LF	Pump	<0.402	0.067 UJ	
02/11/14	LF	Pump	0.532 J	0.47 J-	
04/02/14	LF	Pump	<0.402	0.16 J-	
10/13/14	LF	Pump	0.459 J	0.32 J	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-19B	04/07/15	LF	Pump	0.831 J	0.52 J
	10/07/15	LF	Pump	<0.402	<0.067
GW-19C	04/16/08	LF	Pump	0.830	0.67
	07/15/08	LF	Pump	1.00	0.47 J
	10/16/08	LF	Pump	2.78	1.1
	01/14/09	LF	Pump	1.71 UJ	0.78 J
	04/07/09	LF	Pump	<0.0184	0.39 J
	07/13/09	LF	Pump	<0.618	0.46 J
	10/12/09	LF	Pump	0.654 J	0.45 J
	02/09/10	LF	Pump	1.24	0.58 J
	05/14/10	LF	Pump	1.10	0.32 J
	08/10/10	LF	Pump	<0.618	<0.041
	12/06/10	LF	Pump	<0.618	<0.041
	01/31/11	LF	Pump	1.62 U	<0.041
	04/04/11	LF	Pump	0.989 U	<0.041
	08/01/11	LF	Pump	<0.618	<0.041
	10/11/11	LF	Pump	0.919 U	0.20 J
	02/02/12	LF	Pump	3.47	0.96 J
	04/02/12	LF	Pump	1.13	1.1
	08/14/12	LF	Pump	1.82	1.6
	10/09/12	LF	Pump	1.81	1.7
	02/12/13	LF	Pump	1.88	1.8
	04/02/13	LF	Pump	1.88	1.7
	07/31/13	LF	Pump	1.80	1.7
	10/15/13	LF	Pump	1.96 J	1.7 J-
	02/11/14	LF	Pump	1.76	2.1 J-
	04/02/14	LF	Pump	1.53	1.4 J-
	07/29/14	LF	Pump	1.72	1.5
	10/14/14	LF	Pump	<2.01	1.1
	02/17/15	LF	Pump	1.49	1.2 J-
	04/07/15	LF	Pump	1.41	1.3
	07/28/15	LF	Pump	1.54	1.3
10/07/15	LF	Pump	<0.402	<0.067	
02/24/16	LF	Pump	1.65	1.5	
GW-20	04/18/08	LF	Pump	123	130 <sup>a</sup>
	07/16/08	LF	Pump	42.9	42 <sup>a</sup>
	10/15/08	LF	Pump	53.8	58
	01/15/09	LF	Pump	18.5	17
	04/09/09	LF	Pump	0.998 J	1.4
	07/17/09	LF	Pump	35.5	37
	10/15/09	LF	Pump	18.5	17
	02/10/10	LF	Pump	11.7	9.5
	05/12/10	LF	Pump	6.40	6.3
	08/12/10	LF	Pump	7.38	7.3
	12/08/10	LF	Pump	5.81	4.9
	02/02/11	LF	Pump	5.95	4.7
	04/06/11	LF	Pump	8.24	5.4
	08/02/11	LF	Pump	6.91	7.2
10/11/11	LF	Pump	16	13	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-20	02/02/12	LF	Pump	13.2	13
	04/05/12	LF	Pump	10.7	11
	08/16/12	LF	Pump	12.3	11
	10/12/12	LF	Pump	12.8	13
	02/14/13	LF	Pump	21.2	21
	04/04/13	LF	Pump	21.0	21
	08/01/13	LF	Pump	31.1	27
	10/17/13	LF	Pump	30.7	25
	02/12/14	LF	Pump	40.8	43
	04/03/14	LF	Pump	41.9	36
	07/31/14	LF	Pump	31.1	28
	10/15/14	LF	Pump	27.1	26
	02/19/15	LF	Pump	20.2	15
	04/08/15	LF	Pump	19.3	18
	07/30/15	LF	Pump	23	20
	10/05/15	LF	Pump	22.5	20
02/25/16	LF	Pump	18.5	17	
GW-21	04/18/08	LF	Pump	5.49	5.2
	07/16/08	LF	Pump	<1.00	0.52 J
	10/14/08	LF	Pump	11.2	8.5
	01/13/09	LF	Pump	1.81	0.64 J
	04/07/09	LF	Pump	1.00 UJ	1.6
	07/16/09	LF	Pump	3.60	2.2
	10/14/09	LF	Pump	2.07	1.4
	02/10/10	LF	Pump	2.93	1.2
	05/12/10	LF	Pump	1.77	1.2
	08/10/10	LF	Pump	1.04	0.90 J
	12/07/10	LF	Pump	3.40	2.8
	02/01/11	LF	Pump	5.24	4.4
	04/06/11	LF	Pump	10.2	6.6
	08/04/11	LF	Pump	10.6	8.6
	10/11/11	LF	Pump	9.77	9.3
	02/02/12	LF	Pump	10.4	10
	04/05/12	LF	Pump	11.3	10
	08/16/12	LF	Pump	14	13
	10/11/12	LF	Pump	17.4	15
	02/14/13	LF	Pump	18.6	18
	04/04/13	LF	Pump	24.0	23
	08/01/13	LF	Pump	42.5	39
	10/17/13	LF	Pump	40.1	38
	02/12/14	LF	Pump	38.6	40
	04/03/14	LF	Pump	30.1	27
	07/31/14	LF	Pump	24.7	23
	10/15/14	LF	Pump	16.7	13
	02/19/15	LF	Pump	17.3	15
04/08/15	LF	Pump	15.1	15	
07/30/15	LF	Pump	14	14	
10/05/15	LF	Pump	16.7	14	
02/25/16	LF	Pump	16.2	15	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-22	04/17/08	LF	Pump	1,120	1,200
	07/16/08	LF	Pump	94.2	92
	10/15/08	LF	Pump	879	900 J
	01/15/09	LF	Pump	18.9	20
	04/08/09	LF	Pump	94.7	85
	07/17/09	LF	Pump	344	290
	10/15/09	LF	Pump	172	160
	02/11/10	LF	Pump	969	1,100 J-
	05/13/10	LF	Pump	2,370	2,600
	08/13/10	LF	Pump	659	650
	12/09/10	LF	Pump	361	370
	02/03/11	LF	Pump	524	520
	04/07/11	LF	Pump	52.8 J-	50
	04/07/11	LF	Pump	52.4 J-	49
	08/04/11	LF	Pump	1350	1400
	08/04/11	LF	Pump	1330	1300
	10/11/11	LF	Pump	1090	1100
	10/11/11	LF	Pump	1110	990
	02/03/12	LF	Pump	895	750
	02/03/12	LF	Pump	960	820
	04/05/12	LF	Pump	8,600	8,200
	04/05/12	LF	Pump	8,810	8,800
	08/16/12	LF	Pump	769	1000
	08/16/12	LF	Pump	762	1000
	10/12/12	LF	Pump	191	190
	10/12/12	LF	Pump	203	200
	02/14/13	LF	Pump	98.6	100
	02/14/13	LF	Pump	101	98
	04/04/13	LF	Pump	35.1	31
	04/04/13	LF	Pump	37.9	34
	08/01/13	LF	Pump	18.6	16
	08/01/13	LF	Pump	19.4	16
	10/17/13	LF	Pump	12.2	10
02/12/14	LF	Pump	16.2	16	
04/03/14	LF	Pump	18.7	16	
07/31/14	LF	Pump	28.1	26	
10/15/14	LF	Pump	83.8	78	
02/19/15	LF	Pump	120	100	
02/19/15	LF	Pump	125	100	
04/08/15	LF	Pump	102	110	
04/08/15	LF	Pump	113	100	
07/30/15	LF	Pump	98.7	96	
07/30/15	LF	Pump	99	93	
10/09/15	LF	Pump	104	98	
02/25/16	LF	Pump	64.5	59	
02/25/16	LF	Pump	60.6	60	
GW-23	04/17/08	LF	Pump	1.25	1.0
	07/16/08	LF	Pump	<1.00	1.0 UJ
	10/14/08	LF	Pump	2.86	1.0



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-23	01/13/09	LF	Pump	<0.0184	0.73 J
	04/07/09	LF	Pump	<0.0184	0.80 J
	07/16/09	LF	Pump	2.70	1.1
	10/15/09	LF	Pump	2.05	0.99 J
	02/09/10	LF	Pump	1.19	0.87 J
	05/11/10	LF	Pump	725	810
	08/13/10	LF	Pump	208	200
	12/08/10	LF	Pump	59.3	55
	02/03/11	LF	Pump	3.68	2.6
	04/06/11	LF	Pump	4.94	1.5
	08/02/11	LF	Pump	1.13	0.45 J
	10/11/11	LF	Pump	7.46	6.3
	01/30/12	LF	Pump	1.11	0.73 J
	04/03/12	LF	Pump	1.04	0.72 J
	08/15/12	LF	Pump	2	1.4
	10/10/12	LF	Pump	3.1	0.96 J
	02/13/13	LF	Pump	1.97	1.2
	04/01/13	LF	Pump	1.53	1.3
	07/31/13	LF	Pump	1.52	1.0
	10/16/13	LF	Pump	3.11	1.2
	02/11/14	LF	Pump	1.66	1.5 J-
	04/03/14	LF	Pump	3.18	0.98 J
	07/30/14	LF	Pump	1.6	<0.067 J
	10/14/14	LF	Pump	2.07 J	1.0 J
02/18/15	LF	Pump	2.36	1.5	
04/07/15	LF	Pump	2.54	1.6	
07/29/15	LF	Pump	2.12	1.8	
10/08/15	LF	Pump	2.72	2.5 J-	
02/24/16	LF	Pump	2.2	2.0	
GW-24	02/03/11	LF	Pump	936	900
	04/07/11	LF	Pump	137 J-	150
	08/04/11	LF	Pump	2050	2000
	10/11/11	LF	Pump	1480	1500
	01/30/12	Active extraction well			
GW-25A	02/03/11	LF	Pump	28,400	28,000
	02/03/11	LF	Pump	29,800	28,000
	04/08/11	LF	Pump	84,700	85,000
	04/08/11	LF	Pump	87,900	87,000
	08/05/11	LF	Pump	25400	22000
	08/05/11	LF	Pump	29100	22000
	10/11/11	LF	Pump	3560	3400
	10/11/11	LF	Pump	3510	3100
	02/03/12	LF	Pump	8,170	7,000
	02/03/12	LF	Pump	8,390	7,100
	04/06/12	LF	Pump	7,130	6,100
	04/06/12	LF	Pump	7,000	6,200
	08/17/12	LF	Pump	11500	12000
	08/17/12	LF	Pump	12600	12000
10/12/12	LF	Pump	12000	12000	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-25A	10/12/12	LF	Pump	10800	12000
	02/15/13	LF	Pump	--	--
	04/05/13	LF	Pump	7.79	<0.67
	04/05/13	LF	Pump	6.77	<0.67
	08/02/13	LF	Pump	388	<0.067
	08/02/13	LF	Pump	369	<0.067
	10/15/13	LF	Pump	63.7 J	0.067 UJ
	02/11/14	LF	Pump	5.55	0.067 R
	04/02/14	LF	Pump	2.59	<0.067 R
	07/30/14	LF	Pump	<0.402	<0.067 J
	10/15/14	LF	Pump	<2.01	<0.067
	02/18/15	LF	Pump	5.54	<0.067
	04/07/15	LF	Pump	1.55	<0.067
	07/29/15	LF	Pump	23.3	<0.067
	10/06/15	LF	Pump	<0.402	<0.067 R
02/23/16	LF	Pump	10.5	<0.067	
GW-25B	02/02/11	LF	Pump	2.03	0.11 J
	04/06/11	LF	Pump	8.47	0.074 J
	08/02/11	LF	Pump	1.92	0.64 J
	10/11/11	LF	Pump	1.90 U	0.27 J
	01/31/12	LF	Pump	1.12	0.53 J
	04/05/12	LF	Pump	<1.46	0.53 J
	08/14/12	LF	Pump	1.44	0.41 J
	10/09/12	LF	Pump	3.67	0.48 J
	02/12/13	LF	Pump	1.02	0.40 J
	04/01/13	LF	Pump	0.618 J	0.45 J
	07/30/13	LF	Pump	0.811 J	0.46 J
	10/16/13	LF	Pump	1.47	0.42 J
	02/12/14	LF	Pump	1.76	1.3
	04/03/14	LF	Pump	2.17	0.47 J
	07/30/14	LF	Pump	1.8	1.6 J-
	10/15/14	LF	Pump	5.73	3.1
	02/18/15	LF	Pump	18.9	3.6
	04/09/15	LF	Pump	0.827 J	<0.067
	07/29/15	LF	Pump	0.712 J	0.50 J
	10/06/15	LF	Pump	<0.402	1.0 R
02/23/16	LF	Pump	5.38	0.22 J	
GW-29	02/03/11	LF	Pump	42,200	36,000
	04/08/11	LF	Pump	19,600	19,000
	08/05/11	LF	Pump	2180	1800
	10/11/11	LF	Pump	1500	1500
	02/03/12	LF	Pump	1,060	920
	04/05/12	LF	Pump	767	790
	08/17/12	LF	Pump	609	640
	10/12/12	LF	Pump	971	1100
	02/15/13	LF	Pump	--	--
	04/05/13	LF	Pump	30.6	<0.067
	08/02/13	LF	Pump	20.7	14
10/17/13	LF	Pump	130	88	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-29	02/13/14	LF	Pump	560	650
	02/13/14	LF	Pump	617	660
	04/04/14	LF	Pump	334	270
	04/04/14	LF	Pump	309	300
	08/01/14	LF	Pump	236	210
	08/01/14	LF	Pump	227	220
	10/16/14	LF	Pump	10.6	9.6
	10/16/14	LF	Pump	11.7	9.6
	02/18/15	LF	Pump	22	19
	04/07/15	LF	Pump	15.1	12
	07/29/15	LF	Pump	14.8	12
	10/08/15	LF	Pump	2.76	1.6 J-
	02/24/16	LF	Pump	0.891 J	<0.067
GW-30	08/16/12	LF	Pump	21.8	22
	10/11/12	LF	Pump	32.4	28
	02/14/13	LF	Pump	42.6	44
	04/04/13	LF	Pump	52.2	53
	08/01/13	LF	Pump	36.5	35
	10/17/13	LF	Pump	34.4	33
	02/12/14	LF	Pump	19.4	19
	04/03/14	LF	Pump	14.1	12
	07/31/14	LF	Pump	11.5	11
	10/15/14	LF	Pump	19.1	16
	02/19/15	LF	Pump	17.7	14
	04/08/15	LF	Pump	15.5	15
	07/30/15	LF	Pump	14.4	15
	10/05/15	LF	Pump	18	15
	02/25/16	LF	Pump	15.9	16
GW-31	08/16/12	LF	Pump	100	110
	10/12/12	LF	Pump	118	140
	02/14/13	LF	Pump	30.5	30
	04/04/13	LF	Pump	123	130
	08/02/13	LF	Pump	62.7	62
	10/17/13	LF	Pump	48.7	45
	10/17/13	LF	Pump	47.5	46
	02/13/14	LF	Pump	66.4	62
	02/13/14	LF	Pump	69.8	66
	04/03/14	LF	Pump	92.2	78
	04/03/14	LF	Pump	88.4	78
	07/31/14	LF	Pump	38.1	39
	07/31/14	LF	Pump	38.1	39
	10/16/14	LF	Pump	34.1	28
	10/16/14	LF	Pump	33.6	29
	02/19/15	LF	Pump	25.5	20
	04/08/15	LF	Pump	22.2	22
	07/30/15	LF	Pump	23.5	21
10/05/15	LF	Pump	23.2	21	
02/25/16	LF	Pump	23.1	22	
GW-32	08/16/12	LF	Pump	240	240

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-32	10/12/12	LF	Pump	939	1000
	02/15/13	LF	Pump	225	240
	04/05/13	LF	Pump	1,460	1,600
	04/05/13	LF	Pump	1,550	1,700
	08/02/13	LF	Pump	364	380
	08/02/13	LF	Pump	400	390
	10/17/13	LF	Pump	494	500
	10/17/13	LF	Pump	468	510
	02/13/14	LF	Pump	330	330
	02/13/14	LF	Pump	359	350
	04/04/14	LF	Pump	269	250
	04/04/14	LF	Pump	299	250
	08/01/14	LF	Pump	139	130
	08/01/14	LF	Pump	137	140
	10/16/14	LF	Pump	55.7	47
	02/20/15	LF	Pump	42	36
	04/09/15	LF	Pump	37.3	37
	07/31/15	LF	Pump	44.8	44
	10/09/15	LF	Pump	50.5	48
GW-33A	02/25/16	LF	Pump	36.2	38
	08/16/12	LF	Pump	53.3	53
	10/11/12	LF	Pump	42.2	34
	02/15/13	LF	Pump	52.5	52
	04/04/13	LF	Pump	67.9	84
	04/04/13	LF	Pump	66.3	75
	08/02/13	LF	Pump	655	690
	08/02/13	LF	Pump	665	720
	10/18/13	LF	Pump	605	640
	02/13/14	LF	Pump	17.1	17
	02/13/14	LF	Pump	17.9	15
	04/04/14	LF	Pump	122	110
	04/04/14	LF	Pump	119	110
	08/01/14	LF	Pump	5750	4600
	08/01/14	LF	Pump	5880	4500 <sup>a</sup>
	10/16/14	LF	Pump	8650	7400
	10/16/14	LF	Pump	8760	8600 <sup>a</sup>
	02/20/15	LF	Pump	2210	1500
	02/20/15	LF	Pump	2120	1600
	04/10/15	LF	Pump	796	790
	04/10/15	LF	Pump	788	820
	07/31/15	LF	Pump	394	390
	07/31/15	LF	Pump	411	400
10/08/15	LF	Pump	NA	NA	
10/08/15	LF	Pump	275	280 J-	
02/26/16	LF	Pump	79	64	
02/26/16	LF	Pump	70.1	63	
GW-33B	08/16/12	LF	Pump	0.706 J	0.45 J <sup>a</sup>
	10/08/12	LF	Pump	2.01	0.49 J
	02/12/13	LF	Pump	1.28	0.45 J

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
GW-33B	04/01/13	LF	Pump	0.572 J	0.45 J
	07/30/13	LF	Pump	0.913 J	0.43 J
	10/16/13	LF	Pump	2.79	0.18 J
	02/11/14	LF	Pump	1.08	0.55 J-
	04/02/14	LF	Pump	0.475 J	0.36 J-
	07/30/14	LF	Pump	0.617 J	0.44 J-
	10/14/14	LF	Pump	<2.01	0.45 J
	02/19/15	LF	Pump	1.73	0.45 J
	04/08/15	LF	Pump	0.677 J	0.42 J
	07/30/15	LF	Pump	0.75 J	0.46 J
	10/08/15	LF	Pump	0.762 J	0.48 J-
02/25/16	LF	Pump	1.48	0.46 J	
GW-34	08/16/12	LF	Pump	15.9	15
	10/10/12	LF	Pump	16.4	16
	02/14/13	LF	Pump	12	11
	04/04/13	LF	Pump	18.1	19
	08/01/13	LF	Pump	31.0	30
	10/17/13	LF	Pump	33.4	35
	02/13/14	LF	Pump	28.9	29
	04/03/14	LF	Pump	26.2	23
	08/01/14	LF	Pump	21.2	19
	10/16/14	LF	Pump	13.8	12
	02/19/15	LF	Pump	18.3	14
	04/09/15	LF	Pump	17.4	16
	07/31/15	LF	Pump	16.7	16
	10/08/15	LF	Pump	16.5	15 J-
10/08/15	LF	Pump	16.4	16 J-	
02/25/16	LF	Pump	15.2	15	
GW-35	08/02/13	LF	Pump	12,400	13,000
	10/18/13	LF	Pump	6,740	6,200
	10/18/13	LF	Pump	5,470	6,200
	02/13/14	LF	Pump	5,100	5,200
	02/13/14	LF	Pump	4,710	4,500
	04/04/14	LF	Pump	7,290	7,700
	04/04/14	LF	Pump	6,580	6,500
	08/01/14	LF	Pump	3420	3400
	08/01/14	LF	Pump	3390	3500
	10/16/14	LF	Pump	3180	2800
	10/16/14	LF	Pump	3,280	3,100
	02/20/15	LF	Pump	2,680	2,000
	02/20/15	LF	Pump	2,740	2,100
	04/10/15	LF	Pump	2,380	2,400
	04/10/15	LF	Pump	2560	2400
	07/31/15	LF	Pump	2,230	2,100
	07/31/15	LF	Pump	2,150	2,000
	10/09/15	LF	Pump	3,460	3,400
10/09/15	LF	Pump	3,400	3,300	
02/26/16	LF	Pump	1,490	1,400	
02/26/16	LF	Pump	1,510	1,500	



Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
NH-C07	05/12/10	LF	Pump	1.77	1.2
	08/11/10	LF	Pump	1.73	1.4
	12/07/10	LF	Pump	2.39	1.9
	02/02/11	LF	Pump	4.59	3.7
	04/05/11	LF	Pump	3.58 U	2.4
	08/03/11	LF	Pump	6.65	6.6
	10/11/11	LF	Pump	10.4	8.7
	02/01/12	LF	Pump	4.34	4.1
	04/04/12	LF	Pump	8.02	8.4
	08/16/12	LF	Pump	9.29	8.9
	10/11/12	LF	Pump	11.8	11
	02/14/13	LF	Pump	16	16
	04/05/13	LF	Pump	17.1	17
	08/02/13	LF	Pump	21.6	22
	10/17/13	LF	Pump	27.6	27
	02/13/14	LF	Pump	38.3	39
	04/04/14	LF	Pump	42.5	38
	08/01/14	LF	Pump	40.8	34
	10/16/14	LF	Pump	33.9	29
	10/16/14	LF	Pump	34.3	28
	02/19/15	LF	Pump	24.4	22
	04/09/15	LF	Pump	22	21
	07/31/15	LF	Pump	20.7	22
10/09/15	LF	Pump	22.8	22	
02/25/16	LF	Pump	22.3	22	
NHE-2	10/17/08	LF	Pump	307	440
	01/16/09	LF	Pump	218	230
	05/12/09	LF	Pump	232	190
	07/16/09	LF	Pump	204	220
	10/20/09	LF	Pump	182	190
	02/12/10	LF	Pump	206 J-	190
	02/12/10	LF	Pump	201 J-	190
	05/12/10	LF	Pump	206	170
	08/11/10	LF	Pump	167	180
	12/08/10	LF	Pump	169	160
	02/03/11	LF	Pump	165	160
	04/07/11	LF	Pump	127 J-	130
	08/03/11	LF	Pump	97	99
	10/11/11	LF	Pump	82	79
	02/02/12	LF	Pump	74.4	72
	04/05/12	LF	Pump	60.7	61
	08/15/12	LF	Pump	44.4	43
	10/10/12	LF	Pump	44.2	44
	02/15/13	LF	Pump	--	--
	04/03/13	LF	Pump	40.9	39
07/31/13	LF	Pump	47.9	47	
10/15/13	LF	Pump	56.4 J	58 J-	
02/12/14	LF	Pump	59.2	68	
04/04/14	LF	Pump	68.6	66	

Well/ Barcad ID	Sample Date	Sample Type		Concentrations (µg/L)	
		Filtration	Collection	Total Dissolved Chromium	Chromium VI
NHE-2	08/01/14	LF	Pump	152	130
	02/18/15	LF	Pump	339	360
	04/08/15	LF	Pump	300	320
	07/28/15	LF	Pump	194	230
	10/07/15	LF	Pump	145	130
	02/24/16	LF	Pump	105	110
PZ-NHE-2D	NS	LF	Pump	--	--
PZ-NHE-2S	NS	LF	Pump	--	--

Notes:

Samples were analyzed using USEPA Method 6010B/6020 for chromium and USEPA Method 7199 for chromium VI Duplicate samples are italicized.

<sup>a</sup> Samples analyzed using USEPA Method 218.6 for 97-005 sampling

\* Multi-depth samples designated as: S - Shallow; M - Middle; D - Deep

µg/L = micrograms per liter

FF = Field-filtered

LF = Laboratory-filtered

NF = Not filtered

U = Analyte was qualified as not detected above reporting limit during data validation. UJ = Analyte was not detected; the listed method detection limit is estimated.

J- = Analyte was detected; the listed result is estimated with a potential low bias. J = Analyte was detected; the listed result is estimated.

R = Rejected or unsuable result.

< = Not detected above listed method detection limit

-- = Not sampled or not analyzed

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-1	08/21/91	2.4	--	ND	3.7	--	--	--	--	1.1	--	--	ND	ND	--	1.2	ND	--	40	--	--
	09/17/91	1.6	--	ND	2.8	--	--	--	--	1.3	--	--	ND	ND	--	1.1	ND	--	27	--	--
	01/14/92	ND	--	ND	ND	--	--	--	--	ND	--	--	ND	ND	--	ND	ND	--	3.6	--	--
	03/15/92	5.1	--	1.3	3.1	--	--	--	--	ND	--	--	3.0	ND	--	1.7	ND	--	130	--	--
	05/19/92	3.1	--	0.75	3.3	--	--	--	--	0.85	--	--	1.6	ND	--	1.4	ND	--	58	--	--
	08/11/92	4.3	--	0.51	5.5	--	--	--	--	1.6	--	--	1.4	ND	--	2.1	ND	--	100	--	--
	01/14/93	<3.0	--	<3.0	<3.0	--	--	--	--	<3.0	--	--	<3.0	<3.0	--	<3.0	<3.0	<0.50	54	--	--
	03/02/93	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	0.71	1.4	--	2.2	<0.50	<0.50	25	--	--
	06/17/93	3.0	--	<3.0	2.9	--	--	--	--	<3.0	--	--	5.0	<3.0	--	4.9	<3.0	--	91	--	--
	12/07/93	0.30	--	0.30	<0.20	--	--	--	--	<0.20	--	--	2.1	<0.20	--	2.6	0.30	--	4.4	--	--
	02/18/94	1.4	--	<1.0	1.0	--	--	--	--	<1.0	--	--	3.0	<1.0	--	1.7	<1.0	--	62	--	--
	05/16/94	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	1.1	<0.20	--	1.4	<0.20	--	3.5	--	--
	08/16/94	20	--	<20	<20	--	--	--	--	<20	--	--	36	<50	--	<20	<20	<10	1,800	--	--
	09/08/94	140	--	<100	<100	--	--	--	--	<100	--	--	160	<300	--	<100	<100	<10	6,400	--	--
	11/20/95	<0.20	--	0.20	<0.20	--	--	--	--	<0.20	--	--	1.1	<0.20	--	2.0	<0.20	--	7.0	--	--
	12/18/95	1.2	--	0.28	2.0	--	--	--	--	0.32	--	--	1.3	1.4	--	2.1	<0.20	--	25	--	--
	04/23/96	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50	<0.50	--	1.3	1.2	--	2.5	25	<0.50	7.1	<0.50	<0.50
	07/09/96	3.8	<0.50	0.96	6.2	<0.50	<0.50	--	<0.50	1.6	<0.50	--	1.9	<0.50	--	3.0	3.9	<0.50	86	<0.50	<0.50
	10/09/96	12	<0.50	2.7	17	<0.50	<0.50	--	<0.50	4.0	<0.50	--	4.5	<0.50	--	5.5	<0.50	<0.50	180	<0.50	<0.50
	12/17/96	18	<0.50	6.5	18	<0.50	<0.50	--	<0.50	2.7	<0.50	--	8.3	<0.50	--	8.3	3.7	<0.50	370	<0.50	<0.50
	04/08/97	0.80	--	1.0	1.1	<0.50	--	--	--	<0.50	--	--	5.3	0.80	--	4.5	<0.50	<0.50	21	--	--
	11/09/04	<1.0	<1.0	1.5	2.3	<0.50	<1.0	--	<1.0	<0.50	<1.0	--	10	<2.0	--	5.6	<0.50	<1.0	13	<1.0	<0.50
	02/23/05	<1.0	<1.0	3.1	<1.0	0.91	<1.0	--	<1.0	<0.50	<1.0	<1.0	22	10	--	12	--	--	11	<1.0	<0.50
	05/24/05	<1.0	<1.0	4.8	<1.0	1.5	<1.0	--	<1.0	<0.50	<1.0	<1.0	36	17	--	16	<0.50	<1.0	12	<1.0	<0.50
	08/31/05	<0.23	<0.10	6.1	0.29	1.7	0.70	--	<0.24	<0.36	--	0.66	44	21	--	20	0.15	0.38	12	<0.47	<0.27
	11/29/05	<0.50	<0.50	5.2	<0.50	1.5	0.58	--	<0.50	<0.50	<0.50	<0.50	34	20 J	--	22	<0.50	<0.50	12	<1.0	<0.50
	03/01/06	<0.50	<0.50	4.4	<0.50	1.4	0.51	<0.50	<0.50	<0.50	<0.50	0.46 J	29	18	<2.0	18	<0.50	<0.50	9.4	<1.0	<0.50
	05/24/06	<0.50	<0.50	2.8	<0.50	1.0	0.33 J	<0.50	<0.50	<0.50	21	0.35 J	21	17	<2.0	16	<0.50	<0.50	6.7	<1.0	<0.50
	08/16/06	4.3	<0.50	12	9.6	0.92	0.38 J	<0.50	<0.50	0.62	<0.50	2.1	25	9.4 J	<2.0	13	<0.50	0.22 J	200	1.0 UJ	0.50 UJ
	10/12/06	15	<1.0	26	21	1.6	<1.0	<0.50	<1.0	2.0	<1.0	6.1	28	3.0	<5.0	15	<0.50	<1.0	420	<1.0	<0.50
	10/25/06	17	<0.50	30	34	1.2	<0.50	<0.50	<0.50	2.5	<0.50	7.2	33	4.2 J	<2.0	25	<0.50	<0.50	450	<1.0	<0.50
	01/24/07	7.8	<0.50	11	17	0.83	<0.50	<0.50	<0.50	1.7	<0.50	3.2	17	1.6 J	<2.0	12	<0.50	<0.50	180	<1.0	<0.50
	04/18/07	5.3	<0.40	7.0	12	0.70	<0.40	<0.42	<0.40	1.3	<0.36	2.4	14	1.2	<0.43	8.3	<0.36	<0.43	160	1.0 UJ	<0.43
	07/26/07	4.2	<0.40	5.0	11	0.58	<0.40	<0.42	<0.40	1.2	<0.36	2.0	12	0.94 J	<0.43	10	<0.36	<0.43	120	<0.60	<0.43
	10/25/07	2.5	<0.34	3.5	7.6	0.62	<0.35	<0.30	<0.37	1.1	<0.36	1.5 UJ	13	1.2	<0.30	9.3	<0.32	<0.41	74	<0.59	<0.43
	01/23/08	2.1	<0.34	3.7	6.1	0.66	<0.35	<0.30	<0.37	0.85	<0.36	1.4	14	<0.68	<0.30	11	<0.32	<0.41	80	<0.59	<0.43
	04/17/08	1.4	<0.44	3.0	4.1	0.51	<0.35	<0.33	<0.37	0.56	<0.39	0.98	13	2.3	<0.30	9.6	<0.40	<0.41	49	<0.59	<0.47
	07/17/08	<1.0	<1.0	2.5	<1.0	0.82	<1.0	<0.50	<1.0	<0.50	<1.0	0.29 J	20	5.6	<1.0	11	<1.0	<1.0	11	<1.0	<0.50
	10/16/08	2.0	<0.49	4.0	5.4	0.59	<0.36	<0.14	<1.0	0.57	<1.0	1.4	14	2.7	<1.0	6.7	<0.27	<0.38	62	<0.21	<0.50
	01/15/09	<0.45	<0.54	3.0	<0.40	1.0	<0.38	<0.28	<0.69	<0.43	<0.22	0.48 J	21	8.1	<2.6	9.6	<0.33	<0.40	8.5	<0.31	<0.33
	04/09/09	<0.45	<0.54	2.5	<0.40	1.1	<0.38	<0.28	<0.69	<0.43	<0.22	0.36 J	19	3.6	<2.6	8.9	<0.33	<0.40	8.3	<0.31	<0.33
	07/17/09	2.8	<0.54	4.0	8.6	<0.31	<0.38	<0.28	<0.69	0.81	<0.22	2.4	10	0.77 J	<2.6	7.8	<0.33	<0.40	98	<0.31	<0.33
	10/15/09	<0.45	<0.54	0.46 J	0.60 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	1.3	4.9	<0.49	<2.6	4.9	<0.33	<0.29	46	<0.31	<0.33
	02/12/10	4.6	--	7.7	9	0.54	--	--	--	0.70 J	--	3.5	8.5	0.52 J	--	5.5	<0.33	--	--	--	--
	05/14/10	5.8	0.73 J	5.5	9.7	1.3	<0.38	<0.28	<0.69	0.88 J	<0.22	2.5	4.0	<0.49	<2.6	4.2	<0.33	<0.29	120	<0.31	<0.33
	05/14/10	5.7	0.76 J	5.4	9.2	1.3	<0.38	<0.28	<0.69	0.87 J	<0.22	2.7	3.9	<0.49	<2.6	3.8	<0.33	<0.29	110	<0.31	<0.33

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-1	08/13/10	6.3	<0.54	5.4	13	1.1	--	<0.28	--	0.87 J	--	2.7	3.6	<0.49	--	4.9	<0.33	<0.29	110	<0.31	--
	08/13/10	6.4	<0.54	5.6	13	1.1	--	<0.28	--	0.86 J	--	2.7	3.6	<0.49	--	4.9	<0.33	<0.29	110	<0.31	--
	12/09/10	5.3	0.66 J	3.2	12	1.1	<0.38	<0.28	<0.69	0.70 J	<0.22	2.4	3.2	<0.49	<2.6	4.2	<0.33	<0.29	110	<0.31	<0.33
	02/03/11	4.5	<0.54	3.6	11	0.62	<0.38	<0.28	<0.69	0.81 J	<0.22	2.0	2.6	<0.49	<2.6	2.7	<0.33	<0.29	85	<0.31	<0.33
	04/07/11	1.2	<0.54	1.7	3.1	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.86 J	4.6	1.7	<2.6	4.1	<0.33	<0.29	29	<0.31	<0.33
	04/07/11	1.1	<0.54	1.7	3.1	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.88 J	4.2	1.6	<2.6	4.0	<0.33	<0.29	27	<0.31	<0.33
	08/05/11	2.1	<0.38	2.3	5.3	0.34 J	<0.42	<0.14	<0.48	0.45 J	<0.17	1.0	5.0	3.4	<0.64	4.6	<0.24	<0.37	32	<1.7	<0.30
	08/05/11	2.1	<0.38	2.4	5.4	0.36 J	<0.42	<0.14	<0.48	0.45 J	<0.17	1.1	5.2	3.4	<0.64	4.7	<0.24	<0.37	33	<1.7	<0.30
	10/14/11	3.1	<0.38	2.5	7.6	0.33 J	<0.42	<0.14	<0.48	0.52 J	<0.17	1.0	2.0	1.3 J	<0.64	3.3	<0.24	<0.37	31	<1.7	<0.30
	10/14/11	3.0	<0.38	2.5	7.5	0.37 J	<0.42	<0.14	<0.48	0.52 J	<0.17	0.98 J	1.9	1.3 J	<0.64	3.3	<0.24	<0.37	30	<1.7	<0.30
	02/03/12	1.6	<0.38	1.5	4.7	<0.24	<0.42	<0.14	<0.48	0.38 J	<0.17	0.81 J	3.0	1.1	<0.64	3.0	<0.24	<0.37	24	<1.7	<0.30
	02/03/12	1.5	<0.38	1.5	4.7	<0.24	<0.42	<0.14	<0.48	0.40 J	<0.17	0.81 J	3.1	1.0	<0.64	3.0	<0.24	<0.37	24	<1.7	<0.30
	04/06/12	2.0	<0.38	1.6	4.9	<0.24	<0.42	<0.14	<0.48	0.37 J	<0.17	0.58 J	0.80 J	<0.46	<0.64	2.6	<0.24	<0.37	20	<1.7	<0.30
	04/06/12	1.8	<0.38	1.6	4.7	<0.24	<0.42	<0.14	<0.48	0.40 J	<0.17	0.64 J	0.91 J	<0.46	<0.64	2.5	<0.24	<0.37	20	<1.7	<0.30
	08/17/12	2.9	<0.38	2.7	9.8	0.25 J	<0.42	<0.14	<0.48	0.58 J	<0.17	1.5	1.4	<0.46	<0.64	2.7	<0.24	<0.37	42	<1.7	<0.30
	08/17/12	2.9	<0.38	2.5	9.5	<0.24	<0.42	<0.14	<0.48	0.62 J	<0.17	1.5	1.3	<0.46	<0.64	2.3	<0.24	<0.37	40	<1.7	<0.30
	10/12/12	1.3	<0.38	1.3	4.1	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	1.4	2.1	<0.46	<0.64	2.5	<0.24	<0.37	25	<1.7	<0.30
	10/12/12	1.3	<0.38	1.4	3.8	<0.24	<0.42	<0.14	<0.48	0.40 J	<0.17	1.3	2.0	<0.46	<0.64	2.3	<0.24	<0.37	24	<1.7	<0.30
	02/15/13	1.2	<0.38	1.4	3.8	<0.24	<0.42	<0.14	<0.48	0.54 J	<0.17	1.2	1.8	<0.46	<0.64	2.3	<0.24	<0.37	24	<1.7	<0.30
	02/15/13	1.2	<0.38	1.2	3.4	<0.24	<0.42	<0.14	<0.48	0.52 J	<0.17	1.1	1.8	<0.46	<0.64	2.2	<0.24	<0.37	24	<1.7	<0.30
	04/05/13	0.86 J	<0.38	1.1	2.9	<0.24	<0.42	<0.14	<0.48	1.2	<0.17	1.0 J	2.2	<0.46	<0.64	2.3	<0.24	<0.37	16	<1.7	<0.30
	04/05/13	0.85 J	<0.38	1.2	3.2	<0.24	<0.42	<0.14	<0.48	1.2	<0.17	1.1	2.2	<0.46	<0.64	2.5	<0.24	<0.37	17	<1.7	<0.30
	08/02/13	2.9	<0.38	2.3	8.8	<0.24	<0.42	<0.14	<0.48	1.0	<0.17	1.8	1.3	<0.46	<0.64	2.0	<0.24	<0.37	64	<1.7	<0.30
	08/02/13	2.9	<0.38	2.4	8.0	<0.24	<0.42	<0.14	<0.48	0.89 J	<0.17	1.9	1.6	<0.46	<0.64	2.0	<0.24	<0.37	65	<1.7	<0.30
	10/17/13	2.7	<0.38	2.4	8.6	<0.24	<0.42	<0.14	<0.48	0.83 J	<0.17	1.9	1.5	<0.46	<0.64	3.4	<0.24	<0.37	55	<1.7	<0.30
	10/17/13	2.5	<0.38	2.2	8.0	<0.24	<0.42	<0.14	<0.48	0.80 J	<0.17	1.8	1.3	<0.46	<0.64	3.2	<0.24	<0.37	50	<1.7	<0.30
	02/13/14	2.5	<0.38	2.7	8.7	0.26 J	<0.42	<0.14	<0.48	0.70 J	<0.17	1.8	1.6	<0.46	<0.64	5.1	<0.24	<0.37	49	<1.7	<0.30
	02/13/14	2.4	<0.38	2.6	8.8	0.26 J	<0.42	<0.14	<0.48	0.67 J	<0.17	1.8	1.5	<0.46	<0.64	4.8	<0.24	<0.37	47	<1.7	<0.30
	04/03/14	0.90 J	<0.38	1.2	3.1	<0.24	<0.42	<0.14	<0.48	0.36 J	<0.17	0.84 J	1.2	<0.46	<0.64	1.3	<0.24	<0.37	14	<1.7	<0.30
	04/03/14	0.76 J	<0.38	1.1	2.9	<0.24	<0.42	<0.14	<0.48	0.34 J	<0.17	0.74 J	1.1	<0.46	<0.64	1.2	<0.24	<0.37	14	<1.7	<0.30
	08/01/14	1.1	<0.38	1.8	4.1	<0.24	<0.42	<0.14	<0.48	0.34 J	<0.17	0.67 J	0.49 J	<0.46	<0.64	1.4	<0.24	<0.37	19	<1.7	<0.30
	08/01/14	1.3	<0.38	1.9	4.5	<0.24	<0.42	<0.14	<0.48	0.36 J	<0.17	0.71 J	0.52 J	<0.46	<0.64	1.5	<0.24	<0.37	20	<1.7	<0.30
	10/16/14	0.51 J	<0.38	1.8	1.4	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.47 J	<0.48	<0.46	<0.64	0.65 J	<0.24	<0.37	7.2	<1.7	<0.30
	02/20/15	0.36 J	<0.38	1	1.2	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	<0.48	<0.46	<0.64	1.1	<0.24	<0.37	19	<1.7	<0.30
	02/20/15	0.33 J	<0.38	0.96 J	0.80 J	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	<0.48	<0.46	<0.64	1.0 J	<0.24	<0.37	17	<1.7	<0.30
	04/09/15	<0.30	<0.38	1.0	0.85 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.52 J	<0.24	<0.37	3.6	<1.7	<0.30
	07/31/15	0.39 J	<0.38	1.1	1.4	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.67 J	<0.24	<0.37	7.5	<1.7	<0.30
	07/31/15	0.36 J	<0.38	1.1	1.4	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.68 J	<0.24	<0.37	8.0	<1.7	<0.30
10/09/15	<0.30	<0.38	0.80 J	1.3	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.64 J	<0.24	<0.37	8.4	<1.7	<0.30	
10/09/15	<0.30	<0.38	0.87 J	1.4	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.78 J	<0.24	<0.37	8.4	<1.7	<0.30	
02/26/16	<0.30	<0.38	0.80 J	1.2	0.25 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	3.9	<1.7	<0.30	
02/26/16	<0.30	<0.38	0.77 J	1.1	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.41 J	<0.24	<0.37	3.9	<1.7	<0.30	
GW-2	01/15/92	ND	--	ND	ND	--	--	--	--	ND	--	--	ND	ND	--	ND	ND	ND	1.6	--	<0.50
	03/17/92	2.5	--	ND	2.4	--	--	--	--	0.57	--	--	ND	ND	--	0.58	ND	ND	31	--	<0.50
	05/20/92	12	--	0.53	13	--	--	--	--	3.3	--	--	ND	ND	--	1.9	ND	ND	83	--	<0.50
	08/10/92	15	--	ND	17	--	--	--	--	3.8	--	--	ND	ND	--	2.3	ND	ND	150	--	<0.50

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-2	01/14/93	0.54	--	<0.50	0.64	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.71	<0.50	<0.50	24	--	<0.50
	03/02/93	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.30	--	0.62	<0.50	<0.30	19	--	<0.50
	06/18/93	<3.0	--	<3.0	<3.0	--	--	--	--	<3.0	--	--	<3.0	<3.0	--	<3.0	<3.0	<3.0	48	--	<0.50
	08/19/93	<1.0	--	<1.0	<1.0	--	--	--	--	<1.0	--	--	<1.0	<1.0	--	<1.0	<1.0	<1.0	48	--	<0.50
	11/30/93	0.37	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	0.40	<0.20	--	1.7	<0.20	<0.20	29	--	<0.50
	02/16/94	<20	--	<20	<20	--	--	--	--	<20	--	--	<20	<20	--	<20	<20	<20	890	--	<0.50
	03/09/94	<1.0	--	<1.0	<1.0	--	--	--	--	<1.0	--	--	<1.0	<1.0	--	1.4	<1.0	<1.0	60	--	<0.50
	05/18/94	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	0.49	<0.20	--	0.99	<0.20	<0.20	9.6	--	<0.50
	08/16/94	10	--	<10	<10	<0.50	--	--	--	12	--	--	<10	<10	--	<10	<10	<10	830	--	<0.50
	09/08/94	12	--	<10	17	--	--	--	--	14	--	--	<10	<10	--	<10	<10	<10	810	--	<0.50
	11/22/94	1.5	--	0.50	1.3	--	--	--	--	1.6	--	--	1.7	<0.20	--	2.1	<0.20	<0.20	43	--	<0.50
	12/12/94	0.50	--	0.30	0.50	--	--	--	--	0.70	--	--	1.4	0.50	--	1.9	<0.20	<0.20	13	--	<0.50
	03/09/95	1.1	--	<5.0	10	--	--	--	--	<5.0	--	--	<5.0	<20	--	<5.0	<5.0	<5.0	250	--	<0.50
	09/21/95	<0.20	--	0.59	<0.20	--	--	--	--	<0.20	--	--	3.4	3.3	--	5.0	<0.20	<0.20	5.1	--	<0.50
	11/19/95	<0.20	--	0.50	<0.20	--	--	--	--	<0.20	--	--	2.7	1.6	--	3.0	<0.20	<0.20	4.8	--	<0.50
	12/19/95	2.2	--	0.53	4.9	--	--	--	--	3.8	--	--	1.3	0.76	--	1.8	<0.20	<0.20	50	--	<0.50
	04/23/96	<0.50	<0.50	0.71	<0.50	<0.50	<0.50	--	<0.50	<0.50	<0.50	--	4.3	1.4	--	5.0	15	<0.50	6.7	<0.50	<0.50
	07/09/96	0.81	<0.50	<0.50	1.7	<0.50	<0.50	--	<0.50	2.0	<0.50	--	2.1	<0.50	--	2.8	3.5	<0.50	21	<0.50	<0.50
	10/09/96	12	<0.50	0.89	18	<0.50	<0.50	--	<0.50	8.6	<0.50	--	1.1	<0.50	--	2.6	<0.50	<0.50	190	<0.50	<0.50
	12/18/96	19	<0.50	2.3	23	<0.50	<0.50	--	<0.50	8.0	<0.50	--	2.5	<0.50	--	4.5	1.6	<0.50	460	<0.50	<0.50
	04/08/97	4.3	--	1.0	1.1	<0.50	--	--	--	2.4	--	--	5.6	0.70	--	3.8	<0.50	<0.50	93	--	<0.50
	11/08/04	<1.0	<1.0	2.8	<1.0	0.93	<1.0	--	<1.0	<0.50	<1.0	--	20	4.7	--	10	<0.50	<1.0	14	<1.0	<0.50
	02/22/05	<1.0	<1.0	3.5	<1.0	1.9	<1.0	--	<1.0	<0.50	<1.0	<1.0	29	15	--	15	<0.50	<1.0	8.6	<1.0	<0.50
	05/23/05	<1.0	<1.0	3.2	<1.0	1.6	<1.0	--	<1.0	<0.50	<1.0	<1.0	27	14	--	15	<0.50	<1.0	8.8	<1.0	<0.50
	08/30/05	<0.23	<0.10	3.8	<0.26	1.8	0.55	--	<0.24	<0.36	--	0.54	35	15	--	17	<0.10	0.36	7.3	<0.47	<0.50
	11/28/05	<0.50	<0.50	3.5	<0.50	1.8	0.56	--	<0.50	<0.50	<0.50	<0.50	32	19	--	19	<0.50	<0.50	9.0	<1.0	<0.50
	02/28/06	<0.50	<0.50	2.2	0.31 J	0.78	<0.50	<0.50	<0.50	<0.50	<0.50	0.47 J	16	7.6	<2.0	11	<0.50	<0.50	9.0	<1.0	<0.50
	05/23/06	<0.50	<0.50	2.3	<0.50	0.96	0.32 J	<0.50	<0.50	<0.50	20	0.39 J	20	11	<2.0	13	<0.50	<0.50	7.5	<1.0	<0.50
	08/15/06	2.4	<0.50	2.0	6.9	0.51	<0.50	<0.50	<0.50	3.4	<0.50	2.2	8.2	9.4 J	<2.0	5.8	<0.50	<0.50	120	<1.0	<0.50
	10/24/06	1.9	<0.50	1.2	6.0	<0.50	<0.50	<0.50	<0.50	3.2	<0.50	1.7	3.9	1.3	<2.0	2.9	<0.50	<0.50	110	<1.0	<0.50
	01/23/07	0.88	<0.50	0.99	3.0	<0.50	0.50 UJ	<0.50	<0.50	1.6	<0.50	0.91	4.3	1.1	<2.0	3.1	<0.50	<0.50	45	<1.0	<0.50
	04/17/07	0.57	<0.40	0.72	2.0	<0.33	<0.40	<0.42	<0.40	1.3	<0.36	0.62	3.3	0.55 J	<0.43	2.5	<0.36	<0.43	33	<0.60	<0.43
	07/24/07	0.54	<0.40	0.74	1.7	<0.33	<0.40	<0.42	<0.40	1.0	<0.36	0.63	3.4	<0.48	<0.43	2.6	<0.36	<0.43	25	<0.60	<0.43
	10/23/07	<0.39	<0.34	0.87	1.3	<0.38	<0.35	<0.30	<0.37	0.69	<0.36	0.46 J	5.1	2.4	<0.30	4.0	<0.32	<0.41	17	<0.59	<0.43
	01/22/08	<0.39	<0.34	1.0	0.98 J	<0.38	0.50 UJ	<0.30	<0.37	0.67	<0.36	0.51	5.7	1.5	<0.30	3.8	<0.32	<0.41	18	<0.59	<0.43
	04/17/08	<0.39	<0.44	1.1	1.0	<0.38	<0.35	<0.33	<0.37	0.50	<0.39	0.42	6.2	3.4	<0.30	5.1	<0.40	<0.41	17	<0.59	<0.47
	07/15/08	<1.0	<1.0	1.3	<1.0	<0.50	<1.0	<0.50	<1.0	<0.50	<1.0	<1.0	10	3.5	<10	7.6	<1.0	<1.0	6.0	<10	<0.50
	10/14/08	<0.26	<0.49	<0.27	0.66 J	<0.26	<0.36	<0.14	<1.0	0.34 J	<1.0	0.33 J	3.2	1.5	<10	2.7	<0.27	<0.38	12	<0.21	<0.50
	01/13/09	<0.45	<0.54	0.84 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	5.6	2.5	<2.6	3.1	<0.33	<0.40	4.5 J	<0.31	<0.33
	04/08/09	<0.45	<0.54	0.54 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	2.5	1.1	<2.6	2.2	<0.33	<0.40	4.9 J	<0.31	<0.33
	07/16/09	<0.45	<0.54	<0.37	1.1	<0.31	<0.38	<0.28	<0.69	0.83	<0.22	0.53 J	0.73 J	<0.49	<2.6	1.6	<0.33	<0.40	20	<0.31	<0.33
	10/13/09	4.6	<0.54	0.46 J	0.60 J	<0.31	<0.38	<0.28	<0.69	0.51 J	<0.22	0.44 J	1.6	0.49 J	<2.6	3.3	<0.33	<0.29	18	<0.31	<0.33
	02/11/10	0.79 J	--	0.99 J	2.2	<0.31	--	--	--	0.93 J	--	1.3	1.3	<0.49	--	1.2	<0.33	--	--	--	--
	02/11/10	0.75 J	--	0.92 J	2.1	<0.31	--	--	--	0.83 J	--	1.2	1.2	<0.49	--	1.2	<0.33	--	--	--	--
	05/13/10	0.66 J	<0.54	1.6	1.1	<0.31	<0.38	<0.28	<0.69	0.57 J	<0.22	0.89 J	5.5	1.2	<2.6	4.2	<0.33	<0.29	25	<0.31	<0.33
	08/13/10	<0.45	<0.54	1.8	1.6	<0.31	--	<0.28	--	<0.43	--	0.93 J	7.6	2	--	6.4	<0.33	<0.29	22	<0.31	--



Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-2	08/13/10	<0.45	<0.54	2	1.6	<0.31	--	<0.28	--	<0.43	--	0.94 J	7.6	2.1	--	6.8	<0.33	<0.29	22	<0.31	--
	12/09/10	0.47 J	<0.54	1.8	1.2	0.51	<0.38	<0.28	<0.69	<0.43	<0.22	0.69 J	9.5	2.7	<2.6	6.8	<0.33	<0.29	25	<0.31	<0.33
	12/09/10	<0.45	<0.54	1.6	1.1	0.46 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.62 J	8.5	2.4	<2.6	6.0	<0.33	<0.29	24	<0.31	<0.33
	02/03/11	<0.45	<0.54	1.9	<0.40	0.55	<0.38	<0.28	<0.69	<0.43	<0.22	0.37 J	12	4.3	<2.6	8.1	<0.33	<0.29	8.0	<0.31	<0.33
	02/03/11	<0.45	<0.54	1.8	<0.40	0.56	<0.38	<0.28	<0.69	<0.43	<0.22	0.38 J	11	4.2	<2.6	7.8	<0.33	<0.29	8.1	<0.31	<0.33
	04/07/11	<0.45	<0.54	1.9	<0.40	0.50	<0.38	<0.28	<0.69	<0.43	<0.22	0.50 J	11	3.7	<2.6	7.8	<0.33	<0.29	7.2	<0.31	<0.33
	08/04/11	<0.30	<0.38	1.8	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.7	3.4	<0.64	4.9	<0.24	<0.37	5.1	<1.7	<0.30
	10/13/11	<0.30	<0.38	1.4	<0.43	0.38 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.1	3.3	<0.64	7.1	<0.24	<0.37	4.3	<1.7	<0.30
	02/01/12	<0.30	<0.38	1.9	<0.43	0.45 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.7	3.1	1.2 U	8.8	<0.24	<0.37	4.6	<1.7	<0.30
	04/03/12	<0.30	<0.38	1.9	<0.43	0.32 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.6	3.5	<0.64	9.9	0.30 U	0.57 J	5.6	<1.7	<0.30
	08/16/12	<0.30	<0.38	0.64 J	0.58 J	<0.24	<0.42	<0.14	<0.48	0.33 J	<0.17	<0.46	2.7	<0.46	<0.64	3.4	<0.24	<0.37	17	<1.7	<0.30
	10/12/12	<0.30	<0.38	1.2	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.9	1.2	<0.64	5.3	<0.24	<0.37	6.6	<1.7	<0.30
	02/14/13	<0.30	<0.38	1.2	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.2	1.7	<0.64	5.4	<0.24	<0.37	4.3	<1.7	<0.30
	04/04/13	<0.30	<0.38	1.5	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.6	2.2	<0.64	5.9	<0.24	<0.37	4.6	<1.7	<0.30
	08/02/13	<0.30	<0.38	0.36 J	0.76 J	<0.24	<0.42	<0.14	<0.48	0.46 J	<0.17	0.76 J	0.85 J	<0.46	<0.64	2.7	<0.24	<0.37	17	<1.7	<0.30
	10/17/13	<0.30	<0.38	0.36 J	0.44 J	<0.24	<0.42	<0.14	<0.48	0.30 J	<0.17	0.51 J	1.2	<0.46	1.2 J	1.5	<0.24	<0.37	9.9	<1.7	<0.30
	02/13/14	<0.30	<0.38	<0.28	0.83 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.86 J	<0.48	<0.46	<0.64	0.75 J	<0.24	<0.37	20	<1.7	<0.30
	04/03/14	<0.30	<0.38	0.29 J	0.74 J	<0.24	<0.42	<0.14	<0.48	0.77 J	<0.17	0.83 J	<0.48	<0.46	<0.64	0.49 J	<0.24	<0.37	16	<1.7	<0.30
	07/31/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.0	<0.46	<0.64	0.90 J	<0.24	<0.37	3.5	<1.7	<0.30
	10/16/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.48 J	<0.24	<0.37	2.8	<1.7	<0.30
	02/20/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	0.56 J	<0.46	<0.64	2.1	<0.24	<0.37	18	<1.7	<0.30
	04/09/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.68 J	<0.46	<0.64	1.1	<0.24	<0.37	1.9	<1.7	<0.30
	04/09/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.65 J	<0.46	<0.64	1.3	<0.24	<0.37	1.9	<1.7	<0.30
07/31/15	<0.30	<0.38	0.48 J	0.45 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.47 J	1.4	<0.46	<0.64	2.3	<0.24	<0.37	3.5	<1.7	<0.30	
10/09/15	<0.30	<0.38	0.38 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.5	<0.46	<0.64	2.4	<0.24	<0.37	5.3	<1.7	<0.30	
10/09/15	<0.30	<0.38	0.49 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.58 J	1.5	<0.46	<0.64	2.2	<0.24	<0.37	5.3	<1.7	<0.30	
02/26/16	<0.30	<0.38	0.63 J	0.55 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.2	<0.46	<0.64	1.7	<0.24	<0.37	2.2	<1.7	<0.30	
GW-3	09/17/91	7.9	--	0.55	8.5	ND	--	--	--	2.0	--	--	0.80	ND	--	2.7	ND	--	100	--	<0.50
	01/16/92	ND	--	ND	ND	ND	--	--	--	ND	--	--	ND	ND	--	ND	ND	--	4.7	--	<0.50
	03/16/92	22	--	6.6	11	ND	--	--	--	ND	--	--	13	ND	--	ND	ND	--	620	--	<0.50
	05/19/92	7.5	--	1.5	6.6	ND	--	--	--	1.1	--	--	2.1	ND	--	2.0	ND	--	100	--	<0.50
	08/12/92	13	--	ND	13	ND	--	--	--	ND	--	--	2.8	ND	--	3.3	ND	--	240	--	<0.50
	01/14/93	<5.0	--	<5.0	<5.0	<5.0	--	--	--	<5.0	--	--	<5.0	<30	--	<5.0	<5.0	--	68	--	<0.50
	03/02/93	<5.0	--	<5.0	<5.0	<5.0	--	--	--	<5.0	--	--	<5.0	<30	--	<5.0	<5.0	--	47	--	<0.50
	06/18/93	<50	--	<50	<50	<50	--	--	--	<50	--	--	<50	<300	--	<50	<50	--	2,200	--	<0.50
	08/19/93	<1.0	--	<1.0	<1.0	<1.0	--	--	--	<1.0	--	--	<1.0	<5.0	--	2.2	<1.0	--	49	--	<0.50
	11/30/93	0.60	--	<0.20	0.40	<0.20	--	--	--	<0.20	--	--	<0.20	<1.0	--	1.6	0.20	--	15	--	<0.50
	02/16/94	0.31	--	<4.0	0.31	<4.0	--	--	--	<4.0	--	--	0.26	<20	--	<4.0	<4.0	--	15	--	<0.50
	05/18/94	<0.20	--	<0.20	<0.20	<0.20	--	--	--	<0.20	--	--	<0.20	<1.0	--	0.71	<0.20	--	6.0	--	<0.50
	08/16/94	21	--	<20	22	<20	--	--	--	<20	--	--	<20	<20	--	<20	<20	--	1,200	--	<0.50
	09/08/94	83	--	51	59	<50	--	--	--	<50	--	--	79	<300	--	<50	<50	--	4,300	--	<0.50
	12/13/94	1.4	--	<1.0	1.5	<1.0	--	--	--	<1.0	--	--	1.7	<5.0	--	2.4	<1.0	--	36	--	<0.50
	03/09/95	30	--	12	22	<10	--	--	--	<10	--	--	13	<30	--	<10	<10	--	1,300	--	<0.50
	09/21/95	<0.20	--	0.33	0.63	<0.20	--	--	--	0.84	--	--	1.3	1.6	--	2.2	<0.20	--	18	--	<0.50
11/20/95	0.36	--	0.64	0.61	<0.20	--	--	--	0.49	--	--	1.2	0.64	--	1.5	<0.20	--	15	--	<0.50	
12/19/95	6.6	--	0.98	11	<0.20	--	--	--	5.0	--	--	1.5	0.60	--	2.4	<0.20	--	160	--	<0.50	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-3	04/23/96	<0.50	<0.50	0.63	<0.50	<0.50	<0.50	--	<0.50	<0.50	<0.50	--	1.8	<0.50	--	2.2	13	<0.50	11	<0.50	<0.50
	07/09/96	2.6	<0.50	2.6	5.3	<0.50	<0.50	--	<0.50	3.2	<0.50	--	0.87	<0.50	--	1.6	5.8	<0.50	90	<0.50	<0.50
	10/10/96	16	<0.50	5.5	19	0.65	<0.50	--	<0.50	5.2	--	--	5.5	<0.50	--	4.6	3.6	<0.50	480	<0.50	<0.50
	12/18/96	9.1	<0.50	3.7	11	0.51	<0.50	--	<0.50	2.6	<0.50	--	7.1	<0.50	--	6.2	2.0	<0.50	250	<0.50	<0.50
	04/09/97	2.4	--	1.0	4.2	<0.50	--	--	--	1.3	--	--	4.2	0.60	--	3.7	<0.50	<0.50	60	--	<0.50
	06/11/03	6.9	<0.30	12	8.8	1.2	<0.35	--	<0.32	0.58	<0.36	--	24	7.2	--	15	<0.49	<0.27	200	<0.34	<0.50
	11/10/04	<1.0	<1.0	3.4	<1.0	0.86	<1.0	--	<1.0	<0.50	<1.0	--	23	6.0	--	14	<0.50	<1.0	21	<1.0	<0.50
	02/23/05	<1.0	<1.0	3.8	<1.0	1.3	<1.0	--	<1.0	<0.50	<1.0	<1.0	29	14	--	16	--	--	12	<1.0	<0.50
	05/24/05	<1.0	<1.0	4.4	<1.0	1.5	<1.0	--	<1.0	<0.50	<1.0	<1.0	34	14	--	16	<0.50	<1.0	16	<1.0	<0.50
	08/31/05	<0.23	<0.10	4.0	0.77	1.3	0.53	--	<0.24	<0.36	--	0.54	30	13	--	16	<0.10	<0.36	15	<0.47	<0.50
	11/29/05	<0.50	<0.50	3.8	0.72	1.4	0.51	--	<0.50	<0.50	--	0.54	29	12 J	--	18	<0.50	<0.50	16	<1.0	<0.50
	03/01/06	0.25 J	<0.50	3.0	1.1	0.95	<0.50	<0.50	<0.50	0.54	<0.50	0.59	20	9.5	<2.0	13	<0.50	<0.50	21	<1.0	<0.50
	05/24/06	<0.50	<0.50	2.2	0.84	0.89	0.31 J	<0.50	<0.50	0.52	18	0.46 J	18	11	<2.0	12	<0.50	<0.50	13	<1.0	<0.50
	08/16/06	7.6	0.20 J	7.1	23	0.80	<0.50	<0.50	<0.50	2.8	<0.50	5.4	20	3.9 J	<2.0	28	<0.50	0.24 J	630	1.0 UJ	0.50 UJ
	10/12/06	8.7	<1.0	7.3	20	1.4	<1.0	<0.50	<1.0	3.8	<1.0	5.8	18	<2.0	<5.0	30	<0.50	<1.0	720	<1.0	<0.50
	10/25/06	9.1	<0.50	7.4	28	1.2	<0.50	<0.50	<0.50	3.9	<0.50	5.8	21	1.7	<2.0	29	<0.50	<0.50	700	<1.0	<0.50
	01/24/07	1.9	<0.50	3.0	5.4	0.72	<0.50	<0.50	<0.50	1.5	<0.50	1.6	11	2.2	<2.0	8.4	<0.50	<0.50	150	1.0 UJ	<0.50
	04/18/07	1.9	<0.40	2.9	5.0	0.67	<0.40	<0.42	<0.40	1.5	<0.36	1.4	10	2.0	<0.43	7.0	<0.36	<0.43	110	1.0 UJ	<0.43
	07/26/07	2.8	<0.40	3.8	7.3	0.57	<0.40	<0.42	<0.40	1.6	<0.36	1.8	9.6	1.3	<0.43	8.8	<0.36	<0.43	120	<0.60	<0.43
	10/25/07	1.4	<0.34	2.4	4.1	0.47 J	<0.35	<0.30	<0.37	0.98	<0.36	1.2 UJ	9.7	2.7	<0.30	7.6	<0.32	<0.41	53	<0.59	<0.43
	01/22/08	1.4	<0.34	3.1	3.5	0.62 J	<0.35	<0.30	<0.37	0.92	<0.36	1.3	11	3.4 J	<0.30	8.0	<0.32	<0.41	57	<0.59	<0.43
	04/17/08	0.56	<0.44	2.0	2.0	0.50	<0.35	<0.33	<0.37	<0.46	<0.39	0.73	11	3.9	<0.30	8.3	<0.40	<0.41	31	<0.59	<0.47
	07/17/08	<1.0	<1.0	1.9	0.53 J	<0.50	<1.0	<0.50	<1.0	<0.50	<1.0	0.38 J	16	5.0	<1.0	10	<1.0	<1.0	12	<1.0	<0.50
	10/15/08	<0.26	<0.49	2.8	2.5	0.61	<0.36	<0.14	<1.0	<0.32	<1.0	1.0	9.6	2.5	<1.0	5.5	<0.27	<0.38	43	<0.21	<0.50
	01/15/09	<0.45	<0.54	2.0	0.84 J	0.67	<0.38	<0.28	<0.69	<0.43	<0.22	0.61 J	13	4.6	<2.6	7.2	<0.33	<0.40	15	<0.31	<0.33
	04/09/09	<0.45	<0.54	1.8	1.0	0.58	<0.38	<0.28	<0.69	0.49 J	<0.22	0.65 J	10	2.1	<2.6	5.6	<0.33	<0.40	18	<0.31	<0.33
	07/17/09	1.5	<0.54	3.3	5.3	<0.31	<0.38	<0.28	<0.69	0.95	<0.22	1.4	5.4	1.6	<2.6	5.1	<0.33	<0.40	70	<0.31	<0.33
	10/15/09	1.3	<0.54	2.8	3.3	0.46 J	<0.38	<0.28	<0.69	0.67 J	<0.22	1.6	6.0	1.8	<2.6	4.6	<0.33	<0.29	54	<0.31	<0.33
	02/12/10	6	--	6.4	12	<0.31	--	--	--	1.1	--	2.9	4	<0.49	--	4.4	<0.33	--	--	--	--
	05/14/10	1.9	<0.54	0.43 J	4.3	<0.31	<0.38	<0.28	<0.69	0.49 J	<0.22	<0.33	<0.28	<0.49	<2.6	1.9	<0.33	<0.29	16	<0.31	<0.33
	08/12/10	1.8	<0.54	<0.37	4.6	<0.31	--	<0.28	--	0.56 J	--	0.34 J	<0.28	<0.49	--	5.6	<0.33	<0.29	20	<0.31	--
	12/09/10	1.2	<0.54	<0.37	3.6	<0.31	<0.38	<0.28	<0.69	0.43 J	<0.22	<0.33	<0.28	<0.49	<2.6	2.8	<0.33	<0.29	29	<0.31	<0.33
	12/09/10	1.1	<0.54	<0.37	3.2 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	2.5	<0.33	<0.29	26	<0.31	<0.33
	02/03/11	1.2	<0.54	0.44 J	4.0	<0.31	<0.38	<0.28	<0.69	0.63 J	<0.22	0.38 J	0.30 J	<0.49	<2.6	2.0	<0.33	<0.29	24	<0.31	<0.33
	02/03/11	1.3	<0.54	0.51 J	4.0	<0.31	<0.38	<0.28	<0.69	0.59 J	<0.22	0.39 J	<0.28	<0.49	<2.6	1.9	<0.33	<0.29	24	<0.31	<0.33
	04/08/11	<0.45	<0.54	2.3	<0.40	0.76	<0.38	<0.28	<0.69	<0.43	<0.22	0.43 J	15	5.6	<2.6	7.6	<0.33	0.30 J	7.5	<0.31	<0.33
	04/08/11	<0.45	<0.54	2.5	<0.40	0.71	<0.38	<0.28	<0.69	<0.43	<0.22	0.45 J	16	5.7	<2.6	8.0	<0.33	0.32 J	7.9	<0.31	<0.33
	08/05/11	<0.30	<0.38	2.2	<0.43	0.79	<0.42	<0.14	<0.48	<0.23	<0.17	0.49 J	15	6.7	<0.64	7.7	<0.24	<0.37	14	<1.7	<0.30
	08/05/11	<0.30	<0.38	2.2	<0.43	0.73	<0.42	<0.14	<0.48	<0.23	<0.17	0.47 J	15	6.4	<0.64	7.8	<0.24	<0.37	14	<1.7	<0.30
	10/13/11	0.61 J	<0.38	1.3	2.5	0.35 J	<0.42	<0.14	<0.48	0.82 J	<0.17	1.1	4.2	1.4	<0.64	5.0	<0.24	<0.37	51	<1.7	<0.30
	10/13/11	0.65 J	<0.38	1.3	2.3	0.49 J	<0.42	<0.14	<0.48	0.78 J	<0.17	1.1	4.6	1.5	<0.64	4.9	<0.24	<0.37	50	<1.7	<0.30
	02/02/12	<0.30	<0.38	2.0	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	13	4.7	<0.64	6.7	<0.24	<0.37	5.5	<1.7	<0.30
	02/02/12	<0.30	<0.38	2.0	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	13	4.6	<0.64	6.6	<0.24	<0.37	5.5	<1.7	<0.30
	04/05/12	<0.30	<0.38	0.66 J	0.78 J	<0.24	<0.42	<0.14	<0.48	0.42 J	<0.17	<0.46	3.1	1.0	<0.64	3.6	<0.24	<0.37	24	<1.7	<0.30
	04/05/12	<0.30	<0.38	0.35 J	0.53 J	<0.24	<0.42	<0.14	<0.48	0.29 J	<0.17	<0.46	1.9	0.91 J	<0.64	2.3	<0.24	<0.37	15	<1.7	<0.30
	08/17/12	0.74 J	<0.38	0.65 J	2.2	<0.24	<0.42	<0.14	<0.48	1.4	<0.17	1.6	2.1	<0.46	<0.64	7.8	<0.24	<0.37	110	<1.7	<0.30

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-3	08/17/12	0.85 J	<0.38	0.70 J	4.3	<0.24	<0.42	<0.14	<0.48	1.4	<0.17	1.7	2.1	<0.46	<0.64	7.6	<0.24	<0.37	110	<1.7	<0.30
	10/11/12	<0.30	<0.38	1.2	<0.43	0.42 J	<0.42	<0.14	<0.48	0.28 J	<0.17	0.52 J	6.0	2.2	<0.64	8.2	<0.24	<0.37	14	<1.7	<0.30
	10/11/12	<0.30	<0.38	1.1	<0.43	0.42 J	<0.42	<0.14	<0.48	0.25 J	<0.17	<0.46	5.6	2.2	<0.64	8.1	<0.24	<0.37	14	<1.7	<0.30
	02/15/13	<0.30	<0.38	0.39 J	1.7	<0.24	<0.42	<0.14	<0.48	0.67 J	<0.17	0.75 J	1.5	<0.46	<0.64	2.6	<0.24	<0.37	38	<1.7	<0.30
	02/15/13	<0.30	<0.38	0.40 J	1.7	<0.24	<0.42	<0.14	<0.48	0.70 J	<0.17	0.86 J	1.4	<0.46	<0.64	2.7	<0.24	<0.37	37	<1.7	<0.30
	04/04/13	<0.30	<0.38	1.3	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.74 J	6.5	2.0	<0.64	4.7	<0.24	<0.37	15	<1.7	<0.30
	07/31/13	0.35 J	<0.38	0.48 J	2.4	<0.24	<0.42	<0.14	<0.48	0.75 J	<0.17	1.1	1.0	<0.46	<0.64	1.5	<0.24	<0.37	52	<1.7	<0.30
	10/16/13	<0.30	<0.38	0.59 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.49 J	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	5.6	<1.7	<0.30
	02/11/14	<0.30	<0.38	0.44 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.65 J	<0.46	<0.64	0.57 J	<0.24	<0.37	5.2	<1.7	<0.30
	04/02/14	<0.30	<0.38	0.31 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	5.5	<1.7	<0.30
	07/30/14	<0.30	<0.38	<0.28	0.44 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	2.9	<1.7	<0.30
	10/14/14	<0.30	<0.38	<0.28	0.67 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.90 J	<0.46	<0.64	1.3	<0.24	<0.37	6.7	<1.7	<0.30
	02/20/15	<0.30	<0.38	0.41 J	0.55 J	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	1.1	<0.46	<0.64	1.5	<0.24	<0.37	11	<1.7	<0.30
	04/09/15	<0.30	<0.38	0.32 J	0.61 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.99 J	<0.46	<0.64	1.7	<0.24	<0.37	4.5	<1.7	<0.30
	07/31/15	<0.30	<0.38	0.66 J	0.97 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.0	<0.46	<0.64	1.3	<0.24	<0.37	9.0	<1.7	<0.30
10/06/15	<0.30	<0.38	0.71 J	1.5	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.0	<0.46	<0.64	1.1	<0.24	<0.37	5.1	<1.7	<0.30	
02/24/16	<0.30	<0.38	1.5	1.9	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.87 J	<0.46	<0.64	1.1	<0.24	<0.37	5.9	<1.7	<0.30	
GW-4	08/19/91	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	1.5	--	<0.50
	01/15/92	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	<0.50	--	<0.50
	03/18/92	0.59	--	<0.50	1.2	--	--	--	--	0.73	--	--	<0.50	<0.50	--	<0.50	<0.50	--	10	--	<0.50
	05/19/92	<0.50	--	<0.50	1.0	--	--	--	--	0.75	--	--	<0.50	<0.50	--	<0.50	<0.50	--	4.7	--	<0.50
	08/10/92	<0.50	--	<0.50	0.60	--	--	--	--	0.68	--	--	<0.50	<0.50	--	<0.50	<0.50	--	3.9	--	<0.50
	01/16/93	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.53	<0.50	--	1.4	--	<0.50
	03/03/93	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	2.5	--	<0.50
	06/18/93	<0.50	--	<0.50	1.7	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.60	<0.50	--	20	--	<0.50
	08/19/93	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	<0.20	<0.20	--	0.32	<0.20	--	1.0	--	<0.50
	11/30/93	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	<0.20	<0.20	--	0.30	<0.20	--	0.60	--	<0.50
	02/18/94	5.0	--	<1.0	6.7	--	--	--	--	1.2	--	--	<1.0	<1.0	--	1.2	<1.0	--	65	--	<0.50
	05/17/94	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	<0.20	<0.20	--	0.22	<0.20	--	0.63	--	<0.50
	08/16/94	11	--	<2.0	<2.0	--	--	--	--	2.1	--	--	<2.0	<2.0	--	<2.0	<2.0	--	130	--	<0.50
	09/08/94	8.0	--	<2.0	8.5	--	--	--	--	<2.0	--	--	<2.0	<5.0	--	<2.0	<2.0	--	100	--	<0.50
	12/12/94	0.60	--	<0.20	1.0	--	--	--	--	0.20	--	--	0.50	<0.50	--	0.80	0.40	--	12	--	<0.50
	03/08/95	2.2	--	<1.0	3.2	--	--	--	--	<1.0	--	--	<1.0	<3.0	--	1.2	<1.0	--	41	--	<0.50
	09/20/95	0.22	--	<0.20	6.4	--	--	--	--	<0.20	--	--	1.1	0.41	--	1.8	<1.0	--	4.7	--	<0.50
	11/22/95	0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	0.51	0.52	--	0.98	<0.20	--	5.1	--	<0.50
	12/19/95	0.40	--	0.62	0.84	--	--	--	--	0.26	--	--	3.8	0.54	--	3.2	<0.20	--	10	--	<0.50
	04/25/96	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	1.6	<0.50	--	1.7	41	--	4.0	--	<0.50
	07/11/96	2.7	--	1.0	4.2	--	--	--	--	1.2	--	--	7.0	<0.50	--	5.0	18	--	250	--	<0.50
	10/09/96	0.96	--	1.2	2.1	--	--	--	--	1.0	--	--	7.4	<0.50	--	6.6	1.7	--	23	--	<0.50
	12/18/96	4.8	--	0.64	9.1	--	--	--	--	3.2	--	--	1.3	<0.50	--	3.5	12	--	140	--	<0.50
	04/08/97	<0.50	--	1.2	0.60	<0.50	--	--	--	<0.50	--	--	<0.50	1.2	--	4.7	<0.50	<0.50	11	--	<0.50
11/12/04	<1.0	<1.0	3.7	<1.0	1.1	<1.0	--	<1.0	<0.50	<1.0	--	23	13	--	15	<0.50	<1.0	12	<1.0	<0.50	
02/25/05	<1.0	<1.0	3.9	<1.0	1.0	<1.0	--	<1.0	<0.50	<1.0	<1.0	27	14	--	14	<0.50	<1.0	12	<1.0	<0.50	
05/26/05	<1.0	<1.0	3.9	<1.0	1.0	<1.0	--	<1.0	<0.50	<1.0	<1.0	22	10	--	11	<0.50	<1.0	9.4	<1.0	<0.50	
09/01/05	<0.23	<0.10	4.2	<0.26	1.1	0.40	--	<0.24	<0.36	--	0.56	27	11	--	15	<0.10	0.39	10	<0.47	<0.50	
11/30/05	<0.50	<0.50	3.7	<0.50	0.98	<0.50	--	<0.50	<0.50	<0.50	0.50	23	14 J	--	16	<0.50	<0.50	11	<1.0	<0.50	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-4	03/03/06	<0.50	<0.50	4.1	<0.50	0.98	0.42 J	<0.50	<0.50	<0.50	<0.50	0.52	25	13	<2.0	16	<0.50	<0.50	10	<1.0	<0.50
	05/26/06	<0.50	<0.50	4.4	<0.50	1.0	0.52	<0.50	<0.50	<0.50	<0.50	0.50	29	12	<0.25	19	<0.50	0.29	12	<1.0	<0.50
	08/18/06	3.1	<0.50	2.8	7.7	0.44 J	0.19 J	<0.50	<0.50	0.97	<0.50	1.1	8.8	0.43 J	<2.0	11	<0.50	<0.50	76	<1.0	<0.50
	10/12/06	3.2	<1.0	2.8	5.6	0.54	<1.0	<0.50	<1.0	1.0	<1.0	1.3	11	<2.0	<5.0	8.2	<0.50	<1.0	63	<1.0	<0.50
	10/26/06	3.1	<0.50	2.6	7.7	0.45 J	<0.50	<0.50	<0.50	1.2	<0.50	1.4	10	<1.0	<2.0	14	<0.50	<0.50	73	<1.0	<0.50
	01/26/07	2.1	<0.50	1.2	5.2	<0.50	<0.50	<0.50	<0.50	0.99	<0.50	0.92	5.3	1.0 UJ	<2.0	6.1	<0.50	<0.50	33	<1.0	<0.50
	04/20/07	0.93	<0.40	0.67	3.0	<0.33	<0.40	<0.42	<0.40	0.56	<0.36	0.57	3.8	<0.48	<0.43	10	<0.36	<0.43	24	<0.60	<0.43
	07/27/07	0.75	<0.40	0.46 J	2.1	0.46 J	<0.40	<0.42	<0.40	<0.48	<0.36	0.59	2.4	<0.48	<0.43	5.1	<0.36	<0.43	12	<0.60	<0.43
	10/26/07	0.75	<0.34	0.38 J	2.0	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	0.62 UJ	2.2	<0.68	<0.30	3.9	<0.32	<0.41	7.3	<0.59	<0.43
	01/24/08	0.71	<0.34	0.42 J	1.5	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	0.83	1.9	<1.0 J	<0.30	3.6	<0.32	<0.41	7.2	<0.59	<0.43
	04/18/08	0.52	<0.44	0.49	1.4	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	0.66	2.6	0.72	<0.30	4.4	<0.40	<0.41	7.2	<0.59	<0.47
	07/17/08	<1.0	<1.0	3.1	<1.0	0.83	<1.0	<0.50	<1.0	<0.50	<1.0	0.45 J	21	4.6	<1.0	6.5	<1.0	1.2	7.6	<1.0	<0.50
	10/16/08	<0.26	<0.49	0.62 J	1.1	<0.26	<0.36	<0.14	<1.0	<0.32	<1.0	<0.24	3.3	1.4	<1.0	2.9	<0.27	<0.38	6.0	<0.21	<0.50
	01/15/09	<0.45	<0.54	2.9	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.48 J	17	6.1	<2.6	5.8	<0.33	<0.40	6.7	<0.31	<0.33
	04/09/09	<0.45	<0.54	1.9	<0.40	0.62	<0.38	<0.28	<0.69	<0.43	<0.22	0.37 J	14	1.5	<2.6	5.5	<0.33	0.95 J	6.7	<0.31	<0.33
	07/16/09	<0.45	<0.54	<0.37	0.83 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.75 J	1.1	<0.49	<2.6	2.0	<0.33	<0.40	4.5	<0.31	<0.33
	10/14/09	2.2	<0.54	2.3	4.2	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.81 J	2.2	<0.49	<2.6	2.4	<0.33	<0.29	19	<0.31	<0.33
	02/10/10	1.9	--	2.7	4.1	<0.31	--	--	--	<0.43	--	0.62 J	1.7	<0.49	--	2.3	<0.33	--	--	--	--
	05/12/10	2.9	<0.54	3.5	7.5	<0.31	<0.38	<0.28	<0.69	0.43 J	<0.22	0.89 J	0.74 J	<0.49	<2.6	2.3	<0.33	<0.29	19	<0.31	<0.33
	08/11/10	1.2	<0.54	1.7	2.7	<0.31	--	<0.28	--	<0.43	--	0.34 J	<0.28	<0.49	--	0.97 J	<0.33	<0.29	7.5	<0.31	--
	12/08/10	1.3	<0.54	1.9	3.2	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.39 J	<0.28	<0.49	<2.6	1.5	<0.33	<0.29	8.8	<0.31	<0.33
	02/02/11	1.2	<0.54	2.0	3.1	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	1.0	<0.33	<0.29	7.2	<0.31	<0.33
	04/06/11	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	<0.51	<0.33	<0.29	0.47 J	<0.31	<0.33
	08/03/11	<0.30	<0.38	0.40 J	1	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	0.73 J	<0.24	<0.37	1.9	<1.7	<0.30	<0.30
	10/12/11	<0.30	<0.38	1.2	1.3	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.58 J	<0.24	<0.37	3.4	<1.7	<0.30
	02/02/12	<0.30	<0.38	0.53 J	1.1	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.82 J	<0.24	<0.37	1.9	<1.7	<0.30
	04/04/12	0.58 J	<0.38	1.2	0.56 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	1.5	0.83 J	<0.37	3.5	<1.7	<0.30
	08/15/12	0.81 J	<0.38	2.0	1.5	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.75 J	<0.24	<0.37	5.5	<1.7	<0.30
	10/10/12	0.68 J	<0.38	1.7	1.9	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.70 J	<0.24	<0.37	4.7	<1.7	<0.30
	02/13/13	1.1	<0.38	2	1.2	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.91 J	<0.24	<0.37	7.9	<1.7	<0.30
	04/03/13	0.78 J	<0.38	1.7	1.3	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.70 J	<0.24	<0.37	5.1	<1.7	<0.30
	07/31/13	0.58 J	<0.38	1.5	1.6	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.60 J	<0.24	<0.37	5.7	<1.7	<0.30
	10/16/13	0.70 J	<0.38	1.9	1.9	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.55 J	<0.24	<0.37	6.8	<1.7	<0.30
02/12/14	0.41 J	<0.38	1.6	1.7	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.75 J	<0.24	<0.37	4.3	<1.7	<0.30	
04/03/14	0.35 J	<0.38	1.4	1.2	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.52 J	<0.24	<0.37	3.8	<1.7	<0.30	
07/31/14	0.59 J	<0.38	1.8	2.2	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.48 J	<0.48	<0.46	<0.64	0.80 J	<0.24	<0.37	7.7	<1.7	<0.30	
10/15/14	<0.30	<0.38	0.62 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	0.70 J	<1.7	<0.30	
02/19/15	<0.30	<0.38	0.48 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	<0.48	0.51 J	<0.64	<0.39	<0.24	<0.37	0.96 J	<1.7	<0.30	
04/08/15	<0.30	<0.38	0.49 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	0.97 J	<1.7	<0.30	
07/30/15	<0.30	<0.38	0.53 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	1.6	<1.7	<0.30	
10/06/15	<0.30	<0.38	0.67 J	0.57 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	1.3	<1.7	<0.30	
02/25/16	<0.30	<0.38	1.1	1.0 J	0.30 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.50 J	<0.24	<0.37	2.3	<1.7	<0.30	
GW-5	09/17/91	<0.50	--	<0.50	<0.50	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	<0.50	--	<0.50	
	01/15/92	<0.50	--	<0.50	<0.50	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	<0.50	--	<0.50	
	03/18/92	<0.50	--	<0.50	<0.50	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	<0.50	--	<0.50	
	05/20/92	<0.50	--	<0.50	<0.50	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.52	<0.50	--	0.69	--	<0.50	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-5	08/12/92	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	0.51	--	<0.50
	01/16/93	0.51	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.85	<0.50	--	0.59	--	<0.50
	03/02/93	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.90	<0.50	--	0.55	--	<0.50
	06/18/93	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.69	<0.50	--	0.51	--	<0.50
	08/18/93	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	<0.20	<0.20	--	0.77	<0.20	--	0.40	--	<0.50
	11/30/93	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	0.63	<0.20	--	0.97	<0.20	--	0.78	--	<0.50
	02/18/94	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	<0.20	<0.20	--	0.66	<0.20	--	0.97	--	<0.50
	05/17/94	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	0.94	<0.20	--	1.0	<0.20	--	0.77	--	<0.50
	08/16/94	0.96	--	<0.20	0.79	--	--	--	--	0.67	--	--	0.51	<0.20	--	0.98	0.25	--	6.4	--	<0.50
	09/08/94	0.70	--	<0.20	0.90	--	--	--	--	0.50	--	--	0.30	<0.20	--	0.70	<0.20	--	6.0	--	<0.50
	12/10/94	<0.20	--	<0.20	<0.20	--	--	--	--	<0.20	--	--	1.0	2.4	--	1.1	<0.20	--	1.6	--	<0.50
	03/08/95	<0.20	--	<0.50	<0.20	--	--	--	--	<0.20	--	--	0.30	<0.50	--	0.50	<0.20	--	1.5	--	<0.50
	09/20/95	<0.20	--	0.25	<0.20	--	--	--	--	<0.20	--	--	1.5	9.6	--	3.0	<0.20	--	3.2	--	<0.50
	11/21/95	0.79	--	0.27	0.23	--	--	--	--	<0.20	--	--	0.83	2.6	--	1.1	0.23	--	2.3	--	<0.50
	12/20/95	<0.20	--	0.33	0.27	--	--	--	--	<0.20	--	--	1.5	4.9	--	2.0	<0.20	--	9.0	--	<0.50
	04/24/96	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	1.3	2.5	--	2.4	39	--	4.1	--	<0.50
	07/10/96	1.0	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	2.8	1.3	--	2.8	9.6	--	14	--	<0.50
	10/09/96	<0.50	--	0.58	<0.50	--	--	--	--	<0.50	--	--	3.0	<0.50	--	3.2	0.64	--	3.4	--	<0.50
	12/18/96	<0.50	--	<0.50	<0.50	--	--	--	--	<0.50	--	--	1.4	<0.50	--	1.9	4.5	--	3.8	--	<0.50
	04/08/97	<0.50	--	0.50	<0.50	<0.50	--	--	--	<0.50	--	--	3.5	4.1	--	4.0	<0.50	<0.50	5.2	--	<0.50
	11/12/04	<1.0	<1.0	3.9	<1.0	0.88	<1.0	--	<1.0	<0.50	<1.0	--	21	9.3	--	17	<0.50	<1.0	11	<1.0	<0.50
	02/25/05	<1.0	<1.0	5.6	<1.0	1.3	<1.0	--	<1.0	<0.50	<1.0	<1.0	34	18	--	18	<0.50	<1.0	15	<1.0	<0.50
	05/25/05	<1.0	<1.0	5.3	<1.0	1.5	<1.0	--	<1.0	<0.50	<1.0	<1.0	28	15	--	17	<0.50	<1.0	10	<1.0	<0.50
	09/01/05	<0.23	<0.10	5.4	<0.26	1.3	0.45	--	<0.24	<0.36	--	0.53	32	19	--	18	0.50 U	0.41	11	0.56	<0.50
	11/30/05	<0.50	<0.50	4.3	<0.50	1.2	<0.50	--	<0.50	<0.50	<0.50	<0.50	23	17 J	--	20	<0.50	<0.50	9.4	<1.0	<0.50
	03/03/06	<0.50	<0.50	4.9	<0.50	1.2	0.49 J	<0.50	<0.50	<0.50	<0.50	0.49 J	27	19	<2.0	19	<0.50	<0.50	9.7	<1.0	<0.50
	05/26/06	<0.50	<0.50	4.7	<0.50	1.2	0.48 J	<0.50	<0.50	<0.50	<0.50	0.42 J	29	15	<2.0	20	<0.50	0.27	12	<1.0	<0.50
	08/18/06	<0.50	<0.50	4.4	0.36 J	1.0	0.51	<0.50	<0.50	<0.50	<0.50	0.44 J	28	16	<2.0	26	<0.50	0.34 J	18	<1.0	<0.50
	10/26/06	1.2	<0.50	2.8	1.9	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.51	12	11 J	<2.0	19	<0.50	<0.50	21	<1.0	<0.50
	01/26/07	<0.50	<0.50	4.2	0.59	0.93	0.52	<0.50	<0.50	<0.50	<0.50	0.41 J	24	12 J	<2.0	19	<0.50	<0.50	12	<1.0	<0.50
	04/20/07	1.1	<0.40	2.4	2.4	0.46 J	<0.40	<0.42	<0.40	<0.48	<0.36	0.42 J	12	3.1	<0.43	18	<0.36	<0.43	30	<0.60	<0.43
	07/26/07	0.91	<0.40	2.4	1.9	0.49 J	<0.40	<0.42	<0.40	<0.48	<0.36	0.42 J	11	2.0	<0.43	10	<0.36	<0.43	15	<0.60	<0.43
	10/25/07	1.2	<0.34	2.8	2.1	0.59	<0.35	<0.30	<0.37	<0.43	<0.36	0.54 UJ	10	1.7	<0.30	9.7	<0.32	<0.41	8.6	<0.59	<0.43
	01/24/08	<0.39	<0.34	4.2	0.74	0.94 J	0.39 J	<0.30	<0.37	<0.43	<0.36	0.46 J	20	7.8 J	<0.30	13	<0.32	<0.41	12	<0.59	<0.43
	04/17/08	<0.39	<0.44	3.5	<0.43	0.67	<0.35	<0.33	<0.37	<0.46	<0.39	0.37	19	8.4	<0.30	14	<0.40	<0.41	9.7	<0.59	<0.47
	07/17/08	<1.0	<1.0	3.6	<1.0	0.82	<1.0	<0.50	<1.0	<0.50	<1.0	0.34 J	22	6.3	<1.0	7.8	<1.0	0.53 J	7.5	<1.0	<0.50
	10/16/08	<0.26	<0.49	3.4	0.64 J	0.73	<0.36	<0.14	<1.0	<0.32	<1.0	<0.24	18	7.7	<1.0	7.9	<0.27	0.47 J	8.8	<0.21	<0.50
	01/15/09	<0.45	<0.54	3.3	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	19	9.1	<2.6	7.7	<0.33	<0.40	6.2	<0.31	<0.33
	04/09/09	<0.45	<0.54	3.6	<0.40	0.97	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	20	4.0	<2.6	8.8	<0.33	0.49 J	7.9	<0.31	<0.33
	07/16/09	2.1	<0.54	3.3	3.7	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.46 J	3.5	1.1	<2.6	3.2	<0.33	<0.40	10	<0.31	<0.33
	10/14/09	1.4	<0.54	2.5	2.7	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.61 J	2.5	1.0	<2.6	2.4	<0.33	<0.29	7.4	<0.31	<0.33
	02/10/10	0.80 J	--	1.5	1.8	<0.31	--	--	--	<0.43	--	<0.33	0.70 J	<0.49	--	1.3	<0.33	--	--	--	--
	05/12/10	0.48 J	<0.54	1.1	1.1	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	2.4	0.78 J	<2.6	1.7	<0.33	<0.29	2.5	<0.31	<0.33
	05/12/10	0.45 J	<0.54	1.1	1.2	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	2.4	0.80 J	<2.6	1.7	<0.33	<0.29	2.6	<0.31	<0.33
08/11/10	<0.45	<0.54	<0.37	<0.40	<0.31	--	<0.28	--	<0.43	--	<0.33	<0.28	<0.49	--	0.51 J	<0.33	<0.29	1.1	<0.31	--	
08/11/10	<0.45	<0.54	<0.37	<0.40	<0.31	--	<0.28	--	<0.43	--	<0.33	<0.28	<0.49	--	0.57 J	<0.33	<0.29	1.1	<0.31	--	



Well/Barcad ID	Sample Date	Concentrations (µg/L)																				
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride	
GW-5	12/08/10	<0.45	<0.54	0.43 J	0.40 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.87 J	<0.33	<0.29	1.5	<0.31	<0.33	
	12/08/10	<0.45	<0.54	0.43 J	0.41 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.83 J	<0.33	<0.29	1.4	<0.31	<0.33	
	02/02/11	<0.45	<0.54	0.47 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.52 J	<0.33	<0.29	1.1	<0.31	<0.33	
	02/02/11	<0.45	<0.54	0.47 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.55 J	<0.33	<0.29	1.0	<0.31	<0.33	
	04/06/11	<0.45	<0.54	1.4	1.1	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	5.2	2.3	<2.6	2.2	<0.33	<0.29	3.4	<0.31	<0.33	
	08/03/11	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	0.38 J	<1.7	<0.30	
	10/12/11	<0.30	<0.38	0.71 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.48 J	<0.24	<0.37	1.2	<1.7	<0.30	
	02/02/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.94 J	<0.24	<0.37	0.67 J	<1.7	<0.30	
	04/04/12	<0.30	<0.38	0.30 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	1.1	0.57 J	<0.24	<0.37	0.62 J	<1.7	<0.30
	08/15/12	<0.30	<0.38	0.36 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	<0.37	<1.7	<0.30	
	10/10/12	<0.30	<0.38	0.39 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	0.76 J	<1.7	<0.30	
	02/13/13	<0.30	<0.38	0.68 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	1.8	<1.7	<0.30	
	04/03/13	<0.30	<0.38	0.81 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.51 J	<0.46	<0.64	0.40 J	<0.24	<0.37	0.76 J	<1.7	<0.30	
	07/31/13	<0.30	<0.38	0.72 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	1.4	<1.7	<0.30	
	10/16/13	<0.30	<0.38	0.80 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	0.54 J	<1.7	<0.30	
	02/12/14	<0.30	<0.38	0.74 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.57 J	<0.48	0.74 J	<0.64	<0.39	<0.24	<0.37	0.54 J	<1.7	<0.30	
	04/03/14	<0.30	<0.38	0.70 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.51 J	<0.48	0.70 J	<0.64	<0.39	<0.24	<0.37	0.85 J	<1.7	<0.30	
	07/31/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	0.76 J	<0.64	<0.39	<0.24	<0.37	0.69 J	<1.7	<0.30	
	10/15/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	0.62 J	<0.64	<0.39	<0.24	<0.37	<0.37	<1.7	<0.30	
	02/19/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	<0.48	0.53 J	<0.64	<0.39	<0.24	<0.37	0.49 J	<1.7	<0.30	
04/08/15	<0.30	<0.38	0.42 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	0.47 J	<0.64	<0.39	<0.24	<0.37	<0.37	<1.7	<0.30		
07/30/15	<0.30	<0.38	0.69 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.81 J	<0.46	<0.64	0.64 J	<0.24	<0.37	1.0	<1.7	<0.30		
10/06/15	<0.30	<0.38	0.49 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	<0.37	<1.7	<0.30		
02/25/16	<0.30	<0.38	0.45 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	0.47 J	<1.7	<0.30		
GW-6	09/19/91	--	--	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	0.77	--	<0.50		
	01/16/92	--	--	<0.50	--	--	--	--	<0.50	--	--	0.65	<0.50	--	1.1	<0.50	--	1.2	--	<0.50		
	03/17/92	--	--	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.98	<0.50	--	1.8	--	<0.50		
	05/20/92	--	--	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	0.85	--	<0.50		
	08/11/92	--	--	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	--	0.52	--	<0.50		
	01/14/93	--	--	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.95	<0.50	--	1.7	--	<0.50		
	03/03/93	--	--	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	1.6	<0.50	--	1.7	--	<0.50		
	06/17/93	--	--	<0.20	--	--	--	--	<0.20	--	--	0.50	<0.20	--	1.1	<0.20	--	1.2	--	<0.50		
	08/18/93	--	--	<0.20	--	--	--	--	<0.20	--	--	0.36	<0.20	--	0.87	<0.20	--	0.84	--	<0.50		
	11/30/93	--	--	<0.20	--	--	--	--	<0.20	--	--	0.40	<0.20	--	1.2	<0.20	--	1.2	--	<0.50		
	02/18/94	--	--	<0.20	--	--	--	--	<0.20	--	--	0.56	<0.20	--	0.94	<0.20	--	1.2	--	<0.50		
	05/16/94	--	--	<0.20	--	--	--	--	<0.20	--	--	0.33	<0.20	--	0.81	<0.20	--	0.95	--	<0.50		
	08/16/94	--	--	<0.20	--	--	--	--	<0.20	--	--	0.60	<0.20	--	0.81	<0.20	--	1.5	--	<0.50		
	09/08/94	--	--	<0.20	--	--	--	--	0.40	--	--	0.40	<0.20	--	0.70	<0.20	--	1.1	--	<0.50		
	12/08/94	--	--	<0.20	--	--	--	--	0.30	--	--	0.40	<0.20	--	0.90	<0.20	--	0.70	--	<0.50		
	03/08/95	--	--	<0.20	--	--	--	--	<0.20	--	--	1.0	<0.20	--	1.7	<0.20	--	1.2	--	<0.50		
	09/20/95	--	--	<0.20	--	--	--	--	<0.20	--	--	<0.20	<0.20	--	<0.20	<0.20	--	<0.20	--	<0.50		
	11/20/95	--	--	0.56	--	--	--	--	<0.20	--	--	2.3	2.5	--	2.3	0.33	--	2.7	--	<0.50		
	12/18/95	--	--	0.42	--	--	--	--	<0.20	--	--	1.9	1.9	--	1.9	<0.20	--	2.3	--	<0.50		
	04/23/96	--	--	0.93	--	--	--	--	<0.50	--	--	4.7	2.5	--	4.8	43	--	4.2	--	<0.50		
07/09/96	--	--	0.95	--	--	--	--	<0.50	--	--	6.2	0.96	--	3.8	20	--	4.0	--	<0.50			
10/08/96	--	--	<0.50	--	--	--	--	<0.50	--	--	2.7	<0.50	--	2.5	1.1	--	2.7	--	<0.50			

Well/Barcad ID	Concentrations (µg/L)																				
	Sample Date	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-6	12/17/96	--	--	<0.50	--	--	--	--	--	<0.50	--	--	1.3	<0.50	--	1.7	1.2	--	1.4	--	<0.50
	04/07/97	<0.50	--	0.60	<0.50	<0.50	--	--	--	<0.50	--	--	3.8	2.5	--	2.8	0.50	<0.50	2.5	--	<0.50
	11/08/04	<1.0	<1.0	2.0	<1.0	0.51	<1.0	--	<1.0	<0.50	<1.0	--	13	<2.0	--	7.4	<0.50	<1.0	5.2	<1.0	<0.50
	02/22/05	<1.0	<1.0	4.8	<1.0	1.3	<1.0	--	<1.0	<0.50	<1.0	<1.0	28	14	--	17	<0.50	<1.0	11	<1.0	<0.50
	05/23/05	<1.0	<1.0	5.0	<1.0	1.2	<1.0	--	<1.0	<0.50	<1.0	<1.0	31	13	--	17	<0.50	<1.0	11	<1.0	<0.50
	08/30/05	<0.23	<0.10	5.3	<0.26	1.1	0.48	--	<0.24	<0.36	--	0.49	32	12	--	14	<0.10	0.36	9.8	<0.47	<0.50
	11/28/05	<0.50	<0.50	4.8	<0.50	1.2	0.51	--	<0.50	<0.50	<0.50	<0.50	28	12	--	18	<0.50	<0.50	11	<1.0	<0.50
	02/28/06	<0.50	<0.50	5.1	<0.50	1.1	0.56	<0.50	<0.50	<0.50	<0.50	0.47 J	30	12	<2.0	18	<0.50	<0.50	11	<1.0	<0.50
	05/23/06	<0.50	<0.50	4.3	<0.50	1.0	0.46 J	<0.50	<0.50	<0.50	<0.50	0.39 J	28	15	<2.0	20	<0.50	0.27	9.8	<1.0	<0.50
	08/15/06	<0.50	<0.50	1.8	<0.50	0.43 J	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	11	9.0 J	<2.0	9.3	<0.50	<0.50	5.1	<1.0	<0.50
	10/24/06	<0.50	<0.50	0.63	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	3.5	1.4	<2.0	3.8	<0.50	<0.50	2.7	<1.0	<0.50
	01/23/07	<0.50	<0.50	0.48 J	<0.50	<0.50	0.50 UJ	<0.50	<0.50	<0.50	<0.50	1.0	2.5	0.92 J	<2.0	2.7	<0.50	<0.50	2.0	<1.0	<0.50
	04/17/07	<0.46	<0.40	0.45 J	<0.45	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	0.86	2.4	0.63 J	<0.43	2.7	<0.36	<0.43	1.9	<0.60	<0.43
	07/24/07	<0.46	<0.40	0.51	<0.45	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	0.70	3.0	<0.48	<0.43	3.0	<0.36	<0.43	1.9	<0.60	<0.43
	10/23/07	<0.39	<0.34	0.42 J	<0.43	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	0.48 J	2.5	<0.68	<0.30	2.1	<0.32	<0.41	1.3	<0.59	<0.43
	01/22/08	<0.39	<0.34	<0.37	0.50 UJ	<0.38	0.50 UJ	<0.30	<0.37	<0.43	<0.36	0.61	1.6	<0.68	<0.30	1.6	<0.32	<0.41	1.2	<0.59	<0.43
	04/16/08	<0.39	<0.44	0.37	<0.43	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	0.53	2.0	0.86	<0.30	2.8	<0.40	<0.41	5.8	<0.59	<0.47
	07/15/08	<1.0	<1.0	2.6	<1.0	<0.50	<1.0	<0.50	<1.0	<0.50	<1.0	0.52 J	15	4.8	<1.0	10	<1.0	<1.0	7.9	<1.0	<0.50
	10/14/08	<0.26	<0.49	<0.27	<0.29	<0.26	<0.36	<0.14	<1.0	<0.32	<1.0	0.57 J	1.9	0.92 J	<1.0	2.6	<0.27	<0.38	2.4	<0.21	<0.50
	01/13/09	<0.45	<0.54	2.6	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.43 J	15	4.7	<2.6	6.4	<0.33	0.59 J	6.0 J	<0.31	<0.33
	04/07/09	<0.45	<0.54	3.4	<0.40	0.76	<0.38	<0.28	<0.69	<0.43	<0.22	0.56 J	19	6.8	<2.6	8.1	<0.33	<0.40	23	<0.31	<0.33
	07/15/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.57 J	2.3	0.83 J	<2.6	6.5	<0.33	<0.40	6.7	<0.31	<0.33
	10/15/09	<0.45	<0.54	0.94 J	0.78 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.51 J	3.3	1.0	<2.6	5.5	<0.33	<0.29	13	<0.31	<0.33
	02/09/10	<0.45	--	0.87 J	0.82 J	<0.31	--	--	--	<0.43	--	0.56 J	1.7	0.58 J	--	1.8	<0.33	--	--	--	--
	05/11/10	0.74 J	<0.54	1.6	1.4	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.55 J	3.3	1.3	<2.6	2.6	<0.33	<0.29	3.8	<0.31	<0.33
	08/09/10	0.46 J	<0.54	1.2	1.4	<0.31	--	<0.28	--	<0.43	--	<0.33	1.2	1.1	--	1.7	<0.33	<0.29	2.3	<0.31	--
	12/07/10	<0.45	<0.54	0.63 J	0.76 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	0.82 J	0.93 J	<2.6	1.7	<0.33	<0.29	2.3	<0.31	<0.33
	02/01/11	<0.45	<0.54	0.63 J	0.41 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	0.37 J	<0.49	<2.6	1.0	<0.33	<0.29	1.2	<0.31	<0.33
	04/05/11	<0.45	<0.54	1.9	0.42 J	0.47 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.39 J	8.7	3.7	<2.6	4.2	<0.33	0.45 J	3.8	<0.31	<0.33
	08/02/11	<0.30	<0.38	1.8	<0.43	0.49 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.3	4.1	<0.64	5.8	<0.24	<0.37	4.2	<1.7	<0.30
	10/11/11	<0.30	<0.38	1.1	0.54 J	0.32 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.4	2.4	<0.64	3.9	<0.24	<0.37	3.6	<1.7	<0.30
	01/31/12	<0.30	<0.38	1.1	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.63 J	5.5	1.7	<0.64	4.1	<0.24	<0.37	3.0	<1.7	<0.30
	04/03/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.93 J	1.3	0.70 J	<0.64	2.8	0.31 U	<0.37	1.7	<1.7	<0.30
	08/15/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.55 J	0.67 J	<0.46	<0.64	1.8	<0.24	<0.37	1.1	<1.7	<0.30
	10/09/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.78 J	1.1	<0.46	<0.64	0.95 J	0.25 U	<0.37	1.9	<1.7	<0.30
	02/13/13	<0.30	<0.38	0.32 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.67 J	1.1	<0.46	<0.64	2.2	<0.24	<0.37	1.2	<1.7	<0.30
	04/02/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.92 J	<0.46	<0.64	0.42 J	<0.24	<0.37	1.3	<1.7	<0.30
	08/01/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	8.7	<0.24	<0.37	12	<1.7	<0.30
	10/16/13	<0.30	<0.38	<0.28	0.76 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	9.4	<0.24	<0.37	19	<1.7	<0.30
	02/12/14	<0.30	<0.38	0.39 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.61 J	0.73 J	0.46 J	<0.64	1.0	<0.24	<0.37	1.1	<1.7	<0.30
	04/04/14	<0.30	<0.38	<0.28	0.55 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	3.4	<0.24	<0.37	9.5	<1.7	<0.30
	07/30/14	<0.30	<0.38	0.55 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.73 J	1.5	0.56 J	<0.64	1.9	<0.24	<0.37	1.9	<1.7	<0.30
	10/16/14	<0.30	<0.38	0.73 J	0.55 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.61 J	1.6	0.63 J	<0.64	2.3	<0.24	<0.37	3.6	<1.7	<0.30
	02/18/15	<0.30	<0.38	0.61 J	0.44 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.1	0.62 J	<0.64	1.2	<0.24	<0.37	1.8	<1.7	<0.30
	04/07/15	<0.30	<0.38	0.62 J	0.57 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.50 J	1.7	0.75 J	<0.64	1.8	<0.24	<0.37	1.9	<1.7	<0.30
	07/29/15	<0.30	<0.38	0.63 J	0.60 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.58 J	1.2	0.52 J	<0.64	1.6	<0.24	<0.37	1.8	<1.7	<0.30

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-6	10/07/15	<0.30	<0.38	0.39 J	0.54 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.67 J	0.82 J	<0.46	<0.64	1.4	<0.24	<0.37	2.8	<1.7	<0.30
	02/24/16	<0.30	<0.38	0.53 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.73 J	1.5	<0.46	<0.64	1.4	<0.24	<0.37	1.7	<1.7	<0.30
GW-7	09/08/93	0.19	<0.20	<0.20	--	<0.20	--	--	--	<0.20	--	--	0.58	<0.20	--	0.21	<0.20	<0.20	33	--	<0.50
	11/29/93	<0.50	<0.50	<0.50	--	<0.50	--	--	--	<0.50	--	--	<0.50	<0.50	--	<0.50	<0.50	<0.50	7.7	--	<0.50
	02/16/94	<40	<40	<40	--	<40	--	--	--	<40	--	--	56	<40	--	<40	<40	<40	3,100	--	<0.50
	03/08/94	<0.40	<0.40	<0.40	--	<0.40	--	--	--	<0.40	--	--	1.0	<0.40	--	0.72	<0.40	<0.40	35	--	<0.50
	05/18/94	<0.20	<0.20	<0.20	--	<0.20	--	--	--	<0.20	--	--	<0.20	<0.20	--	<0.20	0.15	<0.20	0.36	--	<0.50
	08/15/94	<1.0	<1.0	<1.0	--	<1.0	--	--	--	<1.0	--	--	2.1	<1.0	--	<1.0	<1.0	<1.0	22	--	<0.50
	09/07/94	<1.0	<1.0	<1.0	--	<1.0	--	--	--	<1.0	--	--	2.3	<1.0	--	<1.0	<1.0	<1.0	48	--	<0.50
	12/11/94	8.1	<5.0	<5.0	7.7	<5.0	--	--	--	<5.0	--	--	8.9	<5.0	--	<5.0	<5.0	<5.0	440	--	<0.50
	03/10/95	51	<10	<40	<40	<10	--	--	--	<40	--	--	70	<100	--	<40	<40	<10	4,700	--	<0.50
	09/21/95	1.6	<0.20	0.67	1.2	<0.20	--	--	--	1.6	--	--	1.4	0.64	--	1.6	<0.20	<0.20	110	--	<0.50
	11/22/95	0.34	<0.20	0.22	0.48	<0.20	--	--	--	0.55	--	--	0.80	0.56	--	0.53	<0.20	<0.20	27	--	<0.50
	12/20/95	14	0.53	14	9.2	<0.20	--	--	--	2.2	--	--	45	0.44	--	7.7	<0.20	0.39	2,400	--	<0.50
	04/24/96	0.54	<0.50	<0.50	0.80	<0.50	<0.50	--	<0.50	0.89	--	--	1.3	0.69	--	1.2	3.1	<0.50	42	<0.50	<0.50
	07/10/96	63	<10	60	42	<10	<10	--	<10	<10	--	--	190	<10	--	36	<10	<10	17,000	<10	<0.50
	10/10/96	23	1.8	44	50	1.0	<0.50	--	<0.50	8.8	--	--	74	<0.50	--	23	<0.50	<0.50	3,700	<0.50	<0.50
	12/19/96	16	<0.50	14	14	<0.50	<0.50	--	<0.50	3.7	--	--	16	<0.50	--	8.0	12	<0.50	1,000	<0.50	<0.50
	04/09/97	7.1	--	7.2	6.2	<0.50	--	--	--	1.9	--	--	11	<0.50	--	4.4	<0.50	<0.50	430	--	<0.50
	11/11/04	1.7	<1.0	5.9	2.5 UJ	0.68	<1.0	--	<1.0	<0.50	--	1.2	20	5.8	--	12	<0.50	<1.0	87	<1.0	<0.50
	02/24/05	<1.0	<1.0	5.2	1.5	1.0	<1.0	--	<1.0	<0.50	--	<1.0	27	11	--	14	<0.50	<1.0	53	<1.0	<0.50
	05/25/05	<1.0	<1.0	4.2	1.0	1.2	<1.0	--	<1.0	<0.50	<1.0	<1.0	25	12	--	11	<0.50	<1.0	27	<1.0	<0.50
	08/31/05	<0.23	<0.10	3.8	0.50	1.3	0.52	--	<0.24	<0.36	--	0.51	29	15	--	16	<0.10	<0.36	17	<0.47	<0.50
	11/29/05	<0.50	<0.50	4.3	0.53	1.7	0.57	--	<0.50	<0.50	--	0.57	33	18 J	--	19	<0.50	<0.50	32	<1.0	<0.50
	11/29/05	<0.50	<0.50	4.2	0.54	1.7	0.62	--	<0.50	<0.50	--	0.56	33	20 J	--	20	<0.50	<0.50	32	<1.0	<0.50
	03/01/06	<0.50	<0.50	4.1	0.64	1.8	0.60	<0.50	<0.50	<0.50	0.12 UJ	0.54	33	20	<2.0	18	<0.50	<0.50	21	<1.0	<0.50
	05/24/06	<0.50	<0.50	3.0	0.48 J	1.7	0.47 J	<0.50	<0.50	<0.50	<0.50	0.44 J	31	22	<2.0	19	<0.50	0.20	17	<1.0	<0.50
	08/16/06	17	11	6.3	49	1.6	0.26 J	0.45 J	<0.50	3.6	<0.50	29	42	7.0 J	<2.0	77	<0.50	0.35 J	2,300	1.0 UJ	0.50 UJ
	10/25/06	20	7.5	4.7	54	<2.5	<2.5	<2.5	<2.5	4.2	<2.5	30	38	<5.0	<10	83	<2.5	<2.5	2,900	<5.0	<2.5
	01/24/07	3.1	0.45 J	3.4	10	1.1	0.40 J	<0.50	<0.50	1.0	<0.50	3.4	26	13 J	<2.0	30	<0.50	<0.50	300	<1.0	<0.50
	04/18/07	13	<0.40	6.6	43	0.76	<0.40	<0.42	<0.40	4.7	<0.36	13	27	0.76 J	<0.43	64	<0.36	<0.43	1,300	<0.60	<0.43
	07/25/07	12	0.56	12	38	1.0	<0.40	<0.42	<0.40	4.2	<0.36	10	24	0.54 J	<0.43	45	<0.36	<0.43	1,000	<0.60	<0.43
	10/24/07	6.9	<0.34	9.2	23	1.1	<0.35	<0.30	<0.37	3.3	<0.36	5.7	20	2.1	<0.30	23	<0.32	<0.41	480 UJ	<0.59	<0.43
	01/23/08	5.7	<0.34	9.5	20	1.2	<0.35	<0.30	<0.37	2.8	<0.36	5.5	20	2.5	<0.30	22	<0.32	<0.41	470	<0.59	<0.43
	04/18/08	3.0	<0.44	5.9	11	1.1	<0.35	<0.33	<0.37	1.6	<0.39	3.0	21	7.2	<0.30	17	<0.40	<0.41	230	<0.59	<0.47
07/17/08	0.91 J	<1.0	4.1	3.1	1.5	0.50 J	<0.50	<1.0	0.87	<1.0	1.3	27	6.6	<10	7.5	<1.0	<1.0	79	<10	<0.50	
10/15/08	<0.26	<0.49	5.9	10	1.0	<0.36	<0.14	<1.0	1.5	<1.0	3.4	17	3.1	<10	9.9	<0.27	<0.38	280	<0.21	<0.50	
01/15/09	<0.45	<0.54	2.9	1.5	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.65 J	22	9.2	<2.6	9.4	<0.33	<0.40	30	<0.31	<0.33	
04/09/09	2.6 J	<2.7	4.6 J	9.6	<1.6	<1.9	<1.4	<3.5	2.3 J	<1.1	4.0 J	15	<2.5	<13	10	<1.6	<2.0	340	<0.31	<0.33	
07/17/09	3.6	<1.1	6.9	14	<0.63	<0.76	<0.57	<1.4	2.6	<0.44	4.8	9.7	<0.98	<5.2	12	<0.65	<0.81	390	<0.62	<0.65	
10/15/09	3.2	<1.1	6.9	10	0.69 J	<0.76	<0.57	<1.4	2.0	<0.44	4.2	10	<0.98	<5.2	7.6	<0.65	<0.58	290	<0.62	<0.65	
02/12/10	3.6	--	8.7	8.8	0.81	--	--	--	1.5	--	3.5	9.5	0.60 J	--	6.2	<0.33	--	--	--	--	
05/14/10	7.1	0.60 J	15	14	0.84	<0.38	<0.28	<0.69	1.5	<0.22	4.6	14	<0.49	<2.6	11	<0.33	<0.29	350	<0.31	<0.33	
08/12/10	6.9	0.58 J	17	16	1.2	--	<0.28	--	1.7	--	6.3	18	<0.49	--	13	<0.33	<0.29	380	<0.31	--	
08/12/10	6.8	0.60 J	17	13	1.1	--	<0.28	--	1.5	--	5.9	18	<0.49	--	13	<0.33	0.45 J	350	<0.31	--	
12/09/10	6.9	<2.7	14	18	<1.6	<1.9	<1.4	<3.5	<2.1	<1.1	7.7	16	<2.5	<13	16	<1.6	<1.5	540	<1.6	<1.6	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-7	12/09/10	6.9	<2.7	14	18	<1.6	<1.9	<1.4	<3.5	<2.1	<1.1	8.1	16	<2.5	<13	17	<1.6	<1.5	550	<1.6	<1.6
	02/02/11	8.1	4.6 J	15	17	<1.6	<1.9	<1.4	<3.5	2.4 J	<1.1	12	19	<2.5	<13	21	<1.6	<1.5	920	<1.6	<1.6
	02/02/11	8.6	3.7 J	15	20	<1.6	<1.9	<1.4	<3.5	2.2 J	<1.1	12	20	<2.5	<13	23	<1.6	<1.5	830	<1.6	<1.6
	04/07/11	3.4	<1.1	5.0	11	0.69 J	<0.76	<0.57	<1.4	1.3 J	<0.44	3.6	8.1	<0.98	<5.2	12	<0.65	<0.58	220	<0.62	<0.65
	04/07/11	3.2	<1.1	4.8	11	0.70 J	<0.76	<0.57	<1.4	1.4 J	<0.44	3.7	8.1	<0.98	<5.2	13	<0.65	<0.58	220	<0.62	<0.65
	08/04/11	2.2	<0.38	1.1	11	<0.24	<0.42	<0.14	<0.48	0.94 J	<0.17	1.3	6.9	1.5	<0.64	16	<0.24	<0.37	130	<1.7	<0.30
	08/04/11	2.1	<0.38	1.4	12	<0.24	<0.42	<0.14	<0.48	0.99 J	<0.17	1.4	7.4	1.5	<0.64	17	<0.24	<0.37	140	<1.7	<0.30
	10/13/11	0.64 J	<0.38	0.94 J	4.0	0.28 J	<0.42	<0.14	<0.48	0.58 J	<0.17	0.69 J	6.9	1.8	<0.64	10	<0.24	<0.37	57	<1.7	<0.30
	10/13/11	0.72 J	<0.38	0.93 J	4.2	0.28 J	<0.42	<0.14	<0.48	0.56 J	<0.17	0.66 J	7.1	1.7	<0.64	10	<0.24	<0.37	57	<1.7	<0.30
	02/01/12	<0.30	<0.38	1.6	0.51 J	0.58	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	13	2.4	<0.64	7.5	<0.24	<0.37	14	<1.7	<0.30
	02/01/12	<0.30	<0.38	1.6	0.48 J	0.51	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	13	2.3	1.1 U	7.1	<0.24	<0.37	14	<1.7	<0.30
	04/04/12	<0.30	<0.38	1.3	0.64 J	0.38 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.6	1.9	<0.64	8.2	0.31 J	<0.37	17	<1.7	<0.30
	08/15/12	1.1	<0.38	1.1	5.0	0.43 J	<0.42	<0.14	<0.48	0.45 J	<0.17	1.0	7.0	1.3	<0.64	18	<0.24	0.54 J	70	<1.7	<0.30
	10/09/12	<0.30	<0.38	1.2	<0.43	0.35 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.0	1.7	<0.64	4.0	<0.24	<0.37	12	<1.7	<0.30
	02/14/13	<0.30	<0.38	0.96 J	1.7	0.27 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.2	1.4	<0.64	6.9	<0.24	<0.37	13	<1.7	<0.30
	04/03/13	<0.30	<0.38	1.1	1.2	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.3	1.9	<0.64	5.3	<0.24	<0.37	18	<1.7	<0.30
	08/01/13	3.8	1.7	0.89 J	22	0.73	<0.42	<0.14	<0.48	1.7	<0.17	3.3	4.3	0.54 J	<0.64	44	<0.24	<0.37	220	<1.7	<0.30
	10/16/13	6.2	2.0	1.1	36	1.1	<0.42	<0.14	<0.48	2.0	<0.17	4.6	5.0	<0.46	<0.64	66	<0.24	<0.37	320	<1.7	<0.30
	02/12/14	4.7	3.6	1.2	32	0.83	<0.42	<0.14	<0.48	1.6	<0.17	4.8	5.8	1.0	<0.64	55	<0.24	<0.37	350	<1.7	<0.30
	04/04/14	6.3	9.3	2.0	40	1.6	<0.42	0.17 J	<0.48	2.3	<0.17	8.5	9.7	0.59 J	<0.64	74	<0.24	<0.37	720	<1.7	<0.30
	07/31/14	2.7 J	<1.9	<1.4	15	<1.2	<2.1	<0.71	<2.4	<1.1	<0.86	4.3 J	4.7 J	<2.3	<3.2	28	<1.2	<1.8	450	<8.3	<1.5
	10/16/14	2.3 J	<1.9	2.2 J	16	<1.2	<2.1	<0.71	<2.4	2.6 J	<0.86	4.5 J	6.4	<2.3	<3.2	30	<1.2	<1.8	960	<8.3	<1.5
	02/20/15	1.1 J	<0.77	1.1 J	9	<0.48	<0.85	<0.28	<0.95	<0.41	<0.34	2	3.5	<0.91	<1.3	11	<0.47	<0.74	310	<3.3	<0.60
	04/10/15	1.6	1.0 J	2.1	11	<0.24	<0.42	<0.14	<0.48	1.9	<0.17	4.1	6.7	<0.46	<0.64	22	<0.24	<0.37	610	<1.7	<0.30
	07/31/15	1.7 J	<1.9	2.1 J	4.4 J	<1.2	<2.1	<0.71	<2.4	1.3 J	<0.86	6.3	6.6	<2.3	<3.2	18	<1.2	<1.8	570	<8.3	<1.5
	10/08/15	<1.5	<1.9	1.5 J	9.2	<1.2	<2.1	<0.71	<2.4	1.2 J	<0.86	9.5	4.5 J	<2.3	<3.2	17	<1.2	<1.8	510	<8.3	<1.5
	10/08/15	<1.5	<1.9	<1.4	8.2	<1.2	<2.1	<0.71	<2.4	1.6 J	<0.86	9.3	5.1	<2.3	<3.2	17	<1.2	<1.8	510	<8.3	<1.5
02/26/16	1.1 J	<0.77	0.79 J	4.4	<0.48	<0.85	<0.28	<0.95	0.85 J	<0.34	3.6	2.0	<0.91	<1.3	9.3	<0.47	<0.74	260	<3.3	<0.60	
03/01/06	<0.50	<0.50	3.9	0.58	1.7	0.59	--	<0.50	<0.50	0.13 UJ	0.52	33	20	--	19	<0.50	<0.50	20	<1.0	<0.50	
05/23/06	<0.50	<0.50	2.0	0.33 J	0.50	0.43 J	<0.50	<0.50	<0.50	<0.50	0.44 J	29	23	<0.22	19	<0.49	0.24	16	<1.1	<0.49	
05/24/06	<0.50	<0.50	2.9	0.43 J	1.7	0.50	<0.50	<0.50	<0.50	<0.50	0.42 J	29	23	<0.23	19	<0.50	0.19	15	<1.0	<0.50	
GW-7-D*	09/09/93	<0.20	--	<0.20	<0.20	0.17	--	--	<0.20	--	--	0.22	<0.20	--	0.30	<0.20	--	0.80	--	<0.50	
	11/29/93	<0.50	--	<0.50	<0.50	<0.50	--	--	<0.50	--	--	0.60	<0.50	--	0.60	<0.50	--	0.90	--	<0.50	
	02/16/94	0.25	--	<0.20	<0.20	<0.20	--	--	0.92	--	--	0.50	<0.20	--	0.77	<0.20	--	30	--	<0.50	
	05/17/94	<0.20	--	<0.20	<0.20	<0.20	--	--	<0.20	--	--	0.55	<0.20	--	0.79	<0.20	--	1.2	--	<0.50	
	08/15/94	<0.20	--	<0.20	<0.20	<0.20	--	--	0.58	--	--	0.39	<0.20	--	0.66	<0.20	--	28	--	<0.50	
	09/07/94	<0.20	--	<0.20	<0.20	<0.20	--	--	1.4	--	--	0.30	<0.20	--	0.40	<0.20	--	32	--	<0.50	
	12/10/94	<0.20	--	0.30	<0.20	<0.20	--	--	0.30	--	--	1.7	<0.20	--	2.9	<0.20	--	8.6	--	<0.50	
	03/09/95	<2.0	--	<2.0	<2.0	<2.0	--	--	--	<2.0	--	--	<2.0	<2.0	--	2.5	<2.0	--	190	--	<0.50
	09/20/95	<0.20	--	0.40	<0.20	<0.20	--	--	--	<0.20	--	--	2.0	3.9	--	4.9	<0.20	--	6.4	--	<0.50
	11/21/95	2.2	--	0.26	2.2	<0.20	--	--	--	2.4	--	--	1.8	1.4	--	5.0	<2.0	--	170	--	<0.50
	12/19/95	3.8	--	0.22	3.8	<0.20	--	--	--	4.2	--	--	2.4	1.4	--	7.4	<0.20	--	310	--	<0.50
	04/24/96	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50	<1.0	--	1.5	1.2	--	2.9	0.56	<0.50	6.9	<0.50	<0.50
	07/10/96	4.9	<0.50	<0.50	4.4	<0.50	<0.50	--	<0.50	5.6	<0.50	--	2.1	<0.50	--	7.8	<0.50	<0.50	680	<0.50	<0.50
	10/10/96	<0.50	<0.50	0.56	<0.50	<0.50	<0.50	--	<0.50	0.65	<0.50	--	3.8	0.74	--	4.7	<0.50	<0.50	17	<0.50	<0.50
	12/19/96	0.69	<0.50	0.51	1.2	<0.50	<0.50	--	<0.50	2.2	<0.50	--	4.0	<0.50	--	4.9	2.3	<0.50	120	<0.50	<0.50

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-8	04/09/97	0.60	--	0.50	1.1	<0.50	--	--	1.3	--	--	4.8	1.0	--	5.2	<0.50	<0.50	68	--	<0.50	
	11/08/04	<1.0	<1.0	1.5	<1.0	0.58	<1.0	--	<1.0	<0.50	--	11	3.4	--	7.9	<0.50	<1.0	14	<1.0	<0.50	
	02/22/05	<1.0	<1.0	1.8	<1.0	0.66	<1.0	--	<1.0	<0.50	<1.0	<1.0	14	4.9	--	8.7	<0.50	<1.0	9.9	<1.0	<0.50
	05/23/05	<1.0	<1.0	1.2	<1.0	<0.50	<1.0	--	<1.0	<0.50	<1.0	<1.0	8.5	2.8	--	7.0	<0.50	<1.0	8.5	<1.0	<0.50
	08/31/05	<0.23	<0.10	2.0	<0.26	0.61	<0.39	--	<0.24	<0.36	--	0.42	14	4.7	--	8.0	<0.10	<0.36	7.3	<0.47	<0.50
	11/28/05	<0.50	--	2.5	<0.50	0.94	<0.50	--	<0.50	<0.50	<0.50	<0.50	18	8.1	--	13	<0.50	<0.50	8.7	<1.0	<0.50
	03/01/06	<0.50	<0.50	2.5	<0.50	0.89	<0.50	<0.50	<0.50	<0.50	<0.50	0.44 J	17	6.7	<2.0	12	<0.50	<0.50	8.2	<1.0	<0.50
	05/23/06	<0.50	<0.50	2.0	<0.50	0.75	0.29 J	<0.50	<0.50	<0.50	<0.50	0.34 J	15	7.2	<2.0	12	<0.50	<0.50	7.2	<1.0	<0.50
	08/15/06	<0.50	<0.50	0.71	1.1	0.25 J	<0.50	<0.50	<0.50	0.68	<0.50	0.74	4.4	1.2	<2.0	5.4	<0.50	<0.50	28	<1.0	<0.50
	10/24/06	<0.50	<0.50	0.57	0.73	<0.50	<0.50	<0.50	<0.50	0.60	<0.50	0.58	3.6	<1.0	<2.0	5.0	<0.50	<0.50	22	<1.0	<0.50
	01/24/07	<0.50	<0.50	0.53	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	<1.0	<2.0	3.4	<0.50	<0.50	10	<1.0	<0.50	
	04/17/07	<0.46	<0.40	0.39 J	<0.45	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	2.5	<0.48	<0.43	3.4	<0.36	<0.43	13	<0.60	<0.43
	07/25/07	<0.46	<0.40	0.38 J	<0.45	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	2.3	<0.48	<0.43	3.0	<0.36	<0.43	12	<0.60	<0.43
	10/23/07	<0.39	<0.34	0.58	<0.43	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	<0.33	4.0	0.94 J	<0.30	4.1	<0.32	<0.41	6.0	<0.59	<0.43
	01/22/08	<0.39	<0.34	0.37 J	0.50 UJ	<0.38	0.50 UJ	<0.30	<0.37	<0.43	<0.36	<0.33	2.1	<0.68	<0.30	2.9	<0.32	<0.41	8.2	<0.59	<0.43
	04/17/08	<0.39	<0.44	0.39	0.43	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	0.35	2.6	<0.68	<0.30	3.8	<0.40	<0.41	13	<0.59	<0.47
	07/15/08	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<0.50	<1.0	<0.50	<1.0	<1.0	4.3	1.2	<1.0	4.5	<1.0	<1.0	6.6	<1.0	<0.50
	10/14/08	<0.26	<0.49	<0.27	<0.29	<0.26	<0.36	<0.14	<1.0	<0.32	<1.0	0.35 J	2.9	<0.89	<1.0	3.1	<0.27	<0.38	11	<0.21	<0.50
	01/13/09	<0.45	<0.54	1.2	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	6.4	1.3	<2.6	4.6	<0.33	<0.40	3.8 J	<0.31	<0.33
	04/07/09	<0.45	<0.54	1.2	<0.40	0.39 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.37 J	6.5	2.0	<2.6	5.3	<0.33	<0.40	6.3	<0.31	<0.33
	07/16/09	<0.45	<0.54	<0.37	0.54 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.52 J	0.71 J	<0.49	<2.6	2.0	<0.33	<0.40	19	<0.31	<0.33
	10/14/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.39 J	0.52 J	<0.49	<2.6	1.5	<0.33	<0.29	11	<0.31	<0.33
	02/09/10	<0.45	--	<0.37	<0.40	<0.31	--	--	<0.43	--	<0.33	0.32 J	<0.49	--	1.1	<0.33	--	--	--	--	
	05/10/10	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	0.50 J	<0.49	<2.6	0.87 J	<0.33	<0.29	7.5	<0.31	<0.33
	08/10/10	<0.45	<0.54	1	<0.40	<0.31	--	<0.28	--	<0.43	--	0.37 J	5.4	1.7	--	4.8	<0.33	<0.29	3.4	<0.31	--
	12/06/10	<0.45	<0.54	0.86 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	5.1	1.8	<2.6	5.6	<0.33	<0.29	3.4	<0.31	<0.33
	02/01/11	<0.45	<0.54	0.95 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	5.0	1.3	<2.6	4.6	<0.33	<0.29	3.4	<0.31	<0.33
	04/05/11	<0.45	<0.54	0.93 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.36 J	4.8	1.7	<2.6	3.7	<0.33	<0.29	2.7	<0.31	<0.33
	08/02/11	<0.30	<0.38	0.85 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.5	1.9	<0.64	4.7	<0.24	<0.37	3.1	<1.7	<0.30
	10/12/11	<0.30	<0.38	1.1	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.7	1.8	<0.64	6.5	<0.24	<0.37	4.0	<1.7	<0.30
	01/31/12	<0.30	<0.38	1.4	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.0	2.2	<0.64	6.6	<0.24	<0.37	4.3	<1.7	<0.30
	04/03/12	<0.30	<0.38	1.6	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.5	2.4	<0.64	7.9	0.94 J	<0.37	7.3	<1.7	<0.30
	08/14/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.5	<0.46	<0.64	5.0	<0.24	<0.37	13	<1.7	<0.30
	10/09/12	<0.30	<0.38	1.3	<0.43	0.32 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.5	1.8	<0.64	4.3	<0.24	<0.37	4.6	<1.7	<0.30
	02/13/13	<0.30	<0.38	0.88 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.56 J	5.1	0.85 J	<0.64	6.7	<0.24	<0.37	6.2	<1.7	<0.30
	04/01/13	<0.30	<0.38	1.4	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.9	1.6	<0.64	5.2	<0.24	<0.37	5.7	<1.7	<0.30
	07/31/13	<0.30	<0.38	<0.28	0.93 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.47 J	1.8	<0.46	<0.64	3.6	<0.24	<0.37	16	<1.7	<0.30
	10/17/13	<0.30	<0.38	<0.28	1.1	<0.24	<0.42	<0.14	<0.48	0.46 J	<0.17	0.80 J	1.4	<0.46	<0.64	2.8	<0.24	<0.37	28	<1.7	<0.30
	02/12/14	<0.30	<0.38	1.0	<0.43	0.25 J	<0.42	<0.14	<0.48	<0.23	<0.17	0.55 J	6.6	1.4	<0.64	5.7	<0.24	<0.37	11	<1.7	<0.30
	04/03/14	<0.30	<0.38	<0.28	0.76 J	<0.24	<0.42	<0.14	<0.48	0.42 J	<0.17	0.76 J	1.6	<0.46	<0.64	2.4	<0.24	<0.37	23	<1.7	<0.30
	07/31/14	<0.30	<0.38	<0.28	0.54 J	<0.24	<0.42	<0.14	<0.48	0.37 J	<0.17	0.65 J	<0.48	<0.46	<0.64	1.2	<0.24	<0.37	18	<1.7	<0.30
	10/14/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.51 J	0.72 J	<0.46	<0.64	1.6	<0.24	<0.37	10	<1.7	<0.30
	02/19/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	1.4	<0.46	<0.64	3.3	<0.24	<0.37	4.9	<1.7	<0.30
	04/09/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.4	<0.46	<0.64	3.0	<0.24	<0.37	5.3	<1.7	<0.30
	07/30/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.3	<0.46	<0.64	4.0	<0.24	<0.37	6.2	<1.7	<0.30
	10/07/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.53 J	1.2	<0.46	<0.64	2.0	<0.24	<0.37	6.7	<1.7	<0.30



Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-8	02/25/16	<0.30	<0.38	<0.28	1.1	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	2.0	0.97 J	<0.46	<0.64	2.5	<0.24	<0.37	12	<1.7	<0.30
GW-9	09/08/93	<0.20	--	--	<0.20	--	--	--	--	<0.20	--	--	0.31	1.0	--	0.28	--	--	2.4	--	<0.50
	11/29/93	<0.50	--	--	<0.50	--	--	--	--	<0.50	--	--	<0.50	<0.50	--	0.50	--	--	3.1	--	<0.50
	02/16/94	0.42	--	--	0.40	--	--	--	--	<0.20	--	--	<0.20	<0.20	--	1.1	--	--	16	--	<0.50
	05/17/94	<0.20	--	--	<0.20	--	--	--	--	<0.20	--	--	<0.20	<0.20	--	<0.20	--	--	3.4	--	<0.50
	08/16/94	3.1	--	--	2.9	--	--	--	--	<1.0	--	--	<1.0	<3.0	--	7.6	--	--	110	--	<0.50
	09/07/94	2.4	--	--	2.9	--	--	--	--	1.8	--	--	<1.0	<3.0	--	4.4	--	--	75	--	<0.50
	12/10/94	0.50	--	--	0.50	--	--	--	--	0.30	--	--	0.50	<0.50	--	1.9	--	--	9.4	--	<0.50
	03/09/95	3.1	--	--	2.2	--	--	--	--	1.4	--	--	<1.0	<3.0	--	6.0	--	--	71	--	<0.50
	09/20/95	<0.20	--	--	<0.20	--	--	--	--	<0.20	--	--	0.37	<0.50	--	0.48	--	--	0.47	--	<0.50
	11/21/95	<0.20	--	--	<0.20	--	--	--	--	<0.20	--	--	0.54	1.4	--	1.0	--	--	5.8	--	<0.50
	12/19/95	5.6	--	--	5.2	--	--	--	--	1.2	--	--	0.95	2.3	--	13	--	--	97	--	<0.50
	04/24/96	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50	--	--	1.5	1.1	--	5.2	<0.50	<0.50	14	<0.50	<0.50
	07/09/96	12	<0.50	<0.50	5.4	<0.50	<0.50	--	<0.50	2.5	<0.50	--	0.77	0.76	--	28	<0.50	<0.50	230	<0.50	<0.50
	10/10/96	3.2	<0.50	<0.50	6.2	<0.50	<0.50	--	<0.50	0.58	<0.50	--	0.62	<0.50	--	13	1.2	<0.50	170	<0.50	<0.50
	12/18/96	1.5	<0.50	<0.50	1.1	<0.50	<0.50	--	<0.50	0.69	<0.50	--	2.1	<0.50	--	6.8	1.8	<0.50	36	<0.50	<0.50
	04/09/97	0.90	--	<0.50	1.2	<0.50	--	--	--	1.3	--	--	1.7	<0.50	--	3.9	<0.50	<0.50	45	--	<0.50
	11/08/04	<1.0	<1.0	1.6	<1.0	0.60	<1.0	--	<1.0	0.53	<1.0	--	12	2.6	--	7.3	<0.50	<1.0	21	<1.0	<0.50
	02/22/05	<1.0	<1.0	1.9	<1.0	0.64	<1.0	--	<1.0	<0.50	<1.0	<1.0	14	4.6	--	9.5	<0.50	<1.0	17	<1.0	<0.50
	05/24/05	<1.0	<1.0	2.0	<1.0	0.63	<1.0	--	<1.0	<0.50	<1.0	<1.0	15	4.3	--	9.0	<0.50	<1.0	9.8	<1.0	<0.50
	08/30/05	<0.23	<0.10	1.9	<0.26	0.68	<0.39	--	<0.24	<0.36	--	0.54	13	6.5	--	9.5	<0.10	<0.36	8.4	<0.47	<0.50
	11/29/05	<0.50	<0.50	1.8	<0.50	0.64	<0.50	--	<0.50	<0.50	<0.50	<0.50	13	6.6 J	--	11	<0.50	<0.50	8.6	<1.0	<0.50
	03/01/06	<0.50	<0.50	2.0	<0.50	0.69	<0.50	<0.50	<0.50	<0.50	<0.50	0.40 J	13	7.0	<2.0	10	<0.50	<0.50	8.4	<1.0	<0.50
	05/23/06	<0.50	<0.50	1.5	<0.50	0.59	0.20 J	<0.50	<0.50	<0.50	<0.50	0.30 J	11	8.0	<2.0	11	<0.50	<0.50	5.2	<1.0	<0.50
	08/15/06	1.1	<0.50	1.1	2.9	0.43 J	<0.50	<0.50	<0.50	0.53	<0.50	0.52	7.4	4.5 J	<2.0	15	<0.50	<0.50	25	<1.0	<0.50
	10/24/06	0.71	<0.50	0.72	2.2	<0.50	<0.50	<0.50	<0.50	0.50	<0.50	0.46 J	5.1	1.7	<2.0	11	<0.50	<0.50	21	<1.0	<0.50
	01/23/07	<0.50	<0.50	1.2	<0.50	0.37 J	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7.8	4.1	<2.0	7.3	<0.50	<0.50	5.6	1.0 UJ	<0.50
	04/17/07	0.54	<0.40	0.48 J	1.5	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	3.3	1.4	<0.43	7.0	<0.36	<0.43	16	<0.60	<0.43
	07/25/07	<0.46	<0.40	0.37 J	1.5	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	2.4	0.94 J	<0.43	5.4	<0.36	<0.43	14	<0.60	<0.43
	10/23/07	<0.39	<0.34	0.50	0.78	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	0.34 J	3.8	1.9	<0.30	5.1	<0.32	<0.41	8.9	<0.59	<0.43
	01/22/08	<0.39	<0.34	<0.37	1.1 J	<0.38	0.50 UJ	<0.30	<0.37	<0.43	<0.36	0.41 J	2.2	0.73 J	<0.30	4.8	<0.32	<0.41	16	<0.59	<0.43
	04/17/08	0.54	<0.44	<0.37	1.7	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	0.49	2.2	0.87	<0.30	7.0	<0.40	<0.41	24	<0.59	<0.47
	07/15/08	<1.0	<1.0	0.31 J	0.53 J	<0.50	<1.0	<0.50	<1.0	<0.50	<1.0	<1.0	3.2	1.0	<1.0	5.6	<1.0	<1.0	11	<1.0	<0.50
	10/14/08	<0.26	<0.49	<0.27	0.75 J	<0.26	<0.36	<0.14	<1.0	<0.32	<1.0	0.31 J	2.9	0.94 J	<1.0	4.5	<0.27	<0.38	12	<0.21	<0.50
	01/13/09	<0.45	<0.54	0.95 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	6.3	1.5	<2.6	4.0	<0.33	<0.40	3.6 J	<0.31	<0.33
	04/08/09	<0.45	<0.54	1.0	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	6.0	2.0	<2.6	4.5	<0.33	<0.40	5.7 J	<0.31	<0.33
	07/16/09	<0.45	<0.54	<0.37	2.7	<0.31	<0.38	<0.28	<0.69	0.46 J	<0.22	0.60 J	0.64 J	<0.49	<2.6	5.0	<0.33	<0.40	25	<0.31	<0.33
	10/14/09	0.66 J	<0.54	<0.37	1.7	<0.31	<0.38	<0.28	<0.69	0.46 J	<0.22	0.57 J	1.3	0.82 J	<2.6	4.6	<0.33	<0.29	23	<0.31	<0.33
	02/09/10	<0.45	--	<0.37	0.67 J	<0.31	--	--	--	<0.43	--	<0.33	0.62 J	0.68 J	--	2.8	<0.33	--	--	--	--
	05/10/10	<0.45	<0.54	<0.37	0.82 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.42 J	0.95 J	<0.49	<2.6	3.5	<0.33	<0.29	13	<0.31	<0.33
	08/10/10	<0.45	<0.54	1	<0.40	<0.31	--	<0.28	--	<0.43	--	0.33 J	5.8	2.5	--	5	<0.33	<0.29	4	<0.31	--
12/06/10	<0.45	<0.54	0.67 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	4.8	1.7	<2.6	4.0	<0.33	<0.29	3.0	<0.31	<0.33	
02/01/11	<0.45	<0.54	0.83 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	5.0	1.6	<2.6	3.5	<0.33	<0.29	3.1	<0.31	<0.33	
04/04/11	<0.45	<0.54	0.78 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.40 J	4.8	1.9	<2.6	3.1	<0.33	<0.29	3.2	<0.31	<0.33	
08/03/11	<0.30	<0.38	0.52 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.9	1.6	<0.64	3.0	<0.24	<0.37	2.7	<1.7	<0.30	
10/12/11	<0.30	<0.38	1.1	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.0	2.1	<0.64	3.5	<0.24	<0.37	4.7	<1.7	<0.30	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																				
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride	
GW-9	01/30/12	<0.30	<0.38	0.99 J	<0.43	0.29 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.7	1.9	<0.64	5.7	<0.24	<0.37	13	<1.7	<0.30	
	04/03/12	<0.30	<0.38	1.2	<0.43	0.33 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.9	2.2	<0.64	6.1	0.82 J	0.82 J	26	<1.7	<0.30	
	08/14/12	<0.30	<0.38	0.68 J	0.60 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.5	0.56 J	<0.64	7.8	<0.24	0.49 J	14	<1.7	<0.30	
	10/11/12	<0.30	<0.38	1.1	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.3	<0.46	<0.64	4.7	<0.24	<0.37	13	<1.7	<0.30	
	02/13/13	<0.30	<0.38	0.82 J	0.64 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.64 J	6.7	1.1	<0.64	5.8	<0.24	<0.37	17	<1.7	<0.30	
	04/01/13	<0.30	<0.38	0.96 J	0.55 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.8	1.3	<0.64	0.54 J	<0.24	0.43 J	19	<1.7	<0.30	
	07/31/13	0.38 J	<0.38	<0.28	2.7	<0.24	<0.42	<0.14	<0.48	0.42 J	<0.17	0.53 J	2.7	<0.46	<0.64	7.6	<0.24	<0.37	17	<1.7	<0.30	
	10/16/13	0.37 J	<0.38	0.49 J	2.4	<0.24	<0.42	<0.14	<0.48	0.38 J	<0.17	0.66 J	2.5	<0.46	<0.64	5.6	<0.24	<0.37	14	<1.7	<0.30	
	02/12/14	<0.30	<0.38	0.80 J	1.7	<0.24	<0.42	<0.14	<0.48	0.30 J	<0.17	0.69 J	5.8	1.4	<0.64	6.3	<0.24	<0.37	19	<1.7	<0.30	
	04/02/14	0.36 J	<0.38	0.38 J	2.4	<0.24	<0.42	<0.14	<0.48	0.46 J	<0.17	0.78 J	2.7	<0.46	<0.64	4.8	<0.24	<0.37	15	<1.7	<0.30	
	07/30/14	<0.30	<0.38	0.32 J	2.3	<0.24	<0.42	<0.14	<0.48	0.39 J	<0.17	0.74 J	1.9	<0.46	<0.64	6.4	<0.24	<0.37	14	<1.7	<0.30	
	10/14/14	<0.30	<0.38	<0.28	1.5	<0.24	<0.42	<0.14	<0.48	0.43 J	<0.17	0.70 J	1.3	<0.46	<0.64	5.8	<0.24	<0.37	15	<1.7	<0.30	
	02/19/15	0.71 J	<0.38	<0.28	5	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	0.76 J	1.4	0.55 J	<0.64	12	<0.24	<0.37	31	<1.7	<0.30	
	04/09/15	0.95 J	<0.38	<0.28	7.5	<0.24	<0.42	<0.14	<0.48	0.92 J	<0.17	0.98 J	1.1	<0.46	<0.64	19	<0.24	<0.37	47	<1.7	<0.30	
	07/30/15	0.77 J	<0.38	<0.28	8.7	<0.24	<0.42	<0.14	<0.48	0.65 J	<0.17	0.88 J	1.4	0.51 J	<0.64	19	<0.24	<0.37	40	<1.7	<0.30	
	10/08/15	<0.30	<0.38	<0.28	15	<0.24	<0.42	<0.14	<0.48	1.7	<0.17	0.87 J	<0.48	<0.46	<0.64	31	<0.24	<0.37	63	<1.7	<0.30	
02/25/16	0.94 J	<0.38	<0.28	9.1	<0.24	<0.42	<0.14	<0.48	0.74 J	<0.17	0.90 J	<0.48	<0.46	<0.64	14	<0.24	<0.37	34	<1.7	<0.30		
GW-10	09/09/93	0.14	<0.50	0.10	<0.50	<0.50	--	--	--	<0.50	--	--	1.3	4.2	--	1.5	<0.50	<0.50	50	--	<0.50	
	11/29/93	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	<0.50	--	--	<0.50	<0.50	--	1.2	<0.50	0.50	15	--	<0.50	
	02/16/94	<40	<40	<40	<40	<40	--	--	--	<40	--	--	52	<40	--	<40	<40	<40	2,300	--	<0.50	
	03/07/94	<2.0	<2.0	<2.0	<2.0	<2.0	--	--	--	<2.0	--	--	4.4	<2.0	--	<2.0	<2.0	<2.0	210	--	<0.50	
	05/18/94	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	--	<0.20	--	--	0.25	<0.20	--	1.0	<0.20	<0.20	12	--	<0.50	
	08/15/94	<100	<100	<100	<100	<100	--	--	--	<100	--	--	170	<300	--	<100	<100	<100	9,000	--	<0.50	
	09/07/94	<100	<100	<100	<100	<100	--	--	--	<100	--	--	100	<300	--	<100	<100	<100	4,700	--	<0.50	
	12/11/94	7.2	<5.0	<5.0	<5.0	<5.0	--	--	--	<5.0	--	--	7.5	<20	--	<5.0	<5.0	<5.0	360	--	<0.50	
	03/10/95	<10	<10	<10	<10	<10	--	--	--	<10	--	--	12	<30	--	<10	<10	<10	1,100	--	<0.50	
	09/21/95	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	--	<0.20	--	--	0.94	1.5	--	2.3	<0.20	<0.20	<0.20	21	--	<0.50
	11/21/95	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	--	<0.20	--	--	0.61	1.1	--	2.3	<0.20	<0.20	30	--	<0.50	
	12/20/95	48	5.3	11	35	2.0	--	--	--	5.3	--	--	140	<0.50	--	44	<0.50	1.1	3,200	--	<0.50	
	04/25/96	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50	--	--	1.0	<0.50	--	2.6	2.3	<0.50	48	<0.50	<0.50	
	07/10/96	89	4.5	8.6	53	1.5	<0.50	--	<0.50	8.3	--	--	230	<0.50	--	81	<0.50	5.6	11,000	<0.50	<0.50	
	10/10/96	58	<0.50	3.3	49	<0.50	<0.50	--	<0.50	9.6	<0.50	--	100	<0.50	--	65	<0.50	0.67	5,300	<0.50	<0.50	
	12/19/96	47	0.63	3.7	26	<0.50	<0.50	--	<0.50	8.0	<0.50	--	100	<0.50	--	67	1.3	4.1	6,000	<0.50	<0.50	
	04/09/97	5.2	--	1.1	4.9	<0.50	--	--	--	1.7	<0.50	--	16	0.60	--	10	<0.50	<0.50	720	--	<0.50	
	06/11/03	4.6	<1.2	<1.1	7.6	<1.1	<1.4	--	<1.3	<1.1	<0.72	6.3	24	<4.4	--	20	<2.0	<1.1	610	<1.4	<0.50	
	11/11/04	<1.0	<1.0	2.0	<1.0	0.84	<1.0	--	<1.0	<0.50	<1.0	<1.0	16	9.5	--	12 J	<0.50	<1.0	25 J	<1.0	<0.50	
	02/25/05	<1.0	<1.0	2.6	<1.0	1.2	<1.0	--	<1.0	<0.50	<1.0	<1.0	23	13	--	13	<0.50	<1.0	18	<1.0	<0.50	
	05/25/05	<1.0	<1.0	2.7	<1.0	1.3	<1.0	--	<1.0	<0.50	--	<1.0	20	13	--	9.8	<0.50	<1.0	11	<1.0	<0.50	
09/01/05	<0.23	<0.10	1.9	0.36	0.90	<0.39	--	<0.24	<0.36	--	0.41	15	10	--	10	<0.10	<0.36	15	<0.47	<0.50		
11/30/05	<0.50	<0.50	1.3	<0.50	0.59	<0.50	--	<0.50	<0.50	<0.50	<0.50	7.5	6.8 J	--	9.7	<0.50	<0.50	6.8	<1.0	<0.50		
11/30/05	<0.50	<0.50	1.3	<0.50	0.61	<0.50	--	<0.50	<0.50	<0.50	<0.50	7.3	6.7 J	--	9.8	<0.50	<0.50	6.9	<1.0	<0.50		
03/02/06	<0.50	<0.50	1.5	<0.50	0.61	<0.50	<0.50	<0.50	<0.50	<0.50	0.35 J	8.7	7.1	<2.0	9.4	<0.50	<0.50	3.9	<1.0	<0.50		
05/26/06	<0.50	<0.50	1.8	<0.50	0.54	0.21 J	<0.50	<0.50	<0.50	<0.50	0.35 J	9.9	4.8	<2.0	13	<0.50	<0.50	12	<1.0	<0.50		
08/16/06	15	<0.50	1.6	39 J	0.39 J	0.22 J	<0.50	<0.50	2.1	<0.50	2.7	16	5.0	<2.0	120	<0.50	0.31 J	480	1.0 UJ	<0.50		
10/25/06	27	<0.50	1.4	83 J	<0.50	<0.50	<0.50	<0.50	4.7	<0.50	3.6	13	3.3 J	<2.0	200 J	<0.50	<0.50	670	<1.0	<0.50		
01/24/07	3.8	<0.50	2.3	12	0.91	0.41 J	<0.50	<0.50	0.82	<0.50	0.96	19	8.6	<2.0	40 J	<0.50	<0.50	140	1.0 UJ	<0.50		

Well/Barcad ID	Sample Date	Concentrations (µg/L)																				
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride	
GW-10	04/18/07	19 J	<0.40	0.98	61	<0.33	<0.40	<0.42	<0.40	4.0	<0.36	3.7	9.9	0.97 J	<0.43	130	<0.36	<0.43	510	<0.60	<0.43	
	07/25/07	10	<0.40	0.92	39	<0.33	<0.40	<0.42	<0.40	2.8	<0.36	3.1	8.1	0.95 J	<0.43	83	<0.36	<0.43	380	<0.60	<0.43	
	10/24/07	7.0	<0.34	1.3	27	<0.38	<0.35	<0.30	<0.37	2.8	<0.36	3.1 U	9.9	1.6	<0.30	43	<0.32	<0.41	300	<0.59	<0.43	
	01/23/08	5.8	<0.34	1.1	22	<0.38	<0.35	<0.30	<0.37	3.2	<0.36	3.9	8.9	0.98 J	<0.30	37	<0.32	<0.41	400	<0.59	<0.43	
	04/17/08	2.4	<0.44	1.1	10	<0.38	<0.35	<0.33	<0.37	1.5	<0.39	2.1	8.3	1.8	<0.30	19	<0.40	<0.41	170	<0.59	<0.47	
	07/16/08	0.83 J	<1.0	1.1	3.0	<0.50	<1.0	<0.50	<1.0	0.66	<1.0	0.96 J	9.0	2.5	<1.0	12	<1.0	<1.0	100	<1.0	<0.50	
	10/15/08	3.0	<0.49	1.2	5.0	0.31 J	<0.36	<0.14	<1.0	1.7	<1.0	2.5	8.2	1.3	<1.0	18	<0.27	0.61 J	220	<0.21	<0.50	
	01/13/09	<0.45	<0.54	1.9	<0.40	0.76	<0.38	<0.28	<0.69	<0.43	<0.22	0.38 J	14	4.4	<2.6	8.1	<0.33	0.55 J	7.8	<0.31	<0.33	
	04/08/09	0.48 J	<0.54	2.1	1.4	0.95	<0.38	<0.28	<0.69	<0.43	<0.22	0.51 J	16	6.1	<2.6	9.5	<0.33	<0.40	30 J	<0.31	<0.33	
	07/17/09	15	<0.54	1.3	49	<0.31	<0.38	<0.28	<0.69	2.8	<0.22	6.0	11	<0.49	<2.6	100	<0.33	<0.40	800 J	<0.31	<0.33	
	10/14/09	16 J	<10	<12	52	<5.9	<5.7	<8.4	<8.5	<4.6	<6.9	6.9 J	11 J	<7.1	<5.9	100	<4.3	<6.4	690	<5.0	<4.6	
	02/11/10	9.5	--	1	34	0.37 J	--	--	--	2.4	--	4.6	7.3	<0.49	--	72	<0.33	--	--	--	--	
	05/13/10	4.1	<1.1	0.93 J	11	<0.63	<0.38	<0.57	<1.4	2.3	<0.44	3.4	5.3	<0.98	<5.2	31	<0.65	<0.58	280	<0.62	<0.65	
	08/10/10	<0.45	<0.54	0.64 J	2.3	<0.31	--	<0.28	--	0.90 J	--	1	4	0.82 J	--	5.8	<0.33	<0.29	72	<0.31	--	
	12/08/10	<0.45	<0.54	0.60 J	0.89 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.54 J	4.3	0.72 J	<2.6	3.8	<0.33	<0.29	34	<0.31	<0.33	
	02/01/11	<0.45	<0.54	1.3	<0.40	0.36 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.42 J	7.0	1.8	<2.6	4.2	<0.33	<0.29	13	<0.31	<0.33	
	04/05/11	<0.45	<0.54	1.3	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.38 J	7.5	2.3	<2.6	4.1	<0.33	<0.29	6.1	<0.31	<0.33	
	08/03/11	<0.30	<0.38	1.2	<0.43	0.50	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.4	3.7	<0.64	6.7	<0.24	<0.37	8.2	<1.7	<0.30	
	10/12/11	<0.30	<0.38	1.6	0.59 J	0.55	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	11	3.2	<0.64	5.3	<0.24	<0.37	9.8	<1.7	<0.30	
	01/31/12	<0.30	<0.38	1.3	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	10	2.9	<0.64	5.5	<0.24	<0.37	9.2	<1.7	<0.30	
	04/04/12	<0.30	<0.38	1.2	<0.43	0.46 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	11	2.7	<0.64	7.3	0.37 J	<0.37	14	<1.7	<0.30	
	08/14/12	4.1	<0.38	0.34 J	20	0.31 J	<0.42	<0.14	<0.48	1.3	<0.17	2.3	1.4	<0.46	<0.64	37	<0.24	<0.37	77	<1.7	<0.30	
	10/10/12	<0.30	<0.38	1.2	0.64 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	12	1.8	<0.64	5.2	<0.24	<0.37	15	<1.7	<0.30	
	02/13/13	0.87 J	<0.38	0.53 J	3.7	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	3	3.5	0.90 J	<0.64	12	<0.24	<0.37	28	<1.7	<0.30	
	04/03/13	<0.30	<0.38	1.3	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.7	2.0	<0.64	4.4	<0.24	<0.37	12	<1.7	<0.30	
	07/31/13	2.9	<0.38	<0.28	22	0.50	<0.42	<0.14	<0.48	1.1	<0.17	4.3	0.92 J	<0.46	<0.64	20	<0.24	<0.37	79	<1.7	<0.30	
	10/16/13	3.8	<0.38	0.44 J	20	0.57	<0.42	<0.14	<0.48	1.2	<0.17	4.9	1.7	<0.46	<0.64	41	<0.24	<0.37	150	<1.7	<0.30	
	02/12/14	1.8	<0.38	0.42 J	17	<0.24	<0.42	<0.14	<0.48	1.1	<0.17	2.2	2.1	0.68 J	<0.64	31	<0.24	<0.37	65	<1.7	<0.30	
	04/03/14	2.4	<0.38	<0.28	16	0.42 J	<0.42	<0.14	<0.48	1.2	<0.17	4.6	0.54 J	<0.46	<0.64	25	<0.24	<0.37	68	<1.7	<0.30	
	07/31/14	1.8	<0.38	0.29 J	14	<0.24	<0.42	<0.14	<0.48	1.3	<0.17	2.5	1.5	<0.46	<0.64	26	<0.24	<0.37	140	<1.7	<0.30	
	10/15/14	2.0	<0.38	0.56 J	15	0.27 J	<0.42	<0.14	<0.48	1.4	<0.17	3.1	3.5	<0.46	<0.64	27	<0.24	<0.37	170	<1.7	<0.30	
	02/19/15	0.57 J	<0.38	0.43 J	4.6	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	1.3	2	<0.46	<0.64	11	<0.24	<0.37	69	<1.7	<0.30	
	04/09/15	0.77 J	<0.38	0.39 J	5.1	0.49 J	<0.42	<0.14	<0.48	0.35 J	<0.17	9.4	1.1	<0.46	<0.64	11	<0.24	<0.37	66	<1.7	<0.30	
	07/30/15	<0.30	<0.38	0.30 J	2.5	0.58	<0.42	<0.14	<0.48	<0.23	<0.17	27	<0.48	<0.46	<0.64	4.6	<0.24	<0.37	12	<1.7	<0.30	
	10/08/15	<0.30	<0.38	0.42 J	1.7	0.37 J	<0.42	<0.14	<0.48	<0.23	<0.17	15	<0.48	<0.46	<0.64	2.5	<0.24	<0.37	5.9	<1.7	<0.30	
	02/25/16	<0.30	<0.38	0.38 J	0.57 J	0.28 J	<0.42	<0.14	<0.48	<0.23	<0.17	5.7	<0.48	<0.46	<0.64	0.82 J	<0.24	<0.37	2.3	<1.7	<0.30	
	GW-11-273	06/05/05	4.3	<1.0	2.0	6.2	0.55	<1.0	--	<1.0	<0.50	18	4.8	<2.0	--	7.3	0.69	<1.0	200	<1.0	<0.50	
		08/31/05	11	1.1	6.0	24	<3.8	<3.9	--	<2.4	<3.6	<0.50	17	23	<4.3	--	39	<1.0	<3.6	1,700	<4.7	<0.50
		11/30/05	3.4	<0.50	2.9	8.7	0.70	<0.50	--	<0.50	0.90	<0.50	3.8	16	3.0 J	--	<2.0	<0.50	<0.50	420	<1.0	<0.50
		03/03/06	2.1	0.14 J	2.5	5.7	0.62	<0.50	<0.50	<0.50	0.42 J	<0.50	2.7	13	4.5	<2.0	15	0.10 J	<0.50	310	<1.0	<0.50
		05/25/06	7.4	<0.50	2.3	19	0.51	<0.50	<0.50	<0.50	2.2	16	3.8	16	2.0	<2.0	45	<0.50	0.46	690	<1.0	<0.50
		08/15/06	13	<0.50	1.9	39	0.36 J	<0.50	0.19 J	<0.50	3.4	<0.50	3.9	13	1.8	0.23 J	84	0.19 J	0.27 J	720	<1.0	<0.50
10/26/06		16	<0.50	1.3	45	<0.50	<0.50	<0.50	<0.50	3.7	<0.50	2.8	7.6	<1.0	<2.0	97	<0.50	<0.50	460	<1.0	<0.50	
01/25/07		9.2 J	<0.50	1.3	28 J	<0.50	<0.50	<0.50	<0.50	2.8 J	<0.50	2.3 J	7.5 J	1.0 UJ	<2.0	85 J	<0.50	<0.50	340 J	<1.0	<0.50	
04/19/07		2.3	<0.40	0.53	5.9	<0.33	<0.40	<0.42	<0.40	0.73	<0.36	0.84	3.2	<0.48	<0.43	13	<0.36	<0.43	92	<0.60	<0.43	
07/27/07		3.6	<0.40	0.77	7.4	<0.33	<0.40	<0.42	<0.40	1.1	<0.36	1.0	4.6	<0.48	<0.43	42	<0.36	<0.43	110	<0.60	<0.43	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-11-273	10/25/07	11	<0.34	1.1	21	0.39 J	<0.35	<0.30	<0.37	1.6	<0.36	1.4	4.3	<0.68	<0.30	99	<0.32	<0.41	200	<0.59	<0.43
	01/24/08	7.2	<0.34	1.0	17	0.38 J	<0.35	<0.30	<0.37	1.4	<0.36	1.4	4.8	<0.68	<0.30	68	<0.32	<0.41	160 J	<0.59	<0.43
	04/17/08	5.7	<0.44	0.95	13	<0.38	<0.35	<0.33	<0.37	1.1	<0.39	1.1	5.0	<0.68	<0.30	62	<0.40	<0.41	140	<0.59	<0.47
	07/17/08	4.1	<1.0	0.78 J	11	0.35 J	<1.0	<0.50	<1.0	0.61	<1.0	1.1	4.3	<1.0	<1.0	25	<1.0	<1.0	110	<1.0	<0.50
	10/16/08	<0.26	<0.49	1.0 J	15	0.29 J	<0.36	<0.14	<1.0	1.8	<1.0	1.4	4.1	<0.89	<1.0	36	<0.27	<0.38	140	<0.21	<0.50
	01/16/09	4.7 J	<2.7	<1.9	15	<1.6	<1.9	<1.4	<3.5	<2.1	<1.1	2.0 J	6.9	<2.5	<1.3	45	<1.6	<2.0	230	<1.6	<1.6
	04/09/09	1.6	<0.54	0.47 J	4.9	0.35 J	<0.38	<0.28	<0.69	0.56	<0.22	1.8 UJ	6.8	<0.49	<2.6	13	0.38 J	<0.40	150	<1.6	<0.33
	07/23/09	13	<2.6	<3.0	38	<1.5	<1.4	<2.1	<2.1	2.2 J	<1.7	1.5 J	2.5 J	<1.8	<1.5	150	<1.1	<1.6	320	<1.2	<1.2
	10/28/09	14	<2.6	<3.0	41	<1.5	<1.4	<2.1	<2.1	3.0 J	<1.7	1.4 J	<1.8	<1.8	<1.5	160	<1.1	<1.6	310	<1.2	<1.2
	05/10/10	8.3	<1.1	0.82 J	27	<0.63	<0.38	<0.57	<1.4	1.8 J	<0.44	0.75 J	0.62 J	<0.98	<5.2	130	<0.65	<0.58	200	<0.62	<0.65
	08/11/10	3.7	<0.54	1.6	19	<0.31	--	<0.28	--	1.5	--	2.1	6.6	0.71 J	--	51	<0.33	<0.29	180	<0.31	--
	12/06/10	1.9	<0.54	1.2	9.6	<0.31	<0.38	<0.28	<0.69	0.83 J	<0.22	1.7	6.4	1.2	<2.6	45	<0.33	<0.29	200	<0.31	<0.33
	02/01/11	1.9	<0.54	1.1	9.1	0.34 J	<0.38	<0.28	<0.69	0.91 J	<0.22	1.3	6.3	1.1	<2.6	30	<0.33	<0.29	180	<0.31	<0.33
	04/05/11	<0.45	<0.54	<0.37	0.90 J	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	0.87 J	<0.49	<2.6	2.5	<0.33	<0.29	14	<0.31	<0.33
	08/03/11	2.3	<0.38	0.85 J	13	0.24 J	<0.42	<0.14	<0.48	1.3	<0.17	0.94 J	4.5	1.8	<0.64	41	<0.24	<0.37	140	<1.7	<0.30
	10/11/11	1.7	<0.38	0.84 J	6.3	0.30 J	<0.42	<0.14	<0.48	0.89 J	<0.17	0.72 J	5.0	1.5	<0.64	33	<0.24	<0.37	110	<1.7	<0.30
	02/01/12	1.1	<0.38	0.85 J	7.7	0.24 J	<0.42	<0.14	<0.48	0.59 J	<0.17	0.73 J	5.0	1.2	1.0 U	26	<0.24	<0.37	89	<1.7	<0.30
	04/04/12	0.97 J	<0.38	0.80 J	4.6	0.28 J	<0.42	<0.14	<0.48	0.67 J	<0.17	0.73 J	4.9	1.1	<0.64	20	<0.24	<0.37	77	<1.7	<0.30
	08/14/12	<0.30	<0.38	0.74 J	0.96 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.0	1.4	<0.64	8.1	<0.24	<0.37	18	<1.7	<0.30
	10/08/12	<0.30	<0.38	0.76 J	1.0	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.1	1.4	<0.64	11	<0.24	<0.37	22	<1.7	<0.30
	02/11/13	<0.30	<0.38	0.82 J	1.2	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.46 J	5.2	1.3	<0.64	8.6	<0.24	<0.37	24	<1.7	<0.30
	04/01/13	<0.30	<0.38	0.87 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.2	1.8	<0.64	5.1	<0.24	<0.37	9.5	<1.7	<0.30
	07/29/13	<0.30	<0.38	0.52 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.55 J	3.1	1.3	<0.64	3.7	<0.24	<0.37	4.5	<1.7	<0.30
	10/14/13	<0.30	<0.38	0.49 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.92 J	2.5	1.3	<0.64	3.8	<0.24	<0.37	4.2	<1.7	<0.30
	02/10/14	<0.30	<0.38	0.35 J	<0.43	<0.24	<0.42	<0.14	<0.48	0.32 J	<0.17	0.71 J	1.8	1.2	<0.64	5.0	<0.24	<0.37	8.1	<1.7	<0.30
	04/01/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.64 J	<0.46	<0.64	2.0	<0.24	<0.37	3.8	<1.7	<0.30
	07/29/14	<0.30	<0.38	<0.28	1.3	<0.24	<0.42	<0.14	<0.48	0.27 J	<0.17	<0.46	0.79 J	<0.46	<0.64	4.7	<0.24	<0.37	8.8	<1.7	<0.30
	10/13/14	<0.30	<0.38	<0.28	4.6	<0.24	<0.42	<0.14	<0.48	0.59 J	<0.17	<0.46	0.91 J	0.61 J	<0.64	9.5	<0.24	<0.37	26	<1.7	<0.30
	02/17/15	0.81 J	<0.38	<0.28	7	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	<0.48	<0.46	<0.64	16	<0.24	<0.37	41	<1.7	<0.30
	04/06/15	0.52 J	<0.38	<0.28	4.5	<0.24	<0.42	<0.14	<0.48	0.39 J	<0.17	<0.46	<0.48	<0.46	<0.64	13	<0.24	<0.37	31	<1.7	<0.30
	07/28/15	1.1	<0.38	<0.28	13	<0.24	<0.42	<0.14	<0.48	0.82 J	<0.17	<0.46	<0.48	<0.46	<0.64	24	<0.24	<0.37	57	<1.7	<0.30
	10/07/15	<0.30	<0.38	<0.28	15	<0.24	<0.42	<0.14	<0.48	1.1	<0.17	0.69 J	<0.48	0.49 J	<0.64	27	<0.24	<0.37	60	<1.7	<0.30
	02/23/16	0.95 J	<0.38	<0.28	9.7	<0.24	<0.42	<0.14	<0.48	0.81 J	<0.17	1.0	<0.48	<0.46	<0.64	19	<0.24	<0.37	48	<1.7	<0.30
GW-11-287	06/05/05	2.6	<1.0	1.6	4.0	<0.50	<1.0	--	<1.0	<0.50	<1.0	20	4.0	<2.0	--	5.2	1.8	<1.0	160	<1.0	<0.50
	08/31/05	11	0.76	5.7	25	0.86	<0.39	--	<0.24	1.9	<0.50	16	27	1.8	--	37	0.71	<0.36	1,100	<0.47	0.27 UJ
	11/30/05	1.6	<0.50	2.6	4.6	0.65	<0.50	--	<0.50	0.52 J	<0.50	3.1	14	5.2 J	--	<2.0	2.3	<0.50	220	<1.0	<0.50
	11/30/05	1.9	<0.50	2.5	5.2	0.68	<0.50	--	<0.50	0.83	<0.50	2.6	14	4.7 J	--	<2.0	1.1	<0.50	250	<1.0	<0.50
	03/03/06	1.8	<0.50	2.3	4.6	0.63	<0.50	<0.50	<0.50	0.57	<0.50	1.9	12	4.6	<2.0	13	1.1	<0.50	210	<1.0	<0.50
	05/25/06	1.6	<0.50	1.8	4.0	0.53	0.20 J	<0.50	<0.50	0.65	<0.50	1.3	11	3.2	<0.22	17	0.48 J	0.51	160	<1.0	<0.50
	08/15/06	11	<0.50	1.8	33	0.36 J	<0.50	<0.50	<0.50	3.5	<0.50	3.6	12	1.7	<2.0	59	0.99	0.27 J	600	<1.0	<0.50
	10/26/06	15	<0.50	1.3	44	<0.50	<0.50	<0.50	<0.50	4.0	<0.50	2.9	7.8	<1.0	<2.0	100	0.42 J	<0.50	500	<1.0	<0.50
	01/25/07	9.3	<0.50	1.3	27	<0.50	<0.50	<0.50	<0.50	2.9	<0.50	2.3	8.0	1.0 UJ	<2.0	85	0.45 J	<0.50	340	<1.0	<0.50
	04/19/07	2.8	<0.40	0.72	7.9	<0.33	<0.40	<0.42	<0.40	1.2	<0.36	1.0	4.8	<0.48	<0.43	23	0.45 J	<0.43	130	<0.60	<0.43
	07/27/07	3.8	<0.40	0.86	11	<0.33	<0.40	<0.42	<0.40	1.3	<0.36	1.1	5.4	<0.48	<0.43	44	<0.36	<0.43	120	<0.60	<0.43
	10/25/07	9.7	<0.34	0.95	22	<0.38	<0.35	<0.30	<0.37	1.7	<0.36	1.2	3.8	<0.68	<0.30	93	<0.32	<0.41	180	<0.59	<0.43
	01/24/08	7.5	<0.34	1.2	18	0.43 J	<0.35	<0.30	<0.37	1.6	<0.36	1.4	5.3	<0.68	<0.30	73	<0.32	<0.41	190 J	<0.59	<0.43

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-11-287	04/17/08	0.97	<0.44	<0.37	2.1	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	0.53	1.1	<0.68	0.35	10	<0.40	<0.41	29	<0.59	<0.47
	07/17/08	6.2	<1.0	1.1	18	0.51	<1.0	<0.50	<1.0	1.4	<1.0	1.6	5.5	<1.0	<1.0	47	<1.0	<1.0	170	<1.0	<0.50
	10/16/08	<0.26	<0.49	1.4	21	0.33 J	<0.36	<0.14	<1.0	2.0	<1.0	1.3	5.1	<0.89	<1.0	60	<0.27	<0.38	180	<0.21	<0.50
	01/16/09	4.9	<0.54	1.4	13	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	1.6	6.5	1.0	<2.6	54	<0.33	<0.40	180	<0.31	<0.33
	04/09/09	1.1	<0.54	0.83 J	3.8	0.48 J	<0.38	<0.28	<0.69	<0.43	<0.22	1.0 UJ	8.2	2.8	<2.6	18	<0.33	<0.40	66	<0.31	<0.33
	07/23/09	13	<2.6	<3.0	36	<1.5	<1.4	<2.1	<2.1	2.2 J	<1.7	1.5 J	2.3 J	<1.8	<1.5	130	<1.1	<1.6	300	<1.2	<1.2
	10/28/09	14	<2.6	<3.0	41	<1.5	<1.4	<2.1	<2.1	2.9 J	<1.7	1.5 J	<1.8	<1.8	<1.5	160	<1.1	<1.6	320	<1.2	<1.2
	02/10/10	12	--	0.93 J	37	<0.63	--	--	--	2.7	--	1.1 J	<0.57	<0.98	--	130	<0.65	--	--	--	--
	05/10/10	4.0	<0.54	0.62 J	15	<0.31	<0.38	<0.28	<0.69	0.74 J	<0.22	1.6	0.44 J	<0.49	<2.6	59	<0.33	<0.29	110	<0.31	<0.33
	08/11/10	2.7	<0.54	1	9.3	<0.31	--	<0.28	--	0.46 J	--	0.89 J	4	0.84 J	--	31	<0.33	<0.29	83	<0.31	--
	12/06/10	0.99 J	<0.54	1.0	4.5	0.32 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.52 J	5.5	2.1	<2.6	32	<0.33	<0.29	63	<0.31	<0.33
	01/31/11	0.77 J	<0.54	1.7	3.1	0.41 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.62 J	8.9	3.9	<2.6	19	<0.33	<0.29	43	<0.31	<0.33
	04/04/11	<0.45	<0.54	1.4	1.5	0.36 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.57 J	7.3	2.1	<2.6	9.4	<0.33	<0.29	21	<0.31	<0.33
	08/01/11	0.57 J	<0.38	1.3	2.9	0.42 J	<0.42	<0.14	<0.48	0.35 J	<0.17	0.46 J	7.7	4.3	<0.64	16	<0.24	<0.37	34	<1.7	<0.30
	10/10/11	<0.30	<0.38	1.3	1.7	0.39 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.0	2.6	0.79 J	12	<0.24	<0.37	23	<1.7	<0.30
	02/01/12	<0.30	<0.38	1.1	1.3	0.29 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.0	2.0	1.0 U	11	<0.24	<0.37	21	<1.7	<0.30
	04/02/12	<0.30	<0.38	1.1	1.1	0.37 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.6	2.1	<0.64	13	<0.24	<0.37	21	<1.7	<0.30
	08/15/12	<0.30	<0.38	0.97 J	0.87 J	0.27 J	<0.42	<0.14	<0.48	<0.23	<0.17	0.59 J	6.1	1.2	<0.64	10	<0.24	<0.37	18	<1.7	<0.30
	10/08/12	<0.30	<0.38	0.66 J	0.66 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.6	1.3	<0.64	10	<0.24	<0.37	13	<1.7	<0.30
	02/11/13	<0.30	<0.38	0.91 J	0.68 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.4	1.5	<0.64	7.3	<0.24	<0.37	16	<1.7	<0.30
	04/01/13	<0.30	<0.38	0.86 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.46 J	5.0	2.3	<0.64	3.6	<0.24	<0.37	14	<1.7	<0.30
	07/29/13	<0.30	<0.38	0.57 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.71 J	3.5	1.7	<0.64	5.2	<0.24	<0.37	6.7	<1.7	<0.30
	10/14/13	<0.30	<0.38	0.51 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.89 J	2.6	0.76 J	<0.64	3.8	<0.24	<0.37	4.7	<1.7	<0.30
	02/10/14	<0.30	<0.38	0.40 J	0.51 J	<0.24	<0.42	<0.14	<0.48	0.29 J	<0.17	0.82 J	2.2	1.5	<0.64	6.4	<0.24	<0.37	12	<1.7	<0.30
	04/01/14	<0.30	<0.38	0.45 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.76 J	2.1	0.61 J	<0.64	3.4	<0.24	<0.37	6.7	<1.7	<0.30
	07/29/14	<0.30	<0.38	<0.28	0.55 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.50 J	1.4	0.47 J	<0.64	6.2	<0.24	<0.37	8.7	<1.7	<0.30
	10/13/14	<0.30	<0.38	<0.28	4.2	<0.24	<0.42	<0.14	<0.48	0.56 J	<0.17	<0.46	0.61 J	0.55 J	<0.64	9.6	<0.24	<0.37	25	<1.7	<0.30
02/17/15	0.79 J	<0.38	<0.28	7.7	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	<0.48	0.46 J	<0.64	20	<0.24	<0.37	44	<1.7	<0.30	
04/06/15	0.81 J	<0.38	<0.28	6.8	<0.24	<0.42	<0.14	<0.48	0.77 J	<0.17	<0.46	0.53 J	0.54 J	<0.64	20	<0.24	<0.37	46	<1.7	<0.30	
07/28/15	1.1	<0.38	<0.28	13	<0.24	<0.42	<0.14	<0.48	0.86 J	<0.17	<0.46	<0.48	<0.46	<0.64	27	<0.24	<0.37	62	<1.7	<0.30	
10/07/15	<0.30	<0.38	<0.28	12	<0.24	<0.42	<0.14	<0.48	0.96 J	<0.17	0.57 J	<0.48	0.50 J	<0.64	24	<0.24	<0.37	57	<1.7	<0.30	
02/23/16	1.1	<0.38	<0.28	10	<0.24	<0.42	<0.14	<0.48	1.1	<0.17	1.0	<0.48	<0.46	<0.64	22	<0.24	<0.37	54	<1.7	<0.30	
GW-11-316	06/05/05	<1.0	<1.0	<1.0	1.7	<0.50	<1.0	--	<1.0	<0.50	<1.0	21	3.0	<2.0	--	3.2	1.9	<1.0	90	<1.0	<0.50
	08/31/05	0.88	0.12	1.7	2.3	<0.38	<0.39	--	0.27	<0.36	<0.50	11	6.3	2.1	--	4.8	1.5	<0.36	99	<0.47	<0.27
	11/30/05	<0.50	<0.50	1.9	1.1	0.58	<0.50	--	<0.50	<0.50	<0.50	2.6	8.6	5.6 J	--	<2.0	<0.50	<0.50	77	<1.0	<0.50
	03/03/06	<0.50	<0.50	1.4	0.39 J	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.72	6.0	5.0	<2.0	6.6	0.10 J	<0.50	28	<1.0	<0.50
	05/25/06	<0.50	<0.50	1.2	<0.50	0.45 J	<0.50	<0.50	<0.50	<0.50	<0.50	0.48 J	5.5	2.9	<2.0	7.2	<0.50	<0.50	19	<1.0	<0.50
	08/15/06	0.64	<0.50	1.4	1.7	0.47 J	<0.50	<0.50	<0.50	<0.50	<0.50	0.80	6.4	3.3 J	<2.0	7.0 J	<0.50	<0.50	43	<1.0	<0.50
	10/26/06	11	<0.50	1.5	27	<0.50	<0.50	<0.50	<0.50	2.2	<0.50	2.7	8.2	1.5 J	<2.0	55	<0.50	<0.50	330	<1.0	<0.50
	01/25/07	6.3	<0.50	1.5	16	0.33 J	<0.50	<0.50	<0.50	0.73	<0.50	1.9	6.5	2.0 J	<2.0	42	<0.50	<0.50	190	<1.0	<0.50
	04/19/07	4.7	<0.40	1.6	14	0.37 J	<0.40	<0.42	<0.40	0.79	<0.36	1.9	7.1	1.4	<0.43	41	<0.36	<0.43	190	<0.60	<0.43
	07/27/07	2.1	<0.40	1.4	6.2	0.35 J	<0.40	<0.42	<0.40	<0.48	<0.36	1.7	6.2	<0.48	<0.43	20	0.44 J	<0.43	130	<0.60	<0.43
	10/25/07	0.62	<0.34	<0.37	2.0	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	5.6	1.6	<0.68	0.38 J	9.3	8.3	<0.41	33	<0.59	<0.43
	01/24/08	2.6	<0.34	1.5	7.3	0.49 J	<0.35	<0.30	<0.37	<0.43	<0.36	1.4	7.0	1.6	0.41 J	27	<0.32	<0.41	120 J	<0.59	<0.43
	04/17/08	1.6	<0.44	1.3	4.1	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	1.1	6.0	0.98	0.38	15	0.78	<0.41	73	<0.59	<0.47
	07/17/08	1.9	<1.0	1.6	6.6	0.56	<1.0	<0.50	<1.0	<0.50	<1.0	1.1	7.7	2.1	<1.0	18	<1.0	<1.0	99	<1.0	<0.50



Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-11-316	10/16/08	<0.26	<0.49	1.6	9.5	0.56	<0.36	<0.14	<1.0	<0.32	<1.0	1.2	7.8	1.8	<1.0	23	<0.27	<0.38	100	<0.21	<0.50
	01/16/09	0.95 J	<0.54	1.0	2.7	0.44 J	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	4.5	1.0	<2.6	11	<0.33	<0.40	43	<0.31	<0.33
	04/09/09	<0.45	<0.54	0.72 J	0.57 J	0.55	<0.38	<0.28	<0.69	<0.43	<0.22	1.0 UJ	7.3	2.3	<2.6	6.7	<0.33	<0.40	14	<0.31	<0.33
	07/23/09	3.0	<0.54	1.7	7.9	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	1.1	6.5	1.2	<2.6	17	<0.33	<0.40	76	<0.31	<0.33
	10/27/09	9.1	<0.54	1.4	26	<0.31	<0.38	<0.28	<0.69	1.2	<0.22	1.7	3.1	0.67 J	<2.6	82	<0.33	<0.29	160	<0.31	<0.33
	02/09/10	7.7	--	1.8 J	18	<0.63	--	--	--	<0.85	--	2.1	3.5	1.0 J	--	46	<0.65	--	--	--	--
	05/11/10	7.8	<1.1	1.6 J	24	<0.63	<0.38	<0.57	<1.4	<0.85	<0.44	1.5 J	3.3	<0.98	<5.2	110	<0.65	<0.58	200	<0.62	<0.65
	08/12/10	2.8	<0.54	1	8.8	<0.31	--	<0.28	--	<0.43	--	1.7	3.2	0.67 J	--	12	<0.33	<0.29	56	<0.31	--
	12/06/10	<0.45	<0.54	1.2	1.1	0.37 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.37 J	7.7	3.2	<2.6	15	<0.33	<0.29	20	<0.31	<0.33
	01/31/11	<0.45	<0.54	1.1	1.2	0.32 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.82 J	5.5	0.55 J	<2.6	5.0	<0.33	<0.29	17	<0.31	<0.33
	04/05/11	<0.45	<0.54	1.1	<0.40	0.34 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.41 J	6.1	0.52 J	<2.6	3.6	<0.33	<0.29	6.5	<0.31	<0.33
	08/03/11	<0.30	<0.38	1.1	0.48 J	0.38 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.9	2.6	<0.64	8.0	<0.24	<0.37	15	<1.7	<0.30
	10/11/11	<0.30	<0.38	1.1	<0.43	0.43 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.2	2.5	<0.64	8.5	<0.24	<0.37	13	<1.7	<0.30
	02/01/12	<0.30	<0.38	1.2	<0.43	0.42 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.7	1.8	1.1 U	8.9	<0.24	<0.37	17	<1.7	<0.30
	04/04/12	<0.30	<0.38	1.1	<0.43	0.43 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.9	1.7	<0.64	8.0	<0.24	<0.37	19	<1.7	<0.30
	08/13/12	<0.30	<0.38	0.40 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.0	0.56 J	<0.64	3.3	<0.24	<0.37	7.9	<1.7	<0.30
	10/08/12	<0.30	<0.38	0.81 J	<0.43	0.32 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.1	1.4	<0.64	10	<0.24	<0.37	25	<1.7	<0.30
	02/11/13	<0.30	<0.38	0.89 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.6	1.2	<0.64	6.4	<0.24	<0.37	25	<1.7	<0.30
	04/01/13	<0.30	<0.38	1.1	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.47 J	7.3	1.4	<0.64	4.6	<0.24	<0.37	35	<1.7	<0.30
	07/29/13	<0.30	<0.38	0.71 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.56 J	4.7	1.4	<0.64	7.1	<0.24	<0.37	20	<1.7	<0.30
	10/14/13	<0.30	<0.38	0.71 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.81 J	3.9	0.70 J	<0.64	6.4	<0.24	<0.37	15	<1.7	<0.30
	02/10/14	<0.30	<0.38	0.41 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.79 J	2.7	1.0	<0.64	6.4	<0.24	<0.37	15	<1.7	<0.30
	04/01/14	<0.30	<0.38	0.72 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.57 J	3.8	1.6	<0.64	6.4	<0.24	<0.37	20	<1.7	<0.30
	07/29/14	<0.30	<0.38	0.28 J	0.58 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.52 J	1.9	0.74 J	<0.64	5.8	<0.24	<0.37	12	<1.7	<0.30
	10/13/14	<0.30	<0.38	<0.28	2.7	<0.24	<0.42	<0.14	<0.48	0.51 J	<0.17	<0.46	1.3	0.71 J	<0.64	7.5	<0.24	<0.37	20	<1.7	<0.30
	02/17/15	0.55 J	<0.38	<0.28	3.8	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	0.55 J	1.2	0.73 J	<0.64	11	<0.24	<0.37	27	<1.7	<0.30
	04/06/15	0.68 J	<0.38	<0.28	5.0	<0.24	<0.42	<0.14	<0.48	0.52 J	<0.17	<0.46	0.96 J	0.82 J	<0.64	15	<0.24	<0.37	35	<1.7	<0.30
	07/28/15	0.57 J	<0.38	<0.28	5.7	<0.24	<0.42	<0.14	<0.48	0.38 J	<0.17	0.55 J	1.2	0.67 J	<0.64	14	<0.24	<0.37	35	<1.7	<0.30
	10/07/15	<0.30	<0.38	<0.28	12	<0.24	<0.42	<0.14	<0.48	0.86 J	<0.17	0.61 J	0.72 J	0.72 J	<0.64	22	<0.24	<0.37	58	<1.7	<0.30
	02/23/16	0.69 J	<0.38	<0.28	7.2	<0.24	<0.42	<0.14	<0.48	0.67 J	<0.17	0.75 J	0.57 J	0.48 J	<0.64	14	<0.24	<0.37	38	<1.7	<0.30
GW-11-352	06/05/05	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	--	<1.0	<0.50	<1.0	2.7	4.3	3.6	--	4.3	<0.50	<1.0	8.8	<1.0	<0.50
	08/31/05	<0.23	<0.10	0.70	<0.26	<0.38	<0.39	--	<0.24	<0.36	<0.50	0.79	3.1	2.8	--	5.2	<0.10	<0.36	3.0	<0.47	<0.27
	11/30/05	<0.50	<0.50	0.52	<0.50	<0.50	<0.50	--	<0.50	<0.50	<0.50	0.58	1.6	2.3 J	--	<2.0	<0.50	<0.50	2.1	<1.0	<0.50
	03/03/06	<0.50	<0.50	0.53	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.46	1.5	2.2	<2.0	4.1	0.35 J	<0.50	1.8 UJ	<1.0	<0.50
	05/25/06	<0.50	<0.50	0.39 J	<0.50	0.24 J	<0.50	<0.50	<0.50	<0.50	<0.50	0.26 J	1.3	1.3	<2.0	4.2	<0.50	<0.50	1.6	<1.0	<0.50
	08/15/06	<0.50	<0.50	0.64	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.9	1.7 J	<2.0	4.6	<0.50	<0.50	2.3	<1.0	<0.50
	10/26/06	<0.50	<0.50	0.89	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.49 J	4.3	2.7 J	<2.0	2.5	<0.50	<0.50	1.8	<1.0	<0.50
	01/25/07	<0.50	<0.50	1.2	<0.50	0.34 J	<0.50	<0.50	<0.50	<0.50	<0.50	0.48 J	8.3	2.4 J	<2.0	6.9	<0.50	<0.50	3.8	<1.0	<0.50
	04/19/07	<0.46	<0.40	1.4	<0.45	0.46 J	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	12	3.4	<0.43	9.1	<0.36	<0.43	7.1	<0.60	<0.43
	07/27/07	<0.46	<0.40	1.3	<0.45	0.49 J	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	11	3.5	<0.43	10	<0.36	<0.43	9.2	<0.60	<0.43
	10/25/07	<0.39	<0.34	1.4	<0.43	0.61	<0.35	<0.30	<0.37	<0.43	<0.36	0.35 J	12	2.7	<0.30	7.2	<0.32	<0.41	7.9	<0.59	<0.43
	01/24/08	<0.39	<0.34	1.8	<0.43	0.72	<0.35	<0.30	<0.37	<0.43	<0.36	<0.33	14	3.8	<0.30	10	<0.32	<0.41	9.9 J	<0.59	<0.43
	04/17/08	<0.39	<0.44	1.4	<0.43	0.49	<0.35	<0.33	<0.37	<0.46	<0.39	<0.33	12	3.3	<0.30	8.2	<0.40	<0.41	7.8	<0.59	<0.47
	07/17/08	<1.0	<1.0	1.5	<1.0	0.51	<1.0	<0.50	<1.0	<0.50	<1.0	<1.0	12	3.1	<1.0	7.2	<1.0	<1.0	8.7	<1.0	<0.50
	10/16/08	<0.26	<0.49	1.8	<0.29	0.57	<0.36	<0.14	<1.0	<0.32	<1.0	0.48 J	14	4.3	<1.0	6.0	<0.27	<0.38	8.1	<0.21	<0.50
	01/16/09	<0.45	<0.54	1.7	<0.40	0.58	<0.38	<0.28	<0.69	<0.43	<0.22	0.49 J	14	3.9	<2.6	8.3	<0.33	<0.40	9.4	<0.31	<0.33

Well/Barcad ID	Sample Date	Concentrations (µg/L)																				
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride	
GW-11-352	04/09/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	1.2 UJ	4.5	<0.49	<2.6	0.75 J	<0.33	<0.40	3.4	<0.31	<0.33	
	07/23/09	<0.45	<0.54	1.0	<0.40	0.40 J	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	9.7	1.8	<2.6	4.9	<0.33	<0.40	9.3	<0.31	<0.33	
	10/27/09	<0.45	<0.54	1.2	<0.40	0.39 J	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	9.5	2.1	<2.6	5.0	<0.33	<0.29	8.7	<0.31	<0.33	
	02/09/10	<0.45	--	<0.37	<0.40	<0.31	--	--	--	<0.43	--	<0.33	3.2	<0.49	--	1.2	<0.33	--	--	--	--	
	05/11/10	<0.45	<0.54	0.59 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	5.0	<0.49	<2.6	0.68 J	<0.33	<0.29	1.9	<0.31	<0.33	
	08/12/10	<0.45	<0.54	0.96 J	<0.40	0.41 J	--	<0.28	--	<0.43	--	<0.33	8.6	1.5	--	3.5	<0.33	<0.29	7.7	<0.31	--	
	12/07/10	<0.45	<0.54	0.79 J	<0.40	0.40 J	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	8.5	1.6	<2.6	5.0	<0.33	<0.29	12	<0.31	<0.33	
	01/31/11	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	1.7	<0.49	<2.6	0.52 J	<0.33	<0.29	1.6	<0.31	<0.33	
	04/04/11	<0.45	<0.54	0.75 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.36 J	7.9	1.7	<2.6	4.2	<0.33	<0.29	13	<0.31	<0.33	
	08/01/11	<0.30	<0.38	0.48 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.6	1.7	<0.64	4.8	<0.24	<0.37	19	<1.7	<0.30	
	10/10/11	<0.30	<0.38	0.40 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.5	0.99 J	<0.64	4.7	<0.24	<0.37	23	<1.7	<0.30	
	01/30/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.4	0.94 J	<0.64	3.7	<0.24	<0.37	28	<1.7	<0.30	
	04/02/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.5	0.62 J	<0.64	5.2	<0.24	<0.37	36	<1.7	<0.30	
	08/13/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.2	0.58 J	<0.64	2.6	<0.24	<0.37	24	<1.7	<0.30	
	10/08/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.2	<0.46	<0.64	4.9	<0.24	<0.37	56	<1.7	<0.30	
	02/12/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.2	0.81 J	<0.64	3.3	<0.24	<0.37	42	<1.7	<0.30	
	04/01/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.9	<0.46	<0.64	2.4	<0.24	<0.37	42	<1.7	<0.30	
	07/29/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.6	<0.46	<0.64	3.8	<0.24	<0.37	73	<1.7	<0.30	
	10/14/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.49 J	1.8	<0.46	<0.64	3.2	<0.24	<0.37	61	<1.7	<0.30	
	02/10/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.2	0.56 J	<0.64	2.8	<0.24	<0.37	54	<1.7	<0.30	
	04/01/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.4	<0.46	<0.64	2.8	<0.24	<0.37	72	<1.7	<0.30	
	07/29/14	<0.30	<0.38	0.34 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.7	0.62 J	<0.64	4.5	<0.24	<0.37	63	<1.7	<0.30	
	10/13/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.49 J	1.8	<0.46	<0.64	2.6	<0.24	<0.37	49	<1.7	<0.30	
	02/17/15	<0.30	<0.38	0.66 J	<0.43	0.28 J	<0.42	<0.14	<0.48	<0.21	<0.17	0.50 J	4.3	0.56 J	<0.64	3.8	<0.24	<0.37	38	<1.7	<0.30	
	04/06/15	<0.30	<0.38	0.67 J	<0.43	0.30 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.9	0.77 J	<0.64	4.2	<0.24	<0.37	33	<1.7	<0.30	
	07/28/15	<0.30	<0.38	0.73 J	<0.43	0.32 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.2	0.71 J	<0.64	3.9	<0.24	<0.37	30	<1.7	<0.30	
	10/07/15	<0.30	<0.38	1.1	0.53 J	0.30 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.5	1.4	<0.64	4.6	<0.24	<0.37	22	<1.7	<0.30	
	02/23/16	<0.30	<0.38	0.83 J	0.85 J	0.40 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.6	1.2	<0.64	4.5	<0.24	<0.37	22	<1.7	<0.30	
	GW-11-407	06/05/05	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	--	<1.0	<0.50	<1.0	2.7	<1.0	<2.0	--	1.8	<0.50	<1.0	10	<1.0	<0.50
		08/31/05	<0.23	<0.10	<0.37	<0.26	<0.38	<0.39	--	<0.24	<0.36	<0.50	0.42	<0.42	<0.43	--	1.9	<0.10	<0.36	5.6	<0.47	<0.27
11/30/05		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	--	<2.0	<0.50	<0.50	4.6	<1.0	<0.50	
03/03/06		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	2.0	0.35 J	<0.50	3.1	<1.0	<0.50	
05/25/06		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.28 J	<0.50	<0.50	<1.0	1.1	<0.50	<0.50	1.9	<1.0	<0.50	
08/15/06		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.0 UJ	<2.0	1.9	<0.50	<0.50	1.8	<1.0	<0.50	
10/26/06		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	0.93	<0.50	<0.50	0.95	<1.0	<0.50	
01/25/07		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.0 UJ	<2.0	1.7	<0.50	<0.50	0.88	<1.0	<0.50	
04/19/07		<0.46	<0.40	<0.35	<0.45	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	<0.39	<0.48	<0.43	1.8	<0.36	<0.43	1.2	<0.60	<0.43	
07/27/07		<0.46	<0.40	<0.35	<0.45	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	<0.39	<0.48	<0.43	1.8	<0.36	<0.43	1.2	<0.60	<0.43	
10/25/07		<0.39	<0.34	<0.37	<0.43	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	<0.33	<0.36	<0.68	<0.30	0.89	<0.32	<0.41	0.65	<0.59	<0.43	
01/24/08		<0.39	<0.34	<0.37	<0.43	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	<0.33	<0.36	<0.68	<0.30	1.6	<0.32	<0.41	1.1	<0.59	<0.43	
04/17/08		<0.39	<0.44	<0.37	<0.43	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	<0.33	<0.36	<0.68	<0.30	1.6	<0.40	<0.41	0.88	<0.59	<0.47	
07/17/08		<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<0.50	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	0.94 J	<1.0	<1.0	0.76 J	<1.0	<0.50	
10/16/08		<0.26	<0.49	<0.27	<0.29	<0.26	<0.36	<0.14	<1.0	<0.32	<1.0	<0.24	<0.35	<0.89	<1.0	0.92 J	<0.27	<0.38	1.0 J	<0.21	<0.50	
01/16/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.49	<0.49	<2.6	1.2	<0.33	<0.40	0.63 J	<0.31	<0.33		
04/09/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.49	<0.49	<2.6	1.0	<0.33	<0.40	0.90 J	<0.31	<0.33		
07/22/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.49	<0.49	<2.6	1.1	<0.33	<0.40	1.1	<0.31	<0.33		

Well/Barcad ID	Sample Date	Concentrations (µg/L)																				
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride	
GW-11-407	10/27/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.23	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	0.64 J	<2.6	1.7	<0.33	<0.29	1.3	<0.31	<0.33	
	02/09/10	<0.45	--	<0.37	<0.40	<0.31	--	--	--	<0.43	--	<0.33	<0.28	<0.49	--	<0.51	0.42 J	--	--	--	--	
	02/09/10	<0.45	--	<0.37	<0.40	<0.31	--	--	--	<0.43	--	<0.33	<0.28	<0.49	--	<0.51	0.36 J	--	--	--	--	
	05/13/10	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.59 J	<0.33	<0.29	0.73 J	<0.31	<0.33	
	08/12/10	<0.45	<0.54	<0.37	<0.40	<0.31	--	<0.28	--	<0.43	--	<0.33	<0.28	<0.49	--	0.61 J	<0.33	<0.29	0.43 J	<0.31	--	
	12/07/10	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	<0.51	<0.33	<0.29	<0.30	<0.31	<0.33	
	01/31/11	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	<0.51	<0.33	<0.29	<0.30	<0.31	<0.33	
	04/04/11	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	<0.51	<0.33	<0.29	<0.30	<0.31	<0.33	
	08/01/11	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	1.0	<0.24	<0.37	0.39 J	<1.7	<0.30	
	10/10/11	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	1.0	<0.24	<0.37	<0.37	<1.7	<0.30	
	01/30/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.79 J	<0.24	<0.37	<0.37	<1.7	<0.30	
	04/02/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	1.2	<0.24	<0.37	<0.37	<1.7	<0.30	
	08/14/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.77 J	<0.24	<0.37	<0.37	<1.7	<0.30	
	10/08/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.86 J	<0.24	<0.37	<0.37	<1.7	<0.30	
	02/12/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.77 J	<0.24	<0.37	<0.37	<1.7	<0.30	
	04/01/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.48 J	<0.48	<0.46	<0.64	0.46 J	<0.24	<0.37	0.51 J	<1.7	<0.30	
	07/29/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.61 J	<0.24	<0.37	0.92 J	<1.7	<0.30	
	10/14/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	0.72 J	<1.7	<0.30	
	02/10/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.48 J	<0.24	<0.37	1.1	<1.7	<0.30	
	04/01/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.54 J	<0.24	<0.37	1.1	<1.7	<0.30	
	07/29/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	1.8	<1.7	<0.30	
	10/13/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.61 J	<0.24	<0.37	4.2	<1.7	<0.30	
	02/17/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	<0.48	<0.46	<0.64	0.88 J	<0.24	<0.37	7.4	<1.7	<0.30	
	04/06/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	1.2	<0.24	<0.37	8.1	<1.7	<0.30	
	07/28/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	1.5	<0.24	<0.37	10	<1.7	<0.30	
	10/07/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	1.4	<0.24	<0.37	11	<1.7	<0.30	
02/23/16	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.77 J	<0.24	<0.37	6.0	<1.7	<0.30		
GW-11-438	06/05/05	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	--	<1.0	<0.50	<1.0	3.1	<1.0	<2.0	--	<1.0	<0.50	<1.0	6.3	<1.0	<0.50	
	08/31/05	<0.23	<0.10	<0.37	<0.26	<0.38	<0.39	--	<0.24	<0.36	<0.50	0.89	0.60	<0.43	--	1.1	0.19	<0.36	6.9	<0.47	<0.50	
	11/30/05	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	--	<2.0	<0.50	<0.50	4.0	<1.0	<0.50	
	03/03/06	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	0.68	0.18 J	<0.50	1.9 UJ	<1.0	<0.50	
	05/25/06	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	0.87	<0.50	<0.50	0.96	<1.0	<0.50	
	08/15/06	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	0.94	<0.50	<0.50	0.71	<1.0	<0.50	
	10/26/06	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	0.52	<0.50	<0.50	0.43 J	<1.0	<0.50	
	01/25/07	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	1.1	<0.50	<0.50	0.47 J	<1.0	<0.50	
	04/19/07	<0.46	<0.40	<0.35	<0.45	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	<0.39	<0.48	<0.43	1.1	<0.36	<0.43	<0.38	<0.60	<0.43	
	07/27/07	<0.46	<0.40	<0.35	<0.45	<0.33	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	<0.39	<0.48	<0.43	0.99	<0.36	<0.43	<0.38	<0.60	<0.43	
	10/25/07	<0.39	<0.34	<0.37	<0.43	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	<0.33	<0.36	<0.68	<0.30	0.94	<0.32	<0.41	0.31 J	<0.59	<0.43	
	01/24/08	<0.39	<0.34	<0.37	<0.43	<0.38	<0.35	<0.30	<0.37	<0.43	<0.36	<0.33	<0.36	<0.68	<0.30	0.82	<0.32	<0.41	<0.31	<0.59	<0.43	
	04/17/08	<0.39	<0.44	<0.37	<0.43	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	<0.33	<0.36	<0.68	<0.30	0.73	<0.40	<0.41	<0.38	<0.59	<0.47	
	07/17/08	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<0.50	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.50 J	<1.0	<1.0	<1.0	<1.0	<0.50
	10/16/08	<0.26	<0.49	<0.27	<0.29	<0.26	<0.36	<0.14	<1.0	<0.32	<1.0	<0.24	<0.35	<0.89	<1.0	0.49 J	<0.27	<0.38	<0.37	<0.21	<0.50	
	01/16/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.49	<0.49	<2.6	0.67 J	<0.33	<0.40	<0.30	<0.31	<0.33	
	04/09/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.49	<0.49	<2.6	<0.51	<0.33	<0.40	<0.30	<0.31	<0.33	
07/22/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.49	<0.49	<2.6	0.56 J	<0.33	<0.40	<0.30	<0.31	<0.33		
10/27/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.23	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.65 J	<0.33	<0.29	<0.30	<0.31	<0.33		

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-11-438	02/09/10	<0.45	--	<0.37	<0.40	<0.31	--	--	--	<0.43	--	<0.33	<0.28	<0.49	--	<0.51	<0.33	--	--	--	--
	02/09/10	<0.45	--	<0.37	<0.40	<0.31	--	--	--	<0.43	--	<0.33	<0.28	<0.49	--	<0.51	<0.33	--	--	--	--
	05/13/10	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.76 J	<0.33	<0.29	<0.30	<0.31	<0.33
	05/13/10	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.59 J	<0.33	<0.29	<0.30	<0.31	<0.33
	08/11/10	<0.45	<0.54	<0.37	<0.40	<0.31	--	<0.28	--	<0.43	--	<0.33	<0.28	<0.49	--	<0.51	<0.33	<0.29	<0.30	<0.31	--
	12/07/10	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	<0.51	<0.33	<0.29	<0.30	<0.31	<0.33
	02/01/11	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	0.64 J	<0.33	<0.29	<0.30	<0.31	<0.33
	04/05/11	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	<0.28	<0.49	<2.6	<0.51	<0.33	<0.29	<0.30	<0.31	<0.33
	08/03/11	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.70 J	<0.24	<0.37	<0.37	<1.7	<0.30
	10/11/11	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.55 J	<0.24	<0.37	<0.37	<1.7	<0.30
	01/30/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	<0.37	<1.7	<0.30
	04/04/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.69 J	<0.24	<0.37	0.41 J	<1.7	<0.30
	08/14/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	<0.37	<1.7	<0.30
	10/08/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.60 J	<0.24	<0.37	<0.37	<1.7	<0.30
	02/12/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.43 J	<0.24	<0.37	<0.37	<1.7	<0.30
	04/01/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	0.38 J	<1.7	<0.30
	07/29/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.73 J	<0.24	<0.37	0.78 J	<1.7	<0.30
	10/14/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.46 J	<0.24	<0.37	0.46 J	<1.7	<0.30
	02/10/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.57 J	<0.24	<0.37	0.69 J	<1.7	<0.30
	04/01/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.44 J	<0.24	<0.37	0.57 J	<1.7	<0.30
	10/13/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	<0.37	<1.7	<0.30
04/06/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.65 J	<0.24	<0.37	0.61 J	<1.7	<0.30	
10/07/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.58 J	<0.24	<0.37	1.0	<1.7	<0.30	
GW-12A-284	05/23/05	<1.0	<1.0	3.3	1.7	0.64	<1.0	--	<1.0	<0.50	<1.0	<1.0	14	4.9	--	9.0	<0.50	<1.0	41	<1.0	<0.50
	09/29/05	2.3	<0.10	5.5	4.9	0.78	<0.39	--	<0.24	0.42	<0.50	1.4	18	11	--	13	<0.10	<0.36	75 J	<0.47	<0.50
	11/29/05	2.3	<0.50	5.7	5.4	0.84	<0.50	--	<0.50	<0.50	<0.50	1.5	20	12 J	--	<2.0	<0.50	<0.50	120	<1.0	<0.50
	03/01/06	2.1	<0.50	6.8	5.1	0.97	0.40 J	<0.50	<0.50	0.40	<0.50	1.8	23	12	<2.0	14	<0.50	<0.50	160	<1.0	<0.50
	05/26/06	1.7	<0.50	6.1	3.9	1.0	0.41 J	<0.50	<0.50	<0.50	<0.50	1.8	24	12	<0.39	15	<0.50	0.26	180	<1.0	<0.50
	08/17/06	0.70	0.35 J	3.0	1.9	0.72	0.29 J	<0.50	<0.50	<0.50	<0.50	0.54	15	11	<2.0	13	<0.50	0.32 J	47	<1.0	<0.50
	10/12/06	<1.0	<1.0	1.6	<1.0	0.62	<1.0	<0.50	<1.0	<0.50	<1.0	<1.0	9.5	3.9	<5.0	6.9	<0.50	<1.0	19	<1.0	<0.50
	10/26/06	<0.50	<0.50	2.6	1.2	0.80	<0.50	<0.50	<0.50	<0.50	<0.50	0.75	15	12 J	<2.0	12	<0.50	<0.50	46	<1.0	<0.50
	01/23/07	0.51	<0.50	1.5	1.4	0.62	0.50 UJ	<0.50	<0.50	<0.50	<0.50	1.0	11	6.8	<2.0	13	<0.50	<0.50	76	<1.0	<0.50
	04/17/07	3.7	2.3	3.3	9.7	1.1	<0.40	<0.42	<0.40	0.89	<0.36	6.2	20	7.9	<0.43	28	<0.36	<0.43	490	<0.60	<0.43
	07/25/07	6.1 J	2.5 J	5.3	14	1.1	<0.40	<0.42	<0.40	1.6	<0.36	12 J	24	4.7	<0.43	38	<0.36	1.1	900 J	<0.60	<0.43
	10/23/07	2.0	0.59	3.4	7.0	0.79	<0.35	<0.30	<0.37	1.1	<0.36	3.8	14	3.3 J	<0.30	14	<0.32	<0.41	280	<0.59	<0.43
	01/22/08	2.0 J	<0.34	4.1 J	7.4 J	0.81 J	0.50 UJ	<0.30	<0.37	1.4 J	<0.36	2.6 J	14 J	3.1 J	<0.30	12 J	<0.32	<0.41	220 J	<0.59	<0.43
	04/15/08	2.5 J	0.61	4.9 J	8.4 J	0.76	<0.35	<0.33	<0.37	1.5 J	<0.39	3.8 J	16 J	3.1 J	<0.30	13 J	<0.40	<0.41	290 J	<0.59	<0.47
	07/15/08	1.3	<1.0	2.4	4.2	0.76	<1.0	<0.50	<1.0	1.3	<1.0	1.6	12	2.2	<1.0	6.0	<1.0	<1.0	130	<1.0	<0.50
	10/14/08	1.3	<0.49	3.2	4.9	0.67	<0.36	<0.14	<1.0	0.77	<1.0	2.0	14	3.3	<1.0	9.6	<0.27	<0.38	140	<0.21	<0.50
	01/13/09	<0.45	<0.54	3.0	5.2	0.78	<0.38	<0.28	<0.69	1.1	<0.22	2.3	12	2.8	<2.6	8.4	<0.33	<0.40	180	<0.31	<0.33
	04/07/09	6.4 J	<5.4	6.4 J	22 J	<3.1	<3.8	<2.8	<6.9	<4.3	2.2 UJ	9.6 J	21	<4.9	<2.6	27	<3.3	<4.0	930	<0.31	<0.33
	07/15/09	1.2 J	<2.6	3.2 J	5.7	<1.5	<1.4	<2.1	<2.1	<1.2	<1.7	3.3 J	11	<1.8	<1.5	11	<1.1	<1.6	260	<1.2	<1.2
	10/14/09	5.4	<2.6	7.3	25	<1.5	<1.4	<2.1	<2.1	3.4 J	<1.7	7.7	18	3.5 J	<1.5	31	<1.1	<1.6	920	<1.2	<1.2
	02/12/10	3.1	--	4.7	12	0.73	--	--	--	2.1	--	4.2	11	2.3 J	--	16	<0.33	--	--	--	--
05/12/10	5.6	<2.7	14	20	<1.6	<1.9	<1.4	<3.5	2.4 J	<1.1	6.4	22	4.2 J	<13	21	<1.6	<1.5	690	<1.6	<1.6	
08/12/10	<0.45	<0.54	2.1	2.7	0.63	--	<0.28	--	<0.43	--	1.6	9.8	0.94 J	--	5.9	<0.33	<0.29	130	<0.31	--	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-12A-284	12/09/10	0.50 J	<0.54	1.3	3.3	0.37 J	<0.38	<0.28	<0.69	0.92 J	<0.22	1.0	8.2	2.6	<2.6	10	<0.33	<0.29	99	<0.31	<0.33
	02/03/11	0.48 J	<0.54	1.6	2.9	0.44 J	<0.38	<0.28	<0.69	0.68 J	<0.22	0.84 J	9.6	2.8	<2.6	8.6	<0.33	<0.29	85	<0.31	<0.33
	04/07/11	0.97 J	<0.54	1.6	5.5	0.47 J	<0.38	<0.28	<0.69	0.62 J	<0.22	1.1	10	3.1	<2.6	14	<0.33	0.44 J	90	<0.31	<0.33
	08/04/11	<0.30	<0.38	2	1.8	0.73	<0.42	<0.14	<0.48	<0.23	<0.17	0.52 J	15	5.3	<0.64	9.8	<0.24	<0.37	34	<1.7	<0.30
	10/11/11	<0.30	<0.38	1.4	1.0	0.62	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	10	1.6	<0.64	6.6	<0.24	<0.37	36	<1.7	<0.30
	01/30/12	No Longer Accessible																			
GW-12A-319	05/23/05	<1.0	<1.0	2.0	<1.0	0.69	<1.0	--	<1.0	<0.50	<0.22	<1.0	14	5.7	--	11	<0.50	<1.0	12	<1.0	<0.50
	09/29/05	0.27	<0.10	3.3	0.67	1.1	0.40	--	<0.24	<0.36	<0.50	0.59	21	17	--	16	<0.10	<0.36	22	<0.47	<0.50
	11/29/05	<0.50	<0.50	2.8	<0.50	0.98	<0.50	--	<0.50	<0.50	<0.50	<0.50	19	15	--	<2.0	<0.50	<0.50	14	<1.0	<0.50
	03/01/06	<0.50	<0.50	1.8	<0.50	0.69	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	11	10	<2.0	9.3	<0.50	<0.50	4.7	<1.0	<0.50
	05/26/06	<0.50	<0.50	1.4	<0.50	0.41 J	<0.50	<0.50	<0.50	<0.50	<0.50	0.30 J	6.0	6.0	<2.0	9.5	<0.50	<0.50	2.7	<1.0	<0.50
	08/17/06	<0.50	<0.50	1.1	<0.50	0.32 J	<0.50	<0.50	<0.50	<0.50	<0.50	0.28 J	5.9	5.3	<2.0	9.2	<0.50	<0.50	4.9	1.0 UJ	<0.50
	10/26/06	0.83	<0.50	5.1	1.8	0.93	<0.50	<0.50	<0.50	<0.50	<0.50	1.9	20	15 J	<2.0	12	<0.50	<0.50	170	<1.0	<0.50
	01/23/07	<0.50	<0.50	2.8	0.98	0.65	0.50 UJ	<0.50	<0.50	<0.50	<0.50	1.2	14	9.1	<2.0	12	<0.50	<0.50	97	<1.0	<0.50
	04/17/07	<0.46	<0.40	3.0	0.74	0.83	<0.40	<0.42	<0.40	<0.48	<0.36	0.87	17	13	<0.43	13	<0.36	<0.43	68	<0.60	<0.43
	07/25/07	0.51	<0.40	3.1	1.7	1.2	<0.40	<0.42	<0.40	<0.48	<0.36	0.98	21	16	<0.43	18	<0.36	<0.43	71	<0.60	<0.43
	10/23/07	2.4	1.4	3.7	7.6	1.5	0.36 J	<0.30	<0.37	0.59	<0.36	4.4	25	15	<0.30	27	<0.32	<0.41	310	<0.59	<0.43
	01/22/08	2.3	0.96	4.6	7.2 J	1.1	0.50 UJ	<0.30	<0.37	0.53	<0.36	5.3	23	12	<0.30	22	<0.32	<0.41	360	<0.59	<0.43
	04/15/08	3.7	2.4	4.5	10	1.1	<0.35	<0.33	<0.37	1.0	<0.39	7.2	25	9.7	<0.30	31	<0.40	0.49	530	<0.59	<0.47
	07/15/08	1.9	1.1	2.4	5.9	1.0	<1.0	<0.50	<1.0	0.56	<1.0	5.0	22	7.6	<1.0	14	<1.0	<1.0	310	<1.0	<0.50
	10/14/08	2.4	1.3	3.5	8.5	1.1	<0.36	<0.14	<1.0	0.32 J	<1.0	5.7	25	9.6	<1.0	25	<0.27	<0.38	510	<0.21	<0.50
	01/13/09	<2.2	<2.7	2.7 J	7.1	<1.6	<1.9	<1.4	<3.5	<2.1	<1.1	5.5	20	6.6	<1.3	19	<1.6	<2.0	430	<1.6	<1.6
	04/07/09	4.0 J	<2.7	3.8 J	14	<1.6	<1.9	<1.4	<3.5	<2.1	1.1 UJ	5.7	19	6.2	<1.3	19	<1.6	<2.0	530	<1.6	<0.33
	07/15/09	2.4 J	<2.7	3.5 J	8.8	<1.6	<1.9	<1.4	<3.5	<2.1	<1.1	4.5 J	21	6.4	<1.3	18	<1.6	<2.0	390 J	<1.6	<1.6
	10/14/09	0.46 J	<0.54	3.1	2.8	1.5	<0.38	<0.28	<0.69	<0.43	<0.22	1.4	23	3.7	<2.6	9.9	<0.33	<0.29	110	<0.31	<0.33
	02/12/10	0.83 J	--	2.7	3.2	1.7	--	--	--	<0.43	--	0.95 J	22	9.0 J	--	16	<0.33	--	--	--	--
	05/12/10	0.53 J	<0.54	2.6	2.4	1.0	<0.38	<0.28	<0.69	<0.43	<0.22	0.86 J	20	6.3	<2.6	14	<0.33	<0.29	60	<0.31	<0.33
	08/12/10	2.3	<0.54	2.8	11	1.2	--	<0.28	--	0.78 J	--	2	22	6.9	--	27	<0.33	<0.29	150	<0.31	--
	12/09/10	2.3	<0.54	2.0	12	0.76	<0.38	<0.28	<0.69	1.0	<0.22	1.8	16	4.6	<2.6	28	<0.33	<0.29	180	<0.31	<0.33
	02/01/11	0.91 J	<0.54	1.9	3.9	0.76	<0.38	<0.28	<0.69	<0.43	<0.22	0.95 J	13	2.2	<2.6	12	<0.33	0.39 J	78	<0.31	<0.33
	04/07/11	<0.45	<0.54	1.8	1.6	0.65	<0.38	<0.28	<0.69	<0.43	<0.22	0.45 J	14	4.8	<2.6	10	<0.33	0.43 J	27	<0.31	<0.33
	08/04/11	<0.30	<0.38	1.6	2.3	0.70	<0.42	<0.14	<0.48	<0.23	<0.17	0.61 J	9.4	3.0	<0.64	4.7	<0.24	<0.37	64	<1.7	<0.30
	10/11/11	<0.30	<0.38	1.2	<0.43	0.54	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	11	2.8	<0.64	7.8	<0.24	<0.37	18	<1.7	<0.30
	02/02/12	<0.30	<0.38	1.3	0.63 J	0.44 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	11	1.7	<0.64	5.3	<0.24	<0.37	29	<1.7	<0.30
	04/05/12	<0.30	<0.38	0.90 J	<0.43	0.49 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.9	2.0	<0.64	6.0	<0.24	<0.37	26	<1.7	<0.30
	08/15/12	<0.30	<0.38	0.95 J	0.73 J	0.42 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.7	2.0	<0.64	6.9	<0.24	0.42 J	37	<1.7	<0.30
	10/10/12	<0.30	<0.38	0.68 J	0.53 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.1	1.9	<0.64	4.4	<0.24	<0.37	31	<1.7	<0.30
	02/13/13	<0.30	<0.38	0.53 J	0.49 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.5	1.7	<0.64	5.3	<0.24	<0.37	37	<1.7	<0.30
	04/03/13	<0.30	<0.38	0.56 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.2	1.4	<0.64	4.0	<0.24	<0.37	31	<1.7	<0.30
07/31/13	<0.30	<0.38	0.55 J	0.61 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.3	1.5	<0.64	4.7	<0.24	<0.37	39	<1.7	<0.30	
10/15/13	<0.30	<0.38	0.53 J	<0.43	0.26 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.1	1.4	<0.64	4.8	<0.24	<0.37	30	<1.7	<0.30	
02/11/14	<0.30	<0.38	0.69 J	0.50 J	0.31 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.4	1.5	<0.64	5.3	<0.24	<0.37	32	<1.7	<0.30	
04/02/14	<0.30	<0.38	0.68 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.0	1.5	<0.64	4.3	<0.24	<0.37	27	<1.7	<0.30	
07/31/14	<0.30	<0.38	0.68 J	<0.43	0.32 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.1	1.5	<0.64	4.5	<0.24	<0.37	32	<1.7	<0.30	
10/15/14	0.52 J	<0.38	0.62 J	2.9	<0.24	<0.42	<0.14	<0.48	0.29 J	<0.17	0.77 J	4.1	1.2	<0.64	5.8	<0.24	<0.37	26	<1.7	<0.30	
02/18/15	<0.30	<0.38	0.65 J	1.8	0.32 J	<0.42	<0.14	<0.48	<0.21	<0.17	0.52 J	4.8	0.74 J	<0.64	5.9	<0.24	<0.37	33	<1.7	<0.30	



Well/Barcad ID	Sample Date	Concentrations (µg/L)																				
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride	
GW-12A-319	04/07/15	<0.30	<0.38	0.41 J	0.85 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.4	<0.46	<0.64	3.9	<0.24	<0.37	24	<1.7	<0.30	
	07/29/15	<0.30	<0.38	0.80 J	2.0	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.4	1.9	<0.64	10 J	<0.24	<0.37	49	<1.7	<0.30	
	10/07/15	<0.30	<0.38	0.84 J	2.0	0.27 J	<0.42	<0.14	<0.48	<0.23	<0.17	0.67 J	5.6	1.7	<0.64	8.0	<0.24	<0.37	51	<1.7	<0.30	
	02/24/16	0.52 J	<0.38	1.9	3.4	0.37 J	<0.42	<0.14	<0.48	0.58 J	<0.17	3.0	9.6	1.7	<0.64	8.5	<0.24	<0.37	160	<1.7	<0.30	
GW-12A-349	05/23/05	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	--	<1.0	<0.50	<1.0	<1.0	4.0	4.5	--	5.2	<0.50	<1.0	2.0	<1.0	<0.50	
	09/29/05	<0.23	<0.10	0.54	<0.26	<0.38	<0.39	--	<0.24	<0.36	<0.50	<0.35	1.0	2.9	--	2.7	<0.10	<0.36	1.2	<0.47	<0.50	
	11/29/05	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50	<0.50	<0.50	0.87	2.8 J	--	<2.0	<0.50	<0.50	0.79	<1.0	<0.50	
	03/01/06	<0.50	<0.50	0.48 J	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.70	2.7	<2.0	2.8	<0.50	<0.50	0.81	<1.0	<0.50	
	05/26/06	<0.50	<0.50	0.40 J	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.25 J	0.66	2.0	<2.0	3.0	<0.50	<0.50	0.63	<1.0	<0.50	
	08/17/06	<0.50	<0.50	0.42 J	<0.50	0.50 UJ	<0.50	<0.50	<0.50	<0.50	<0.50	0.20 J	1.3	2.1	<2.0	3.4	<0.50	<0.50	0.95	1.0 UJ	<0.50	
	10/26/06	<0.50	<0.50	1.4	<0.50	0.40 J	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	8.4	4.3 J	<2.0	7.5	<0.50	<0.50	3.1	<1.0	<0.50	
	01/23/07	<0.50	<0.50	0.99	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	5.3	3.1	<2.0	5.8	<0.50	<0.50	1.9	1.0 UJ	<0.50	
	04/17/07	<0.46	<0.40	1.7	<0.45	0.53	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	14	4.7	<0.43	11	<0.36	<0.43	5.0	<0.60	<0.43	
	07/25/07	<0.46	<0.40	1.8	<0.45	0.60	<0.40	<0.42	<0.40	<0.48	<0.36	<0.40	15	5.1	<0.43	12	<0.36	<0.43	5.9	<0.60	<0.43	
	10/23/07	<0.39	<0.34	1.8	<0.43	0.62	<0.35	<0.30	<0.37	<0.43	<0.36	<0.33	15	5.6	<0.30	12	<0.32	<0.41	5.3	<0.59	<0.43	
	01/22/08	<0.39	<0.34	1.6	0.50 UJ	0.54	0.50 UJ	<0.30	<0.37	<0.43	<0.36	<0.33	14	4.6	<0.30	9.8	<0.32	<0.41	4.1	<0.59	<0.43	
	04/15/08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	07/15/08	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	0.44 J	<1.0	<0.50	<1.0	<1.0	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	
	10/14/08	<0.26	<0.49	<0.27	<0.29	<0.26	<0.36	<0.14	<1.0	<0.32	<1.0	<0.24	1.8	<0.89	<1.0	<0.35	<0.27	<0.38	0.62 J	<0.21	<0.50	
	01/13/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	1.8	<0.49	<2.6	<0.51	<0.33	<0.40	0.73 J	<0.31	<0.33	
	04/07/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	0.22 UJ	<0.33	1.7	<0.49	<2.6	<0.51	<0.33	<0.40	0.46 J	<0.31	<0.33	
	07/15/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	2.8	<0.49	<2.6	<0.51	<0.33	<0.40	0.44 J	<0.31	<0.33	
	10/14/09	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	1.3	<0.49	<2.6	<0.51	<0.33	<0.29	<0.30	<0.31	<0.33	
	02/12/10	<0.45	--	<0.37	<0.40	<0.31	--	--	--	<0.43	--	<0.33	1.8	<0.49	--	<0.51	<0.33	--	--	--	--	
	05/12/10	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	2.7	<0.49	<2.6	<0.51	<0.33	<0.29	0.66 J	<0.31	<0.33	
	08/12/10	<0.45	<0.54	<0.37	<0.40	<0.31	--	<0.28	--	<0.43	--	<0.33	2.0	<0.49	--	<0.51	<0.33	<0.29	0.63 J	<0.31	--	
	12/09/10	<0.90	<1.1	<0.75	<0.80	<0.63	<0.76	<0.57	<1.4	<0.85	<0.44	<0.66	2.9	<0.98	<5.2	<1.0	<0.65	<0.58	0.89 J	<0.62	<0.65	
	02/01/11	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	2.0	<0.49	<2.6	<0.51	<0.33	<0.29	0.59 J	<0.31	<0.33	
	04/07/11	<0.45	<0.54	<0.37	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	1.7	<0.49	<2.6	<0.51	<0.33	<0.29	0.63 J	<0.31	<0.33	
	08/04/11	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.2	<0.46	<0.64	<0.39	<0.24	<0.37	0.55 J	<1.7	<0.30	
	10/11/11	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.2	<0.46	<0.64	<0.39	<0.24	<0.37	1.0	<1.7	<0.30	
	02/01/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.94 J	<0.46	0.94 U	<0.39	<0.24	<0.37	1.3	<1.7	<0.30	
	04/05/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	1.0	<1.7	<0.30	
	08/15/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	3.2	<1.7	<0.30	
	10/10/12	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.54 J	<0.46	<0.64	<0.39	<0.24	<0.37	2.5	<1.7	<0.30	
	02/13/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	3.1	<1.7	<0.30	
	04/03/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	5.3	<1.7	<0.30	
	07/31/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	5.7	<1.7	<0.30	
	10/15/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	4.6	<1.7	<0.30	
02/11/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	4.8	<1.7	<0.30		
04/02/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	6.4	<1.7	<0.30		
10/15/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.96 J	<0.46	<0.64	<0.39	<0.24	<0.37	4.2	<1.7	<0.30		
04/08/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	0.65	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	3.5	<1.7	<0.30		
10/07/15	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	1.3	<1.7	<0.30		
GW-12B	02/14/13	1.8	<0.38	0.56 J	11	<0.24	<0.42	<0.14	<0.48	0.97 J	<0.17	1.4	3.2	<0.46	<0.64	26	<0.24	<0.37	50	<1.7	<0.30	
	04/04/13	<0.30	<0.38	1.0	1.2	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.48 J	9.2	1.7	<0.64	6.6	<0.24	0.41 J	26	<1.7	<0.30	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																				
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride	
GW-12B	08/01/13	2.7	<0.38	0.37 J	15	<0.24	<0.42	<0.14	<0.48	1.4	<0.17	2.5	1.9	<0.46	<0.64	33	<0.24	<0.37	72	<1.7	<0.30	
	10/16/13	5.1	0.50 J	0.78 J	25	0.73	<0.42	<0.14	<0.48	2.2	<0.17	4.8	3.5	<0.46	<0.64	52	<0.24	<0.37	400	<1.7	<0.30	
	02/13/14	4.1	<0.77	<0.56	31	0.54 J	<0.85	<0.28	<0.95	1.8 J	<0.34	4.0	2.5	<0.91	<1.3	35	<0.47	<0.74	290	<3.3	<0.60	
	04/04/14	4.5	<0.38	0.76 J	28	0.46 J	<0.42	<0.14	<0.48	2.6	<0.17	7.2	4.3	<0.46	<0.64	46	<0.24	<0.37	580	<1.7	<0.30	
	07/31/14	5.9	<1.9	2.4 J	28	<1.2	<2.1	<0.71	<2.4	3.2 J	<0.86	11	11	<2.3	<3.2	47	<1.2	<1.8	1600	<8.3	<1.5	
	10/16/14	<3.0	<3.8	3.9 J	13	<2.4	<4.2	<1.4	<4.8	<2.3	<1.7	10 J	15	<4.6	<6.4	31	<2.4	<3.7	1500	<17	<3.0	
	02/20/15	<3.0	<3.8	7.3 J	16	<2.4	<4.2	<1.4	<4.8	<2.1	<1.7	18	26	<4.6	<6.4	22	<2.4	<3.7	1,600	<17	<3.0	
	04/09/15	<3.0	<3.8	9.0 J	19	<2.4	<4.2	<1.4	<4.8	5.4 J	<1.7	25	31	<4.6	<6.4	33	<2.4	<3.7	1,800	<17	<3.0	
	04/09/15	3.7 J	<3.8	11	21	<2.4	<4.2	<1.4	<4.8	5.4 J	<1.7	28	38	<4.6	<6.4	39	<2.4	<3.7	1,900	<17	<3.0	
	07/30/15	<3.0	<3.8	2.9 J	7.8 J	<2.4	<4.2	<1.4	<4.8	2.8 J	<1.7	12	13	<4.6	<6.4	20	<2.4	<3.7	1,100	<17	<3.0	
	10/08/15	<1.5	<1.9	1.6 J	3.0 J	<1.2	<2.1	<0.71	<2.4	2.4 J	<0.86	9.3	6.6	<2.3	<3.2	15	<1.2	<1.8	700	<8.3	<1.5	
	02/26/16	2.5 J	<1.9	4.4 J	19	<1.2	<2.1	<0.71	<2.4	2.8 J	<0.86	10	15	<2.3	<3.2	21	<1.2	<1.8	1,100	<8.3	<1.5	
	GW-14A	11/09/04	<1.0	<1.0	2.1	1.8	0.50	<1.0	--	<1.0	<0.50	<1.0	<1.0	11	<2.0	--	8.3	<0.50	<1.0	29	<1.0	<0.50
		02/23/05	<1.0	<1.0	3.9	<1.0	1.6	<1.0	--	<1.0	<0.50	<1.0	<1.0	31	7.0	--	16	<0.50	<1.0	14	<1.0	<0.50
05/24/05		<1.0	<1.0	4.9	<1.0	1.4	<1.0	--	<1.0	<0.50	<1.0	<1.0	34	9.6	--	17	<0.50	<1.0	19	<1.0	<0.50	
08/31/05		<0.23	<0.10	4.4	0.26	1.2	0.51	--	<0.24	<0.36	--	0.51	30	11	--	16	<0.10	<0.36	12	<0.47	<0.50	
11/29/05		<0.50	<0.50	4.4	<0.50	1.4	0.56	--	<0.50	<0.50	<0.50	0.54	32	15 J	--	<2.0	<0.50	<0.50	14	<1.0	<0.50	
03/01/06		<0.50	<0.50	2.7	0.29 J	0.81	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	18	8.1	<2.0	12	<0.50	<0.50	10	<1.0	<0.50	
05/25/06		<0.50	<0.50	2.6	<0.50	0.82	0.33 J	<0.50	<0.50	<0.50	<0.50	0.46 J	18	7.0	<2.0	11	<0.50	<0.50	8.6	<1.0	<0.50	
08/16/06		0.81	<0.50	2.6	2.5 UJ	0.91	0.35 J	<0.50	<0.50	0.75	<0.50	0.91 UJ	19	3.7 J	<2.0	15	<0.50	<0.50	75	1.0 UJ	0.50 UJ	
10/12/06		2.3	<1.0	2.3	4.8	0.61	<1.0	<0.50	<1.0	2.1	<1.0	1.7	9.7	2.2	<5.0	8.5	<0.50	<1.0	110	<1.0	<0.50	
10/25/06		2.7	<0.50	2.5	7.7	0.43 J	<0.50	<0.50	<0.50	2.6	<0.50	2.1	8.3	2.8 J	<2.0	9.3	<0.50	<0.50	150	<1.0	<0.50	
01/25/07		1.6	<0.50	1.6 J	5.4	0.50 UJ	0.50 UJ	0.50 UJ	<0.50	2.2	0.50 UJ	1.2 J	6.9	0.78 J	<2.0	5.6	<0.50	<0.50	64	<1.0	<0.50	
04/18/07		1.0	<0.40	1.4	3.1	<0.33	<0.40	<0.42	<0.40	1.4	<0.36	0.91	6.6	<0.48	<0.43	4.8	<0.36	<0.43	43	<0.60	<0.43	
07/25/07		0.86	<0.40	1.2	2.6	<0.33	<0.40	<0.42	<0.40	1.0	<0.36	0.82	5.0	<0.48	<0.43	4.3	<0.36	<0.43	32	<0.60	<0.43	
10/24/07		0.40 J	<0.34	1.1	1.6	<0.38	<0.35	<0.30	<0.37	0.68	<0.36	0.60 U	6.1	1.7	<0.30	7.9	<0.32	<0.41	23	<0.59	<0.43	
01/23/08		0.39 J	<0.34	1.3 J	1.3 J	0.50 UJ	0.50 UJ	0.50 UJ	<0.37	0.52	0.50 UJ	0.70	6.5	1.3	<0.30	9.7	0.50 UJ	<0.41	39 J	<0.59	0.50 UJ	
04/17/08		0.40	<0.44	1.0	1.5	<0.38	<0.35	<0.33	<0.37	<0.46	<0.39	0.58	5.8	1.8	<0.30	8.9	<0.40	<0.41	59	<0.59	<0.47	
07/16/08		<1.0	<1.0	1.3	<1.0	<0.50	<1.0	<0.50	<1.0	<0.50	<1.0	0.41 J	8.6	2.7	<1.0	4.3	<1.0	<1.0	6.8	<1.0	<0.50	
10/14/08		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/14/09		<0.45	<0.54	0.76 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	4.7	<0.49	<2.6	1.7	<0.33	<0.40	2.2	<0.31	<0.33	
04/08/09		<0.45	<0.54	0.84 J	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	4.8	1.9	<2.6	3.2	<0.33	<0.40	4.1 J	<0.31	<0.33	
07/16/09		<0.45	<0.54	0.88 J	2.0	<0.31	<0.38	<0.28	<0.69	0.72	<0.22	1.2	2.5	<0.49	<2.6	2.2	<0.33	<0.40	25	<0.31	<0.33	
10/15/09		<0.45	<0.54	0.74 J	1.3	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	1.0	3.2	1.2	<2.6	4.3	<0.33	<0.29	16	<0.31	<0.33	
08/13/10		2	<0.54	1.4	4.1	<0.31	--	<0.28	--	0.66 J	--	1.9	1.1	<0.49	--	1.6	<0.33	<0.29	47	<0.31	--	
12/09/10		1.4	<0.54	0.91 J	3.1	<0.31	<0.38	<0.28	<0.69	0.52 J	<0.22	1.4	0.74 J	<0.49	<2.6	2.6	<0.33	<0.29	29	<0.31	<0.33	
02/03/11		0.82 J	<0.54	1.4	1.9	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.79 J	6.6	2.1	<2.6	3.8	<0.33	<0.29	20	<0.31	<0.33	
04/08/11		0.57 J	<0.54	1.7	1.6	0.36 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.82 J	8.4	2.0	<2.6	5.3	<0.33	<0.29	18	<0.31	<0.33	
08/05/11		<0.30	<0.38	1.1	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.78 J	5.5	2.2	<0.64	5.7	2.4	<0.37	6.1	<1.7	<0.30	
10/13/11		0.30 J	<0.38	0.89 J	1.3	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.72 J	3.2	0.96 J	<0.64	4.1	<0.24	<0.37	19	<1.7	<0.30	
02/02/12		<0.30	<0.38	0.80 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	3.1	1.1	<0.64	6.7	0.39 J	<0.37	2.9	<1.7	<0.30	
04/05/12		<0.30	<0.38	0.53 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.5	0.70 J	<0.64	2.5	1.4	<0.37	7.5	<1.7	<0.30	
08/16/12		<0.30	<0.38	0.37 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.8	0.70 J	<0.64	2.6	<0.24	<0.37	5.1	<1.7	<0.30	
10/11/12		<0.30	<0.38	0.54 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.8	<0.46	<0.64	2.1	<0.24	<0.37	3.2	<1.7	<0.30	
02/14/13		<3.0	<3.8	<2.8	<4.3	<2.4	<4.2	<1.4	<4.8	<2.3	<1.7	<4.6	<4.8	<4.6	<6.4	<3.9	<2.4	<3.7	<3.7	<17	<3.0	
04/04/13		<1.5	<1.9	<1.4	<2.2	<1.2	<2.1	<0.71	<2.4	<1.1	<0.86	<2.3	<2.4	<2.3	<3.2	<1.9	<1.2	<1.8	<1.8	<8.3	<1.5	

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-14A	08/02/13	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	0.45 J	<0.24	<0.37	1.5	<1.7	<0.30
	10/16/13	0.35 J	<0.38	<0.28	2.3	<0.24	<0.42	<0.14	<0.48	0.23 J	<0.17	<0.46	<0.48	<0.46	<0.64	13	<0.24	<0.37	69	<1.7	<0.30
	02/13/14	<0.30	<0.38	<0.28	0.61 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	3.8	<0.24	<0.37	8.2	<1.7	<0.30
	04/02/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	3.4	<1.7	<0.30
	07/29/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	<0.48	<0.46	<0.64	<0.39	<0.24	<0.37	5.9	<1.7	<0.30
	10/15/14	<0.30	<0.38	0.31 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.98 J	<0.46	<0.64	1.0	<0.24	<0.37	1.7	<1.7	<0.30
	02/17/15	<0.30	<0.38	0.33 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	0.87 J	<0.46	<0.64	1.8	<0.24	<0.37	2.5	<1.7	<0.30
	04/09/15	<0.30	<0.38	0.32 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.90 J	<0.46	<0.64	1.5	<0.24	<0.37	2.4	<1.7	<0.30
	07/29/15	<0.30	<0.38	0.45 J	0.83 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.80 J	<0.46	<0.64	1.0	<0.24	<0.37	3.9	<1.7	<0.30
	10/07/15	<0.30	<0.38	0.56 J	1.0 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.73 J	<0.46	<0.64	1.4	<0.24	<0.37	3.8	<1.7	<0.30
	02/23/16	<0.30	<0.38	0.90 J	1.4	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.52 J	<0.46	<0.64	0.70 J	<0.24	<0.37	3.0	<1.7	<0.30
	GW-14B	11/09/04	<1.0	<1.0	3.6	<1.0	1.3	<1.0	--	<1.0	<0.50	<1.0	<1.0	28	7.0	--	15	<0.50	<1.0	15	<1.0
02/24/05		<1.0	<1.0	4.3	<1.0	1.7	<1.0	--	<1.0	<0.50	<1.0	<1.0	37	16	--	16	<0.50	<1.0	9.5	<1.0	<0.50
05/24/05		<1.0	<1.0	4.8	<1.0	1.9	<1.0	--	<1.0	<0.50	<1.0	<1.0	41	19	--	17	<0.50	<1.0	10	<1.0	<0.50
08/31/05		<0.23	<0.10	4.4	<0.26	1.6	0.65	--	<0.24	<0.36	--	0.49	37	19	--	16	0.12	<0.36	9.3	<0.47	<0.50
11/29/05		<0.50	<0.50	4.1	<0.50	1.9	0.59	--	<0.50	<0.50	<0.50	<0.50	37	18 J	--	<2.0	<0.50	<0.50	9.7	<1.0	<0.50
03/01/06		<0.50	<0.50	4.2	<0.50	2.0	0.66	<0.50	<0.50	<0.50	0.13 UJ	0.49 J	37	20	<2.0	19	<0.50	<0.50	9.4	<1.0	<0.50
05/24/06		<0.50	<0.50	3.0	<0.50	1.7	0.49 J	<0.50	<0.50	<0.50	<0.50	0.36 J	30	19	<2.0	19	<0.50	<0.50	7.5	<1.0	<0.50
08/16/06		<0.50	<0.50	1.8	<0.50	0.54	0.28 J	<0.50	<0.50	<0.50	<0.50	0.41 UJ	13	5.6 J	<2.0	9.3	<0.50	<0.50	6.5	1.0 UJ	0.50 UJ
10/25/06		2.0	<0.50	2.3	6.0	0.52	<0.50	<0.50	<0.50	2.0	<0.50	1.6	10	3.7	<2.0	7.6	<0.50	<0.50	98	<1.0	<0.50
01/24/07		0.98	<0.50	2.0	2.7	0.59	<0.50	<0.50	<0.50	1.1	<0.50	0.89	12	5.0	<2.0	8.0	<0.50	<0.50	38	1.0 UJ	<0.50
04/17/07		1.5	<0.40	1.4	4.3	<0.33	<0.40	<0.42	<0.40	1.9	<0.36	1.2	5.5	0.75 J	<0.43	4.3	<0.36	<0.43	63	<0.60	<0.43
07/25/07		0.93	<0.40	1.3	2.6	<0.33	<0.40	<0.42	<0.40	0.98	<0.36	0.86	5.4	<0.48	<0.43	4.4	<0.36	<0.43	32	<0.60	<0.43
10/24/07		0.45 J	<0.34	1.1	1.4	<0.38	<0.35	<0.30	<0.37	0.74	<0.36	0.62 U	6.2	1.5	<0.30	6.2	<0.32	<0.41	23	<0.59	<0.43
01/23/08		<0.39	<0.34	1.1	1.1	<0.38	<0.35	<0.30	<0.37	0.49 J	<0.36	0.62	5.8	1.2	<0.30	6.9	<0.32	<0.41	21	<0.59	<0.43
04/17/08		<0.39	<0.44	1.3	<0.43	0.43	<0.35	<0.33	<0.37	<0.46	<0.39	0.36	9.4	4.5	<0.30	8.5	<0.40	<0.41	20	<0.59	<0.47
07/16/08		<1.0	<1.0	2.4	<1.0	1.0	<1.0	<0.50	<1.0	<0.50	<1.0	0.48 J	21	6.5	<10	7.7	<1.0	0.46 J	6.9	<10	<0.50
10/14/08		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
01/15/09		<0.45	<0.54	2.0	<0.40	<0.31	<0.38	<0.28	<0.69	<0.43	<0.22	0.40 J	15	7.0	<2.6	6.0	<0.33	<0.40	5.1	<0.31	<0.33
04/08/09		<0.45	<0.54	1.1	<0.40	0.40 J	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	6.2	3.0	<2.6	3.9	<0.33	<0.40	4.1 J	<0.31	<0.33
07/16/09		<0.45	<0.54	0.79 J	1.1	<0.31	<0.38	<0.28	<0.69	0.51	<0.22	0.89 J	3.0	0.96 J	<2.6	2.5	<0.33	<0.40	16	<0.31	<0.33
10/15/09		<0.45	<0.54	0.83 J	1.1	<0.31	<0.23	<0.28	<0.69	<0.43	<0.22	0.82 J	3.7	1.3	<2.6	4.2	<0.33	<0.29	14	<0.31	<0.33
08/13/10		<0.45	<0.54	1.6	<0.40	0.42 J	--	<0.28	--	<0.43	--	0.41 J	12	4.1	--	9.1	<0.33	<0.29	8	0.39 J	--
12/09/10		<0.45	<0.54	1.9	0.50 J	0.47 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.50 J	14	4.0	<2.6	9.1	<0.33	<0.29	9.4	<0.31	<0.33
02/03/11		<0.45	<0.54	1.9	<0.40	0.58	<0.38	<0.28	<0.69	<0.43	<0.22	<0.33	15	4.6	<2.6	9.3	<0.33	<0.29	7.9	0.35 J	<0.33
04/08/11		<0.45	<0.54	2.0	<0.40	0.51	<0.38	<0.28	<0.69	<0.43	<0.22	0.39 J	14	4.0	<2.6	8.8	<0.33	0.51 J	6.8	<0.31	<0.33
08/04/11		<0.30	<0.38	1.8	<0.43	0.39 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	11	4.4	<0.64	7.7	<0.24	<0.37	4.5	<1.7	<0.30
10/13/11		<0.30	<0.38	1.7	<0.43	0.53	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.6	4.1	<0.64	10	<0.24	<0.37	3.6	<1.7	<0.30
02/02/12		<0.30	<0.38	1.7	<0.43	0.43 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.7	4.1	<0.64	11	<0.24	<0.37	3.5	<1.7	<0.30
04/05/12		<0.30	<0.38	1.1	<0.43	0.31 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.3	3.1	<0.64	4.0	<0.24	<0.37	5.0	<1.7	<0.30
08/16/12		<0.30	<0.38	1.2	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	5.4	1.3	<0.64	6.9	<0.24	<0.37	5.0	<1.7	<0.30
10/11/12		<0.30	<0.38	1.6	<0.43	0.53	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.3	3.5	<0.64	10	<0.24	<0.37	5.6	<1.7	<0.30
02/15/13		<0.30	<0.38	1.6	<0.43	0.41 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.3	3.3	<0.64	6.5	<0.24	<0.37	5.9	<1.7	<0.30
04/04/13		<0.61	<0.77	1.1 J	<0.86	<0.48	<0.85	<0.28	<0.95	<0.45	<0.34	<0.92	4.5	1.6 J	<1.3	3.5	<0.47	<0.74	5.0	<3.3	<0.60
08/02/13		<1.5	<1.9	<1.4	<2.2	<1.2	<2.1	<0.71	<2.4	<1.1	<0.86	<2.3	<2.4	<2.3	<3.2	<1.9	<1.2	<1.8	3.6 J	<8.3	<1.5
10/17/13		<0.30	<0.38	1.0	0.77 J	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.59 J	4.3	1.5	<0.64	5.5	<0.24	<0.37	16	<1.7	<0.30

Well/Barcad ID	Sample Date	Concentrations (µg/L)																			
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromochloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl Chloride
GW-14B	02/13/14	<0.30	<0.38	1.4	<0.43	0.26 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	6.7	1.3	<0.64	7.3	<0.24	<0.37	7.9	<1.7	<0.30
	04/02/14	<0.30	<0.38	0.60 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.6	0.79 J	<0.64	1.9	<0.24	<0.37	3.8	<1.7	<0.30
	07/29/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.90 J	<0.46	<0.64	1.0	<0.24	<0.37	3.9	<1.7	<0.30
	10/15/14	<0.30	<0.38	<0.28	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	0.51 J	<0.46	<0.64	0.84 J	<0.24	<0.37	3.7	<1.7	<0.30
	02/17/15	<0.30	<0.38	0.46 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	<0.46	1.5	0.58 J	<0.64	2.2	<0.24	<0.37	1.5	<1.7	<0.30
	04/09/15	<0.30	<0.38	0.48 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	2.1	0.64 J	<0.64	2.5	<0.24	<0.37	2.0	<1.7	<0.30
	07/29/15	<0.30	<0.38	0.49 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.8	0.78 J	<0.64	2.4	<0.24	<0.37	1.6	<1.7	<0.30
	10/08/15	<0.30	<0.38	0.33 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	1.9	<0.46	<0.64	1.8	<0.24	<0.37	1.7	<1.7	<0.30
02/23/16	<0.30	<0.38	1.1	<0.43	0.35 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	4.6	1.5	<0.64	2.9	<0.24	<0.37	2.2	<1.7	<0.30	
GW-15	05/13/04	<1.0	<1.0	1.2	<1.0	<0.50	<1.0	--	<1.0	<0.50	<1.0	<1.0	6.4	<5.0	--	2.3	<0.50	<1.0	14	<1.0	<0.50
	11/10/04	3.5	<1.0	6.7	6.0	1.3	<1.0	--	<1.0	0.54	<1.0	1.5	23	7.9	--	13	<0.50	<1.0	120	<1.0	<0.50
	02/25/05	4.0	<1.0	8.0	7.6	1.2	<1.0	--	<1.0	0.51	<1.0	2.2	26	8.2	--	13	<0.50	<1.0	160	<1.0	<0.50
	05/24/05	3.7	<1.0	7.8	1.0 J	1.4	<1.0	--	<1.0	0.63	<1.0	2.0	24	8.4	--	15	<0.50	3.2 J	150	<1.0	<0.50
	09/01/05	<0.23	<0.10	4.0	0.56	1.6	0.51	--	<0.24	<0.36	--	0.62	33	20	--	16	<0.10	<0.36	29	<0.47	<0.50
	11/30/05	<0.50	<0.50	2.8	<0.50	1.4	<0.50	--	<0.50	<0.50	<0.50	<0.50	22	15 J	--	<2.0	<0.50	<0.50	11	<1.0	<0.50
	03/02/06	<0.50	<0.50	1.7	<0.50	0.70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	10	9.1	<2.0	10	<0.50	<0.50	5.0	<1.0	<0.50
	05/25/06	<0.50	<0.50	1.7	<0.50	0.52	0.19 J	<0.50	<0.50	<0.50	<0.50	0.34 J	9.8	7.2	<2.0	10	<0.50	<0.50	6.8	<1.0	<0.50
	08/18/06	7.7	0.43 J	1.6	23	0.50 J	0.20 J	<0.50	<0.50	1.7	<0.50	2.7	14	4.4	<2.0	60	<0.50	0.30 J	330	1.0 UJ	<0.50
	10/26/06	34	1.5	2.1	86	0.53	<0.50	<0.50	<0.50	5.5	<0.50	10	24	1.1	<2.0	170	<0.50	<0.50	1,500	<1.0	<0.50
	01/25/07	4.1	<0.50	2.4	13	1.1	<0.50	<0.50	<0.50	0.76	<0.50	1.3	22	12 J	<2.0	43	<0.50	<0.50	150	<1.0	<0.50
	04/19/07	22	0.76	1.6	75	<0.33	<0.40	<0.42	<0.40	4.6	<0.36	6.6	19	1.3	<0.43	130	<0.36	<0.43	910	<0.60	<0.43
	07/25/07	18	1.0	1.9	58	0.48 J	<0.40	<0.42	<0.40	4.5	<0.36	7.8	18	1.0	<0.43	120	<0.36	<0.43	910	<0.60	<0.43
	10/24/07	2.3	<0.34	2.0	9.4	0.64	<0.35	<0.30	<0.37	1.5	<0.36	2.0	15	6.0	<0.30	23	<0.32	<0.41	160	<0.59	<0.43
	01/23/08	8.3	2.8	2.7	31	0.72	<0.35	<0.30	<0.37	3.7	<0.36	9.5	17	1.7	<0.30	53	<0.32	<0.41	740	<0.59	<0.43
	04/17/08	4.8	4.6	2.5	16	1.1	<0.35	<0.33	<0.37	1.7	<0.39	7.4	18	5.4	<0.30	30	<0.40	<0.41	390	<0.59	<0.47
	07/16/08	0.44 J	<1.0	2.6	1.2	1.1	<1.0	<0.50	<1.0	<0.50	<1.0	1.1	25	6.7	<1.0	15	<1.0	<1.0	75	<1.0	<0.50
	10/15/08	2.3	1.6	2.3	6.5	0.94	<0.36	0.14 J	<1.0	1.1	<1.0	3.8	16	5.3	<1.0	15	<0.27	0.60 J	260	<0.21	<0.50
	01/14/09	<0.45	<0.54	2.8	<0.40	1.4	0.54 J	<0.28	<0.69	<0.43	<0.22	0.37 J	23	6.9	<2.6	7.5	<0.33	<0.40	7.5	<0.31	<0.33
	04/08/09	<0.45	<0.54	2.8	0.43 J	1.6	<0.38	<0.28	<0.69	<0.43	<0.22	0.46 J	21	7.6	<2.6	11	<0.33	<0.40	19	<0.31	<0.33
	07/17/09	9.9	3.1	1.8	38	<0.31	<0.38	<0.28	<0.69	2.7	<0.22	10	17	0.52 J	<2.6	48	<0.33	<0.40	790 J	<0.31	<0.33
	10/14/09	4.8	1.4	1.2	15	0.41 J	<0.38	<0.28	<0.69	2.2	<0.22	5.6	9.8	<0.49	<2.6	33	<0.33	<0.29	420	<0.31	<0.33
	02/11/10	2.4	--	1.4 J	7.2	<0.63	--	--	--	1.9 J	--	4.4	5.7	<0.98	--	22	<0.65	--	--	--	--
	05/13/10	2.1	<1.1	4.0	3.4	<0.63	<0.76	<0.57	<1.4	1.5 J	<0.44	3.9	7.6	<0.98	<5.2	7.7	<0.65	<0.58	200	<0.62	<0.65
	08/12/10	8.9	<1.1	1.6 J	23	<0.63	--	<0.57	--	2.3 J	--	4.6	9.3	<0.98	--	80	<0.65	<0.58	590	<0.62	--
	08/12/10	8.7	<1.1	1.6 J	24	<0.63	--	<0.57	--	2.5	--	4.7	9.7	<0.98	--	83	<0.65	<0.58	520	<0.62	--
	12/08/10	2.2	<0.54	1.2	8.1	0.47 J	<0.38	<0.28	<0.69	0.74 J	<0.22	2.0	9.1	1.9	<2.6	21	<0.33	<0.29	180	<0.31	<0.33
	12/08/10	2.1	<0.54	1.2	7.9	0.44 J	<0.38	<0.28	<0.69	0.70 J	<0.22	2.0	8.5	1.9	<2.6	20	<0.33	<0.29	170	<0.31	<0.33
	02/02/11	0.57 J	<0.54	1.2	2.3	0.40 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.65 J	8.3	2.5	<2.6	9.3	<0.33	<0.29	52	<0.31	<0.33
	04/06/11	<0.45	<0.54	1.6	0.62 J	0.42 J	<0.38	<0.28	<0.69	<0.43	<0.22	0.40 J	9.7	3.1	<2.6	6.0	<0.33	0.56 J	18	<0.31	<0.33
	08/04/11	<0.30	<0.38	1.5	<0.43	0.50 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	12	2.4	<0.64	4.1	<0.24	<0.37	9.2	<1.7	<0.30
	10/13/11	<0.30	<0.38	1.3	<0.43	0.49 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	12	2.5	<0.64	6.2	<0.24	<0.37	15	<1.7	<0.30
	02/01/12	<0.30	<0.38	0.88 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	8.9	1.8	<0.64	5.7	<0.24	<0.37	14	<1.7	<0.30
	04/04/12	<0.30	<0.38	0.94 J	<0.43	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	7.8	2.3	<0.64	7.7	0.24 J	1.3	23	<1.7	<0.30
	08/15/12	2.6	0.39 J	0.70 J	0.67 J	0.43 J	<0.42	<0.14	<0.48	0.85 J	<0.17	1.4	3.7	0.98 J	<0.64	31	<0.24	0.97 J	75	<1.7	<0.30
	10/10/12	<0.30	<0.38	1.3	<0.43	0.47 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	10	2.2	<0.64	4.0	<0.24	1.2	15	<1.7	<0.30
02/14/13	0.53 J	<0.38	1.2	1.6	<0.24	<0.42	<0.14	<0.48	<0.23	<0.17	0.71 J	8.2	2.3	<0.64	11	<0.24	<0.37	28	<1.7	<0.30	

Well/Barcad ID	Sample Date	Concentrations (µg/L)														
		1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloropropane	Benzene	Bromo-chloromethane	Carbon Tetrachloride	Chlorobenzene	Chloroform	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Methylene Chloride	Tetrachloroethene
GW-15	04/03/13	<0.30	<0.38	1.4	<0.43	0.45 J	<0.42	<0.14	<0.48	<0.23	<0.17	<0.46	9.1	2.7	<0.64	5.6
	08/01/13	3.5	1.2	0.57 J	1.8	0.51	<0.42	<0.14	<0.48	1.5	<0.17	2.8	2.7	<0.46	<0.64	39
	10/16/13	7.7	3.7	1.5	37	1.5	<0.42	0.20 J	<0.48	2.3	<0.17	7.5	7.9	<0.46	<0.64	75
	02/12/14	2.9	<0.38	0.50 J	22	0.25 J	<0.42	<0.14	<0.48	1.5	<0.17	2.9	3.0	0.78 J	<0.64	47
	04/03/14	5.1	0.66 J	0.83 J	24	0.74	<0.42	<0.14	<0.48	1.8	<0.17	5.8	4.9	<0.46	<0.64	48
	07/31/14	3.8	1.4 J	0.85 J	14	0.81 J	<1.1	<0.35	<1.2	1.4 J	<0.43	4.2	4.6	<1.1	<1.6	42
	10/15/14	2.2	1.8	1.3	14	0.57	<0.42	<0.14	<0.48	1.5	<0.17	4.5	5.8	<0.46	<0.64	26
	02/19/15	<0.30	<0.38	<0.28	0.66 J	<0.24	<0.42	<0.14	<0.48	<0.21	<0.17	0.56 J	1.2	<0.46	<0.64	3.7



**Holchem / Former Chase Chemical Company**

Chase Chemical Company operated at 13540 and 13546 Desmond Street in Pacoima from approximately 1967 to 1987, distributing chemicals. In 1987, Holchem took over operating the same type of business at the site. The facility has had 23 aboveground storage tanks (ASTs), 19 underground storage tanks (USTs), a clarifier, 2 sumps, and a drum storage area large enough for 300 drums. Chase Chemical and Holchem had AQMD permits to store chlorinated hydrocarbons in the tanks, including TCE, methylene chloride (dichloromethane), acetone, and 1,1,1-TCA.

Chase Chemical Company submitted a chemical use questionnaire to the Regional Board in 1983, as required by the Underground Tank Leak Detection Program. Based on the volume of hazardous chemicals stored in USTs, the Regional Board issued a letter on November 18, 1983 requiring subsurface assessment. A series of sampling events found elevated levels of petroleum and chlorinated hydrocarbons in the soil and groundwater. The first permanent monitoring well was installed in 1989, five more wells were installed in July 1990. Two of those first six wells had free product and by 1992, almost 900 gallons of free product had been removed. DTSC took the lead on regulatory oversight in 1996. Additional monitoring wells have been installed over the years and today there are 25 wells associated with the site.

The maximum concentration of TCE ever detected in groundwater was 27,400 ug/L in 1988 and the maximum concentration of PCE was 9,600 ug/L in December of 1998. The site's groundwater monitoring program began including analysis for 1,4-dioxane in 2004 and the maximum concentration ever detected was 600 ug/L in 2007. Other contaminants that have historically been detected at significantly elevated levels include benzene, toluene, vinyl chloride, and 1,1,1-TCA.

SVE and bioventing systems were in operation at the site from 2003 to 2010 and removed 27,725 pounds of VOCs from the subsurface. In December 2010, DTSC responded to post-remediation soil confirmation sampling and [stated](#): “The continuing detections in groundwater indicate that a residual source is still present, but that it is not in the remediated area. At the groundwater velocities calculated by Arcadis, there has been more than enough time for VOC impacts to dissipate if the source was completely removed. The remaining source must exist outside the influence of the biovent system.”

In October of 2011, additional [off-site groundwater investigation](#) was conducted to delineate off-site contamination and to evaluate the effect of the Verdugo Fault Zone (VFZ), which is located downgradient of the site, on groundwater migration. The VFZ creates a water table differential of as much as 130 feet and acts as a partial barrier to south-southwestward groundwater migration. However, the investigation identified channel fill deposits allowing groundwater movement across the VFZ in certain locations. In response to the investigation, DTSC stated: “The hydro-geologic effect of the Verdugo Fault on the plume has been identified and the extent of the VOC contamination above MCLs has been delineated both vertically and laterally.”

The most recent groundwater data available is from an October 2014 sampling event, when PCE was detected at a maximum of 24 ug/L and TCE was 12 ug/L. The wells continue to be monitored quarterly, but the more recent reports have not been uploaded to EnviroStor.

Most recent groundwater data available:

**Summary of Fourth Quarter 2014 Groundwater Analytical Results**

Well ID	MW-1	MW-1 Dup	MW-3	MW-4	MW-5	MW-6	MW-10	MW-11	MW-13	MW-14	MW-17	MW-18	MW-19	MW-20	MW-21	MW-22	MW-23	MW-23 Dup	MW-24	MW-25	MW-25 Dup	PMW-53	
Date	10/08/14	10/08/14	10/06/14	10/06/14	10/08/14	10/07/14	10/07/14	10/07/14	10/07/14	10/07/14	10/09/14	10/09/14	10/09/14	10/08/14	10/09/14	10/09/14	10/09/14	10/09/14	10/06/14	10/08/14	10/08/14	10/09/14	
<b>VOCs by EPA Method 8260B (ug/L)</b>																							
Acetone	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	
2-Butanone (methyl ethyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
2-Hexanone (methyl butyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Methylene chloride	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
4-Methyl-2-pentanone (methyl isobutyl ketone)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Benzene	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
1,2-Dichlorobenzene (1,2-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,3-Dichlorobenzene (1,3-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,4-Dichlorobenzene (1,4-DCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Chlorobenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2,4-Trimethylbenzene (1,2,4-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,3,5-Trimethylbenzene (1,3,5-TMB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
n-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
s-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
t-Butylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Isopropylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
n-Propylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Toluene	14	13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
p-Isopropyltoluene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Xylenes (p/m- and o- xylene)	1.1	1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Methyl-tert-butyl ether (MTBE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Tetrachloroethene (PCE)	24	24	9.2	16	20	17	33	6.7	8.3	12	3.7	<1.0	1.1	2.2	5.6	1.5	1.4	1.4	1.4	14	9.3	9.4	14
1,1,1-Trichloroethane (1,1,1-TCA)	1.2	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,1,2-Trichloroethane (1,1,2-TCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Trichloroethene (TCE)	12	12	<1.0	1.6	2.6	1.8	8.4	<1.0	<1.0	<1.0	1.3	<1.0	<1.0	<1.0	3.7	<1.0	3.1	2.9	1.9	2.7	2.6	4.7	
1,1-Dichloroethane (1,1-DCA)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2-Dichloroethane (1,2-DCA)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
1,1-Dichloroethene (1,1-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.1	<1.0	1.3	1.1	<1.0	<1.0	<1.0	<1.0	
cis-1,2-Dichloroethene (cis 1,2-DCE)	2.6	2.6	<1.0	<1.0	1.3	3.1	25	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6.7	6.4	6.1	25	23	27	
trans-1,2-Dichloroethene (trans 1,2-DCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	2.3	<1.0	
Vinyl Chloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	
Carbon Tetrachloride	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Styrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2-Dibromomethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2-Dichloropropane (1,2-DCP)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
<b>SVOCs by EPA Method 8260B or 8270 (ug/L)</b>																							
2-Methylphenol	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
3/4-Methylphenol	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
Isophrone	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
Benzoic Acid	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
Hexachlorobutadiene	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
2,4-Dimethylphenol	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
1,2,4-Trichlorobenzene (1,2,4-TCB)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
2-Methylnaphthalene	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
bis-2-ethylhexylphthalate	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
Di-n-Octyl Phthalate	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	
1-Methylnaphthalene	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	

**Notes:**  
D - Data qualified from a diluted sample  
== - Not analyzed  
mg/L - Milligrams per liter  
ug/L - Micrograms per liter  
Dup - Duplicate Sample  
NS - Not Sampled

Source: [Fourth Quarter 2014 Groundwater Monitoring Report](#), Arcadis, January 29, 2015

Historical groundwater data from MW-1, the well with the highest concentrations of contaminants:

Well ID	MW-1																										
	Date	1988	03/08/90	08/31/95	08/14/96	02/19/97	09/10/97	03/10/98	06/25/98	09/23/98	12/15/98	03/23/99	06/07/99	05/31/00	08/16/00	11/16/00	02/28/01	05/29/01	09/16/01	12/17/01	03/08/02	05/14/02	08/15/02	11/12/02	03/19/03	05/09/03	08/07/03
<b>VOCs by EPA Method 8260 (µg/L)</b>																											
Acetone	--	NS	540,000	120,000	480,000	940,000	1,600,000	3,600,000	2,800,000	1,700,000	180,000	130,000	--	--	--	--	38,000	--	8,250	27,000	650,000	13,000	270,000	31,000	21,000	530	
2-Butanone (methyl ethyl ketone)	--	NS	500,000	110,000	520,000	850,000	780,000	2,300,000	760,000	1,600,000	84,000	9,200	255	1,808	23,900	4,040J	44,900	47,100	7,490	15,000	260,000	14,000	120,000	33,000	11,000	<250	
Chloroform	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	10	--	--	--	16	3.5	<50	<10	<2,500	<200	<20	<25	
Naphthalene	--	NS	59	--	--	--	--	--	130	--	190	--	--	23	--	105	--	--	46	36	<500	<100	<25,000	<2,000	<200	<250	
2-Hexanone (methyl butyl ketone)	--	NS	--	--	--	--	--	--	2,800	--	2,500	--	--	--	--	--	--	--	<20	44	<500	<100	<25,000	<2,000	<200	<250	
Methylene chloride	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11	<10	<500	<100	<25,000	<2,000	<200	<250	
4-Methyl-2-pentanone (methyl isobutyl ketone)	--	NS	--	--	--	22,000	12,000	83,000	36,000	56,000	5,000	12,500	--	289	11,300	2,010	64,600	12,000	2,550	5,300	15,000J	3,700	<25,000	5,600	1,400	270	
Benzene	--	NS	--	--	--	--	--	180	200	170	--	--	--	17	31	--	27	--	13	10	25	12	<1,300	<100	<10	<13	
1,2-Dichlorobenzene (1,2-DCB)	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	19	--	--	--	6.8	4.6	<50	<10	<2,500	<200	<20	<25	
1,3-Dichlorobenzene (1,3-DCB)	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	<1.0	<50	<10	<2,500	<200	<20	<25	
1,4-Dichlorobenzene (1,4-DCB)	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	1.2	<50	<10	<2,500	<200	<20	<25	
Chlorobenzene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	<1.0	<50	<10	<2,500	<200	<20	<25	
Ethylbenzene	25,600	NS	1,700	--	--	1,100	1,900	2,100	1,900	5,000	1,800	2,300	39	490	549	714	1,200	--	254	220	320	340	<2,500	290	290	140	
1,2,4-Trimethylbenzene (1,2,4-TMB)	--	NS	--	--	--	350	360	380	320	460	420	380	40	120	187	--	451	--	53	54	110	130	<2,500	<200	94	86	
1,3,5-Trimethylbenzene (1,3,5-TMB)	--	NS	--	--	--	--	--	100	--	140	220	--	28	42	83	--	148	--	36	32	67	59	<2,500	<200	40	40	
n-Butylbenzene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	681	<5	4.0	<50	12	<2,500	<200	<20	<25	
s-Butylbenzene	--	NS	--	--	--	--	--	--	--	--	--	--	10	--	--	--	--	--	<5	6.7	<50	10	<2,500	<200	<20	<25	
t-Butylbenzene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	1.8	<50	<10	<2,500	<200	<20	<25	
Isopropylbenzene	--	NS	--	--	--	--	--	--	--	--	--	--	15	--	45	--	--	--	19	17	<50	24	<2,500	<200	<20	<25	
n-Propylbenzene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	4.1	<50	11	<2,500	<200	<20	<25	
Toluene	174,900	NS	40,000	7,600	30,000	19,000	15,000	58,000	35,000	80,000	21,000	35,000	280	3,920	7,130	8,700	12,600	2,720	3,110	3,400	4,400	3,800	3,200	4,400	1,100	470	
p-Isopropyltoluene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	14	--	--	--	<5	1.4	<50	<10	<2,500	<200	<20	<25	
Total Xylenes (p/m- and o- xylene)	--	NS	6,300	3,000	9,700	7,500	8,000	8,200	7,300	19,000	5,800	8,600	125	1,090	1,300	1,630	4,960	848	991	890	1,400	1,390	<2,500	1,420	1,890	1,080	
Methyl tert-butyl ether (MTBE)	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1	<1.0	<50	<10	<2,500	<200	<20	<25	
Tetrachloroethene (PCE)	--	NS	3,400	2,100	4,000	3,200	3,600	3,600	4,100	9,600	4,200	5,100	1,160	1,340	3,180	3,150	3,000	1,620	894	400	850	740	<2,500	720	98	120	
1,1,1-Trichloroethane (1,1,1-TCA)	43,900	NS	6,600	2,200	--	3,200	2,200	4,900	5,500	5,000	3,700	4,300	345	930	1,340	1,320	1,520	367J	502	380	470	470	<2,500	560	220	100	
1,1,2-Trichloroethane (1,1,2-TCA)	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	<1.0	<50	<10	<2,500	<200	<20	<25	
Trichloroethene (TCE)	27,400	NS	12,000	4,100	8,100	8,300	6,300	12,000	13,000	24,000	9,100	13,000	1,040	1,580	3,410	3,660	4,420	1,610	1,740	1,200	1,700	1,300	<2,500	1,100	1,400	950	
1,1-Dichloroethane (1,1-DCA)	--	NS	--	--	--	--	--	220	330	220	200	--	15	26	54	--	65	--	104	110	280	86	<2,500	<200	100	79	
1,2-Dichloroethane (1,2-DCA)	--	NS	--	--	--	1,700	1,300	4,900	4,300	3,400	1,700	2,000	--	--	334	--	--	309J	252	310	1,400	240	<1,300	490	260	190	
1,1-Dichloroethene (1,1-DCE)	--	NS	--	--	--	340	--	67	300	91	--	--	35	28	48	--	31	--	34	40	58	36	<2,500	<200	29	<25	
cis-1,2-Dichloroethene (cis 1,2-DCE)	--	NS	--	--	--	320	--	700	2,000	570	430	660	38	--	100	--	110	--	1,480	3,900	8,800	2,600	6,000	5,500	2,300	3,500	
trans-1,2-Dichloroethene (trans 1,2-DCE)	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	11	56	<10	<2,500	<200	<20	<25	
Vinyl Chloride	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	0.86	<25	<5.0	<1,300	<100	<10	<13	
Carbon Tetrachloride	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	195	--	58	<0.5	<25	<5.0	<1,300	<100	<10	<13
Styrene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	<1.0	<50	<10	<2,500	<200	<20	<25	
1,2-Dibromomethane	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	<1.0	<50	<10	<2,500	<200	<20	<25	
1,2-Dichloropropane (1,2-DCCP)	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<5	2.7	<50	<10	<2,500	<200	<20	<25	
<b>SVOCs by EPA Method 8260B or 8270 (µg/L)</b>																											
2-Methylphenol	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	<10	4.4J	<10	<10	<20	==	==	
3/4-Methylphenol	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	<10	19	12	<10	<20	==	==	
Isophorone	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	<10	67	<10	110	<20	==	==	
Benzoic Acid	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	<50	<50	<50	<50	<100	==	==	
Hexachlorobutadiene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	<10	<10	<10	<10	<20	==	==	
2,4-Dimethylphenol	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	<10	<10	<10	<10	<20	==	==	
1,2,4-Trichlorobenzene (1,2,4-TCB)	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	<10	<10	<10	<10	<20	==	==	
Naphthalene	--	NS	59	--	--	--	--	130	--	--	--	--	--	--	390	90	71	54	32	26	31	65	48	150	70	==	==
2-Methylnaphthalene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	170	11	--	--	<10	<10	4.1J	<10	22	<20	==	==	
bis-2-ethylhexylphthalate	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	13	25	--	<10	<10	<10	<10	<10	<20	==	==	
1-Methylnaphthalene	--	NS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<10	<10	4.5	<10	20	<20	==	==	
Temperature (Degrees Celsius)	==	NS	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	==	25.22	24.9	24.78	21.8	22.89	22.49	29.11	

Notes:

- B - Analyte also detected in method blank
- D - Data qualified from a diluted sample
- J - Data qualified as estimated µg/L - Micrograms per liter mg/L - Milligrams per liter
- - Not detected
- == - Not analyzed
- NS - Not Sampled
- \* A conversion error in the Second Quarter 2007 Report resulted in an erroneous value. The correct value is shown.
- 1. Reported result appears anomalous suspected conversion error.



Well ID	MW-1 Cont.																								
	Date	11/06/03	02/11/04	04/28/04	07/09/04	10/07/04	01/13/05	04/06/05	07/08/05	11/03/05	01/10/06	04/04/06	08/16/06	12/01/06	02/01/07	04/04/07	08/23/07	11/20/07	03/06/08	05/19/08	07/09/08	11/06/08	11/06/08 Dup	02/05/09	05/14/09
VOCs by EPA Method 8260 (µg/L)																									
Acetone	8,800	<1,000	17,000	18,000 D	830	6,700	16	<250	29,000	<100	16	30	<50	4,800	90	120	<50	130	<50	66	<50	<50	<50	<50	
2-Butanone (methyl ethyl ketone)	3,500	<1,000	5,100	9,800	590	6,500	<10	<250	6,100	<100	<10	<10	<10	1,400	39	13	16	26	<10	<10	<10	<10	<10	<10	
Chloroform	<100	<100	<50	<50	<20	<50	1.1	<25	2.7	<10	1.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Naphthalene	<1,000	<1,000	<500	<500	<200	<500	52	<250	<20	<100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
2-Hexanone (methyl butyl ketone)	<1,000	<1,000	<500	<500	<200	<500	<10	<250	<20	<100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Methylene chloride	<1,000	<1,000	<500	<500	<200	<500	<10	<250	180	<100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
4-Methyl-2-pentanone (methyl isobutyl ketone)	<1,000	<1,000	520	1,500	470	1,300	250	<250	180	150	<10	<10	<10	85	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Benzene	<50	320	<25	<25	<10	<25	2.7	<13	<1.0	<5.0	<0.50	<0.50	<0.50	0.93	0.74	0.68	0.67	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
1,2-Dichlorobenzene (1,2-DCB)	<100	<100	<50	<50	<20	<50	22	<25	6.9	<10	4.4	<1.0	<1.0	1.3	1.4	2	1.9	1.4	1.5	1.6	1.4	1.5	1.6	1.4	
1,3-Dichlorobenzene (1,3-DCB)	<100	<100	<50	<50	<20	<50	<1.0	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,4-Dichlorobenzene (1,4-DCB)	<100	<100	<50	<50	<20	<50	4.5	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Chlorobenzene	<100	<100	<50	<50	<20	<50	<1.0	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Ethylbenzene	450	300	81	76	280	140	270	200	39	47	2	<1.0	1.5	11	6.4	2.2	2.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2,4-Trimethylbenzene (1,2,4-TMB)	270	190	130	150	420	190	190	120	60	28	39	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,3,5-Trimethylbenzene (1,3,5-TMB)	<100	<100	54	77	180	80	73	36	20	11	14	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
n-Butylbenzene	<100	<100	<50	<50	47	<50	<1.0	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
is-Butylbenzene	<100	<100	<50	<50	26	<50	7.5	<25	3.2	<10	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
t-Butylbenzene	<100	<100	<50	<50	<20	<50	2.5	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Isopropylbenzene	<100	<100	<50	<50	31	<50	13	<25	4.0	<10	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
n-Propylbenzene	<100	<100	<50	<50	21	<50	7.8	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Toluene	550	130	75	84	210	620	27	200	15	13	12	1.9	41	360	210	35	90	28	15	2.2	<1.0	<1.0	1.1	<1.0	
p-Isopropyltoluene	<100	<100	<50	<50	<20	<50	4.8	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Xylenes (p/m- and o- xylene)	2,540	1,050	890	1,060	3,170	1,990	622	860	175	154	56	<1.0	5.8	38.5	32.1	6	23.1	6.1	5.2	<1.0	<1.0	<1.0	<1.0	<2.0	
Methyl tert-butyl ether (MTBE)	<100	<100	<50	<50	<20	<50	<1.0	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Tetrachloroethene (PCE)	210	<100	<50	<50	520	<50	16	<25	50	<10	32	30	33	65	61	35	55	50	26	26	22	22	12	13	
1,1,1-Trichloroethane (1,1,1-TCA)	<100	<100	52	<50	47	<50	15	<25	6.2	<10	5.7	2.3	5.2	19	<1.0	<1.0	35	12	<1.0	2.7	<1.0	<1.0	<1.0	<1.0	
1,1,2-Trichloroethane (1,1,2-TCA)	<100	<100	<50	<50	<20	<50	<1.0	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Trichloroethene (TCE)	700	690	230	<50	280	85	32	70	90	<10	64	97	120	200	190	83	160	76	49	26	29	29	23	19	
1,1-Dichloroethane (1,1-DCA)	<100	<100	54	59	38	<50	49	45	10	<10	4.6	4	4.4	10.0	8.2	14.0	15.0	4.5	2.2	1.2	<1.0	<1.0	<1.0	<1.0	
1,2-Dichloroethane (1,2-DCA)	120	170	100	170	65	75	26	<13	3.4	<5.0	1.9	6.5	7.2	22	13	16	12	5.2	2.3	0.72	<0.50	<0.50	<0.50	<0.50	
1,1-Dichloroethene (1,1-DCE)	<100	<100	<50	<50	<20	<50	10	<25	7.8	<10	5.5	1.7	3.0	3.9	4.2	<1.0	7.5	2.3	1.8	1.4	1.7	1.8	1.4	1.1	
cis-1,2-Dichloroethene (cis 1,2-DCE)	1,900	3,700	4,100	6,100	2,400	2,900	2,000	3,700	730	980	260	530	660	690	1,000	450	260	190	150	160	130	140	120	70	
trans-1,2-Dichloroethene (trans 1,2-DCE)	<100	<100	<50	<50	<20	<50	1.8	<25	<2.0	<10	<1.0	3.6	1.7	4.6	1.5	7.5	1.0	4.2	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	
Vinyl Chloride	<50	<50	<25	<25	<10	<25	<0.50	<13	<1.0	<5.0	<0.50	<0.50	<0.50	1.4	1.5	3.0	4.9	5.9	9.1	5.5	9.7	10	14	14	
Carbon Tetrachloride	<50	<50	<25	<25	<10	<25	<0.50	<13	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Styrene	<100	<100	<50	<50	24	<50	<1.0	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2-Dibromomethane	<100	<100	<50	<50	<20	<50	<1.0	<1.0	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
1,2-Dichloropropane (1,2-DCP)	<100	<100	<50	<50	<20	<50	<1.0	<25	<2.0	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
SVOCs by EPA Method 8260B or 8270 (µg/L)																									
2-Methylphenol	==	<10	==	==	==	12	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	
3/4-Methylphenol	==	34	==	==	==	26	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	
Isophorone	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	
Benzoic Acid	==	<50	==	==	==	<50	==	==	==	<50	==	==	==	<50	==	==	==	<50	==	==	==	==	<50	==	
Hexochlorobutadiene	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	
2,4-Dimethylphenol	==	<10	==	==	==	34	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	
1,2,4-Trichlorobenzene (1,2,4-TCB)	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<1.0	<1.0	
Naphthalene	==	50	==	==	==	39	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	
2-Methylnaphthalene	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	
bis-2-ethylhexylphthalate	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	
1-Methylnaphthalene	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	<10	==	==	==	==	<10	==	

Notes:

- B - Analyte also detected in method blank
- D - Data qualified from a diluted sample
- J - Data qualified as estimated µg/L - Micrograms per liter mg/L - Milligrams per liter
- - Not detected
- == - Not analyzed
- NS - Not Sampled
- \* A conversion error in the Second Quarter 2007 Report resulted in an erroneous value. The correct value is shown.
- 1. Reported result appears anomalous suspected conversion error.



# **Hewitt Landfill**

The site is located at 7245-7361 Laurel Canyon Boulevard and is bound by Saticoy Street to the north, Laurel Canyon Boulevard to the east, Raymer Street to the south, and 170 Freeway to the west. The Site was used for gravel mining from 1923 to 1962. The gravel mine was excavated to depths of 130 to 150 feet below ground surface. After mining activities ceased, a municipal solid waste landfill operated at the site from 1962 to 1975, at which time the landfill was capped. The landfill is not equipped with a liner or leachate collection and removal system.

Subsurface investigations have been conducted at the site since approximately 1988, first under the oversight of the Regional Board's Land Disposal program and have included installation of groundwater monitoring wells, soil vapor monitoring probes, sampling of landfill gas extraction wells, and leachate sampling wells. In November 2013, USEPA requested the Regional Board's assistance in further investigating groundwater contamination in the vicinity of the site. On January 31, 2014, the Regional Board issued an investigative order requiring a groundwater monitoring program. The Regional Board issued a Cleanup and Abatement Order (CAO) on September 8, 2015, requiring the responsible parties to laterally and vertically delineate the extent of contamination on-site and off-site and to conduct remedial action.

The site's groundwater monitoring program currently consists of 12 shallow wells, two of which are offsite, and five deep zone wells. Some of the shallow wells have been dry at the times of sampling events. Volatile organic compounds (VOCs) have been detected above maximum concentration levels (MCLs) in several of the wells. Perchloroethylene (PCE) was detected at a maximum concentration of 200 ug/L in 1987, which was anomalous for that well, and has been detected consistently in another well at levels ranging from 120 to 170 ug/L in the past year. Trichloroethylene (TCE) has been detected at a maximum concentration of 150 ug/L in October 2015.

In 2006, the site's groundwater monitoring program started including analysis for five chemicals of emerging concern: 1,2,3-trichloropropane (1,2,3-TCP), hexavalent chromium (CrVI), 1,4-dioxane, perchlorate, and n-nitrosodimethylamine. The maximum 1,4-dioxane concentration in groundwater observed to date was 590 micrograms per liter ( $\mu\text{g}/\text{L}$ ) in July 2013 and 1,4-dioxane was detected in leachate a maximum concentration of 860 ug/L in June 2015. Perchlorate has been detected very sporadically in groundwater below the site. The maximum perchlorate concentration in groundwater detected to date was 72  $\mu\text{g}/\text{L}$  in July 2013. Perchlorate was detected in leachate at a maximum concentration of 200  $\mu\text{g}/\text{L}$  in June 2015.

LADWP's North Hollywood West (NH-West) well field is just south of the site and the Rinaldi-Toluca well field is to the northeast of the site. The nearest Rinaldi-Toluca production well is approximately 300 feet north of the eastern portion of the site, and the nearest NH-West production well is approximately 2,000 feet south of the site. Several of the water supply wells have been affected by concentrations of 1,4-dioxane in excess of the Drinking Water Notification Level (NL) and VOCs in excess of MCLs.

**Historical Summary of VOC Exceedances in Groundwater Monitoring Wells  
Hewitt Site, North Hollywood, California  
1984-2013**

Well	VOC CA MCLs	PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	VC	1,1-DCA	1,2-DCP
		5	5	6	6	10	0.5	5	5
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
4899	11/8/1984	3	NA	NA	NA	NA	NA	NA	NA
	2/1/1987	200	45	10	NA	21	<1	46	9
	4/4/1988	2	<1	<1	NA	<1	<1	<1	<1
	8/10/1988	3	<1	<1	NA	<1	<1	<1	<1
	11/9/1988	<1	<1	<1	NA	<1	<1	<1	<1
	2/10/1989	<1	<1	<1	NA	<1	<1	<1	<1
	7/20/2006	4.1	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0
	11/16/2006	4.6	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0
	2/1/2007	5.2	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0
	4/24/2007	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0
2/14/2011	5.6	<1	<1	<1	<1	<0.50	<1	<1	
7/3/2013	6.9	<1	<1	<1	<1	<0.50	<1	<1	
4909F*	4/4/1988	<1	<1	<1	NA	<1	<1	<1	<1
	8/10/1988	4	1	<1	NA	<1	<1	<1	<1
	11/15/1988	1	<1	<1	NA	<1	<1	<1	<1
	2/6/1989	2	1	<1	NA	<1	<1	<1	<1
	9/1/1995	22	<1	NA	NA	<1	NA	NA	NA
	7/21/2006	15/23	40/74	2.7	4.1	<1.0	<0.50	5.8	<1.0
	10/27/2006	21	65	<1.0	3.4	<1.0	<0.50	7.1	<1.0
	2/1/2007	14	50	1.1	2.0	<1.0	<0.50	2.6	<1.0
	4/24/2007	17	84	<1.0	3.8	<1.0	<0.50	6.6	<1.0
	2/15/2011	8.8	30	<1	1.2	<1	<0.5	<1	<1
4909FR	7/2/2013	51	44	<1	6.6	<1	<0.50	11	1.1
4909C (LADWP)	1/23/1985	6	2	NA	NA	NA	NA	NA	NA
	2/1/1987	6	71	<1	NA	<1	<1	<1	<1
	4/26/1988	<1	<1	<1	NA	<1	<1	<1	<1
	8/10/1988	<1	<1	<1	NA	<1	<1	<1	<1
	11/9/1988	<1	<1	<1	NA	<1	<1	<1	<1
	2/6/1989	<1	<1	<1	NA	<1	<1	<1	<1
	8/1/2007	5.5	33	<1.0	1.2	<1.0	<0.50	<1.0	<1.0
4909C-293	7/12/2013	1.5	18	0.32	0.97	<0.50	<0.50	1.8	<0.5
4909C-392	7/12/2013	0.19	9.7	<0.50	0.48	<0.50	<0.50	0.25	<0.5
4909C-398	7/12/2013	0.40	15	0.075	0.52	<0.50	<0.50	0.21	<0.5
MW-1	2/22/2011	26	15	3.1	<1	<1	<0.50	<1	<1
	7/3/2013	130	85	2.5	<1	<1	<0.50	<1	<1
MW-2	2/25/2011	3.0	7.8	<1	1.2	<1	<0.50	2.6	<1
	7/2/2013	28	11	<1	6.6	<1	0.57	<1	<1
MW-3	7/3/2013	5.3	1.0	<1	<1	<1	<0.50	<1	<1
MW-4	7/2/2013	13	2.0	<1	9.9	<1	<0.50	<1	<1

Notes:

PCE = tetrachloroethene

TCE = trichloroethene

1,1-DCE = 1,1-dichloroethene

cis-1,2-DCE = cis-1,2-dichloroethene

trans-1,2-DCE = trans-1,2-dichloroethene

VC = vinyl chloride

1,1-DCA = 1,1-dichloroethane

1,2-DCP = 1,2-Dichloropropane

\* Well 4909F destroyed in April 2013.

LADWP = Los Angeles Department of Water and Power

µg/L = microgram per liter

CA MCLs = California Maximum Contaminant Levels

NA = not analyzed

Exceeds CA MCLs

Source: [2015 Fourth Quarter Groundwater Monitoring Report](#), Golder Associates, January 2016



**Historical Summary of VOC Exceedances in Groundwater Monitoring Wells  
Hewitt Site, North Hollywood, California  
2014-2015**

Well	Sample Date	Tetrachloroethene (PCE)	Tichloroethene (TCE)	1,1-Dichloroethene (1,1-DCE)	cis-1,2-Dichloroethene (cis-1,2-DCE)	1,1-Dichloroethane (1,1-DCA)	1,2-Dichloroethane (1,2-DCA)
	CA MCLs	5.0	5.0	6.0	6.0	5.0	0.5
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
4899	4/3/2014	4.4	0.13 (J)	< 0.18	< 0.085	< 0.11	< 0.17
	11/18/2014	NS	NS	NS	NS	NS	NS
	3/19/2015	NS	NS	NS	NS	NS	NS
	6/5/2015	NS	NS	NS	NS	NS	NS
	8/12/2015	NS	NS	NS	NS	NS	NS
	10/13/2015	NS	NS	NS	NS	NS	NS
4909FR	4/2/2014	26	28	0.5	5.9	11	0.18 (J)
	11/18/2014	NS	NS	NS	NS	NS	NS
	3/19/2015	NS	NS	NS	NS	NS	NS
	6/5/2015	NS	NS	NS	NS	NS	NS
	8/12/2015	NS	NS	NS	NS	NS	NS
	10/13/2015	NS	NS	NS	NS	NS	NS
MW-1	4/3/2014	49	54	5.9	0.66	0.58	< 0.17
	11/18/2014	19	63	5.1	0.98	0.99	< 0.17
	3/19/2015	150	130	11	1.1	1.6	< 0.17
	6/5/2015	150	120	7.9	0.75	0.85	< 0.17
	8/12/2015	170	150	9.3	0.9	1.1	< 0.34
	10/13/2015	120	150	8.9	1.3	1.7	< 0.34
MW-2	4/3/2014	14	10	0.31 (J)	4.1	1.1	0.38 (J)
	11/19/2014	1.7	8.2	0.30 (J)	3.8	2.1	0.53
	3/19/2015	55	76	1.7	6.6	5.1	< 0.17
	6/5/2015	46	53	0.92	4.2	2.9	0.45 (J)
	8/12/2015	46	50	0.79	3.9	2.5	< 0.34
	10/15/2015	32	49	0.90	5	3.4	< 0.34
MW-3	4/2/2014	6.8	1.5	< 0.18	0.76	0.19 (J)	< 0.17
	11/18/2014	NS	NS	NS	NS	NS	NS
	3/19/2015	NS	NS	NS	NS	NS	NS
	6/5/2015	NS	NS	NS	NS	NS	NS
	8/12/2015	NS	NS	NS	NS	NS	NS
	10/13/2015	NS	NS	NS	NS	NS	NS
MW-4	4/2/2014	11	2.7	< 0.18	16	0.20 (J)	0.29 (J)
	11/18/2014	NS	NS	NS	NS	NS	NS
	3/19/2015	NS	NS	NS	NS	NS	NS
	6/5/2015	NS	NS	NS	NS	NS	NS
	8/12/2015	NS	NS	NS	NS	NS	NS
	10/13/2015	NS	NS	NS	NS	NS	NS
MW-5	3/18/2015	36	55	0.87	3.3	4.4	< 0.17
	6/4/2015	37	45	0.82	5	3	0.52
	8/11/2015	57	56	1.2	5.6	3.4	0.53
	10/13/2015	47	51	1.0	5.4	4.6	NS
MW-6	3/18/2015	8.4	40	0.32 (J)	1.4	0.76	< 0.17
	6/4/2015	19	62	0.67	2.1	2.3	< 0.17
	8/11/2015	30	120	1.7	3.2	3.3	< 0.34
	10/13/2015	25	110	1.2	4	4.3	< 0.34
MW-7	3/17/2015	20	9	< 0.18	0.88	2.6	< 0.17
	6/5/2015	55	21	< 0.18	1.8	5.2	< 0.17
	8/11/2015	57	23	< 0.47	1.8	5.4	< 0.34
	10/13/2015	44	22	< 0.47	1.8	7.1	< 0.34
MW-8D	3/26/2015	0.30 (J)	0.14 (J)	< 0.18	< 0.085	< 0.11	< 0.17
	6/4/2015	0.42 (J)	0.37 (J)	< 0.18	< 0.085	< 0.11	< 0.17
	8/12/2015	< 0.39	< 0.34	< 0.47	< 0.39	< 0.37	< 0.34
	10/16/2015	< 0.39	< 0.34	< 0.47	< 0.39	< 0.37	< 0.34
MW-8S	3/26/2015	35	13	3	< 0.085	< 0.11	< 0.17
	6/4/2015	63	15	3.4	0.77	0.27 (J)	< 0.17
	8/12/2015	64	16	3.7	0.74	< 0.37	< 0.34
	10/15/2015	61	21	4.4	1.7	< 0.37	< 0.34
MW-9	3/19/2015	5.1	3.3	< 0.18	< 0.085	< 0.11	< 0.17
	6/4/2015	62	53	< 0.18	0.52	0.51	< 0.17
	8/11/2015	46	52	5.4	0.5	0.58	< 0.34
	10/14/2015	14	19	2.2	< 0.39	2.2	< 0.34

Notes:  
µg/L = micrograms per liter  
CA MCLs = California Maximum Contaminant Levels  
NS = not sampled since the well was dry  
(J) = Estimated Value  
Exceeds criteria or currently-recommended guideline

## Historical Summary of Groundwater Monitoring Results for Emerging Contaminants Hewitt Site, North Hollywood, California 2006-2015

Well	Sample Date	1,2,3-Trichloropropane	Hex Chrome (Total Dissolved)	1,4-Dioxane	Perchlorate	N-Nitrosodimethylamine
	<b>CA MCLs</b>	0.005*	10	1*	6	0.01*
		µg/L	µg/L	µg/L	µg/L	µg/L
4899	7/20/2006	<0.005	0.13	<2.0	<2.0	<2.0
	11/18/2006	<0.005	<1.0	<2.0	<2.0	<2.0
	2/1/2007	<0.005	0.22	<2.0	<2.0	<2.0
	2/14/2011	<0.005	<0.2	<1.0	<2.0	NA
	7/3/2013	<0.005	1.3	<1.0	<2.0	NA
	4/3/2014	<0.0019	1.4	1.5	<0.45	NA
	11/18/2014	NS	NS	NS	NS	NS
	3/19/2015	NS	NS	NS	NS	NS
	6/5/2015	NS	NS	NS	NS	NS
	8/12/2015	NS	NS	NS	NS	NS
10/13/2015	NS	NS	NS	NS	NS	
4909F*	7/21/2006	<0.005	1.3	<2.0	<2.0	<2.0
	10/27/2006	<0.005	1.2	<2.0	<2.0	<2.0
	2/1/2007	<0.005	1.5	<2.0	<2.0	<2.0
	2/15/2011	<0.005	<0.20	<1.0	<2.0	NA
4909FR	7/2/2013	<0.005	0.85	1.7	<2.0	NA
	4/2/2014	<0.0019	1.8	2.3	3.0 J	NA
	11/18/2014	NS	NS	NS	NS	NS
	3/19/2015	NS	NS	NS	NS	NS
	6/5/2015	NS	NS	NS	NS	NS
	8/12/2015	NS	NS	NS	NS	NS
10/13/2015	NS	NS	NS	NS	NS	
4909C	8/1/2007	<0.005	0.99	<2.0	<2.0	<2.0
4909C- 293	7/12/2013	<0.005	<0.20	0.40	<2.0	NA
4909C- 392	7/12/2013	<0.005	<0.20	0.47	<2.0	NA
4909C- 398	7/12/2013	<0.005	0.42	0.48	<2.0	NA
MW-1	2/22/2011	<0.005	4.8	<1.0	<2.0	NA
	7/3/2013	<0.005	2.7	<1.0	<2.0	NA
	4/3/2014	<0.0019	3.7	<0.38	<0.45	NA
	11/18/2014	<0.0011	4.0	<0.21	0.90 J	<0.0073
	3/19/2015	<0.0016	4.4	<0.21	<1.3	<0.0073
	6/5/2015	< 0.0011	4	< 0.32	< 1.3	< 0.0073
	8/12/2015	< 0.0041	4.2	0.21	< 1.4	0.0049 (R)
	10/13/2015	< 0.0041	3.9/4.1	0.32	< 1.4	<0.00028
MW-2	2/25/2011	<0.005	<0.2	51	<2	NA
	7/2/2013	<0.01	< 0.20	440	72	NA
	4/3/2014	<0.0019	<0.054	400	<0.45	NA
	11/19/2014	<0.0011	<0.055	180	<1.3	<0.0073
	3/19/2015	<0.0016	<0.055	120	<1.3	<0.0073
	6/5/2015	< 0.0011	< 0.055	210	< 1.3	< 0.0073
	8/12/2015	< 0.0041	< 0.07	26	< 4.2	0.0040 (B) (R)
	10/15/2015	< 0.0041	< 0.07 / <0.07	160 (J)	< 3.5	<0.00028
MW-3	7/3/2013	<0.005	0.98	99	6.1	NA
	4/2/2014	<0.0019	1.4	19	8.1	NA
	11/18/2014	NS	NS	NS	NS	NS
	3/19/2015	NS	NS	NS	NS	NS
	6/5/2015	NS	NS	NS	NS	NS
	8/12/2015	NS	NS	NS	NS	NS
10/13/2015	NS	NS	NS	NS	NS	

**Notes:**

µg/L = micrograms per liter; NA = not available

CA MCLs = California Maximum Contaminant Levels

\* Drinking water notification level (DWNL) established by California Division of Drinking Water.

(R)= data rejected; (J) = Estimated Value

Exceeds criteria or currently recommended guideline

NS = not sampled since the well was dry

## Historical Summary of Groundwater Monitoring Results for Emerging Contaminants Hewitt Site, North Hollywood, California 2006-2015

Well	Sample Date	1,2,3-Trichloropropane	Hex Chrome (Total/Dissolved)	1,4-Dioxane	Perchlorate	N-Nitrosodimethylamine
	CA MCLs	0.005*	10	1*	6	0.01*
MW-4	7/2/2013	0.012	0.70	590	5.3	NA
	4/2/2014	0.021	0.81	460	<0.45	NA
	11/18/2014	NS	NS	NS	NS	NS
	3/19/2015	NS	NS	NS	NS	NS
	6/5/2015	NS	NS	NS	NS	NS
	8/12/2015	NS	NS	NS	NS	NS
	10/13/2015	NS	NS	NS	NS	NS
MW-5	3/18/2015	<0.0016	0.70	56	<1.3	<0.0073
	6/4/2015	< 0.0011	0.92	210	< 1.3	< 0.0073
	8/11/2015	< 0.0041	0.88	26	< 2.1	0.0046 (R)
	10/13/2015	< 0.0041	1.1/1.1	220 (J)	< 3.5	<0.00028
MW-6	3/18/2015	<0.0016	1.6	<0.21	<1.3	<0.0073
	6/4/2015	< 0.0011	1.2	4.5	< 1.3	< 0.0073
	8/11/2015	< 0.0041	1.5	3.1	< 1.4	0.0056 (R)
	10/13/2015	< 0.0041	1.7/1.6	1.8	< 1.4	<0.00028
MW-7	3/17/2015	0.0084	0.85	<0.21	3.2 J	<0.0073
	6/5/2015	0.020	1.2	1.6	3.8 (J)	< 0.0073
	8/11/2015	0.017	1.3 (J)	1.1	< 1.7	0.0086 (R)
	10/13/2015	0.024	1.4/1.3	1.5	< 3.5	<0.00028
MW-8S	3/26/2015	<0.0016	0.17 J	0.83	<1.3	<0.0073
	6/4/2015	< 0.0011	1.9	< 0.32	< 1.3	< 0.0073
	8/12/2015	< 0.0041	3.6	4.0 (J)	< 1.4	0.0046 (R)
	10/15/2015	< 0.0041	3.7/3.5 J	20	< 3.5	<0.00028
MW-8D	3/26/2015	<0.0016	2.2	<0.21	<1.3	<0.0073
	6/4/2015	< 0.0011	3.1	< 0.32	< 1.3	< 0.0073
	8/12/2015	< 0.0041	3.2	< 0.11	< 2.1	0.0040 (R)
	10/16/2015	< 0.0041	2.8/2.9	0.68	< 3.5	<0.00028
MW-9	3/19/2015	<0.0016	3.4	<0.21	<1.3	<0.0073
	6/4/2015	< 0.0011	5.4	1.8	< 1.3	< 0.0073
	8/11/2015	< 0.0041	6	1.7	< 1.4	0.0047 (R)
	10/14/2015	< 0.0041	6/6.4	0.65	4.6	<0.00028

**Notes:**

µg/L = micrograms per liter; NA = not available

CA MCLs = California Maximum Contaminant Levels

\* Drinking water notification level (DWNL) established by California Division of Drinking Water.

(R)= data rejected; (J) = Estimated Value

Exceeds criteria or currently recommended guideline

NS = not sampled since the well was dry

Source: [2015 Fourth Quarter Groundwater Monitoring Report](#), Golder Associates, January 2016

## **Attachment H**

### **GSIS 97-005 Sampling Presentation**



# Groundwater System Improvement Study – 97-005 Sampling

Nov 5 | 2014



# 2014 Sampling Summary (Task 4.2)

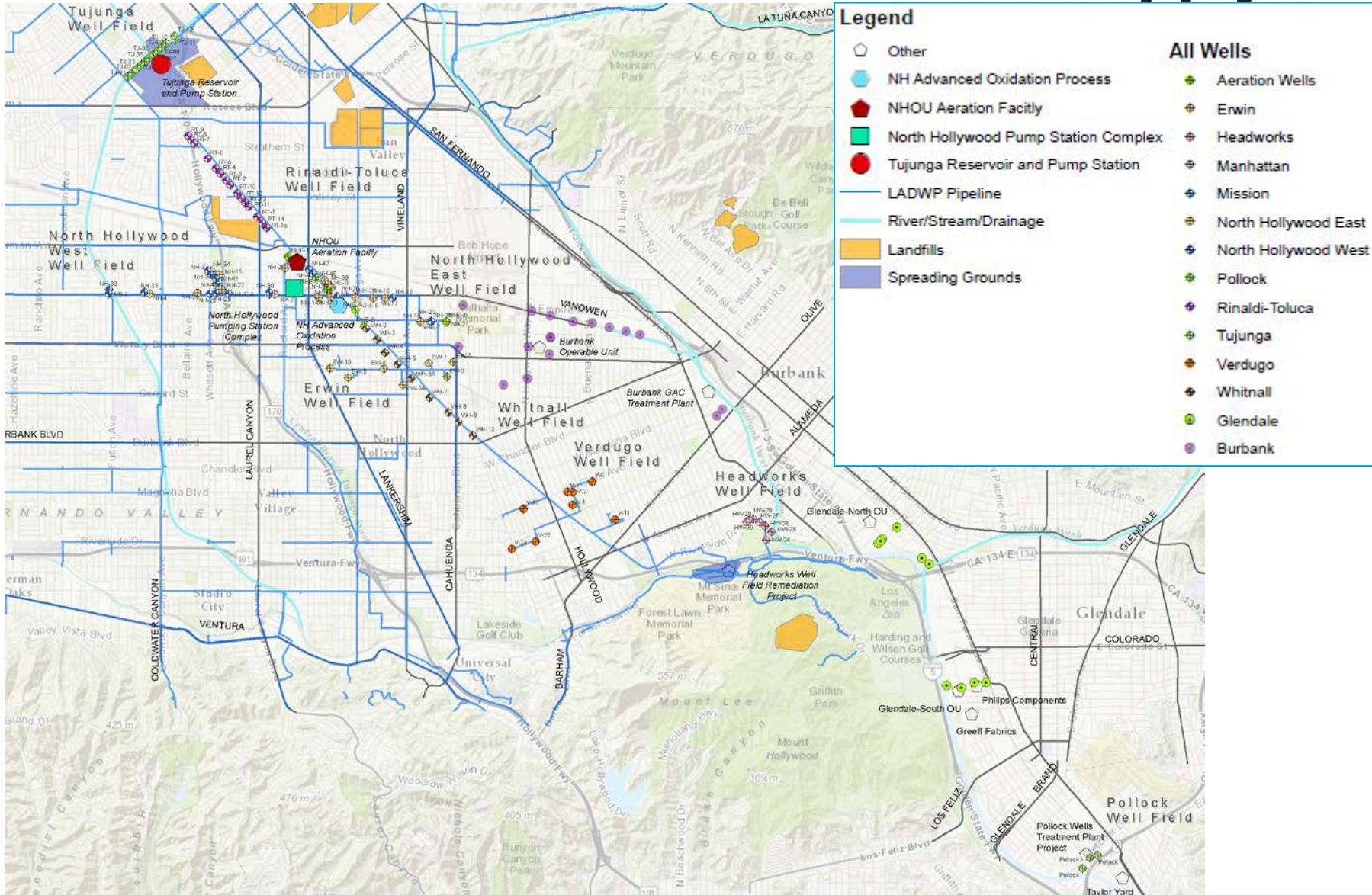
<u>Well Field</u>	<u>Wells</u>	<u>Zones</u>
Rinaldi-Toluca	10	30
North Hollywood West	7	21
Tujunga <sup>1</sup>	6	18
Other	<u>2</u>	<u>2</u>
<b>Total</b>	<b>25</b>	<b>71</b>

Note:

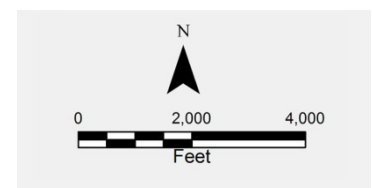
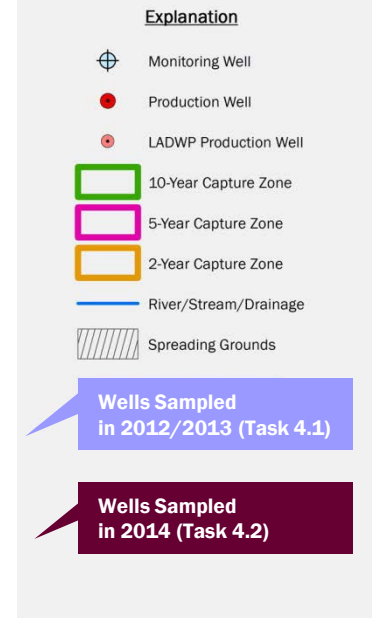
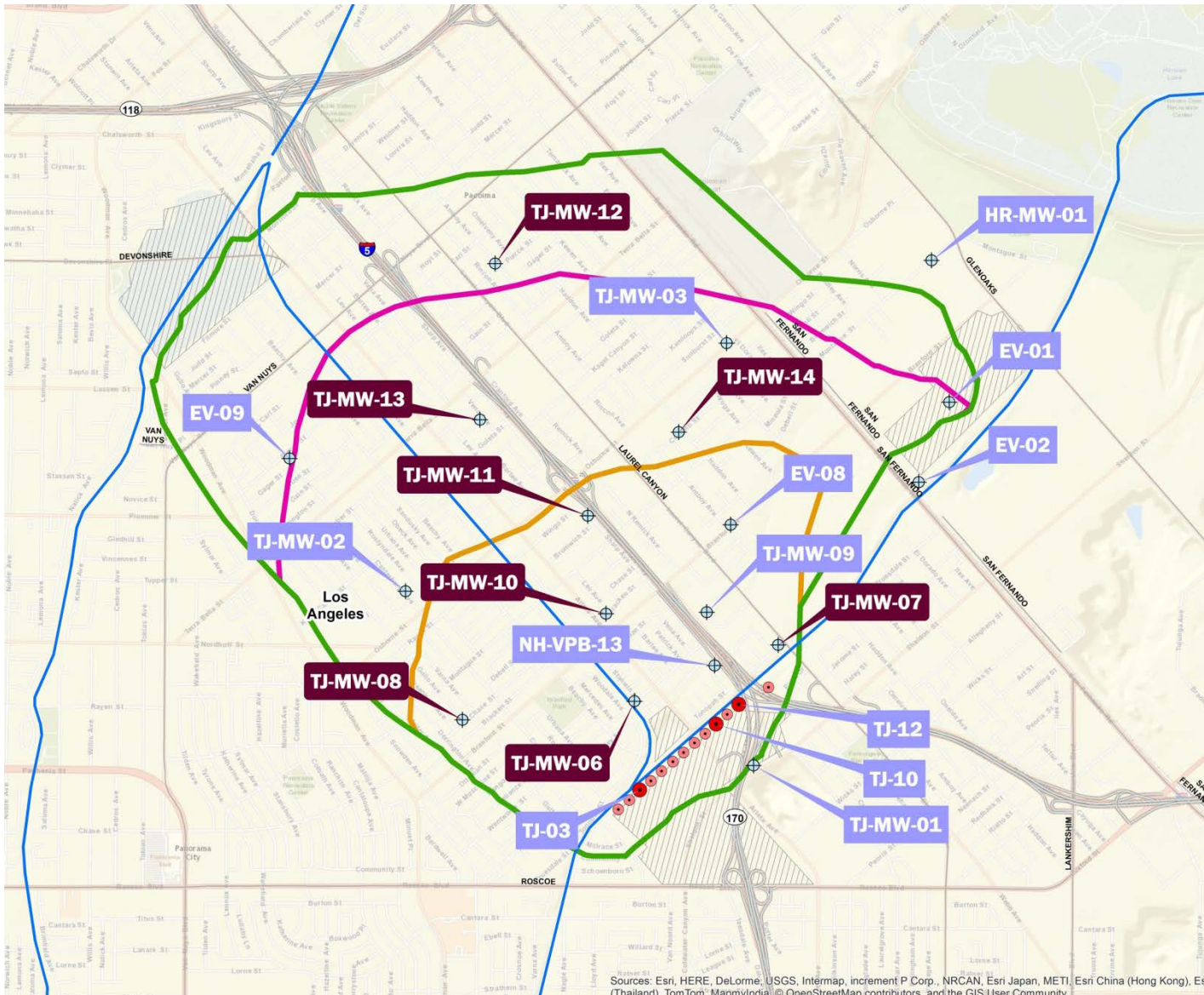
<sup>1</sup>Does not include samples collected and analyzed at two monitoring wells installed under the US Army Corp contract.



# San Fernando Groundwater Basin Supply

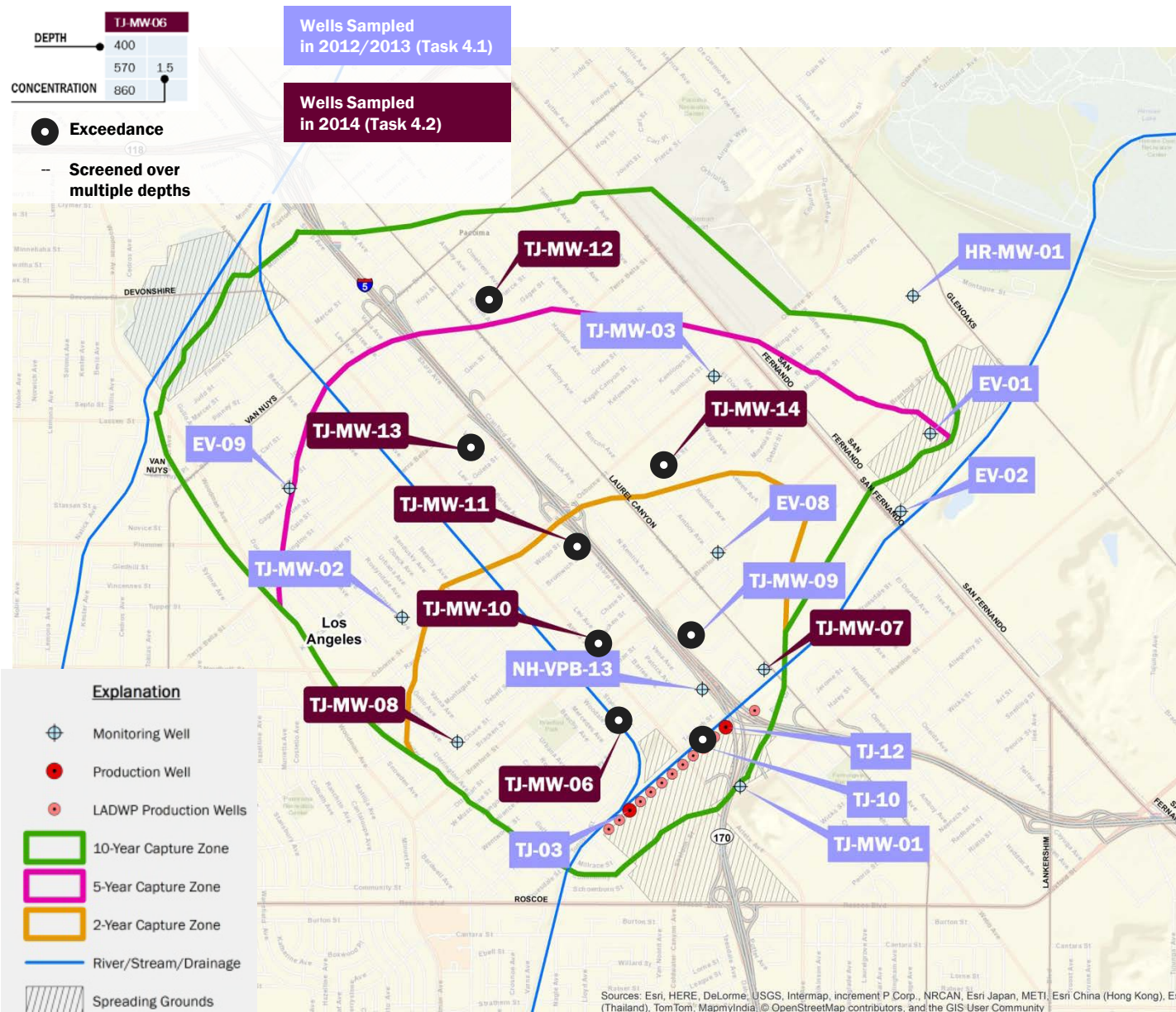






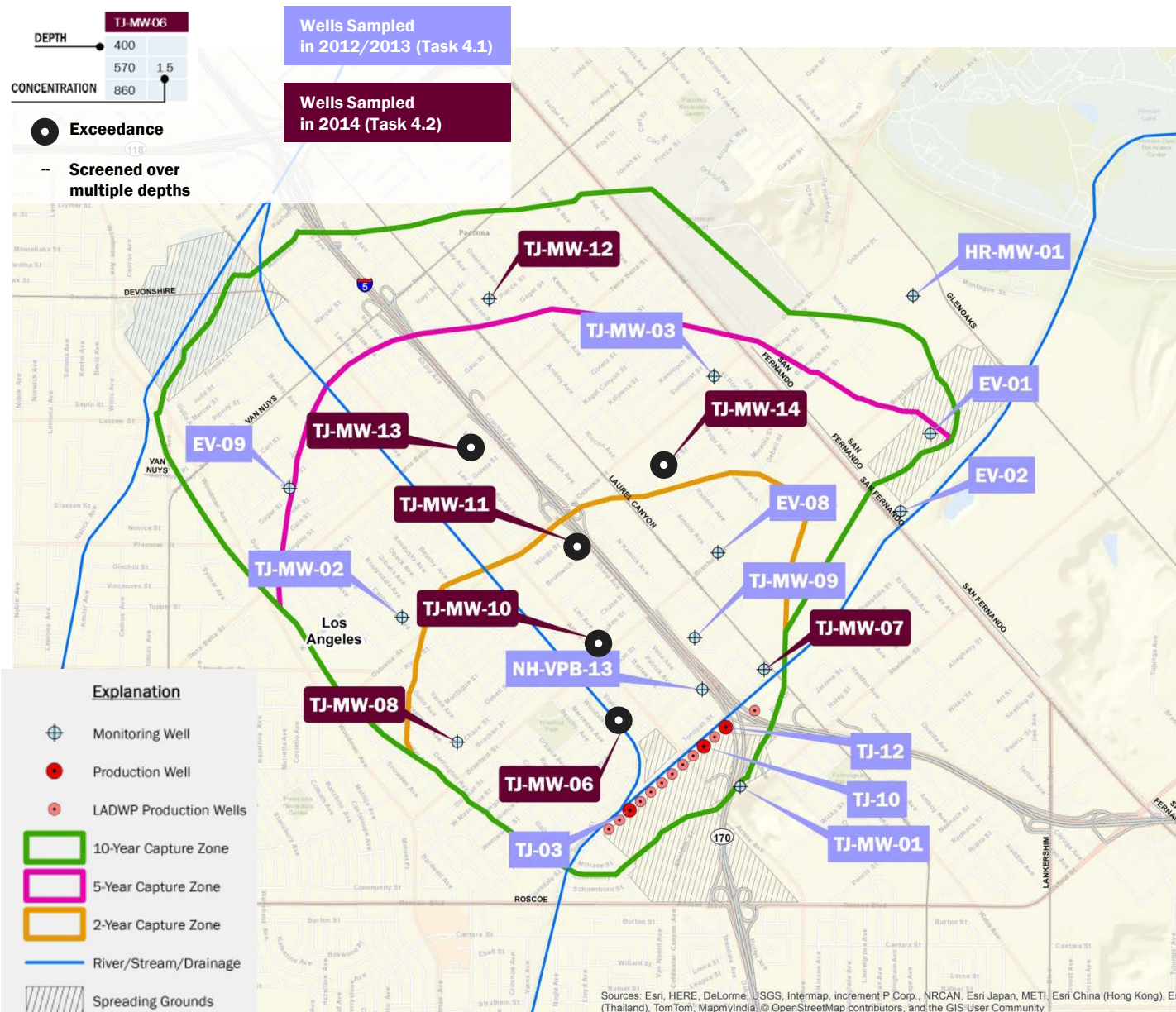
# Tujunga Well Field – 2014 Sampling Event (Task 4.2)





<b>TJ-MW-12</b>		<b>HR-MW-01</b>
490		250
590	31	<b>EV-08</b>
910		480
<b>TJ-MW-14</b>		<b>EV-01</b>
460	19	285
580	11	<b>EV-02</b>
900		390
<b>TJ-MW-13</b>		<b>EV-09</b>
460		375
670	6.4	490
910	41	550
<b>TJ-MW-11</b>		680
440	13	<b>TJ-MW-02</b>
560	21	450
900	68	<b>NH-VPB-13</b>
<b>TJ-MW-10</b>		374
440	22	<b>TJ-MW-03</b>
560	24	470
860	91	<b>TJ-MW-09</b>
<b>TJ-MW-07</b>		580
420		850
600		<b>TJ-12</b>
860		--
<b>TJ-MW-08</b>		<b>TJ-10</b>
390		--
		6.5
530		<b>TJ-MW-01</b>
820		474
<b>TJ-MW-06</b>		<b>TJ-03</b>
400		--
570	63	
860		

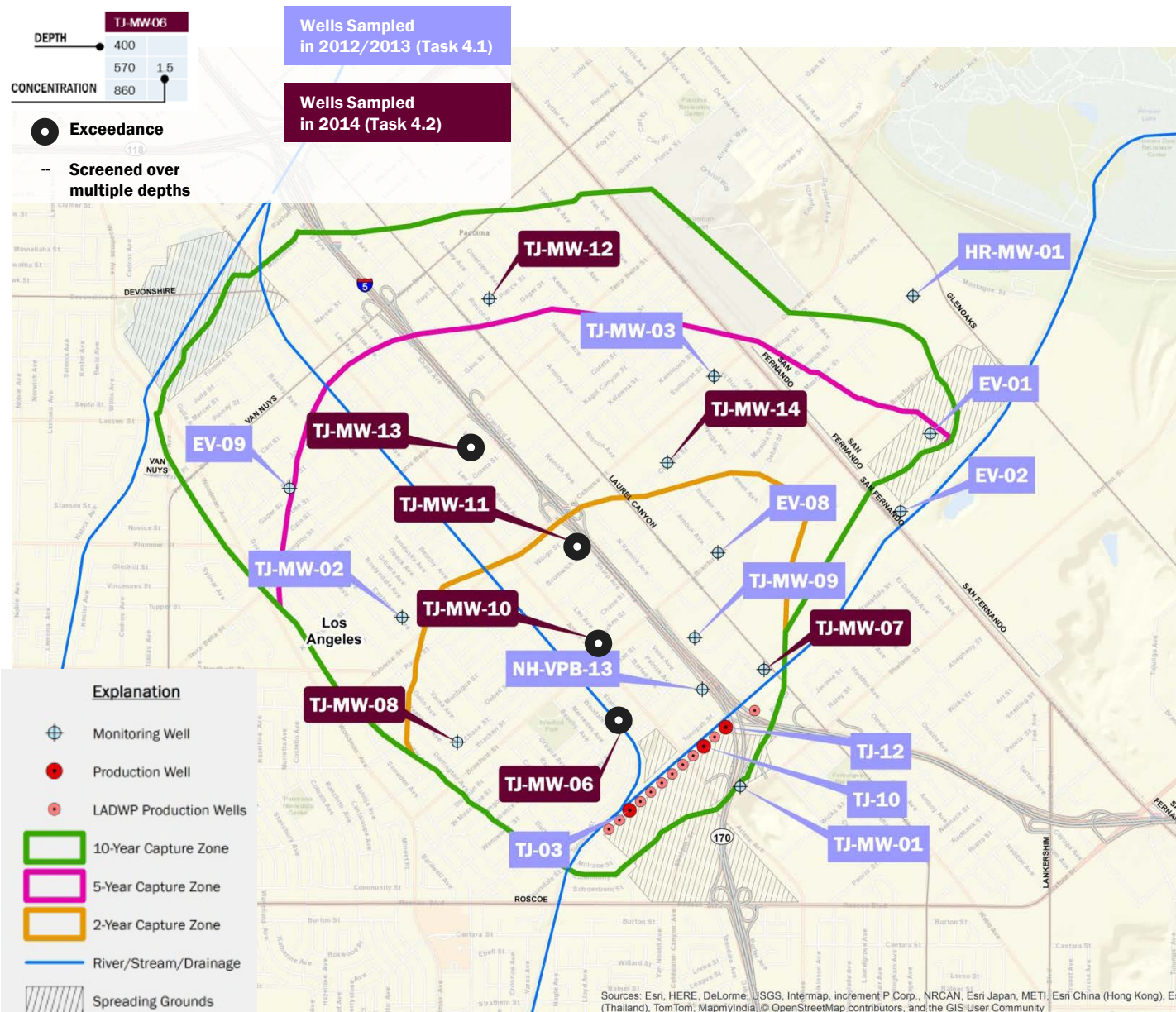
# Tujunga – TCE (5 µg/L MCL)



<b>TJ-MW-12</b>		<b>HR-MW-01</b>
490		250
590		<b>EV-08</b>
910		480
<b>TJ-MW-14</b>		<b>EV-01</b>
460	6	285
580		<b>EV-02</b>
900		390
<b>TJ-MW-13</b>		<b>EV-09</b>
460	22	375
670	43	490
910	50	550
<b>TJ-MW-11</b>		680
440	45	<b>TJ-MW-02</b>
560	51	450
900	95	<b>NH-VPB-13</b>
<b>TJ-MW-10</b>		374
440	50	<b>TJ-MW-03</b>
560	98	470
860	110	<b>TJ-MW-09</b>
<b>TJ-MW-07</b>		580
420		850
600		<b>TJ-12</b>
860		--
<b>TJ-MW-08</b>		<b>TJ-10</b>
390		--
530		<b>TJ-MW-01</b>
820		474
<b>TJ-MW-06</b>		<b>TJ-03</b>
400		--
570	82	
860		

# Tujunga – PCE (5 µg/L MCL)

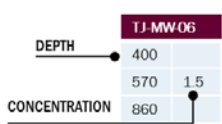




<b>TJ-MW-12</b>		<b>HR-MW-01</b>
490		250
590		<b>EV-08</b>
910		480
<b>TJ-MW-14</b>		<b>EV-01</b>
460		285
580		<b>EV-02</b>
900		390
<b>TJ-MW-13</b>		<b>EV-09</b>
460	10	375
670	10	490
910	18	550
<b>TJ-MW-11</b>		680
440	12	<b>TJ-MW-02</b>
560	26	450
900	27	<b>NH-VPB-13</b>
<b>TJ-MW-10</b>		374
440	9.3	<b>TJ-MW-03</b>
560	26	470
860	20	<b>TJ-MW-09</b>
<b>TJ-MW-07</b>		580
420		850
600		<b>TJ-12</b>
860		--
<b>TJ-MW-08</b>		<b>TJ-10</b>
390		--
530		<b>TJ-MW-01</b>
820		474
<b>TJ-MW-06</b>		<b>TJ-03</b>
400		--
570	10	
860		

# Tujunga – 1,1-DCE (6 µg/L MCL)

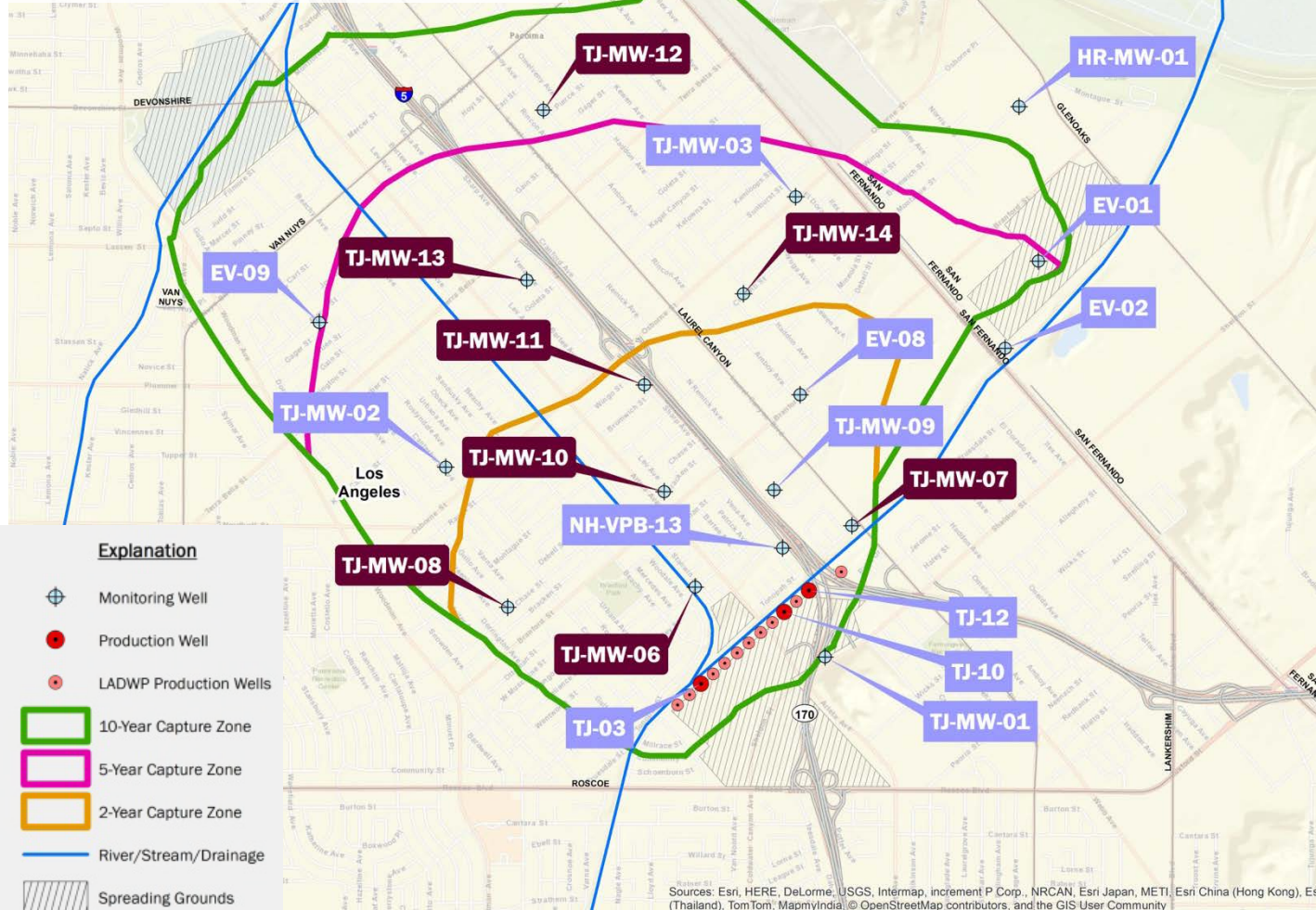




Wells Sampled  
in 2012/2013 (Task 4.1)

Wells Sampled  
in 2014 (Task 4.2)

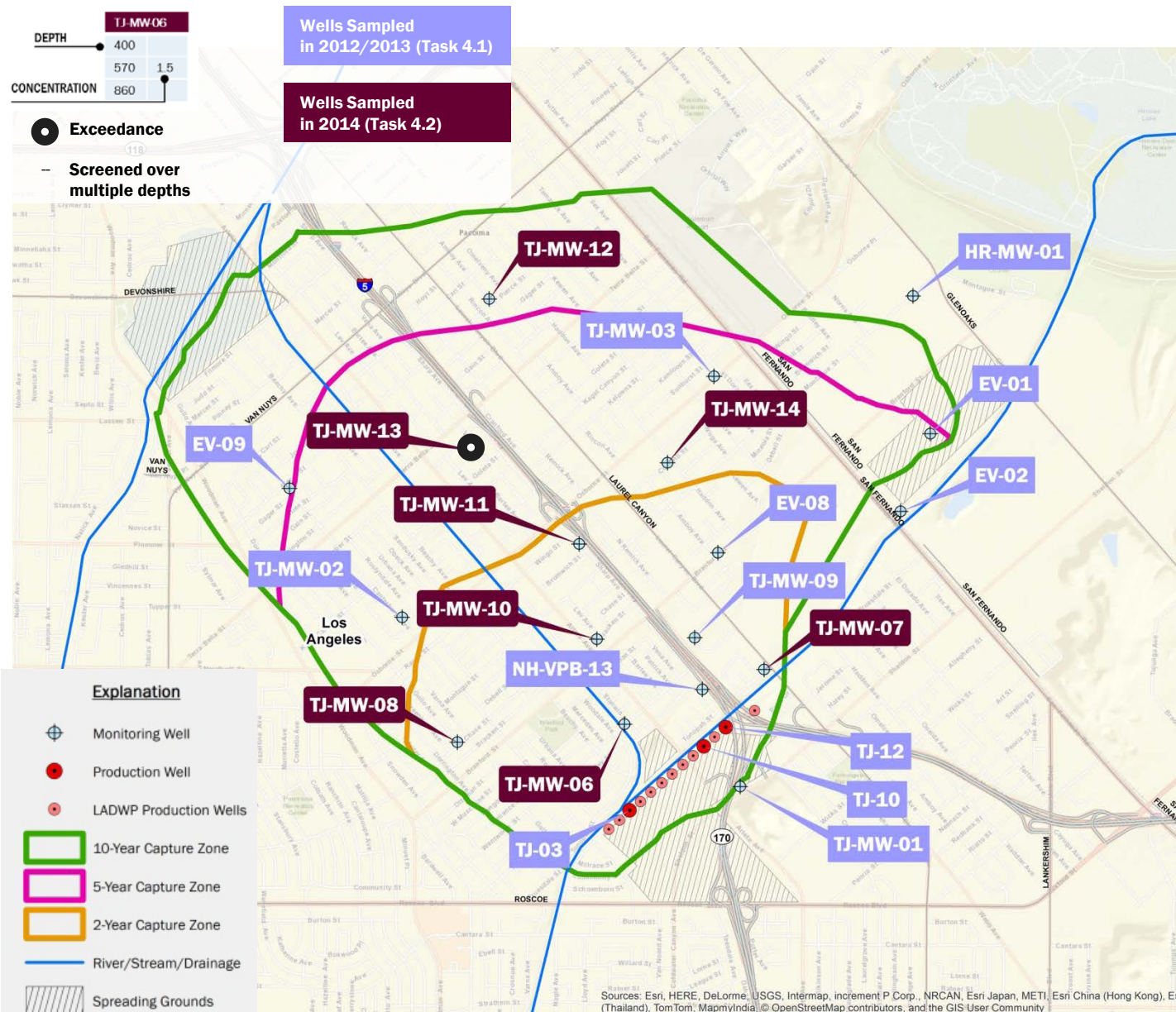
● Exceedance  
- Screened over multiple depths



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

<b>TJ-MW-12</b>	HR-MW-01
490	250
590	EV-08
910	480
<b>TJ-MW-14</b>	EV-01
460	285
580	EV-02
900	390
<b>TJ-MW-13</b>	EV-09
460	375
670	490
910	550
<b>TJ-MW-11</b>	680
440	TJ-MW-02
560	450
900	NH-VPB-13
<b>TJ-MW-10</b>	374
440	TJ-MW-03
560	470
860	TJ-MW-09
<b>TJ-MW-07</b>	580
420	850
600	TJ-12
860	--
<b>TJ-MW-08</b>	TJ-10
390	--
530	TJ-MW-01
820	474
<b>TJ-MW-06</b>	TJ-03
400	--
570	
860	

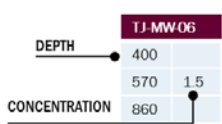
# Tujunganga – 1,2,3-TCP (0.005 µg/L MCL)



<b>TJ-MW-12</b>	490	HR-MW-01	250	
	590	EV-08	480	
	910			
<b>TJ-MW-14</b>	460	EV-01	285	
	580	EV-02	390	
	900			
<b>TJ-MW-13</b>	460	EV-09	375	
	670		490	
	910	18	550	
<b>TJ-MW-11</b>	440		680	
	560		TJ-MW-02	450
	900		NH-VPB-13	
<b>TJ-MW-10</b>	860		TJ-MW-09	374
	420		TJ-MW-03	470
	600		TJ-12	850
	860			--
<b>TJ-MW-08</b>	390		TJ-10	
	530			--
	820		TJ-MW-01	474
<b>TJ-MW-06</b>	400		TJ-03	
	570			--
	860			

# Tujunga – MTBE (13 µg/L MCL)

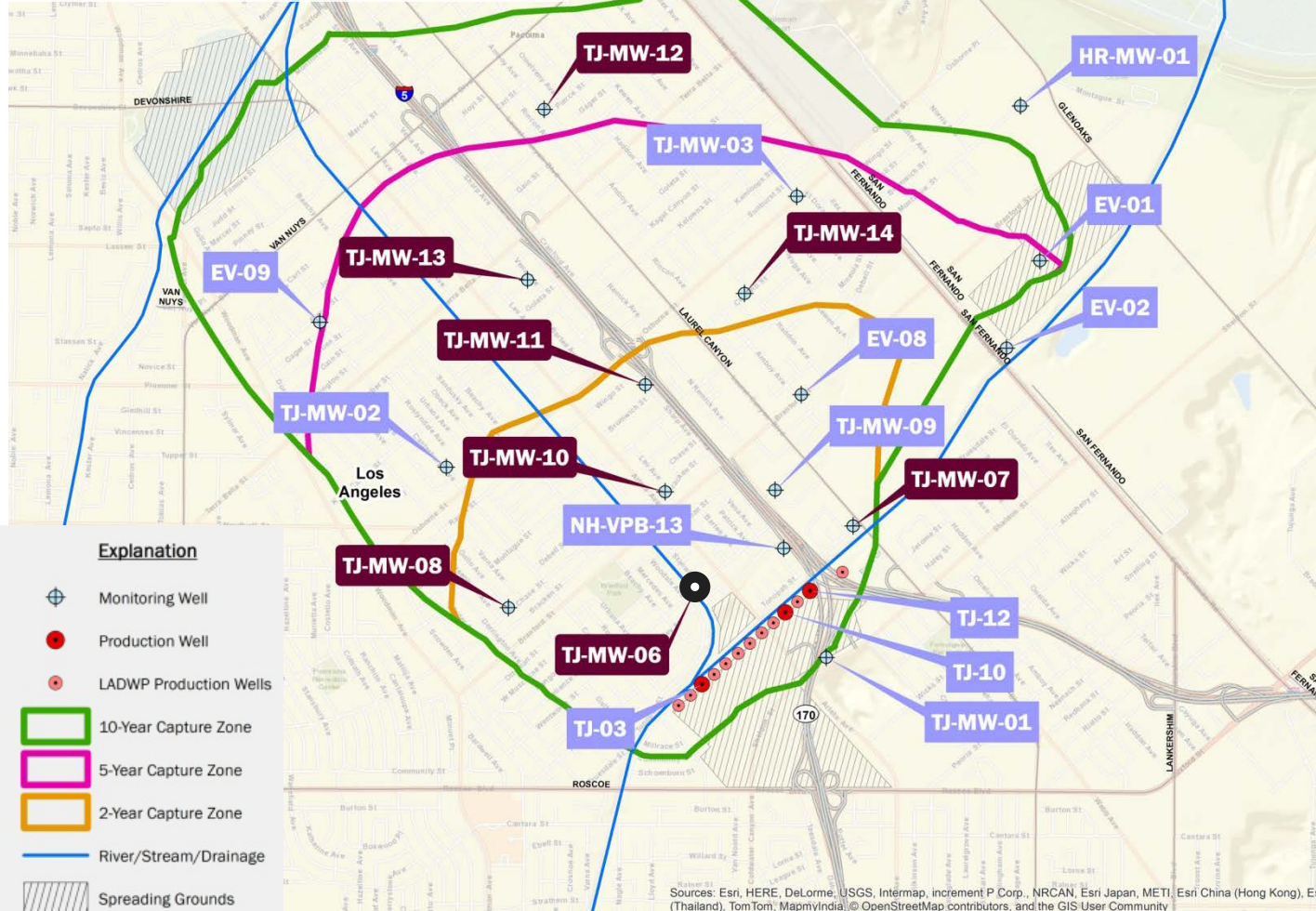




Wells Sampled  
in 2012/2013 (Task 4.1)

Wells Sampled  
in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



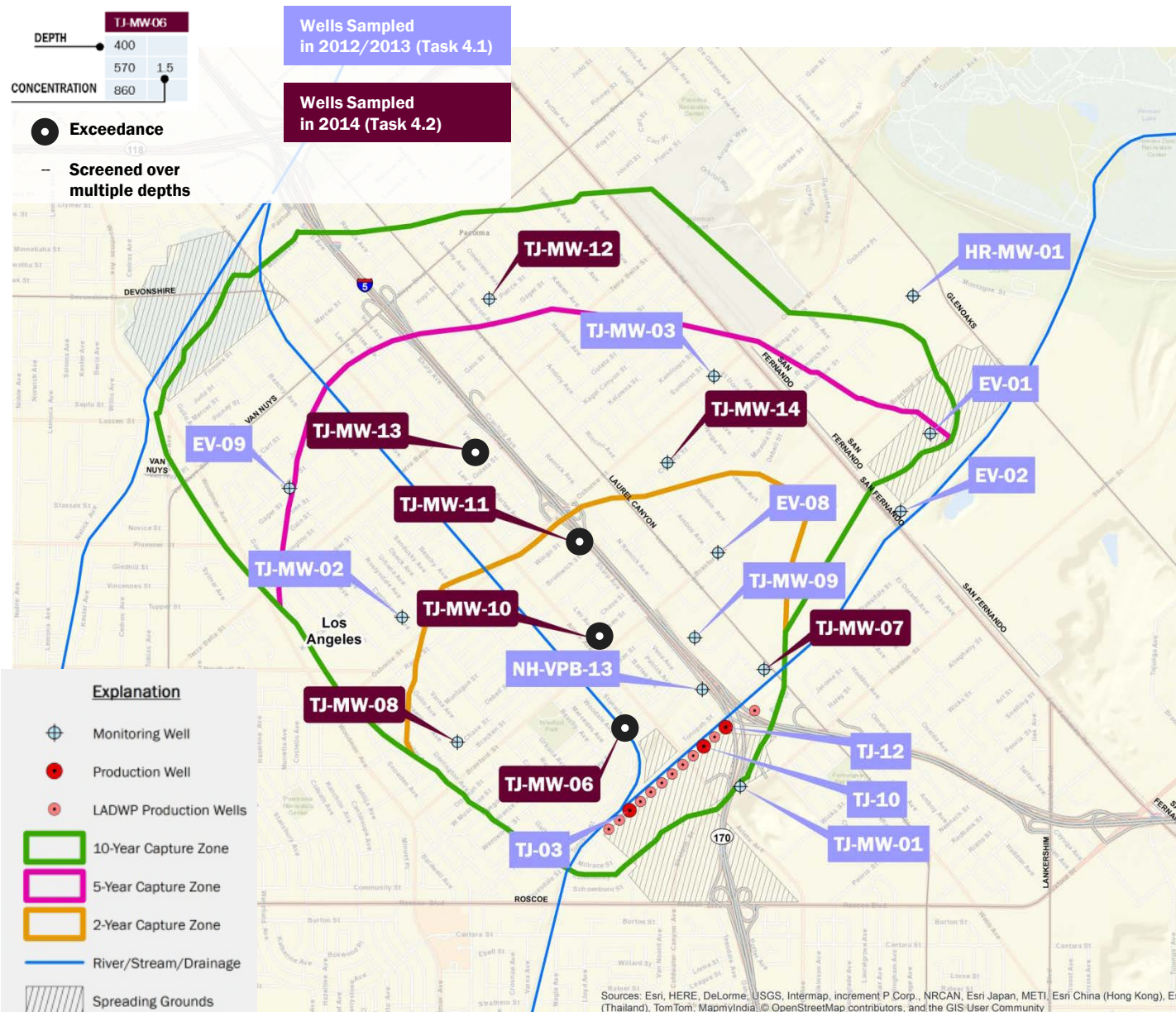
**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

<b>TJ-MW-12</b>	HR-MW-01
490	250
590	EV-08
910	480
<b>TJ-MW-14</b>	EV-01
460	285
580	EV-02
900	390
<b>TJ-MW-13</b>	EV-09
460	375
670	490
910	550
<b>TJ-MW-11</b>	680
440	TJ-MW-02
560	450
900	NH-VPB-13
<b>TJ-MW-10</b>	374
440	TJ-MW-03
560	470
860	TJ-MW-09
<b>TJ-MW-07</b>	580
420	850
600	TJ-12
860	--
<b>TJ-MW-08</b>	TJ-10
390	--
530	TJ-MW-01
820	474
<b>TJ-MW-06</b>	TJ-03
400	--
570	
860	0.6

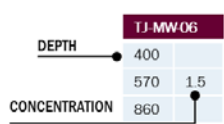
# Tujunga – Carbon Tet (0.5 μg/L MCL)



<b>TJ-MW-12</b>		<b>HR-MW-01</b>
490		250
590		<b>EV-08</b>
910		480
<b>TJ-MW-14</b>		<b>EV-01</b>
460		285
580		<b>EV-02</b>
900		390
<b>TJ-MW-13</b>		<b>EV-09</b>
460	1.7	375
670	1.1	490
910	4.7	550
<b>TJ-MW-11</b>		680
440	1.4	<b>TJ-MW-02</b>
560	2.6	450
900		<b>NH-VPB-13</b>
<b>TJ-MW-10</b>		374
440	1.1	<b>TJ-MW-03</b>
560	2.1	470
860	7.7	<b>TJ-MW-09</b>
<b>TJ-MW-07</b>		580
420		850
600		<b>TJ-12</b>
860		--
<b>TJ-MW-08</b>		<b>TJ-10</b>
390		--
530		<b>TJ-MW-01</b>
820		474
<b>TJ-MW-06</b>		<b>TJ-03</b>
400		--
570	1.5	
860		

# Tujunga – 1,4-Dioxane (1 µg/L NL)

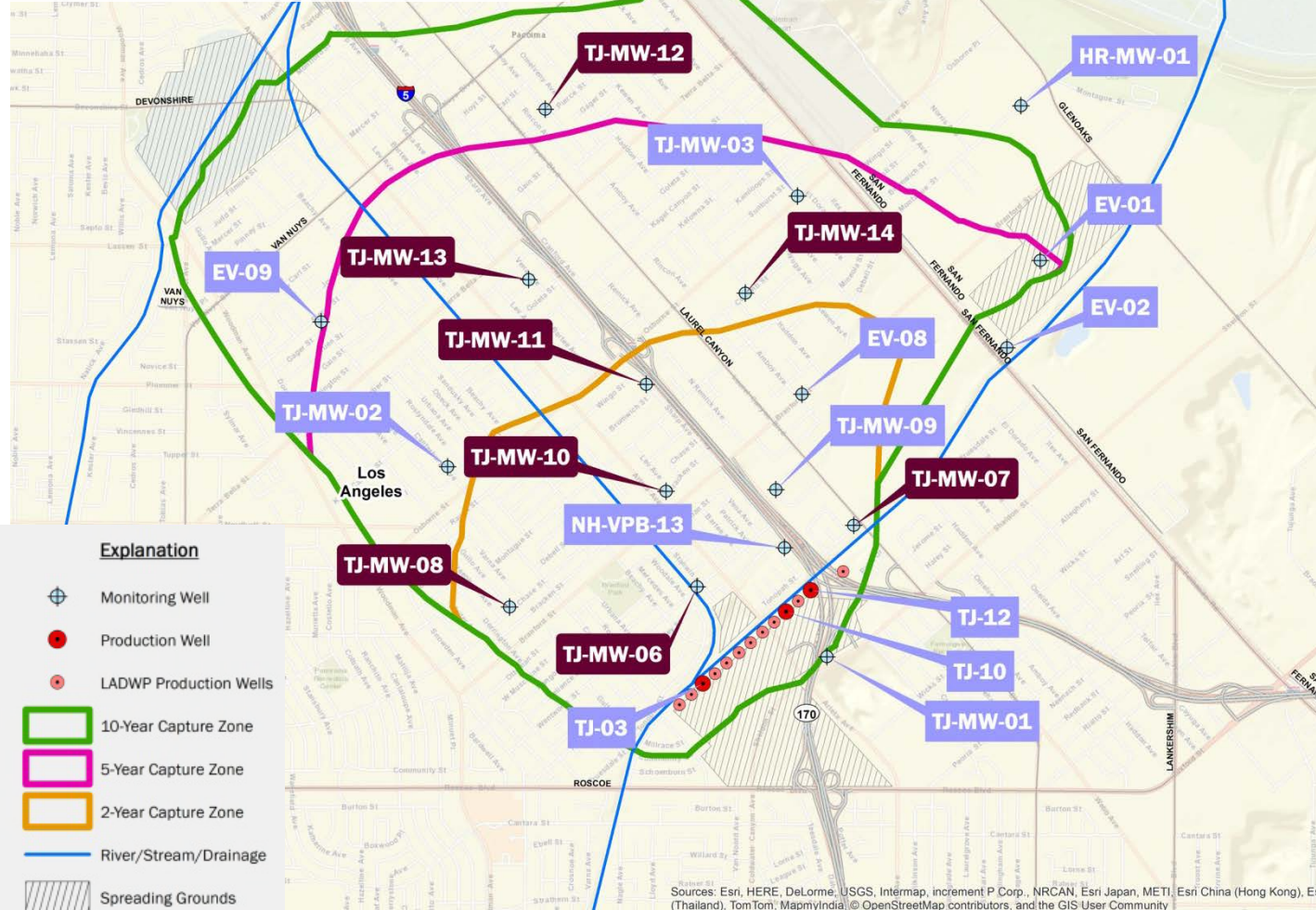




Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
 - Screened over multiple depths

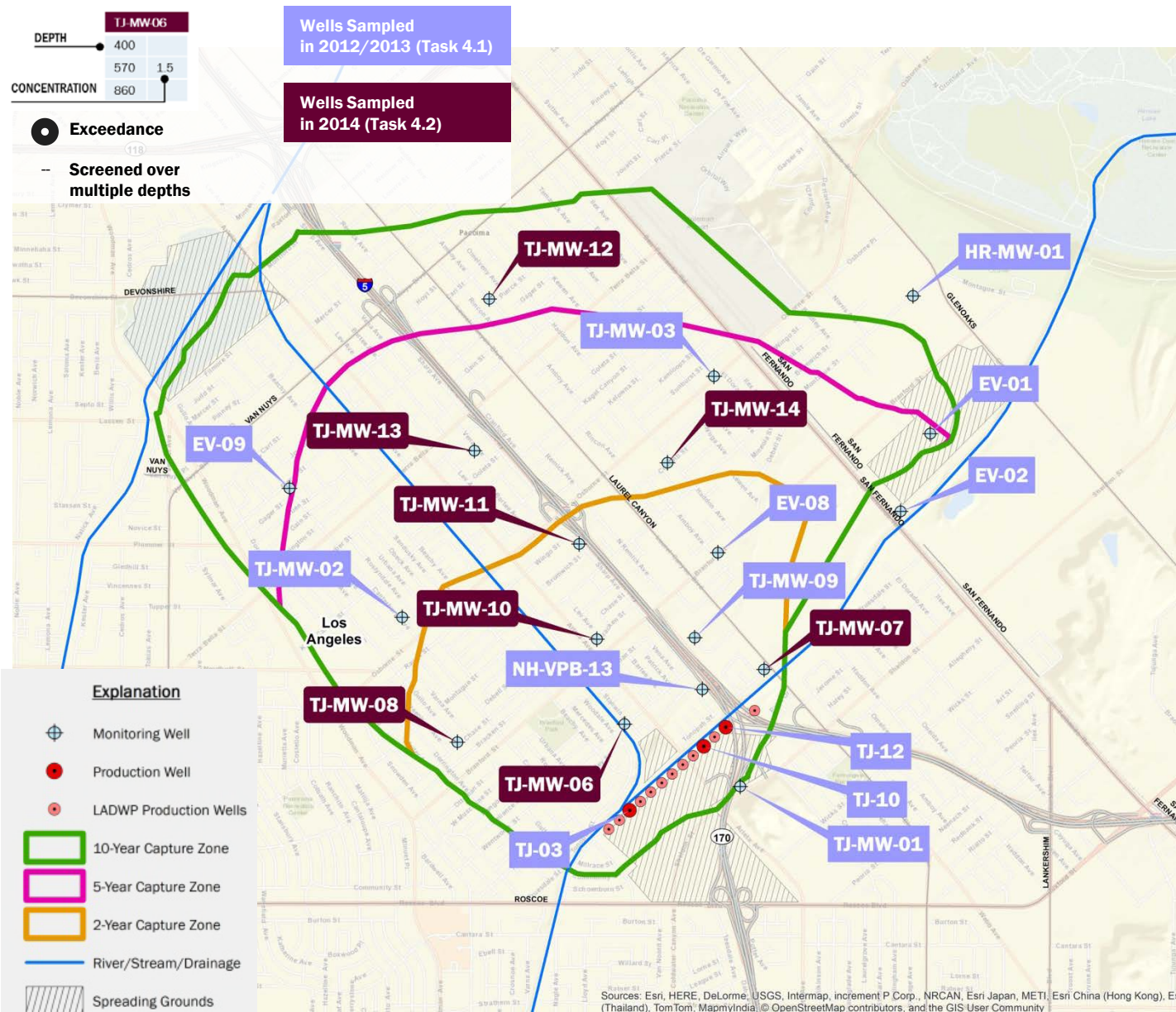


Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

TJ-MW-12	HR-MW-01
490	250
590	EV-08
910	480
TJ-MW-14	EV-01
460	285
580	EV-02
900	390
TJ-MW-13	EV-09
460	375
670	490
910	550
TJ-MW-11	680
440	TJ-MW-02
560	450
900	NH-VPB-13
TJ-MW-10	374
440	TJ-MW-03
560	470
860	TJ-MW-09
TJ-MW-07	580
420	850
600	TJ-12
860	--
TJ-MW-08	TJ-10
390	--
530	TJ-MW-01
820	474
TJ-MW-06	TJ-03
400	--
570	
860	

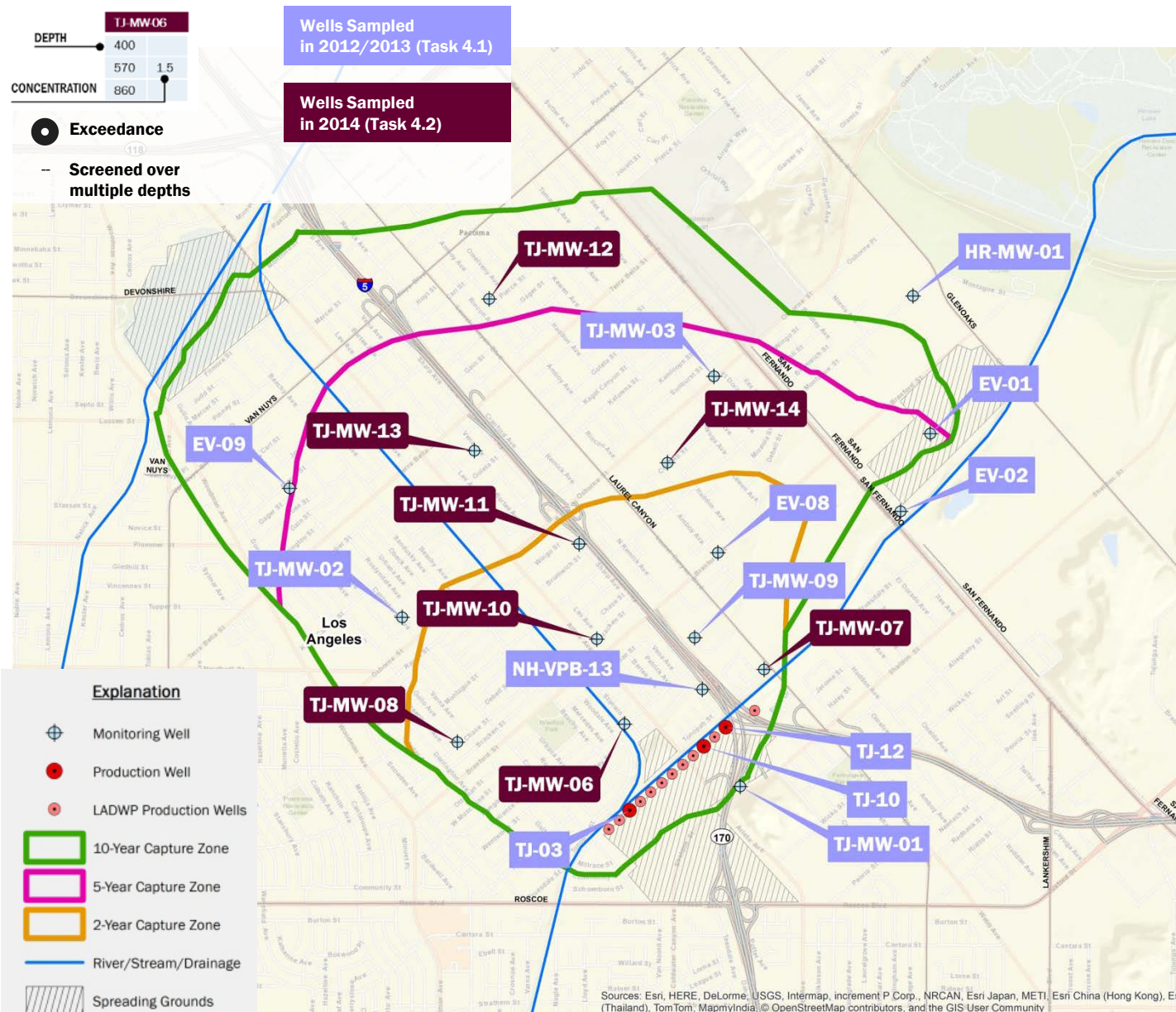
# Tujunganga – NDMA (0.010 µg/L NL)





<b>TJ-MW-12</b>	HR-MW-01
490	250
590	EV-08
910	480
<b>TJ-MW-14</b>	EV-01
460	285
580	EV-02
900	390
<b>TJ-MW-13</b>	EV-09
460	375
670	490
910	550
<b>TJ-MW-11</b>	680
440	TJ-MW-02
560	450
900	NH-VPB-13
<b>TJ-MW-10</b>	374
440	TJ-MW-03
560	470
860	TJ-MW-09
<b>TJ-MW-07</b>	580
420	850
600	TJ-12
860	--
<b>TJ-MW-08</b>	TJ-10
390	--
530	TJ-MW-01
820	474
<b>TJ-MW-06</b>	TJ-03
400	--
570	
860	

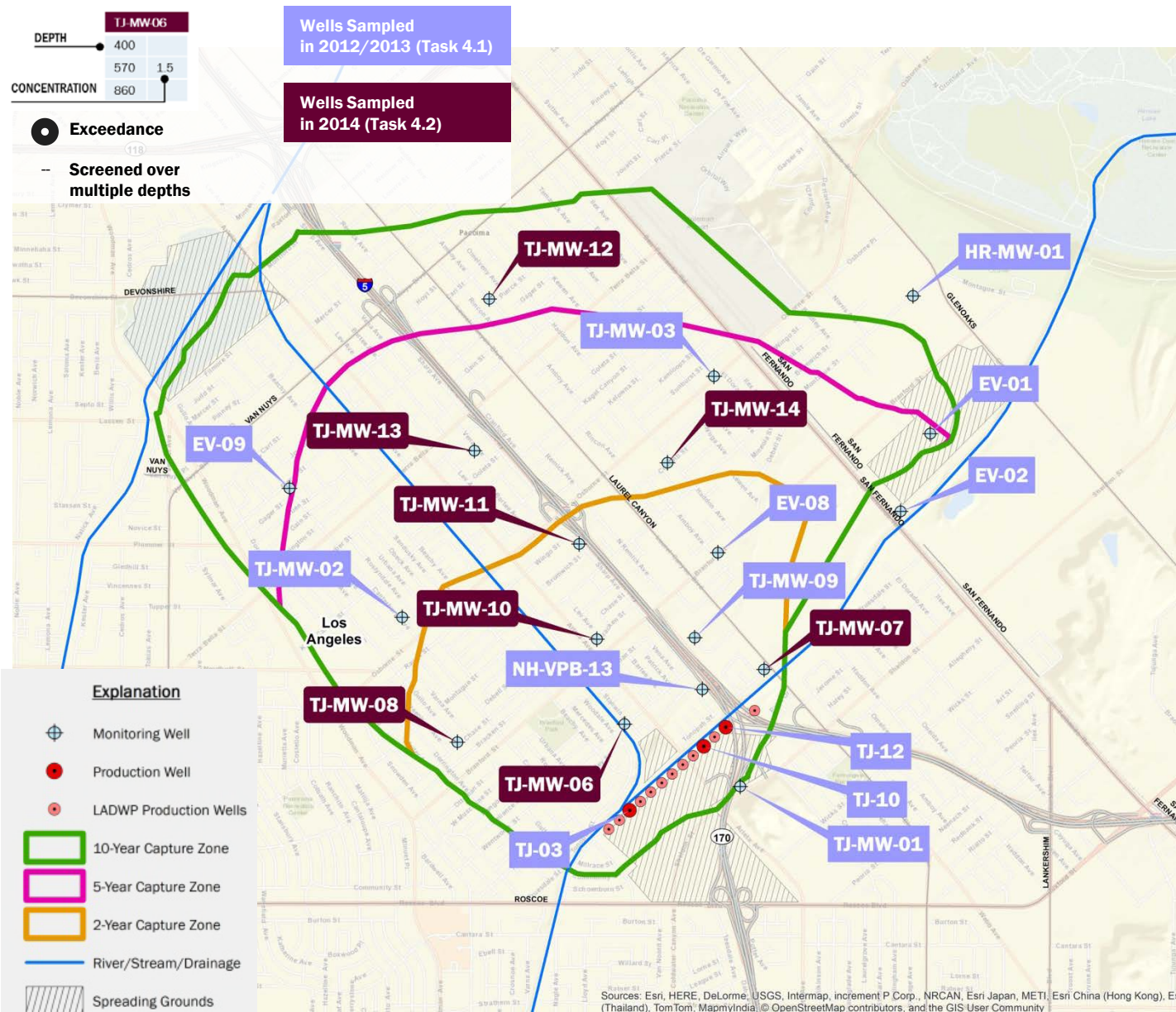
# Tujunga – Cr(VI) (10 µg/L MCL)



<b>TJ-MW-12</b>	HR-MW-01
490	250
590	EV-08
910	480
<b>TJ-MW-14</b>	EV-01
460	285
580	EV-02
900	390
<b>TJ-MW-13</b>	EV-09
460	375
670	490
910	550
<b>TJ-MW-11</b>	680
440	TJ-MW-02
560	450
900	NH-VPB-13
<b>TJ-MW-10</b>	374
440	TJ-MW-03
560	470
860	TJ-MW-09
<b>TJ-MW-07</b>	580
420	850
600	TJ-12
860	--
<b>TJ-MW-08</b>	TJ-10
390	--
530	TJ-MW-01
820	474
<b>TJ-MW-06</b>	TJ-03
400	--
570	
860	

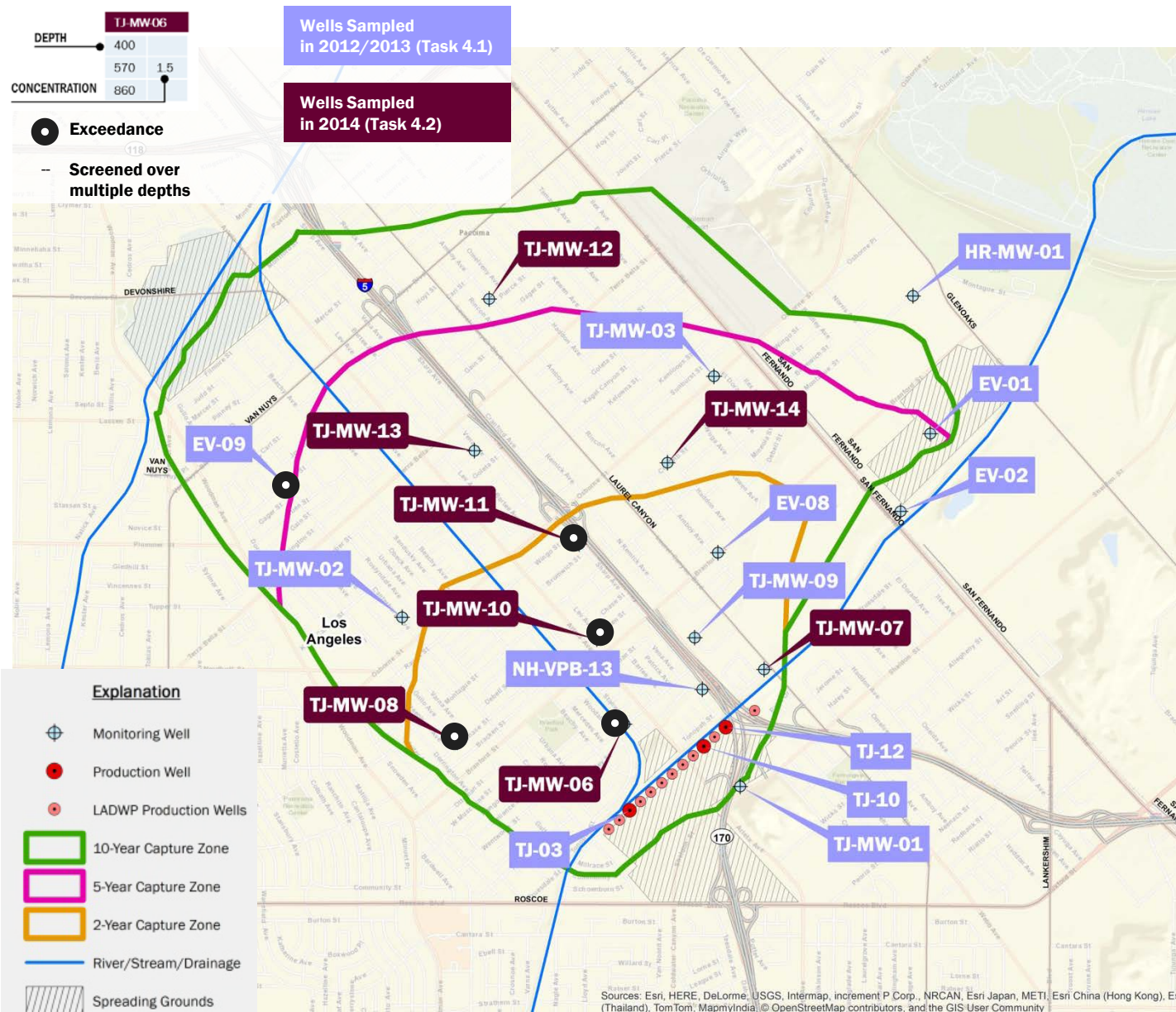
# Tujunga – Total Chromium (50 µg/L MCL)





<b>TJ-MW-12</b>	HR-MW-01
490	250
590	EV-08
910	480
<b>TJ-MW-14</b>	EV-01
460	285
580	EV-02
900	390
<b>TJ-MW-13</b>	EV-09
460	375
670	490
910	550
<b>TJ-MW-11</b>	680
440	TJ-MW-02
560	450
900	NH-VPB-13
<b>TJ-MW-10</b>	374
440	TJ-MW-03
560	470
860	TJ-MW-09
<b>TJ-MW-07</b>	580
420	850
600	TJ-12
860	--
<b>TJ-MW-08</b>	TJ-10
390	--
530	TJ-MW-01
820	474
<b>TJ-MW-06</b>	TJ-03
400	--
570	
860	

# Tujunga – Perchlorate (6 µg/L MCL)



<b>TJ-MW-12</b>		<b>HR-MW-01</b>
490		250
590		<b>EV-08</b>
910		480
<b>TJ-MW-14</b>		<b>EV-01</b>
460		285
580		<b>EV-02</b>
900		390
<b>TJ-MW-13</b>		<b>EV-09</b>
460		375
670		490
910		550
<b>TJ-MW-11</b>		680
440	57	<b>TJ-MW-02</b>
560		450
900		<b>NH-VPB-13</b>
<b>TJ-MW-10</b>		374
440	66	<b>TJ-MW-03</b>
560	47	470
860	51	<b>TJ-MW-09</b>
<b>TJ-MW-07</b>		580
420		850
600		<b>TJ-12</b>
860		--
<b>TJ-MW-08</b>		<b>TJ-10</b>
390	51	--
530		<b>TJ-MW-01</b>
820		474
<b>TJ-MW-06</b>		<b>TJ-03</b>
400	77	--
570		
860		

# Tujunga – Nitrate (as NO<sub>3</sub>) (45 mg/L MCL)

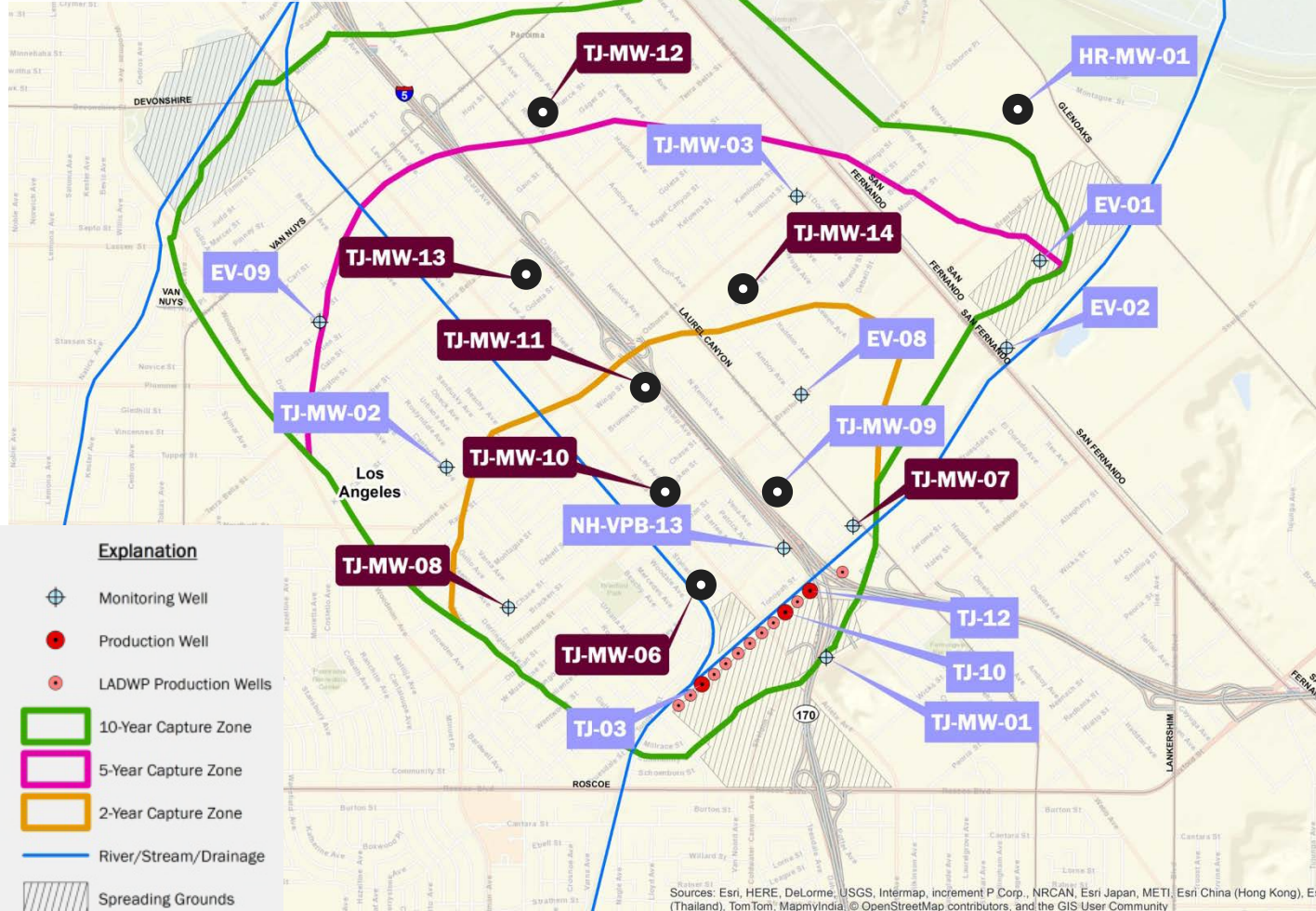


DEPTH	TJ-MW06
400	
570	1.5
CONCENTRATION	
860	

Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

- Exceedance
- Screened over multiple depths



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

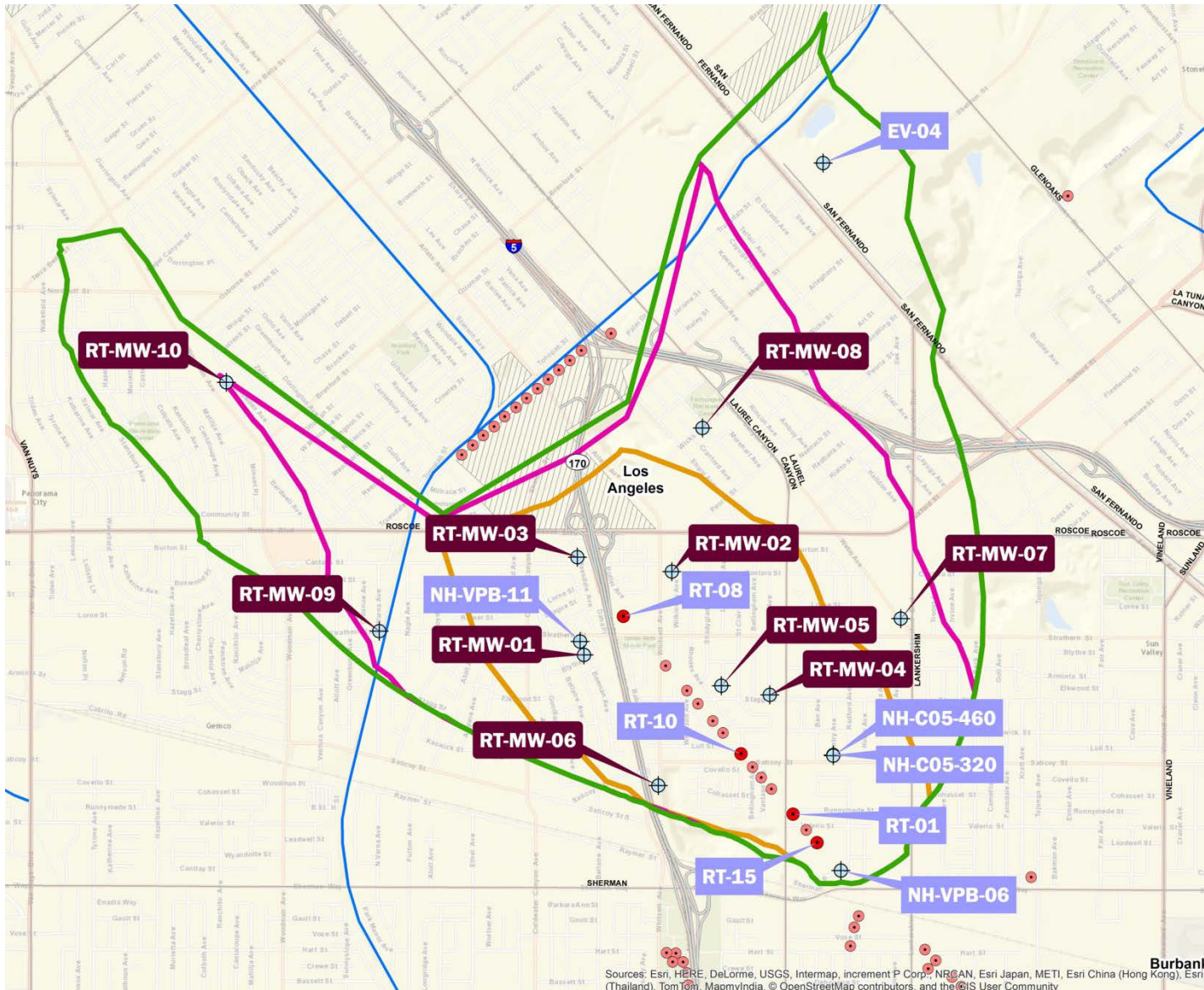
<b>TJ-MW-12</b>		<b>HR-MW-01</b>	
490		250	720
590	570	<b>EV-08</b>	
910	830	480	
<b>TJ-MW-14</b>		<b>EV-01</b>	
460	600	285	
580	1000	<b>EV-02</b>	
900	610	390	
<b>TJ-MW-13</b>		<b>EV-09</b>	
460	540	375	
670	550	490	
910	540	550	
<b>TJ-MW-11</b>		680	
440	570	<b>TJ-MW-02</b>	
560	560	450	
900		<b>NH-VPB-13</b>	
<b>TJ-MW-10</b>		374	
440		<b>TJ-MW-03</b>	
560	510	470	
860	500	<b>TJ-MW-09</b>	
<b>TJ-MW-07</b>		580	
420		850	620
600		<b>TJ-12</b>	
860		--	
<b>TJ-MW-08</b>		<b>TJ-10</b>	
390		--	
530		<b>TJ-MW-01</b>	
820		474	
<b>TJ-MW-06</b>		<b>TJ-03</b>	
400	500	--	
570			
860			

# Tujunga – TDS (500 mg/L Secondary MCL)



# **Tujungang Well Field – Other Contaminants above Regulatory Limits**

- Cis-1,2-Dichloroethylene (TJ-MW-11 and TJ-MW-13)
- Iron and Manganese
- Nitrogen, Nitrate-Nitrite
- Specific Conductance
- Sulfate (as  $\text{SO}_4$ )

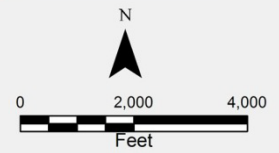


**Explanation**

- Monitoring Well
- Production Well
- LADWP Production Well
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

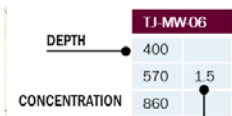
Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)



# Rinaldi-Toluca – 2014 Sampling Event (Task 4.2)



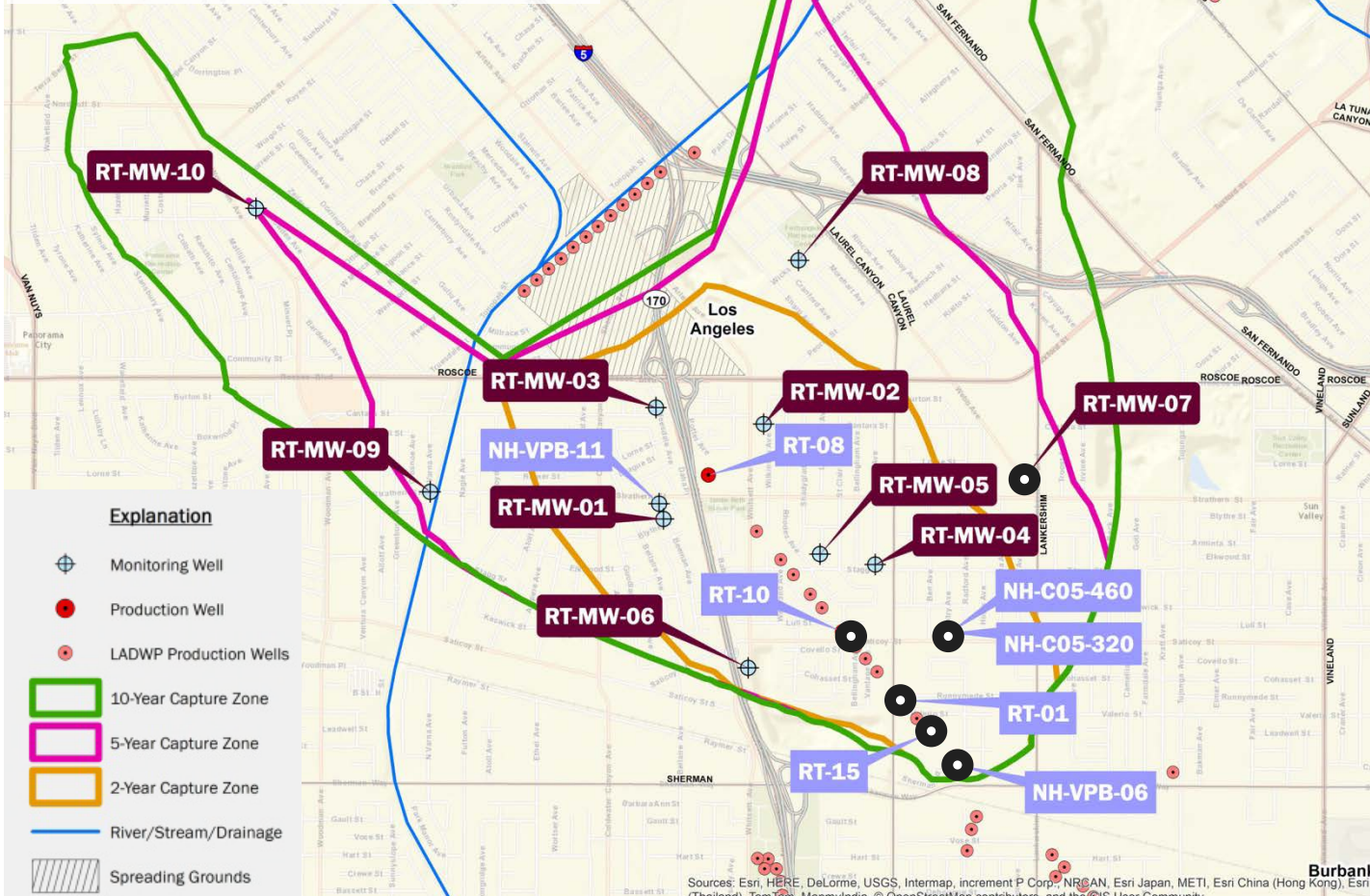


Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance

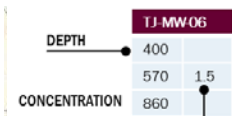
-- Screened over multiple depths



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08	
400	400	
630	580	
860	760	
RT-MW-09	RT-MW-07	
300	340	40
560	510	
800	770	
RT-MW-03	NH-VPB-11	
380	280	
570	RT-08	
760	--	
RT-MW-01	RT-10	
370	--	5.8
630	RT-15	
780	--	6.2
RT-MW-06	NH-C05	
310	320	16
510	460	18
710	RT-01	
RT-MW-02	--	18
370	NH-VPB-06	
650	340	5
810	EV-04	
RT-MW-05	280	
340		
570		
890		
RT-MW-04		
320		
450		
730		

# Rinaldi-Toluca – TCE (5 µg/L MCL)



Wells Sampled in 2012/2013 (Task 4.1)

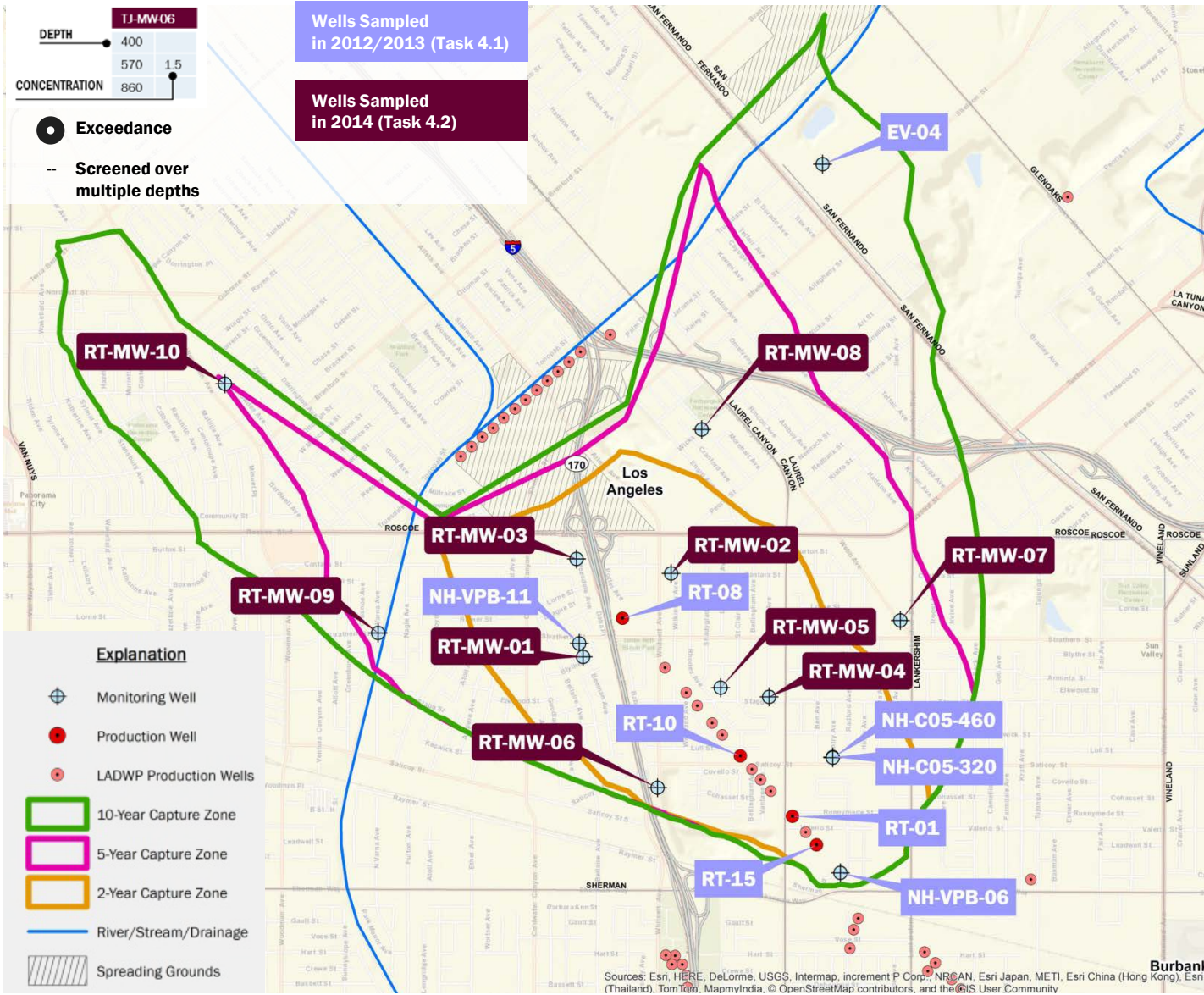
Wells Sampled in 2014 (Task 4.2)

● Exceedance

-- Screened over multiple depths

**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
RT-MW-01	RT-08
570	--
760	--
RT-MW-06	NH-C05
310	320
510	460
RT-MW-02	RT-01
710	--
RT-MW-05	NH-VPB-06
370	340
650	340
RT-MW-04	EV-04
810	280
RT-MW-03	RT-15
340	--
570	--
890	--
RT-MW-02	RT-10
370	--
630	--
780	--
RT-MW-01	RT-15
370	--
630	--
780	--
RT-MW-06	RT-10
310	--
510	--
710	--
RT-MW-02	RT-10
370	--
650	--
810	--
RT-MW-05	RT-10
340	--
570	--
890	--
RT-MW-04	RT-10
320	--
450	--
730	--

# Rinaldi-Toluca – PCE (5 µg/L MCL)



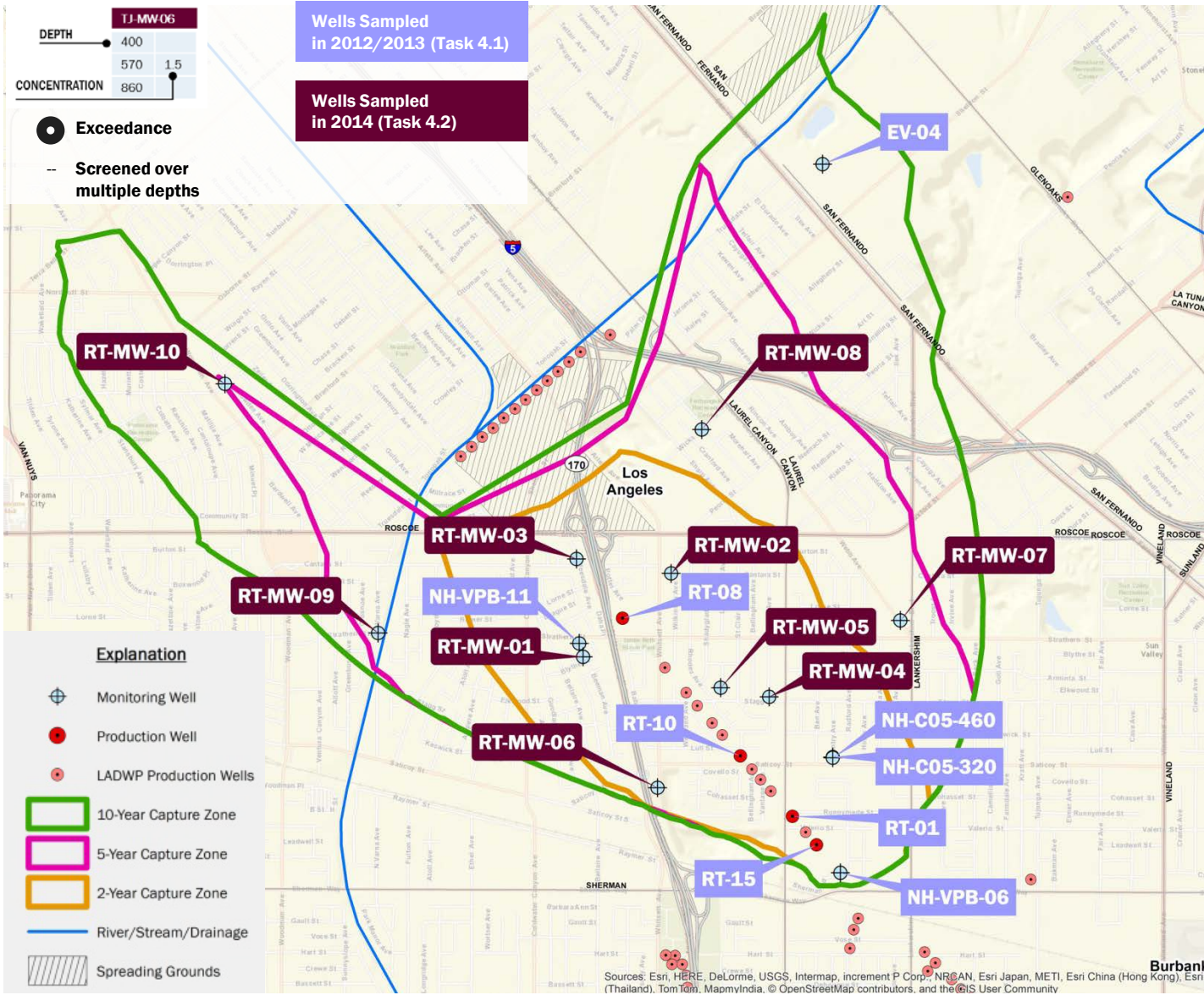


TJ-MW06	
DEPTH	400
	570
CONCENTRATION	860
	1.5

Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

- Exceedance
- Screened over multiple depths

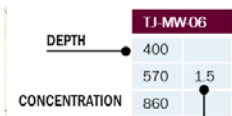


Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
570	RT-08
760	--
RT-MW-01	RT-10
370	--
630	RT-15
780	--
RT-MW-06	NH-C05
310	320
510	460
710	RT-01
RT-MW-02	--
370	NH-VPB-06
650	340
810	EV-04
RT-MW-05	280
340	
570	
890	
RT-MW-04	
320	
450	
730	

# Rinaldi-Toluca – 1,1-DCE (6 µg/L MCL)





Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance

-- Screened over multiple depths

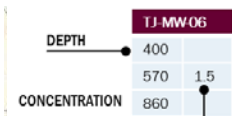


- Explanation**
- ⊕ Monitoring Well
  - Production Well
  - LADWP Production Wells
  - 10-Year Capture Zone
  - 5-Year Capture Zone
  - 2-Year Capture Zone
  - River/Stream/Drainage
  - Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
RT-MW-01	RT-08
570	--
760	--
RT-MW-01	RT-10
370	--
630	RT-15
780	--
RT-MW-06	NH-C05
310	320
510	460
710	RT-01
RT-MW-02	RT-01
370	--
650	NH-VPB-06
810	EV-04
RT-MW-05	RT-01
280	280
340	
570	
890	
RT-MW-04	RT-01
320	
450	
730	

# Rinaldi-Toluca – 1,2,3-TCP (0.005 µg/L MCL)



Wells Sampled in 2012/2013 (Task 4.1)

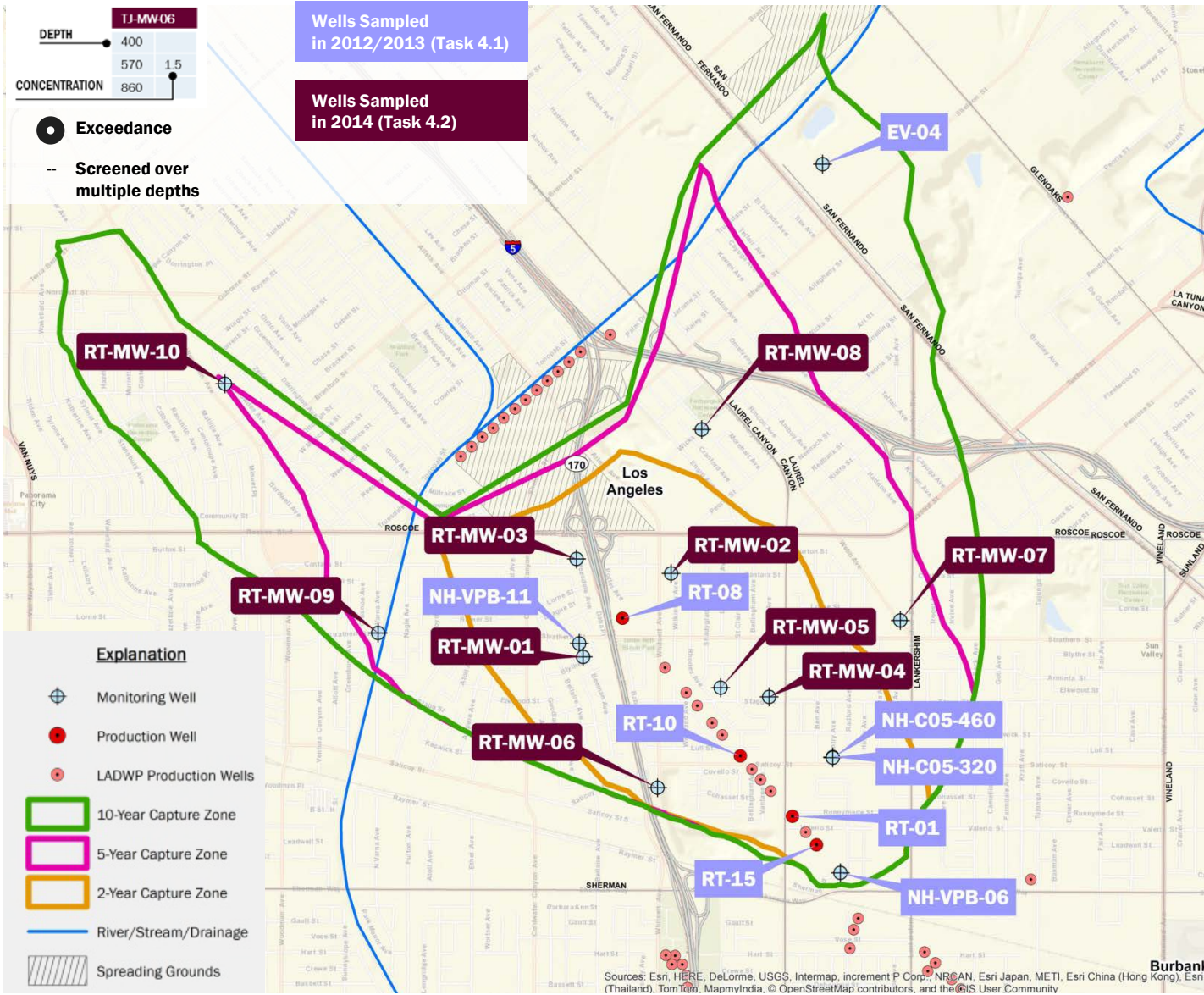
Wells Sampled in 2014 (Task 4.2)

● Exceedance

-- Screened over multiple depths

**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

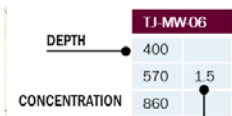


Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
RT-MW-01	RT-08
570	--
760	--
RT-MW-01	RT-10
370	--
630	RT-15
780	--
RT-MW-06	NH-C05
310	320
510	460
710	RT-01
RT-MW-02	NH-VPB-06
370	--
650	340
810	EV-04
RT-MW-05	RT-01
280	280
340	
570	
890	
RT-MW-04	RT-01
320	
450	
730	

# Rinaldi-Toluca – MTBE (13 µg/L MCL)





Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance

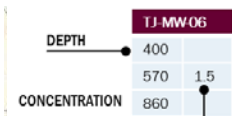
-- Screened over multiple depths



- Explanation**
- ⊕ Monitoring Well
  - Production Well
  - LADWP Production Wells
  - 10-Year Capture Zone
  - 5-Year Capture Zone
  - 2-Year Capture Zone
  - River/Stream/Drainage
  - Spreading Grounds

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
RT-08	
570	
760	--
RT-MW-01	RT-10
370	--
RT-15	
630	
780	--
RT-MW-06	NH-C05
310	320
510	460
RT-01	
710	
RT-MW-02	NH-VPB-06
370	340
650	340
810	EV-04
RT-MW-05	280
340	
570	
890	
RT-MW-04	
320	
450	
730	

# Rinaldi-Toluca – Carbon Tet (0.5 µg/L MCL)



Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance

-- Screened over multiple depths

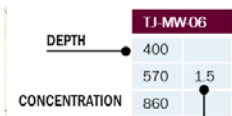


Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
RT-MW-01	RT-08
570	--
760	--
RT-MW-06	NH-C05
310	320
510	460
710	RT-01
RT-MW-02	NH-VPB-06
370	340
650	1
810	EV-04
RT-MW-05	RT-01
280	280
340	
570	
890	
RT-MW-04	RT-10
320	
450	
730	

# Rinaldi-Toluca – 1,4-Dioxane (1 µg/L NL)





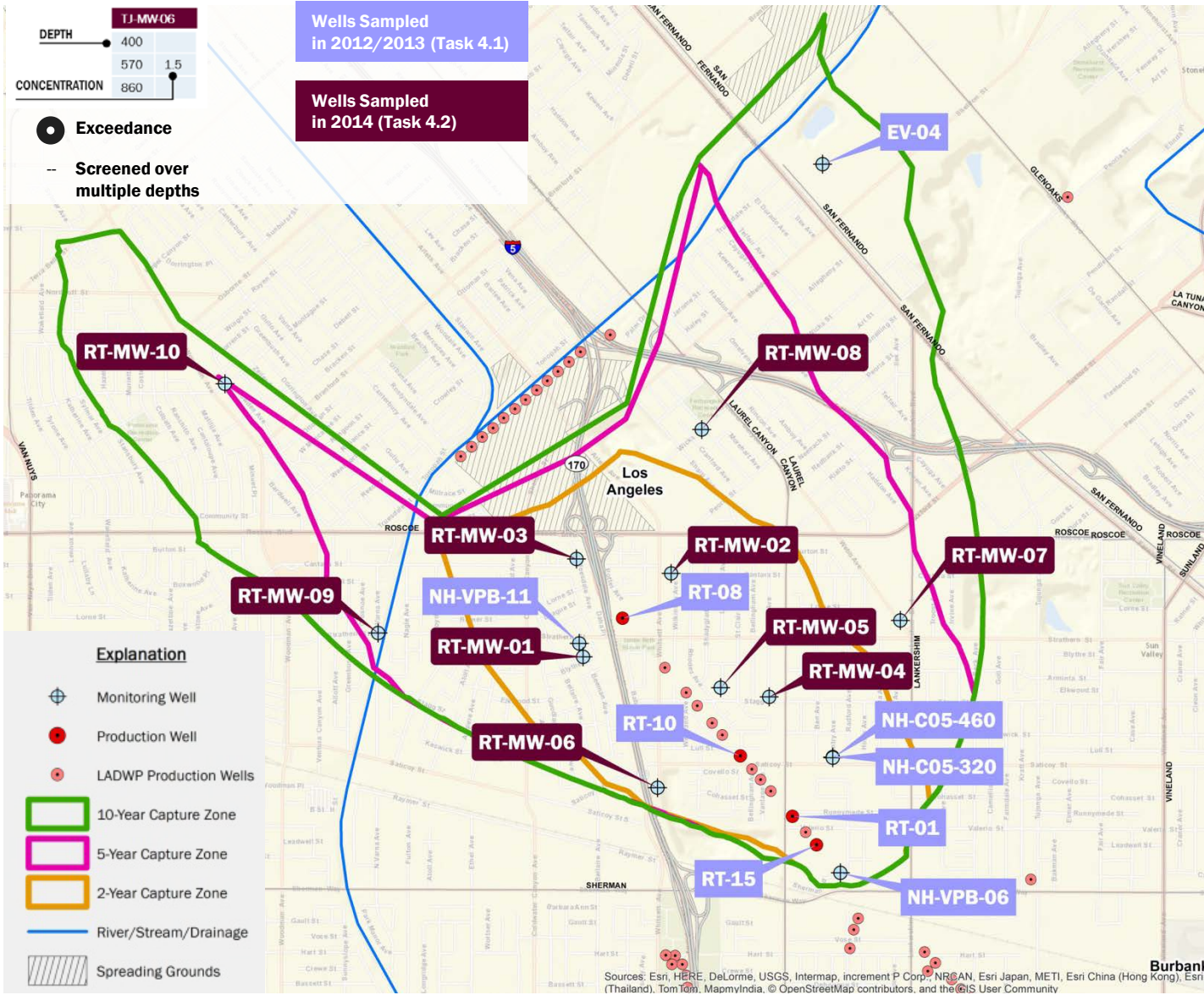
Wells Sampled  
in 2012/2013 (Task 4.1)

Wells Sampled  
in 2014 (Task 4.2)

● Exceedance

— Screened over multiple depths

- Explanation**
- ⊕ Monitoring Well
  - Production Well
  - LADWP Production Wells
  - 10-Year Capture Zone
  - 5-Year Capture Zone
  - 2-Year Capture Zone
  - River/Stream/Drainage
  - Spreading Grounds



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
RT-MW-01	RT-08
570	--
760	--
RT-MW-01	RT-10
370	--
630	RT-15
780	--
RT-MW-06	NH-C05
310	320
510	460
710	RT-01
RT-MW-02	RT-01
370	--
650	NH-VPB-06
810	EV-04
RT-MW-05	RT-01
280	280
340	
570	
890	
RT-MW-04	RT-01
320	
450	
730	

# Rinaldi-Toluca – NDMA (0.010 µg/L NL)





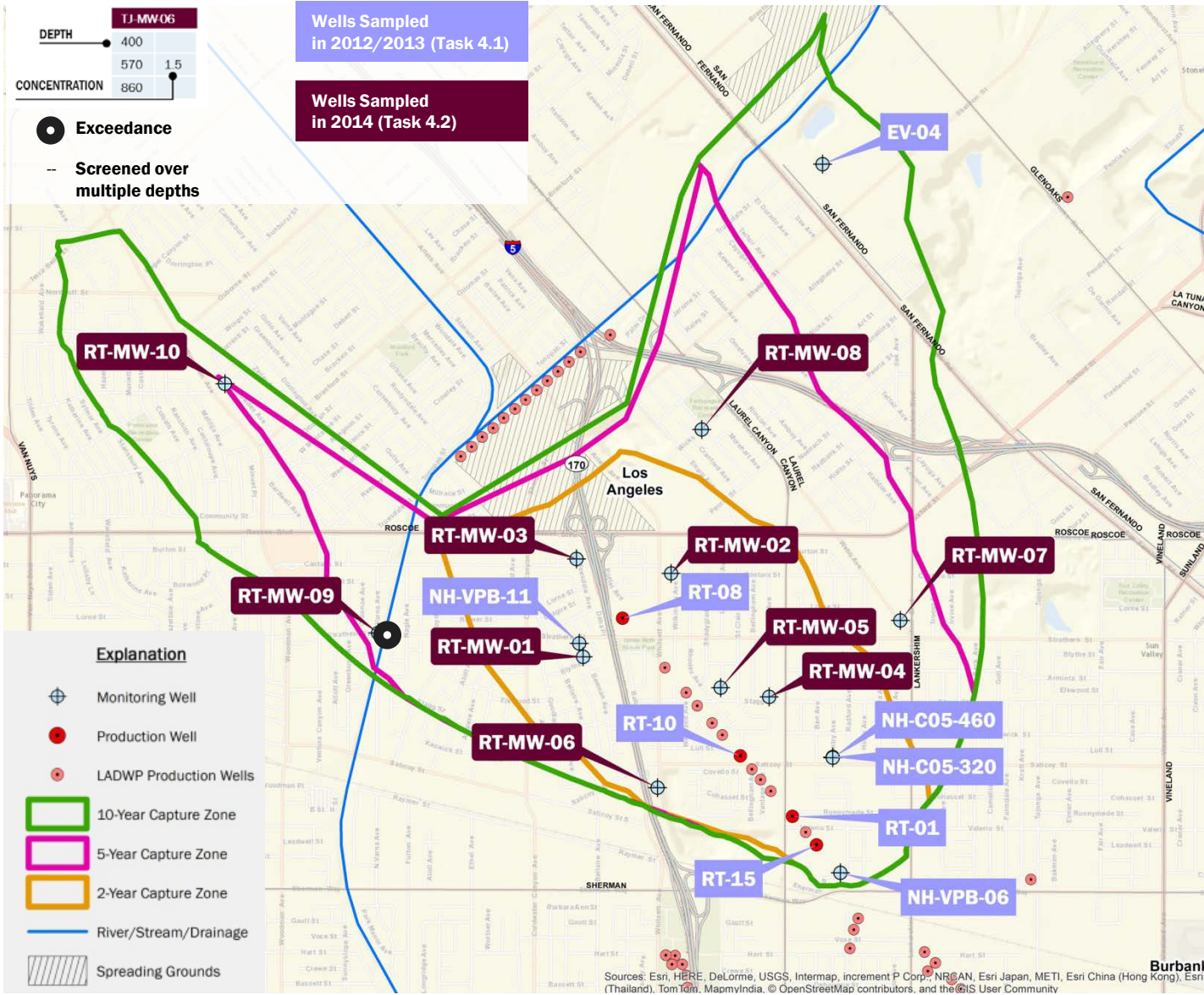
TJ-MW06	
DEPTH	400
	570
CONCENTRATION	860
	1.5

Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

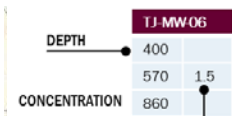
● Exceedance

-- Screened over multiple depths



RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	12
560	340
800	510
	770
RT-MW-03	NH-VPB-11
380	280
570	RT-08
760	--
RT-MW-01	RT-10
370	--
630	RT-15
780	--
RT-MW-06	NH-C05
310	320
510	460
710	RT-01
RT-MW-02	--
370	NH-VPB-06
650	340
810	EV-04
RT-MW-05	280
340	
570	
890	
RT-MW-04	
320	
450	
730	

# Rinaldi-Toluca – Cr(VI) (10 µg/L MCL)

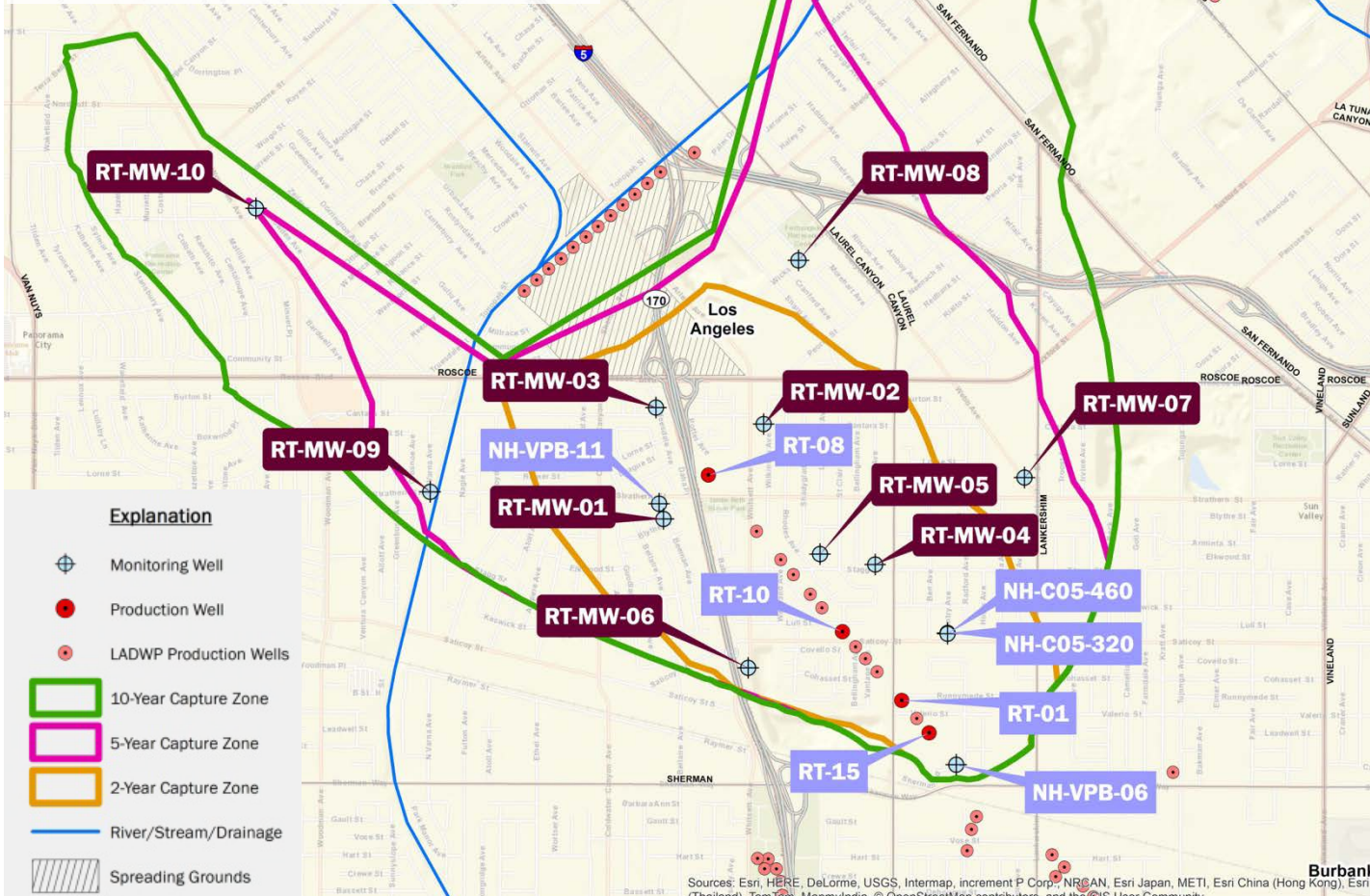


Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance

-- Screened over multiple depths

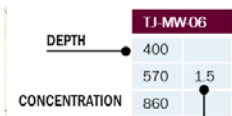


- Explanation**
- ⊕ Monitoring Well
  - Production Well
  - LADWP Production Wells
  - 10-Year Capture Zone
  - 5-Year Capture Zone
  - 2-Year Capture Zone
  - River/Stream/Drainage
  - Spreading Grounds

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
RT-MW-01	RT-08
570	--
760	--
RT-MW-01	RT-10
370	--
630	RT-15
780	--
RT-MW-06	NH-C05
310	320
510	460
710	RT-01
RT-MW-02	RT-01
370	--
650	NH-VPB-06
810	EV-04
RT-MW-05	RT-01
280	280
340	
570	
890	
RT-MW-04	RT-01
320	
450	
730	

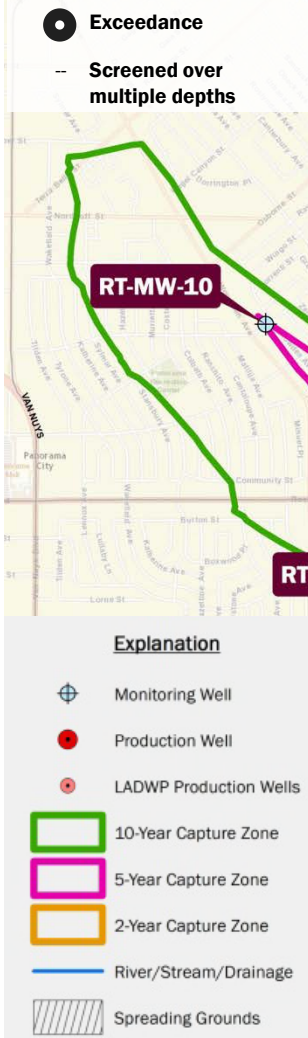
# Rinaldi-Toluca – Total Chromium (50 µg/L MCL)





Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08
400	400
630	580
860	760
RT-MW-09	RT-MW-07
300	340
560	510
800	770
RT-MW-03	NH-VPB-11
380	280
RT-MW-01	RT-08
570	--
760	--
RT-MW-01	RT-10
370	--
630	RT-15
780	--
RT-MW-06	NH-C05
310	320
510	460
710	RT-01
RT-MW-02	NH-VPB-06
370	--
650	340
810	11
RT-MW-05	EV-04
340	280
570	
890	
RT-MW-04	
320	
450	
730	11

# Rinaldi-Toluca – Perchlorate (6 µg/L MCL)

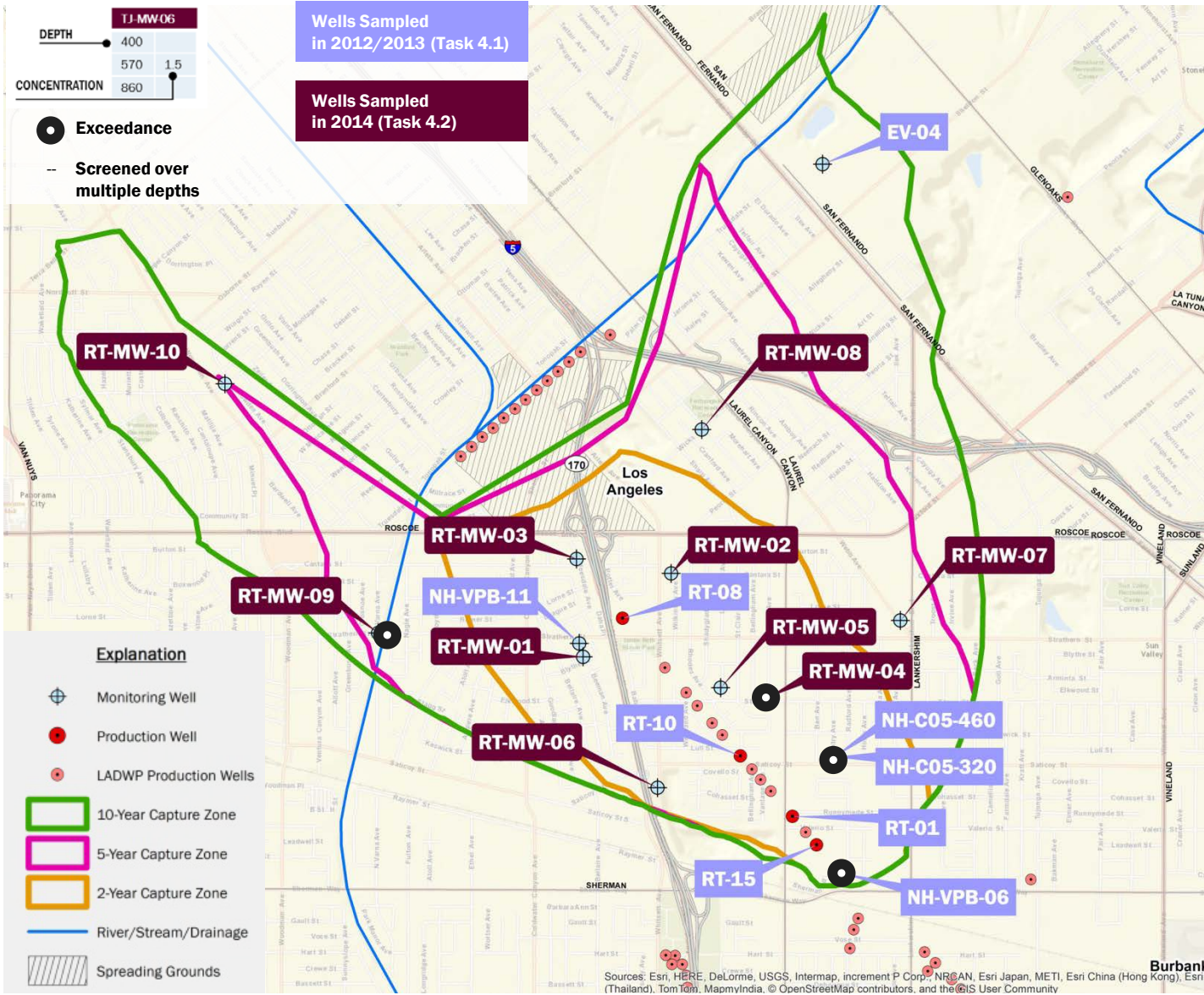


TJ-MW06	
DEPTH	400
	570
CONCENTRATION	860
	1.5

Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

- Exceedance
- Screened over multiple depths

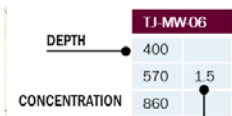


Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

RT-MW-10	RT-MW-08		
400	71	400	
630		580	
860		760	
RT-MW-09	RT-MW-07		
300		340	
560		510	
800		770	
RT-MW-03	NH-VPB-11		
380		280	
570		RT-08	
760		--	
RT-MW-01	RT-10		
370		--	
630		RT-15	
780		--	
RT-MW-06	NH-C05		
310		320	62
510		460	
710		RT-01	
RT-MW-02		--	
370		NH-VPB-06	
650		340	68
810		EV-04	
RT-MW-05		280	
340			
570			
890			
RT-MW-04			
320	69		
450			
730			

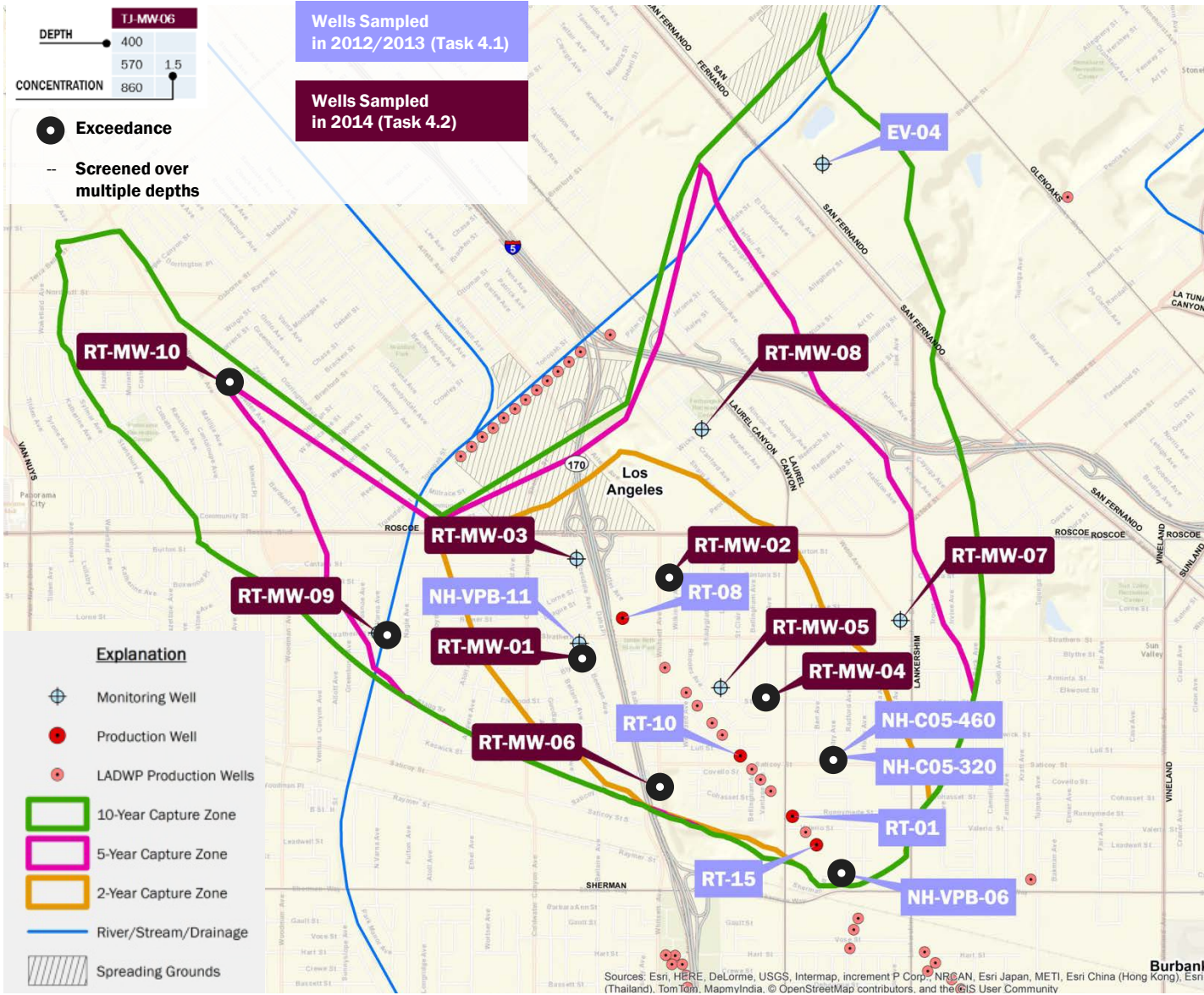
# Rinaldi-Toluca – Nitrate (as NO<sub>3</sub>) (45 mg/L MCL)





Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapbox, © OpenStreetMap contributors, and the GIS User Community

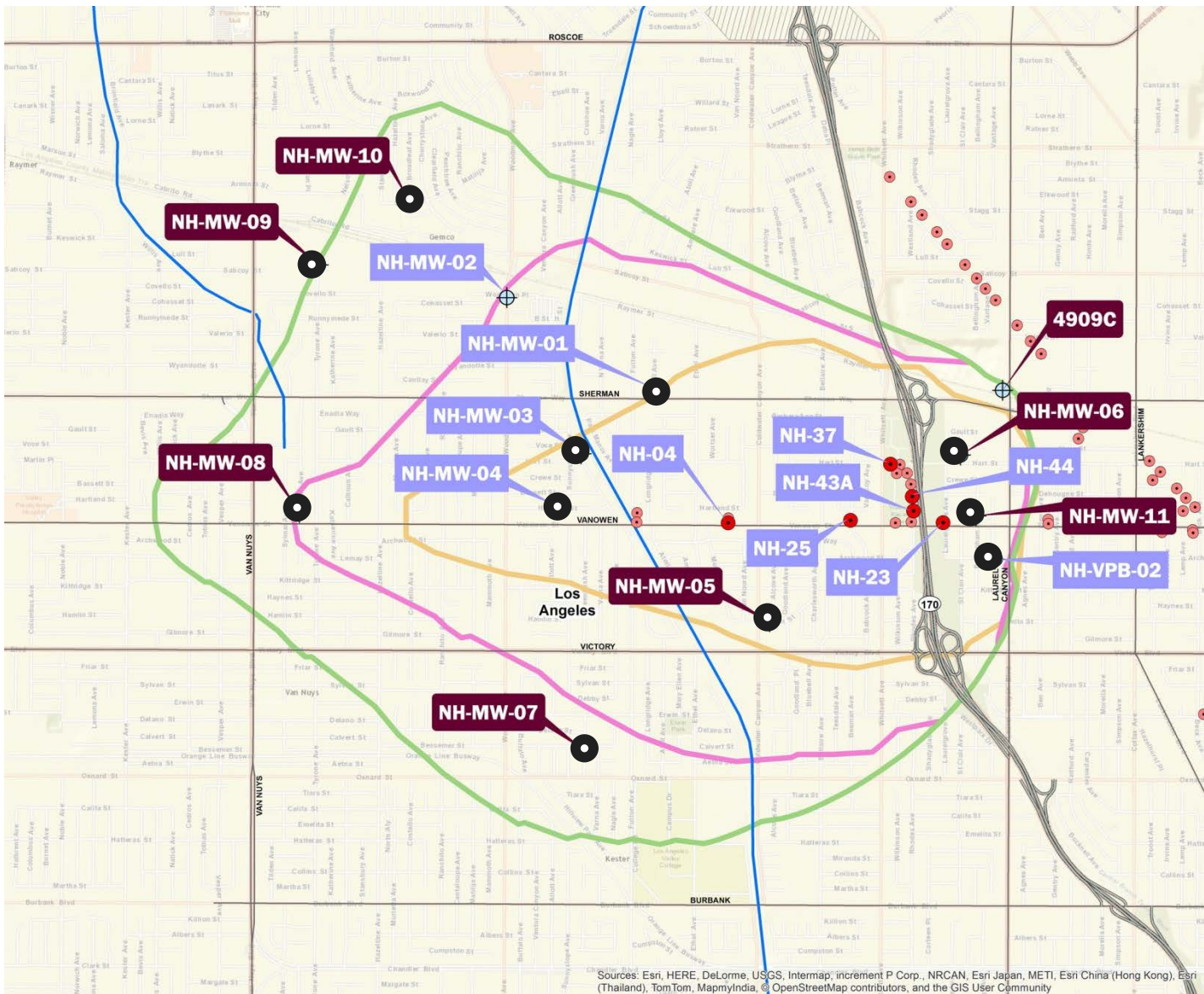
RT-MW-10		RT-MW-08	
400	700	400	
630	590	580	
860		760	
RT-MW-09		RT-MW-07	
300	560	340	
560	1300	510	
800	810	770	
RT-MW-03		NH-VPB-11	
380		280	
570		RT-08	
760		--	
RT-MW-01		RT-10	
370		--	
630	940	RT-15	
780		--	
RT-MW-06		NH-C05	
310		320	560
510	1,300	460	
710	620	RT-01	
RT-MW-02		--	
370	600	NH-VPB-06	
650		340	550
810		EV-04	
RT-MW-05		280	
340			
570			
890			
RT-MW-04			
320	540		
450			
730			

# Rinaldi-Toluca – TDS (500 mg/L Secondary MCL)



# **Rinaldi-Toluca Well Field – Other Contaminants above Regulatory Limits**

- Bis(2-Ethylhexyl) Phthalate (NH-VPB-06)
- Mercury (RT-08)
- Iron and Manganese
- Nitrogen, Nitrate-Nitrite
- Taste and Odor Number (TON) and Turbidity
- Specific Conductance
- Sulfate (as  $\text{SO}_4$ )



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

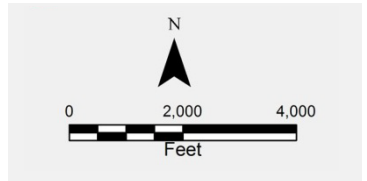


**Explanation**

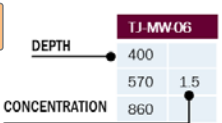
- Monitoring Well
- Production Well
- LADWP Production Well
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

**Wells Sampled in 2012/2013 (Task 4.1)**

**Wells Sampled in 2014 (Task 4.2)**



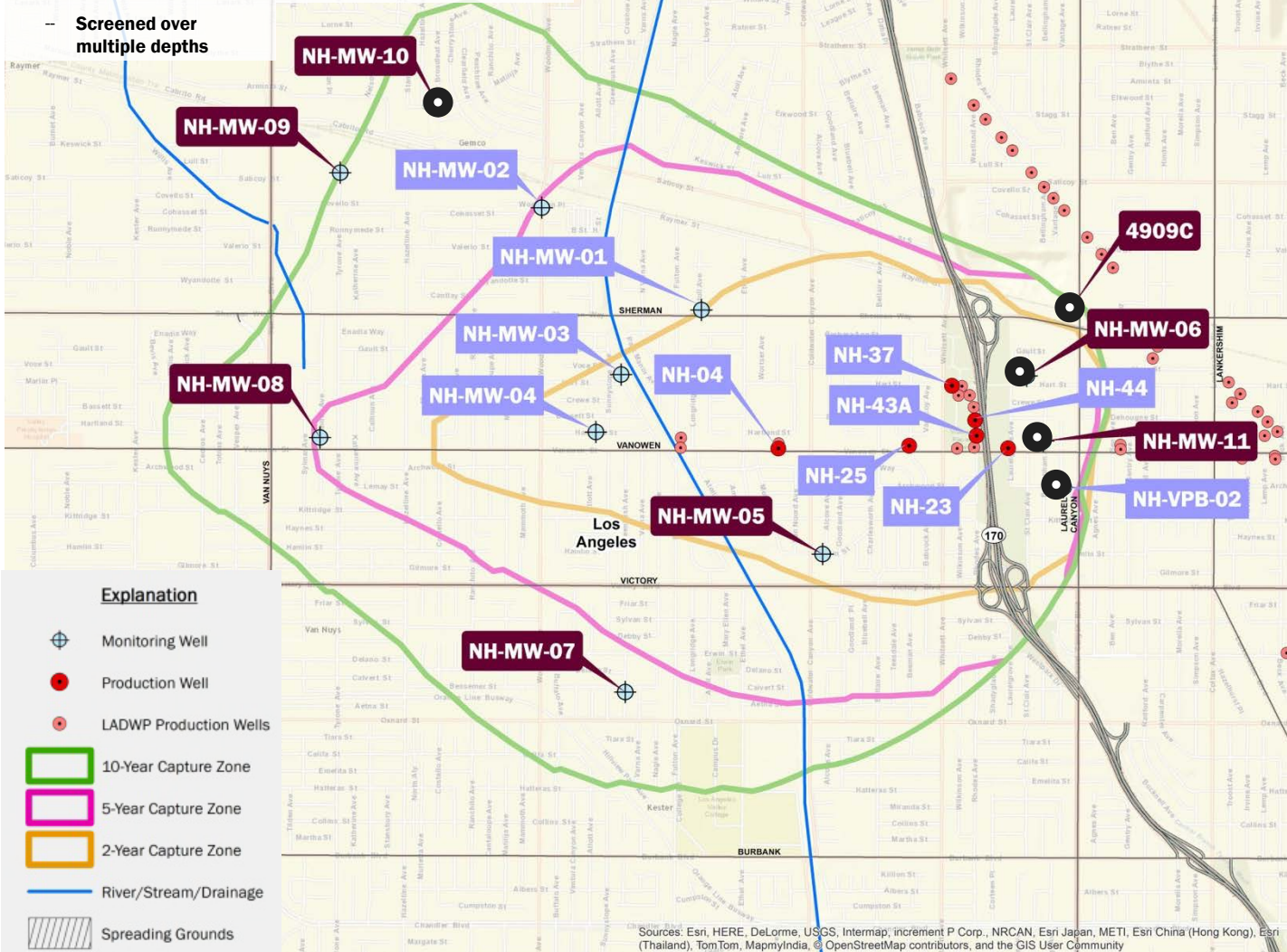
# NH West – 2014 Sampling Event (Task 4.2)



Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



**Explanation**

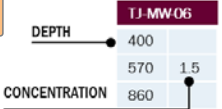
- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

<b>NH-MW-10</b>			<b>NH-MW-02</b>		
300	5		305		
450			333		
820			375		
<b>NH-MW-09</b>			<b>NH-MW-01</b>		
340			288		
570			320		
800			370		
<b>NH-MW-08</b>			<b>NH-MW-03</b>		
250			268		
430			374		
770			772		
<b>NH-MW-07</b>			<b>NH-MW-04</b>		
230			385		
390			NH-04		
770			--		
<b>NH-MW-05</b>			<b>NH-37</b>		
250			--		
510			NH-43A		
720			--		
<b>NH-MW-11</b>			<b>NH-25</b>		
280	52		--		
450	16		NH-23		
710			--	18	
<b>NH-MW-06</b>			<b>NH-44</b>		
280	98		--		
580			NH-VPB-02		
810			255	9.4	
<b>4909C</b>					
370	45				

# NH West – TCE (5 µg/L MCL)

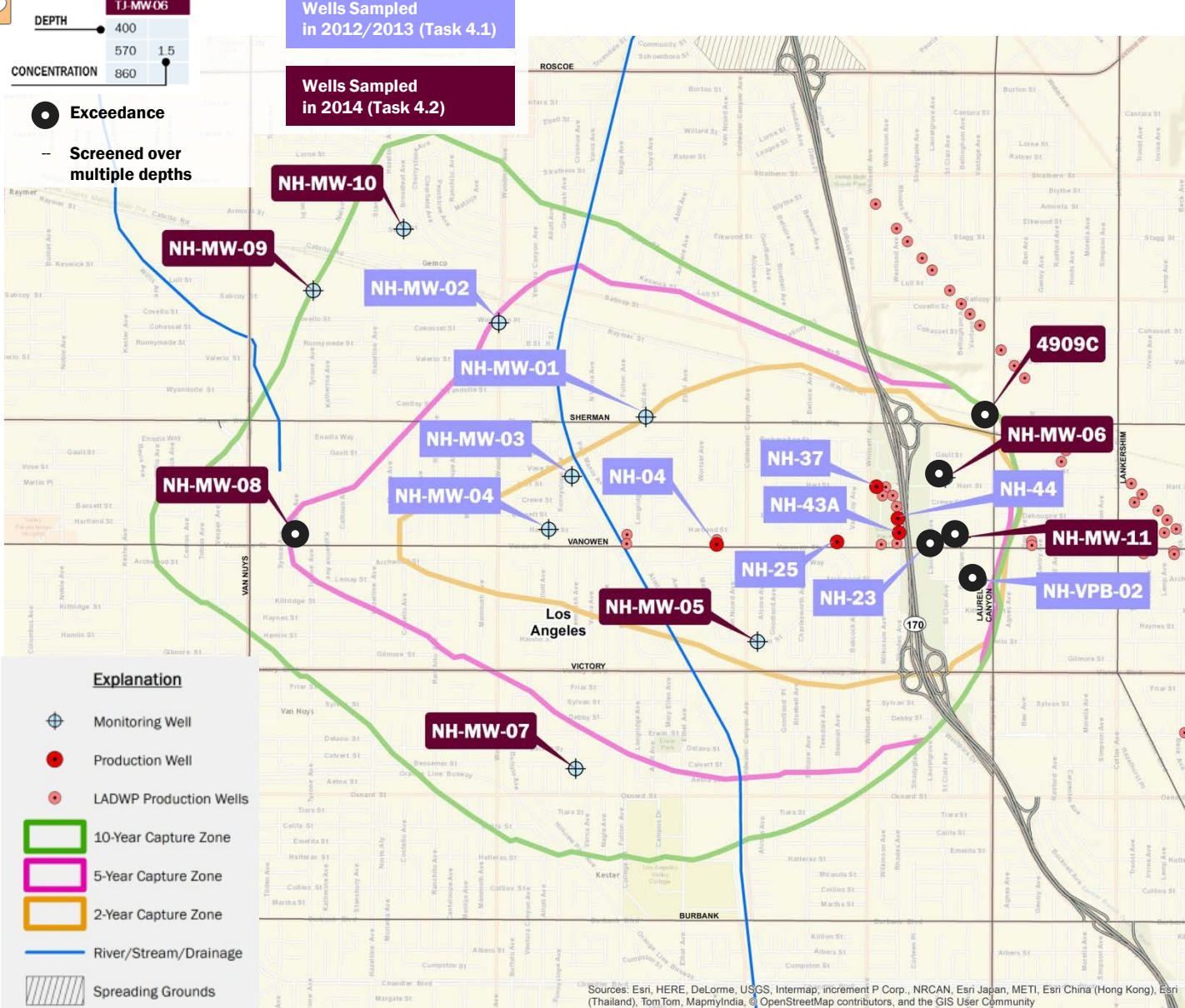




Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



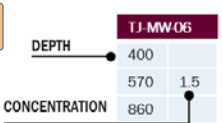
**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10		NH-MW-02	
300		305	
450		333	
820		375	
NH-MW-09		NH-MW-01	
340		288	
570		320	
800		370	
NH-MW-08		NH-MW-03	
250		268	
430	22	374	
770		772	
NH-MW-07		NH-MW-04	
230		385	
390		NH-04	
770		--	
NH-MW-05		NH-37	
250		--	
510		NH-43A	
720		--	
NH-MW-11		NH-25	
280	32	--	
450		NH-23	
710		--	8
NH-MW-06		NH-44	
280	72	--	
580		NH-VPB-02	
810		255	37
4909C			
370	9.4		

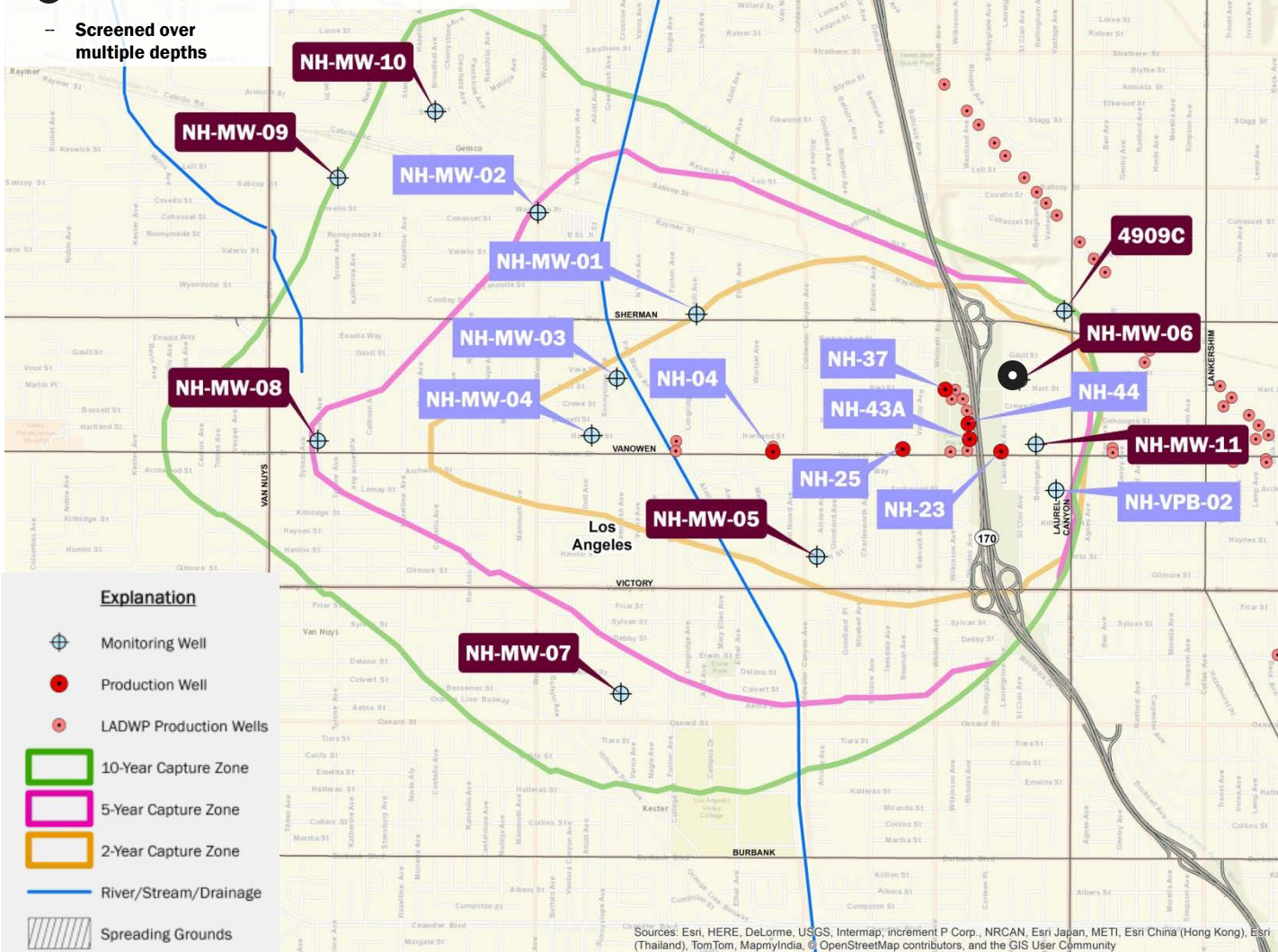
# NH West – PCE (5 µg/L MCL)



Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths

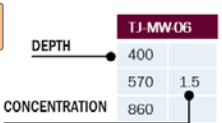


Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10	NH-MW-02
300	305
450	333
820	375
NH-MW-09	NH-MW-01
340	288
570	320
800	370
NH-MW-08	NH-MW-03
250	268
430	374
770	772
NH-MW-07	NH-MW-04
230	385
390	NH-04
770	--
NH-MW-05	NH-37
250	--
510	NH-43A
720	--
NH-MW-11	NH-25
280	--
450	NH-23
710	--
NH-MW-06	NH-44
280	7.7
580	NH-VPB-02
810	255
4909C	
370	

# NH West - 1,1-DCE (6 µg/L MCL)

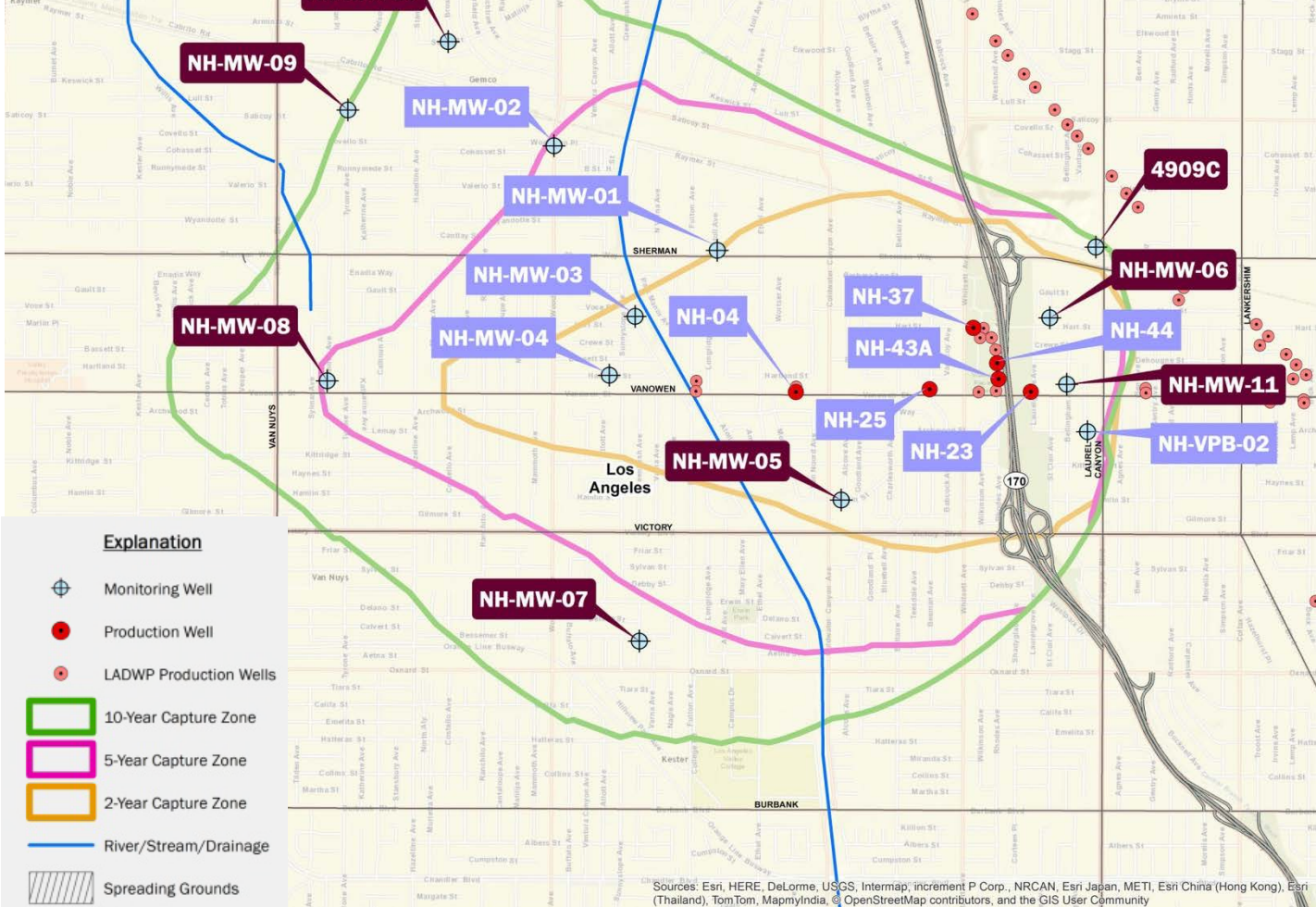




Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



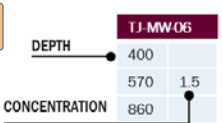
**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10	NH-MW-02
300	305
450	333
820	375
NH-MW-09	NH-MW-01
340	288
570	320
800	370
NH-MW-08	NH-MW-03
250	268
430	374
770	772
NH-MW-07	NH-MW-04
230	385
390	NH-04
770	--
NH-MW-05	NH-37
250	--
510	NH-43A
720	--
NH-MW-11	NH-25
280	--
450	NH-23
710	--
NH-MW-06	NH-44
280	--
580	NH-VPB-02
810	255
4909C	
370	

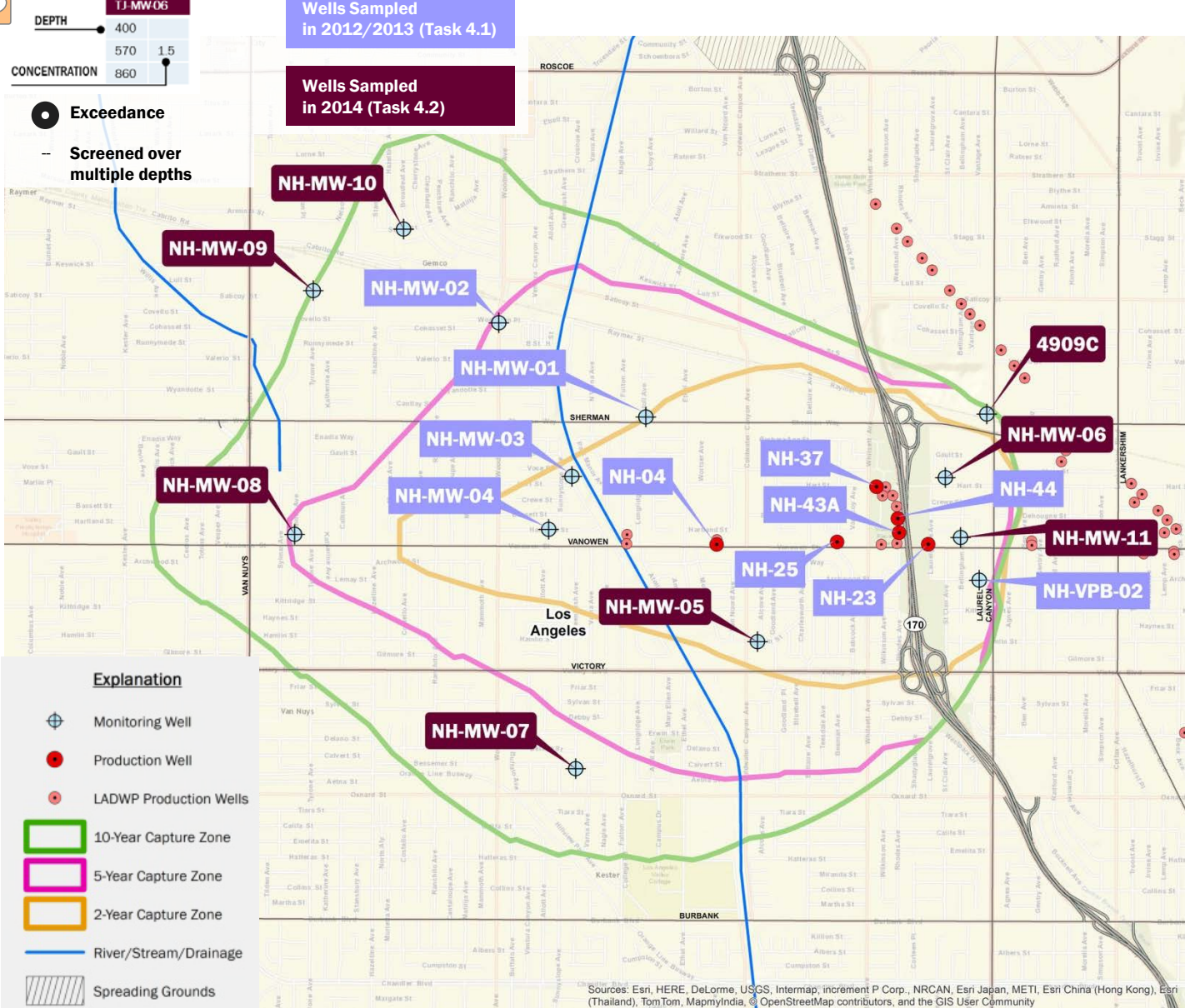
# NH West - 1,2,3-TCP (0.005 µg/L MCL)



Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

- Exceedance
- Screened over multiple depths



**Explanation**

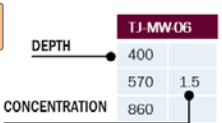
- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10	NH-MW-02
300	305
450	333
820	375
NH-MW-09	NH-MW-01
340	288
570	320
800	370
NH-MW-08	NH-MW-03
250	268
430	374
770	772
NH-MW-07	NH-MW-04
230	385
390	NH-04
770	--
NH-MW-05	NH-37
250	--
510	NH-43A
720	--
NH-MW-11	NH-25
280	--
450	NH-23
710	--
NH-MW-06	NH-44
280	--
580	NH-VPB-02
810	255
4909C	
370	

# NH West – MTBE (13 µg/L MCL)

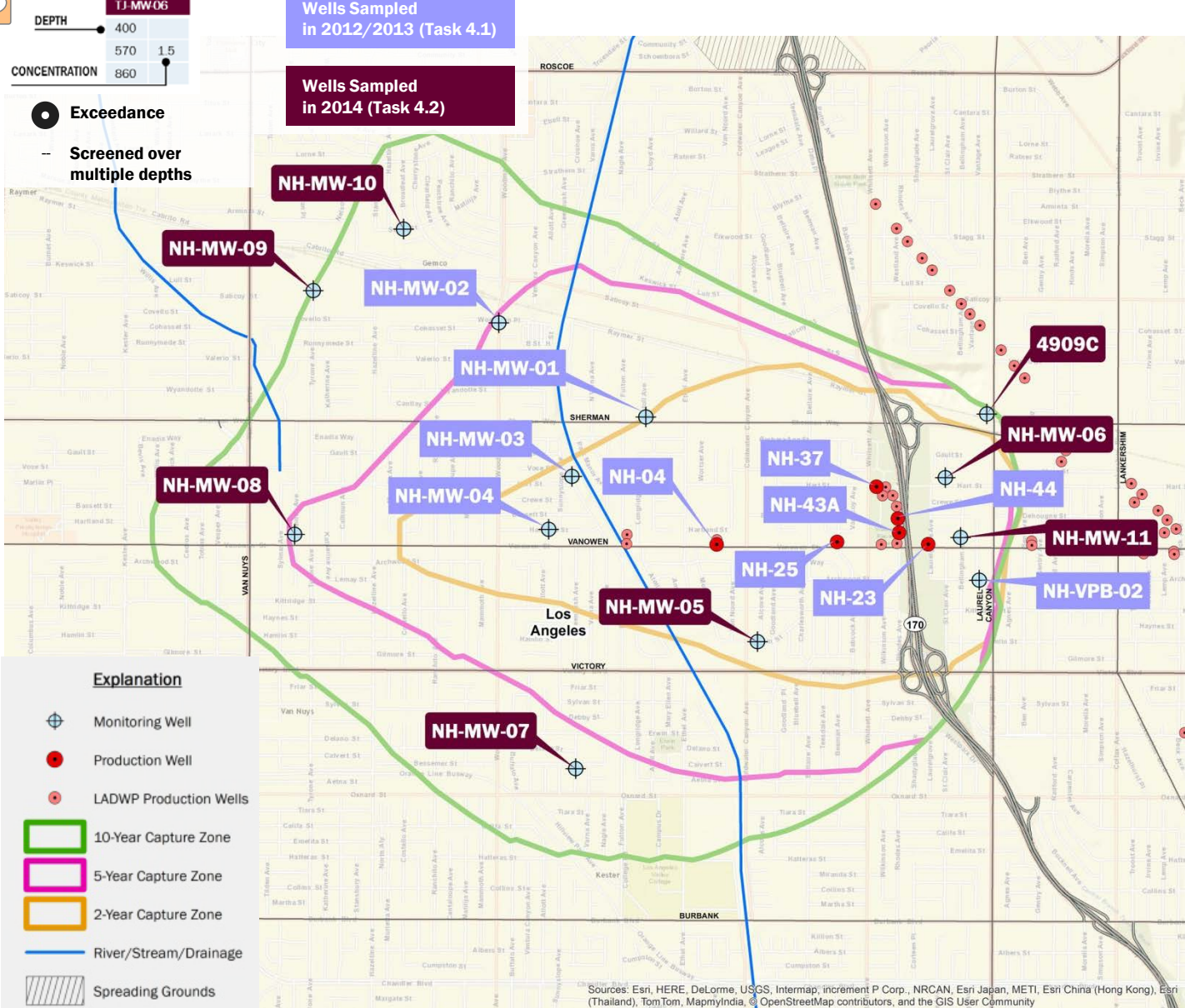




Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



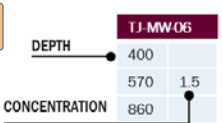
**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10	NH-MW-02
300	305
450	333
820	375
NH-MW-09	NH-MW-01
340	288
570	320
800	370
NH-MW-08	NH-MW-03
250	268
430	374
770	772
NH-MW-07	NH-MW-04
230	385
390	NH-04
770	--
NH-MW-05	NH-37
250	--
510	NH-43A
720	--
NH-MW-11	NH-25
280	--
450	NH-23
710	--
NH-MW-06	NH-44
280	--
580	NH-VPB-02
810	255
4909C	
370	

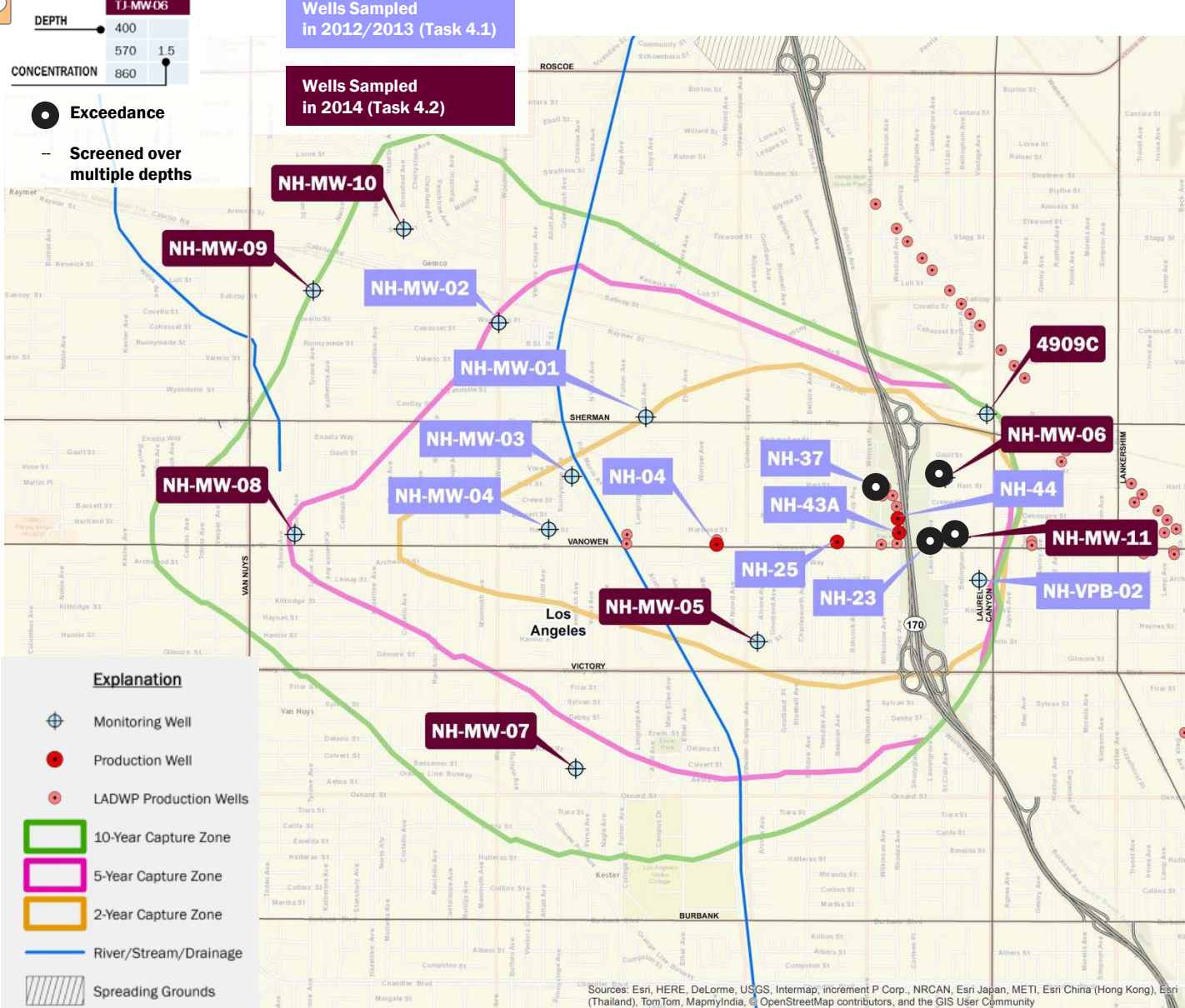
# NH West – Carbon Tet (0.5 µg/L MCL)



Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



**Explanation**

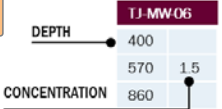
- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10		NH-MW-02	
300		305	
450		333	
820		375	
NH-MW-09		NH-MW-01	
340		288	
570		320	
800		370	
NH-MW-08		NH-MW-03	
250		268	
430		374	
770		772	
NH-MW-07		NH-MW-04	
230		385	
390		NH-04	
770		--	
NH-MW-05		NH-37	
250		--	1.5
510		NH-43A	
720		--	
NH-MW-11		NH-25	
280	2.1	--	
450		NH-23	
710		--	7.6
NH-MW-06		NH-44	
280	9.7	--	
580		NH-VPB-02	
810		255	
4909C			
370			

# NH West - 1,4-Dioxane (1 µg/L NL)

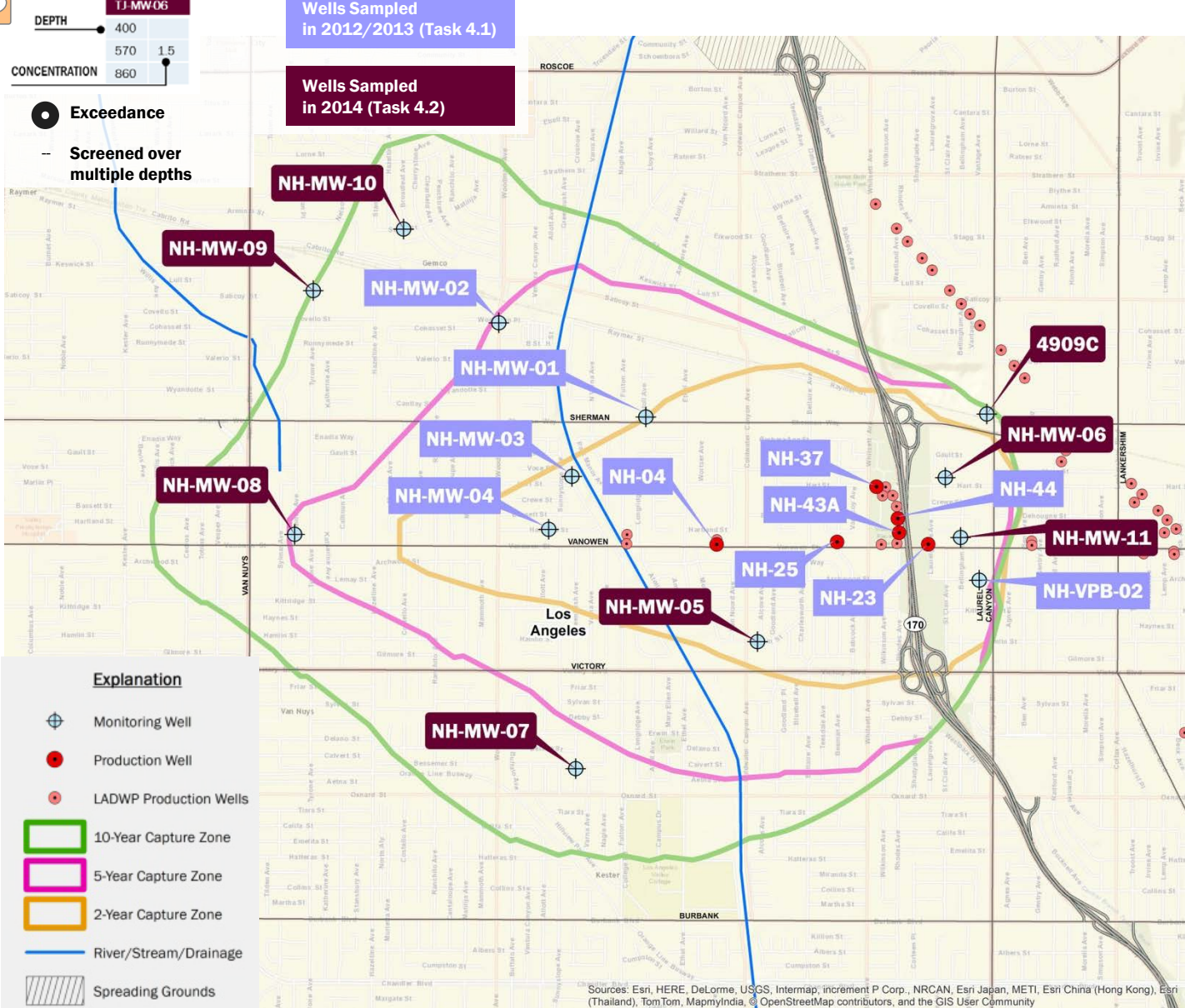




Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths

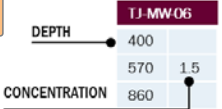


Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10	NH-MW-02
300	305
450	333
820	375
NH-MW-09	NH-MW-01
340	288
570	320
800	370
NH-MW-08	NH-MW-03
250	268
430	374
770	772
NH-MW-07	NH-MW-04
230	385
390	NH-04
770	--
NH-MW-05	NH-37
250	--
510	NH-43A
720	--
NH-MW-11	NH-25
280	--
450	NH-23
710	--
NH-MW-06	NH-44
280	--
580	NH-VPB-02
810	255
4909C	
370	

# NH West – NDMA (0.010 µg/L NL)

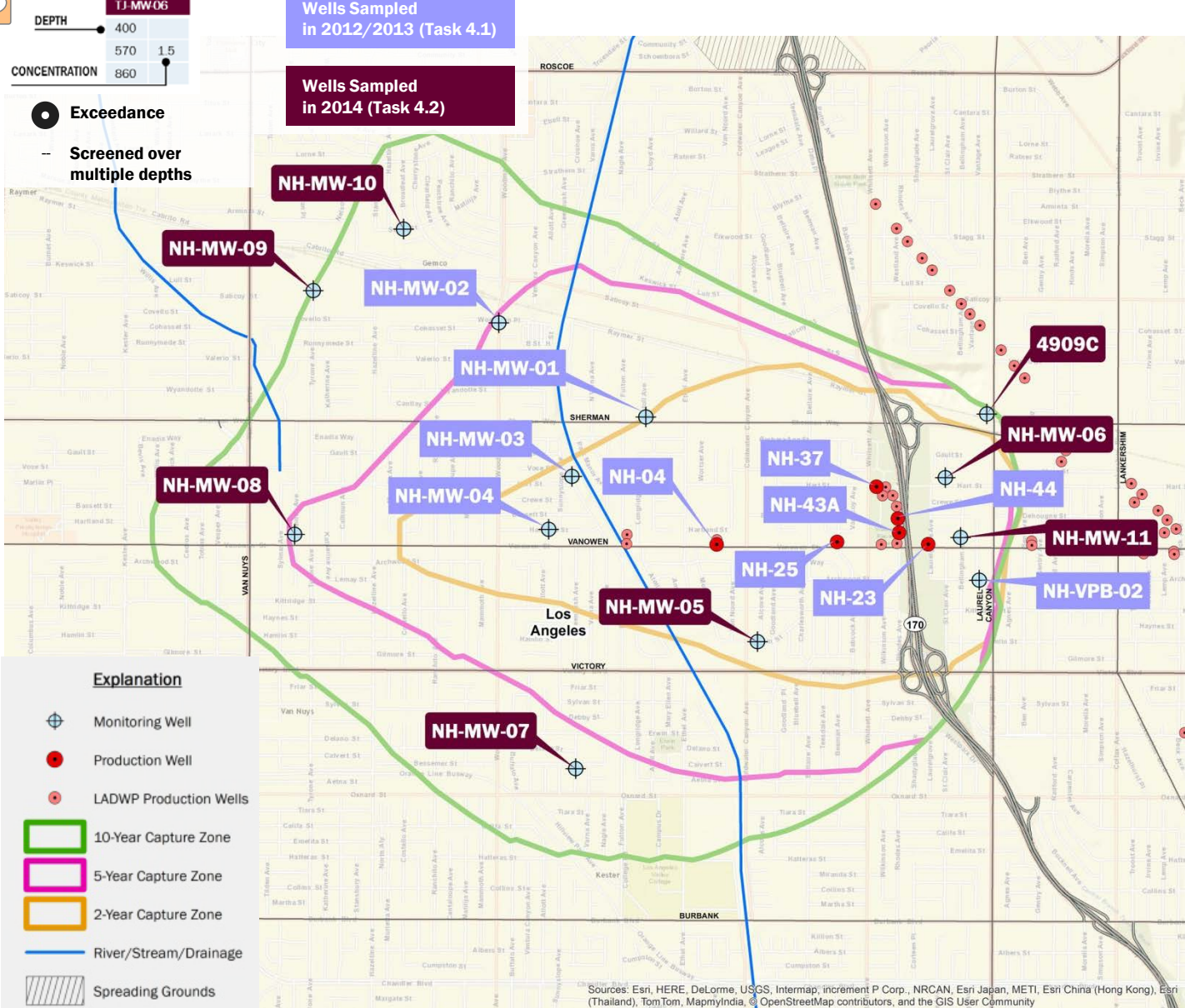




Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



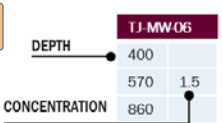
**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10	NH-MW-02
300	305
450	333
820	375
NH-MW-09	NH-MW-01
340	288
570	320
800	370
NH-MW-08	NH-MW-03
250	268
430	374
770	772
NH-MW-07	NH-MW-04
230	385
390	NH-04
770	--
NH-MW-05	NH-37
250	--
510	NH-43A
720	--
NH-MW-11	NH-25
280	--
450	NH-23
710	--
NH-MW-06	NH-44
280	--
580	NH-VPB-02
810	255
4909C	
370	

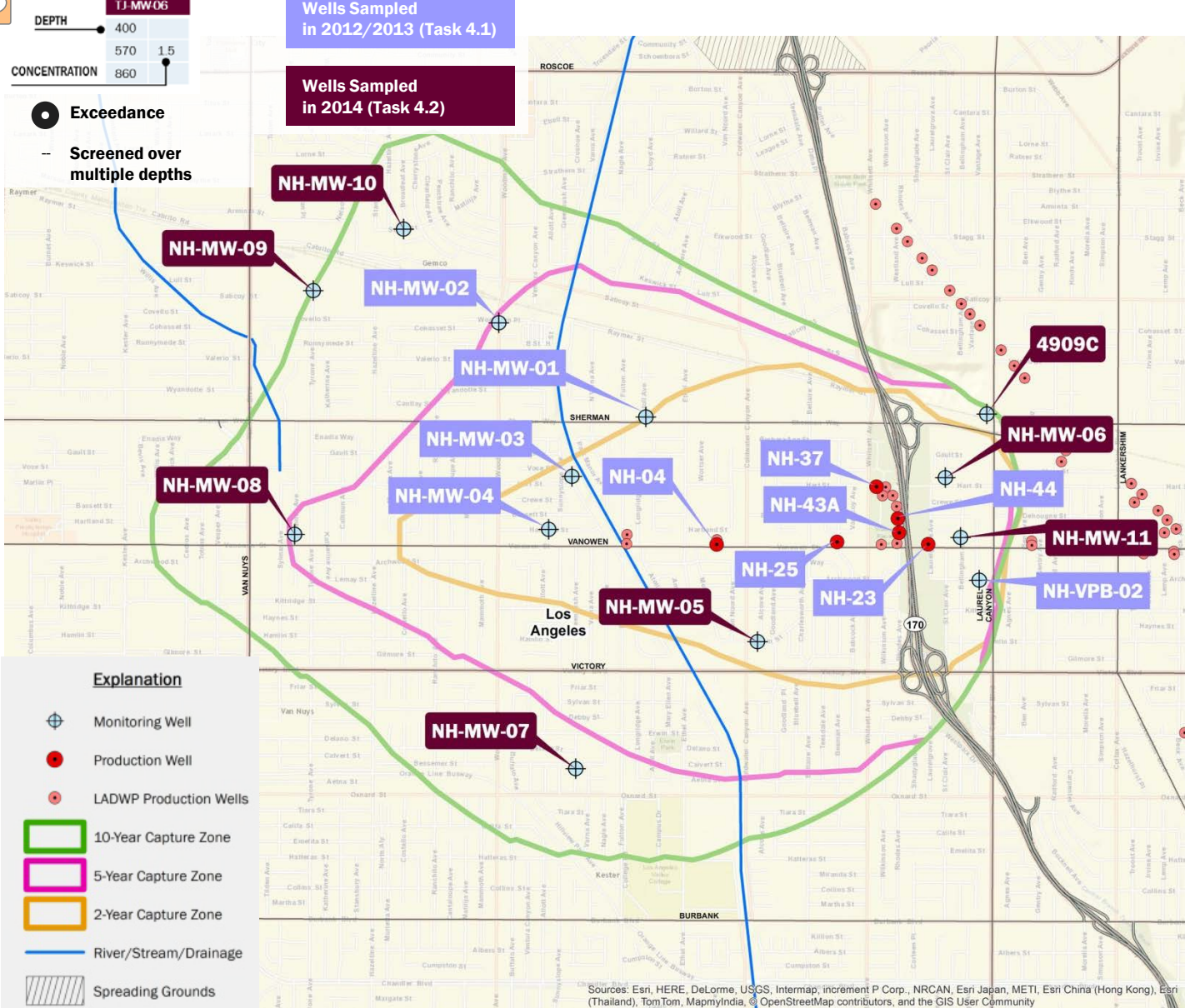
# NH West – Cr(VI) (10 µg/L MCL)



Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



**Explanation**

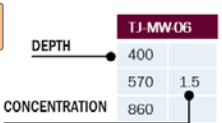
- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10	NH-MW-02
300	305
450	333
820	375
NH-MW-09	NH-MW-01
340	288
570	320
800	370
NH-MW-08	NH-MW-03
250	268
430	374
770	772
NH-MW-07	NH-MW-04
230	385
390	NH-04
770	--
NH-MW-05	NH-37
250	--
510	NH-43A
720	--
NH-MW-11	NH-25
280	--
450	NH-23
710	--
NH-MW-06	NH-44
280	--
580	NH-VPB-02
810	255
4909C	
370	

# NH West – Total Chromium (50 µg/L MCL)

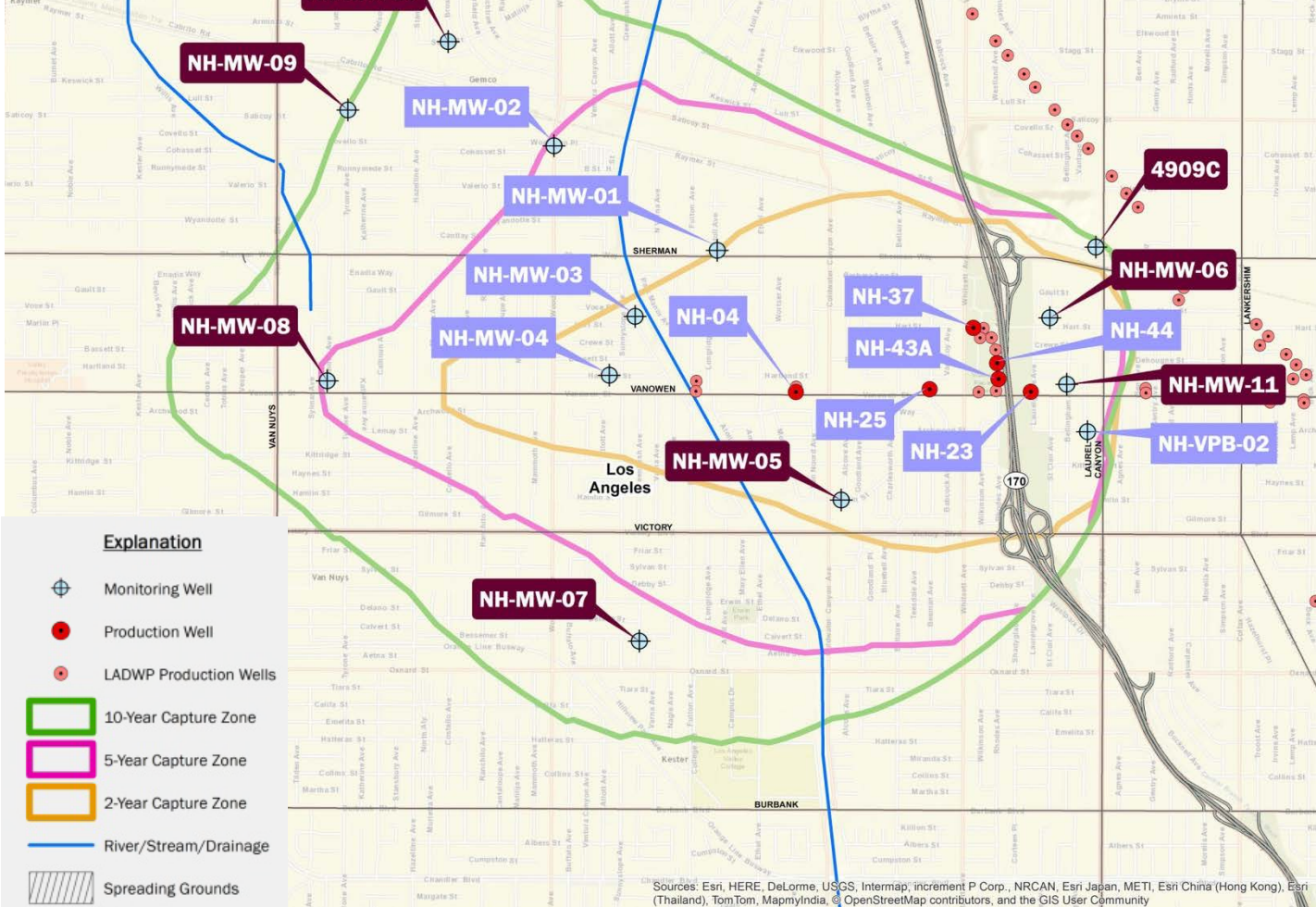




Wells Sampled  
in 2012/2013 (Task 4.1)

Wells Sampled  
in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



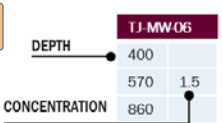
**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

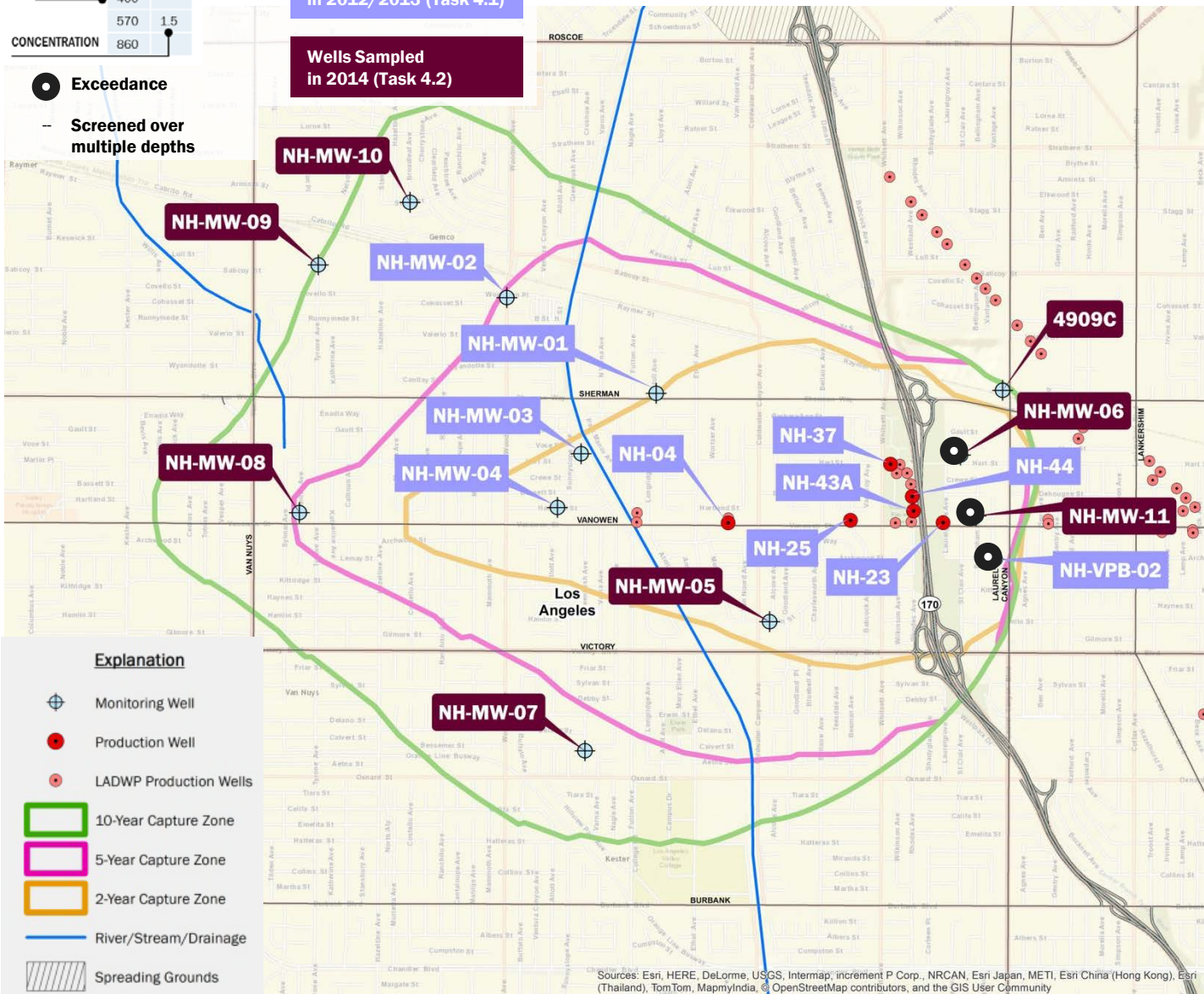
NH-MW-10	NH-MW-02
300	305
450	333
820	375
NH-MW-09	NH-MW-01
340	288
570	320
800	370
NH-MW-08	NH-MW-03
250	268
430	374
770	772
NH-MW-07	NH-MW-04
230	385
390	NH-04
770	--
NH-MW-05	NH-37
250	--
510	NH-43A
720	--
NH-MW-11	NH-25
280	--
450	NH-23
710	--
NH-MW-06	NH-44
280	--
580	NH-VPB-02
810	255
4909C	
370	

# NH West – Perchlorate (6 µg/L MCL)



Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)



**Explanation**

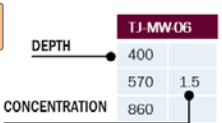
- Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

NH-MW-10		NH-MW-02	
300		305	
450		333	
820		375	
NH-MW-09		NH-MW-01	
340		288	
570		320	
800		370	
NH-MW-08		NH-MW-03	
250		268	
430		374	
770		772	
NH-MW-07		NH-MW-04	
230		385	
390		NH-04	
770		--	
NH-MW-05		NH-37	
250		--	
510		NH-43A	
720		--	
NH-MW-11		NH-25	
280	59	--	
450		NH-23	
710		--	
NH-MW-06		NH-44	
280	58	--	
580		NH-VPB-02	
810		255	61
4909C			
370			

# NH West – Nitrate (as NO<sub>3</sub>) (45 mg/L MCL)

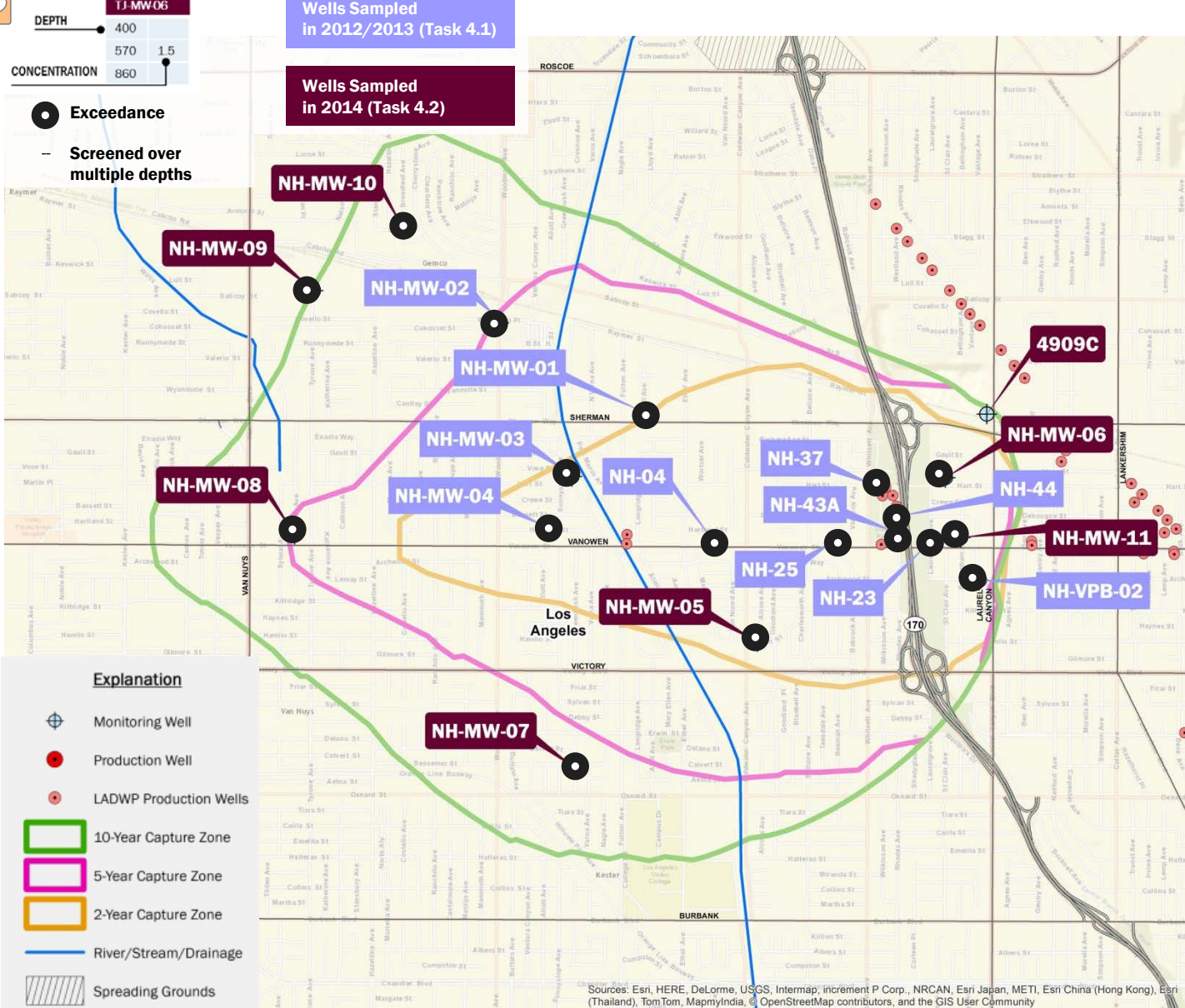




Wells Sampled in 2012/2013 (Task 4.1)

Wells Sampled in 2014 (Task 4.2)

● Exceedance  
- Screened over multiple depths



**Explanation**

- ⊕ Monitoring Well
- Production Well
- LADWP Production Wells
- 10-Year Capture Zone
- 5-Year Capture Zone
- 2-Year Capture Zone
- River/Stream/Drainage
- Spreading Grounds

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

<b>NH-MW-10</b>	300	930	<b>NH-MW-02</b>	305	920
	450	1,400		333	
	820	770		375	1,400
<b>NH-MW-09</b>	<b>NH-MW-01</b>				
340	1,200	288	1,200		
570	800	320	1,300		
800	750	370	1,100		
<b>NH-MW-08</b>	<b>NH-MW-03</b>				
250	750	268	840		
430	910	374			
770	740	772	860		
<b>NH-MW-07</b>	<b>NH-MW-04</b>				
230	870	385	1,100		
390	950	<b>NH-04</b>			
770	790	--	1,100		
<b>NH-MW-05</b>	<b>NH-37</b>				
250	750	--	720		
510	730	<b>NH-43A</b>			
720	720	--	860		
<b>NH-MW-11</b>	<b>NH-25</b>				
280	540	--	990		
450		<b>NH-23</b>			
710		--	640		
<b>NH-MW-06</b>	<b>NH-44</b>				
280	630	--	940		
580	810	<b>NH-VPB-02</b>			
810		255	600		
<b>4909C</b>					
370					

# NH West – TDS (500 mg/L Secondary MCL)



# North Hollywood West Well Field – Other Contaminants above Regulatory Limits

- Iron and Manganese
- Chlorate
- Nitrogen, Nitrate-Nitrite
- Taste and Odor Number (TON) and Turbidity
- Specific Conductance
- Sulfate (as  $\text{SO}_4$ )