STELLAR
ENVIRONMENTAL SOLUTIONS, INC.
2198 SIXTH STREET, SUITE 201·BERKELEY, CA 94710
TEL: (510)644-3123 · FAX: (510)644-3859
GEOSCIENCE & ENGINEERING CONSULTING

November 20, 2017

RECEIVED
By Alameda County Environmental Health 3:02 pm, Nov 21, 2017

Ms. Dilan Roe
Alameda County Health Care Services Agency
Environmental Health Services
Local Oversight Program
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Subject: Submittal Acknowledgement regarding Remedial Action Workplan for Recharging the Permeable Reactive Barrier for Mitigation of Hydrocarbon Contamination related to Former USTs at the Redwood Regional Park Service Yard, 7867 Redwood Road, Oakland, California (ACEH Fuel Leak Case No. RO0000246)

Dear Ms. Roe:

We have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on our behalf to ACDEH's FTP server and the SWRCB's Geotracker website.

Sincerely,

Matthew Graul

Matthew Graul
EBRPD Representative

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November 20, 2017

Ms. Dilan Roe
Local Oversight Program
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Subject: Remedial Action Workplan for Recharging the Permeable Reactive Barrier for Mitigation of Hydrocarbon Contamination related to Former USTs at the Redwood Regional Park Service Yard, 7867 Redwood Road, Oakland, California
Alameda County Fuel Leak Case No. RO0000246.

Dear Ms. Roe

INTRODUCTION AND BACKGROUND

On behalf of the responsible party, East Bay Regional Park District (EBRPD), Stellar Environmental Solutions, Inc. (Stellar Environmental) is submitting this Workplan for the above referenced site. Following our meeting of August 1, 2017 with EBRPD, the site owner representatives and Stellar Environmental at your offices we had a meeting in the field to observe the conditions there. Per the request in your letter dated October 23, 2017, we have prepared this Workplan to pursue additional site remediation. The request in the same letter for soil characterization will be responded to under r separate letter following our clarification discussion scheduled for November 22, 2017.

As per our discussions at your offices the specific remedy converged on was that of recharging the permeable reactive barrier (PRB) with remedial compound. We have selected the bioremediation product (Nutrisulfate®) based on the geochemical indicators and concentrations of the contaminants of concern. The injection of Nutrisulfate®) is designed to treat elevated concentrations of hydrocarbons in the distal groundwater plume in front of the downgradient onsite sensitive receptor, Redwood Creek. See attached site location and plan Figures 1 and 2.

The site has been the subject of various environmental investigations, soil and groundwater remediation, and groundwater monitoring since the 1993 removal of two underground fuel

storage tanks (UFSTs). Site monitoring has shown impacts to soil and groundwater from total extractable hydrocarbons-diesel range (TEHd); total volatile hydrocarbons-gasoline range (TVHg); methyl *tertiary*-butyl ether (MTBE); and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Petroleum constituents have also been documented in Redwood Creek, approximately 150 feet directly downgradient from the former UFSTs, as the plume has been noted to "daylight" in the stream bank, particularly during Redwood Creek's low-flow season. The problem has been persistent, despite multiple injection treatments with ORC® or equivalent products and bioventing, where air (for its oxygen content) is pumped by a blower into the subsurface via piping leading to wells. The remediation has been successful in significantly reducing the higher concentrations down to lower ones, but limited near the downgradient receptor, Redwood Creek. As a result of Redwood Creek being the primary receptor, the permeable reactive barrier (PRB) was installed in November 2013 to clean the leading edge of the plume before it moves into Redwood Creek.

The site currently contains 11 site groundwater monitoring wells, 7 of which are currently sampled on a semiannual basis. The site also contains an operating bioventing system that consists of five vent wells (VWs) and four vapor monitoring points (VMPs) that was shut down in June 2011 after having fulfilled its' design purpose.

Following the 2001 and 2002 ORC® injections, there was a contaminant concentration rebound within approximately one year. This lead to the realization that there was significant unrecorded contaminant mass upgradient of the injected area, despite base-of-excavation and other data points suggesting otherwise. Subsequent additional borings (BH-16 through BH-19) in 2003 confirmed the residual total petroleum hydrocarbon (TPH) mass upgradient. Due to the difficulty of excavating this area, which is a steep embankment slope, a soil bioventing system was installed to oxygenate the former UFST removal area. The bioventing remediation has been only partially successful as it does not effectively address the residual contamination held in the stratigraphic traps in the saturated zone and capillary fringe zone.

Significant increases in the hydrocarbon concentrations in upgradient source well MW-2, which was installed in the former UFST excavation in 1994, were observed in December 2007. These increases suggested that the previous two years of drought resulted in a release of hydrocarbons from the original UFST excavation area and/or capillary fringe, and saturated areas were exposed. In March 2009, a small pilot test injection of ORC® in the upgradient source area around well MW-2 indicated ORC® contact can result in reduction of the higher hydrocarbon concentrations, at least in the more permeable and aerobic area of the former UST backfilled area where MW-2 is located. This suggested that ORC® would be efficient in achieving dissolved hydrocarbon concentration reductions in the former UFST source area.

Based on further examination of the 2001 and 2002 injection areas and considering the high variability of sediments, an in-situ injection design of "treatment zones" transverse to the plume versus the "area" design was decided upon and implemented in February 2010. Special consideration was given to the upgradient source area as described below in detail. Injection into the source area in a barrier zone configuration is justified by the calculation of the groundwater velocity. Based on the distance of about 20 to 30 feet between the reactive barrier wall location and Redwood creek, we estimate it takes less than one year for groundwater to migrate from there down to the Redwood creek interface. The UST source area is approximately 130-150 feet from Redwood Creek.

Moderate initial lowering of the hydrocarbon contaminant concentrations was observed in the key site wells in both the 30-day post-injection and quarterly monitoring (equivalent to 60-day post-injection) events following the February 2010 injections. This may be due to the recharge influencing distribution of the injected Advanced ORC™ product, or it could reflect that microbial biodegradation activity is occurring preferentially in natural site constituents in competition with the target residual hydrocarbons.

Historical groundwater elevation and analytical data is summarized in the attached tables.

RATIONALE FOR RECHARGING THE PERMEABLE REACTIVE BARRIER WITH NUTRISULFATE®

Previous applications of ORC® focused on the upper and mid areas of the contaminant plume to treat two principal areas; the upper yard area (source area), and mid-plume area, immediately downgradient in the roadway area where high residual contamination in the capillary fringe and saturated zone are indicated to be present based on the hydrochemical history of the plume. The PRB installed in 2013 was designed to act as an *in-situ* reactive zone transverse across the entire width of the contaminant plume in the lowest, most downgradient and accessible area at the crest of the slope bank leading down to the sensitive receptor of Redwood Creek. This would provide plume control and passive treatment of the plume over time. The groundwater would be treated as it flows into and through the relatively more permeable reactive PRB zone and prevent further migration of the plume. This remedy was designed to create an oxygenated barrier zones at critical locations transverse to the plume, focusing depth and loading based on lithology and known or suspected TPH mass.

Aquifers contaminated by organic pollutants become rapidly depleted of oxygen due to the activities of aerobic heterotrophic microorganisms. Once oxygen is consumed, other electron acceptors must be readily available and requisite populations capable of utilizing these electron

acceptors must be present, else further natural biodegradation processes cannot proceed. The depletion of electron acceptors is generally considered to be the primary factor that limits hydrocarbon biodegradation in-situ. The Oxygen was added as the terminal electron acceptor in the Treatment Barrier wall treatment scheme to remediate the hydrocarbon-contaminated plumes but the limiting factor in this case, beyond the low solubility of oxygen in groundwater and the ability to achieve good distribution thereof in the subsurface, was the lack of recharge through the Treatment Barrier due to anomalously low rainfall in the 2013, 2014 and 2015 winter seasons, the effectiveness of the PRB in treating site contaminants was minimal and the activity of the ORC product has since expired. Groundwater monitoring in December 2016 showed elevated concentrations of hydrocarbons in groundwater in wells immediately downgradient of the PRB (within 10 feet) with a historical high site concentration of 120,000 µg/L TVHg detected in well MW-9.

These data show a preponderance of negative Redox measurements (less than 100 mV) and dissolved oxygen typically less than 1 mg/L in wells in close to the PRB. Because these measurements suggest anaerobic conditions exist, it was decided to further evaluate subsurface conditions with anion quantification and microbial analyses in site wells MW-7, MW-8 and MW-9 during the scheduled semiannual groundwater monitoring conducted in September 2017 to determine whether aerobic or anaerobic conditions prevail for selection of the appropriate remedial product. The anion analysis quantified total volatile fatty acids (VFAs), chloride, nitrite, nitrate, sulfate, phosphate, and bromide and showed a preponderance of sulfate. Because the analysis is from the actual field site and not in a controlled laboratory tests, it cannot be definitively said that one process such as iron reduction, nitrate reduction, sulfate reduction or methanogenesis is exclusive at the site. The microbial analysis showed a 10xE4 to 10xE6 microbial population count indicative of moderate anaerobic conditions, whereas a microbial count of 10xE8 to 10xE9 would be expected in an aerobic environment. However, based on the geochemical and microbial data, in conjunction with the dissolved oxygen and Redox field measurements, sulfate reduction and anaerobic conditions appear to be the prominent process at this site. Thus the remedial product selected for this proposed Workplan application is Nutrisulfate®, manufactured by Tersus Environmental, LLC, that is designed to bioremediate hydrocarbons in an anaerobic environment and is based on enhancing existing sulfate utilization to stimulate anaerobic degradation of hydrocarbon contaminants. Nutrisulfate® is designed to stimulate biodegradation by providing a soluble, readily available electron acceptor solution. In the presence of elevated sulfate, anaerobic groundwater bacteria use BTEX, MTBE and other petroleum hydrocarbons for carbon and energy while mineralizing the hydrocarbons to carbon dioxide and water. Sulfate addition enhances natural conditions and reduces the carbon footprint when compared to conventional remediation.

This Workplan proposes to recharge the PRB with the sulfate releasing compound remedial product, Nutrisulfate™ based on the recent monitoring indications of the nearby wells showing a predominant anaerobic environment where anaerobic biodegradation will be enhanced with the introduction of additional sulfate. The planned treatment product Nutrisulfate® is a complex of metabolic supplements and sulfate. (Nutrisulfate® drums have 55 gallons of liquid product with a concentration over 127 g/L sulfate). This will be effective to quickly treat the high TPH concentrations seen in well MW-9 and secondarily to bioremediate upgradient source contaminants that will migrate down to the PRB.

This Workplan scope includes installation of four injection wells in the PRB that will be used to monitor the PRB and introduce additional bioremedial product in the future, if needed. The product injection proposed in this Workplan is planned to be accomplished in two events, approximately 2 months apart to increase the effective lifespan of the product and to ensure the sulfate concentration does not exceed 250 mg/L, the MCL for sulfate.

Attached Figure 2 is a site plan showing the location of cross-section A-A which is presented in Figure 3. Figure 3 illustrates the depth of the PRB in relation to the contaminated zone and Redwood Creek. The locations of the 4 injection wells proposed to be installed in the PRB that lies across the distal area of the contaminant plume are shown on the site plan Figure 4.

PROPOSED SCOPE OF WORK FOR TREATMENT BARRIER WALL

Project work elements proposed in this Workplan include: 1) Pre-Field Work Planning and Remedial Product Selection; 2) Nutrisulfate® Product Injection; 3) Installation of Injection Wells; 4) Disposal of Project-Generated Drill Soil; 5) Post-Treatment Groundwater Monitoring and Laboratory Analyses; and 6) Technical Report Preparation.

Task 1 – Pre-Field Work Planning

This task includes the cost to conduct all the pre-field work planning and permitting elements for the proposed borehole program, including permitting:

- Obtain a ACEH input and Workplan concurrence, and conduct site inspection with ACEH (this inspection was conducted on October 5, 2017;
- Complete a site Health and Safety Plan to reflect the injection well installation and remedial product handling and injection;
- Complete a site visit to mark well locations and notify Underground Service Alert and EBRPD facility personnel for subsurface utility location;

- Retain injection well installation and drilling subcontractor;
- Obtain required injection well permits from Alameda County Public Works;
- Notify EBRPD of schedule to coordinate project activities with park facilities personnel and operation;
- Purchase the Nutrisulfate® product from the distributor and arrange with EBRPD personnel for delivery to the site. The Nutrisulfate® product will be delivered as a liquid (1,040 lbs of liquid contained in two 55-gallon drums).

Remedial Product Selection

As discussed in detail above, in addition to regular semiannual groundwater monitoring activities conducted in September 2017, site wells MW-7, MW-8 and MW-9 were also tested for anion quantification and microbial population to determine whether aerobic or anaerobic subsurface conditions prevail and assist in the in-situ remedial product selection. Based on the geochemical and microbial data, in conjunction with the dissolved oxygen and Redox field measurements, sulfate reduction and anaerobic conditions appears to be dominant in this location of the plume and the PRB. Stellar Environmental selected the Nutrisulfate® bioremediation product after reviewing the various options for in-situ bioremediation. The proposed Workplan remedial design accomplishes this through enhanced natural attenuation/biodegradation and *in situ* chemical reduction uniquely induced via the use of a sulfate delivery bioremediation compound. The method relies on sulfate utilization as previously described.

The post injection monitoring will evaluate the efficacy of the remediation effectiveness by monitoring the sulfate trends within the plume compared to background sulfate levels to confirm sulfate depletion. Sulfate reducing bacteria will use the petroleum hydrocarbons as a food source and the sulfate as the terminal electron acceptor. The desired results are the rapid bioremediation of aqueous phase petroleum hydrocarbons and gasoline additives. The metabolites in Nutrisulfate® greatly enhance microbial growth. The product is engineered for the slow release of sulfate to stimulate the bioremediation of the hydrocarbon groundwater environment at the site. The effective activity of the substrate is approximately 3 weeks. This will limit creating elevated sulfide that could potentially migrate to the Redwood Creek.

Advantages include:

- Improved bioremediation kinetics
- Thinner (parallel to groundwater flow) bio-barriers

- Faster remedies
- Reduced costs

The material data safety sheet for the Nutrisulfate® product is included as Attachment C.

Task 2 – Nutrisulfate® Product Injection Specifications

The PRB injection treatment loading specification are based upon the TPH analytical results of the December 2016 groundwater monitoring event with an average TPH concentration of 8,000 µg/L, the permeable volume of the PRB and existing geochemical conditions.

The product injection is planned to be accomplished in two events, approximately 2 months apart to increase the effective lifespan of the product and to ensure the sulfate concentration does not exceed 250 mg/L, the MCL for sulfate. The first application of the Nutrisulfate® product will be performed with the drilling rig and entail injection of the product in 4 points spaced approximately 10 feet apart along the length of the PRB. The first application utilizing the drill rig will allow for more uniform vertical distribution of the product within the PRB. The following day, after the drilling rig injection activity is completed, four 4-inch diameter injection wells will be installed in the approximate location of the injection points, which will be utilized to monitor the PRB and can be used to introduce additional bioremedial product in the future, as needed. The second application of the Nutrisulfate® product will be performed approximately 2 months later.

Nutrisulfate® drums contain 55 gallons of product with over 127 g/L sulfate concentration. The treatment is planned to achieve a concentration of 250 ppm sulfate in the PRB. For the estimated 1,200 cubic feet treatment volume of the PRB (3 feet x 40 feet x 10 feet) we will inject two drums of Nutrisulfate®. The first drum will be injected utilizing the drilling rig and the second drum will be gravity fed into the injection wells approximately 2 months later.

Injection Design and Layout

The injection system equipment mobilized to the site will consist of:

- Direct-push Geoprobe drilling rig equipped with drive rods (typically 1½-inch outside diameter) and injection tooling with fluid delivery sub-assembly.
- Injection pump rated for 5 gpm at 200 psi for sandy formations, and 800 psi for silt and clay formations (Geoprobe DP-800).
- Injection hosing, pressure gauges and a pressure relief valve with a bypass.

- Clear hosing between mixing tank/drum and pump.
- Access to water and electricity is available onsite.
- A drum handler, chemical feeder, mixing and solution holding tank, and feed pump, and an injection manifold system capable of multiple point injections, if desired.

The injection specifications are:

- The first injection will consist of a total of 4 injection points to a depth of 22 feet bgs using a Geoprobe drilling rig through which the Nutrisulfate® product will be injected.
- The saturated thickness of the treatment zone (including capillary fringe) is about 10 feet thick, located from approximately 12 to 22 feet bgs.
- The treatment area is primarily constrained by the dimensions of the PRB, however the injected product is also expected to penetrate laterally during injection, thus the ROI is estimated to be approximately 5-7 feet.
- The product loading will be delivered at 1 foot intervals.
- The product loading will be approximately 1.4 pounds per foot injected from the top down;
- Approximately 3-5 gallons of water will be injected after injection of the Nutrisulfate® product in each 1 foot injection interval, not to exceed 50 gallons per well.
- Delivery point spacing is approximately 10 feet.
- The effective activity of the substrate is approximately 3 weeks.

The injection specifications for the first and second treatment are summarized in Table 1.

Table 1: Summary of Treatment Zone per Application Information and Assumptions

Treatment Zone Area	Treatment Zone Thickness	Injection Points	Total Nutrisulfate®	Nutrisulfate® per bore	Nutrisulfate® per bore foot	Assumed ROI (b)	n_e
ft^2	ft	#	gallons	gallons	gallons (a)	ft	%
120	10	4	55	13.75	1.4	5-7	25%

Notes:
ROI = radius of influence
(b) estimated to 250 ppm sulfate to the injection radius.
ne = electron donor activity, measure of reduction
(a) each gallon = approximately 9.4 lbs product

Please note that this approach assumes the proposed treatment area is anaerobic; the source area has depleted sulfate when compared to background levels; aquifer has neutral pH and dissolved metals are present. The treatment is estimated to achieve approximately 250 mg/kg sulfate in the injection ROI.

Task 3 – Installation of Injection Wells in the PRB

Following the injection of the bioremediation product, four injection wells will be installed by a California C-57 licensed driller utilizing a Geoprobe™ rig with a hollow stem auguring capability, under the direct supervision of a Stellar Environmental, CA-registered Geologist. The advantage of installing the four injection wells in the PRB is that they can be used to introduce additional bioremedial product in the future, as needed. The wells are to be completed as 4-inch-diameter Schedule 40 PVC wells to a depth of 20 feet below ground surface (bgs). Ten feet of screened casing with 0.20-inch slots or 0.25 inch holes will be installed from 10-20 feet bgs in the existing ¾" drain rock. The well casing will be emplaced through the drill auger and the existing drain rock of the PRB will be allowed to collapse around the casing as the augers are retracted, thus none to minimal amount of filter park material is expected to be used and will only be used as needed to bridge above the upper well screen (to extend a minimum of 0.5 foot above the top of the screen). The annular pollution seal will consist of a 2-foot thick hydrated bentonite chips installed from 9.5-7.5 feet bgs and overlain by Type II Portland cement grout to near the ground surface (0.5-1 foot bgs). The surface completion will use a traffic-rated flush-mounted well box installed in a concrete collar. A locking well cap will be installed at each well.

Well Development

The four newly installed injection wells will be developed by Blaine Tech Services (San Jose, California), if needed, by surging and bailing with a surge block to reduce the any fine-grained native materials that may have infiltrate the filter during the well installation. The wells will not be developed until at least 48 hours has elapsed after installation of final grout seal.

Task 4 – Pre and Post PRB Product Injection Groundwater Sampling and Analysis

Two episodes of Nutrisulfate® injection are to be completed separated by 60 days. The first is nominally to be completed in December, 2017 with the second injection approximately 60 days later.

Sample sets from the key downgradient wells MW-7, MW-9, MW-12, upgradient wells MW-10 and MW-11, relative to the PRB, and 2 temporary grab sample points in the PRB will be collected prior to the first product injection and approximately 30-days after each product injection event to evaluate the remedy, in addition to regularly scheduled semiannual groundwater monitoring events. Groundwater samples will be analyzed in accordance with ACEHs' current site groundwater monitoring requirements for the following:

- Total extractable and volatile hydrocarbons –TPH-d and TPH-g by EPA Method 8015M and 8260; and

- Aromatic hydrocarbons, naphthalene, benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260.

In addition, Stellar Environmental will analyze wells MW-7, MW-9 and MW-12, located directly downgradient of the PRB, for alternate electron acceptors including nitrates, sulfates, biological oxygen demand (BOD), and chemical oxygen demand (COD) to evaluate the PRB.

The monitoring and injection well samples will be collected after purging the wells of three to five casing volumes, following of aquifer stability parameters [temperature, pH, electrical conductivity and dissolved oxygen (DO)]. A post-purge) measurement will be collected in the field. Well purging and sampling equipment will be new and clean and disposed of after each use.

The efficacy of the remediation remedy will be measured by the indications of changes in both the geochemical environment within the sampled media and the change in the COC concentrations of baseline and post injection results at both the injection wells and nearby upgradient and downgradient monitoring wells.

Upon collection, the groundwater samples are labeled and securely sealed in appropriate containers, placed in an ice chest with ice at approximately 4 degrees C, and transported to the analytical laboratory under chain-of-custody record.

Task 5 – Disposal of Project-Generated Soil and Wastewater

Hydrocarbon contaminated soil cuttings are not expected to be generated during the drilling activity as drilling will occur within the foot print of the existing PRB where no hydrocarbon contaminants are expected to be encountered. However any suspected contaminated soil that is potentially generated will be disposed to the appropriate Class II landfill.

Any liquid waste (from well overflow, decontamination or unused bioremedial product) will be containerized and disposed to the appropriate recycling facility.

- Collect required soil/water disposal profile sample for laboratory analysis;
- Coordinate and pay for soil/water transport and disposal; and
- Document the soil and wastewater profiling and disposal in the appropriate semiannual groundwater monitoring report covering the time in which the disposal occurs.

Task 6 – Technical Reporting

Stellar Environmental will complete a report that covers the remedy installation along with the pre- and post-PRB recharge groundwater monitoring. This will be integrated into the semiannual groundwater monitoring reports in which the activity occurs.

The report will include:

- The responsible party's perjury statement letter, work scope and objectives, site description, summary of previous investigational findings;
- Summary of Tersus Nutrisulfate™ product, rationale for application and efficacy;
- Detailed description of the RPB injection well installation and construction, Nutrisulfate™ product injection and associated field data;
- Bioremediation product loading calculations and in-ground acceptance;
- Semiannual groundwater monitoring with discussion of analytical results compared to regulatory criteria and effect of bioremedial product;
- Pre-and post-injection groundwater monitoring data, including geochemical indicators;
- Map and figures showing key site features, monitoring wells, PRB and injection well locations; and
- Technical appendices, (laboratory data, well sampling logs and Department of Water Resource Well completion Reports, etc).

As required, site data will be electronically uploaded to both the State of California Geotracker system and the ACEH "ftp" system.

TEAM QUALIFICATIONS

Stellar Environmental has completed dozens of similar projects, including several under the jurisdiction of ACEH. Our team will consist of:

- Stellar Environmental Solutions, Inc. (owners' consultant responsible for overall project coordination, geologic evaluation, and report certification by a California Professional Geologist)
- An C-57 licensed drilling contractor with hazardous material rating
- The ELAP certified laboratory, Enthalpy Analytical (formerly Curtis and Tompkins) will perform the required laboratory analyses.

We trust that this workplan submittal meets your agency's needs. "I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's Geotracker website."

If you have any questions regarding this report, please contact either Mr. Matt Graul of the EBRPD or us at 510-644-3123.

Sincerely,

Richard S. Makdisi, P.G.
President/Technical Director

Matt Graul, Stewardship Manager
East Bay Regional Park District

Attachments:

Attachment A – Figures: Site Location, Site Plan Showing Cross-Section Location A-A', Cross-Section A-A', and Site Plan Showing Showing Proposed PRB Injection Points and Well Locations
Attachment B – Historical Groundwater Elevation and Analytical data and hydrographs of key wells
Attachment C – Tersus Nutrisulfate™ MSDS

REGISTERED GEOLOGIST
RICHARD S. MAKDISI
No. 4852
Exp. 4/2018
STATE OF CALIFORNIA

ATTACHMENT A

Site Figures

N

SITE LOCATION ON U.S.G.S. TOPOGRAPHIC MAP

Redwood Reg. Park Service Yard, Oakland, CA	By: MJC	OCTOBER 2016
	Figure 1	

STELLAR ENVIRONMENTAL SOLUTIONS, INC
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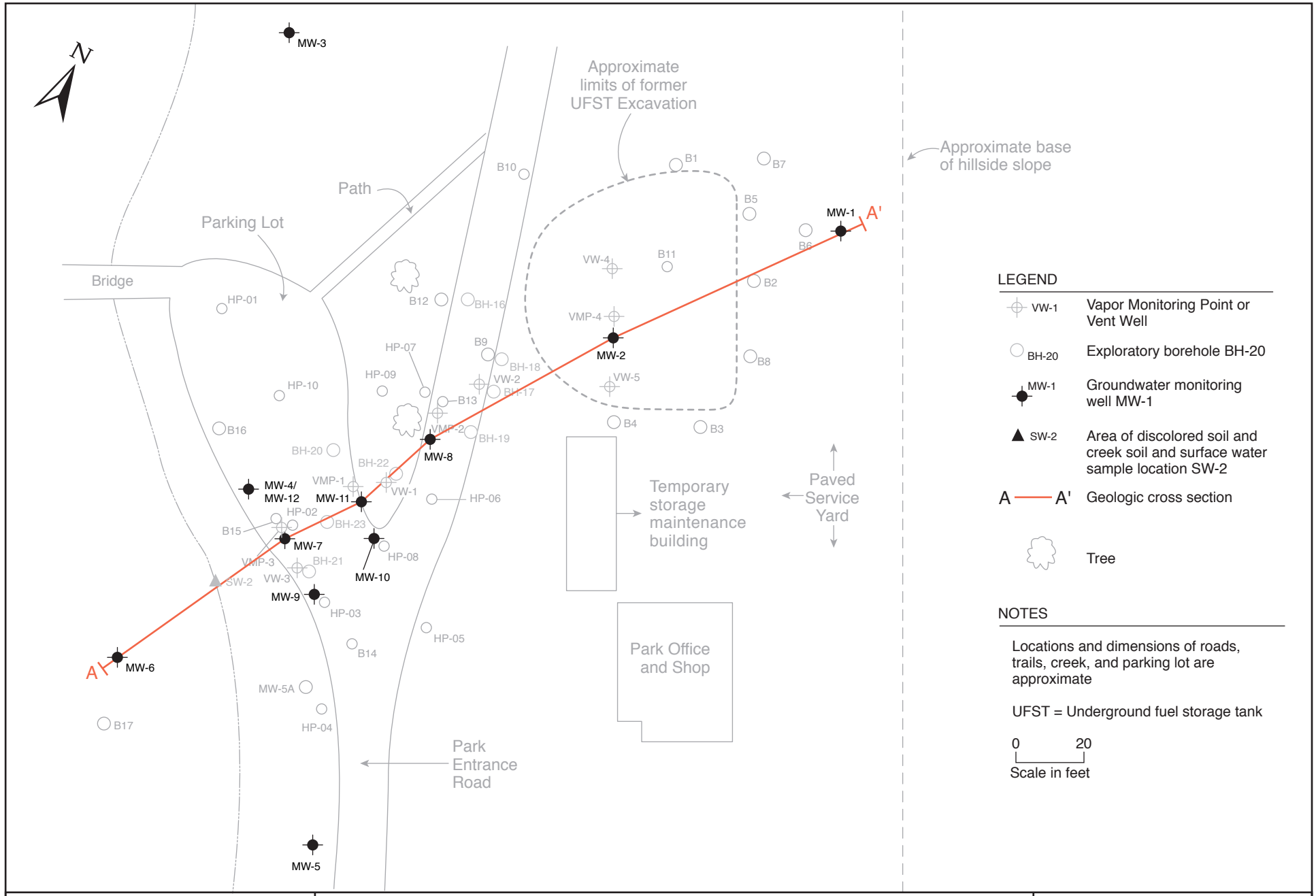
2015-02-01



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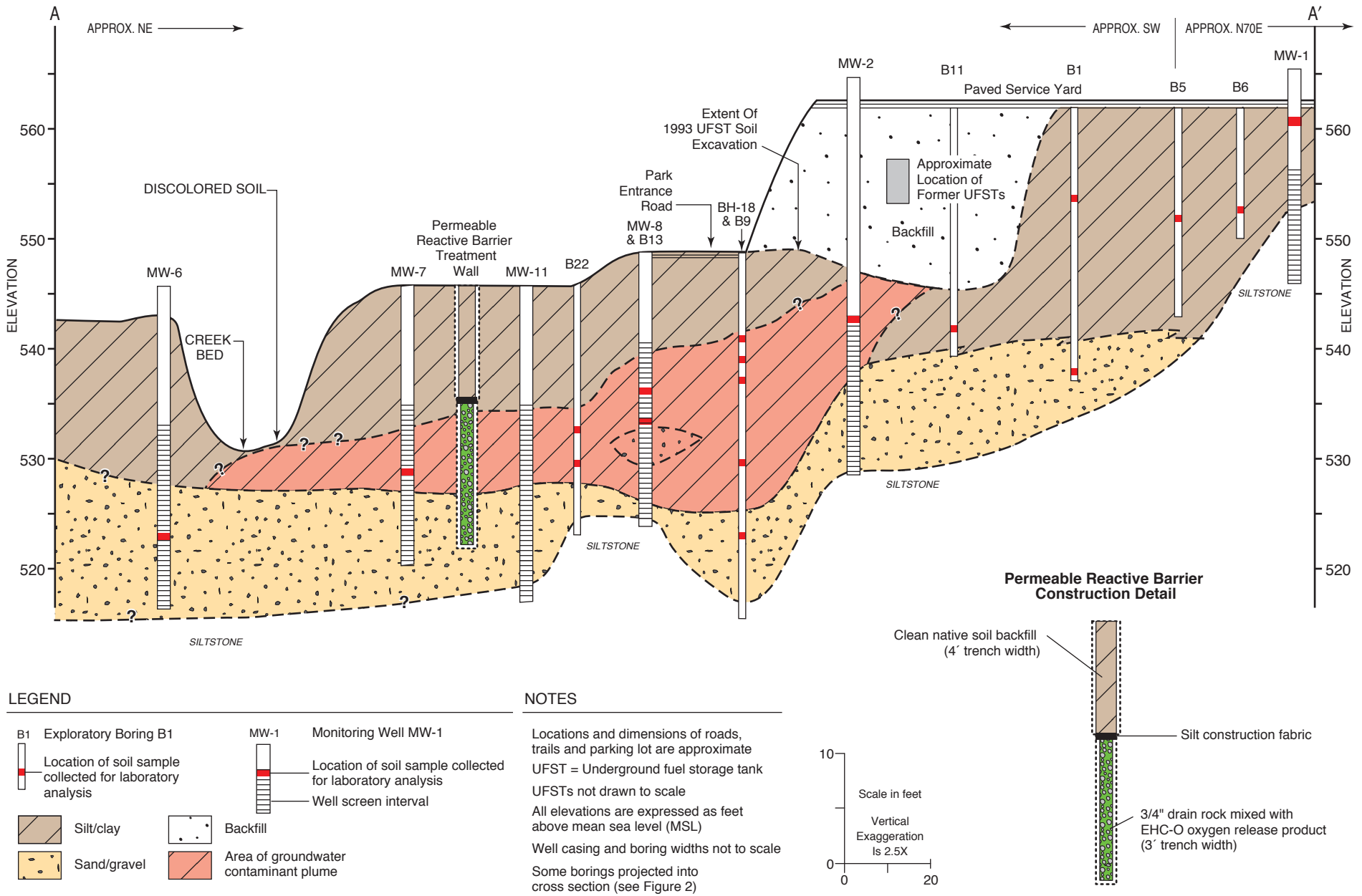
SITE PLAN SHOWING HISTORICAL BORINGS, WELLS AND GEOLOGIC CROSS-SECTION LOCATIONS
Redwood Regional Park Service Yard, Oakland, CA

Figure 2

by: MJC | APRIL 2017

2017-02-02



LEGEND

- B1 — Exploratory Boring B1
- Location of soil sample collected for laboratory analysis
- MW-1 — Monitoring Well MW-1
- Location of soil sample collected for laboratory analysis
- Well screen interval
- Silt/clay
- Sand/gravel
- Backfill
- Area of groundwater contaminant plume

NOTES

Locations and dimensions of roads, trails and parking lot are approximate

UFST = Underground fuel storage tank

UFSTs not drawn to scale

All elevations are expressed as feet above mean sea level (MSL)

Well casing and boring widths not to scale

Some borings projected into cross section (see Figure 2)

10 — Scale in feet — Vertical Exaggeration Is 2.5X — 0 — 0 — 20

Permeable Reactive Barrier Construction Detail

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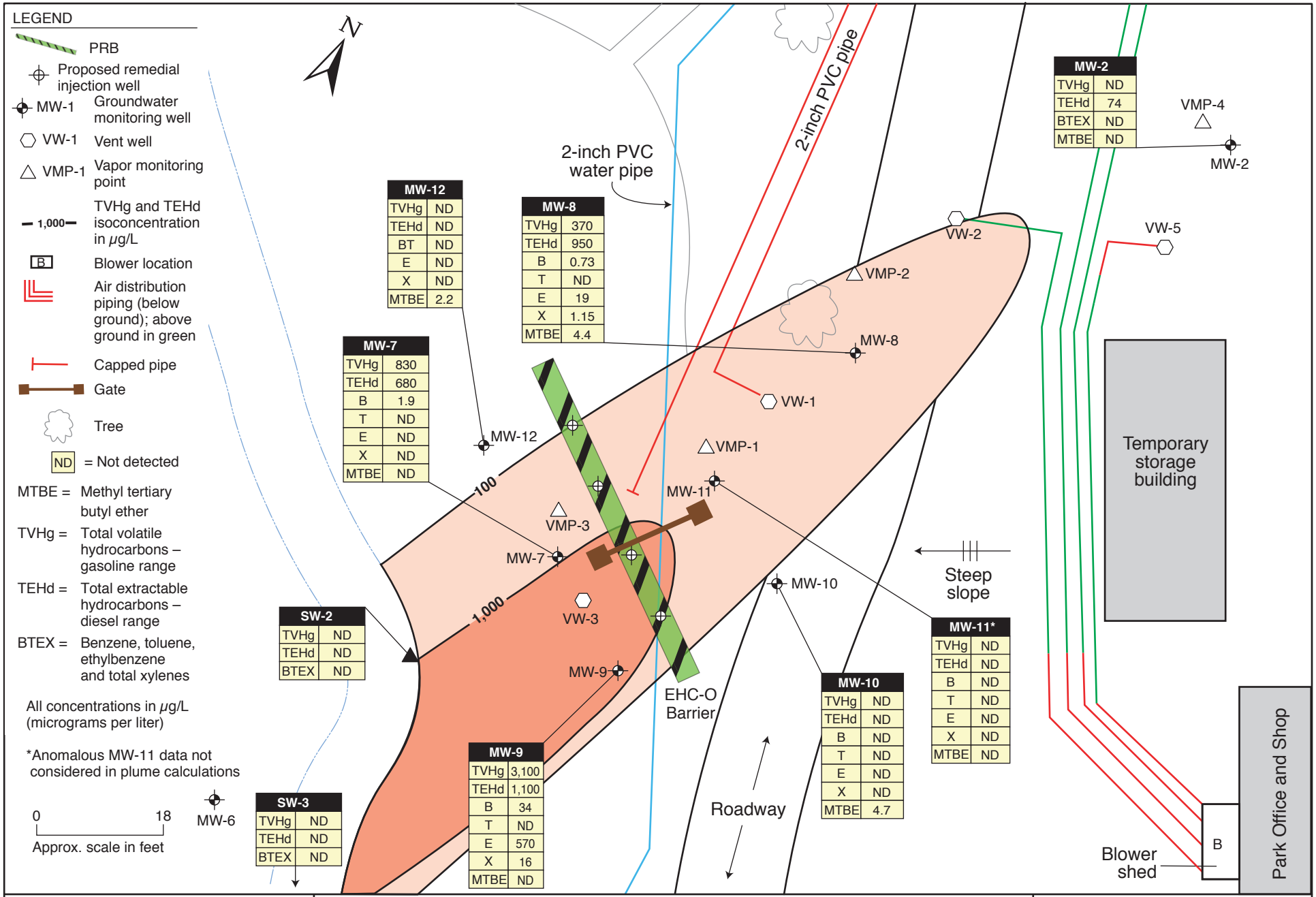
CROSS SECTION A-A' SHOWING LOCATION OF TREATMENT WALL AND CONSTRUCTION DETAIL
Redwood Regional Park Service Yard, Oakland, CA

Figure 3

by: MJC | APRIL 2017

2017-02-05



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PLAN VIEW OF PRB TREATMENT WALL & LOCATION OF PROPOSED INJECTION WELLS & TPH PLUME — MARCH 20, 2017
7867 Redwood Rd, Oakland, CA

Figure 4

by: MJC | NOVEMBER 2017

2017-02-06

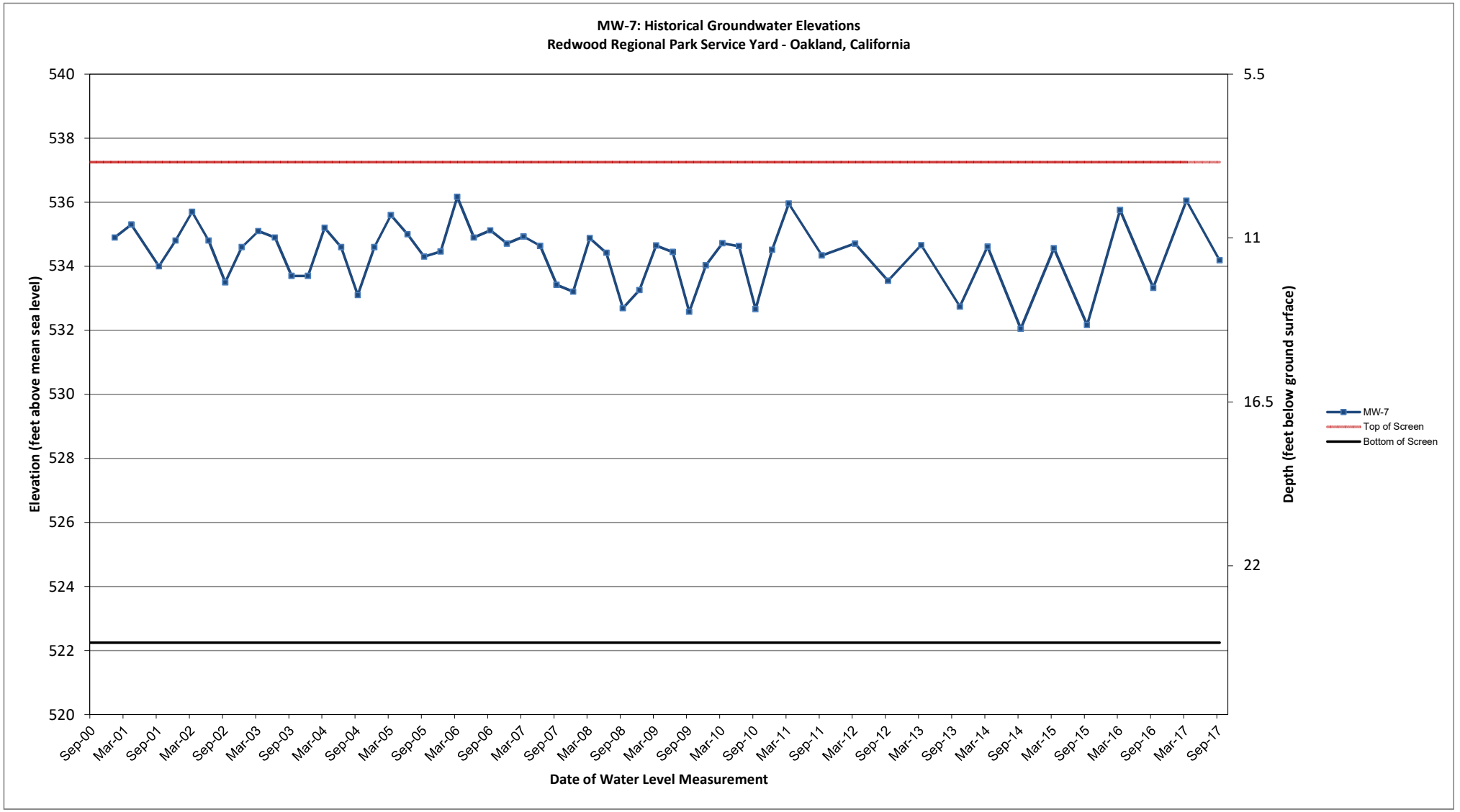
ATTACHMENT B

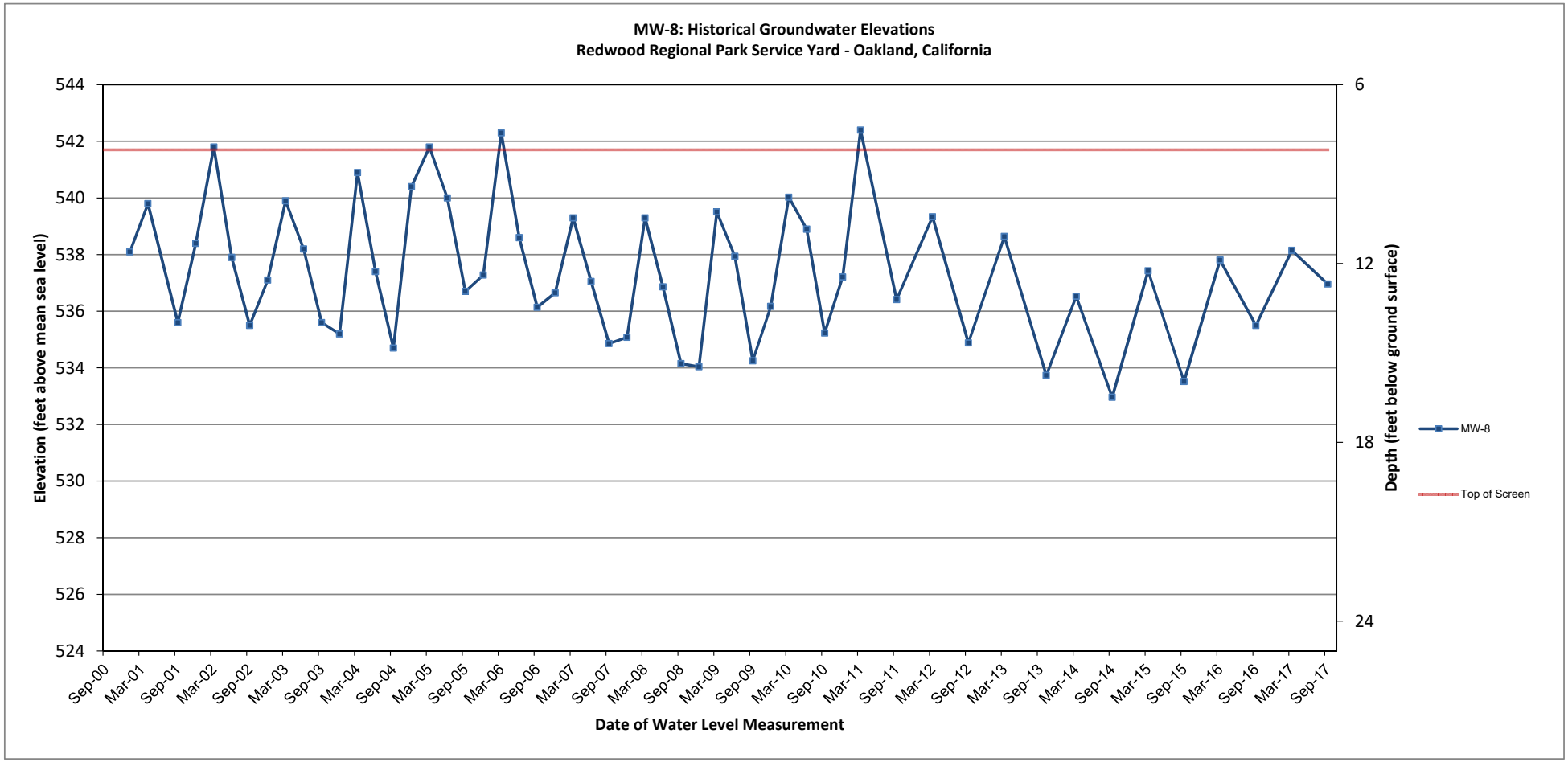
Historical Groundwater Elevation and Analytical Data

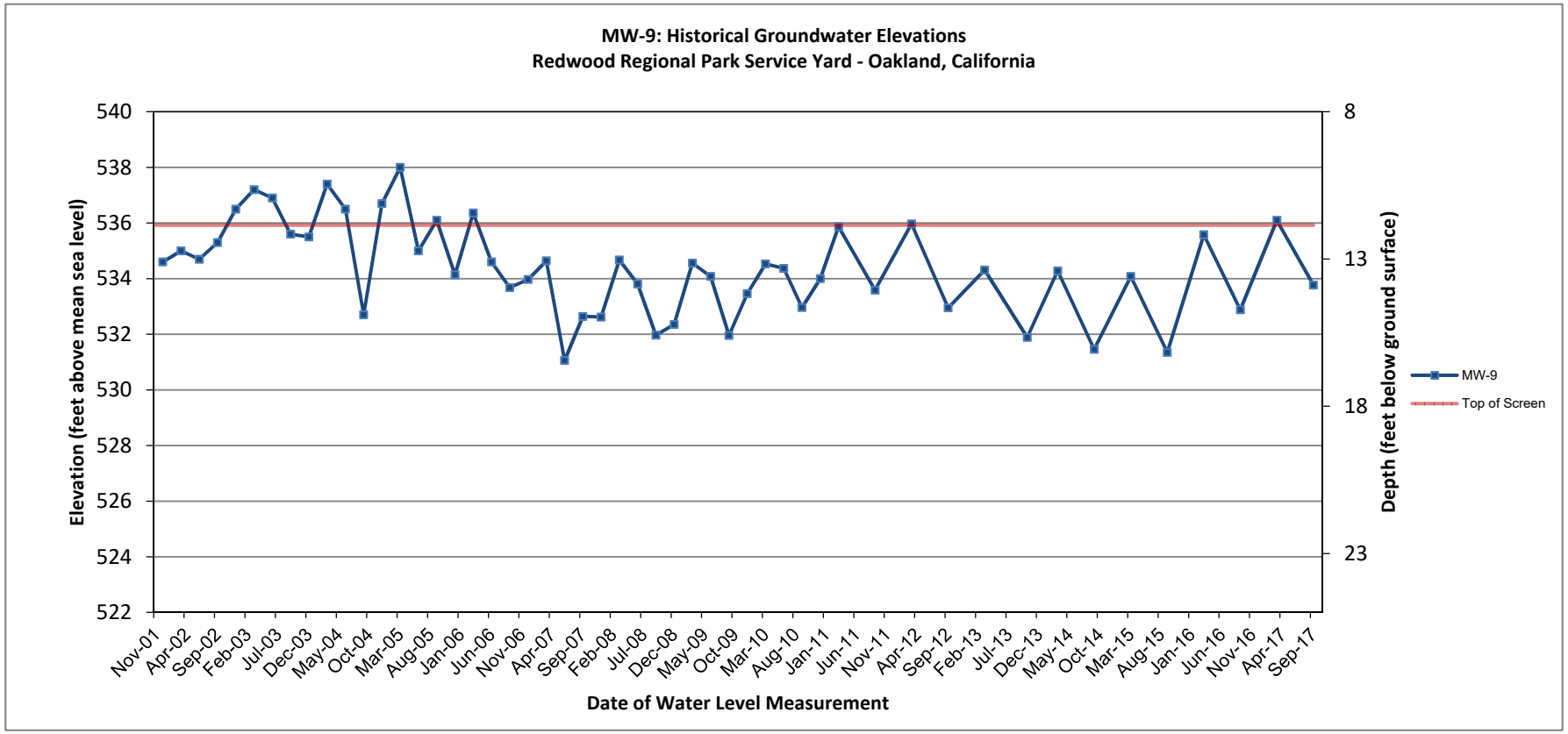
HISTORICAL GROUNDWATER ELEVATIONS IN MONITORING WELLS
REDWOOD REGIONAL PARK SERVICE YARD
7867 REDWOOD ROAD, OAKLAND, CALIFORNIA

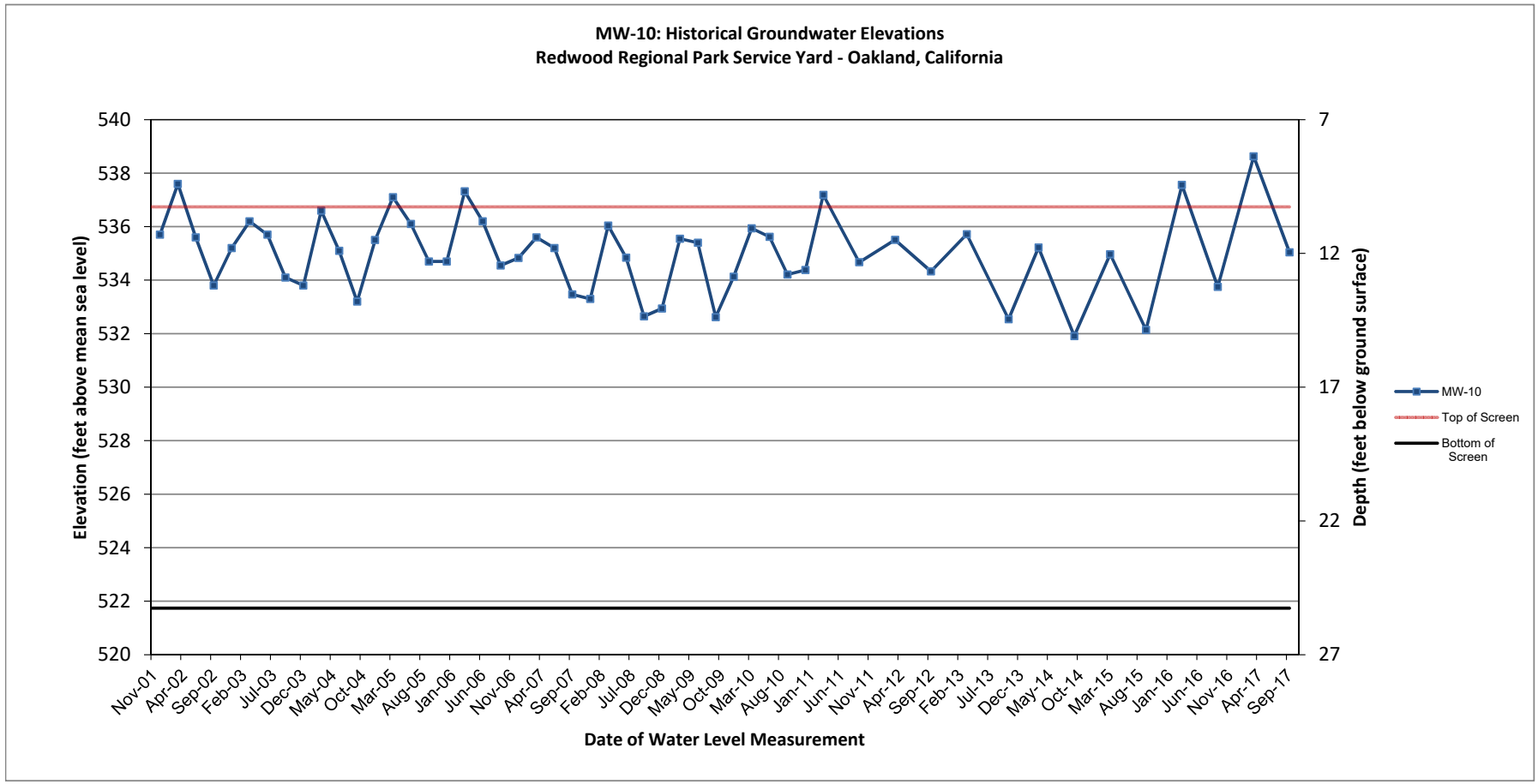
Well I.D.	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
TOC Elevation (a)	565.83	566.42	560.81	548.10	547.41	545.43	547.56	549.13	549.28	547.22	547.75	544.67
Date Monitored	Groundwater Elevations (feet above mean sea level)											
09/18/98	563.7	544.2	540.8	534.5	531.1	531.4						
04/06/99	565.2	546.9	542.3	535.6	532.3	532.9						
12/20/99	562.9	544.7	541.5	534.9	531.2	532.2						
09/28/00	562.8	542.7	538.3	532.2	530.9	532.0						
01/11/01	562.9	545.1	541.7	535.0	531.2	532.3	534.9	538.1				
04/13/01	562.1	545.7	541.7	535.1	531.5	532.4	535.3	539.8				
09/01/01	560.9	542.0	537.7	533.9	530.7	531.8	534.0	535.6				
12/17/01	562.2	545.2	542.2	534.8	531.4	532.4	534.8	538.4	534.6	535.7	535.2	
03/14/02	563.0	547.1	542.2	535.5	532.4	533.3	535.7	541.8	535.0	537.6	536.6	
06/18/02	562.1	544.7	541.1	534.6	531.2	532.2	534.8	537.9	534.7	535.6	535.3	
09/24/02	561.4	542.2	537.3	533.5	530.6	531.8	533.5	535.5	535.3	533.8	531.7	
12/18/02	562.4	545.0	542.0	534.8	531.5	532.5	534.6	537.1	536.5	535.2	532.8	
03/27/03	562.6	545.7	541.7	534.8	531.6	532.4	535.1	539.9	537.2	536.2	533.6	
06/19/03	562.3	544.9	541.5	534.8	531.3	532.3	534.9	538.2	536.9	535.7	533.2	
09/10/03	561.6	542.1	537.9	533.8	530.8	531.9	533.7	535.6	535.6	534.1	531.9	
12/10/03	562.4	542.7	537.6	533.7	530.9	531.9	533.7	535.2	535.5	533.8	531.7	
03/18/04	563.1	546.6	541.9	535.0	531.7	532.4	535.2	540.9	537.4	536.6	533.8	
06/17/04	562.1	544.3	540.7	534.3	531.0	532.1	534.6	537.4	536.5	535.1	532.7	
09/21/04	561.5	541.1	536.5	533.1	530.5	531.6	533.1	534.7	532.7	533.2	533.2	
12/14/04	562.2	545.3	541.7	534.7	531.4	532.2	534.6	540.4	536.7	535.5	532.9	
03/16/05	563.8	547.3	541.7	535.3	532.4	532.8	535.6	541.8	538.0	537.1	534.2	
06/15/05	562.9	545.9	541.6	535.0	531.7	532.5	535.0	540.0	535.0	536.1	535.6	
09/13/05	562.3	543.5	539.7	534.4	530.9	532.2	534.3	536.7	536.1	534.7	532.4	
12/15/05	562.2	544.3	541.4	(b)	531.0	532.2	534.5	537.3	534.1	534.7	534.9	535.1
03/30/06	565.8	548.6	542.7	(b)	533.9	534.4	536.2	542.3	536.4	537.3	537.6	535.7
06/20/06	563.6	545.4	541.6	(b)	531.5	532.5	534.9	538.6	534.6	536.2	535.5	535.0
09/29/06	561.9	542.8	539.0	(b)	530.7	532.1	535.1	536.1	533.7	534.6	534.7	534.7
12/14/06	562.9	544.2	541.5	(b)	531.1	532.3	534.7	536.7	534.0	534.8	535.2	535.0
03/21/07	562.5	545.2	541.7	(b)	531.4	532.4	534.9	539.3	534.6	535.6	535.6	535.1
06/20/07	561.5	543.5	540.8	(b)	531.0	532.4	534.6	537.1	531.1	535.2	535.3	534.9
9/14/2007	560.71	541.02	536.99	(b)	530.46	531.58	533.42	534.86	532.64	533.47	533.68	533.74
12/6/2007	560.62	541.22	536.85	(b)	530.68	531.48	533.21	535.08	532.62	533.3	533.61	533.64
3/14/2008	561.76	545.73	541.63	(b)	531.34	532.30	534.88	539.30	534.67	536.04	535.89	535.72
6/13/2008	560.92	543.61	540.6	(b)	530.83	532.02	534.42	536.86	533.81	534.84	535.16	534.67
9/18/2008	560.43	540.15	536.41	(b)	529.85	531.11	532.69	534.15	531.97	532.65	533.09	533.12
12/17/2008	561.11	540.88	536.77	(b)	530.68	531.67	533.26	534.04	532.35	532.94	533.29	533.66
3/16/2009	561.84	546.25	539.51	(b)	531.63	532.58	534.65	539.51	534.56	535.55	535.49	535.08
6/10/2009	561.05	545.02	541.38	(b)	531.02	532.08	534.45	537.94	534.08	535.40	535.18	534.96
9/25/2009	560.00	540.79	536.33	(b)	529.98	Dry	532.58	534.25	531.96	532.62	532.97	533.08
12/21/2009	560.93	543.49	541.22	(b)	530.96	532.06	534.03	536.17	533.46	534.13	534.57	534.69
3/29/2010	561.48	546.44	541.59	(b)	531.52	532.58	534.72	540.03	534.53	535.94	535.55	535.28
6/22/2010	561.17	545.62	541.40	(b)	531.26	532.41	534.63	538.90	534.37	535.62	535.27	535.21
9/28/2010	560.32	543.36	537.91	(b)	530.6	532.02	532.66	535.23	532.96	534.21	533.99	534.16
12/16/2010	561.33	545.52	541.51	(b)	531.11	532.31	534.52	537.21	534.00	534.38	535.10	535.15
3/23/2011	563.68	547.97	542.49	(b)	532.78	534.43	535.96	542.40	535.87	537.19	537.88	536.15
9/23/2011	561.03	543.54	539.52	(b)	530.81	532.31	534.34	536.41	533.59	534.67	534.85	534.86
3/22/2012	562.25	546.42	542.02	(b)	531.83	533.13	534.71	539.34	535.97	535.51	536.03	535.69
9/19/2012	560.93	541.83	537.53	(b)	530.6	531.91	533.55	534.88	532.95	534.33	534.17	534.17
3/14/2013	561.80	545.57	541.74	(b)	531.01	532.11	534.66	538.64	534.31	535.72	535.67	535.37
10/3/2013	560.95	541.01	536.21	(b)	530.02	531.14	532.74	533.74	531.89	532.54	533.08	533.06
3/10/2014	561.68	541.01	541.67	(b)	531.99	532.02	534.61	536.53	534.28	535.22	535.57	534.89
9/19/2014	560.40	540.33	535.53	(b)	529.31	530.50	532.05	532.96	531.46	531.91	533.66	532.28
3/23/2015	561.41	545.47	541.46	(b)	531.01	532.09	534.56	537.43	534.08	534.97	535.44	534.82
9/24/2015	560.26	540.82	535.79	(b)	529.34	530.39	532.17	533.52	531.35	532.14	532.65	532.4
3/21/2016	563.95	545.26	539.95	(b)	533.22	534.16	535.76	537.81	535.58	537.56	537.45	536.69
9/6/2016	561.06	543.78	537.23	(b)	530.32	NM	533.33	535.50	532.88	533.75	534.07	533.66
3/20/2017	565.75	548.02	540.78	(b)	533.20	534.89	536.05	538.15	536.1	538.63	537.51	534.57
9/28/2017	562.10	544.2	538.63	(b)	530.50	532.51	534.19	536.96	533.77	535.04	535.36	534.5

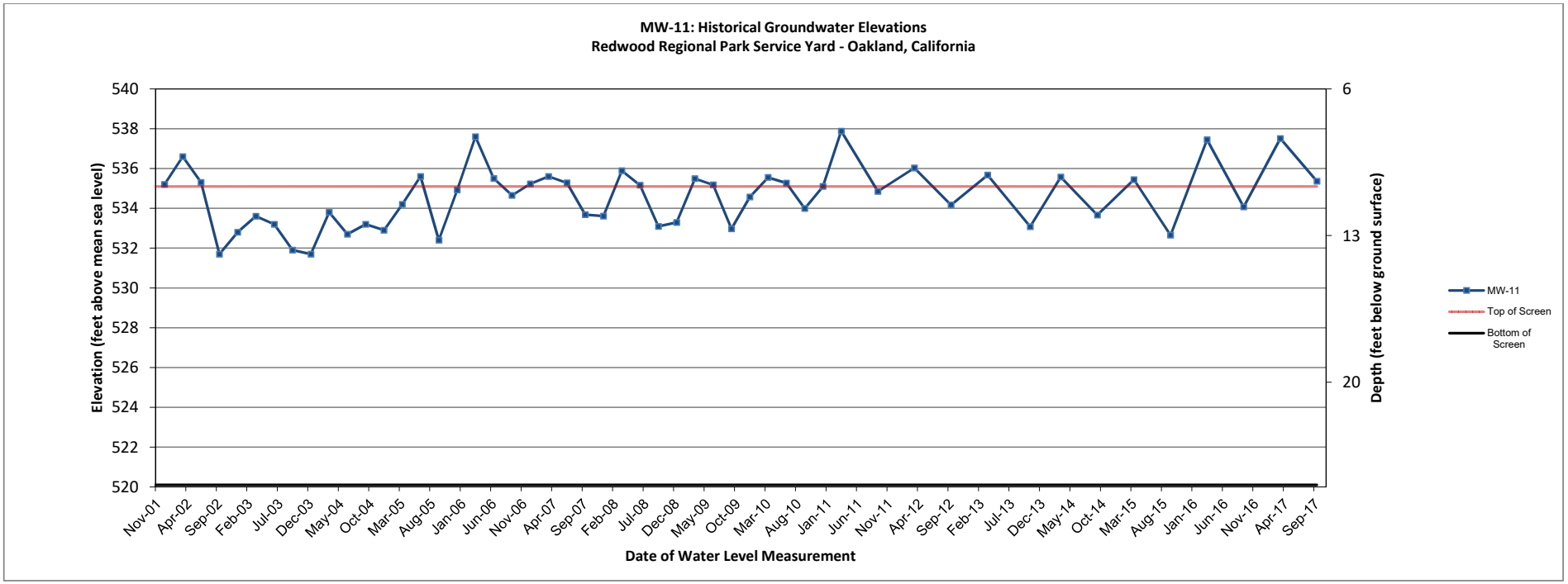
TOC = Top of well Casing
(a) TOC Elevations resurveyed on December 15, 2005 in accordance GeoTracker requirements.
(b) Well decomissioned and replaced by MW-12 in December 2005.
NM = not measured

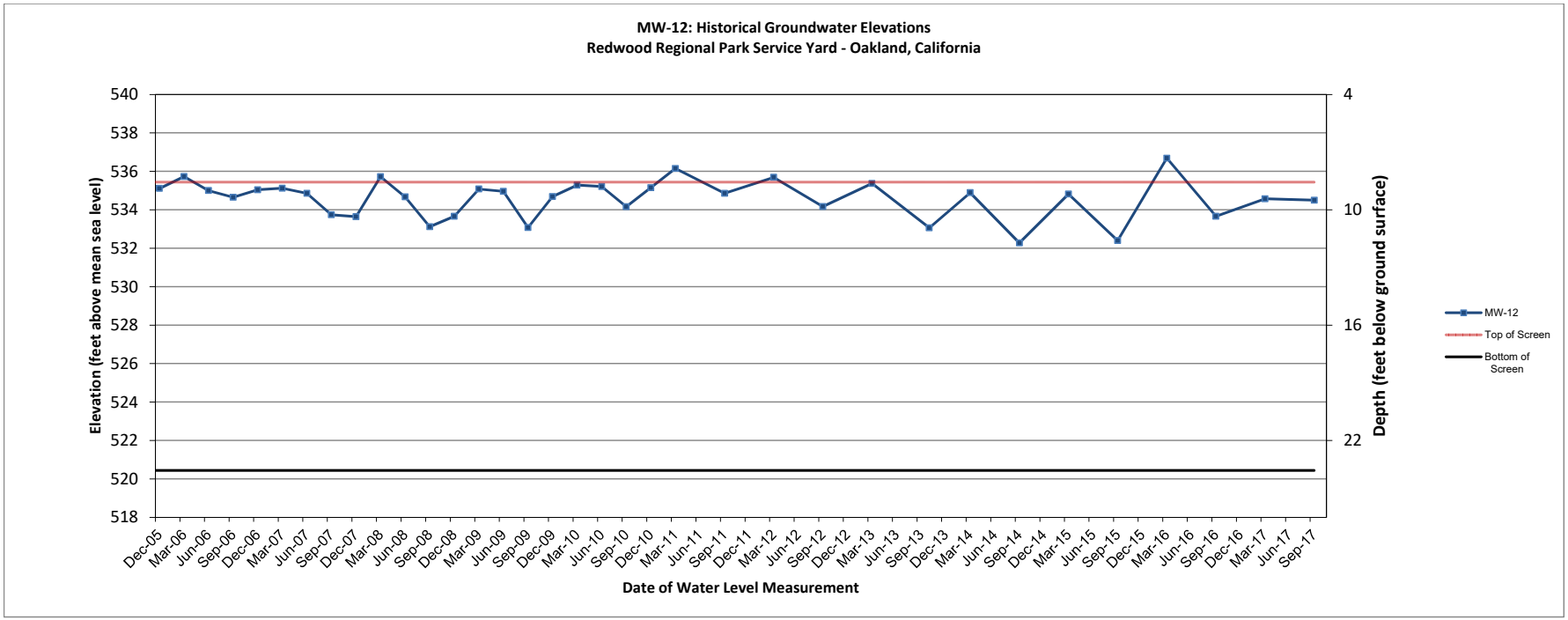

MW-7: Historical Groundwater Elevations
Redwood Regional Park Service Yard - Oakland, California
Elevation (feet above mean sea level)
Depth (feet below ground surface)
Date of Water Level Measurement
540
538
536
534
532
530
528
526
524
522
520
5.5
11
16.5
22
Sep-00
Mar-01
Sep-01
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
Sep-05
Mar-06
Sep-06
Mar-07
Sep-07
Mar-08
Sep-08
Mar-09
Sep-09
Mar-10
Sep-10
Mar-11
Sep-11
Mar-12
Sep-12
Mar-13
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
MW-7
Top of Screen
Bottom of Screen


MW-8: Historical Groundwater Elevations
Redwood Regional Park Service Yard - Oakland, California
Elevation (feet above mean sea level)
544
542
540
538
536
534
532
530
528
526
524
Depth (feet below ground surface)
6
12
18
24
Sep-00
Mar-01
Sep-01
Mar-02
Sep-02
Mar-03
Sep-03
Mar-04
Sep-04
Mar-05
Sep-05
Mar-06
Sep-06
Mar-07
Sep-07
Mar-08
Sep-08
Mar-09
Sep-09
Mar-10
Sep-10
Mar-11
Sep-11
Mar-12
Sep-12
Mar-13
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Date of Water Level Measurement
MW-8
Top of Screen


MW-9: Historical Groundwater Elevations
Redwood Regional Park Service Yard - Oakland, California
Elevation (feet above mean sea level)
Depth (feet below ground surface)
540
538
536
534
532
530
528
526
524
522
8
13
18
23
Nov-01
Apr-02
Sep-02
Feb-03
Jul-03
Dec-03
May-04
Oct-04
Mar-05
Aug-05
Jan-06
Jun-06
Nov-06
Apr-07
Sep-07
Feb-08
Jul-08
Dec-08
May-09
Oct-09
Mar-10
Aug-10
Jan-11
Jun-11
Nov-11
Apr-12
Sep-12
Feb-13
Jul-13
Dec-13
May-14
Oct-14
Mar-15
Aug-15
Jan-16
Jun-16
Nov-16
Apr-17
Sep-17
Date of Water Level Measurement
MW-9
Top of Screen


MW-10: Historical Groundwater Elevations
Redwood Regional Park Service Yard - Oakland, California
Elevation (feet above mean sea level)
Depth (feet below ground surface)
540
538
536
534
532
530
528
526
524
522
520
7
12
17
22
27
Nov-01
Apr-02
Sep-02
Feb-03
Jul-03
Dec-03
May-04
Oct-04
Mar-05
Aug-05
Jan-06
Jun-06
Nov-06
Apr-07
Sep-07
Feb-08
Jul-08
Dec-08
May-09
Oct-09
Mar-10
Aug-10
Jan-11
Jun-11
Nov-11
Apr-12
Sep-12
Feb-13
Jul-13
Dec-13
May-14
Oct-14
Mar-15
Aug-15
Jan-16
Jun-16
Nov-16
Apr-17
Sep-17
Date of Water Level Measurement
MW-10
Top of Screen
Bottom of Screen


MW-11: Historical Groundwater Elevations
Redwood Regional Park Service Yard - Oakland, California
Elevation (feet above mean sea level)
540
538
536
534
532
530
528
526
524
522
520
Depth (feet below ground surface)
6
13
20
Nov-01
Apr-02
Sep-02
Feb-03
Jul-03
Dec-03
May-04
Oct-04
Mar-05
Aug-05
Jan-06
Jun-06
Nov-06
Apr-07
Sep-07
Feb-08
Jul-08
Dec-08
May-09
Oct-09
Mar-10
Aug-10
Jan-11
Jun-11
Nov-11
Apr-12
Sep-12
Feb-13
Jul-13
Dec-13
May-14
Oct-14
Mar-15
Aug-15
Jan-16
Jun-16
Nov-16
Apr-17
Sep-17
Date of Water Level Measurement
MW-11
Top of Screen
Bottom of Screen


MW-12: Historical Groundwater Elevations
Redwood Regional Park Service Yard - Oakland, California
Elevation (feet above mean sea level)
Depth (feet below ground surface)
Date of Water Level Measurement
MW-12
Top of Screen
Bottom of Screen

Summary of Historical Soil Sample Analytical Results
Redwood Regional Park Service Yard
Oakland, California
(all concentrations in mg/kg)

Sample I.D.	Sample Depth (feet)	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
UFST Excavation Confirmation Samples – May & June 1993 (*indicates soil at that location was removed)								
DT-1*	10	*NA*	**4**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
DT-2*	10	*NA*	**3**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
GT-1*	12	**800**	*NA*	**6.3**	**43**	**18**	**94**	*NA*
GT-2*	12	**2,200**	*NA*	**19**	**120**	**45**	**250**	*NA*
E1-17	17	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
E2-16	16	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
E3-16	16	**12,000**	*NA*	**80**	**390**	**230**	**1,100**	*NA*
E4-13	13	**6**	*NA*	**0.37**	**0.006**	**0.1**	**0.1**	*NA*
E5-7.5	7.5	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
Exploratory Borehole Samples – September and October 1993								
B1-11	11	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B1-27	27	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B2-11	11	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B2-15	15	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B3-12	12	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B3-18	18	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B4-18	18	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B4-23	23	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B5-11	11	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B7-12	12	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B8-4	4	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B8-10	10	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B9-11	11	**370**	*NA*	**1.7**	**7.9**	**6.9**	**34**	*NA*
B9-21	21	*< 1*	*NA*	**0.1**	**0.011**	**0.017**	**0.069**	*NA*
B9-28	28	*< 1*	*NA*	*< 0.005*	**0.033**	**0.035**	**0.14**	*NA*
B10-6	6	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*

Sample I.D.	Sample Depth (feet)	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
B10-21	21	*< 1*	**7**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B11-11.5	11.5	*< 1*	< 2	**0.021**	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
B12-14.5	14.5	**150**	*NA*	**0.24**	**0.44**	**1.7**	**4.6**	*NA*
B12-15	15	**77**	*NA*	**0.15**	**0.24**	**0.9**	**2.7**	*NA*
B12-21	21	**97**	*NA*	**0.46**	**1.2**	**2**	**5.4**	*NA*
B13-12	12	**1,500**	*NA*	*< 0.4*	*< 0.4*	**13**	**78**	*NA*
B13-15	15	**1,800**	**420**	**8.8**	**39**	**30**	**120**	*NA*
B14-18	18	**210**	**50**	**0.017**	**0.1**	**0.34**	**0.63**	*NA*
B15-17	17	**1,900**	**1,300**	**1.1**	**0.8**	**9.1**	**14**	*NA*
B16-17.5	17.5	**50**	*NA*	*< 0.1*	*< 0.1*	**0.2**	**0.2**	*NA*
B17-12.5	12.5	*< 1*	*NA*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
Monitoring Well Installation Borehole Samples – October 1994								
MW1-5	5	*< 1*	**3**	< 0.005	< 0.005	*< 0.005*	*< 0.005*	*NA*
MW-21	21	**130**	**48**	**0.31**	**0.18**	**1.3**	**4.4**	*NA*
MW3-10	10	< 1	**3**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
MW3-25	25	< 1	**5**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
MW4-15.5	15.5	**22**	**4**	*< 0.005*	**0.038**	*< 0.005*	**0.49**	*NA*
MW4-16.5	16.5	**10**	**43**	*< 0.005*	**0.009**	**0.11**	**0.21**	*NA*
MW5A-15	15	**570**	**200**	*< 0.005*	**1.1**	**1.9**	**2.9**	*NA*
MW5-15	15	*< 1*	**2**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
MW6-19	19	*< 1*	**2**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
Exploratory Borehole Samples - April 1999								
HP-01 17.5’	17.5’	*< 1.0*	**3.8**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
HP-02-14’	14’	**970**	**640**	**1.3**	**1.3**	**5.5**	**8.7**	*NA*
HP-03-13’	13’	*< 1.0*	**5.8**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
HP-04-15’	15’	*< 1.0*	**1.7**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
HP-05-15’	15’	*< 1.0*	**4.3**	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*NA*
HP-06-11’	11’	**1,700**	**360**	**1.4**	**2.7**	**21**	**81**	*NA*
HP-07-12’	12’	**2.9**	**340**	**0.028**	*< 0.005*	**0.13**	**0.347**	*NA*
HP-08-15.5’	15.5’	**580**	**83**	< 0.1	**1.0**	**4.7**	**4.7**	*NA*
HP-09-15’	15’	**610**	**630**	**1.5**	**1.5**	**3.8**	**11.2**	*NA*
HP-10-14’	14’	**500**	**76**	**0.19**	**1.6**	**2.0**	**3.21**	*NA*

Sample I.D.	Sample Depth (feet)	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
Monitoring Well Installation Borehole Samples – December 2000								
MW-7-15.5'	15.5'	**640**	**170**	**3.0**	*< 0.1*	**5.1**	**4.4**	*NA*
MW-8-16'	16'	**1,800**	**780**	**6.2**	*< 1.3*	**23**	**43.7**	*NA*
Exploratory Borehole Samples – September 2003								
BH-16-11.5'	11.5'	**35**	**35**	**0.01**	**0.22**	**0.19**	**0.98**	***<0.035***
BH-16-19'	19'	**5.2**	**49**	*<0.005*	**0.04**	**0.08**	**0.08**	***<0.035***
BH-17-10'	9.5'	**236**	**66**	*<0.125*	**0.73**	**3.7**	**7.7**	***<0.875***
BH-17-13'	12'	**33**	**8.5**	**0.04**	**0.28**	**0.52**	**0.78**	***<0.175***
BH-18-8'	**7.5'**	*<3.0*	**2.0**	*<0.005*	*<0.005*	*<0.005*	*<0.015*	*<0.035*
BH-18-12'	11'	*<3.0*	**4.0**	*<0.005*	*<0.005*	**0.019**	**0.063**	*<0.035*
BH-19-10'	10'	**20**	**55**	*<0.005*	*<0.005*	**0.43**	**2.0**	*<0.035*
BH-19-15'	15'	**170**	**6.0**	**0.13**	*<0.005*	**2.2**	**3.2**	**0.15**
BH-20-11'	11'	*<3.0*	**1.5**	*<0.005*	*<0.005*	*<0.005*	*<0.015*	*<0.035*
BH-20-13'	13'	**792**	**77**	*<0.5*	*<0.5*	**8.3**	**26**	*<3.5*
BH-21-14'	14'	*<3.0*	**4.0**	*<0.005*	*<0.005*	*<0.005*	*<0.015*	*<0.035*
BH-21-15.5'	15.5'	**821**	**71**	**0.49**	*<0.125*	**5.6**	**14**	*<0.875*
BH-22-12'	12'	*<3.0*	**2.3**	*<0.005*	*<0.005*	*<0.005*	*<0.015*	*<0.035*
BH-22-15'	15'	**17**	**13**	**0.07**	*<0.025*	**0.98**	**1.5**	*<0.175*
BH-23-12'	12'	*<3.0*	**2.0**	*<0.005*	*<0.005*	*<0.005*	*<0.015*	*<0.035*
BH-23-15.5'	15.5'	**414**	**54**	*<0.25*	**3.4**	**2.8**	**9.0**	*<1.75*
Bioventing Pilot Test Well Installation Exploratory Borehole Samples – June 2004								
VW-1-10' (a)	10'	*<0.98*	**1.1**	*<0.0049*	*<0.0049*	*<0.0049*	*<0.0049*	*<0.020*
VW-1-15.5'	15.5'	**38**	**1.5**	*<0.025*	*<0.025*	**0.26**	**0.13**	*<0.1*
VMP-1-10.5'	10.5'	*<1.0*	*<1.0*	*<0.0052*	*<0.0052*	*<0.0052*	*<0.0052*	*<0.021*
VMP-1-14.5'	14.5'	**2,100**	**42**	*<0.500*	<0.500	**15**	4	*<2*
VMP-2-10.5'	10.5'	**3500**	**1,000**	**1.4**	*<1.3*	**42**	**197**	*<5*
VMP-2-14.5'	14.5'	**3,200**	**650**	**8**	<0.500	**40**	**77**	*<2*
VMP-3-10.5'	10.5'	*<1.1*	*1.2*	*<5.5*	*<5.5*	*<5.5*	*<5.5*	*<22*
VMP-3-15'	15'	**1,400**	**470**	*<0.055*	*<0.500*	*<0.500*	**14**	*<2*

Notes:

TVHg = Total volatile hydrocarbons – gasoline range

TEHd =Total petroleum hydrocarbons – diesel range

NA = Not Analyzed for this constituent

mg/kg = milligrams per kilogram (equivalent to parts per million – ppm)

No soil samples were collected during installation of wells MW-9, MW-10 and MW-11. VW-1-10 mislabeled asVMP-1-10 on lab report

HISTORICAL GROUNDWATER MONITORING WELLS ANALYTICAL RESULTS
REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA
(all concentrations in ug/L, equivalent to parts per billion [ppb])

Well MW-2									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Nov-94	**66**	*< 50*	**3.4**	*< 0.5*	*< 0.5*	**0.9**	**4.3**	*NA*
2	Feb-95	**89**	*< 50*	**18**	**2.4**	**1.7**	**7.5**	**30**	*NA*
3	May-95	*< 50*	*< 50*	**3.9**	*< 0.5*	**1.6**	**2.5**	**8.0**	*NA*
4	Aug-95	*< 50*	*< 50*	**5.7**	*< 0.5*	*< 0.5*	*< 0.5*	**5.7**	*NA*
5	May-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**—**	*NA*
6	Aug-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**—**	*NA*
7	Dec-96	*< 50*	*< 50*	**6.3**	*< 0.5*	**1.6**	*< 0.5*	**7.9**	*NA*
8	Feb-97	*< 50*	*< 50*	**0.69**	*< 0.5*	**0.55**	*< 0.5*	**1.2**	*NA*
9	May-97	**67**	*< 50*	**8.9**	*< 0.5*	**5.1**	*< 1.0*	**14**	*NA*
10	Aug-97	*< 50*	*< 50*	**4.5**	*< 0.5*	**1.1**	*< 0.5*	**5.6**	*NA*
11	Dec-97	**61**	*< 50*	**21**	*< 0.5*	**6.5**	**3.9**	**31**	*NA*
12	Feb-98	**2,000**	**200**	**270**	**92**	**150**	**600**	**1,112**	*NA*
13	Sep-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**—**	**7.0**
14	Apr-99	**82**	**710**	**4.2**	*< 0.5*	**3.4**	**4.0**	**12**	**7.5**
15	Dec-99	**57**	*< 50*	**20**	**0.6**	**5.9**	*<0.5*	**27**	**4.5**
16	Sep-00	*< 50*	*< 50*	**0.72**	*< 0.5*	*< 0.5*	*< 0.5*	**0.7**	**7.9**
17	Jan-01	**51**	*< 50*	**8.3**	*< 0.5*	**1.5**	*< 0.5*	**9.8**	**8.0**
18	Apr-01	**110**	*< 50*	**10**	*< 0.5*	**11**	**6.4**	**27**	**10**
19	Aug-01	**260**	**120**	**30**	**6.7**	**1.6**	**6.4**	**45**	**27**
20	Dec-01	**74**	**69**	**14**	**0.8**	**3.7**	**3.5**	**22**	**6.6**
21	Mar-02	*< 50*	*< 50*	**2.3**	**0.51**	**1.9**	**1.3**	**8.3**	**8.2**
22	Jun-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**—**	**7.7**
23	Sep-02	**98**	*< 50*	**5.0**	*< 0.5*	*< 0.5*	*< 0.5*	**—**	**13**
24	Dec-02	*< 50*	*< 50*	**4.3**	*< 0.5*	*< 0.5*	*< 0.5*	**—**	*< 2.0*
25	Mar-03	**130**	**82**	**39**	*< 0.5*	**20**	**4.1**	**63**	**16**
26	Jun-03	*< 50*	*< 50*	**1.9**	*< 0.5*	*< 0.5*	*< 0.5*	**1.9**	**8.7**
27	Sep-03	**120**	*< 50*	**8.6**	**0.51**	**0.53**	*< 0.5*	**9.6**	**23**
28	Dec-03	**282**	*<100*	**4.3**	**1.6**	**1.3**	**1.2**	**8.4**	**9.4**

Well MW-2 Continued

Well MW-2									
29	Mar-04	**374**	*<100*	**81**	**1.2**	**36**	**7.3**	**126**	**18**
30	Jun-04	*< 50*	*< 50*	**0.75**	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**15**
31	Sep-04	**200**	*< 50*	**23**	*< 0.5*	*< 0.5*	**0.70**	**24**	**16**
32	Dec-04	**80**	*< 50*	**14**	*< 0.5*	*2.9*	**0.72**	**18**	**20**
33	Mar-05	**190**	**68**	**27**	*<0.5*	**14**	**11**	**52**	**26**
34	Jun-05	**68**	*< 50*	**7.1**	*< 0.5*	**6.9**	**1.8**	**16**	**24**
35	Sep-05	*< 50*	*< 50*	**2.5**	*< 0.5*	*< 0.5*	*< 1.0*	**2.5**	**23**
36	Dec-05	*< 50*	*< 50*	**3.9**	*< 0.5*	*< 0.5*	*< 1.0*	**3.9**	**23**
37	Mar-06	**1300**	**300**	**77**	**4.4**	**91**	**250**	**422**	**18**
38	Jun-06	*< 50*	**60**	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	**—**	**17**
39	Sep-06	**270**	**52**	**31**	*< 0.5*	**15**	**6.69**	**53**	**17**
40	Dec-06	*< 50*	*< 50*	**2.1**	*< 0.5*	*< 0.5*	*< 0.5*	**2**	**16**
41	Mar-07	**59**	*< 50*	**4**	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**14**
42	Jun-07	*<50*	*<50*	**3.5**	*<0.5*	*<0.5*	*<0.5*	**3.5**	**8**
43	Sep-07	**2,600**	**260**	**160**	**44**	**86**	**431**	**721**	**15**
44	Dec-07	**16,000**	**5,800**	**23**	**91**	**230**	**2,420**	**2764**	**16**
44a	Jan-08	**480**	**200**	**1.1**	**3.2**	**5.5**	**68**	**77.8**	**11**
45	Mar-08	**20,000**	**24,000**	**21**	**39**	**300**	**2,620**	**2980**	**13**
45a	Apr-08	**800**	**640**	**2.6**	**2.1**	**13**	**155**	**172.7**	**13**
46a	May-08	**7,100**	**3,900**	**14**	**8.8**	**140**	**710**	**872.8**	**11**
46	Jun-08	**5,700**	**1,000**	**9.4**	**5.2**	**80**	**550**	**644.6**	**11**
46a	Jul-08	**6,400**	**2,200**	**13**	**5.1**	**140**	**570**	**728.1**	**2.9**
46b	Jul-08	**390**	**55**	**1.3**	**0.77**	**4.6**	**44.4**	**51.07**	**9**
46c	Aug-08	**28,000**	**7,100**	**12**	**19**	**260**	**2,740**	**3031**	*<20*
46d	Aug-08	**8,700**	**2,700**	**5.7**	**7.4**	**130**	**900.0**	**1043.1**	**3.5**
47	Sep-08	**40,000**	**9,100**	**1.6**	*<0.5*	**110**	**910.0**	**1021.6**	**9.5**
48	Dec-08	**9,200**	**2,200**	**0.52**	*<0.5*	*<0.5*	**201.0**	**201.52**	**12**
49	Mar-09	**3,100**	**37,000**	**1.1**	**1.4**	**7.9**	**35.0**	**45.4**	**14**
50	May-09	**5,000**	**15,000**	**1.5**	*<0.5*	**9.8**	**39.0**	**50**	**13**
51	Jun-09	**2,400**	**8,000**	**5.4**	*<0.5*	**11**	**20.2**	**36.6**	**13**
52	Aug-09	**1,900**	**3,100**	**1.6**	**1.8**	**11**	**23.8**	**38.2**	**7.1**
53	Sep-09	**1,400**	**1,800**	*<0.5*	*<0.5*	*<0.5*	**4.2**	**4.24**	**12**
54	Dec-09	**590**	**1,800**	*<0.5*	*<0.5*	**1.2**	**1.2**	**2.4**	**3.6**

Well MW-2 Continued

Well MW-2									
55	Mar-10	**1,900**	**3,200**	*<0.5*	*<0.5*	*<0.5*	**2.2**	**2.2**	**2.2**
56	Mar-10	**2,000**	**4,300**	*<0.5*	*<0.5*	*<0.5*	**3.5**	**3.45**	*<2.0*
57	Jun-10	**1,300**	**2,400**	*<0.5*	*<0.5*	*<0.5*	**1.7**	**-**	*<2.0*
58	Sep-10	**910**	*<50*	*<0.5*	*<0.5*	*<0.5*	**1.5**	**1.45**	*<2.0*
59	Dec-10	**910**	**1,600**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	**2.6**
60	Mar-11	**860**	**1,100**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	**3.1**
61	Sep-11	**780**	**810**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
62	Mar-12	**460**	**610**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
63	Sep-12	**160**	**190**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
64	Mar-13	**470**	**810**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
65	Oct-13	**120**	**67**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	**2.3**
66	Mar-14	**320**	**290**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
67	Sep-14	**610**	**480**	*<0.5*	**1**	**4.7**	**1.9**	**7.6**	**3.7**
68	Mar-15	**370**	**450**	<0.5	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
69	Sep-15	**790**	**980**	*<0.5*	**0.6**	*<0.5*	**3.3**	—	*<2.0*
70	Mar-16	*< 50*	*< 50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	—	*<2.0*
71	Sep-16	**410**	**400**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
72	Mar-17	*<50*	**74 Y**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
73	Sep-17	**75**	**78**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<0.5*

Well MW-4									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Nov-94	**2,600**	**230**	**120**	**4.8**	**150**	**88**	**363**	*NA*
2	Feb-95	**11,000**	**330**	**420**	**17**	**440**	**460**	**1,337**	*NA*
3	May-95	**7,200**	**440**	**300**	**13**	**390**	**330**	**1,033**	*NA*
4	Aug-95	**1,800**	**240**	**65**	**6.8**	**89**	**67**	**227**	*NA*
5	May-96	**1,100**	**140**	**51**	*< 0.5*	*< 0.5*	**47**	**98**	*NA*
6	Aug-96	**3,700**	**120**	**63**	**2.0**	**200**	**144**	**409**	*NA*
7	Dec-96	**2,700**	**240**	**19**	*< 0.5*	**130**	**93**	**242**	*NA*
8	Feb-97	**3,300**	*< 50*	**120**	**1.0**	**150**	**103**	**374**	*NA*
9	May-97	**490**	*< 50*	**2.6**	**6.7**	**6.4**	**6.7**	**22**	*NA*
10	Aug-97	**1,900**	**150**	**8.6**	**3.5**	**78**	**53**	**143**	*NA*
11	Dec-97	**1,000**	**84**	**4.6**	**2.7**	**61**	**54**	**123**	*NA*
12	Feb-98	**5,300**	**340**	**110**	**24**	**320**	**402**	**856**	*NA*
13	Sep-98	**1,800**	*< 50*	**8.9**	*< 0.5*	**68**	**27**	**104**	**23**

Well MW-4 Continued

Well MW-4									
14	Apr-99	**2,900**	**710**	**61**	**1.2**	**120**	**80**	**263**	**32**
15	Dec-99	**1,000**	**430**	**4.0**	**2.0**	**26**	**14**	**46**	*< 2.0*
16	Sep-00	**570**	**380**	*< 0.5*	*< 0.5*	**16**	**4.1**	**20**	**2.4**
17	Jan-01	**1,600**	**650**	**4.2**	**0.89**	**46**	**13.8**	**65**	**8.4**
18	Apr-01	**1,700**	**1,100**	**4.5**	**2.8**	**48**	**10.7**	**66**	**5.0**
19	Aug-01	**1,300**	**810**	**3.2**	**4.0**	**29**	**9.7**	**46**	*< 2.0*
20	Dec-01	*< 50*	**110**	*< 0.5*	*< 0.5*	*< 0.5*	**1.2**	**1.2**	*< 2.0*
21	Mar-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
22	Jun-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
23	Sep-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
24	Dec-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
25	Mar-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
26	Jun-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
27	Sep-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
28	Dec-03	*<50*	*<100*	*<0.3*	*<0.3*	*<0.3*	*<0.6*	—	*< 5.0*
29	Mar-04	*<50*	*<100*	*<0.3*	*<0.3*	*<0.3*	*<0.6*	—	*< 5.0*
30	Jun-04	*<50*	**2,500**	*<0.3*	*<0.3*	*<0.3*	*<0.6*	—	*< 5.0*
31	Sep-04	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
32	Dec-04	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
33	Mar-05	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
34	Jun-05	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
35	Sep-05	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*
Groundwater monitoring in this well discontinued with Alameda County Health Care Services Agency approval.									

Well MW-5									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Nov-94	**50**	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
2	Feb-95	**70**	*< 50*	**0.6**	*< 0.5*	*< 0.5*	*< 0.5*	**0.6**	*NA*
3	May-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
4	Aug-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
5	May-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
6	Aug-96	**80**	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
7	Dec-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
8	Feb-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
9	May-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
10	Aug-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
11	Dec-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
12	Feb-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
13	Sep-98	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2*
Groundwater monitoring in this well discontinued in 1998 with Alameda County Health Care Services Agency approval. Subsequent groundwater monitoring conducted to confirm plume's southern limit									
14	Jun-04	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	**5.9**
15	Sep-04	*<50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 1.0*	—	*< 2.0*

Well MW-7									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Jan-01	**13,000**	**3,100**	**95**	**4**	**500**	**289**	**888**	**95**
2	Apr-01	**13,000**	**3,900**	**140**	*< 0.5*	**530**	**278**	**948**	**52**
3	Aug-01	**12,000**	**5,000**	**55**	**25**	**440**	**198**	**718**	**19**
4	Dec-01	**9,100**	**4,600**	**89**	*< 2.5*	**460**	**228**	**777**	*< 10*
5	Mar-02	**8,700**	**3,900**	**220**	**6.2**	**450**	**191**	**867**	**200**
6	Jun-02	**9,300**	**3,500**	**210**	**6.3**	**380**	**155**	**751**	**18**
7	Sep-02	**9,600**	**3,900**	**180**	*< 0.5*	**380**	**160**	**720**	*< 2.0*
8	Dec-02	**9,600**	**3,700**	**110**	*< 0.5*	**400**	**189**	**699**	*< 2.0*
9	Mar-03	**10,000**	**3,600**	**210**	**12**	**360**	**143**	**725**	**45**
10	Jun-03	**9,300**	**4,200**	**190**	*< 10*	**250**	**130**	**570**	**200**
11	Sep-03	**10,000**	**3,300**	**150**	**11**	**300**	**136**	**597**	*< 2.0*
12	Dec-03	**9,140**	**1,100**	**62**	**45**	**295**	**184**	**586**	**89**
13	Mar-04	**8,170**	**600**	**104**	**41**	**306**	**129**	**580**	**84**
14	Jun-04	**9,200**	**2,700**	**150**	*< 0.5*	**290**	**91**	**531**	*< 2.0*
15	Sep-04	**9,700**	**3,400**	**98**	*< 0.5*	**300**	**125**	**523**	*< 2.0*
16	Dec-04	**8200**	**4,000**	**95**	*< 0.5*	**290**	**124**	**509**	*< 2.0*
17	Mar-05	**10,000**	**4,300**	**150**	*<0.5*	**370**	**71**	**591**	*<2.0*
18	Jun-05	**10,000**	**3,300**	**210**	*<1.0*	**410**	**56**	**676**	*<4.0*
19	Sep-05	**7,600**	**2,700**	**110**	*<1.0*	**310**	**54**	**474**	*<4.0*
20	Dec-05	**2,900**	**3,300**	**31**	*<1.0*	**140**	**41**	**212**	*<4.0*
21	Mar-06	**6,800**	**3,000**	**110**	*< 1.0*	**280**	**42**	**432**	**110**
22	Jun-06	**6,900**	**3,600**	**63**	*< 2.5*	**290**	**43**	**396**	*< 10*
23	Sep-06	**7,900**	**3,600**	**64**	*< 0.5*	**260**	**58**	**382**	49
24	Dec-06	**7,300**	**2,400**	**50**	*< 0.5*	**220**	**42**	**312**	*< 2.0*
25	Mar-07	**6,200**	**2,900**	**34**	*< 0.5*	**190**	**15**	**239**	*< 2.0*
26	Jun-07	**6,800**	**3,000**	**30**	*<1.0*	**160**	**27**	**217**	*<4.0*
27	Sep-07	**6,400**	**3,000**	*<0.5*	*<0.5*	**170**	**43**	**213**	*<2.0*
28	Dec-07	**4,800**	**2,800**	*<0.5*	*<0.5*	**100**	**26.5**	**126.5**	*2.7*

Well MW-7 Continued

Well MW-7									
30	Mar-08	**5,400**	**5,900**	**21**	*<0.5*	**150**	**15**	**186**	**51**
31	Jun-08	**4,800**	**3,500**	**55**	*<0.5*	**140**	**7.0**	**202**	*<2.0*
32	Sep-08	**6,400**	**2,800**	**22**	*<0.5*	**100**	**9.3**	**131**	*<2.0*
33	Dec-08	**3,500**	**3,600**	**5**	*<0.5*	**100**	**9.1**	**114**	*<2.0*
34	Mar-09	**5,100**	**6,700**	**19**	*<0.5*	**140**	**12.3**	**171**	**51**
35	Jun-09	**4,600**	**5,400**	**40**	*< 0.5*	**140**	**5.1**	**185**	**260**
36	Sep-09	**4,400**	**4,700**	*<0.5*	*<0.5*	**96**	**5.6**	**102**	**3.5**
37	Dec-09	**4,900**	**4,500**	*< 0.5*	*< 0.5*	**90**	**2.9**	**93**	**57.0**
38	Mar-10	**5,300**	**4,300**	**17**	*<0.5*	**110**	**2.6**	**130**	**16.0**
39	Mar-10	**2,600**	**6,100**	**11**	*<0.5*	**76**	**4.5**	**92**	*<2.0*
40	Jun-10	**5,800**	**5,000**	**20**	*<0.5*	**140**	**9.9**	**170**	*<2.0*
41	Sep-10	**6,300**	**4,100**	*<0.5*	*<0.5*	**93**	**6.0**	**99**	**69.0**
42	Dec-10	**5,400**	**3,500**	*<0.5*	*<0.5*	**99**	**9.2**	**108**	**87.0**
43	Mar-11	**5,500**	**3,400**	**11**	*<0.5*	**94**	**8.5**	**114**	*<2.0*
44	Sep-11	**5,800**	**3,300**	*<0.5*	*<0.5*	**97**	**3.1**	**100**	*<2.0*
45	Mar-12	**6,400**	**3,500**	*<0.5*	*<0.5*	**110**	**5.6**	**116**	*<2.0*
46	Sep-12	**5,700**	**3,000**	*<0.5*	*<0.5*	**84**	*<0.5*	**84**	*<2.0*
47	Mar-13	**6,000**	**3,300**	*<0.5*	*<0.5*	**82**	*<0.5*	**82**	*<2.0*
48	Oct-13	**6,400**	**6,000**	**35**	*<0.5*	**75**	**5.10**	**115**	*<2.0*
49	Dec-13	**6,000**	**4,200**	*<0.5*	*<0.5*	**100**	*<0.5*	**100**	*<2.0*
50	Mar-14	**7,500**	**4,900**	*<0.5*	*<0.5*	**130**	**2.0**	**132**	*<2.0*
51	Jun-14	**3,400**	**9,100**	*<0.5*	*<0.5*	**170**	**6.9**	**177**	*<2.0*
52	Sep-14	**6,500**	**6,000**	*<0.5*	*<0.5*	**150**	**5.1**	**155**	*<2.0*
53	Mar-15	**7,700**	**3,200**	*<0.5*	*<0.5*	**91**	*<0.5*	**91**	*<2.0*
54	Sep-15	**6,800**	**2,800**	*<0.5*	*<0.5*	**85**	*<0.5*	**85**	*<2.0*
55	Dec-15	**4,700**	**2,100**	*<0.5*	*<0.5*	**64**	*<0.5*	**64**	**43**
56	Mar-16	**1,500**	**850**	*<0.5*	*<0.5*	**12**	*<0.5*	**12**	*<2.0*
57	Sep-16	**6,800**	**2,100**	**69**	*<0.5*	*<0.5*	**5.3**	**74.3**	*<2.0*
58	Mar-17	**830**	**680**	**1.9**	*<0.5*	*<0.5*	*<0.5*	1.9	*<2.0*
59	Sep-17	**1,600**	**810**	*<0.5*	*<0.5*	*3.6*	*5.3*	8.9	*<0.5*

Well MW-8									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Jan-01	**14,000**	**1,800**	**430**	**17**	**360**	**1230**	**2,037**	**96**
2	Apr-01	**11,000**	**3,200**	**320**	**13**	**560**	**1,163**	**2,056**	**42**
3	Aug-01	**9,600**	**3,200**	**130**	**14**	**470**	**463**	**1,077**	**14**
4	Dec-01	**3,500**	**950**	**69**	**2.4**	**310**	**431**	**812**	*< 4.0*
5	Mar-02	**14,000**	**3,800**	**650**	**17**	**1,200**	**1,510**	**3,377**	**240**
6	Jun-02	**2,900**	**1,100**	**70**	**2.0**	**170**	**148**	**390**	**19**
7	Sep-02	**1,000**	**420**	**22**	*< 0.5*	**64**	**50**	**136**	*< 2.0*
8	Dec-02	**3,300**	**290**	**67**	*< 0.5*	**190**	**203**	**460**	*< 2.0*
9	Mar-03	**13,000**	**3,500**	**610**	**12**	**1,100**	**958**	**2,680**	*< 10*
10	Jun-03	**7,900**	**2,200**	**370**	**7.4**	**620**	**562**	**1,559**	*< 4.0*
11	Sep-03	**3,600**	**400**	**120**	**3.3**	**300**	**221**	**644**	*< 2.0*
12	Dec-03	**485**	**100**	**19**	**1.5**	**26**	**36**	**83**	*< 5.0*
13	Mar-04	**16,000**	**900**	**592**	**24**	**1,060**	**1,870**	**3,546**	**90**
14	Jun-04	**5,900**	**990**	**260**	**9.9**	**460**	**390**	**1,120**	*< 10*
15	Sep-04	**2,000**	**360**	**100**	*< 2.5*	**180**	**102**	**382**	*< 10*
16	Dec-04	**15,000**	**4,000**	**840**	**21**	**1,200**	**1,520**	**3,581**	*< 10*
17	Mar-05	**24,000**	**7,100**	**840**	**51**	**1,800**	**2,410**	**5,101**	*<10*
18	Jun-05	**33,000**	**5,700**	**930**	**39**	**2,500**	**3,860**	**7,329**	*<20*
19	Sep-05	**5,600**	**1,200**	**270**	**6.6**	**400**	**390**	**1,067**	*<20*
20	Dec-05	**3,700**	**1,300**	**110**	*< 5.0*	**320**	**356**	**786**	*<20*
21	Mar-06	**22,000**	**4,300**	**550**	**30**	**1,800**	**2,380**	**4,760**	*<20*
22	Jun-06	**19,000**	**5,000**	**500**	**28**	**1,800**	**1,897**	**4,225**	*<20*
23	Sep-06	**9,000**	**820**	**170**	**7.7**	**730**	**539**	**1,447**	*<10*
24	Dec-06	**4,400**	**800**	**75**	**4.2**	**320**	**246**	**645**	*< 2.0*
25	Mar-07	**15,000**	**4,500**	**340**	**19**	**1,300**	**1,275**	**2,934**	*< 20*
26	Jun-07	**10,000**	**3,500**	**220**	**11**	**670**	**675**	**1,576**	*<4.0*
27	Sep-07	**9,400**	**3,400**	**200**	**6.9**	**1,000**	**773**	**1,980**	*<8.0*
28	Dec-07	**1,200**	**500**	**15**	**0.88**	**95**	**57.7**	**168.58**	*<2.0*
30	Mar-08	**11,000**	**13,000**	**150**	**13**	**1,100**	**950.0**	**2,213**	**76**
31	Jun-08	**2,000**	**1,700**	**27**	**2.5**	**190**	**113.2**	**333**	*<2.0*
32	Sep-08	**5,500**	**4,400**	**89**	**3.9**	**630**	**194.4**	**917**	*<2.0*
33	Dec-08	**520**	**400**	**1.5**	*<0.5*	**20**	**4.4**	**26**	**4.5**

Well MW-8 Continued

Well MW-8									
34	Mar-09	**4,600**	**7,300**	**55**	*<5.0*	**410**	**639.0**	**1,104**	*<20*
35	Jun-09	**2,100**	**3,400**	**32**	*< 0.5*	**260**	**80.8**	**373**	**55**
36	Sep-09	**440**	**1,700**	**2.8**	*<0.5*	**33**	**2.7**	**39**	**3.7**
37	Dec-09	**560**	**540**	**1.5**	*< 0.5*	**39**	**7.1**	**48**	**4.2**
38	Mar-10	**220**	**270**	**0.8**	*<0.5*	**14**	**3.1**	**18**	**3.9**
39	Mar-10	**3,400**	**5,700**	**28.0**	*<0.5*	**340**	**255.7**	**624**	*<2.0*
40	Jun-10	**4,700**	**4,200**	**27.0**	**2.9**	**400**	**103.2**	**533**	**27**
41	Sep-10	**900**	**1,300**	**2.9**	*<0.5*	**22**	*<2.5*	**25**	*<10*
42	Dec-10	**180**	**260**	*<0.5*	*<0.5*	**5**	**1.0**	**6.4**	**7.2**
43	Mar-11	**6,000**	**5,900**	**39**	*<0.5*	**510**	**431.0**	**980.0**	*<2.0*
44	Sep-11	**1,700**	**1,200**	**7**	**0.9**	**120**	**12.2**	**139.7**	*<2.0*
45	Mar-12	**1,200**	**790**	**11**	**0.9**	*<0.5*	**99.0**	**110.9**	*<2.0*
46	Sep-12	**730**	**430**	**4.7**	*<0.5*	**45**	**3.8**	**53.5**	**9.2**
47	Mar-13	**840**	**690**	**5.6**	*<0.5*	**47**	**9.9**	**62.51**	**15**
48	Oct-13	**150**	**140**	*<0.5*	*<0.5*	**3.3**	*<0.5*	**3.3**	*<2.0*
49	Mar-14	**79**	**120**	*<0.5*	*<0.5*	2.1	*<0.5*	**2.1**	*11*
50	Sep-14	**57**	**66**	*<0.5*	*<0.5*	**1.5**	**0.66**	**2.16**	**11**
51	Mar-15	**190**	**68**	*<0.5*	*<0.5*	**1.6**	*<0.5*	**1.6**	**11**
52	Sep-15	**<50**	**97**	*<0.5*	*<0.5*	**<0.5**	*<0.5*	**0**	**6**
53	Mar-16	**170**	**290**	**0.53**	*<0.5*	**3.6**	**5.52**	**9.65**	**3**
54	Sep-16	**220**	**430**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	**4.5**
55	Mar-17	**370**	**950**	*0.73*	*<0.5*	**19**	1.15	**20.88**	4.4
56	Sep-17	**300**	**140**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*

Well MW-9									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Aug-01	**11,000**	**170**	**340**	**13**	**720**	**616**	**1,689**	**48**
2	Dec-01	**9,400**	**2,700**	**250**	**5.1**	**520**	**317**	**1,092**	*< 10*
3	Mar-02	**1,700**	**300**	**53**	**4.2**	**120**	**67**	**244**	**20**
4	Jun-02	**11,000**	**2,500**	**200**	**16**	**600**	**509**	**1,325**	**85**
5	Sep-02	**3,600**	**2,800**	**440**	**11**	**260**	**39**	**750**	*< 4.0*
6	Dec-02	**7,000**	**3,500**	**380**	**9.5**	**730**	**147**	**1,266**	*< 10*
7	Mar-03	**4,400**	**1,400**	**320**	**6.9**	**400**	**93**	**820**	*< 2.0*
8	Jun-03	**7,600**	**1,600**	**490**	**10**	**620**	**167**	**1,287**	*< 4.0*
9	Sep-03	**8,300**	**2,900**	**420**	**14**	**870**	**200**	**1,504**	*< 10*
10	Dec-03	**7,080**	**700**	**287**	**31**	**901**	**255**	**1,474**	*< 10*

Well MW-9 Continued

Well MW-9									
11	Mar-04	**3,550**	**600**	**122**	**15**	**313**	**84**	**534**	**35**
12	Jun-04	**6,800**	**1,700**	**350**	*< 2.5*	**620**	**99**	**1,069**	*< 10*
13	Sep-04	**7,100**	**1,900**	**160**	*8.1*	**600**	**406**	**1,174**	*< 10*
14	Dec-04	**4,700**	**2,800**	**160**	*< 2.5*	**470**	*< 0.5*	**630**	*< 10*
15	Mar-05	**4,200**	**1,600**	**97**	*<2.5*	**310**	**42**	**449**	*< 10*
16	Jun-05	**9,900**	**2,000**	**170**	*<2.5*	**590**	**359**	**1,119**	*< 10*
17	Sep-05	**3,600**	**1,200**	**250**	*<0.5*	**330**	**36**	**616**	*< 2.0*
18	Dec-05	**8,700**	**1,500**	**150**	**4**	**650**	**551**	**1,355**	*< 4.0*
19	Mar-06	**3,600**	**880**	**37**	*<1.0*	**210**	**165**	**412**	*< 4.0*
20	Jun-06	**3,200**	**1,300**	**39**	*<1.0*	**220**	**144**	**403**	**4.2**
21	Sep-06	**12,000**	**3,300**	**130**	**8**	**850**	**604**	**1,592**	*<1.0*
22	Dec-06	**12,000**	**2,800**	**140**	**9.4**	**880**	**634**	**1,663**	*< 10*
23	Mar-07	**9,600**	**2,900**	**120**	**8.7**	**780**	**453**	**1,362**	*< 10*
24	Jun-07	**7,100**	**2,200**	**75**	**5.2**	**480**	**298**	**858**	*<4.0*
25	Sep-07	**4,500**	**2,100**	**60**	**3.8**	**420**	**227**	**710**	*<4.0*
26	Dec-07	**6,200**	**2,000**	**51**	*<0.5*	**340**	**128.8**	**519.8**	*<2.0*
27	Mar-08	**6,400**	**3,500**	**67**	**5.2**	**480**	**177.6**	**724.6**	**38**
28	Jun-08	**10,000**	**3,400**	**89**	*<2.5*	**510**	**231.0**	**830.0**	*<10*
29	Sep-08	**4,800**	**2,700**	**53**	*<0.5*	**250**	**66.4**	**369.4**	*<2.0*
30	Dec-08	**4,300**	**2,300**	**45**	*<0.5*	**330**	**39.1**	**414.1**	*<2.0*
31	Mar-09	**4,000**	**2,200**	*<2.0*	*<0.5*	**160**	**34.9**	**194.9**	*<2.0*
32	Jun-09	**4,100**	**3,600**	**62**	*< 0.5*	**280**	**41.7**	**383.7**	**160**
33	Sep-09	**2,200**	**2,900**	**15**	*<0.5*	**110**	**11.8**	**136.8**	*<2.0*
34	Dec-09	**2,500**	**4,000**	**27**	*<0.5*	**170**	**8.7**	**205.7**	*<2.0*
35	Mar-10	**3,300**	**2,600**	**15**	*<0.5*	**140**	**12.0**	**167.0**	**8.6**
36	Mar-10	**2,500**	**3,400**	**16**	*<0.5*	**70**	**15.4**	**101.4**	**2.1**
37	Jun-10	**1,700**	**1,300**	**13**	*<0.5*	**48**	**4.9**	**65.9**	**11**
38	Sep-10	**13,000**	**2,900**	**43**	*<0.5*	**300**	**47.9**	**390.9**	**43**
39	Dec-10	**3,900**	**2,400**	**32**	*<0.5*	**240**	**20.5**	**292.5**	**82**

Well MW-9 Continued

Well MW-9									
40	Mar-11	**700**	**680**	**1.6**	*<0.5*	**10**	**3.5**	**15.1**	**14**
41	Sep-11	**2,600**	**1,900**	**12**	*<0.5*	**160**	**10.2**	**182.2**	*<2.0*
42	Mar-12	**1,100**	**940**	**9**	*<0.5*	**25**	**1.6**	**35.6**	*<2.0*
43	Sep-12	**10,000**	**8,600**	**25**	<0.5	**260**	**19.0**	**304.0**	*<2.0*
44	Mar-13	**4,000**	**2,400**	**9.1**	<0.5	**73**	**9.7**	**91.8**	*<2.0*
45	Oct-13	**3,200**	**1,500**	**20**	<0.5	**51**	**6.6**	**77.6**	*<2.0*
49	Dec-13	**3,000**	**2,700**	**22**	*<0.5*	**120**	**4.6**	**147**	*<2.0*
50	Mar-14	**3,100**	**5,200**	**49**	*<0.5*	**420**	**83**	**552**	*<2.0*
51	Jun-14	**12,000**	**2,600**	**54**	<0.5	**610**	**160**	**824**	*<2.0*
52	Sep-14	**17,000**	**5,800**	**65**	**13.0**	**51**	**204**	**333**	*<2.0*
53	Mar-15	**4,300**	**2,000**	**24**	*<0.5*	**150**	**19**	**193**	*<2.0*
54	Sep-15	**3,000**	**950**	**25**	*<0.5*	**59**	**3**	**87**	**46**
55	Dec-15	**2,700**	**1,400**	**9.6**	*<0.5*	*<8.3*	*<8.3*	**10**	*<33*
56	Mar-16	**4,000**	**2,600**	**18.0**	*<8.3*	**84**	*<8.3*	**102**	*<33*
57	Sep-16	**120,000**	**6,400**	**550**	*<8.3*	**7,600**	**490**	**8,640**	*<33*
58	Mar-17	**3,100**	**1,100**	**34**	*<0.5*	**570**	16	**620**	*<2.0*
59	Sep-17	**100**	**50**	*<0.5*	*<0.5*	1.8	*<0.5*	1.8	*<0.5*

Well MW-10									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Aug-01	**550**	**2,100**	**17**	*< 0.5*	**31**	**44**	**92**	**40**
2	Dec-01	*< 50*	**81**	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	**25**
3	Mar-02	*< 50*	*< 50*	**0.61**	*< 0.5*	*< 0.5*	*< 0.5*	**0.61**	**6.0**
4	Jun-02	*< 50*	*< 50*	**0.59**	*< 0.5*	**0.58**	*< 0.5*	**1.2**	**9.0**
5	Sep-02	**160**	**120**	**10**	*< 0.5*	**6.7**	**3.6**	**20**	**26**
6	Dec-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	**16**
7	Mar-03	**110**	*< 50*	**11**	*< 0.5*	**12**	**1.3**	**24**	**15**
8	Jun-03	**110**	*< 50*	**9.6**	*< 0.5*	**6.8**	*< 0.5*	**16**	**9.0**
9	Sep-03	*< 50*	*< 50*	**1.1**	*< 0.5*	**1.5**	*< 0.5*	**2.6**	**7.0**
10	Dec-03	**162**	*<100*	**6.9**	*<0.3*	**8.0**	*<0.6*	**15**	**9.9**
11	Mar-04	**94**	*<100*	**2.8**	*<0.3*	**5.7**	**7.0**	**16**	*<5.0*
12	Jun-04	**150**	**56**	**11**	*< 0.5*	**12**	*< 0.5*	**23**	**15**
13	Sep-04	*< 50*	*< 50*	**1.6**	*< 0.5*	**1.9**	*< 1.0*	**3.5**	**5.8**
14	Dec-04	**64**	*< 50*	**3.7**	*< 0.5*	**3.7**	**0.7**	**8.1**	**10**

Well MW-10 Continued

Well MW-10									
15	Mar-05	**95**	**98**	**8.3**	*<0.5*	**7.7**	**0.77**	**17**	**13**
16	Jun-05	**150**	**57**	**14**	*<0.5*	**10**	**1.0**	**25**	*<2.0*
17	Sep-05	**87**	*< 50*	**5.0**	*<0.5*	**3.6**	*<1.0*	**8.6**	*<2.0*
18	Dec-05	*< 50*	*< 50*	**1.2**	*<0.5*	*<0.5*	*<1.0*	**1.2**	**7.8**
19	Mar-06	**58**	**71**	**3.2**	*<0.5*	**2.2**	*<1.0*	**5.4**	**8.8**
20	Jun-06	**73**	**140**	**4.9**	*<0.5*	**2.5**	*<1.0*	**7.4**	**5.3**
21	Sep-06	**88**	**51**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	**9.6**
22	Dec-06	*<50*	*<50*	**0.61**	*<0.5*	**0.55**	*<0.5*	**1.2**	**3.7**
23	Mar-07	**57**	*<50*	**3.6**	*<0.5*	**2.2**	*<0.5*	**5.8**	**3.1**
24	Jun-07	**60**	**65**	**2.4**	*<0.5*	**1.6**	*<0.5*	**4.0**	**4.0**
25	Sep-07	**84**	*<50*	**3.6**	*<0.5*	**2.3**	**0.52**	**6.4**	**3.6**
26	Dec-07	**130**	**67**	**0.77**	*<0.5*	**340**	**0.83**	**341.6**	*<2.0*
27	Mar-08	**78**	**170**	**1.7**	*<0.5*	**3.1**	**0.97**	**5.8**	**2.4**
28	Jun-08	**230**	**320**	**12**	*<0.5*	**9.9**	**3.50**	**25.4**	*<2.0*
29	Sep-08	**80**	*<50*	**1.6**	*<0.5*	**0.52**	*<0.5*	**2.1**	**3.0**
30	Dec-08	*<50*	**66**	**0.89**	*<0.5*	*<0.5*	*<0.5*	**0.9**	**2.1**
31	Mar-09	**76**	**230**	*<2.0*	*<0.5*	**1.4**	*<0.5*	**1.4**	*<2.0*
32	Jun-09	**72**	**120**	**2.0**	*< 0.5*	**4.4**	**1.3**	**7.7**	*<2.0*
33	Sep-09	**74**	**220**	**1.6**	*<0.5*	*<0.5*	*<0.5*	**1.6**	*<2.0*
34	Dec-09	**72**	**150**	**0.6**	*<0.5*	**1.6**	**1.2**	**3.4**	*<2.0*
36	Mar-10	**63**	**280**	**1.3**	*<0.5*	**48**	**<0.5**	**49.3**	*<2.0*
37	Jun-10	**110**	**340**	**1.4**	*<0.5*	**2.6**	**0.74**	**4.7**	**2.4**
38	Sep-10	**140**	**360**	**2.1**	*<0.5*	**1.4**	<0.5	**3.5**	**4.3**
39	Dec-10	**80**	**440**	*<0.5*	*<0.5*	**0.69**	<0.5	**0.7**	**4.1**
40	Mar-11	**170**	**1,200**	**1.0**	*<0.5*	**3.7**	**1.8**	**6.5**	**6.3**
41	Sep-11	**150**	**220**	**0.8**	*<0.5*	**1.9**	**1**	**3.7**	*<2.0*
42	Mar-12	**80**	**92**	**0.81**	*<0.5*	**1.5**	*<0.5*	**2.3**	**3.4**
43	Sep-12	**170**	**200**	*<0.5*	*<0.5*	**2**	**0.94**	**2.9**	*<2.0*
44	Mar-13	**310**	**58**	*<0.5*	*<0.5*	**7.3**	**7.94**	**15.2**	*<2.0*
45	Oct-13	**69**	*<50*	*<0.5*	*<0.5*	**0.84**	*<0.5*	**0.8**	**4.8**
46	Dec-13	*<52*	**220**	*<0.5*	**0.61**	**2**	**1.5**	**4.1**	**3.7**
47	Mar-14	*<50*	**87**	*<0.5*	*<0.5*	**0.51**	*<0.5*	**0.5**	**3.7**
48	Jun-14	**55**	<50	*<0.5*	**0.61**	**2**	**1.5**	**4.1**	*<2.0*
49	Sep-14	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.0	**4.5**
50	Mar-15	**61**	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.0	**3.3**
51	Sep-15	*<50*	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.0	**2.6**
52	Dec-15	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.0	**2.6**
53	Mar-16	**90**	**110**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.0	**<2.0**
54	Sep-16	**63**	**120**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*0*	**4.4**
55	Mar-17	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	4.7
56	Sep-17	**62**	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	3.1

Well MW-11									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Aug-01	**17,000**	**7,800**	**390**	**17**	**820**	**344**	**1,571**	*< 10*
2	Dec-01	**5,800**	**2,800**	**280**	**7.8**	**500**	**213**	**1,001**	*< 10*
3	Mar-02	**100**	**94**	*< 0.5*	*< 0.5*	**0.64**	*< 0.5*	**0.64**	**2.4**
4	Jun-02	**8,200**	**2,600**	**570**	**13**	**560**	**170**	**1,313**	*< 4*
5	Sep-02	**12,000**	**4,400**	**330**	**13**	**880**	**654**	**1,877**	*< 10*
6	Dec-02	**18,000**	**4,500**	**420**	*< 2.5*	**1,100**	**912**	**2,432**	*< 10*
7	Mar-03	**7,800**	**2,600**	**170**	**4.7**	**530**	**337**	**1,042**	**53**
8	Jun-03	**14,000**	**3,800**	**250**	*< 2.5*	**870**	**693**	**1,813**	*< 10*
9	Sep-03	**10,000**	**3,000**	**250**	**9.9**	**700**	**527**	**1,487**	*< 4*
10	Dec-03	**15,000**	**1,100**	**314**	**60**	**1,070**	**802**	**2,246**	**173**
11	Mar-04	**4,900**	**400**	**72**	**17**	**342**	**233**	**664**	**61**
12	Jun-04	**10,000**	**2,300**	**210**	**2.8**	**690**	**514**	**1,417**	*< 10*
13	Sep-04	**7,200**	**2,300**	**340**	*< 2.5*	**840**	**75**	**1,255**	*< 10*
14	Dec-04	**11,000**	**3,900**	**180**	**5.1**	**780**	**695**	**1,660**	*< 10*
15	Mar-05	**4,600**	**1,900**	**69**	*<2.5*	**300**	**206**	**575**	*< 10*
16	Jun-05	**1,400**	**590**	**85**	*<0.5*	**110**	**8.2**	**203**	*< 2.0*
17	Sep-05	**12,000**	**3,100**	**220**	*< 1.0*	**840**	**762**	**1,822**	*< 4.0*
18	Dec-05	**2,500**	**2,100**	**120**	*< 2.5*	**260**	**16**	**396**	*< 10*
19	Mar-06	**2,200**	**1,300**	**27**	*<2.5*	**130**	**5.2**	**162**	*< 10*
20	Jun-06	**3,700**	**1,900**	**170**	*<1.0*	**230**	**14**	**414**	*< 4.0*
21	Sep-06	**3,600**	**2,100**	**80**	*<0.5*	**230**	**8.8**	**319**	*< 2.0*
22	Dec-06	**6,000**	**3,500**	**83**	*<1.0*	**260**	**16.4**	**359**	*< 4.0*
23	Mar-07	**4,500**	**1,900**	**110**	*< 0.5*	**170**	**7.9**	**288**	*< 2.0*
24	Jun-07	**4,300**	**2,200**	**120**	*<0.5*	**140**	**6.6**	**267**	*<4.0*
25	Sep-07	**5,500**	**2,700**	**86**	*<0.5*	**180**	**16.1**	**282**	*<2.0*
26	Dec-07	**7,100**	**4,000**	**68**	*<0.5*	**140**	**14**	**222**	**35**
27	Mar-08	**5,300**	**4,000**	**130**	*<0.5*	**120**	**13**	**263**	**8.8**
28	Jun-08	**3,600**	**4,200**	**190**	*<0.5*	**140**	**11**	**341**	*<2.0*
29	Sep-08	**7,300**	**4,600**	**130**	*<0.5*	**110**	**4.5**	**245**	*<2.0*
30	Dec-08	**2,800**	**1,600**	**93**	*<0.5*	**82**	**0.69**	**176**	*<2.0*

Well MW-11 Continued

Well MW-11									
31	Mar-09	**4,100**	**4,600**	**18**	*<0.5*	**82**	**8**	**108**	**8.0**
32	Jun-09	**2,100**	**2,700**	**38**	*< 0.5*	**80**	**3.3**	**121**	**3.3**
33	Sep-09	**830**	**2,400**	**11**	*<0.5*	**19**	*<0.5*	**30**	*<2.0*
34	Dec-09	**2,200**	**3,100**	**19**	*<0.5*	**46**	**0.78**	**66**	**14.0**
35	Mar-10	**2,300**	**2,500**	**13**	*<0.5*	**59**	**0.79**	**73**	**3.4**
36	Mar-10	**1,500**	**3,400**	**12**	*<0.5*	**48**	*<0.5*	**60**	*<2.0*
37	Jun-10	**2,000**	**3,500**	**14**	*<0.5*	**42**	**0.92**	**57**	**7.9**
38	Sep-10	**3,000**	**2,200**	**18**	*<0.5*	**41**	**0.55**	**60**	**8.0**
39	Dec-10	**1,800**	**2,900**	**13**	*<0.5*	**49**	**1.9**	**64**	**15.0**
40	Mar-11	**180**	**1,600**	*<0.5*	*<0.5*	**1.2**	*<0.5*	**1.2**	**6.9**
41	Sep-11	**2,200**	**2,500**	**12**	*<0.5*	**44**	**2.2**	**58.2**	*<2.0*
42	Mar-12	**1,300**	**1,200**	**8.7**	*<0.5*	**29**	*<0.5*	**37.7**	*<2.0*
43	Sep-12	**2,400**	**1,800**	**7.7**	*<0.5*	**29**	*<0.5*	**36.7**	*<2.0*
44	Mar-13	**1,500**	**1,900**	**4.8**	*<0.5*	**22**	*<0.5*	**26.8**	*<2.0*
45	Oct-13	**3,000**	**1,600**	**14**	*<0.5*	**35**	*<0.5*	**49**	*<2.0*
46	Dec-13	**2,500**	**2,000**	*<0.5*	**13**	*<0.5*	**0.68**	**13.7**	*<2.0*
47	Mar-14	**3,000**	**2,800**	**13**	*<0.5*	**34**	*<0.5*	**47.0**	*<2.0*
48	Jun-14	**2,300**	**1,400**	**6**	*<0.5*	**20**	**6.1**	**32.1**	*<2.0*
49	Sep-14	**190**	**3,400**	**6.8**	*<0.5*	***26***	*<0.5*	**32.8**	**3.7**
50	Mar-15	**1,300**	**1,500**	*<0.5*	*<0.5*	**8.4**	*<0.5*	**8.4**	*<2.0*
51	Sep-15	**2,500**	**1,800**	*<0.5*	*<0.5*	**25**	*<0.5*	**25.0**	*24.0*
52	Dec-15	**3,100**	**1,600**	*<0.5*	*<0.5*	**30**	*<0.5*	**30.0**	*<2.0*
53	Mar-16	**720**	**610**	*<0.5*	*<0.5*	**6.1**	*<0.5*	**6.1**	*<2.0*
54	Sep-16	**1,500**	**1,500**	*<0.5*	*<0.5*	**11**	**0.62**	**11.6**	*<2.0*
55	Mar-17	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
56	Sep-17	**730**	**340**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	0.56

Well MW-12									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	Dec-05	**1,300**	**700**	*< 0.5*	*< 0.5*	**33**	**5.6**	**39**	*< 2.0*
2	Mar-06	**1,100**	**540**	*<0.5*	*<0.5*	**8.5**	**1.5**	**10**	**49**
3	Jun-06	**680**	**400**	*<0.5*	*<0.5*	**5.8**	**1.4**	**7.2**	*< 2.0*
4	Sep-06	**910**	**480**	*<0.5*	*<0.5*	**9.9**	**1.5**	**11.4**	**21**
5	Dec-06	**770**	**230**	*< 0.5*	*< 0.5*	**7.4**	**2.0**	**9.4**	*< 2.0*
6	Mar-07	**390**	**110**	*< 0.5*	*< 0.5*	**1.7**	**1.7**	**3.4**	*< 2.0*
7	Jun-07	**590**	**280**	*<0.5*	*<0.5*	**4.5**	**0.9**	**5.4**	*<2.0*
8	Sep-07	**390**	**180**	*<0.5*	*<0.5*	**2.4**	**2.4**	**4.8**	*<2.0*
9	Dec-07	**210**	**140**	*<0.5*	*<0.5*	**2.1**	**1.3**	**3.4**	*<2.0*
10	Mar-08	**720**	**500**	*<0.5*	**4.4**	**9.0**	**2.8**	**16.2**	*<2.0*
11	Jun-08	**220**	**50**	*<0.5*	*<0.5*	**2.0**	*<0.5*	**2.0**	*<2.0*
12	Sep-08	**370**	**95**	*<0.5*	*<0.5*	**2.8**	**0.98**	**3.8**	*<2.0*
13	Dec-08	**93**	**170**	*<0.5*	*<0.5*	**0.76**	*<0.5*	**0.8**	*<2.0*
14	Mar-09	**180**	**130**	*<0.5*	*<0.5*	**1.70**	*<0.5*	**1.7**	*<2.0*
15	Jun-09	**300**	**280**	*< 0.5*	*< 0.5*	**4.60**	*< 0.5*	**4.6**	*<2.0*
16	Sep-09	**330**	**270**	*<0.5*	*<0.5*	**2.30**	*<0.5*	**2.3**	*<2.0*
17	Dec-09	**76**	**170**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.0	*<2.0*
18	Mar-10	**240**	**380**	*<0.5*	*<0.5*	**2.7**	*<0.5*	**2.7**	*<2.0*
19	Jun-10	**540**	**370**	*<0.5*	*<0.5*	**3.5**	**0.92**	**4.4**	**7.9**
20	Sep-10	**380**	**220**	*<0.5*	*<0.5*	**1.7**	*<0.5*	**1.7**	**8**
21	Dec-10	**320**	**350**	*<0.5*	*<0.5*	**1.5**	*<0.5*	**1.5**	**3.9**
22	Mar-11	**290**	**450**	*<0.5*	**0.74**	**1.3**	*<0.5*	**2.0**	**11**
23	Sep-11	**530**	**340**	*<0.5*	*<0.5*	**2.2**	*<0.5*	**2.2**	*<2.0*
24	Mar-12	**410**	**240**	*<0.5*	*<0.5*	**1.9**	*<0.5*	**1.9**	*<2.0*
25	Sep-12	**340**	**210**	*<0.5*	*<0.5*	**1.1**	*<0.5*	**1.1**	*<2.0*
26	Mar-13	**430**	**200**	*<0.5*	*<0.5*	**1.2**	*<0.5*	**1.2**	**7.1**
27	Oct-13	**350**	**200**	*<0.5*	*<0.5*	**0.92**	*<0.5*	**0.92**	*<2.0*
28	Dec-13	**290**	**210**	*<0.5*	*<0.5*	**0.68**	*<0.5*	**0.68**	**2.5**
29	Mar-14	*<50*	**62**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	**2.8**
30	Jun-14	**2,300**	**190**	*<0.5*	*<0.5*	**0.65**	*<0.5*	**0.65**	*<2.0*
31	Sep-14	**2,500**	**130**	*<0.5*	**6.8**	**26**	*<0.5*	**32.8**	*<2.0*
32	Mar-15	*<50*	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
33	Sep-15	*<50*	**91**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
34	Dec-15	*<50*	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*2.1*
35	Mar-16	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
36	Sep-16	*<50*	**58**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0*
55	Mar-17	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	2.2
56	Sep-17	*<50*	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<0.5*

HISTORICAL SURFACE WATER ANALYTICAL RESULTS
REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA
(all concentrations in ug/L, equivalent to parts per billion [ppb])

Surface Water Sampling Location SW-1 (Upstream of Contaminated Groundwater Discharge Location SW-2)

Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Feb-94	**50**	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
2	May-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
3	May-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
4	Aug-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
5	Dec-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
6	Feb-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
7	Aug-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
8	Dec-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
9	Feb-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*NA*
10	Sep-98	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*
11	Apr-99	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	—	*< 2.0*

Sampling at this location discontinued after April 1999 with Alameda County Health Services Agency approval.

Surface Water Sampling Location SW-2 (Area of Historical Contaminated Groundwater Discharge)

Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Feb-94	**130**	*< 50*	**1.9**	*< 0.5*	**4.4**	**3.2**	**9.5**	*NA*
2	May-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
3	Aug-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
4	May-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
5	Aug-96	**200**	*< 50*	**7.5**	*< 0.5*	**5.4**	*< 0.5*	**13**	*NA*
6	Dec-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
7	Feb-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
8	Aug-97	**350**	**130**	**13**	**0.89**	**19**	**11**	**44**	*NA*
9	Dec-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
10	Feb-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*NA*
11	Sep-98	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
12	Apr-99	**81**	*<50*	**2.0**	*< 0.5*	**2.5**	**1.3**	**5.8**	**2.3**
13	Dec-99	**1,300**	**250**	**10**	**1.0**	**47**	**27**	**85**	**2.2**
14	Sep-00	**160**	**100**	**2.1**	*< 0.5*	**5.2**	**1.9**	**9.2**	**3.4**
15	Jan-01	*< 50*	*< 50*	*< 0.5*	*< 0.5*	**0.53**	*< 0.5*	**0.5**	*< 2.0*
16	Apr-01	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
17	Sep-01	**440**	**200**	**2.1**	*< 0.5*	**17**	**1.3**	**20**	**10**
18	Dec-01	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*

SW-2 Continued

Surface Water Sampling Location SW-2 (Area of Historical Contaminated Groundwater Discharge)									
19	Mar-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
20	Jun-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
21	Sep-02	**220**	**590**	**10**	*< 0.5*	**13**	*< 0.5*	**23**	*< 2.0*
22	Dec-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
23	Mar-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	**0.56**	*< 0.5*	**0.56**	**2.8**
24	Jun-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*<0.5*	*< 2.0*
25	Sep-03	**190**	**92**	**2.1**	*< 0.5*	**4.2**	*< 0.5*	**6.3**	*< 2.0*
26	Dec-03	**86**	*< 100*	*< 0.3*	*< 0.3*	*< 0.3*	*< 0.6*	*<0.6*	*< 5.0*
27	Mar-04	*<50*	*<100*	*<0.3*	*<0.3*	**1.1**	*<0.6*	**1.1**	*< 5.0*
28	Jun-04	*<50*	*<50*	*<0.5*	*<0.5*	**0.83**	*<0.5*	**0.83**	*< 2.0*
29	Sep-04	**260**	**370**	**4.4**	*<0.5*	**6.3**	*< 1.0*	**11**	*< 2.0*
30	Dec-04	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*1.0*	*< 2.0*
31	Mar-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
32	Jun-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
33	Sep-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
34	Dec-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
35	Mar-06	*<50*	**62**	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
36	Jun-06	*<50*	**110**	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
37	Sep-06	**62**	**94**	*<0.5*	*<0.5*	**0.81**	*<0.5*	**0.8**	*< 2.0*
38	Dec-06	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
39	Mar-07	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
40	Jun-07	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<1.0*	*<2.0*
41	Sep-07	*<50*	**77**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	<1.0	*<2.0*
42	Dec-07	**130**	**430**	*<0.5*	*<0.5*	**1.5**	*<0.5*	**1.5**	*<2.0*
43	Mar-08	*<50*	**130**	*<0.5*	*<0.5*	*<0.5*	**0.61**	**0.61**	*<2.0*
44	Jun-08	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
45	Sep-08	**530**	**690**	*<0.5*	*<0.5*	**4.3**	*<0.5*	**4.3**	*<2.0*
46	Dec-08	*<50*	**83**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*

SW-2 Continued

Surface Water Sampling Location SW-2 (Area of Historical Contaminated Groundwater Discharge)									
47	Mar-09	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<1.0*	*<2.0*
48	Jun-09	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
49	Sep-09	**110**	**220**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
50	Dec-09	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
51	Mar-10	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
52	Jun-10	*<50*	**240**	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
53	Sep-10	*<50*	**66**	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
54	Dec-10	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*NA*
55	Mar-11	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*NA*
56	Sep-11	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*NA*
57	Mar-12	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
58	Sep-12	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
59	Mar-13	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
60	Oct-13	*<50*	**930**	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	**4.8**
61	Mar-14	*<50*	<49	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
62	Sep-14	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
63	Mar-15	*<50*	<51	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
64	Sep-15	*NS*	NS	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
65	Mar-16	*<50*	<50	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
66	Sep-16	*NS*	NS	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
67	Mar-17	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*2.8 b*
68	Sep-17	*NS*	NS	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*

Surface Water Sampling Location SW-3 (Downstream of Contaminated Groundwater Discharge Location SW-2)									
Event	**Date**	**TVHg**	**TEHd**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Total BTEX**	**MTBE**
1	May-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
2	Aug-95	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
3	May-96	*< 50*	**74**	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
4	Aug-96	**69**	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
5	Dec-96	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
6	Feb-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
7	Aug-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
8	Dec-97	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
9	Feb-98	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*NA*
10	Sep-98	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
11	Apr-99	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
12	Dec-99	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
13	Sep-00	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
14	Jan-01	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
15	Apr-01	*< 50*	*<50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
16	Sep-01	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*< 0.5*	*NS*
17	Dec-01	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
18	Mar-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
19	Jun-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	**2.4**
20	Sep-02	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
21	Dec-02	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
22	Mar-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
23	Jun-03	*< 50*	*< 50*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	*< 2.0*
24	Sep-03	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
25	Dec-03	**60**	*< 100*	*< 0.3*	*< 0.3*	*< 0.3*	*< 0.6*	*<0.6*	*< 5.0*
26	Mar-04	*<50*	*<100*	*<0.3*	*<0.3*	*<0.6*	*<0.6*	*<0.6*	*< 5.0*
27	Jun-04	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
28	Sep-04	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
29	Dec-04	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*

SW-3 Continued

Surface Water Sampling Location SW-3 (Downstream of Contaminated Groundwater Discharge Location SW-2)									
30	Mar-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
31	Jun-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
32	Sep-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
33	Dec-05	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
34	Mar-06	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
35	Jun-06	*<50*	**120**	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
36	Sep-06	*<50*	**120**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*0.5*	**7.8**
37	Dec-06	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	*< 2.0*
38	Mar-07	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*< 1.0*	*<1.0*	**3.3**
39	Jun-07	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*0.5*	*<2.0*
40	Sep-07	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
41	Dec-07	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
42	Mar-08	*<50*	**200**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
43	Jun-08	*<50*	**55**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
44	Sep-08	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
45	Dec-08	*<50*	**360**	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<2.0*
46	Mar-09	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*0.5*	*<2.0*
47	Jun-09	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<2.0*
48	Sep-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
49	Dec-09	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
50	Mar-10	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
51	Jun-10	*<50*	*<50*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<0.5*	*<2.0*
52	Sep-10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
53	Dec-10	*<50*	*<50*	*<0.5*	**0.57**	*<0.5*	**0.81**	**1.4**	*NA*
54	Mar-11	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*NA*
55	Sep-11	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*NA*
57	Mar-12	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
58	Sep-12	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
59	Mar-13	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*<0.5*	*<2.0*
60	Oct-13	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
61	Mar-14	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
62	Sep-14	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
63	Mar-15	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
64	Sep-15	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
65	Mar-16	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
66	Sep-16	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
67	Mar-17	*<50*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<2.0 b*
68	Sep-17	*<50*	*<49*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0	*<0.5*

NS = Not Sampled (no surface water present during sampling event)

ATTACHMENT C

Bio-Remedial Product MSDS

Nutrisulfate™
Bioremediation Nutrient

Section 1: Chemical Product and Company Identification

Product Name: Sulfate Enhanced Yeast Fermentation Product
Catalog Codes: Nutrisulfate™
CAS#:
TSCA: NA
HMIS Code: NA
Trade Name and Synonyms: Nutrisulfate™, Nutrimens-SEB™, Nutrimens™ Hydrocarbons – Liquid

Chemical Family: Yeast & Magnesium sulfate (magnesium sulphate)
Contact Information:
Tersus Environmental, LLC
109 E. 17th Street, Suite #3880
Cheyenne, WY 82001
Ph: 307.638.2822 • info@tersusenv.com
www.tersusenv.com
For emergency assistance, call: 919.638.7892

Section 2: Composition and Information on Ingredients

COMPONANT	%	CAS #	OSHA TWA	OSHA STEL	ACGIH TWA	ACGIH STEL
Yeast Fermentation Product	9 to 10		---	---	---	---
Magnesium Sulfate Solution (MgO_4S; magnesium sulfate)	Balance	7487 – 88 – 9	---	---	---	---

HAZARDOUS INGREDIENTS: NONE AS DEFINED UNDER THE U.S. OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) OR THE CANADIAN HAZARDOUS PRODUCTS. ACT S.C. 1987, C.30 (PART 1).

SARA HAZARD: NONE NOTED (SECTION 311/312) TITLE III SECTION 313 - NOT LISTED
All components of this product are listed on the TSCA registry.

Section 3: Physical/Chemical Characteristics

Boiling Point .....212 degrees F
Vapor Pressure (mmg Hg)..... N/A
Vapor Density (AIR = 1) .....N/A
Solubility in Water..... dispersible
Appearance and Odor.....brown liquid, yeast aroma
Specific Gravity (H_2O = 1) ..... varies by concentration & temperature
Melting Point.....N/A
Evaporation Rate .....N/A
(Butyl Acetate = 1)

Section 4: Fire and Explosion Data

FLASH POINT (METHOD USED) ..... N/A
FLAMMABLE LIMITS..... N/A
LEL..... N/A
UEL..... N/A
EXTINGUISHING MEDIA ..... none
SPECIAL FIRE FIGHTING PROCEDURES ..... none
UNUSUAL FIRE FIGHTING HAZARDS ..... none

Section 5: Reactivity Data

STABILITY: Generally stable.
HAZARDOUS POLYMERIZATION: Will not occur.

Section 6: Health Hazard Data

Based on specific concentration as sold

ROUTE(S) OF ENTRY: Inhalation

HEALTH HAZARDS (ACUTE AND CHRONIC)..... Respiring yeast generates carbon dioxide. Over exposure to carbon dioxide gas may cause asphyxiation.

CARCINOGENICITY: ..... No

NPT..... No

OSHA REGULATED..... No

SIGNS AND SYMPTIONS OF EXPOSURE ..... Over exposure to carbon dioxide include: stupor, dizziness, unconsciousness, death.

MEDICAL CONDITIONS GENERALLY AGGRAVATED
BY EXPOSURE ..... None known for this product. Over exposure to carbon dioxide may aggravate certain medical conditions.

EMERGENCY AND FIRST AID PROCEDURES ..... If exposed to carbon dioxide, move to fresh air. Give respiratory support if needed. Seek medical attention.

Eye contact: Causes mild irritation to the eyes.

Skin contact: No known adverse effects.

Inhalation: Causes nausea, vomiting, abdominal cramps, and diarrhea.

Ingestion: Causes nausea, vomiting, abdominal cramps, and diarrhea.

Chronic hazards: No known chronic hazards. Not listed by NTP, IARC or OSHA as a carcinogen.

Physical hazards: Spilled material can be slippery

Section 7: Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Conventional cleanup

WASTE DISPOSAL METHOD: In accordance with Federal, State and Local regulations

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store in a cool area.

OTHER PRECAUTIONS: None

Section 8: Control Measures

RESPIRATORY PROTECTION (SPECIFY TYPE): Confined spaces that held yeast fermentation product could potentially contain carbon dioxide gas. Use NIOSH/MSHA approved self-contained breathing apparatus or supplied respirator if oxygen content below 19%. Use in accordance with 29 CFR 1901.134

IS RESPIRATORY PROTECTION NECESSARY: UNNECESSARY IF VENTILATION IDENTIFIED BELOW IS USED

VENTILATION LOCAL EXHAUST: Use adequate mechanical ventilation.

PROTECTIVE GLOVES: Work Type

EYE PROTECTION: Safety glasses a good practice

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: None

HYGENIC PRACTICES: Good manufacturing practices

PROTECTIVE CLOTHING UNNECESSARY IF OTHER CONTROL MEASURES ARE USED

Section 9: Disclaimer and/or Comments

We suggest that containers be either professionally reconditioned for re-use by certified firms or properly disposed of by certified firms to help reduce the possibility of an accident. Disposal of containers should be in accordance with applicable federal, state and local laws and regulations. "Empty" drums should not be given to individuals.

The conditions of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Tersus Environmental be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Tersus Environmental has been advised of the possibility of such damages.