SECOND FIVE-YEAR REVIEW REPORT

PEMACO SUPERFUND SITE

LOS ANGELES COUNTY, CALIFORNIA

Prepared by

US Army Corps of Engineers, Seattle District

for

U.S. Environmental Protection Agency

Region IX

San Francisco, California

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September 22, 2015

John Lyons, Acting Assistant Division Director

Superfund Site Cleanup Branch

U.S. Environmental Protection Agency, Region 9

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EXECUTIVE SUMMARY

This is the second Five-Year Review (FYR) of the Pemaco Superfund Site (Site) located in Maywood, California within southeast Los Angeles County. The purpose of this FYR is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this FYR was the signing of the previous FYR on September 30, 2010.

The Site is comprised of 1.4 acres located in a former mixed industrial and residential neighborhood. Pemaco, Inc. operated as a custom chemical blender from the 1940s until 1991 when the site was abandoned. A wide variety of chemicals were used on site including chlorinated and aromatic solvents, flammable liquids, oils, and specialty chemicals.

The Record of Decision (ROD) was signed on January 13, 2005. Pursuant to the ROD, remedial actions have been implemented at the Site to treat and remove contaminants (volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], non-halogenated volatile organic compounds [NHVOCs], and metals) from soil and groundwater. The remedy addresses three zones of contamination:

1. surface and near-surface soil remediation zone (0 – 3 feet below ground surface [bgs]);
2. upper vadose-zone soil and perched groundwater (3 – 35 feet bgs); and
3. lower vadose-zone soil and Exposition Zone groundwater (65 to 175 feet bgs).

The ROD selected a multi-component remedy to treat each of the three remediation zones. For surface and near-surface soils, the ROD specified soil capping and limited hot spot removal. For upper vadose-zone soils and perched groundwater, the ROD specified High-Vacuum, Dual-Phase Extraction (HVDPE) to capture and treat contaminated groundwater and soil vapors. For the lower vadose-zone soils and Exposition Zone groundwater, the ROD specified thermal treatment with Electrical Resistance Heating (ERH) in the area where soil and groundwater had the highest levels of contamination, coupled with HVDPE. In addition, a groundwater extraction and treatment system was installed.

The ROD also prohibited residential use of the Pemaco property through zoning and the use of a deed restriction. It further stated that hazardous wastes remained at the Site at levels unsuitable for unrestricted land use, and that additional institutional controls may be required in the form of a State of California Land Use Covenant with the City of Maywood. The City of Maywood has issued a zoning change on its maps to identify the area as *"park"* land. In addition, the City of Maywood and the California Department of Toxic Substances Control (DTSC) have not entered into a Land Use Covenant to permanently change the site's land use to recreational. U.S. EPA sent a draft Land Use Covenant to both parties during April 2015 and the agency is still waiting for comments from both parties.

The remedy for soil was partially completed in July 2005 with the emplacement of soil cover over all but the former ERH area. The former ERH area has not yet been capped or revegetated, but it is fenced and excludes human receptors. Soil cover with revegetation or fencing is protective of human exposure by direct contact.

The groundwater remedy (extraction system) began operating in April 2007 and is effectively treating groundwater to discharge standards. However, the groundwater remedial action objectives (RAOs) are not being met because groundwater has not been restored to beneficial use. There have been increasing levels of contamination in all five hydrogeologic zones (A through E) since 2011 and the full lateral and vertical extent of trichloroethylene (TCE) contamination has not been fully delineated. The A and B zones are not delineated to the north, the C zone is only delineated to the east, and the D zone is only delineated to the northwest. Several wells in both the perched zone and the A zone (southern) were dry during the last sampling event, so a true evaluation of the remaining contamination could not be performed.

Although the indoor air RAO (remediation of groundwater to drinking water standards) is not being met the indoor air risk has been addressed. Periodic investigation of indoor air concentrations, and/or soil sentry probe sampling has shown there is no risk to the residents living in the area.

There have been changes to the Applicable or Relevant and Appropriate Requirements (ARARs) and toxicity data for some compounds in soil and groundwater since the first FYR; however, the changes do not affect protectiveness. Land use has not changed since the first FYR and the exposure assumptions and pathways are still valid.

The remedy at the Pemaco Superfund Site currently protects human health because exposure pathways to contaminated soil and groundwater are being controlled. However, in order for the remedy to be protective in the long-term, the following actions are necessary:

1. Investigation of the increasing trends of contaminant concentration in each aquifer and the evaluation of the effectiveness of the groundwater extraction and treatment system;
2. Identification of the full extent of contamination in each zone (onsite, off site and vertically);
3. Capping and revegetation of the ERH area; and
4. Finalization of a Land Use Covenant by DTSC, U.S. EPA and City of Maywood.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Pemaco Superfund Site		
U.S. EPA: CAD980737092		
Region: 9:	**State:** CA	**City / County:** Maywood / Los Angeles County

SITE STATUS	
NPL Status: Final	
Multiple OUs? ☐ Yes ☑ No	Has the site achieved construction completion? ☑ Yes ☐ No

REVIEW STATUS
Lead Agency: U.S. EPA **If "*Other Federal Agency*" was selected above, enter Agency name:** [Click here to enter text]
Author name (Federal or State Project Manager): Rose Marie Caraway
Author Affiliation: U.S. EPA
Review period: September 9, 2014 – September 4, 2015
Date of Site Inspection: December 2, 2014
Type of Review: Statutory
Review Number: 2
Triggering Action Date: September 30, 2015
Due Date (*Five years after triggering action data*): September 30, 2015

ISSUES / RECOMMENDATIONS

OU(s) without Issues / Recommendations Identified in the Five-Year Review:

None

Issues and Recommendations Identified in the Five-Year Review:

OU(S):	**Issue Category:** Institutional Controls			
Groundwater and Soil	**Issue:** DTSC, U.S. EPA, and the City of Maywood have not finalized a Land Use Covenant to permanently change the site's land use to recreational. The City of Maywood has issued a zoning change on its maps to identify the area as "park" land. This IC has not yet been completed. U.S. EPA sent a draft Covenant to the parties during April 2015.			
	Recommendation: The DTSC, U.S. EPA, and the City of Maywood should finalize the draft Land Use Covenant to permanently change the site's land use to recreational.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	State	U.S. EPA	September 30, 2015

OU(s): Groundwater	**Issue Category:** Remedy Performance			
	Issue: Contaminants of concern in four hydrogeological zones (A,B, C, and D) have shown that some wells have been increasing in concentration since 2011.			
	Recommendation: An investigation and evaluation of the increasing concentrations of COCs needs to continue. This includes evaluating the effectiveness of the extraction and treatment system and investigating the possibility of an unknown source contributing to the increasing concentrations (additional field sampling will be required).			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	U.S. EPA	U.S. EPA	September 30, 2016
OU(s): Groundwater	**Issue Category:** Remedy Performance			
	Issue: The increasing concentrations in some of the wells and the possibility of an unknown source has caused the full extent of contamination to be uncertain on site, off site and vertically because additional monitoring wells need to be installed. CPT work conducted during December 2014 indicate that additional work will be required. The A and B zones are not delineated to the north, the C zone is only delineated to the east, and the D zone is only delineated to the northwest.			
	Recommendations: The groundwater monitoring program should be expanded to delineate the extent of contamination (installation of additional wells and groundwater sampling) in all aquifer zones.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	U.S. EPA	U.S. EPA	September 30, 2016
OU(s) Soil	**Issue Category:** Remedy Performance			
	Issue: The ERH Area has not been capped and revegetated			
	Recommendation: Cap and revegetate the ERH area			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	U.S. EPA	U.S. EPA	September 30, 2016

SITEWIDE PROTECTIVE STATEMENT

For sites that have achieved construction completion, enter a site wide protectiveness determination and statement.

Protectiveness Determination:	Addendum Due Date (*if applicable*):
Short-term Protective:	[Click here to enter date]

Protectiveness Statement: The remedy at the Pemaco Superfund Site currently protects human health because exposure pathways to contaminated soil and groundwater are being controlled. However, in order for the remedy to be protective in the long-term, the following actions are necessary: (1) investigation of the increasing trends of contaminant concentration in each aquifer and the evaluation of the effectiveness of the groundwater extraction and treatment system; (2) identification of the full extent of contamination in each zone (onsite, off site and vertically); (3) capping and revegetation of the ERH area; and (4) finalization of a Land Use Covenant by DTSC, U.S. EPA and City of Maywood.

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ACRONYMS AND ABBREVIATIONS

AST	above ground storage tank
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act CFR
CFR	Code of Federal Regulations
COCs	contaminants of concern
CRWQCB	California Regional Water Quality Control Board DAF
DAF	dilution attenuation factor
DTSC	California Department of Toxic Substances Control EPA
ERH	electrical resistance heating
EWE	excavation worker exposure
FS	Feasibility Study
FTO	flameless thermal oxidation
FYR	Five-Year Review
GAC	granular activated carbon
HRS	Hazard Ranking System
HVDPE	High-vacuum dual-phase extraction
HWCD	Los Angeles County Fire Department, Hazardous Waste Control Department
IC	Institutional Control
IRIS	Integrated Risk Information System
J	result is an estimated value
LACSD	Los Angeles County Sanitary District
LARWQCB	Los Angeles Regional Water Quality Control Board
MCL	Maximum Contaminant Level
MIBK	methyl isobutyl ketone
NCP	National Contingency Plan
NHVOC	non-halogenated volatile organic compound
NPL	National Priorities List
O&F	operational and functional
O&M	operation and maintenance
OM&M	operation maintenance and monitoring
OSTRI	Office of Superfund Remediation and Technology Innovation

OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbons
PCE	perchloroethylene
PRG	Preliminary Remediation Goal
RA	remedial action
RAOs	Remedial Action Objectives
RD	Remedial Design
RfD	oral reference dose
RI	Remedial Investigation
ROD	Record of Decision
RSLs	Regional Screening Levels
RPM	Remedial Project Manager
SSL	soil screening level
SSRL	site-specific remediation level
SVE	soil-vapor extraction
SVOC	semi-volatile organic compound
TCE	trichloroethylene
U.S. EPA	Environmental Protection Agency
UST	underground storage tank
UV	Ultraviolet
UV-Ox	ultraviolet oxidation
VC	vinyl chloride
VE	vacuum enhanced
VOC	volatile organic compounds

1.0 INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of FYRs are documented in FYR reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (U.S. EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Contingency Plan (NCP). CERCLA 121 states:

> *"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment is being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."*

U.S. EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> *"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action."*

U.S. EPA Region 9 conducted the FYR and prepared this report regarding the remedy implemented at the Pemaco Superfund Site (also referred to as "the Pemaco Site" or "the Site") in Maywood, Los Angeles County, California. U.S. EPA is the lead agency for developing and implementing the remedy for the Site. California Department of Toxic Substances Control (DTSC), as the support agency representing the State of California, has reviewed all supporting documentation and provided input to U.S. EPA during the FYR process.

This is the second FYR for the Pemaco Superfund Site. The triggering action for this statutory review is the signing of the first FYR on September 30, 2010. The FYR is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

The Site consists of one Operable Unit (OU) for soil and groundwater. The remedy addresses three zones of contamination within the OU:

- Surface and near-surface soil remediation zone (0-3 feet below ground surface [bgs]);
- Upper vadose-zone soil and perched groundwater (3-35 feet bgs); and
- Lower vadose-zone soil and Exposition Zone groundwater (65-175 feet bgs).

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2.0 SITE CHRONOLOGY

Table 2-1 lists the dates of important events for the Pemaco Superfund Site.

Table 2-1 Chronology of Site Events

Event	Date
Environmental investigation performed by site owner to investigate potential leakage from tanks.	December 1990
Initial complaint to Los Angeles County Fire Department. It was determined by the responding health officers that the site was an imminent danger to human health.	May 28, 1992
Emergency response by the Los Angeles County Fire Department. A fire occurred on site, destroying the warehouse building and some materials inside.	December 12, 1993
U.S. EPA-initiated removal action U.S. EPA secured the site after the fire by removing 6 drums, verified that all storage tanks were empty, grouted an unmarked borehole, and attached locking caps to each standpipe.	December 1993
U.S. EPA completes Preliminary Assessment/Site Investigation. Pemaco Site entered into CERCLIS as Site CAD980737092.	June 1995
U.S. EPA conducts additional site characterization as part of the Expanded Site Investigation and evaluates Hazard Ranking System (HRS) Factors.	February to May 1997
Underground/aboveground storage tank (UST/AST) removal begins. All USTs and ASTs are removed in preparation for installation of a soil-vapor extraction (SVE) system. Buildings demolished.	August 25, 1997
SVE system used to treat volatile organic compound (VOC)-contaminated soil in the northeastern area of the site (now Maywood Riverfront Park).	March 1998
Site added to National Priorities List (NPL) based on the previous studies.	January 19, 1999
U.S. EPA conducts Remedial Investigation/Feasibility Study (RI/FS).	January 2000 to March 2002
U.S. EPA installs additional, deeper monitoring wells and conducts additional indoor air sampling in neighborhood surrounding the site.	March to August 2003
Record of Decision (ROD) is signed.	January 13, 2005
Maywood Riverfront Park constructed in conjunction with the Trust for Public Land and other agencies. Park construction included removal of several hot spots along the northern edge of the Pemaco property, along with capping, grading, and revegetation.	March 2005 to 2006
Hot Spot Removal Action in the northeast corner of the Site during construction of the Maywood Riverfront Park. Removal is conducted by the City of Maywood with U.S. EPA oversight.	March 28, 2005
Remedial design report is finalized.	May 2005
Dual-phase extraction system construction begins.	August 26, 2005
Treatment system construction, including building of treatment plant, trenching, piping, and additional wells.	August 1, 2005, to April 23, 2007
Installation of Electrical Resistance Heating (ERH) electrodes begins.	October 2006
Groundwater extraction and treatment system complete and operational.	April 25, 2007
Vapor extraction and treatment system complete and operational.	May 4, 2007
ERH operation begins.	September 25, 2007
ERH shutdown.	April 10, 2008

Event	Date
Declaration remedy as Operational and Functional (O&F) by U.S. EPA.	August 28, 2008
2010 FYR signed by U.S. EPA.	September 30, 2010
U.S. EPA worked with Regional Water Quality Control Board to implement a Waste Discharge NPDES Permit, where the treated waste discharge was for Wastewater Reclamation. U.S. EPA proposed to use the treated groundwater from the Pemaco Superfund Site for landscape irrigation of approximately 3.45 acres of unpaved green space at the Maywood Riverfront Park.	October 2011 to June 13,2012
Groundwater and vapor extraction and treatment system shut down due to expiration of Los Angeles County Sanitary District (LACSD) discharge permit.	April 21, 2012
Groundwater and vapor extraction and treatment system restarted under temporary 1-month LACSD discharge permit to conduct tests of pre-treatment and other options and to enhance 1,4-dioxane removal efficiency.	August 7, 2012
Temporary LACSD discharge permit expires. Groundwater and vapor extraction and treatment system shut down.	September 7, 2012
Letter from Regional Water Quality Control Board to U.S. EPA and the City of Maywood concurring with the proposed discharge of treated groundwater for landscape irrigation at the Park provided all conditions of the WDR related ARARS are met. U.S. EPA subsequently decided not to move forward with water reclamation and continued release of the water to the LA County Sanitation District.	November 9, 2012
LACSD approves new 5-year discharge permit.	February 27, 2013
Groundwater extraction and treatment system is fully operational under new LACSD discharge permit.	April 1, 2013
Vapor extraction and treatment system is re-started.	November 19, 2013
The Los Angeles Unified School District Coordinates with the City of Maywood to export the large soil piles from the southwest corner of 60th Street and Walker Avenue. Approximately 7,000 cubic yards of soil removed from area adjacent to the Pemaco treatment plant.	January 30 2014 to February 5, 2014
ERH electrode wells, vapor recovery wells, and temperature monitoring points were decommissioned.	April 28, 2014 to November 19, 2014
Cone Penetration Testing (CPT) investigation of the areas to the north and west of the Pemaco Site to identify possible off-site contamination sources.	December 2014
U.S. EPA sent a draft Land Use Covenant to DTSC and City of Maywood.	April 2015
Sampling of five Sentry Soil Vapor probes located along 59th Place and Walker Avenue to confirm that VOCs were not migrating from the Pemaco Site.	July 15, 2015

3.0 BACKGROUND

3.1. PHYSICAL CHARACTERISTICS

The Pemaco Superfund Site is located at 5973 South District Boulevard in east Los Angeles County, in the City of Maywood, along the Los Angeles River (Figure 3-1). It is bounded to the north by Slauson Avenue. Residential and light industrial properties are located to the west and south, and the concrete- lined Los Angeles River lies to the east. The Site is currently within the Maywood Riverfront Park which is primarily open space with concrete walking paths. The Pemaco Site is comprised of approximately 4.1 acres. Construction of the park began in March 2005 and was completed in June 2006. The topography of the site is relatively flat, sloping from the Los Angeles River Bike Path to the east toward Walker Avenue in the west.

3.2. GEOLOGY/HYDROGEOLOGY

3.2.1. Local Geology/Hydrogeology

There are two distinct hydrogeologic units within the study area: a perched zone groundwater unit and the stratigraphic equivalent of the regional Exposition Aquifer. Site stratigraphy as it pertains to groundwater is summarized below.

Perched Zone: Groundwater in the perched zone is typically encountered between 20 and 40 feet bgs and occurs in semi-continuous and discontinuous lenses of poorly graded sand, silty sand, and sandy silt.

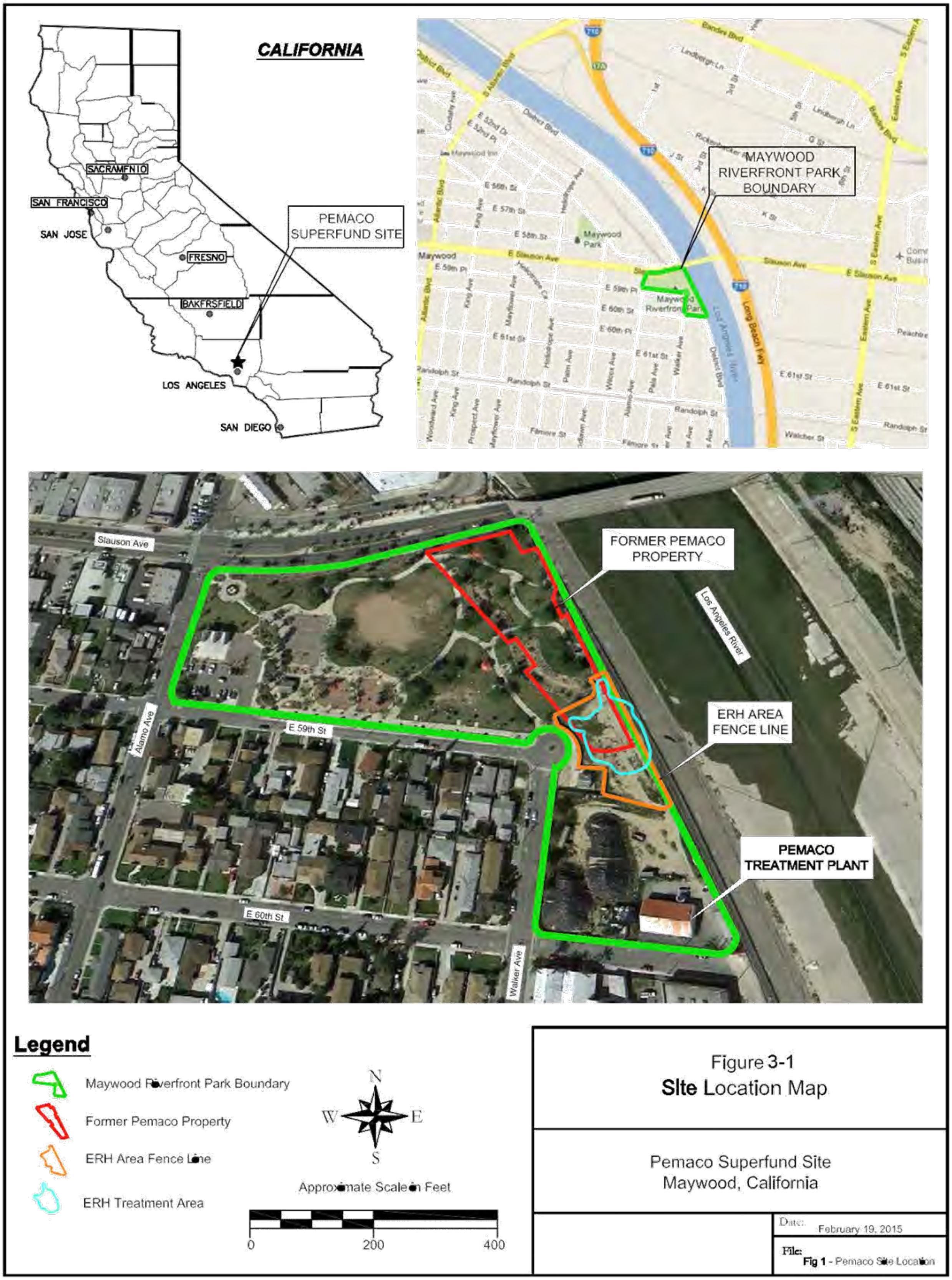
These lenses range from 5 inches to 5 feet in thickness. The geometry of the perched zone is controlled by the highly irregular and undulating top surface of the underlying, laterally extensive clay.

The complex hydrogeology of the perched zone causes highly variable groundwater gradients. The overall general component of apparent groundwater flow in the perched zone is towards the southwest, but there are many localized areas that indicate that the apparent groundwater flow is in multiple directions.

Exposition Zones: The Exposition zones include five distinct water-bearing intervals (A through E) that are typically encountered at depths between 65 and 175 feet bgs, and are separated by silt/clay intervals. The zones of concern at the Site are the A through D zones.

- **A Zone:** This zone is present from 65 to 75 feet bgs. It is comprised of fine silty and poorly graded sands locally interbedded with well-graded sands. The thickness of the zone ranges from 0.25 to 10 feet;
- **B Zone:** This zone is present from 80 to 90 feet bgs. It is comprised of fine silty sands, poorly graded sands, and poorly graded sands with silt. The thickness of the zone ranges from 1.5 to 10 feet;
- **C Zone:** This zone is present from 100 to 110 feet bgs. It is comprised of saturated dark greenish gray fine silty sands, poorly graded sands, and poorly graded sands with silt. The thickness of the zone ranges from 2 to 6 feet;
- **D Zone:** This zone is present from 125 to 145 feet bgs. It is comprised of interbedded fine silty sands, poorly graded sands, and poorly graded sands with silt, well-graded sands and gravelly sands, and local well-graded sandy gravel intervals. The thickness of the zone ranges from 6 to 15 feet; and

Figure 3-1 Location Map for the Pemaco Superfund Site



- **E Zone:** This zone is encountered between 160 and 175 feet bgs. It is comprised of alternating saturated intervals of 1-foot-thick fine silty sands and well-graded sands. The thickness of this unit has not been determined.

3.3. Land and Resource Use

The Pemaco Site has become fully incorporated into the Maywood Riverfront Park as part of the larger Los Angeles River Greenway program and the Los Angeles River Master Plan. The Park currently consists of soccer fields, basketball courts, a play area, native plant landscaping, and picnic areas. The land use maps show the Site zoned as park.

Municipal wells are located approximately 2,600 feet from the site to the north, approximately 4,000 feet from the site to the southwest, and 1,800 feet from the site to the south.

3.4. History of Contamination

Pemaco, Inc. is a former chemical blending and distribution facility that stored a wide variety of chemicals, including aromatic and chlorinated solvents, flammable liquids, specialty chemicals, and oils. These chemicals were stored in a combination of aboveground storage tanks (ASTs), underground storage tanks (USTs), and drums. Historically, the Pemaco facility consisted of a 22,000-square-foot warehouse in the northern portion of the property, and 31 USTs and at least 6 ASTs in the southern part of the property. Pemaco, Inc. operated on this site from the 1940s until April 1991, when the site was abandoned (Los Angeles County Report of Investigation, Biren 1992).

On May 28, 1992, the City of Maywood planning director filed a complaint with the Los Angeles County Fire Department, Hazardous Waste Control Department (HWCD) regarding abandoned drums, USTs, and ASTs on the Site. It was reported that 400 drums were abandoned on site, many of which were damaged, uncovered, leaking, or unlabeled (Report of Investigation, Biren 1992).

A fire broke out on December 12, 1993 at the site. This fire consumed the warehouse and several drums of unknown chemicals (HazMat Emergency Incident Report of 12/12/1993). The facility remained unsecured until December 15 through 21, 1993, when the U.S. EPA executed a removal action that included the following actions:

- Erecting a chain-link fence topped with razor wire;
- Grouting an unmarked borehole;
- Verifying that all storage tanks were empty;
- Securing all standpipes; and
- Removing six 55-gallon drums offsite.

Based on the initial response described below, the Pemaco Site was added to the National Priorities List (NPL) in January 1999.

3.5. Initial Response

An Emergency Site Assessment/Remedial Investigation of the Pemaco Site was conducted in 1997. The results of this investigation indicated that hazardous substances, as defined by CERCLA, including chlorinated and non-chlorinated VOCs, had been released into the groundwater. A layer of chlorinated and non-chlorinated VOCs ranging from 3 to 5 feet thick was found in the perched aquifer unit (Unilateral Administrative Order No. 97-13, U.S. EPA 1997).

A soil-vapor extraction (SVE) system was installed as an interim treatment method in 1997. It remained operational until 1998, when it was shut down due to concerns about dioxin emissions the SVE system may have produced as a byproduct of the thermal oxidation treatment system. By the time the SVE system was removed, it had treated over 90,000 pounds of hydrocarbons (Final Pemaco ROD, U.S. EPA 2005).

3.6. BASIS FOR TAKING ACTION

The perched zone groundwater under the Site is characterized as being of poor quality contained within a thin discontinuous aquifer with low transmissivity. The Exposition zone groundwater is classified by the Los Angeles Regional Water Quality Control Board (LARWQCB) as a potential drinking-water source. Therefore, the U.S. EPA used this classification in its reasonable-exposure assumption in its risk assessment.

Other beneficial uses for groundwater beneath the Pemaco Site include possible industrial applications, groundwater recharge, and freshwater replenishment.

The U.S. EPA examined several other exposure pathways as potential exposure routes. The potential exposure routes include the following; drinking the groundwater during residential use; inhaling the chemicals in the groundwater during use of groundwater; contact with contaminated surface soils via dermal, ingestion, and inhalation pathways; subsurface exposure from excavation work via dermal, ingestion, and inhalation pathways; and vapor intrusion from the subsurface by volatile chemicals.

Based on potential use of contaminated groundwater by future users, off-site migration of contaminated groundwater to existing users, potential direct contact with contaminated soils by Riverfront Park users, and the potential for soil-vapor intrusion into residences surrounding the site, the Pemaco Superfund Site was added to the NPL on January 19, 1999. A variety of contaminants of concern (COCs) were identified, including halogenated volatile organic compounds (HVOCs, primarily trichloroethylene (TCE), metals, and polycyclic aromatic hydrocarbons (PAHs).

4.0 REMEDIAL ACTIONS

4.1. REMEDY SELECTION

The ROD was signed on January 13, 2005. The 2005 ROD Remedial Action Objectives (RAOs) for the Pemaco Site are divided by media type as described below:

Soil RAOs

- Prevent human exposure (by direct contact) to contaminated soils having COCs in excess of soil applicable or relevant and appropriate requirements (ARARs) and standards that are protective of human health and the environment; and
- Prevent migration of COCs from soil to groundwater at levels that would exceed drinking water standards.

Groundwater RAOs

- Restore the groundwater quality in perched groundwater zone, and Exposition Zones to drinking water standards (MCLs);
- Prevent vertical migration of COCs from the perched groundwater and deeper Exposition Zones at rates that would cause groundwater to exceed drinking water standards;
- Prevent further offsite migration of contaminated groundwater beneath additional adjacent properties; and
- Prevent migration of contaminated groundwater to local production wells.

Indoor Air RAOs

- Remediate COCs in soil and groundwater to drinking water standards and other health based action levels to eliminate potential exposures to indoor air contaminants created by site contamination; and
- Prevent further migration of soil vapor in excess of ARARs and standards that are protective of human health and the environment.

The remedial action for the Pemaco Site addresses removal of contaminants from soil and groundwater and prevention of exposure through institutional controls (ICs). Since the subsurface geologic and hydrogeologic environments and contamination levels found at the Site are highly irregular and variable, U.S. EPA divided the site into three subsurface zones or "remediation zones" and assembled remedial alternatives by zone to develop an appropriate cleanup strategy for each individual zone. The remediation zones identified at the Pemaco Site are as follows:

- Surface and near surface soil remediation zone (0-3 feet bgs);
- Upper vadose zone soil and perched groundwater (3-40 feet bgs); and
- Lower vadose zone soil and Exposition Zone (A through E zones) groundwater (65-175 feet bgs).

The selected remedy for the Site is as follows:

- Surface and near-surface soil: Hot spot removal and soil cover/revegetation;
- Upper vadose zone soil and perched groundwater: High Vacuum Dual Phase Extraction (HVDPE) with ultraviolet (UV) oxidation for treatment of extracted groundwater, and flameless thermal oxidation (FTO) and granular activated carbon (GAC) for treatment of extracted vapors. (*Note that UV oxidation was never implemented because GAC treatment was sufficient.*);
- Lower vadose zone soil and Exposition Zone groundwater: Electrical Resistance Heating (ERH) with vacuum-enhanced groundwater extraction, groundwater extraction and treatment, and monitored natural attenuation (MNA). UV oxidation for treatment of extracted groundwater, and FTO and GAC for treatment of extracted vapors; and
- Institutional controls (ICs).

Based on comments received during the public comment period, the following activities were included as part of the remedy implementation:

- Indoor air sampling and additional vapor monitoring on Walker Avenue and 59th Street during remedial operations
- Vapor monitoring of the FTO unit. Dioxin and furans added to the list of analytes.
- Heat exchanger and a vapor phase carbon adsorption unit installed to the post-exhaust side of the FTO unit.
- *In-situ* oxidation and/or in-situ bioremediation polishing step to be implemented if the agency determines that it is necessary to augment treatment of the of the principal threat source area.

Site-specific remediation levels (SSRLs) for each zone are listed in Table 4-1.

Table 4-1 SSRLs Specified in the ROD

Zone	Contaminant of Concern (COC)	Site-Specific Remediation Levels[1] (IN BOLD)						
		ARARs[2]		10^{-6} Cancer Risk				
		Primary MCLs	Region IX PRGs (type of PRG)	Park User Exposure[3]		Excavation Worker Exposure[4]		Remediation Levels[5]
COCs found only in the Upper Vadose Zone	***VOCs (µg/kg)***							
	1,1-Dichloroethene	-	60 µg/kg	-		722 µg/kg	ca	**60 µg/kg**
	Acetone	-	16,000 µg/kg	-		-		**16,000 µg/kg**
	Ethylbenzene	-	13,000 µg/kg	-		-		**13,000 µg/kg**
	Tetrachloroethene	-	60 µg/kg	-		11,300 µg/kg	ca	**60 µg/kg**
	Toluene	-	12,000 µg/kg	-		-		**12,000 µg/kg**
	Xylenes (total)	-	210,000 µg/kg	-		-		**210,000 µg/kg**
	SVOCs (µg/kg)		DAF 20 SSL					
	Benzo (a) anthracene	-	2000 µg/kg	-		2,610 µg/kg	ca	**2,000 µg/kg**
	Benzo (a) pyrene	-	8,000 µg/kg	-		261 µg/kg	ca	**261 µg/kg**
	Benzo (b) fluoranthene	-	5,000 µg/kg	-		2,610 µg/kg	ca	**2,610 µg/kg**
Upper Vadose Zone	Carbazole	-	600 µg/kg	-		-		**600 µg/kg**
	Dibenzo (a,h) anthracene	-	2,000 µg/kg	-		762 µg/kg	ca	**762 µg/kg**
	Indeno (1,2,3-cd) pyrene	-	14,000 µg/kg	-		2,610 µg/kg	ca	**2,610 µg/kg**
	Isophorone	-	500 µg/kg	-		-		**500 µg/kg**
Both Upper and Lower Vadose Zone	***VOCs (µg/kg) DAF 20***		DAF 20 SSL					
	Benzene	-	30 µg/kg	-		-		30 µg/kg
	1,2-Dichloroethane	-	20 µg/kg	-		-		20 µg/kg
	cis-1,2-Dichloroethene	-	400 µg/kg	-		-		400 µg/kg
	Methylene chloride	-	20 µg/kg	-		-		20 µg/kg
	Trichloroethene	-	60 µg/kg	-		-		60 µg/kg
	Vinyl Chloride	-	10 µg/kg	-		-		10 µg/kg
	Metals (mg/kg) DAF 20		DAF 20 SSL					

Zone	Contaminant of Concern (COC)	Site-Specific Remediation Levels[1] (IN BOLD)						
		ARARs[2]		10^{-6} Cancer Risk				
		Primary MCLs	Region IX PRGs (type of PRG)	Park User Exposure[3]		Excavation Worker Exposure[4]		Remediation Levels[5]
	Chromium (total)	--	38 mg/kg	--		--		38 mg/kg
Perched Ground-water Zone	**VOCs (µg/L)**		Tap Water					
	1,1-Dichloroethane	5 µg/L	810/0.2 µg/L*	--		--		**5 µg/L**
	1,1,2-Trichloroethane	5 µg/L	**0.2 µg/L**	--		--		**5 µg/L** **0.60 µg/L[7]**
	Chloroethane	--	**4.6 µg/L**	--				**100 µg/L6**
	Ethylbenzene	300 µg/L	1300 µg/L	-				**300 µg/L**
	Toluene	**150 µg/L**	720 µg/L	-				**150 µg/L**
	NHVOCs (µg/L)		Tap Water					
	Acetonitrile (Coelute w/ MIBK)	-	100 µg/L	-		-		**100 µg/L**
	Methyl isobutyl ketone (MIBK)	-	2000 µg/L	-		-		**2000 µg/L**
	SVOCs (µg/L)		Tap Water					
	1,4-Dioxane	**3.0 µg/L****	6.1 µg/L	--		--		**3.0 µg/L****
	bis(2 Ethylhexyl)phthalate	**4 µg/L**	4.8 µg/L	--		--		**4 µg/L**
	Naphthalene***	-	6.2 µg/L	-		-		**6.2 µg/L**
	Metals (µg/L)		Tap Water					
	Chromium (total)	**50 µg/L**	--	--		--		**50 µg/L**
	Iron	--	**11,000 µg/L**	--		--		**11,000 µg/L**
	Lead	**15 µg/L****	--	--		--		**15 µg/L**** **5 µg/L7**
	Selenium	**50 µg/L**	180 µg/L	-		-		**50 µg/L**
	Manganese	-	**880 µg/L**	--		--		**880 µg/L**
	Thallium	**2 µg/L**	2.4 µg/L	--		--		**2 µg/L**
	Anions (µg/L)		Tap Water					

Zone	Contaminant of Concern (COC)	Site-Specific Remediation Levels[1] (IN BOLD)						
		ARARs[2]		10^{-6} Cancer Risk				
		Primary MCLs	Region IX PRGs (type of PRG)	Park User Exposure[3]		Excavation Worker Exposure[4]		Remediation Levels[5]
	Sulfide	--	110 µg/L#	--		--		110 µg/L 1 µg/L7

Notes:

1. Concentrations in bold represent SSRLs (most conservative of numbers 2 through 5).
2. Primary Maximum Contaminant Levels (MCLs) are based on the most conservative of the federal EPA and California Department of Health Services MCLs for drinking water. For groundwater COCs with no available MCLs, EPA Region IX Preliminary Remediation Goals (PRGs) were used. Subsurface soils were screened against Region IX PRGs Soil Screening Levels (SSLs) with Dilution Attenuation Factors (DAF). DAF 20 PRGs are used when the contaminated soil is not directly adjacent to a drinking water source and dilution of the contaminant is occurring before it reaches the drinking water source. DAF 1 PRGs assume that the contaminated soil is directly adjacent to a drinking water source and no dilution of the contaminant is occurring along the pathway between the source soil and the drinking water source.
3. Park user exposure scenario calculated at 10^{-6} cancer risk (from Maywood Riverfront Park, or MRP, Risk Assessment). Remediation levels are risk-based values developed during the Pemaco Baseline Risk Assessment. These levels are calculated by rearranging the equations used to calculate each COC's hazard quotient or incremental cancer risk so that the equations can be used to solve for a concentration that will result in target hazard indexes of 1.0 or a target cancer risk of 1E-06. Remediation goal options differ for each risk driver. Due to the numerous receptor scenarios, the most conservative goal was listed when COCs overlapped from one receptor to another.
4. Excavation worker exposure scenario calculated at 10^{-6} cancer risk (from MRP Risk Assessment).
5. DTSC recommended clean-up levels based on background or ambient levels in Los Angeles for arsenic are 10-12 mg/kg and for benzo(a)pyrene are 900 µg/kg.
6. California Regional Water Quality Control Board Los Angeles Region Waste Discharge Requirements for Los Angeles and Ventura Counties.
7. California Regional Water Quality Control Board Los Angeles Region Waste Discharge Requirements for Los Angeles and Ventura Counties. The discharge limit applies when water is extracted from the aquifer, treated, and discharged. The MCL or Federal Action Level applies for waters left in the groundwater aquifer.

µg/kg microgram per kilogram mg/kg: milligram per kilogram
µg/L microgram per liter ca: carcinogenic
nc noncarcinogenic

*State of California modified PRG
**California Department of Health Action Level, no available MCL
+ The value of lead is The EPA remediation goal for residential exposure
++ The lead value was derived using The Adult lead Model for non-residential exposure using parameters for a Mexican American Population
# 110 µg/L is the Region IX Tap Water PRG for hydrogen sulfide

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4.2. Remedy Implementation

The remedy implemented at the Pemaco site consists of the following:

- Soil capping;
- ERH to heat soils and groundwater in the most contaminated area of the site;
- HVDPE to extract contaminated groundwater and to remove contaminated vapors liberated by the heating in the ERH Area;
- HVDPE to extract contaminated groundwater from the upper vadose zone in areas at the Pemaco site outside the ERH Area and along 59th Place to intercept contaminated groundwater and soil vapors flowing toward the surrounding neighborhood;
- A treatment plant to treat contaminated groundwater and soil vapors; and
- Institutional controls to prevent future residential reuse of the site.

The ERH and HDVPE addressed contamination in the upper vadose zone, lower vadose zone, perched groundwater, and Exposition zone groundwater. Therefore, each component of the remedy is discussed in the sections that follow, rather than how the remedy was implemented in each of the three zones for which SSRLs were established.

4.2.1. Soil Capping

Soil capping was implemented in March 2005, during the construction of Maywood Riverfront Park. It included the removal of hot spots of soil contamination from six areas in the park. After contaminated soils were removed, a 1- to 3-foot-thick certified fill protective cover was placed over the majority of the park and it was vegetated (TN&A 2007a). A soil cover is protective of human exposure by direct contact and meets the RAOs. The ERH treatment area has not yet been capped or revegetated, but is enclosed by fencing, meeting the intent of the RAOs.

4.2.2. Electrical Resistance Heating System

Installation of the ERH system began in October 2006. The 58 ERH electrodes were installed between December 13, 2006 and February 20, 2007. The 58 electrodes heated the subsurface soils by using soil resistance to convert electrical energy to heat energy. Soils were heated to above the boiling point of water and the heating volatilized the contamination in the soil and groundwater, which was then collected by the vapor-recovery system. Extracted vapors were conveyed to the treatment plant via subsurface piping. Vapor monitoring points and temperature monitoring probes in and around the ERH allowed monitoring of soil vapor and temperatures in the ERH Area.

The ERH was active for 200 days, from September 25, 2007 to April 10, 2008. Following shutdown of the ERH, HVDPE continues to remove contaminated groundwater and vapor from the area. U.S. EPA recently removed all of the ERH electrodes and other wells utilized for this treatment process (November 2014 to January 2015) so that the land in this area could be developed and added into the existing Park when the City of Maywood has the funds to continue redevelopment.

4.2.3. Groundwater and Vapor Extraction System

The groundwater and vapor extraction system at the Pemaco Site consists of groundwater pumping wells, vapor extraction wells, and dual-phase extraction wells which are connected to subsurface piping that conveys the extracted groundwater and vapors to an on-site treatment plant.

The extraction system extends beyond the boundaries of the Pemaco Site to intercept contaminated groundwater and vapor before they reach the surrounding residential neighborhood. Construction commenced on August 26, 2005 with installation of the dual-phase extraction wells. Trenching, piping, and other construction activities followed.

Groundwater extraction: Groundwater extraction began on April 25, 2007 and continues to the present. The groundwater extraction system consists of perched zone, vadose zone, and Exposition zone wells.

There are 23 perched zone wells, which range from about 30 to 40 feet deep. These wells pump water extracted from the perched zone to the treatment facility (Appendix C, Figure C-1). There are 31 wells in the lower vadose zone and the Exposition zone, including: 12 A zone wells (DA-1 through DA-12), 12 B zone wells (DB-1 through DB-12), and 7 wells screened in both the A and B zones (DAB-1 through DAB-7). Not all groundwater extraction wells are in use at one time. An optimization evaluation by the plant operator is done each quarter to determine the most efficient/beneficial wells to be used for extraction. The uptime goal of the groundwater treatment system was set to 90% beginning in the third quarter of 2013. Non-attainment of the uptime goals in the last three quarters of 2014 was due to planned and minor unplanned maintenance activities and shutting the system down for semi-annual sampling.

Vapor recovery: Vapor recovery began on May 4, 2007 and continues to the present. The vapor recovery system consists of 58 combination electrode/vapor recovery wells in the ERH Area, 29 vapor recovery wells, 33 exposition wells, 25 perched zone wells, and 10 groundwater monitoring wells that were modified and connected to the vapor recovery system in November 2007. In response to public comments, a heat exchanger and a vapor phase carbon adsorption unit was installed to the post-exhaust side of the FTO unit. Not all vapor extraction wells are in use at one time. An optimization evaluation by the plant operator is done each quarter to determine the most efficient/beneficial wells to be used for extraction. The uptime goal of the pulsed operation vapor extraction was set to 40% beginning in the first quarter of 2014.

Non-attainment of the uptime goals in the last three quarters of 2014 was due to planned and minor unplanned maintenance activities and shutting the system down for semi-annual sampling.

4.2.4. Groundwater and Vapor Treatment Plant

Contaminated groundwater and vapors are treated in the on-site treatment plant. Construction of the Pemaco treatment plant was completed in March 2007 and the plant was considered fully operational after completion of a 30-day shakedown on April 23, 2007.

Groundwater and vapor are conveyed to the treatment plant by subsurface piping and enter the plant via seven headers. Extracted groundwater is treated by:

1. Chlorination to reduce the potential for biofouling;
2. Passing the groundwater through 10-micron filters to remove solids; and

3. Passing the groundwater through GAC to remove contaminants. Treated groundwater is discharged to the LA County Sanitary District sewer system. Vapor is treated by cooling and passing through vapor-phase GAC, then discharged to ambient air though a stack at the top of the treatment plant. Condensate from extracted vapor is separated from the vapor and combined with groundwater for treatment.

Vinyl chloride (VC) was detected at concentrations that exceeded Maximum Individual Cancer Risk (MIRC) levels in the vapor influent. Because VC is not effectively treated by GAC, an FTO was installed as part of the vapor treatment system to reduce concentrations before passing through GAC. The FTO was disconnected because VC concentrations were low enough to be treated by GAC alone. The public was concerned about generation of dioxin/furans from the FTO, when the system was first turned on.

Further testing confirmed that no dioxins/furans were present in the system exhaust. The FTO began operation on June 1, 2007 and continued until June 9, 2008. Although it is no longer used, the FTO remained on site until December 19, 2014 when it was sold via GSA auction.

4.2.5. Institutional Controls

The objectives of the institutional controls (ICs) defined by the ROD included the following:

- Prohibit sensitive uses such as residential, hospital, school, child-care facility, and hospice;
- Prohibit groundwater extraction and/or use without prior review and written approval of DTSC, except as provided for in the ROD;
- Prohibit alteration, disturbance, or excavation of soil and caps without a DTSC-approved excavation work plan, except as provided for in the ROD; and
- Require contaminated soils brought to the surface by grading, excavation, trenching, or backfilling to be managed in accordance with state and federal law.

The ROD required that the City of Maywood prohibit residential use of the property through zoning and required that a State of California Land Use Covenant with the City of Maywood might be required to permanently change the allowable land use at the site. U.S. EPA signed a Covenant Not to Sue Agreement with the Trust for Public Land and the City of Maywood during 2004. The Covenant discusses that the City of Maywood would allow U.S. EPA access to continue cleanup of the site and that residential housing would not be allowed on former Pemaco property. The ROD states that the rezoning is already complete. The maps on the City of Maywood web site show that the former site area is zoned as a park. According to the Acting City Planner work on the zoning change is expected to be formalized in 2015. U.S. EPA will continue working with the State of California and the City of Maywood to finalize the land use covenant for the site.

The Los Angeles Regional Water Quality Control Board (LARWQCB) has permit restrictions in place to prevent private wells from being installed.

4.3. OPERATION AND MAINTENANCE (O&M)

Operation and maintenance (O&M) of the treatment plant is described in the Pemaco Operation and Maintenance Manual dated May 23, 2007 (TN&A 2007b). During this operational timeframe the LACSD discharge permit for the site was scheduled to expire during November 2011. U.S. EPA requested an extension of the deadline so U.S. EPA could begin working with the Regional Water Quality Control

Board to implement a NPDES Permit for release of the treated groundwater to land and the LA River. U.S. EPA proposed to use the treated groundwater from the Pemaco Superfund Site for landscape irrigation of approximately 3.45 acres of unpaved green space at the Maywood Riverfront Park. U.S. EPA conducted testing associated with acquiring the NPDES permit between November 2011 to January 2012 and additional testing occurred from August 2012 to September 2012. The results of the testing indicated that the treated effluent did not contain chemical constituents and radionuclides with concentrations in excess of Maximum Contaminant Levels (MCLS). The Regional Water Quality Control Board issued a letter to U.S. EPA and the City of Maywood on November 9, 2012 concurring with a proposed discharge of treated groundwater for landscape irrigation at the Park provided all conditions of the WDR related ARARS were met. U.S. EPA subsequently decided not to move forward with water reclamation and continued release of the water to the LA County Sanitation District due to the cost of the changes associated with changing the treatment system.

A 5-year discharge permit was issued in February of 2013 and the groundwater treatment system was turned back on again during April 2013, followed by the vapor treatment system during November 2013.

The annual O&M costs from April 2010 through December 2014 are provided in Table 4-2. These costs include treatment plant operation and groundwater monitoring. The costs for 2014 include removal and demolition of infrastructure in the ERH area.

Table 4-2 Annual O&M Costs (2010-2014)

Year	Total Annual Cost (rounded to the nearest $1,000)
2010	$1,846,000
2011	$1,840,000
2012	$2,438,000
2013	$1,204,000
2014	$1,719,000

5.0 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

5.1. Previous Five-Year Review Protectiveness Statement and Issues

The protectiveness statement from the first FYR for the Pemaco Site is as follows:

> *"The remedy at the Pemaco Superfund site currently protects human health and the environment, because exposure pathways that could result in unacceptable risks are being controlled. However, the following actions should be taken:*
>
> *1. The City of Maywood should change the zoning of the Pemaco Property.*
>
> *2. DTSC should finalize a Land Use Covenant to permanently change the Site's land use to recreational.*
>
> *3. U.S. EPA will access the area around MW-25-130 and evaluate whether further action is warranted."*

The 2010 FYR included three issues and recommendations. Each recommendation and the current status are discussed in Table 5-1.

Table 5-1 Status of Recommendations from the 2010 FYR

Issues from previous FYR	Recommendation	Action Taken and Outcome	Date of Action
Institutional Control	The City of Maywood needs to complete the zoning change from industrial to recreational and prohibit residential housing on the properties.	City Zoning maps show the park designation	2015
Institutional Control	DTSC and the City of Maywood need to record a State Land Use Covenant that permanently changes the site's land use to recreational.	No action	n/a
Exposition "D" Zone Concentrations	U.S. EPA will access area around well MW-25- 130 and evaluate whether further action is needed.	CPT Investigation conducted during December 2014 indicated additional sampling and well installation is necessary	n/a

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6.0 FIVE-YEAR REVIEW PROCESS

6.1. Administrative Components

U.S. EPA Region 9 initiated the second FYR in September 2014 and scheduled its completion for September 2015. The U.S. EPA Region 9 review team was led by Rose Marie Caraway of U.S. EPA, Remedial Project Manager (RPM) for the Pemaco Site, and also included the U.S. EPA site attorney Thelma Estrada. On September 9, 2014, U.S. EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review team members are listed in Table 6-1.

Table 6-1 Pemaco Superfund Site Five-Year Review Team

Review Team	Agency
Rose Marie Caraway, Remedial Project Manager	U.S. EPA
Thelma Estrada, Attorney	U.S. EPA
Carlin Hafiz , Community Involvement Coordinator	U.S. EPA
Miriam Gilmer, Project Manager	USACE, Seattle District
Cathy Martin, Technical Lead	USACE, Seattle District
Lisa Scott, Hydrogeologist	USACE, Seattle District
David Clark, Biologist	USACE, Seattle District

6.2. Community Involvement

On October 1, 2014, a public notice was mailed to City of Maywood residents and published on the City of Maywood website. The notice announced the commencement of the FYR process for the Pemaco Site, provided Rose Marie Caraway's contact information, and invited community participation. The public notice is available in Appendix A. U.S. EPA was not contacted as a result of this advertisement.

The FYR report will be made available to the public once it has been finalized. Copies of this document will be placed in the following designated public repositories and can be accessed online: www.epa.gov/region9/Pemaco.

U.S. EPA Region 9
95 Hawthorne Street, Suite 403 S San Francisco, California 94105
Hours: Monday - Friday 8 a.m. - 5 p.m.

Maywood City Hall 4319 East Slauson Ave. Maywood, CA 90270
(323) 562 -5570

Maywood Cesar Chavez Library 4323 E. Slauson Ave.
Maywood, CA 90270
(323)771-8600

6.3. Document Review

This FYR included a review of relevant, site-related documents including the ROD, remedial action reports, and recent monitoring data. A complete list of the documents reviewed can be found in Appendix B.

6.3.1. ARARs Review

Section 121 (d)(2)(A) of CERCLA specifies that Superfund remedial actions (RAs) must meet any federal standards, requirements, criteria, or limitations that are determined to be legally ARARs. ARARs are those standards, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, RA, location, or other circumstance at a CERCLA site.

Chemical-specific ARARs identified in the selected remedy within the ROD for the groundwater at this Site and considered for this FYR for continued groundwater treatment and monitoring are listed in Table 6-2. The groundwater remediation levels for the Pemaco Site were developed under the assumption that groundwater at the site may be used in the future for domestic purposes. The more stringent of either the California or federal MCLs were used as groundwater remediation levels. If a designated MCL was not available, U.S. EPA tap water Regional Screening Levels (RSLs) were used as remediation levels. For chemicals lacking MCLs or RSLs, other health-based standards and effluent limits were used as remediation levels.

Table 6-2 also lists changes to applicable groundwater contaminant criteria. Note that RSLs were not listed for COCs whose cleanup levels were established by MCLs. The criteria for methyl isobutyl ketone (MIBK), naphthalene, and manganese have become more stringent, and an RSL for 1,4-dioxane was established that is more stringent than the established remediation level. The changes to 1,4-dioxane and naphthalene do not affect the protectiveness of the selected remedy, since these changes are within the risk management range of 1×10^{-4} to 1×10^{-6}. However, the revised criteria for MIBK and manganese do not affect protectiveness because they were not detected in the most recent groundwater monitoring event.

Chemical-specific ARARs identified in the selected remedy within the ROD for the soils at this Site and considered for this FYR are listed in Table 6-3. To address the soil-to-groundwater exposure pathway, U.S. EPA used the soil-to-groundwater Preliminary Remediation Goals (PRGs) (U.S. EPA 2004) as remediation levels. The PRGs used as remediation levels were based on a dilution attenuation factor (DAF) of 20 and used either MCLs or risk-based concentrations as the target concentrations in groundwater. For those

COCs with no PRGs, a separate risk assessment was conducted establishing what is called the excavation worker exposure (EWE) to use as remediation levels.

Table 6-3 lists changes to applicable soil contaminant criteria. The U.S. EPA Region 9 RSL table (November 2014) lists two different types of soil screening levels (SSLs), “risk-based” screening levels or MCL- based screening levels. When the ROD was written in 2005, only MCL-based SSLs were included on the RSL (then PRG) chart. The cleanup levels mandated in the ROD for soils are a product of either these MCL-based SSLs, or the separate EWE risk assessment. As a result, for the purposes of this comparison, MCL-based SSLs are used for COCs that have MCLs, and risk-based SSLs are used for the remaining COCs; the appropriate SSL is highlighted in grey.

The criteria for several COCs have become more stringent. The changes to the SSLs for tetrachloroethene (PCE), benzo(a)anthracene, benzo(b)flouranthene, dibenzo(a,h)anthracene, and TCE have not altered the protectiveness of the selected remedy, since the new criteria are within the risk management range of 1×10^{-4} to 1×10^{-6}.

Federal and state laws and regulations other than the chemical-specific ARARs that have been promulgated or changed over the past five years are described in Table 6-4. The table does not include those ARARs identified in the ROD that are no longer pertinent, nor does it include ARARs that did not change in the last five years. For example, ARARs related to remedial design and construction are not included in the table if they do not continue into long-term Operation Maintenance & Monitoring (OM&M).

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Table 6-2 Summary of Groundwater ARAR Changes

Zone	COC	Remediation Level from ROD	MCL, RSL (PRG), or EWE?	Current Standards				More or Less Stringent?
				Federal MCL (as of Nov. 2014)	CA MCL (as of June 2014)	RSL for tap water (as of Nov. 2014)	Other	
Perched Groundwater Zone	**VOCs (µg/L)**							
	1, 1-Dichloroethane	5	MCL	None	5	N/A		Same
	1, 1, 2-Trichloroethane	5	MCL	5	5	N/A		Same
	Chloroethane	100	CRWQCB LA1	None	None	None	1001	Same
	Ethylbenzene	300	MCL	700	300	N/A		Same
	Toluene	150	MCL	1000	150	N/A		Same
	NHVOCs (µg/L)							
	Acetonitrile (Coelute w/ MIBK)	100	PRG	None	None	130		Less
	Methyl isobutyl ketone (MIBK)	2000	PRG	None	None	12002		**More**
	SVOCs (µg/L)							
	1, 4-Dioxane	3	HAL3	None	None	0.784		**More**
	bis (2-Ethylhexyl)phthalate	4	MCL	6	None	N/A		Less
	Naphthalene	6.2	PRG	None	None	0.174		**More**
	Metals (µg/L)							
	Chromium (total)	50	MCL	100	500	N/A		Less
	Iron	11000	PRG	None	None	14000		Less
	Lead	15	N/A5	15	15	N/A		Same
	Selenium	50	MCL	50	50	N/A		Same

Zone	COC	Remediation Level from ROD	MCL, RSL (PRG), or EWE?	Current Standards				More or Less Stringent?
				Federal MCL (as of Nov. 2014)	CA MCL (as of June 2014)	RSL for tap water (as of Nov. 2014)	Other	
Both Perched and Exposition Zone Groundwater or Exposition Zone Groundwater only	**VOCs (µg/L)**							
	Acetone	5500	MCL	None	None	14000		Less
	1, 1-Dichloroethene	6	MCL	7	6	N/A		Same
	1, 2-Dibromo-3-chloropropane	0.2	MCL	0.2	0.2	N/A		Same
	1, 2-Dichloroethane	0.5	MCL	5	0.5	N/A		Same
	Benzene	1	MCL	5	1	N/A		Same
	Chloroform	80	MCL	80	80	N/A		Same
	cis-1,2-Dichloroethene	6	MCL	70	6	N/A		Same
	Dibromochloromethane	80	MCL	80	80	N/A		Same
	Methylene chloride	5	MCL	5	5	N/A		Same
	Methyl tert butyl ether	13	MCL	None	13	N/A		Same
	Tetrachloroethene	5	MCL	5	5	N/A		Same
	trans-1, 2-Dichloroethene	10	MCL	100	10	N/A		Same
	Trichloroethene	5	MCL	5	5	N/A		Same
	Vinyl Chloride	0.5	MCL	2	0.5	N/A		Same
	Metals (µg/L)							
	Aluminum	1000	MCL	None	1000	N/A		Same
	Arsenic	10	MCL	10	10	N/A		Same
	Manganese	880	PRG	None	None	4306		**More**
	Thallium	2	MCL	2	2	N/A		Same
	Anions (µg/L)							
	Sulfide	110	PRG7	None	None	None	1107	Same

Notes:
1. California Regional Water Quality Board Los Angeles Region Waste Discharge Requirements for Los Angeles and Ventura Counties
2. Non-cancer RSL only
3. California Department of Public Health Drinking Water Notification Level as of December 14, 2010, no available MCL
4. Cancer RSL
5. The value of lead is the EPA remediation goal for residential exposure
6. Non-cancer RSL only
7. Remediation level taken from 2005 EPA Region IV PRG for hydrogen sulfide. There is no published 2014 RSL for hydrogen sulfide, so the same screening level is assumed.

Table 6-3 Summary of Soil ARAR Changes

Zone	COC	Remediation Level from ROD	PRG (RSL) or EWE?	Risk-based SSLs		MCL-based SSLs		More or Less Stringent?
				SSL	DAF 20 SSL	SSL	DAF 20 SSL	
Upper Vadose Zone Soils	**VOCs (µg/kg)**							
	1,1-Dichloroethene	60	PRG	100	2000	2.5	503	**More**
	Acetone	16000	PRG	2900	58000	None	None	Less
	Ethylbenzene	13000	PRG	1.7	34	780	15600	Less
	Tetrachloroethene	60	PRG	5.1	102	2.3	464	**More**
	Toluene	12000	PRG	760	15200	690	13800	Less
	Xylenes (total)	210000	PRG	190	3800	9800	1960003	**More**
	SVOCs (µg/kg)							
	Benzo (a) anthracene	2000	PRG	12	2404	None	None	**More**
	Benzo (a) pyrene	261	EWE1	4	80	240	4800	Less
	Benzo (b) fluoranthene	2610	EWE	41	8204	None	None	**More**
	Carbazole2	600	PRG	No SSL				Same
	Dibenzo (a,h) anthracene	762	EWE	13	2604	None	None	**More**
	Indeno (1,2,3-cd) pyrene	2610	EWE	240	4800	None	None	Less
	Isophorone	500	PRG	26	520	None	None	Less
Upper and Lower Vadose Zone Soils	**VOCs (µg/kg)**							
	Benzene	30	PRG	0.23	4.6	2.6	52	Less
	1,2-Dichloroethane	20	PRG	0.048	0.96	1.4	28	Less
	cis-1,2-Dichloroethene	400	PRG	11	220	21	420	Less
	Methylene chloride	20	PRG	2.9	58	1.3	26	Less
	Trichloroethene	60	PRG	0.18	3.6	1.8	365	**More**
	Vinyl Chloride	10	PRG	0.0065	0.13	0.69	13.8	Less
	Metals (mg/kg)							
	Chromium (total)	38	PRG	None	None	180000	3600000	Less

Notes:
1 Excavation Worker Exposure
2 Neither an MCL nor an RSL have been developed for Carbazole
3 Non-cancer SSL
4 Cancer SSL
5 Cancer SSL

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Table 6-4 ARAR Review Table

Authority	Medium	Requirement	Status in ROD	Status in First FYR	Current Status
Action-Specific Criteria					
Federal Regulatory Requirement	Groundwater	Hazardous Waste Regulations Water quality monitoring and response systems for permitted systems; 22 CCR Div. 4.5, Chap. 14, Art. 6	Relevant and Appropriate	No substantive change	Amendment filed 4/12/2011 -

As noted above, a portion of the California State code related to hazardous waste facilities has changed since the last five year review. Specifically, the state revised its requirements for water quality monitoring on such sites, adding a surface water component to monitoring requirements. This ARAR change is not applicable to the Pemaco Site, as the site is not classified as a RCRA hazardous waste site. Additionally, there is no exposure route that involves surface water, since the COCs are effectively contained below a cap of clean soil. Any surface water runoff from the site will not be affected by the contaminants below ground surface.

6.3.2. Human Health Risk Assessment Review

A human health risk assessment was completed for the Site as part of the Remedial Investigation (RI) completed in 2003 and summarized in the 2005 ROD. The risk assessment identified the following exposure pathways and associated risks:

- The current trespasser scenario evaluated exposure to surface soils by the ingestion, dermal, and inhalation pathways;
- The future park user scenario evaluates exposure to surface soil by the ingestion, dermal, and inhalation pathways;
- The future excavation worker scenario evaluates exposure to surface and subsurface soils (to 15 feet bgs) by the ingestion, dermal and inhalation pathways;
- Although the remedy outlined in the ROD prohibits residential use of the property, the future onsite residential scenario evaluates exposure to surface soils and to groundwater within the Exposition A and B zones by the ingestion, dermal, and inhalation pathways. Vapor intrusion by volatile chemicals detected in onsite shallow soil gas was also evaluated for the future onsite residential scenario; and
- The current offsite residential scenario evaluates risks posed by potential inhalation exposure to chemicals volatilizing from the onsite subsurface soil and perched groundwater or volatilizing from perched groundwater plumes that are migrating offsite. There are currently no water supply wells in the Exposition A and B groundwater zones; therefore, exposure to groundwater in these zones was not evaluated.

The risk assessment was reviewed to identify any changes in exposure or toxicity that would impact protectiveness. The exposure pathways are still relevant as stated.

6.3.3. Toxicity Values

U.S. EPA's Integrated Risk Information System (IRIS) has a program to update toxicity values used by the Agency in risk assessment when newer scientific information becomes available. In the past five years, there have been a number of changes to the toxicity values for certain contaminants of concern at the Site. Revisions to the toxicity values for TCE, cyanide and cis-1,2-dichloroethene indicate a higher risk. A toxicity reassessment was also released for PCE, however this does not change PCE-related risks as they continue to be assessed using a more protective toxicity assessment by Cal/U.S. EPA's Office of Environmental Health Hazard Assessment (OEHHA).

Groundwater results are compared to RSLs as a first step in determining whether response actions may be needed to address potential human health exposures. The RSLs are chemical-specific concentrations that correspond to an excess cancer risk level of $1x10^{-6}$ (or a Hazard Quotient (HQ) of 1 for non-carcinogens) developed for standard exposure scenarios (e.g., residential and commercial/industrial). RSLs are not de facto cleanup standards for a Superfund site, but they do provide a good indication of whether actions may be needed.

In September 2011, U.S. EPA completed a review of the TCE toxicity literature and posted on IRIS both cancer and non-cancer toxicity values which resulted in lower RSLs for TCE. The screening level for chronic exposure for cancer excess risk level of $1x10^{-6}$ is 0.44 µg/L. U.S. EPA uses an excess cancer risk range between $1x10^{-4}$ and $1x10^{-6}$ for assessing potential exposures, which corresponds to a TCE concentration between 0.44 and 44 µg/L. The revised protective exposure range is within the current MCL for TCE of 5 µg/L. U.S. EPA's 2011 Toxicological Review for TCE also developed protective levels that include at least a 10 fold margin of safety for health effects other than cancer. Any concentration below the non- cancer RSL indicates that no adverse health effect from exposure is expected. Concentrations significantly above the RSL may indicate an increased potential of non-cancer effects. The non-cancer screening level for TCE is 2.6 µg/L. U.S. EPA considers the TCE MCL of 5 µg/L protective for both cancer and non-cancer effects.

U.S. EPA's 2011 TCE Toxicological Review assessment concluded that TCE exposure poses potential human health hazards for non-cancer toxicity to multiple organs and to the developing fetus, including fetal cardiac malformations. This and other findings of the TCE assessment indicate that women in the first trimester of pregnancy are one of the most sensitive populations to TCE inhalation exposure and that the TCE impacts during fetal development are by definition near-term impacts. In a June 30, 2014 Memorandum, U.S. EPA Region 9's toxicologists recommended interim action levels and response actions to address potential developmental hazards arising from inhalation exposures to TCE in indoor air from subsurface vapor intrusion. On July 14, 2014, the U.S. EPA Region 9 Director of Superfund distributed the toxicologists' findings to all Superfund staff, recommending that the action levels and response actions be considered at all Region 9 Sites. On August 27, 2014, U.S. EPA's Office of Superfund Remediation and Technology Innovation (OSTRI) issued a memorandum suggesting that the regions should consider early or interim actions where appropriate to eliminate, reduce, or control hazards.

On February 10, 2012, the IRIS program published its revised toxicity assessment for PCE. This reassessment set PCE cancer potency factors less stringent than previously used to assess excess cancer risks from PCE exposure. However, for Superfund sites within the state of California, Region 9 uses the PCE toxicity factors developed by Cal/U.S. EPA's OEHHA, which have not changed. This practice is based on a long-standing agreement between Region 9 and Cal/U.S. EPA that OEHHA toxicity values will be used in cases where they are significantly more protective than U.S. EPA values; such is the case with

PCE. Thus, Cal-modified RSLs apply at the Pemaco site (cancer risk: 0.14 µg/L; non-cancer risk: 10 µg/L). The MCL for PCE (5 µg/L) is within the protective exposure range for PCE and remains protective.

IRIS also indicated that the non-cancer toxicity factors for both for cis-1,2-dichloroethene and cyanide have changed in the last five years, as shown in Table 6-5.

Table 6-5 Non-cancer toxicity factors for cis-1,2-dichloroethene and cyanide

Compound	ROD RfD	Current RfD
cis-1,2-dichloroethene	0.01 mg/kg-day	0.002 mg/kg-day
cyanide	0.02 mg/kg-day	0.0006 mg/kg-day

In both cases, the oral reference dose (RfD) decreased. However, this results in no change to the protectiveness of the remedy since there is no exposure through drinking the groundwater.

In addition, several polycyclic aromatic hydrocarbons (PAHs), including benzo(a)pyrene, are currently under review, as part of U.S. EPA's IRIS reassessment program. Any potential change to these chemicals will need to be addressed in subsequent FYRs.

6.3.4. Ecological Review

An ecological risk assessment was not included in the ROD or any other previous documents or studies. According to Section 7.2 of the ROD: "*Due to the urban location of Pemaco, no risks to ecological receptors are anticipated, therefore an ecological risk assessment was not performed.*" Further justification was provided by the conservative risk scenarios developed for human health, making it unlikely that ecological risk would exceed human risk in these scenarios. This assessment is still valid.

6.4. Data Review

6.4.1. Soil Sampling (Post-ERH)

In January 2012, a soil sampling event occurred to verify whether RAOs for soil, as defined in the ROD for the site, had been met (SulTRAC 2012). Soil samples were collected at locations in the upper and lower vadose zones where pre-remediation (contamination reduction) concentrations exceeded SSRLs as defined in the ROD (Figure 6-1). Samples were collected from the same locations and depths as the pre- remediation samples. Twenty-eight locations were identified and samples were collected by direct-push type drill rig.

Forty-six (46) of fifty-three (53) grab samples collected at locations and depths where the pre-remediation samples exceeded an SSRL do not currently exceed an SSRL. Post-remediation samples at seven locations exceeded the SSRLs for a single contaminant as outlined below.

- Sample PB-02-35.0-35.5-010512 exceeded the TCE SSRL of 60.0 micrograms per kilogram (µg/kg). Post-remediation results (260 µg/kg) were lower than pre-remediation results (970 J µg/kg);
- Sample PB-03-35.0-35.5-010512 exceeded the benzene SSRL of 30 µg/kg. Post-remediation results (800 µg/kg) exceeded pre-remediation results (230 µg/kg);
- Sample PD-07-32.0-32.5-010512 exceeded the PCE SSRL of 60 µg/kg. Post-remediation results (100 µg/kg) exceeded pre-remediation results (65 µg/kg);

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Figure 6-1 Post-ERH Soil Sampling Locations

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- Sample B-29-26.0-26.5-011112 exceeded the benzene SSRL of 30 µg/kg. Post-remediation results (280 µg/kg) were greater than pre-remediation results (230 µg/kg);
- Sample MW-06-26.11-26.61-01-011012 exceeded the benzene SSRL of 30 µg/kg. Post-remediation results (150 µg/kg) were lower than pre-remediation results (4,100 J µg/kg);
- Sample PD-08-35.0-35.5-010412 exceeded the benzene SSRL of 30 µg/kg. Post-remediation results (130 µg/kg) exceeded pre-remediation results (110 µg/kg); and
- Sample HP-06-29.0-29.5-01-04-12 exceeded the benzene SSRL of 30 µg/kg. Post-remediation results (210 µg/kg) were lower than pre-remediation results (2,000 µg/kg).

Note: J indicates an estimates value.

Six of seven samples were located in clayey or silty soil layers (PB-02, PB-03, PD-07, B-29, MW-06, and PD-08). Historical groundwater samples were available from five of these locations (PB-02, PB-03, PD-07, MW-06, and PD-08) and recent groundwater samples at four (PB-02, PB-03, PD-07, and MW-6) of the five locations these locations indicate that these contaminants are not contaminating groundwater at concentrations above the SSRL (SulTRAC 2012).

Data results indicate that the surface cap is still protective of direct contact for human exposure. .

6.4.2. Groundwater

6.4.2.1. Groundwater Elevations/Gradients (Gauging)

Groundwater elevations from June 2013 to July 2014 (OTIE, 2013, 2014) have dropped significantly in all hydrologic zones. All pumps were turned off for a minimum of 7 days to allow the groundwater elevations to stabilize prior to taking gauging data and sampling. The results of the groundwater elevation data, comparison to the static June 2013 elevations (OTIE 2013), calculated gradients, and inferred groundwater flow directions by hydrogeologic zone are summarized in Table 6-6. Of the 87 wells with water column (wells gauged), groundwater elevations were calculated for 67 wells (the remaining eleven wells did not have surveyed top-of-casing data and therefore elevations could not be calculated).

Table 6-6 Groundwater Gauging Summary

Hydrogeologic Zone	Number of Wells Gauged	Wells with Ground-water Elevations[1]	Dry Wells[2]	July 2014 Groundwater Elevation (ft. amsl)[3]	Comparison to June 2013 Elevation (ft. amsl)[4]		Estimated Horizontal Gradient[56]	Inferred Flow Direction
					Minimum	Maximum		
Perched	22	14	2	-2.20	116.64	123.71	0.02	south
A	19	11	6	-5.72	74.33	76.83	0.02 to 0.03	variable
B	25	22	1	-4.71	69.60	74.97	0.006	southwest
A & B	7	6	0	-5.77	73.69	76.58	Not used	
C	6	6	0	-2.02	43.82	45.50	0.0008	southeast
D	7	7	0	-3.87	25.04	27.29	0.003	south
E	1	1	0	-4.09	24.65	24.65	n/a[6]	n/a[6]

Notes:

[1]Groundwater elevations calculated from surveyed well top of casing minus depth to groundwater
[2]Wells with no measurable water or water column less than 1 foot
[3]Average static groundwater elevation difference from June 2013 to July 2014
[4]ft amsl = feet above mean sea level
[5]Hydraulic gradient expressed in ft/ft
[6]n/a=not applicable (insufficient data to calculate or estimate)

Perched Zone. In July 2014, depth to water was measured in 14 wells screened in the perched zone and groundwater elevations were calculated. Two wells gauged were either dry or had less than 1-foot of water in the casing; therefore, elevations could not be calculated. Depths to groundwater ranged from 23.83 feet below top of casing (btoc) to 33.40 feet btoc. The average decline in groundwater elevations between June 2013 and July 2014 was 2.20 feet and the number of dry wells stayed the same (2). Groundwater elevations ranged from 116.64 feet amsl to 123.71 feet amsl. The groundwater flow direction was generally south at an estimated horizontal hydraulic gradient of approximately 0.02 ft/ft (Appendix C, Figure C-1).

Exposition A Zone. In July 2014, depth to water was measured in all 11 wells screened in the Exposition A zone and groundwater elevations were calculated. Six wells were either dry or had less than 1-foot of water in the casing; therefore, elevations could not be calculated. Depths to groundwater ranged from 62.49 to 73.98 feet btoc. The average decline in groundwater elevations between June 2013 and July 2014 was 5.72 feet. The number of dry wells on the gauging list increased from one to six. Groundwater elevations ranged from 74.33 to 76.83 feet amsl, with higher elevations seen generally in the southeast part of the Site along the LA River. Groundwater flow in the northern portion of the A zone was to the south-southeast at an estimated horizontal hydraulic gradient of approximately 0.03 feet per foot (ft/ft) and in the southern portion of the Site to the west at an estimated horizontal hydraulic gradient of approximately 0.02 ft/ft (Appendix C, Figure C-2).

Exposition B Zone. In July 2014, depth to water was measured in 22 wells screened in the Exposition B zone and groundwater elevations were calculated. One well measured was dry; therefore, groundwater elevations could not be calculated. Depths to groundwater ranged from 64.51 feet btoc to 77.74 feet btoc. The average decline in groundwater elevations between June 2013 and July 2014 was 4.71 feet. Groundwater elevations ranged from 69.60 to 74.97 feet amsl. There was no change in the number of dry wells compared to June of 2013. Groundwater flow direction is variable, but generally west/southwest at an estimated horizontal hydraulic gradient of approximately 0.006 ft/ft. There appears to be a southerly flow component in the northern part of the Site. (Appendix C, Figure C-3)

Exposition A & B Zone. In July 2014, depth to water was measured in 7 wells screened across the Exposition A and B zones including 5 extraction wells and groundwater elevations were calculated. None of the gauged wells were dry. Groundwater gradients were not calculated due to the screens crossing between hydrologic units. Depths to groundwater ranged from 61.94 to 73.68 feet btoc. Groundwater elevations declined an average of 5.77 between June 2013 and July 2014. Groundwater elevations ranged from 73.69 to 76.58 feet amsl.

Exposition C Zone. In July 2014, depth to water was measured in 6 wells screened in the Exposition C zone and groundwater elevations were calculated. None of the gauged wells were dry. Depths to groundwater ranged from 94.08 to 103.99 feet btoc. Groundwater elevations declined an average of 2.02 feet from June 2013. Groundwater elevations ranged from 43.82 to 45.50 feet amsl. The groundwater flow direction was generally southeast, at a relatively flat estimated horizontal hydraulic gradient of 0.0008 ft/ft. Groundwater gradients and flow directions in July 2014 were similar to those observed in June 2013. (Appendix C, Figure C-4)

Exposition D Zone. In July 2014, depth to water was measured in 7 wells screened in the Exposition D zone and groundwater elevations were calculated. None of the gauged wells were dry. Depths to groundwater ranged from 112.78 to 121.28 feet btoc. Groundwater elevations declined an average of 3.87 feet in this zone between June 2013 and July 2014. Groundwater elevations ranged from 25.04 to 27.29 feet amsl. The groundwater flow direction was to the south with an estimated horizontal hydraulic gradient of approximately 0.003 ft/ft. Groundwater flow direction during June 2013 was generally to the south and southeast at a similar relatively flat estimated horizontal hydraulic gradient. (Appendix C, Figure C-5)

Exposition E Zone. Only one well, MW-10-170, is screened in the Exposition E Zone. Depth to groundwater was 116.10 feet btoc and the groundwater elevation was 24.65 feet amsl. The groundwater level in this well declined by 4.09 feet since the June 2013 sampling event.

6.4.2.2. Groundwater Quality

In July 2014, groundwater samples were collected from 74 wells. The primary COCs with SSRL exceedances during this sampling event were: 1,1-dichloroethene (1,1-DCE) (4 wells); 1,4-dioxane (15 wells); cis-1,2-DCE (16 wells); PCE (1 well); TCE (24 wells); and VC (2 wells). Analytical results are presented in Tables C-1 through C-9 of Appendix C. Concentration trends were evaluated for TCE in all wells, cis-1,2-DCE in wells in the Exposition A to E zones, and compounds that exceeded their respective SSRLs for all wells. Historical concentrations were plotted versus time for TCE and cis-1,2-DCE for selected zones.

Perched Zone. Historical concentrations of TCE versus time are presented on Graphs C-1 through C-5 in Appendix C. TCE concentrations showed an overall decreasing trend in all wells with the exception of PC-06 and PB-03 (Graphs C-1 through C-5). PC-06 and PB-03 exceedances remain near the SSRLs. PC-06, PB-03, PB-01, and PB-02 is extraction wells and is expected to draw contamination toward them (they may continue to have exceedances as remediation continues). Concentrations of COCs in groundwater are presented in Appendix C, Figure C-6. Analytical results are in Table C-1 of Appendix C.

In July 2014, 18 wells in the perched zone were sampled. In three of the wells, TCE and/or cis-1,2-DCE concentrations exceeded the SSRL. Other COCs detected above SSRLs were PCE and VC. All COC detections in perched zone groundwater were from wells in the area northwest of the Active Remediation Area. Results of the analysis are discussed below:

- The TCE SSRL of 5 µg/L was exceeded in one well, PB-03, at 6.7 J µg/L. The TCE concentrations showed an overall decrease in all wells except PC-06. The concentrations in PC-06 were relatively stable;
- The cis-1,2-DCE SSRL of 6 µg/L was exceeded in wells PB-02, PB-03, and PB-05 at concentrations of 120 µg/L, 21 µg/L, and 8 µg/L, respectively;
- The PCE SSRL of 5 µg/L was exceeded in PC-06 at a concentration of 44 µg/L;
- The VC SSRL of 0.5 µg/L was exceeded in PB-02 at a concentration of 18 µg/L;
- The 1,4-dioxane SSRL of 3 µg/L in wells B-20 and PB-01 at concentrations of 10 µg/L and 4.2 J µg/L, respectively; and

- 1,4-Dioxane concentrations in groundwater from B-20 increased to above the SSRL during July 2014.

Exposition A Zone. Historical concentrations of TCE versus time are presented on Graph C-6 through Graph C-8 in Appendix C. Concentrations of COCs in groundwater are presented on Figure C-7, and TCE concentration contours are presented on Figure C-12. Analytical results are in Tables C-2 of Appendix C, are for July 2014. Only two wells had COCs exceedances (DA-01 and MW-21-80).

In July 2014, twelve wells screened in the A zone were sampled. The only COCs with concentrations exceeding SSRLs in the A zone were TCE, cis-1,2-DCE, 1,4-dioxane, and methylene chloride in wells DA-01 and MW-21-80. TCE concentrations above SSRLs were 16 µg/L (DA-01) and 470 µg/L (MW-21-80). MW-21-80 is directly upgradient of the groundwater extraction system. DA-01 is an active extraction well and is expected to draw contamination (it may continue to have exceedances as remediation continues). These two wells show COCs higher than found in the perched zone. The northern extent of TCE-impacted groundwater in the A zone is currently undefined; however it is upgradient of the groundwater extraction system.

TCE concentrations in the A zone wells generally have declining trends, except in well MW-21-80, which exhibited an increasing trend since 2007.

The following other COCs exceeded their respective SSRLs:

- The cis-1,2-DCE SSRL of 6 µg/L was exceeded in MW-21-80 at a concentration of 100 µg/L.
- The 1,4-dioxane SSRL of 3 µg/L was exceeded in DA-01 and MW-21-80 at concentrations of 21 µg/L and 11 µg/L, respectively. The1,4-dioxane concentrations in the samples from DA-01 increased since the July 2014 sampling event.
- The methylene chloride SSRL of 5 µg/L was exceeded in MW-21-80 at a concentration of 6 J µg/L.

Exposition B Zone. Historical concentrations of TCE versus time are presented on Graphs C-9 through C-17 in Appendix C; and for cis-1,2-DCE are presented on Graphs C-18 through C-26. Groundwater COC concentrations are presented on Figures C-8 and C-9. TCE concentration contours are presented on Figure C-13, and cis-1,2-DCE concentration contours are presented in Appendix C, Figure C-14.

Analytical results are in Tables C-3 and C-4 of Appendix C. The COC exceedances are higher than in other groundwater zones.

In July 2014, 23 B zone and 7 A & B zone wells were sampled during July 2014. Samples collected from wells screened across the A & B zones are considered representative of the B zone for the purposes of this evaluation. COCs with concentrations exceeding SSRLs in the B zone and A & B zone wells include TCE, cis-1,2-DCE, VC, 1,2-dichloroethane (1,2-DCA), and 1,4-dioxane. TCE was detected above the SSRL in 15 groundwater wells. TCE concentrations exceedances ranged from 7.1µg/L (MW-13-85) to 940 µg/L (MW-01-80) in 16 wells. Detected cis-1,2-DCE concentrations ranged from 11µg/L (MW-22-90) to 480 µg/L (MW-20-85) in 8 wells.

The July 2014 TCE plume is generally similar to the December 2013 plume, with the following exceptions:

- A significant increase in the TCE concentration in MW-06-85 (from 0.32 J µg/L to 280 µg/L);

- An increase in TCE concentrations in MW-02-95 (from 490 µg/L to 850 µg/L). This well is located the groundwater treatment area which may be drawing contamination toward the well; increase in TCE concentrations in MW-21-90 (from 46 µg/L to 150 µg/L);
- A decrease in TCE concentrations in DAB-08 (from 570 µg/L to 320 µg/L). This well is an extraction well and is expected to draw contamination toward it (it may continue to have exceedances as remediation continues over time);
- Three wells (MW-28B, MW-06-85, and MW-12-90) with exceedances above the SSRLs are located downgradient of the groundwater treatment area, and appear to be outside the zone of influence (capture zone) of the extraction wells (groundwater treatment area); and
- The northern extent of TCE-impacted groundwater in the B zone is currently undefined; however it is upgradient of the groundwater extraction system.

TCE concentrations generally decreased from north to south across the Site. South of the ERH Treatment Area, TCE concentrations were below the SSRL with the exception of those from MW-13-85. TCE concentration in MW-13-85 in July 2014 was 7.1 µg/L, which is below the previous historical low concentration of 8.5 µg/L in December 2013. The groundwater extraction treatment system appears to have influence in the south with overall decreases in concentrations below SSRLs.

TCE concentrations increased from December 2013 to July 2014 in samples from wells DB-03 (36µg/L to 39 µg/L), MW-20-85 (0.72 J µg/L to 8 µg/L), MW-22-90 (8.5 µg/L to 13 µg/L), MW-01-80 (870 µg/L to 940 µg/L) to the west and northwest of the ERH Treatment Area.

TCE concentration trends for the B Zone and A & B Zone wells were generally decreasing or stable with the exception of four wells (DAB-08, MW 29-85, MW-21-90, and MW-12-90). TCE concentrations in these wells had overall increasing trends, but minor.

These wells are located as follows:

- DAB-08, west/northwest of the ERH Treatment Area,
- MW-29-85, on the southwest boundary of the ERH Treatment Area,
- MW-21-90, northwest of the ERH Treatment Area, and
- MW-12-90, west of the ERH Treatment Area on Alamo Avenue.

Although MW-01-80 had a significant increase in TCE concentrations from 2003 to 2012, concentrations have a slight decreasing trend since 2012. TCE concentration in well MW-06-85 increased significantly from 0.32 J µg/L during December 2013 to 280 µg/L during July 2014 (Appendix C, Graph C-11). This is the first sampling event during which TCE was detected at a concentration above the SSRL in this well.

The cis-1,2-DCE plume was similar to the TCE plume; cis-1,2-DCE concentrations also generally decreased from north to south across the Site. The highest cis-1,2-DCE concentration (480 µg/L) was detected in well MW-20-85, northwest of the ERH Treatment Area. The cis-1,2-DCE plume was limited to the northwest of the ERH Treatment Area at the site and the west portion of the residential area between Alamo and Walker Avenues. The cis-1,2-DCE concentration trends for the B Zone and A & B Zone wells were generally decreasing or stable, with the exception of three wells: MW-20-85, MW-21-90, and MW-22-90 located to the north and northwest of the ERH Treatment Area.

Cis-1,2-DCE concentrations in samples from these three wells had overall increasing trends. Although MW-01-80 had a significant increase in cis-1,2-DCE concentrations from 2007 to 2012, there has been a slight decreasing trend since 2012. Cis-1,2-DCE concentration in well MW-06-85 increased from 0.08 µg/L during December 2013 to 36 µg/L during July 2014. This is the first sampling event since January 2006 during which cis-1,2-DCE was detected in this well at a concentration above the SSRL. The presence of cis-1,2 DCE maybe evidence of biodegradation is underway (MNA), and maybe expected to show fluctuations in concentrations related to the TCE biodegradation processes. TCE exceedances are also present in all three of these wells, which act as a source.

The following other COCs exceeded their respective SSRLs:

- The 1,2-dichloroethane SSRL of 0.5 µg/L was exceeded in MW-28B at a concentration of 2 µg/L;
- The VC SSRL of 0.5 µg/L was exceeded in MW-20-85 at a concentration of 21 µg/L; and
- The 1,4-dioxane SSRL of 3 µg/L was exceeded in seven B zone wells (DB-01, DB-04, MW-06-85, MW-20-85, MW-21-90, MW-22-90, MW-28B), and one A & B zone well (DAB-08) at concentrations ranging from 3.3 µg/L (MW-22-90) to 47 µg/L (MW-28B).

1,4-Dioxane concentrations increased in six wells MW-20-85, MW-21-90, and MW-22-90, DB-04, MW-06-85 and MW-28B. 1,4-Dioxane concentrations decreased in A & B zone well DAB-08.

Exposition C Zone. Historical concentrations of TCE versus time plots are presented in Appendix C, Graphs C-27 through C-28; cis-1,2-DCE versus time plots are presented on Graphs C-29 through C-30. Concentrations of COCs in groundwater are presented in Appendix C, Figure C-10 and TCE concentration contours are presented in Appendix C, Figure C-15. Analytical results are in Tables C-5 of Appendix C.

In July 2014, six monitoring wells screened in the C zone were sampled, primarily located in the southern portion of the Site and to the south and west off site on Alamo Avenue (well MW-10-110). The only COCs to exceed SSRLs in the C zone were TCE, cis-1,2-DCE, and 1,4-dioxane.

TCE was detected in groundwater from all six wells sampled; however, only two wells had exceedances above SSRLs with concentrations of 540 µg/L (MW-23-110) and 700 µg/L (MW-05-105). The TCE groundwater plume with concentrations above the SSRL extends off site to the west and south of the ERH Treatment Area. The highest off-site TCE concentration was in MW-05-105, located to the west and adjacent to the Site boundary. The northern extent of the TCE plume is not defined, however, is located in the upgradient boundary of the site. TCE concentrations in MW-10-110, MW-24-110, MW-25-110, and MW-34-110 were either stable or decreasing. TCE concentrations in two wells southwest and west of the ERH Treatment Area (MW-05-105 and MW-23-110, respectively) have shown increasing trends since 2011. Vertical migration maybe occurring from the upper zone due the increase concentrations in these wells.

Cis-1,2-DCE was detected in groundwater from five of the six wells sampled at concentrations ranging from 0.43 J µg/L (MW-25-110) to 88 µg/L (MW-05-105). The cis-1,2-DCE groundwater plume was similar to the TCE groundwater plume in areal extent; cis-1,2-DCE was only detected in groundwater from wells with TCE detections. Cis-1,2-DCE concentrations in MW-10-110, MW-11-100, MW-25-110, MW-24-110, and MW-34-110 were either stable or decreasing. Cis-1,2-DCE concentrations in groundwater from MW-05-105 and MW-23-110 had increasing trends. The presence of cis-1,2 DCE maybe evidence of biodegradation is underway (MNA), and maybe expected to show fluctuations in concentrations related to the TCE biodegradation processes. TCE exceedances are also present in both of these wells, which act as a source.

1,4-Dioxane was detected at concentrations ranging from 0.63 J µg/L to 4.3 µg/L in all three samples from C Zone wells. The 1,4-dioxane concentration from well MW-05-105 (4.3 µg/L) was above the SSRL of 3 µg/L. The 1,4-dioxane concentrations have increased in all three wells.

Exposition D Zone. Historical concentrations of TCE versus time plots are presented on Graphs C-31 through C-32; cis-1,2-DCE versus time plots are presented on Graphs C-33 through C-34. Concentrations of COCs in groundwater are presented on Figure C-11 and TCE concentration contours are presented on Figure C-16. COCs with concentrations exceeding SSRLs in the D Zone include TCE, cis-1,2-DCE, and 1,4-dioxane. Analytical results are presented in Tables C-6 of Appendix C.

In July 2014, seven wells screened in the D zone were sampled. D zone monitoring wells are located in the southern portion of the Site and off site to the west and south. TCE was detected above the SSRL for TCE (5 µg/L) in MW-07-130, MW-11-130, and MW-25-130 at concentrations of 130 µg/L, 11 µg/L, and 230 µg/L, respectively. TCE concentrations in wells MW-25-130, MW-07-130, and MW-11-130 (located along the Los Angeles River) have increasing trends. TCE concentrations in well MW-23-145 (located west of the ERH Treatment Area) also have an increasing trend; although concentrations are below the SSRL they increased gradually from 0.58 µg/L in July 2008 to 3.0 µg/L in July 2014. Vertical migration may be occurring from the upper zone due the increase concentrations in these wells. Concentrations in the other monitored wells were generally stable.

Other COCs detected at concentrations above SSRLs were cis-1,2-DCE and 1,4-dioxane at concentrations of 10 µg/L and 36 µg/L, respectively, in MW-25-130. Concentrations of cis-1,2-DCE in MW-25-130 exhibited fluctuations generally within an order of magnitude around the SSRL from 2010 through 2012; however the past four samples (2013 to 2014) have been relatively stable at around 10 µg/L. Cis-1,2-DCE concentrations in wells MW-05-135, MW-07-130, MW 11-130 and MW-12-15 have increasing trends since 2007. 1,4-Dioxane concentrations in MW-25-130 increased from 11 µg/L to 36 µg/L; both concentrations are above the SSRL of 3 µg/L. The presence of cis-1,2 DCE may be evidence of biodegradation is underway (MNA), and maybe expected to show fluctuations in concentrations related to the TCE biodegradation processes. TCE exceedances are also present in all three of these wells, which act as a source.

Exposition E Zone. Well MW-10-170, the only well screened in the E zone, is located downgradient of the site to the east-southeast (Appendix C, Figure C-11). Historical concentrations of TCE are presented on Graph C-35. TCE was detected in this well at a concentration of 0.1 J µg/L, which is below the SSRL. Historically, TCE has either not been detected or has been well below the SSRL in samples collected from this well. Analytical results are in Tables C-6 of Appendix C. One well off site is not a good representative of vertical migration to the E zone.

6.4.2.3. Historical Concentration Trends

Historical TCE concentration trends were evaluated for wells in all zones. The graphical analyses are included in Appendix C and are discussed below.

Perched Zone: TCE concentrations in the perched zone have shown generally decreasing trends in the18 wells sampled.

Exposition A Zone: TCE concentrations in the A zone have shown generally decreasing trends in 12 of the 13 wells sampled. Well MW-21-80 is the only well that has exhibited an increasing trend since 2007. Data results indicate that the extent of the groundwater plume in the A zone is unknown to the north and west of the site due to the lack of monitoring wells. Increases in COC concentrations in MW-21-80 suggest that RAOs for restoring groundwater quality are not being achieved.

Exposition B Zone: TCE concentrations in the B zone are generally decreasing from north to south across the Site based on the 30 wells sampled. TCE concentration trends for both the B zone and A & B zone wells have shown generally decreasing or stable trends with the exception of four wells (DAB-08, MW-29-85, MW-21-90, and MW-12-90). Data results indicate that the extent of the groundwater plume in the B zone is unknown to the north and west of the site due to the lack of monitoring wells.

Exposition C Zone: TCE concentrations in the C zone have shown increasing trends in the six wells sampled, with sharp increases in two of the wells since 2011 (MW-23-110 and MW-05-105). From June 2013 to July 2014, TCE concentrations increased from 63 µg/L to 540 µg/L in MW-23-110 and 26 µg/L to 700 µg/L in MW-05-105. Data results indicate that the extent of the groundwater plume in the C zone is only known to the east due to the lack of monitoring wells.

Exposition D Zone: TCE concentrations in the D zone have shown stable to increasing trends in the seven wells sampled. TCE concentrations in wells MW-25-130, MW-07-130, and MW-11-130 (located along the Los Angeles River) have increasing trends. Concentrations in the other monitored wells were generally stable. From April 2011 to July 2014, TCE concentrations increased from 99 µg/L and 230 µg/L in MW-25-130 and from 20 µg/L to 130 µg/L in MW-07-130. Data results indicate that the extent of the groundwater plume in the D zone is only known to the northwest due to the lack of monitoring wells.

6.4.2.4. Treatment System Evaluation

Mass of VOCs removed by the groundwater and vapor treatment systems has decreased substantially since ERH was active (Figure 6-2). The volume of groundwater extracted has decreased significantly since 2011 (likely due to the plant was shut down due to expiration of the LACSD discharge permit for much of 2012 and 2013, and the continuing optimization efforts), which corresponds to a decrease in the total VOC mass removed by the groundwater treatment system since 2011 (Figures 6-2 and 6-3). The annual mass removal efficiency of the groundwater treatment system (lbs. VOCs removed per million gallons of water treated), though, has been relatively stable over the last five years (Figure 6-3). Since the restart of the system in 2013, quarterly estimated mass removal efficiency of the groundwater treatment system has declined somewhat, and quarterly estimated mass removal efficiency (lbs. VOCs removed per million standard cubic feet treated) has been inconsistent (Figure 6-4). It is difficult to interpret the recent system efficiencies in light of the optimization efforts; different sets of groundwater and vapor extraction wells have been used each quarter since the system was restarted (see Section 4.3.3). The most efficient mass removal in the groundwater treatment system occurred in the second quarter of 2013, when only wells DB-01, DB-04, DB-07, and DB-08 were in operation. The most efficient mass removal in the vapor treatment system occurred in the first quarter of 2014, when only wells PB-01, PB-02, PC-06, and PD-04 were in operation. However, mass removal and achievement of SSRLs is not the only goal of the remedial action; prevention of contaminant migration is also a goal. These goals, along with the current understanding of contaminant distribution, must be carefully considered when determining which extraction wells should be in operation.

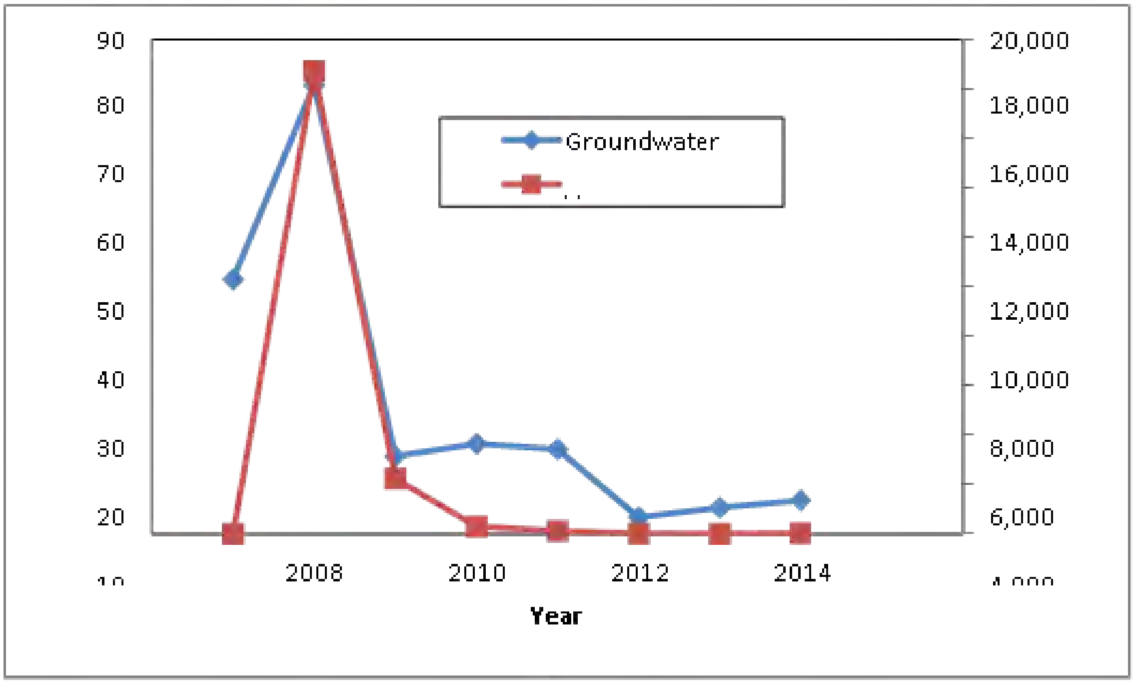

Figure 6-2 **Mass of VOCs removed from 2007-2014**

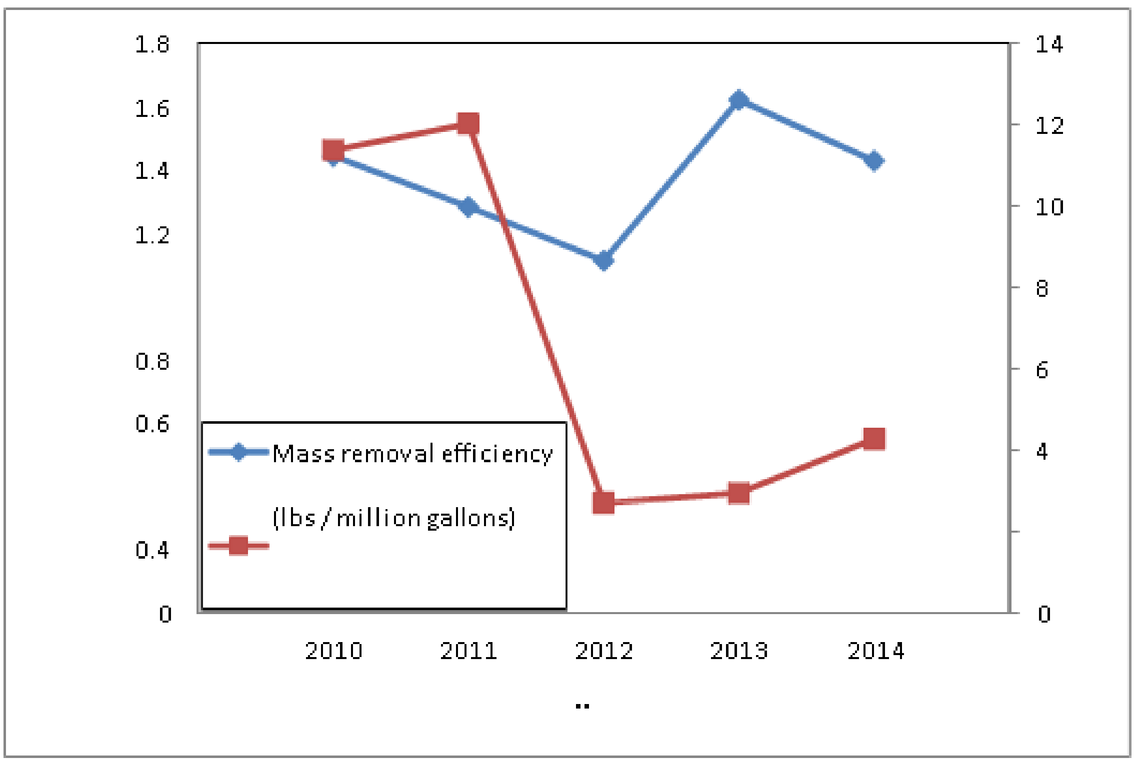

Figure 6-3 **Annual VOC Removal Efficiency in Groundwater from 2010-2014**

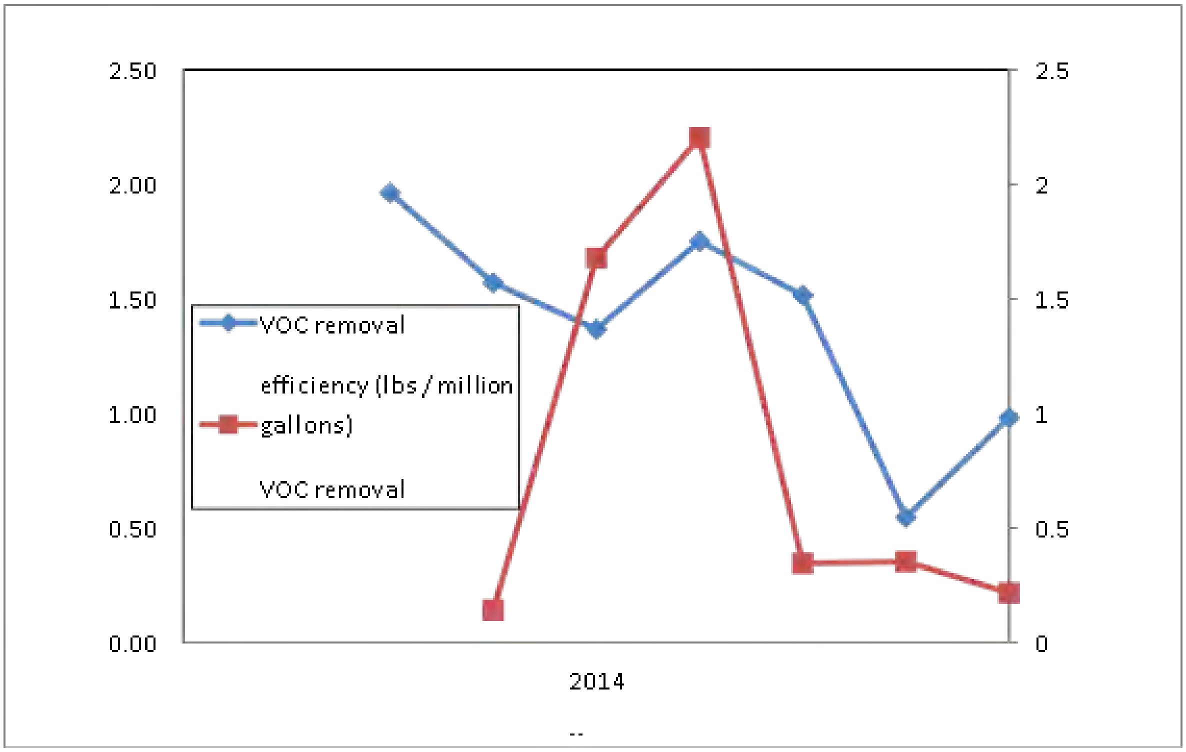

Figure 6-4 Recent Quarterly VOC Removal Efficiencies

6.5. Site Inspection

U.S. EPA conducted a site inspection on December 2, 2014. The Site Inspection Checklist with a list of attendees is presented in Appendix D. The remedy systems and components that were observable are in good repair and operating as designed. The exception is the solids filtration unit at the groundwater treatment plant, which requires more maintenance than anticipated due to well damage caused by the ERH. The general impression is that the remedial systems are functioning very well, are well maintained, and problems and/or concerns are pro-actively addressed. Data, records, and logs reviewed during the site inspection support the statement that the remedy is effective and functioning as designed

The following concerns were recorded during the Site Inspection:

- There have been issues with vandalism in 2013. Vandals cut the fence in the former ERH area and stole electrical wires placed there by the City of Maywood;
- Above ground piping serving the ERH area was removed during 2014; and
- A few wells are listed for abandonment.

6.6. Interviews

During the FYR process, interviews were conducted by telephone with Brian Hendron (OTIE Project Superintendent) on December 8, 2014 and Lori Parnass (DTSC Project Manager) on December 9, 2014.

The purpose of the interviews was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy that have been implemented to date. Interviews are summarized below and complete interviews are included in Appendix E.

The primary input from Brian Hendron (OTIE) was as follows:

1. Monitoring data does show that contaminant levels within the original plume are decreasing.
2. There have been significant changes in the last 5 years.
    a) On-site staff reduced from full time staff of 3 to 1;
    b) The number of remediation wells currently active reduced by 50%;
    c) Sampling routine has also been reduced by 50%; and
    d) Changes to O&M requirements applied over last few years have reduced the effort required for O&M by approximately 50%. The current footprint of the active remediation plan allows for less monitoring effort than the previous plan with no reduction in the effectiveness of the remedy.
3. Some issues which have caused additional manpower effort include high sediment content in groundwater systems causing excessive filter replacement.
4. Significant effort has been applied to O&M optimization which includes:
    a) Adding additional filter vessels to capture sediment coming into groundwater system. This allows for system to more efficiently capture sediment coming in and run longer between shutdowns or filter change outs;
    b) Installation of variable frequency drive (VFD) on groundwater treatment system booster tank pump to reduce flowrate through groundwater treatment system filter vessel, which allows longer contact time or removable sediment and higher efficiency of the filter themselves; and
    c) Installation of VFD on vapor extraction system blower to reduce energy consumption and excess vacuum applied to treatment area.

Lori Parnass (DTSC) provided the following input:

1. The remedy is functioning as intended.
2. ERH was underperforming and has been removed from operation.
3. Bioaugmentation may be used to help decrease groundwater concentrations in the future.
4. The land use covenant may be expected within 2 years.

6.7. INSTITUTIONAL CONTROLS

Table 6-7 lists the ICs associated with areas of interest at the Site.

Table 6-7 Institutional Control Summary Table

Impacted Parcel(s)	Media	ICs Specified in the Decision Documents?	IC Objective	Instrument in Place	Notes
APN6314-030-005 APN6314-032-900 APN6314-030-800 APN6314-003-001 APN6314-032-008 APN6314-030-004	Ground- water	Yes	Prevents human exposure to contaminated groundwater	Los Angeles Regional Water Quality Control Board private well permit restriction	
	Soil	Yes	Prevent human exposure to contaminated soil	Land Use Restrictions	Recording No. 02 3199193

The ROD states that the IC objectives to be achieved through land-use restrictions included the following:

- Prohibit sensitive uses such as residential, hospital, school, child-care facility, and hospice;
- Prohibit groundwater extraction and/or use without prior review and written approval of DTSC, except as provided for in the ROD;
- Prohibit alteration, disturbance, or excavation of soil and caps without a DTSC-approved excavation work plan, except as provided for in the ROD; and
- Require contaminated soils brought to the surface by grading, excavation, trenching, or backfilling to be managed in accordance with state and federal law

The Trust for Public Land recorded a covenant dated December 30, 2002, restricting certain uses of the property, including prohibiting residential use of the property and prohibiting the alteration of the soil cover. The ROD required that the City of Maywood prohibit residential use of the property through zoning, and suggested that a State of California Land Use Covenant with the City of Maywood may be required to permanently change the allowable land use at the site. The City of Maywood has issued a zoning change on its maps to identify the area as “park” land. This IC has not yet been completed.

Likewise, DTSC representatives stated during the site inspection that the State of California has not yet finalized a Land Use Covenant for the site

7.0 TECHNICAL ASSESSMENT

7.1. QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

The remedy is performing as intended. The surface cap is preventing human exposure (by direct contact) of contaminated soils having COCs in excess of soil ARARs and standards that are protective of human health and the environment. The 2012 soil sampling event results showed that there has been significant contaminant reduction at the site since the pre-remediation soil samples were collected. Soil sample analysis indicates that VOC levels are currently significantly lower than before remediation began with the exception of seven locations (PB-02, PB-03, PD-07, B-29, MW-06, PD-08, and HP-06) where some COC exceed the SSRLs. These hot spots are now capped and revegetated. Although the former ERH treatment area has not been capped and revegetated, the fencing surrounding the area meets the RAO by protecting human receptors from exposure.

The groundwater chemicals of concern concentrations are generally decreasing towards MCLs with a few exceptions. In the C zone, TCE was detected in groundwater from all six wells sampled, however, only two had exceedances above SSRLs with concentrations of 540 µg/L (MW-23-110) along the site boundary and 700 µg/L (MW-05-105) just outside the site boundary. TCE concentrations in these two wells southwest and west of the ERH Treatment Area (MW-05-105 and MW-23-10, respectively) have shown increasing trends since 2011. In the D Zone, TCE was detected above the SSRL for TCE of 5 µg/L in MW-07-130, and MW-11-130, at concentrations of 130 µg/L, and 11 µg/L off-site (down gradient south of the site). TCE concentrations in these wells have been increasing trends over time. Additionally, the E zone has only one well being monitored for vertical migration and it is downgradient of the site.

Historically, TCE has either not been detected or has been well below the SSRL in samples collected from this well. Although some contaminant levels increased in 2014, it is possible that concentrations of chlorinated solvents (TCE, 1,1-DCE, c-1,2-DCE) in Site groundwater are part of a regional groundwater issue which could impact whether or not the cleanup on the Pemaco site could reach the numeric goals identified in the ROD. There is a need for additional investigation to determine how much of the increasing concentrations are attributable to residual Pemaco contamination and how much is attributable to offsite sources showing up on site. The contaminated groundwater does not pose an immediate threat to the off-site municipals wells.

7.2. QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND REMEDIAL ACTION OBJECTIVES (RAOS) USED AT THE TIME OF REMEDY SELECTION STILL VALID?

The exposure assumptions and pathways identified in the RODs are still valid, although there are changes in toxicity data and ARARs for some compounds.

The groundwater ARARs for MIBK, naphthalene, and manganese have become more stringent, and an RSL for 1,4-dioxane was established that is more stringent than the ROD remediation level. The changes to 1,4-dioxane and naphthalene have not altered the protectiveness of the selected remedy, since the new criteria are within the risk management range of 1×10^{-4} to 1×10^{-6}. The revised ARARs for MIBK and manganese do not affect protectiveness because they were not detected in the most recent groundwater sampling event.

Revision to the soil toxicity values for TCE, cyanide and cis-1,2-DCE indicate a higher risk and PCE, which indicate a lower risk, from exposure to these chemicals than previously considered. Toxicity data for

TCE, cis-1,2-DCE and cyanide in soil have been lowered. The cancer and non-cancer RSLs for PCE have been raised. However, there is no current exposure to these compounds. Therefore, changes to toxicity values do not affect protectiveness.

The ARARs for several soil COCs have become more stringent. The changes to the SSLs for PCE, benzo(a)anthracene, benzo(b)flouranthene, dibenzo(a,h)anthracene, and TCE have not altered the protectiveness of the selected remedy, since these changes are within the risk management range of 1×10^{-4} to 1×10^{-6}.

No new contaminants have been identified and no new risk assessment methodologies have come into use. The RAOs are still valid. However, the RAOs for preventing offsite migration and vertical migration by contaminated groundwater are not being met.

7.3. Question C: Has Any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

There is no new information that might affect the protectiveness of the remedy.

7.4. Technical Assessment Summary

The remedy for soil was implemented in July 2005 with the emplacement of soil cover over most of the Site. The former ERH area has not been capped or revegetated. The ERH area is fenced and excludes human receptors. Soil cover with revegetation or fencing is protective of human exposure by direct contact and meets the RAOs. Institutional controls in the form of zoning change from industrial to recreational has not been completed by the City, nor has a Restrictive Covenant from DTSC. The soils remedy is functioning as intended.

The groundwater remedy (extraction system) began in April 2007 and is effectively treating groundwater to discharge standards. However, the groundwater RAOs are not being met and groundwater has not been restored to drinking water standards. There have been increasing levels of contamination in all four hydrogeologic zones since 2011 and the extent of TCE contamination in each zone needs additional investigation to find plume boundaries.

The indoor air RAO of remediating groundwater to drinking water standards has not been met and concentrations in groundwater are increasing. However, the indoor air risk has been addressed through investigation of indoor air concentrations which indicate that there is no risk through exposure to indoor air.

There have been changes to the ARARs and toxicity data for some compounds in soil and groundwater since the first FYR. However, they do not affect protectiveness. Land use has not changed since the first FYR and exposure assumption and pathways are still valid.

8.0 ISSUES

Table 8-1 summarizes the current issues for the Pemaco Superfund Site.

Table 8-1 Current Issues for the Pemaco Superfund Site

Issue	Affects Current Protectiveness? (Yes or No)	Affects Future Protectiveness? (Yes or No)
DTSC has not finalized a Land Use Covenant to permanently change the site's land use to recreational. The City of Maywood has issued a zoning change on its maps to identify the area as "park" land.	No	Yes
Contaminants of concern in four hydrogeologic zones (A, B, C, and D) have been increasing in concentrations since 2011.	No	Yes
The full extent of contamination in each of the four hydrogeologic zones has not been fully delineated on site, off site, or vertically.	No	Yes
The ERH Area has not been capped or revegetated	No	Yes

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9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 9-1 provides recommendations to address the current issues at the Pemaco Superfund Site.

Table 9-1 Recommendations to Address Current Issues at the Pemaco Superfund Site

Issue	Recommendations/ Follow-Up Actions	Responsible Party	Oversight Agency	Milestone Date	Affects Protectiveness? (Yes or No)	
					Current	Future
DTSC has not finalized a Land Use Covenant to permanently change the site's land use to recreational. The City of Maywood has issued a zoning change on its maps to identify the area as "park" land.	DTSC and the City of Maywood should finalize the draft Land Use Covenant submitted to them in April 2015 which permanently changes the site's land use to recreational.	DTSC and City of Maywood	U.S. EPA	09/2016	No	Yes
Contaminants of concern in four hydrogeologic zones (A, B, C, and D) have been increasing in concentration since 2011.	An investigation and evaluation of the increase in COCs needs to be conducted. This includes evaluating the effectiveness of the groundwater extraction and treatment system and investigating whether or not there is an unknown source contributing to the increasing concentrations. Evaluate vertical contaminant movement, including impact to downgradient municipal wells is needed	U.S. EPA	U.S. EPA	09/2016	No	Yes
The full extent of contamination in each of the four hydrogeologic zones has not been fully delineated on site, off site, or vertically.	The groundwater monitoring program should be expanded to define the extent of contamination (installation of additional wells and groundwater sampling) in all hydrogeologic zones.	U.S. EPA	U.S. EPA	09/2016	No	Yes
The ERH area has not been capped or revegetated.	The ERH area should be capped and revegetated.	U.S. EPA	U.S. EPA and City of Maywood	09/2016	No	Yes

In addition, the following are recommendations that not do affect current protectiveness but were identified during the FYR:

- All COCs from the ROD should be monitored unless there is a reason to delete them. Changes to the analyte list should be documented within the data quality objectives of the Sampling and Analysis Plan.; and
- The groundwater and vapor extraction systems are evaluated on a quarterly basis to determine what wells are used for extraction. It is based on the most recent sampling event (COC concentrations and groundwater gradients). However, additional information about how the determinations are made is needed, including protocols to make this determination.

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10.0 PROTECTIVENESS STATEMENT

The remedy at the Pemaco Superfund Site currently protects human health because exposure pathways to contaminated soil and groundwater are being controlled. However, in order for the remedy to be protective in the long-term, the following actions are necessary: (1) investigation of the increasing trends of contaminant concentration in each aquifer and the evaluation of the effectiveness of the groundwater extraction and treatment system; (2) identification of the full extent of contamination in each zone (onsite, off site and vertically); (3) capping and revegetation of the ERH area; and (4) finalization of a Land Use Covenant by DTSC, U.S. EPA and City of Maywood.

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11.0 NEXT REVIEW

This is a statutory review of the Site that requires ongoing FYRs as long as waste is left on site that does not allow for unlimited use and unrestricted exposure. The next FYR will be due within five years of the signature date of this FYR.

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APPENDIX A

Public Notice

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Pemaco Superfund Site
Public Notice of Five-Year Review
Sitio Superfund Pemaco
Aviso Público de Revisión de Cada Cinco Años

Aerial photograph of the Maywood Riverfront Park and Pemaco Superfund Site

EPA
United States Environmental Protection Agency Region 9
75 Hawthorne Street (SFD)
San Francisco, CA 94105
Attn: Carlin Hafiz (Pemaco 10/14)

Official Business
Penalty for Private Use, $300
Address Service Requested

FIRST-CLASS MAIL
POSTAGE & FEES
PAID
U.S. EPA
PERMIT No. G-35

Pemaco Superfund Site
Public Notice
Sitio Superfund Pemaco
Aviso Público

U.S. Environmental Protection Agency • Region 9 • San Francisco

The United States Environmental Protection Agency begins the second Five-Year Review of cleanup at the Pemaco Superfund Site

The United States Environmental Protection Agency (EPA) has begun the second Five-Year Review of cleanup actions undertaken at the Pemaco Superfund Site, in Maywood, CA. The Review will evaluate whether the cleanup actions for the Site remain protective of human health and the environment. The Review is expected to be complete by June 2015.

The Review Process

The purpose of the second Five-Year Review is to evaluate how the soil vapor extraction and groundwater treatment system is operating. EPA will look at the progress of the cleanup to make sure the actions performed over the past nine years are continuing to protect the community. EPA would like to talk to the community about how the cleanup has progressed over time.

(continued on page 2)

Agencia de Protección Ambiental de los EE.UU • Región 9 • San Francisco

La Agencia de Protección Ambiental de los EE.UU. Inicia la Revisión de Cada Cinco Años sobre la limpieza en el Sitio Superfund Pemaco

La Agencia de Protección Ambiental de los EE. UU. (EPA, por sus siglas en inglés) ha iniciado la segunda Revisión de Cada Cinco Años sobre las acciones de limpieza llevadas a cabo en el Sitio Pemaco Superfund, en Maywood, CA. La Revisión evaluará si las acciones de limpieza para el Sitio siguen protegiendo la salud humana y el medio ambiente. Se espera que la Revisión finalice en junio 2015.

El Proceso de Revisión

El propósito de la segunda Revisión de Cada Cinco Años es para evaluar cómo está operando el sistema de tratamiento de agua subterránea y extracción de vapor del suelo. La EPA observará el progreso de la limpieza para asegurarse que las acciones realizadas durante los últimos nueve años continúan protegiendo a la comunidad. La EPA quisiera hablar con la comunidad acerca de cómo ha progresado la limpieza en este tiempo.

(continúa en la página 3)

STAY INFORMED

September 2014 removal of heater wells used for treatment.
Septiembre 2014 eliminación de pozos calentadores utilizados para el tratamiento.

Call Toll Free

Toll-free number **1-800-231-3075** has been set up for community members to call and obtain information on the Pemaco Site.

Pemaco Information Website

To keep the public informed, the EPA maintains the Superfund Website: **www.epa.gov/region09/pemaco** EPA websites will be updated regularly with Fact Sheets, community meeting information, monitoring reports, and progress updates.

Information Repository

Maywood César Chavez Public Library
4323 East Slauson Avenue
Maywood, CA 90207
(323) 771-8600

EPA Superfund Records Center
95 Hawthorne Street
San Francisco, CA 94105
(415) 947-8000

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Carlin Hafiz
Community Involvement Coordinator
600 Wilshire Blvd,, Ste. 1460
(213) 244-1814
Or Toll Free: (800) 231-3075
hafiz.carlin@epa.gov

The Review Process continued

The Review process will include taking a look at recent scientific developments, and comparing current chemical concentrations in the groundwater against cleanup numbers to make sure they are still safe. Some chemicals present in groundwater and/or soil at the beginning of the cleanup have met the safe levels established in the cleanup plan – the Record of Decision (ROD) – for the Site.

The Superfund law requires an evaluation of the protectiveness of the treatment system every five years when the cleanup actions will take longer than five years to complete. EPA will continue to evaluate the protectiveness of the cleanup until the chemical concentrations found in the groundwater meet the cleanup numbers established in the ROD. For this current review, EPA will examine the mechanical components of the groundwater and vapor treatment system to ensure that they continue to operate properly.

Upon completion of the second Five-Year Review, EPA will send out a 2015 Fact Sheet to inform you of the conclusions of the Review. Also, a copy of the second Five-Year Review will be placed in the local **Information Repository** listed on this page.

Community Involvement

EPA is always interested in hearing from the public. If you are interested in being interviewed for the Five-Year Review, let us know. If you have any issues or concerns about the Pemaco Site's cleanup plan or progress of cleanup, EPA would like to talk with you. Please contact Rose Marie Caraway or Carlin Hafiz at the EPA Contacts numbers listed on this page. If you would like to be included in our postal mailing list and receive future fact sheets, please contact Carlin Hafiz.

Site History

The Pemaco Site was formerly used as a chemical mixing facility that operated from the 1950s until 1991 when operations ended. The Site was placed on the National Priorities List (NPL) in January of 1999 to address contaminants that include chlorinated solvents and other volatile organic compounds (VOCs). Following extensive site investigation work, the ROD was signed in 2005. The ROD summarized EPA's selected cleanup actions and cleanup work began the Summer of 2005. The cleanup activities resulted in the majority of the former Pemaco property being incorporated into Maywood Riverfront Park by the fall of 2006. The cleanup work continues to the present day with the operation of the treatment plant.

Cleanup Objectives

The objective of groundwater cleanup activities is to restore groundwater to drinking water quality and prevent contamination from spreading. Indoor air quality objectives require cleanup of contaminated soils and groundwater in order to prevent migration of soil vapors, especially into homes and businesses. To meet these goals, EPA and the City of Maywood covered the park area with clean soil when the park was constructed in 2005. Wells were also installed on the former Pemaco location and in the surrounding community. Underground soils and groundwater that contained chemicals with the highest concentrations were heated to high temperatures in order to clean them up. Greater than 21,618 pounds of contaminants have been removed from soil and groundwater. Approximately 30,500 gallons of water per day are handled by the treatment plant.

El Proceso de Revisión continuación

El proceso de Revisión incluirá observar los desarrollos científicos recientes y comparar las concentraciones de químicos actuales en el agua subterránea en comparación con los números de limpieza para asegurar que siguen siendo seguros. Algunos químicos presentes en el agua subterránea y/o suelo al inicio de la limpieza han alcanzado los niveles de seguridad establecidos en el plan de limpieza – Documentos de Decisión (ROD, por sus siglas en inglés) – para el Sitio.

La ley de Superfund exige una evaluación de la protección del sistema de tratamiento, cada cinco años, cuando las acciones de limpieza tomen más de cinco años en completarse. La EPA continuará evaluando el propósito de protección de la limpieza hasta que las concentraciones de sustancias químicas encontradas en el agua subterránea cumplan con los números de limpieza establecidos en el ROD. Para esta revisión, la EPA examinará los componentes mecánicos del sistema de aguas subterráneas y el tratamiento de vapor para asegurarse que siguen funcionando correctamente.

Tras la finalización de la segunda Revisión de Cada Cinco Años, la EPA enviará una Hoja de Datos en el 2015 para informarles de las conclusiones de la Revisión. También, una copia de la Segunda Revisión de Cada Cinco Años será colocada en el local del **Depósito de Información** señalado en esta página.

Participación Comunitaria

La EPA siempre está interesada en escuchar al público. Si usted está interesado en ser entrevistado para la Revisión de Cada Cinco Años, háganos saber. Si usted tiene cualquier problema o preocupación sobre el plan de limpieza del Sitio Pemaco o del progreso de la limpieza, nos gustaría hablar con usted. Por favor de comunicarse con Rose Marie Caraway o con Carlin Hafiz a los números de contacto de la EPA señalados en esta página. Si a usted le gustaría ser incluido en nuestra lista de correos y recibir hojas de datos posteriores, por favor de comunicarse con Carlin Hafiz.

Historia del Sitio

El Sitio Pemaco fue utilizado antiguamente como una instalación industrial para mezclar químicos que operó desde la década de 1950 hasta 1991 cuando terminaron las operaciones. El Sitio fue colocado en la Lista de Prioridades Nacionales (NPL, por sus siglas en inglés) en enero de 1999 para abordar los contaminantes que incluían disolventes clorados y otros compuestos orgánicos volátiles (VOCs, por sus siglas en inglés). Despues de una amplia investigación sobre el terreno del Sitio, el ROD fue firmado en 2005. El ROD resumío las acciones de limpieza seleccionadas por la EPA y el trabajo de limpieza comenzo en el verano del año 2005. Las actividades de limpieza dieron como resultado que la mayoría de la antigua propiedad Pemaco se incorporara al Parque Riverfront de Maywood, en el otoño del año 2006. El trabajo de limpieza continúa hasta la fecha con la operación de la planta de tratamiento.

Objetivos de Limpieza

El objetivo de las actividades de limpieza del agua subterránea es restaurar el agua subterránea como agua de calidad potable y prevenir contaminación por propagación. Los objetivos de calidad del aire interior requieren de la limpieza de suelos y aguas subterránea contaminadas para prevenir la migración de vapores del suelo, especialmente a casas y negocios. Para cumplir estos objetivos, la EPA y la Ciudad de Maywood cubrieron el área del parque con tierra limpia cuando el parque fue construido en el año 2005. También fueron instalados pozos en la antigua ubicación de Pemaco y en la comunidad que la rodea. Los suelos subterráneos y el agua subterránea que contenían sustancias químicas en las mayores concentraciones más elevadas fueron calentados a altas temperaturas para limpiarlos. Más de 21,618 libras de contaminantes han sido removidas del suelo y del agua subterránea. Aproximadamente 30,500 galones de agua diarios son manejados por la planta de tratamiento.

ESTAR INFORMADOS

Perforación de pozos abandonado, septiembre de 2014.
September 2014 well abandonment drilling.

Llame Gratis

El número gratuito **1-800-231-3075** ha sido establecido para que los miembros de la comunidad puedan llamar y obtener información sobre el Sitio Pemaco.

Página web de Información Pemaco

Para mantener al público informado, la EPA mantiene la Página web Superfund: **www.epa.gov/region09/pemaco** Las páginas web de EPA serán regularmente actualizadas con Hojas de Datos, información de reuniones comunitarias, reportes de monitoreo y actualizaciones de progreso.

Depósitos de Información

Biblioteca Pública Maywood César Chavez
4323 East Slauson Avenue
Maywood, CA 90207
(323) 771-8600

Centro de Registros Superfund de EPA
95 Hawthorne Street
San Francisco, CA 94105
(415) 947-8000

Contactos de la EPA

Rose Marie Caraway, MBA, Gerente de Proyectos de Remediación
75 Hawthorne St. (SFD 7-2)
San Francisco, CA 94105
(415) 972-3158
caraway.rosemarie@epa.gov

Carlin Hafiz
Coordinadora de Participación Comunitaria
600 Wilshire Blvd, Ste. 1460
(213) 244-1814
Llame gratis: (800) 231-3075
hafiz.carlin@epa.gov

APPENDIX B

List of Documents Reviewed

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List of Documents Reviewed

Arcadis. 2013. Quarterly Groundwater Monitoring and Remedial Progress Report for the First Quarter of 2013. Former W.W. Henry Property. April.

Arcadis. 2013. Quarterly Groundwater Monitoring and Remedial Progress Report for the Second Quarter of 2013. Former W.W. Henry Property. July.

Arcadis. 2014. Quarterly Groundwater Monitoring and Remedial Progress Report for the Second Quarter of 2014. July.

Oneida Total Integrated Enterprises (OTIE). 2013. 2013 Second Quarter Operation and Maintenance Report (April – June) Pemaco Superfund Site. Maywood, California. September.

Oneida Total Integrated Enterprises (OTIE). 2013. 2013 Third Quarter Operation and Maintenance Report (July-September) Pemaco Superfund Site. Maywood, California. October.

Oneida Total Integrated Enterprises (OTIE). 2014. 2013 Fourth Quarter Operation and Maintenance Report (October-December) Pemaco Superfund Site. Maywood, California. January.

Oneida Total Integrated Enterprises (OTIE). 2014. 2014 First Quarter Operation and Maintenance Report (January – March) Pemaco Superfund Site. Maywood, California. September.

Oneida Total Integrated Enterprises (OTIE). 2014. 2014 Second Quarter Operation and Maintenance Report (April-June) Pemaco Superfund Site. Maywood, California. October.

Oneida Total Integrated Enterprises (OTIE). 2014. 2014 Third Quarter Operation and Maintenance Report (July – September) Pemaco Superfund Site. Maywood, California. September.

Oneida Total Integrated Enterprises (OTIE). 2014. Draft-Final Sampling and Analysis Plan. Pemaco Superfund Site. Maywood California. September.

Oneida Total Integrated Enterprises (OTIE). 2014. First Semi-Annual Groundwater Monitoring Report, July 2014 Monitoring Event for Pemaco Superfund Site. Maywood, California. December.

Oneida Total Integrated Enterprises (OTIE). 2014. First Semi-Annual Groundwater Monitoring Report, 2013 June Monitoring Event for Pemaco Superfund, Site Maywood, California. April.

Oneida Total Integrated Enterprises (OTIE). 2014. Second Semi-Annual Groundwater Monitoring Report, December 2013 and March 2014 Monitoring Events for Pemaco Superfund Site. Maywood, California. August.

SulTRAC. 2012. 2010 Monitoring and Sampling Report, Pemaco Superfund Site, Los Angeles County, California. March.

SulTRAC. 2012. Monitoring and Sampling Report January through June 2011 for Pemaco Superfund Site, Los Angeles County, California. September.

SulTRAC. 2012. Post-Remediation Soil Sampling Summary for Pemaco Superfund Site, Maywood, California. April.

SulTrac. 2012. Post-Remediation Soil Sampling Summary for Pemaco Superfund Site. Maywood, California. April.

SulTRAC. 2013. 2010 Annual Operations Report for Pemaco Superfund Site. Maywood, California. April.

SulTRAC. 2013. 2011 Annual Operations Report for Pemaco Superfund Site. Maywood, California. April.

SulTRAC. 2013. 2012 Annual Operations Report for Pemaco Superfund Site. Maywood, California. April.

SulTRAC. 2013. Monitoring and Sampling Report January through June 2012 for Pemaco Superfund Site, Los Angeles County, California. April.

SulTRAC. 2013. Monitoring and Sampling Report January through June 2012 for Pemaco Superfund Site, Los Angeles County, California. April.

SulTRAC. 2013. Monitoring and Sampling Report July through December 2011 for Pemaco Superfund Site, Los Angeles County, California. January.

SulTRAC. 2013. Monitoring and Sampling Report July through December 2012 for Pemaco Superfund Site, Los Angeles County, California. May.

TN & Associates (TN&A). 2007a. Draft Final Construction Report, Maywood Riverfront Park. May

TN&A 2007b. Operation and Maintenance Manual, PEMACO Superfund Site, 5050 Slauson Avenue, Maywood, California. May 23.

United States Environmental Protection Agency (USEPA). 2010. First Five-Year Review Report for Pemaco Superfund Site. Maywood, California. September.

USEPA. 2005. Record of Decision. Pemaco Superfund Site Maywood, California. January.

APPENDIX C

Figures, Graphs, Tables

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Figures

List of Figures

Groundwater Gradient Map

Chemical of Concern in Groundwater by Hydrological Units

Chemical of Concern in Groundwater by Plume Maps

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Groundwater Gradient Map

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LEGEND:

PC-01 U.S. EPA, DPE Well, "OFF"

PB-01 U.S. EPA, DPE Well, "ON"

B-01 / SV-01 U.S. EPA, Monitoring Well

PA-02 Grayed Wells Indicate Abandoned or Inaccessible

Dry — Dry Indicates less than 6 inches of water in well; Wells have a 6-inch sump

Groundwater Contour (1-Foot Intervals; Dashed Where Inferred)

Groundwater Flow Direction

122.81 Groundwater Elevation

Former Pemaco Property

Maywood Riverfront Park (Site) Boundary

Site Fencing

NOTES:

1. This groundwater gradient map represents static conditions. No extraction wells were operated within seven days of depth-to-water measurements.
2. Wells screened in intervals below the Perched Zone are not shown in this figure.
3. All groundwater elevations are expressed in feet above mean sea level.
4. No groundwater elevation beneath well symbol indicates groundwater elevation data not collected during July 2014 monitoring event.

DPE = dual phase extraction
NS = not surveyed as a value engineering option during June 2013 re-survey effort
U.S. EPA = United States Environmental Protection Agency, Region 9
FP = Free Product

N
W E
S

Approximate Scale in Feet

0 100 200

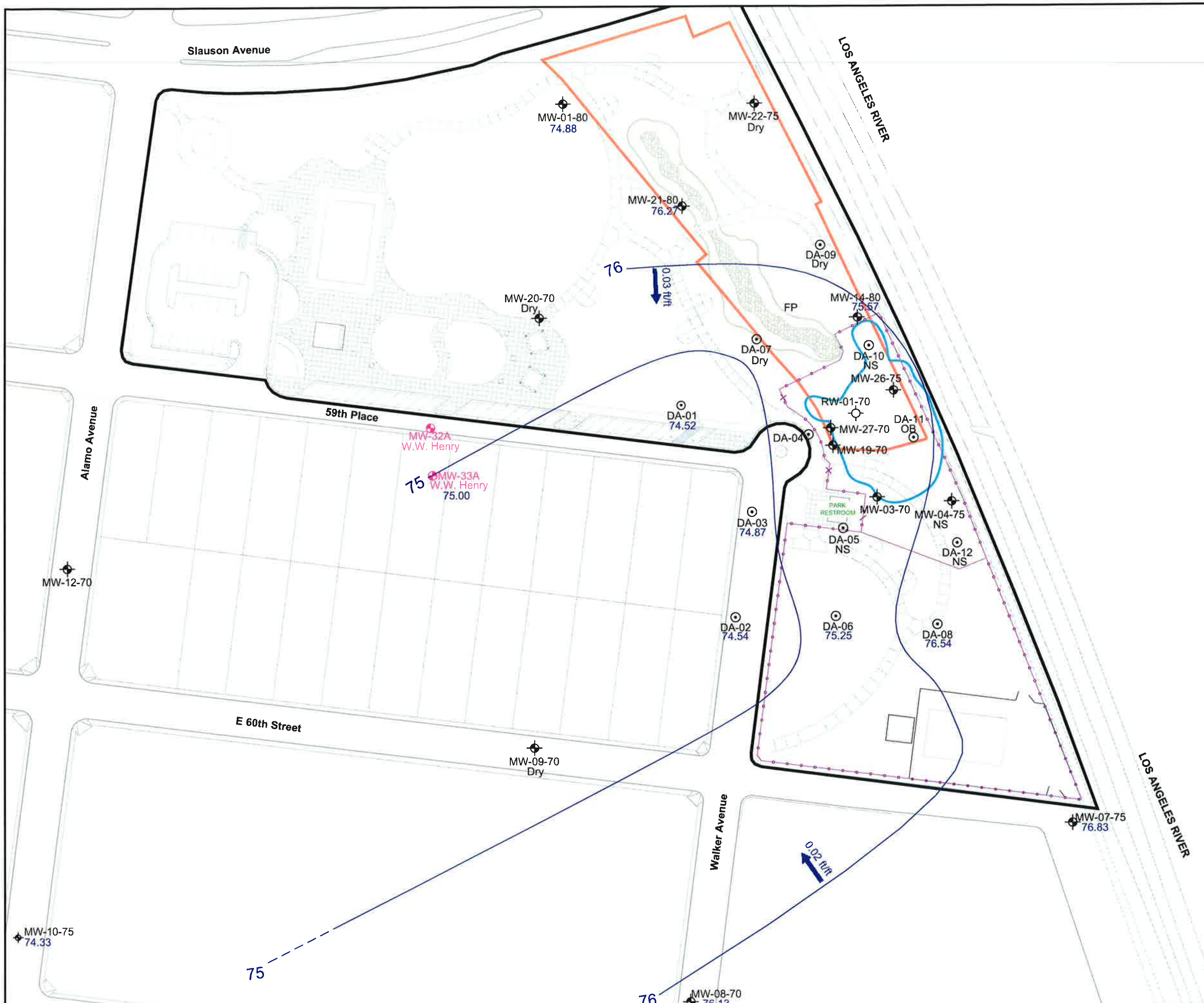
Figure C-1
Groundwater Gradient Map
Perched Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE

Date: March 13, 2015

File: Pem_Site_GW Contour.dwg



LEGEND:

DA-1	U.S. EPA, Extraction Well, Individual Screens for the 'A' Zone
MW-14-80	U.S. EPA, Monitoring Well, Exposition Aquifer
RW-01-70	U.S. EPA, Recovery Well, Exposition Aquifer (Currently Used as a Monitoring Well)
MW-33A W.W. Henry	W.W. Henry Well 5100 59th Place, Property 7 from Alamo Corner
Dry	Dry Indicates less than 6 inches of water in well Wells have a 6 inch sump
	Groundwater Contour (1-Foot Intervals; Dashed Where Inferred)
	Groundwater Flow Direction
73.18	Groundwater Elevation
	Former Pemaco Property
	Maywood Riverfront Park (Site) Boundary
	ERH Treatment Area
	Site Fencing

NOTES:

1. This groundwater gradient map represents static conditions. No extraction wells were operated within seven days of depth-to-water measurements.
2. Wells screened in intervals above or below the 'A' zone are not shown in this figure.
3. All groundwater elevations are expressed in feet above mean sea level.
4. No groundwater elevation beneath well symbol indicates groundwater elevation data not collected during July 2014 monitoring event.

COC = contaminant of concern
ERH = Electrical Resistance Heating
NS = not surveyed as a value engineering option during June 2013 re-survey effort
OB = obstructed
ppb = parts per billion
U.S. EPA = United States Environmental Protection Agency, Region 9

N W E S

Approximate Scale in Feet

0 100 200

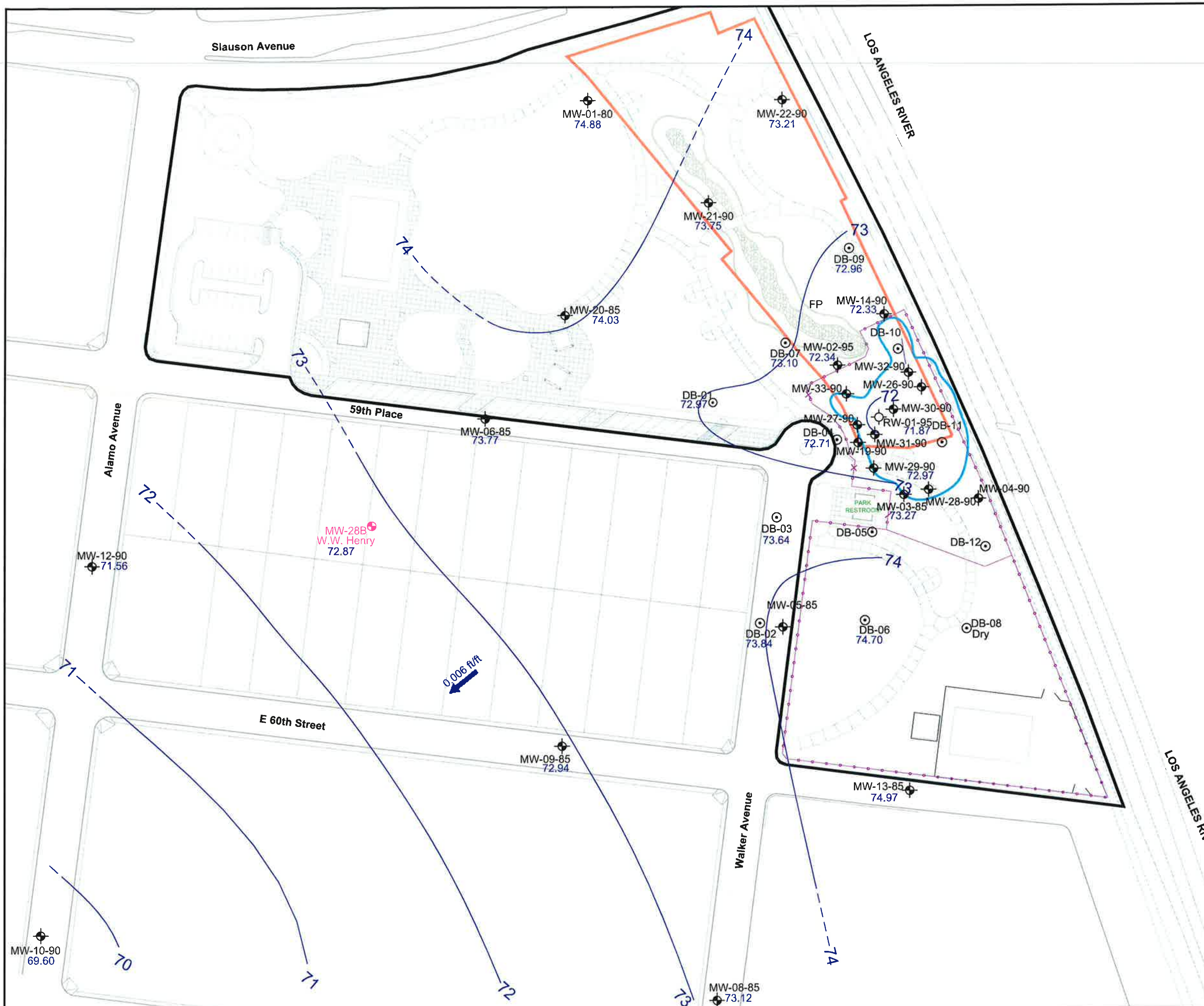
Figure C-2
Groundwater Gradient Map
Exposition 'A' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE
Oneida Total Integrated Enterprises

Date: March 13, 2015

File: Pem_Site_GW Contour.dwg



LEGEND:

DB-02	U.S. EPA, Extraction Well, Individual Screens for the 'B' Zone
DAB-01	U.S. EPA, Extraction Well, Screened though Both 'A' and 'B' Zones
MW-1-80	U.S. EPA, Monitoring Well, Exposition Aquifer
RW-1-70	U.S. EPA, Recovery Well, Exposition Aquifer (Currently Used as a Monitoring Well)
MW-28B W.W. Henry	W.W. Henry Well 5024 59th Place, Property 6 from Alamo
Dry	Dry Indicates less than 6 inches of water in well Wells have a 6 inch sump
	Groundwater Contour (1-Foot Intervals; Dashed Where Inferred)
	Groundwater Flow Direction
73.64	Groundwater Elevation
	Former Pemaco Property
	Maywood Riverfront Park (Site) Boundary
	ERH Treatment Area
	Site Fencing

NOTES:

1. This groundwater gradient map represents static conditions. No extraction wells were operated within seven days of depth-to-water measurements.
2. All groundwater elevations are expressed in feet above mean sea level.
3. No groundwater elevation beneath well symbol indicates groundwater elevation data not collected during July 2014 monitoring event.

ERH = Electrical Resistance Heating
NS = not surveyed as a value engineering option during June 2013 re-survey effort
U.S. EPA = United States Environmental Protection Agency, Region 9

Approximate Scale in Feet
0 100 200

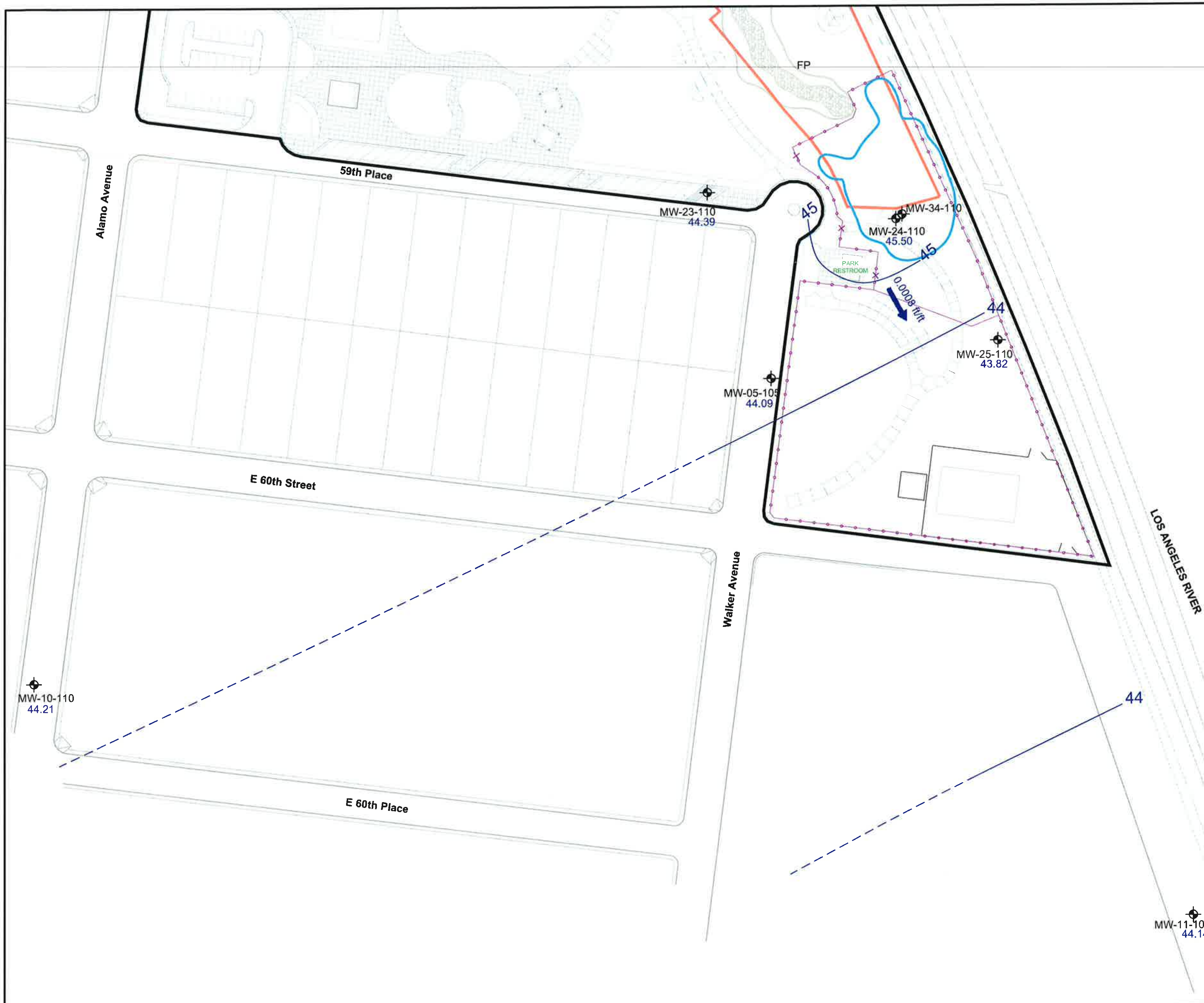
N W E S

Figure C-3
Groundwater Gradient Map
Exposition 'B' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE
Oneida Total Integrated Enterprises

Date: March 13, 2015
File: Pem_Site_GW Contour.dwg



LEGEND:

- MW-25-110 U.S. EPA, Monitoring Well, Exposition Aquifer
- Groundwater Contour (1-Foot Intervals; Dashed Where Inferred)
- Apparent Groundwater Flow Direction
- 43.82 Groundwater Elevation
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- ERH Treatment Area
- Site Fencing

NOTES:

1. This groundwater gradient map represents static conditions. No extraction wells were operated within seven days of depth-to-water measurements.
2. Wells screened in intervals above or below the 'C' zone are not shown in this figure.
3. All groundwater elevations are expressed in feet above mean sea level.
4. No groundwater elevation beneath well symbol indicates groundwater elevation data not collected during July 2014 monitoring event.

ERH = Electrical Resistance Heating
U.S. EPA = United States Environmental Protection Agency, Region 9

N W E S

Approximate Scale in Feet

0 100 200

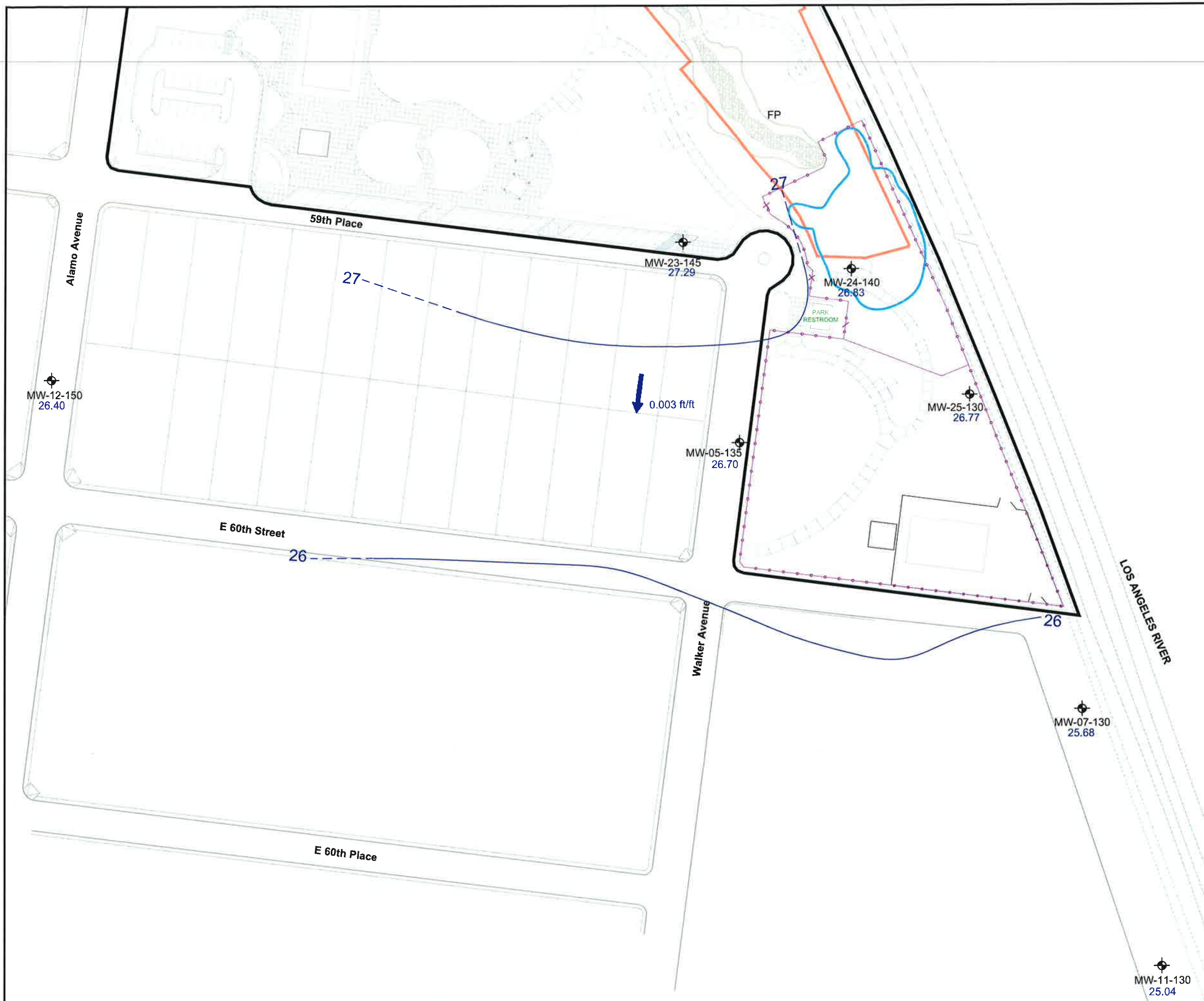
Figure C-4
Groundwater Gradient Map
Exposition 'C' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE

Date: March 13, 2013

File: Pem_Site_GW Contour.dwg



LEGEND:

MW-24-140 U.S. EPA, Monitoring Well, Exposition Aquifer

Groundwater Contour (1-Foot Intervals; Dashed Where Inferred)

Groundwater Flow Direction

26.77 Groundwater Elevation

Former Pemaco Property

Maywood Riverfront Park (Site) Boundary

ERH Treatment Area

Site Fencing

NOTES:

1. This groundwater gradient map represents static conditions. No extraction wells were operated within seven days of depth-to-water measurements.
2. Wells screened in intervals above or below the 'D' zone are not shown in this figure.
3. All groundwater elevations are expressed in feet above mean sea level.

ERH = Electrical Resistance Heating
U.S. EPA = United States Environmental Protection Agency, Region 9

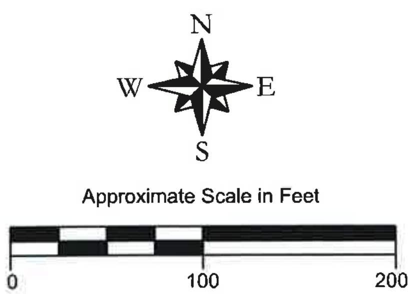


Figure C-5
Groundwater Gradient Map
Exposition 'D' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE

Date: March 13, 2015

File: Pem_Site_GW Contour.dwg

Chemical of Concern in Groundwater by Hydrological Units

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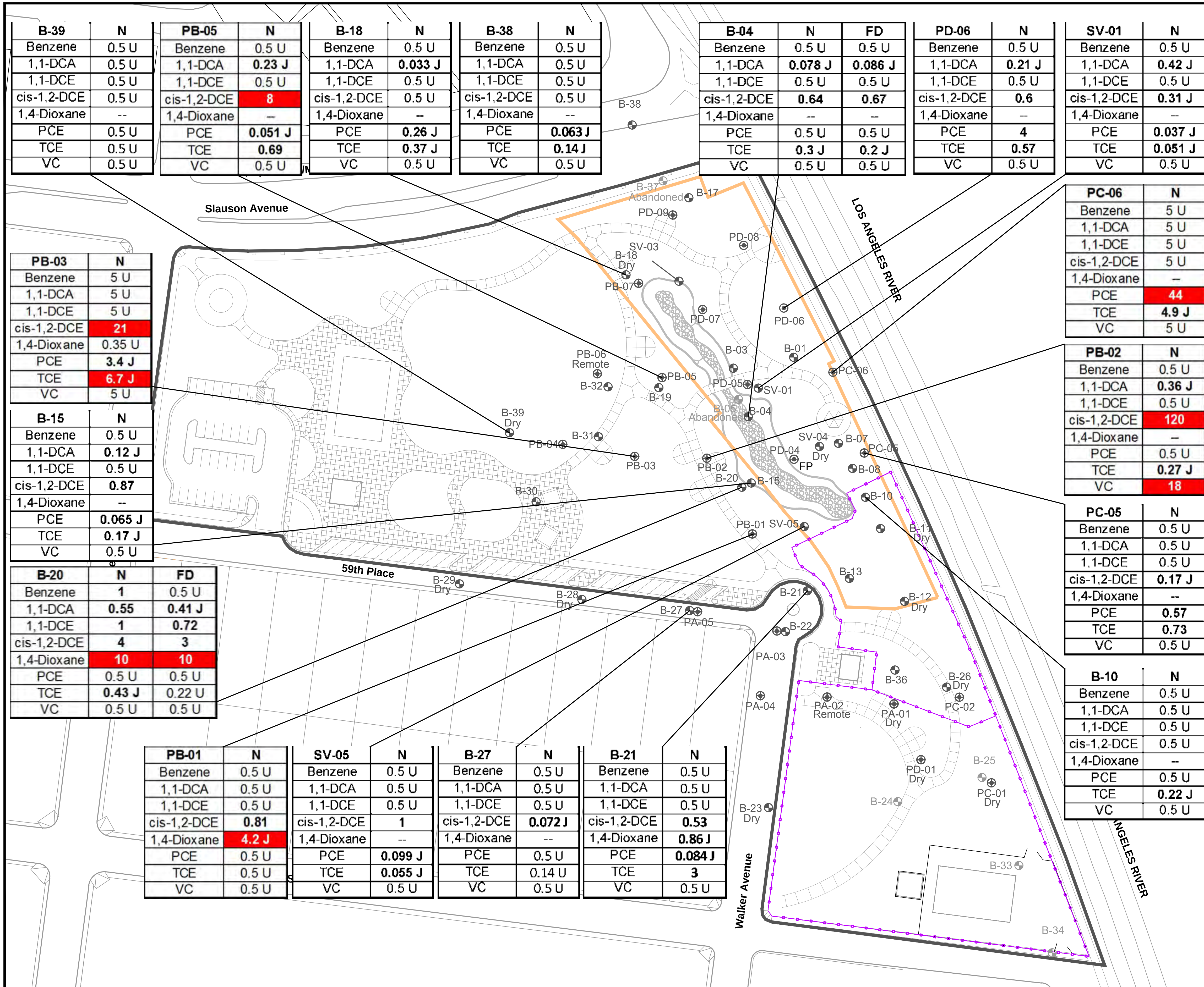


B-39	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	0.5 U
TCE	0.5 U
VC	0.5 U

PB-05	N
Benzene	0.5 U
1,1-DCA	**0.23 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**8**
1,4-Dioxane	–
PCE	**0.051 J**
TCE	**0.69**
VC	0.5 U

B-18	N
Benzene	0.5 U
1,1-DCA	**0.033 J**
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	**0.26 J**
TCE	**0.37 J**
VC	0.5 U

B-38	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	**0.063 J**
TCE	**0.14 J**
VC	0.5 U

B-04	N	FD
Benzene	0.5 U	0.5 U
1,1-DCA	**0.078 J**	**0.086 J**
1,1-DCE	0.5 U	0.5 U
cis-1,2-DCE	**0.64**	**0.67**
1,4-Dioxane	--	--
PCE	0.5 U	0.5 U
TCE	**0.3 J**	**0.2 J**
VC	0.5 U	0.5 U

PD-06	N
Benzene	0.5 U
1,1-DCA	**0.21 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**0.6**
1,4-Dioxane	--
PCE	**4**
TCE	**0.57**
VC	0.5 U

SV-01	N
Benzene	0.5 U
1,1-DCA	**0.42 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**0.31 J**
1,4-Dioxane	--
PCE	**0.037 J**
TCE	**0.051 J**
VC	0.5 U

PC-06	N
Benzene	5 U
1,1-DCA	5 U
1,1-DCE	5 U
cis-1,2-DCE	5 U
1,4-Dioxane	–
PCE	**44**
TCE	**4.9 J**
VC	5 U

PB-02	N
Benzene	0.5 U
1,1-DCA	**0.36 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**120**
1,4-Dioxane	–
PCE	0.5 U
TCE	**0.27 J**
VC	**18**

PC-05	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.17 J**
1,4-Dioxane	--
PCE	**0.57**
TCE	**0.73**
VC	0.5 U

B-10	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	0.5 U
TCE	**0.22 J**
VC	0.5 U

PB-03	N
Benzene	5 U
1,1-DCA	5 U
1,1-DCE	5 U
cis-1,2-DCE	**21**
1,4-Dioxane	0.35 U
PCE	**3.4 J**
TCE	**6.7 J**
VC	5 U

B-15	N
Benzene	0.5 U
1,1-DCA	**0.12 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**0.87**
1,4-Dioxane	--
PCE	**0.065 J**
TCE	**0.17 J**
VC	0.5 U

B-20	N	FD
Benzene	**1**	0.5 U
1,1-DCA	**0.55**	**0.41 J**
1,1-DCE	**1**	**0.72**
cis-1,2-DCE	**4**	**3**
1,4-Dioxane	**10**	**10**
PCE	0.5 U	0.5 U
TCE	**0.43 J**	0.22 U
VC	0.5 U	0.5 U

PB-01	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.81**
1,4-Dioxane	**4.2 J**
PCE	0.5 U
TCE	0.5 U
VC	0.5 U

SV-05	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**1**
1,4-Dioxane	--
PCE	**0.099 J**
TCE	**0.055 J**
VC	0.5 U

B-27	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.072 J**
1,4-Dioxane	--
PCE	0.5 U
TCE	0.14 U
VC	0.5 U

B-21	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.53**
1,4-Dioxane	**0.86 J**
PCE	**0.084 J**
TCE	**3**
VC	0.5 U

LEGEND:

- PB-01 U.S. EPA, Extraction Well, Perched Zone
- B-01 / SV-01 U.S. EPA, Monitoring Well, Perched Zone
- PB-1 Grayed Wells indicate Abandoned or Inaccessable
- Dry: Dry Indicates less than six inches of water in well. Wells have a 6 inch sump
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- Site Fencing

NOTES:

1. All analyte concentrations are expressed in μg/L.
2. Wells without a chembox were not sampled during the first semi-annual groundwater monitoring event.
3. Red highlighting indicates a result that exceeds the SSRL.
4. Bold font indicates an anlytical detection.
5. Perched Zone SSRLs (μg/L):
   1,1-DCA: 5
   1,1-DCE: 6
   1,4-Dioxane: 3
   Benzene: 1
   cis-1,2-DCE: 6
   PCE: 5
   TCE: 5
   VC: 0.5

U.S. EPA = United States Environmental Protection Agency, Region 9
ERH = Electrical Resistive Heating
SSRL = Site Specific Remediation Limit
μg/L = micrograms per liter
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dochhloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
N = normal sample
FD = field duplicate
U = not detected above reporting limit
J = estimated value
NA = not available
FP = Free Product

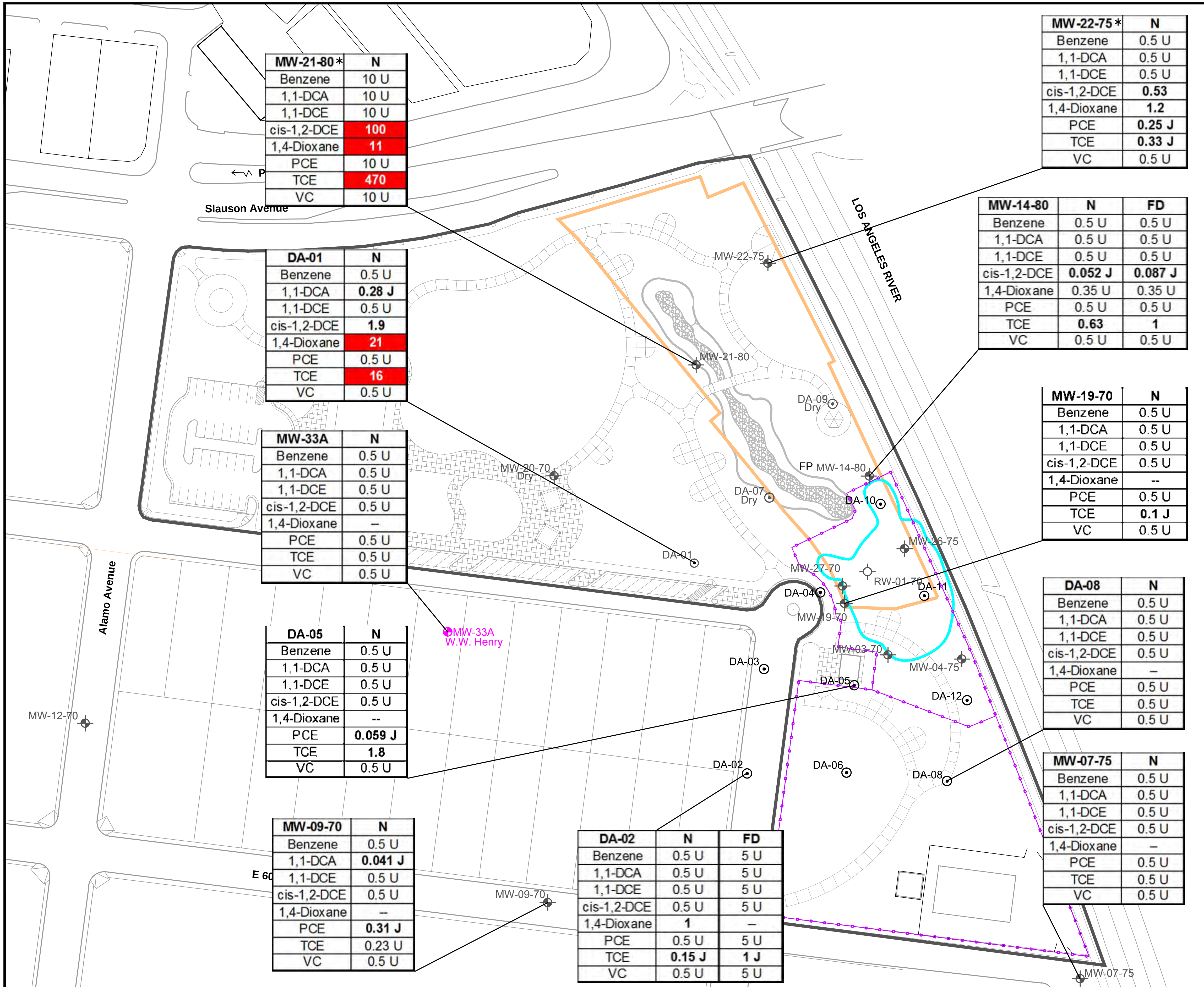
Figure C-6
Chemicals of Concern in Groundwater
Perched Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE

Date: October 14, 2014

File: Pem_Site_COC_1SA14.dwg



MW-21-80*	N
Benzene	10 U
1,1-DCA	10 U
1,1-DCE	10 U
cis-1,2-DCE	100
1,4-Dioxane	11
PCE	10 U
TCE	470
VC	10 U

DA-01	N
Benzene	0.5 U
1,1-DCA	**0.28 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**1.9**
1,4-Dioxane	21
PCE	0.5 U
TCE	16
VC	0.5 U

MW-33A	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	0.5 U
TCE	0.5 U
VC	0.5 U

DA-05	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	**0.059 J**
TCE	**1.8**
VC	0.5 U

MW-09-70	N
Benzene	0.5 U
1,1-DCA	**0.041 J**
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	**0.31 J**
TCE	0.23 U
VC	0.5 U

DA-02	N	FD
Benzene	0.5 U	5 U
1,1-DCA	0.5 U	5 U
1,1-DCE	0.5 U	5 U
cis-1,2-DCE	0.5 U	5 U
1,4-Dioxane	**1**	--
PCE	0.5 U	5 U
TCE	**0.15 J**	**1 J**
VC	0.5 U	5 U

MW-22-75*	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.53**
1,4-Dioxane	**1.2**
PCE	**0.25 J**
TCE	**0.33 J**
VC	0.5 U

MW-14-80	N	FD
Benzene	0.5 U	0.5 U
1,1-DCA	0.5 U	0.5 U
1,1-DCE	0.5 U	0.5 U
cis-1,2-DCE	**0.052 J**	**0.087 J**
1,4-Dioxane	0.35 U	0.35 U
PCE	0.5 U	0.5 U
TCE	**0.63**	**1**
VC	0.5 U	0.5 U

MW-19-70	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	0.5 U
TCE	**0.1 J**
VC	0.5 U

DA-08	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	0.5 U
TCE	0.5 U
VC	0.5 U

MW-07-75	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	0.5 U
TCE	0.5 U
VC	0.5 U

LEGEND:

- DA-01 — U.S. EPA, Extraction Well, Individual Screens for the 'A' Zone
- MW-22-75 — U.S. EPA, Monitoring Well, Exposition Aquifer
- RW-01-70 — U.S. EPA, Recovery Well, Exposition Aquifer (Currently Used as a Monitoring Well)
- MW-33a W.W. Henry — W.W. Henry Well 5100 59th Place, Property 7 from Alamo Corner
- Dry — Dry Indicates less than six inches of water in well Wells have a 6 inch sump
- ERH Treatment Area
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. Wells without a chembox were not sampled during the first semi-annual groundwater monitoring event.
3. Red highlighting indicates a result that exceeds the SSRL.
4. Bold font indicates an anlytical detection.
5. A Zone SSRLs (µg/L):
   1,1-DCA: 5
   1,1-DCE: 6
   Benzene: 1
   cis-1,2-DCE: 6
   PCE: 5
   TCE: 5
   VC: 0.5
6. Adopted SSRL (µg/L):
   1,4-Dioxane: 3

* = Nested with B Zone well
U.S. EPA = United States Environmental Protection Agency, Region 9
ERH = Electrical Resistive Heating
SSRL = Site Specific Remediation Limit
µg/L = micrograms per liter
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dochhloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
N = normal sample
FD = field duplicate
U = not detected above reporting limit
J = estimated value
NA = not available

N W E S

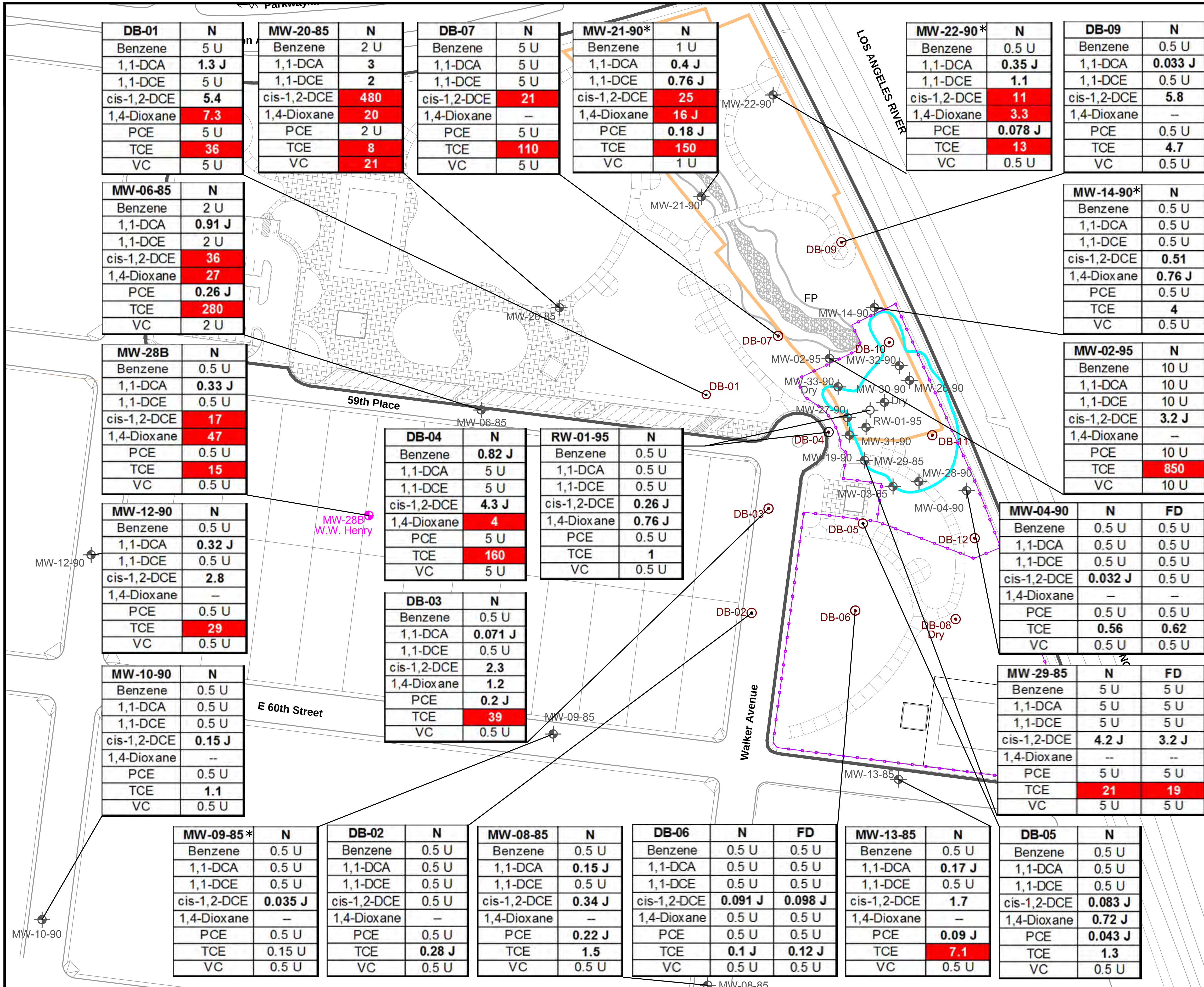
Approximate Scale in Feet
0 100 200

Figure C-7
Chemicals of Concern in Groundwater
Exposition 'A' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE Oneida Total Integrated Enterprises

Date: October 14, 2014
File: Pem_Site_COC_1SA14.dwg



DB-01	N
Benzene	5 U
1,1-DCA	**1.3 J**
1,1-DCE	5 U
cis-1,2-DCE	**5.4**
1,4-Dioxane	**7.3**
PCE	5 U
TCE	**36**
VC	5 U

MW-20-85	N
Benzene	2 U
1,1-DCA	**3**
1,1-DCE	**2**
cis-1,2-DCE	**480**
1,4-Dioxane	**20**
PCE	2 U
TCE	**8**
VC	**21**

DB-07	N
Benzene	5 U
1,1-DCA	5 U
1,1-DCE	5 U
cis-1,2-DCE	**21**
1,4-Dioxane	–
PCE	5 U
TCE	**110**
VC	5 U

MW-21-90*	N
Benzene	1 U
1,1-DCA	**0.4 J**
1,1-DCE	**0.76 J**
cis-1,2-DCE	**25**
1,4-Dioxane	**16 J**
PCE	**0.18 J**
TCE	**150**
VC	1 U

MW-22-90*	N
Benzene	0.5 U
1,1-DCA	**0.35 J**
1,1-DCE	**1.1**
cis-1,2-DCE	**11**
1,4-Dioxane	**3.3**
PCE	**0.078 J**
TCE	**13**
VC	0.5 U

DB-09	N
Benzene	0.5 U
1,1-DCA	**0.033 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**5.8**
1,4-Dioxane	–
PCE	0.5 U
TCE	**4.7**
VC	0.5 U

MW-06-85	N
Benzene	2 U
1,1-DCA	**0.91 J**
1,1-DCE	2 U
cis-1,2-DCE	**36**
1,4-Dioxane	**27**
PCE	**0.26 J**
TCE	**280**
VC	2 U

MW-14-90*	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.51**
1,4-Dioxane	**0.76 J**
PCE	0.5 U
TCE	**4**
VC	0.5 U

MW-28B	N
Benzene	0.5 U
1,1-DCA	**0.33 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**17**
1,4-Dioxane	**47**
PCE	0.5 U
TCE	**15**
VC	0.5 U

MW-02-95	N
Benzene	10 U
1,1-DCA	10 U
1,1-DCE	10 U
cis-1,2-DCE	**3.2 J**
1,4-Dioxane	–
PCE	10 U
TCE	**850**
VC	10 U

DB-04	N
Benzene	**0.82 J**
1,1-DCA	5 U
1,1-DCE	5 U
cis-1,2-DCE	**4.3 J**
1,4-Dioxane	**4**
PCE	5 U
TCE	**160**
VC	5 U

RW-01-95	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.26 J**
1,4-Dioxane	**0.76 J**
PCE	0.5 U
TCE	**1**
VC	0.5 U

MW-12-90	N
Benzene	0.5 U
1,1-DCA	**0.32 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**2.8**
1,4-Dioxane	–
PCE	0.5 U
TCE	**29**
VC	0.5 U

MW-04-90	N	FD
Benzene	0.5 U	0.5 U
1,1-DCA	0.5 U	0.5 U
1,1-DCE	0.5 U	0.5 U
cis-1,2-DCE	**0.032 J**	0.5 U
1,4-Dioxane	–	–
PCE	0.5 U	0.5 U
TCE	**0.56**	**0.62**
VC	0.5 U	0.5 U

DB-03	N
Benzene	0.5 U
1,1-DCA	**0.071 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**2.3**
1,4-Dioxane	**1.2**
PCE	**0.2 J**
TCE	**39**
VC	0.5 U

MW-10-90	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.15 J**
1,4-Dioxane	--
PCE	0.5 U
TCE	**1.1**
VC	0.5 U

MW-29-85	N	FD
Benzene	5 U	5 U
1,1-DCA	5 U	5 U
1,1-DCE	5 U	5 U
cis-1,2-DCE	**4.2 J**	**3.2 J**
1,4-Dioxane	--	--
PCE	5 U	5 U
TCE	**21**	**19**
VC	5 U	5 U

MW-09-85*	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.035 J**
1,4-Dioxane	–
PCE	0.5 U
TCE	0.15 U
VC	0.5 U

DB-02	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	–
PCE	0.5 U
TCE	**0.28 J**
VC	0.5 U

MW-08-85	N
Benzene	0.5 U
1,1-DCA	**0.15 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**0.34 J**
1,4-Dioxane	–
PCE	**0.22 J**
TCE	**1.5**
VC	0.5 U

DB-06	N	FD
Benzene	0.5 U	0.5 U
1,1-DCA	0.5 U	0.5 U
1,1-DCE	0.5 U	0.5 U
cis-1,2-DCE	**0.091 J**	**0.098 J**
1,4-Dioxane	0.5 U	0.5 U
PCE	0.5 U	0.5 U
TCE	**0.1 J**	**0.12 J**
VC	0.5 U	0.5 U

MW-13-85	N
Benzene	0.5 U
1,1-DCA	**0.17 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**1.7**
1,4-Dioxane	–
PCE	**0.09 J**
TCE	**7.1**
VC	0.5 U

DB-05	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.083 J**
1,4-Dioxane	**0.72 J**
PCE	**0.043 J**
TCE	**1.3**
VC	0.5 U

LEGEND:

- DB-01 — U.S. EPA, Extraction Well, Individual Screens for the 'B' Zone
- MW-22-75 — U.S. EPA, Monitoring Well, Exposition Aquifer
- RW-01-70 — U.S. EPA, Recovery Well, Exposition Aquifer (Currently Used as a Monitoring Well)
- MW-33a W.W. Henry — W.W. Henry Well 5100 59th Place, Property 7 from Alamo Corner
- Dry — Dry Indicates less than six inches of water in well Wells have a 6 inch sump
- ERH Treatment Area
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. Wells without a chembox were not sampled during the first semi-annual groundwater monitoring event.
3. Red highlighting indicates a result that exceeds the SSRL.
4. Bold font indicates an anlytical detection.
5. B Zone SSRLs (µg/L):
   1,1-DCA: 5
   1,1-DCE: 6
   Benzene: 1
   cis-1,2-DCE: 6
   PCE: 5
   TCE: 5
   VC: 0.5
6. Adopted SSRL (µg/L):
   1,4-Dioxane: 3

* = Nested with A Zone well
U.S. EPA = United States Environmental Protection Agency, Region 9
ERH = Electrical Resistive Heating
SSRL = Site Specific Remediation Limit
µg/L = micrograms per liter
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dochhloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
N = normal sample
FD = field duplicate
U = not detected above reporting limit
J = estimated value
NA = not available

N E S W

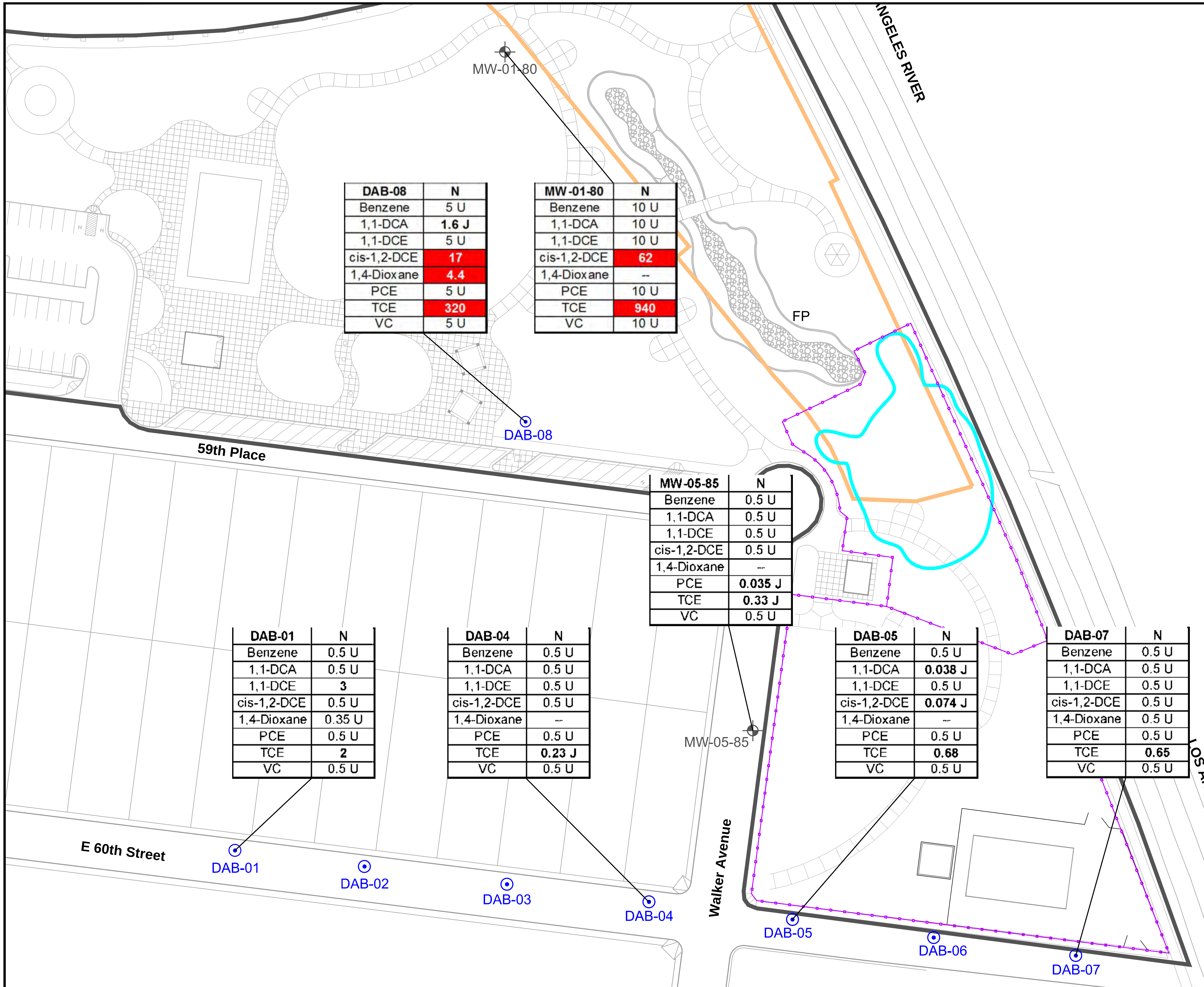
Approximate Scale in Feet
0 100 200

Figure C-8
Chemicals of Concern in Groundwater
Exposition 'B' Zones, July 2014

Pemaco Superfund Site
Maywood, California

OTIE Oneida Total Integrated Enterprises

Date: October 15, 2014
File: Pem_Site_COC_1SA14.dwg



DAB-08	N
Benzene	5 U
1,1-DCA	**1.6 J**
1,1-DCE	5 U
cis-1,2-DCE	17
1,4-Dioxane	4.4
PCE	5 U
TCE	320
VC	5 U

MW-01-80	N
Benzene	10 U
1,1-DCA	10 U
1,1-DCE	10 U
cis-1,2-DCE	62
1,4-Dioxane	--
PCE	10 U
TCE	940
VC	10 U

MW-05-85	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	**0.035 J**
TCE	**0.33 J**
VC	0.5 U

DAB-01	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	**3**
cis-1,2-DCE	0.5 U
1,4-Dioxane	0.35 U
PCE	0.5 U
TCE	**2**
VC	0.5 U

DAB-04	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	0.5 U
TCE	**0.23 J**
VC	0.5 U

DAB-05	N
Benzene	0.5 U
1,1-DCA	**0.038 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**0.074 J**
1,4-Dioxane	--
PCE	0.5 U
TCE	**0.68**
VC	0.5 U

DAB-07	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	0.5 U
PCE	0.5 U
TCE	**0.65**
VC	0.5 U

LEGEND:

- DAB-1 — U.S. EPA, Extraction Well, Screened though Both 'A' and 'B' Zones
- MW-01-80 — U.S. EPA, Monitoring Well, Exposition Aquifer
- ERH Treatment Area
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. Wells without a chembox were not sampled during the first semi-annual groundwater monitoring event.
3. Red highlighting indicates a result that exceeds the SSRL.
4. Bold font indicates an anlytical detection.
5. A & B Zone SSRLs (µg/L):
   1,1-DCA: 5
   1,1-DCE: 6
   Benzene: 1
   cis-1,2-DCE: 6
   PCE: 5
   TCE: 5
   VC: 0.5
6. Adopted SSRL (µg/L):
   1,4-Dioxane: 3

U.S. EPA = United States Environmental Protection Agency, Region 9
ERH = Electrical Resistive Heating
SSRL = Site Specific Remediation Limit
µg/L = micrograms per liter
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dochhloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
N = normal sample
FD = field duplicate
U = not detected above reporting limit
J = estimated value
NA = not available

N E S W

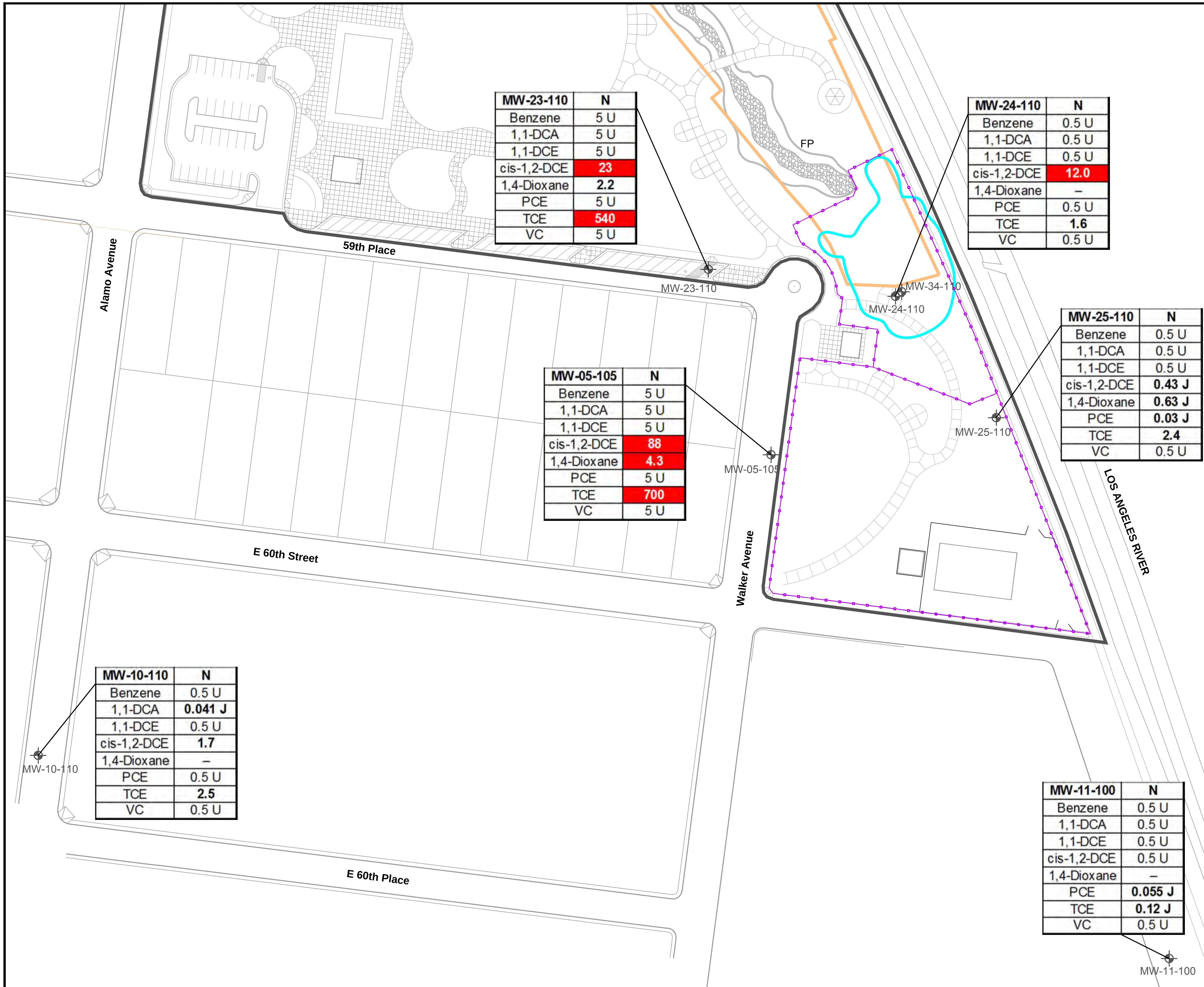
Approximate Scale in Feet
0 75 150

Figure C-9
Chemicals of Concern in Groundwater
Exposition 'A' & 'B' Zones, July 2014

Pemaco Superfund Site
Maywood, California

OTIE Oneida Total Integrated Enterprises

Date: October 15, 2014
File: Pem_Site_COC_1SA14.dwg



MW-23-110	N
Benzene	5 U
1,1-DCA	5 U
1,1-DCE	5 U
cis-1,2-DCE	**23**
1,4-Dioxane	**2.2**
PCE	5 U
TCE	**540**
VC	5 U

MW-24-110	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**12.0**
1,4-Dioxane	–
PCE	0.5 U
TCE	**1.6**
VC	0.5 U

MW-05-105	N
Benzene	5 U
1,1-DCA	5 U
1,1-DCE	5 U
cis-1,2-DCE	**88**
1,4-Dioxane	**4.3**
PCE	5 U
TCE	**700**
VC	5 U

MW-25-110	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.43 J**
1,4-Dioxane	**0.63 J**
PCE	**0.03 J**
TCE	**2.4**
VC	0.5 U

MW-10-110	N
Benzene	0.5 U
1,1-DCA	**0.041 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**1.7**
1,4-Dioxane	–
PCE	0.5 U
TCE	**2.5**
VC	0.5 U

MW-11-100	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	–
PCE	**0.055 J**
TCE	**0.12 J**
VC	0.5 U

LEGEND:

- MW-23-110 U.S. EPA, Monitoring Well, Exposition Aquifer
- ERH Treatment Area
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. Wells without a chembox were not sampled during the first semi-annual groundwater monitoring event.
3. Red highlighting indicates a result that exceeds the SSRL.
4. Bold font indicates an anlytical detection.
5. C Zone SSRLs (µg/L):
   1,1-DCA: 5
   1,1-DCE: 6
   Benzene: 1
   cis-1,2-DCE: 6
   PCE: 5
   TCE: 5
   VC: 0.5
6. Adopted SSRL (µg/L):
   1,4-Dioxane: 3

U.S. EPA = United States Environmental Protection Agency, Region 9
ERH = Electrical Resistive Heating
SSRL = Site Specific Remediation Limit
µg/L = micrograms per liter
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dochhloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
N = normal sample
FD = field duplicate
U = not detected above reporting limit
J = estimated value
NA = not available

N W E S

Approximate Scale in Feet
0 100 200

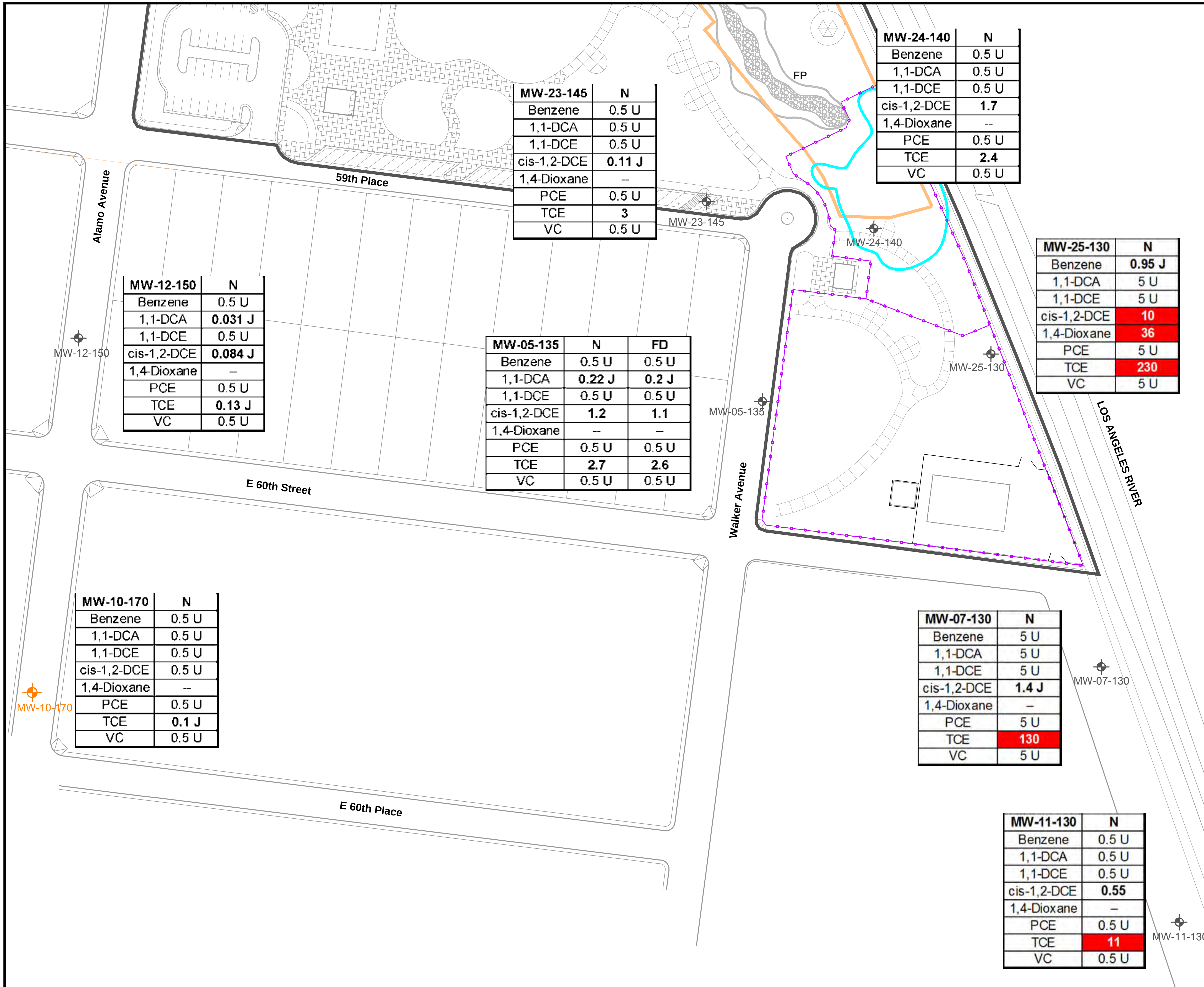
Figure C-10
Chemicals of Concern in Groundwater
Exposition 'C' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE Oneida Total Integrated Enterprises

Date: October 15, 2014

File: Pem_Site_COC_1SA14.dwg



MW-23-145	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.11 J**
1,4-Dioxane	--
PCE	0.5 U
TCE	**3**
VC	0.5 U

MW-24-140	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**1.7**
1,4-Dioxane	--
PCE	0.5 U
TCE	**2.4**
VC	0.5 U

MW-12-150	N
Benzene	0.5 U
1,1-DCA	**0.031 J**
1,1-DCE	0.5 U
cis-1,2-DCE	**0.084 J**
1,4-Dioxane	--
PCE	0.5 U
TCE	**0.13 J**
VC	0.5 U

MW-05-135	N	FD
Benzene	0.5 U	0.5 U
1,1-DCA	**0.22 J**	**0.2 J**
1,1-DCE	0.5 U	0.5 U
cis-1,2-DCE	**1.2**	**1.1**
1,4-Dioxane	--	--
PCE	0.5 U	0.5 U
TCE	**2.7**	**2.6**
VC	0.5 U	0.5 U

MW-25-130	N
Benzene	**0.95 J**
1,1-DCA	5 U
1,1-DCE	5 U
cis-1,2-DCE	**10**
1,4-Dioxane	**36**
PCE	5 U
TCE	**230**
VC	5 U

MW-10-170	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	0.5 U
1,4-Dioxane	--
PCE	0.5 U
TCE	**0.1 J**
VC	0.5 U

MW-07-130	N
Benzene	5 U
1,1-DCA	5 U
1,1-DCE	5 U
cis-1,2-DCE	**1.4 J**
1,4-Dioxane	--
PCE	5 U
TCE	**130**
VC	5 U

MW-11-130	N
Benzene	0.5 U
1,1-DCA	0.5 U
1,1-DCE	0.5 U
cis-1,2-DCE	**0.55**
1,4-Dioxane	--
PCE	0.5 U
TCE	**11**
VC	0.5 U

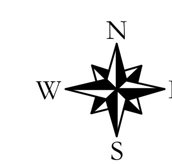
LEGEND:

- MW-23-110 — U.S. EPA, Monitoring Well, Exposition 'D' Zone
- MW-10-170 — U.S. EPA, Monitoring Well, Exposition 'E' Zone
- ERH Treatment Area
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. Wells without a chembox were not sampled during the first semi-annual groundwater monitoring event.
3. Red highlighting indicates a result that exceeds the SSRL.
4. Bold font indicates an anlytical detection.
5. D & E Zone SSRLs (µg/L):
   1,1-DCA: 5
   1,1-DCE: 6
   Benzene: 1
   cis-1,2-DCE: 6
   PCE: 5
   TCE: 5
   VC: 0.5
6. Adopted SSRL (µg/L):
   1,4-Dioxane: 3

U.S. EPA = United States Environmental Protection Agency, Region 9
ERH = Electrical Resistive Heating
SSRL = Site Specific Remediation Limit
µg/L = micrograms per liter
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dochhloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
N = normal sample
FD = field duplicate
U = not detected above reporting limit
J = estimated value
NA = not available



Approximate Scale in Feet

0 100 200

Figure C-11
Chemicals of Concern in Groundwater
Exposition 'D' and 'E' Zones, July 2014

Pemaco Superfund Site
Maywood, California

OTIE
Oneida Total Integrated Enterprises

Date: October 15, 2014

File: Pem_Site_COC_1SA14.dwg

Chemical of Concern in Groundwater by Plume Map

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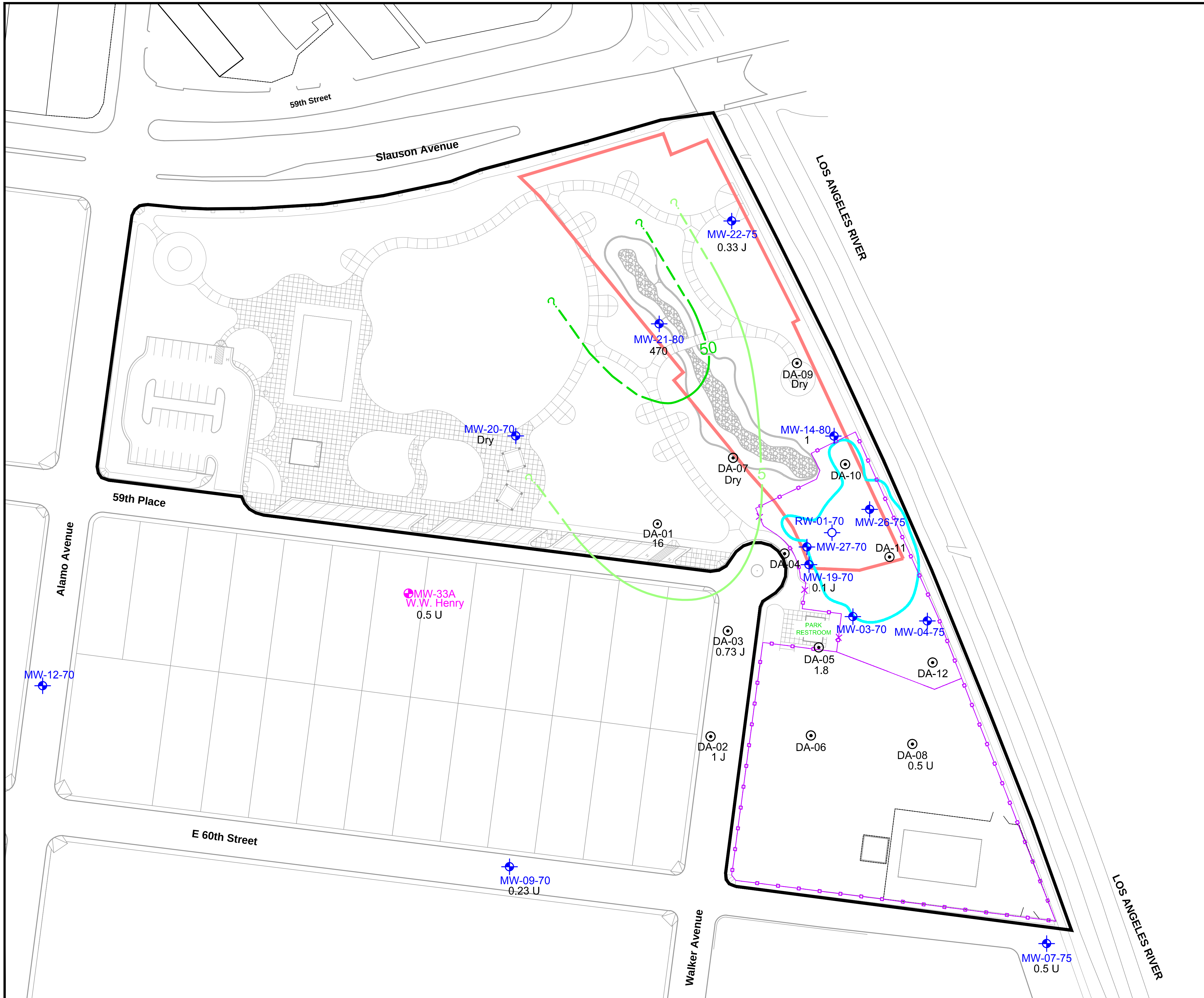


LEGEND:

DA-01	U.S. EPA, Extraction Well, Individual Screens for the 'A' Zone
MW-22-75	U.S. EPA, Monitoring Well, Exposition Aquifer
RW-01-70	U.S. EPA, Recovery Well, Exposition Aquifer (Currently Used as a Monitoring Well)
	5 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
	50 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
Dry	Dry Indicates less than six inches of water in well Wells have a 6 inch sump
5.7	TCE Concentration
	Former Pemaco Property
	Maywood Riverfront Park (Site) Boundary
	ERH Treatment Area
	Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. The SSRL for TCE is 5 µg/L.
3. Where duplicate samples were analyzed, the higher concentration is shown.
4. Wells without results were not sampled during the second semi-annual groundwater monitoring event.
5. Dry indicates less than 1 foot of water in well.

µg/L = micrograms per liter
ERH = Electrical Resistive Heating
J = estimated value
SSRL = Site Specific Remediation Limit
TCE = Trichloroethene
U = not detected above reporting limit
U.S. EPA = United States Environmental Protection Agency, Region 9

N
W E
S

Approximate Scale in Feet

0 100 200

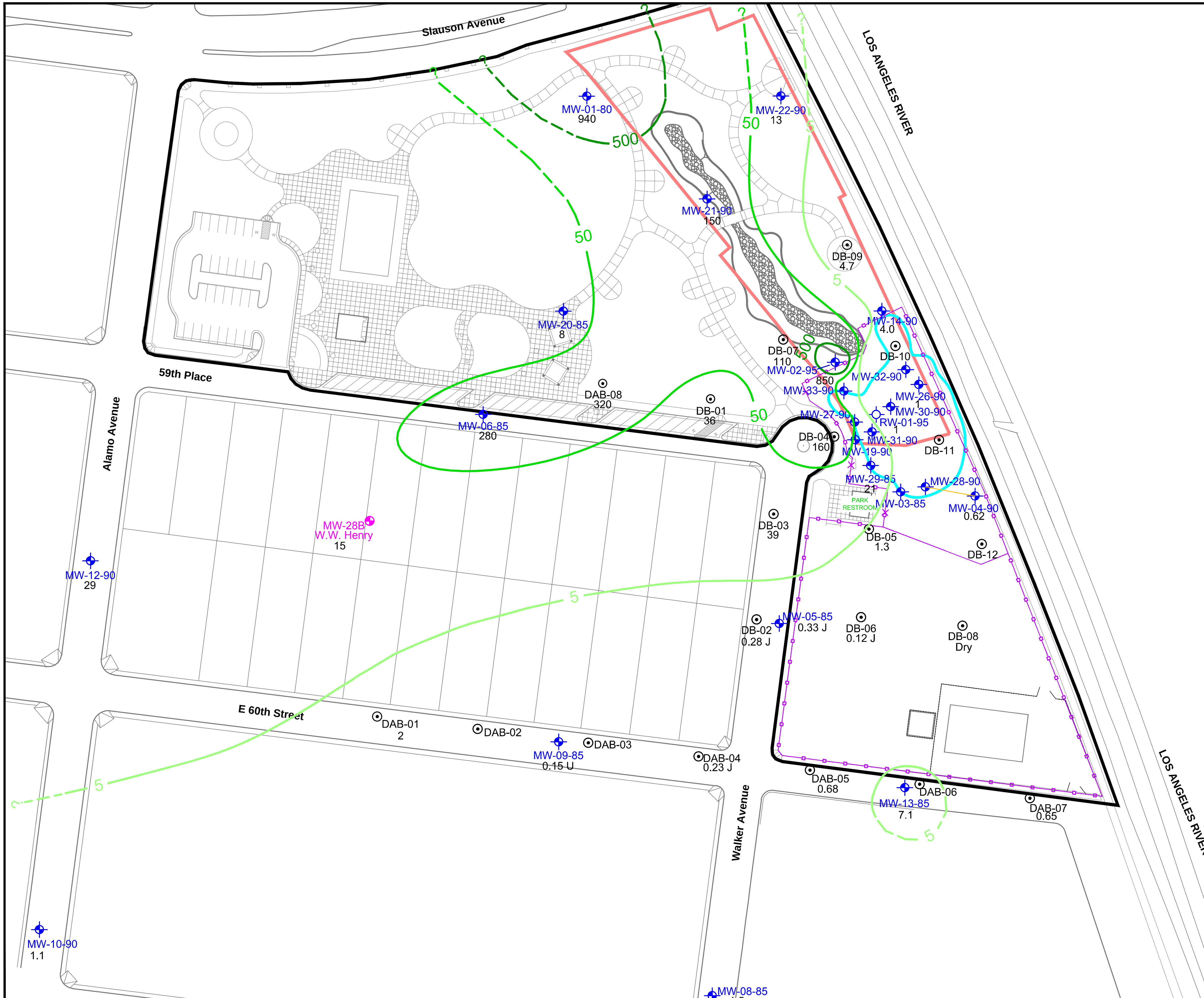
Figure C-12
Trichloroethene Plume in Groundwater
Exposition 'A' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE
Oneida Total Integrated Enterprises

Date: October 17, 2014

File: Pem_Site_COC_2SA13.dwg



LEGEND:

DB-01	U.S. EPA, Extraction Well, Individual Screens for the 'B' and 'A'&'B' Zones
MW-01-80	U.S. EPA, Monitoring Well, Exposition Aquifer
RW-01-95	U.S. EPA, Recovery Well, Exposition Aquifer (Currently Used as a Monitoring Well)
MW-28B W.W. Henry	W.W. Henry Well 5024 59th Place, Property 6 from Alamo
	5 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
	50 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
	500 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
110	TCE Concentration
Dry	Dry Indicates less than six inches of water in well Wells have a 6 inch sump
	Former Pemaco Property
	Maywood Riverfront Park (Site) Boundary
	ERH Treatment Area
	Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. The SSRL for TCE is 5 µg/L.
3. Where duplicate samples were analyzed, the higher concentration is shown.
4. Wells without results were not sampled during the second semi-annual groundwater monitoring event.

µg/L = micrograms per liter
ERH = Electrical Resistive Heating
J = estimated value
SSRL = Site Specific Remediation Limit
TCE = Trichloroethene
U = not detected above reporting limit
U.S. EPA = United States Environmental Protection Agency, Region 9

N
W E
S

Approximate Scale in Feet

0 100 200

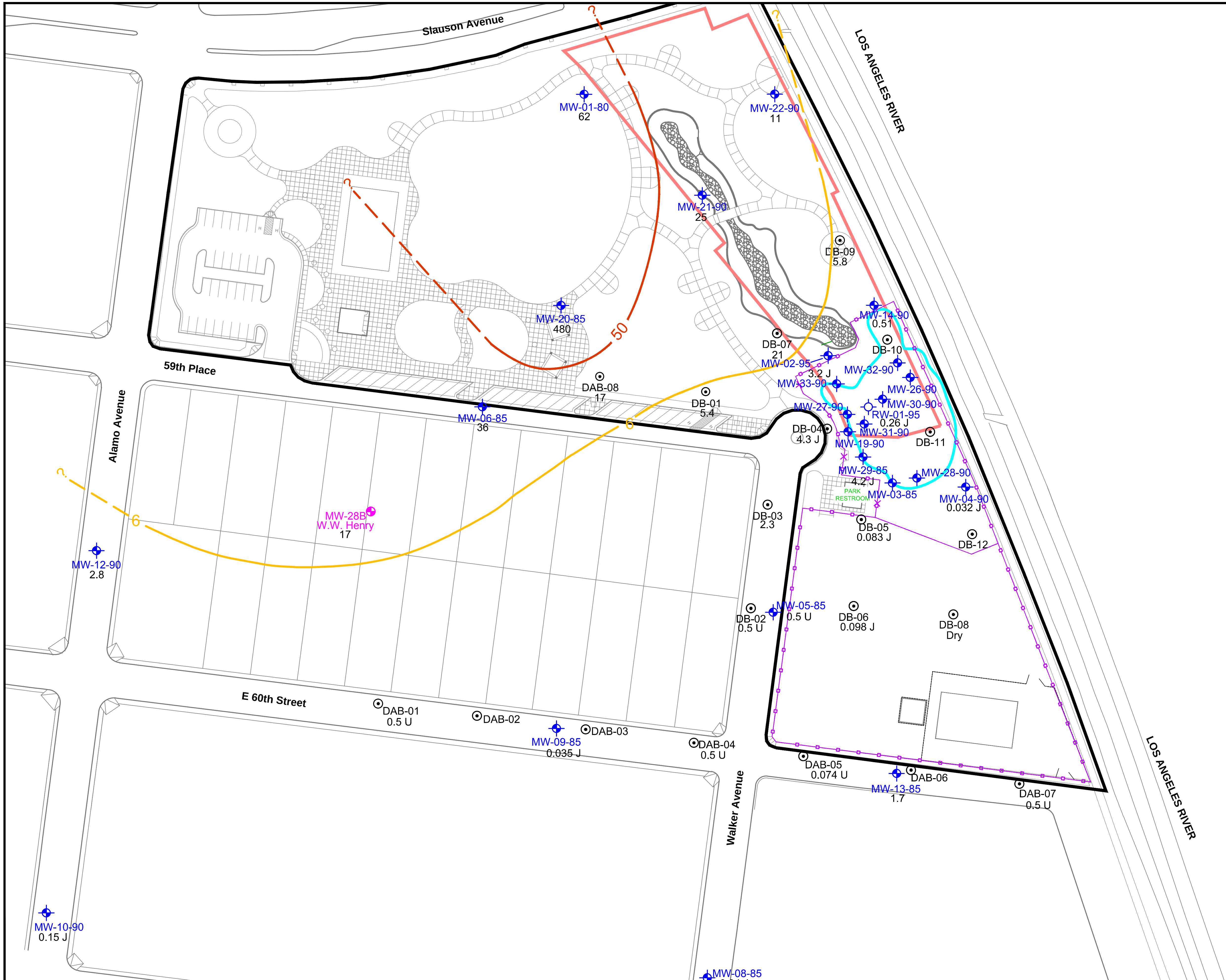
Figure C-13
Trichloroethene Plume in Groundwater
Exposition 'B' and 'A'&'B' Zones, July 2014

Pemaco Superfund Site
Maywood, California

OTIE
Oneida Total Integrated Enterprises

Date: October 17, 2014

File: Pem_Site_COC_2SA13.dwg



LEGEND:

DB-01	U.S. EPA, Extraction Well, Individual Screens for the "B" Zone
MW-21-90	U.S. EPA, Monitoring Well, Exposition Aquifer
RW-01-95	U.S. EPA, Recovery Well, Exposition Aquifer (Currently Used as a Monitoring Well)
MW-28B W.W. Henry	W.W. Henry Well 5024 59th Place, Property 6 from Alamo
	6 µg/L cis-1,2-DCE Isoconcentration Contour (Dashed Where Inferred)
	50 µg/L cis-1,2-DCE Isoconcentration Contour (Dashed Where Inferred)
Dry	Dry Indicates less than six inches of water in well Wells have a 6 inch sump
	Former Pemaco Property
	Maywood Riverfront Park (Site) Boundary
	ERH Treatment Area
	Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. The SSRL for cis-1,2-DCE is 6 µg/L.
3. Where duplicate samples were analyzed, the higher concentration is shown.
4. Wells without results were not sampled during the second semi-annual groundwater monitoring event.

µg/L = micrograms per liter
cis-1,2-DCE = cis-1,2-Dichloroethene
ERH = Electrical Resistive Heating
J = estimated value
SSRL = Site Specific Remediation Limit
U = not detected above reporting limit
U.S. EPA = United States Environmental Protection Agency, Region 9

N W E S

Approximate Scale in Feet

0 100 200

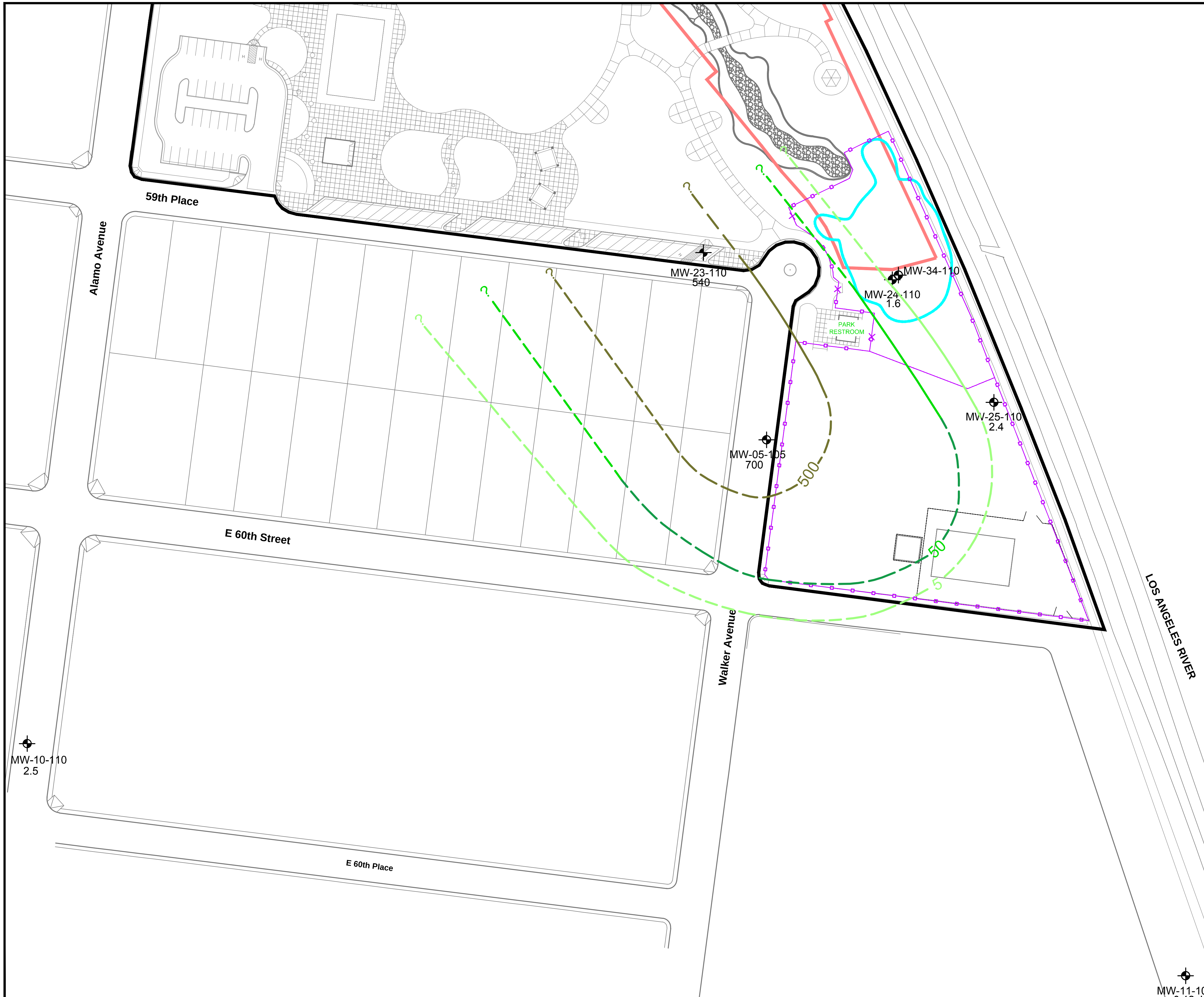
Figure C-14
cis-1,2-Dichloroethene Plume in Groundwater Exposition 'B' and 'A'&'B' Zones, July 2014

Pemaco Superfund Site
Maywood, California

OTIE Oneida Total Integrated Enterprises

Date: October 17, 2014

File: Pem_Site_COC_2SA13.dwg



LEGEND:

- MW-23-110 U.S. EPA, Monitoring Well, Exposition Aquifer
- 5 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
- 50 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
- 140 TCE Concentration
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- ERH Treatment Area
- Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. The SSRL for TCE is 5 µg/L.
3. Wells without results were not sampled during the second semi-annual groundwater monitoring event.

µg/L = micrograms per liter
ERH = Electrical Resistive Heating
J = estimated value
SSRL = Site Specific Remediation Limit
TCE = Trichloroethene
U = not detected above reporting limit
U.S. EPA = United States Environmental Protection Agency, Region 9

N W E S

Approximate Scale in Feet

0 100 200

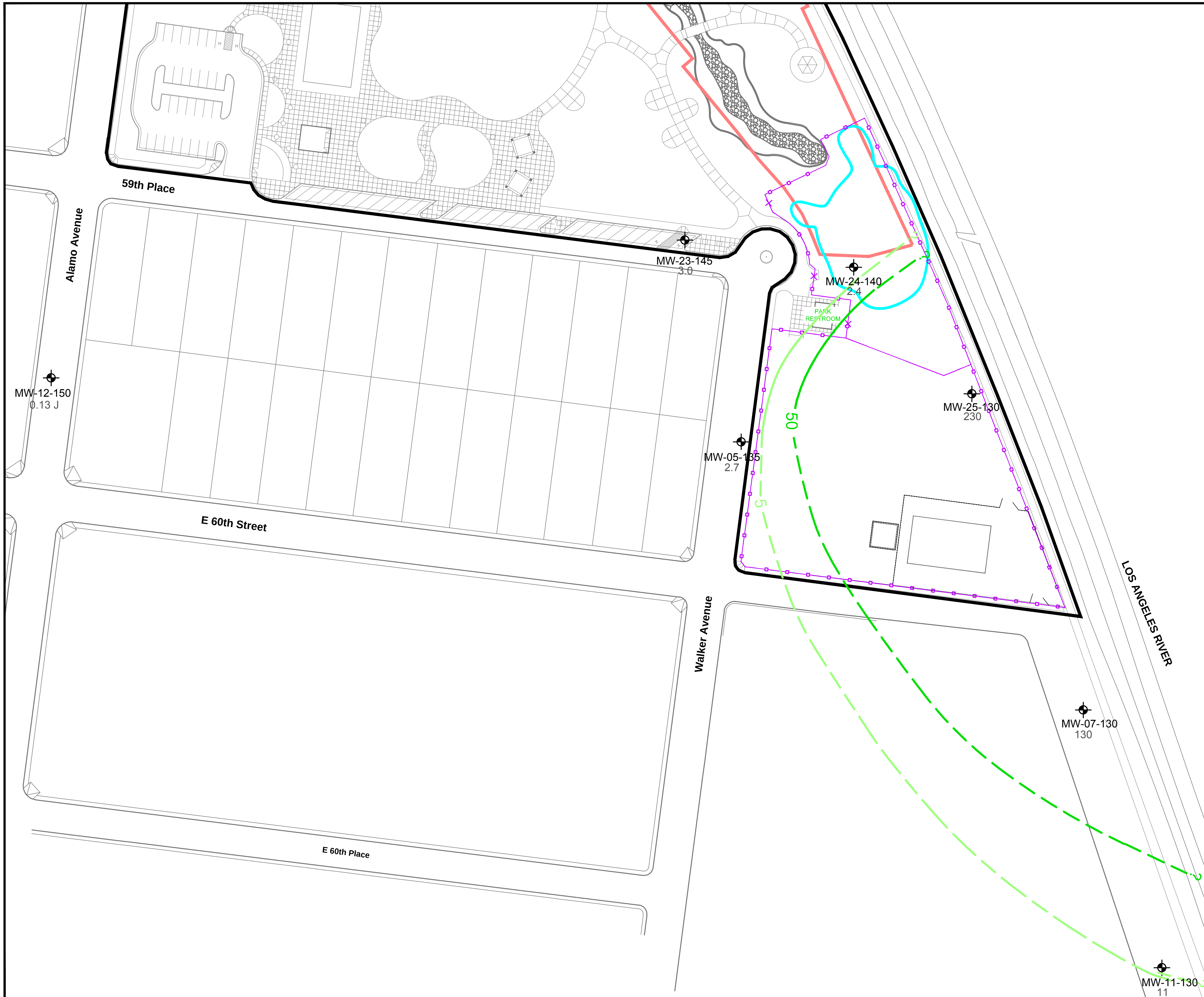
Figure C-15
Trichloroethene Plume in Groundwater
Exposition 'C' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE
Oneida Total Integrated Enterprises

Date: March 13, 2015

File: Pem_Site_COC_2SA13.dwg



LEGEND:

- MW-25-130 U.S. EPA, Monitoring Well, Exposition Aquifer
- 5 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
- 50 µg/L TCE Isoconcentration Contour (Dashed Where Inferred)
- 270 TCE Concentration
- Former Pemaco Property
- Maywood Riverfront Park (Site) Boundary
- ERH Treatment Area
- Site Fencing

NOTES:

1. All analyte concentrations are expressed in µg/L.
2. The SSRL for TCE is 5 µg/L.
3. Where duplicate samples were analyzed, the higher concentration is shown.

µg/L = micrograms per liter
ERH = Electrical Resistive Heating
J = estimated value
SSRL = Site Specific Remediation Limit
TCE = Trichloroethene
U = not detected above reporting limit
U.S. EPA = United States Environmental Protection Agency, Region 9

N W E S

Approximate Scale in Feet

0 100 200

Figure C-16
Trichloroethene Plume in Groundwater
Exposition 'D' Zone, July 2014

Pemaco Superfund Site
Maywood, California

OTIE
Oneida Total Integrated Enterprises

Date: October 17, 2014

File: Pem_Site_COC_2SA13.dwg

Graphs

List of Graphs

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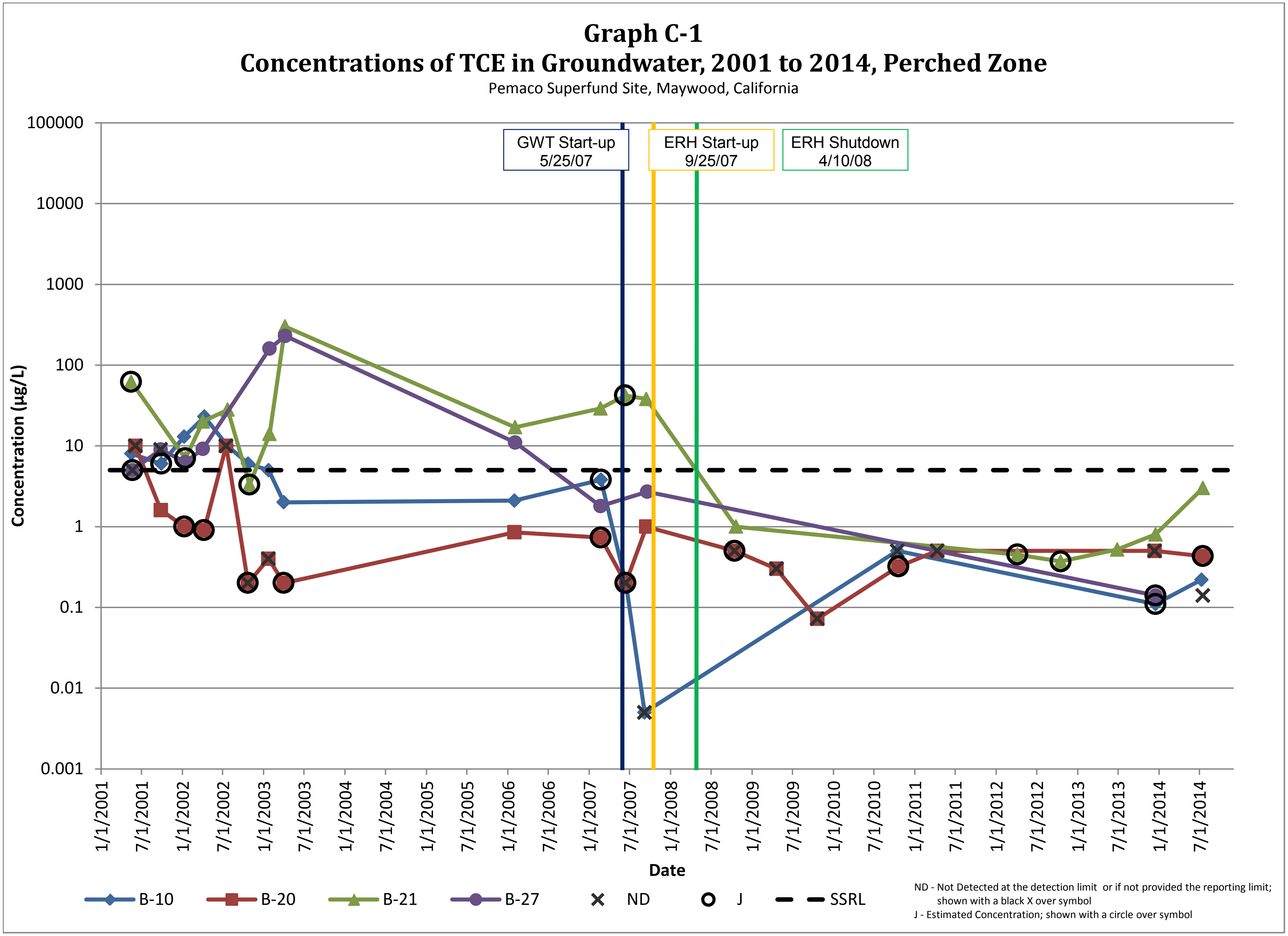
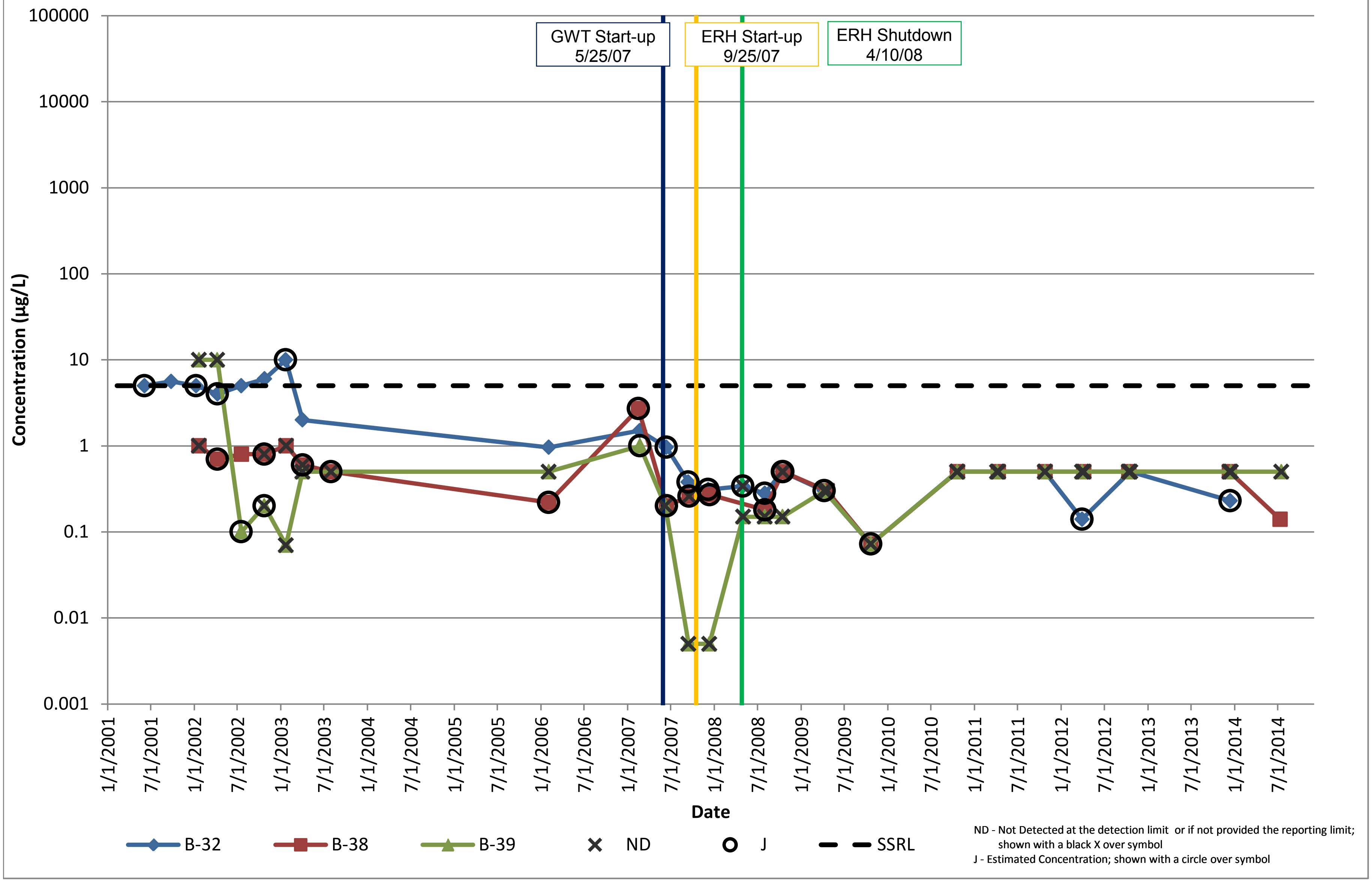

Graph C-1
Concentrations of TCE in Groundwater, 2001 to 2014, Perched Zone
Pemaco Superfund Site, Maywood, California
Concentration (µg/L)
100000
10000
1000
100
10
1
0.1
0.01
0.001
GWT Start-up 5/25/07
ERH Start-up 9/25/07
ERH Shutdown 4/10/08
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
1/1/2005
7/1/2005
1/1/2006
7/1/2006
1/1/2007
7/1/2007
1/1/2008
7/1/2008
1/1/2009
7/1/2009
1/1/2010
7/1/2010
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
Date
B-10
B-20
B-21
B-27
ND
J
SSRL
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol

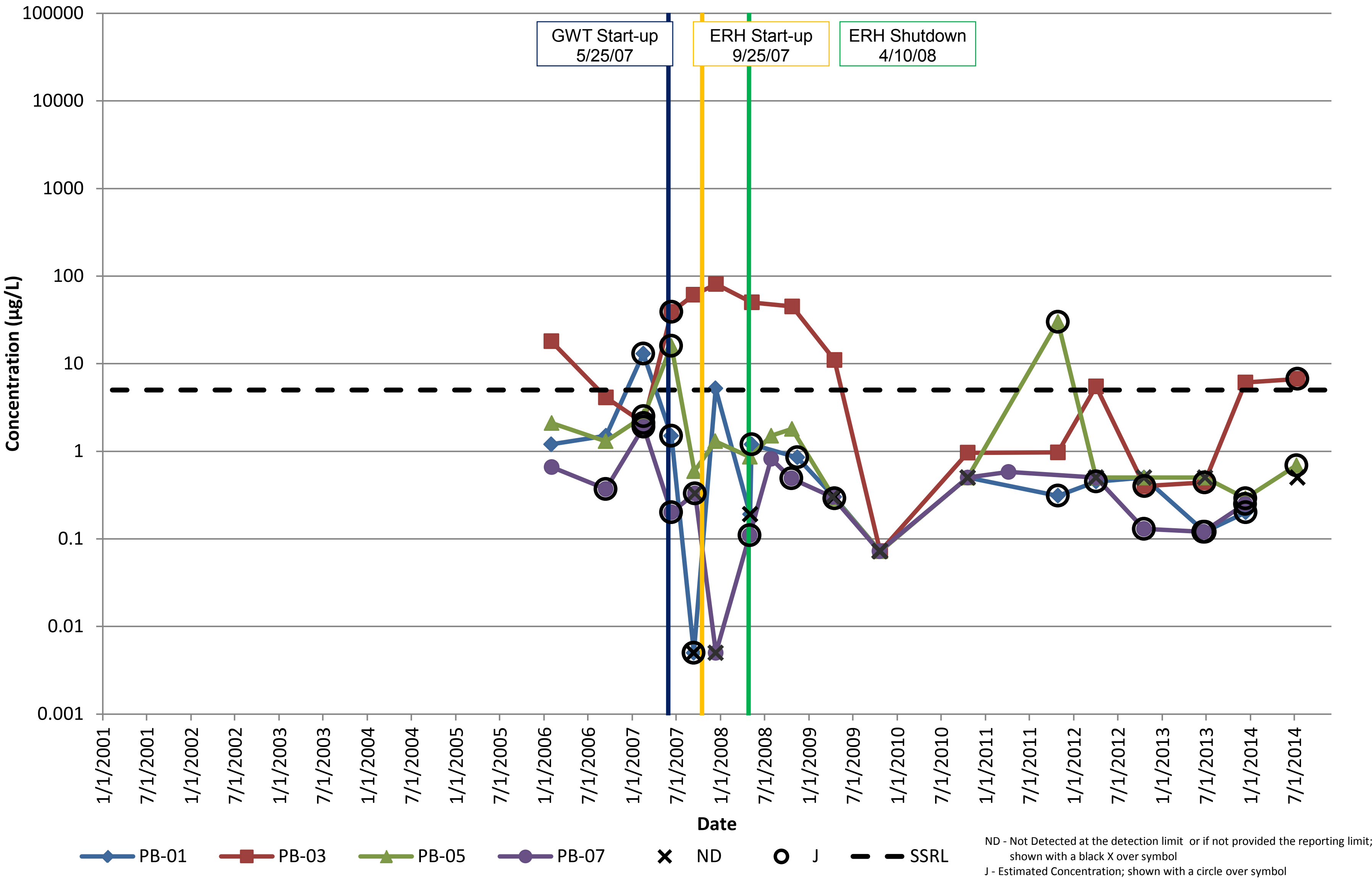
Graph C-2
Concentrations of TCE in Groundwater, 2001 to 2014, Perched Zone

Pemaco Superfund Site, Maywood, California

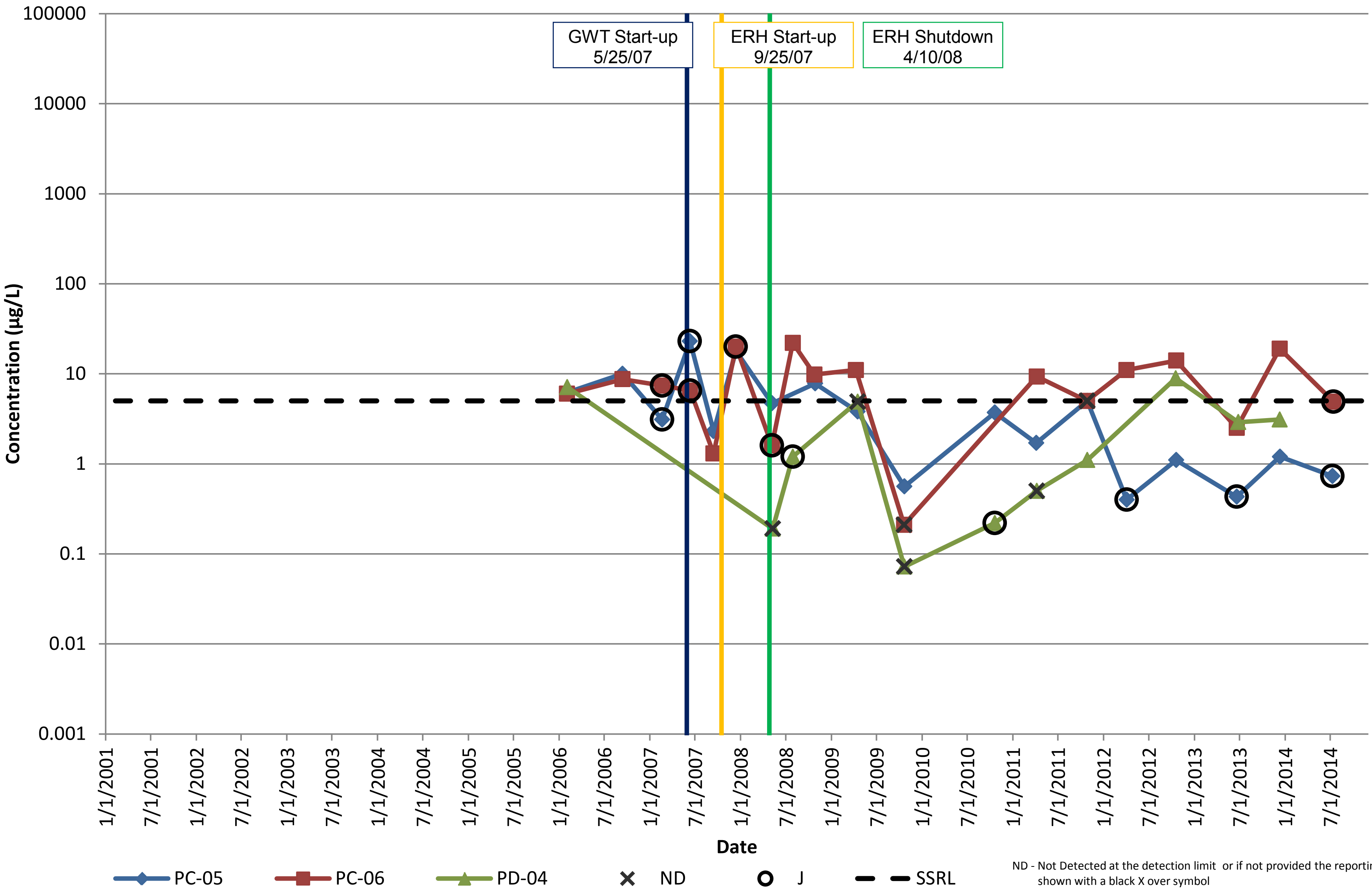


Graph C-3
Concentrations of TCE in Groundwater, 2001 to 2014, Perched Zone

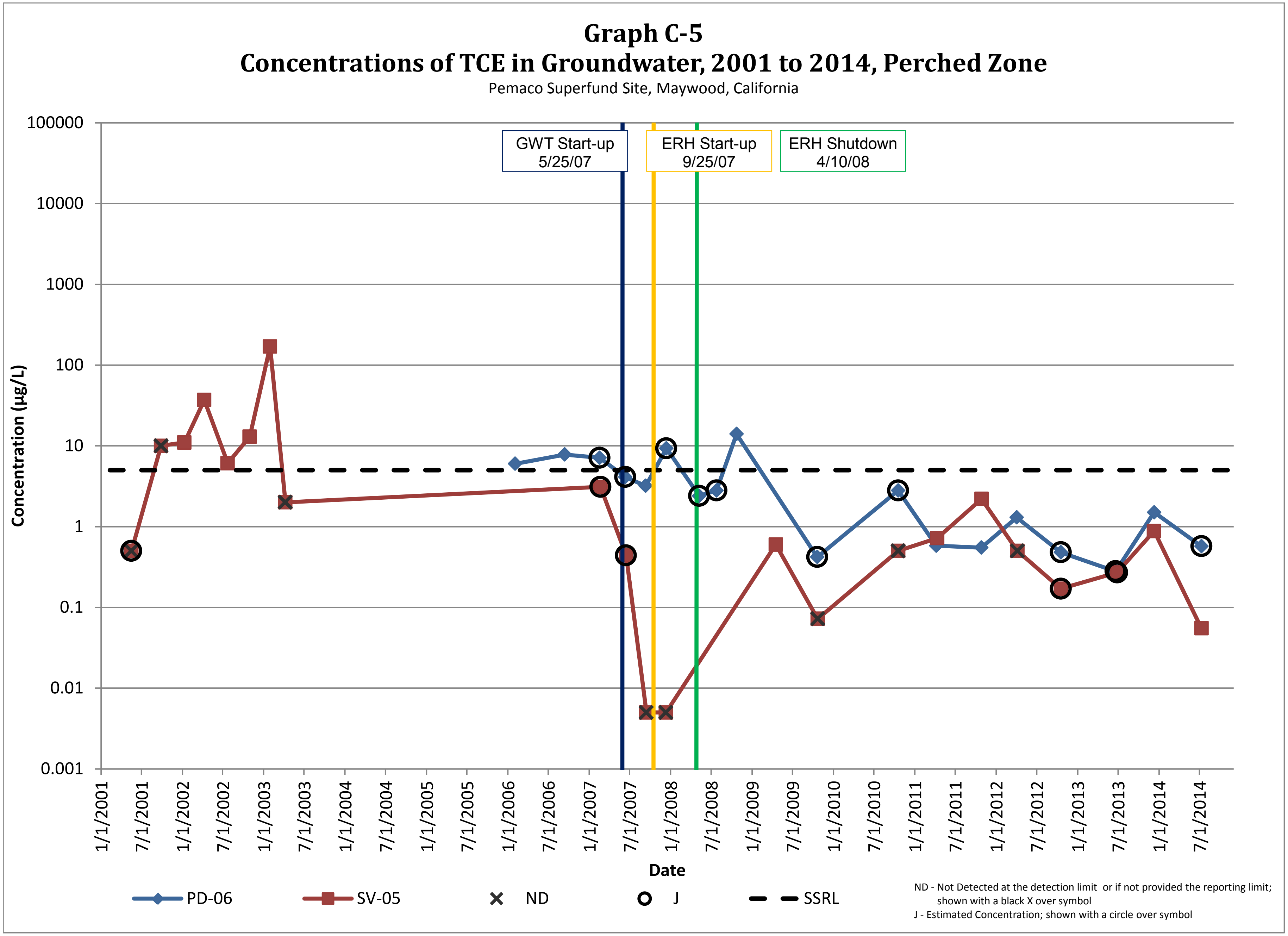
Pemaco Superfund Site, Maywood, California



Graph C-4
Concentrations of TCE in Groundwater, 2001 to 2014, Perched Zone
Pemaco Superfund Site, Maywood, California



ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol



Graph C-5
Concentrations of TCE in Groundwater, 2001 to 2014, Perched Zone
Pemaco Superfund Site, Maywood, California
Concentration (µg/L)
100000
10000
1000
100
10
1
0.1
0.01
0.001
GWT Start-up 5/25/07
ERH Start-up 9/25/07
ERH Shutdown 4/10/08
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
1/1/2005
7/1/2005
1/1/2006
7/1/2006
1/1/2007
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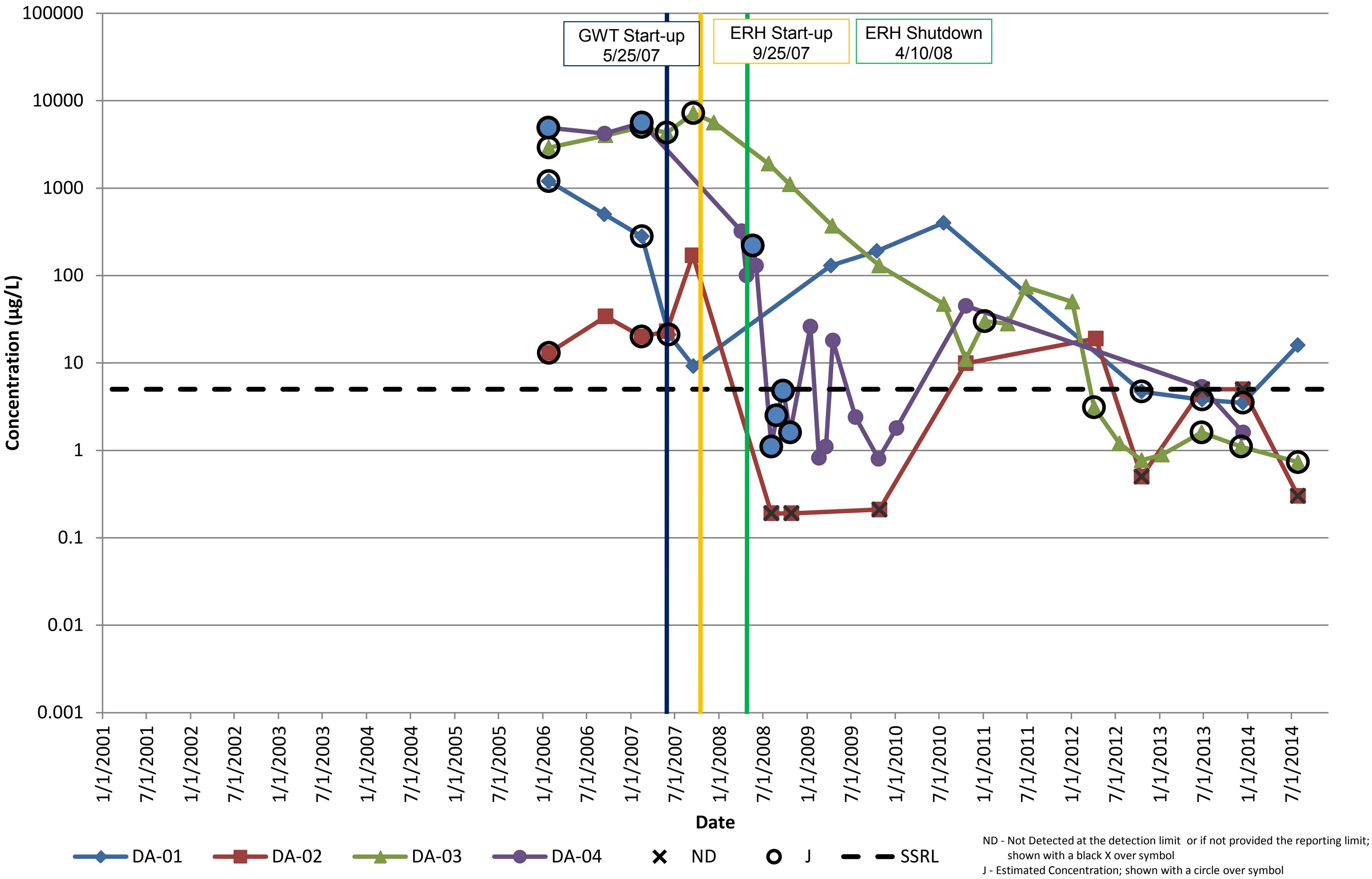
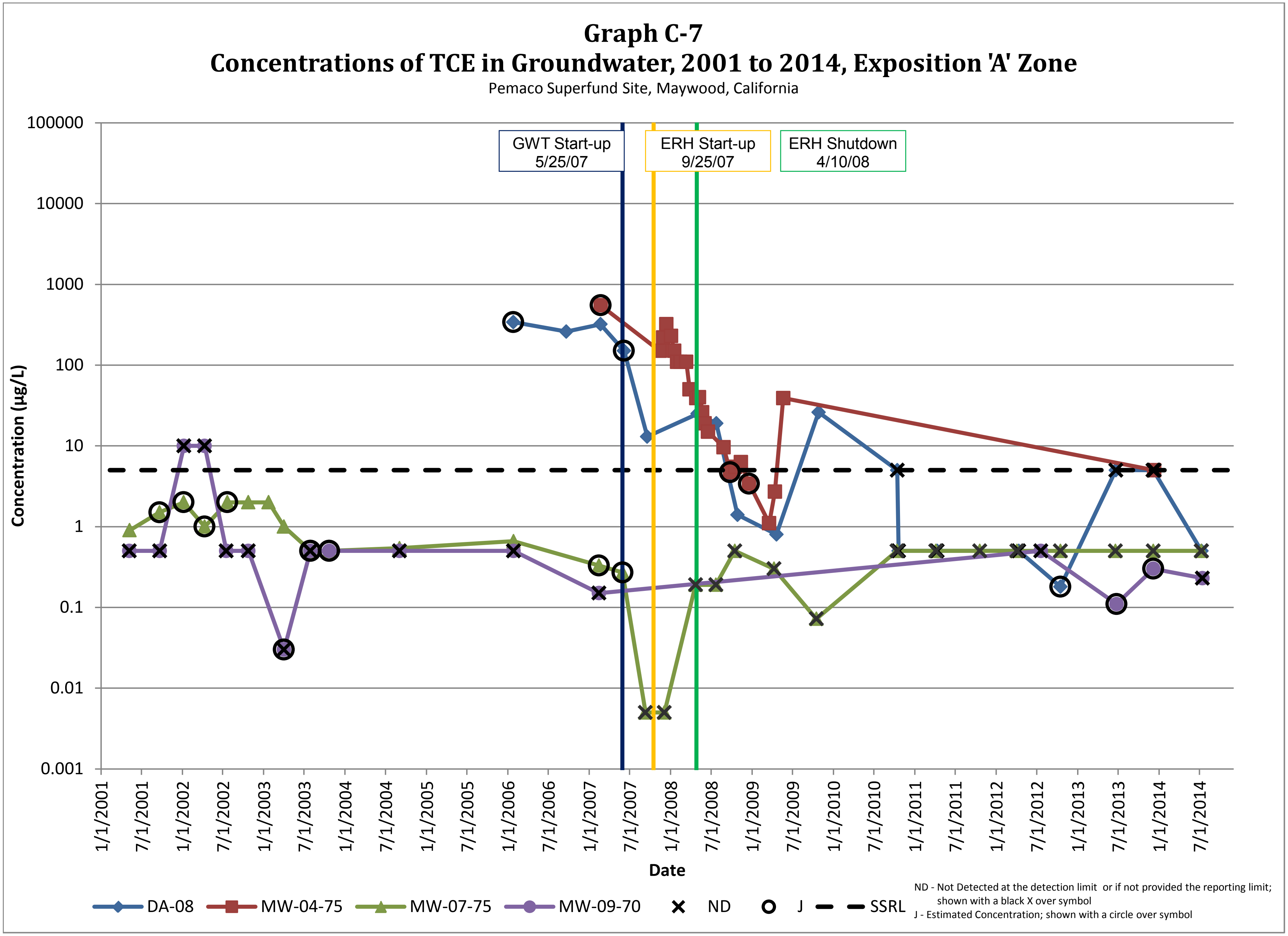
7/1/2008
1/1/2009
7/1/2009
1/1/2010
7/1/2010
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
Date
PD-06
SV-05
ND
J
SSRL
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol

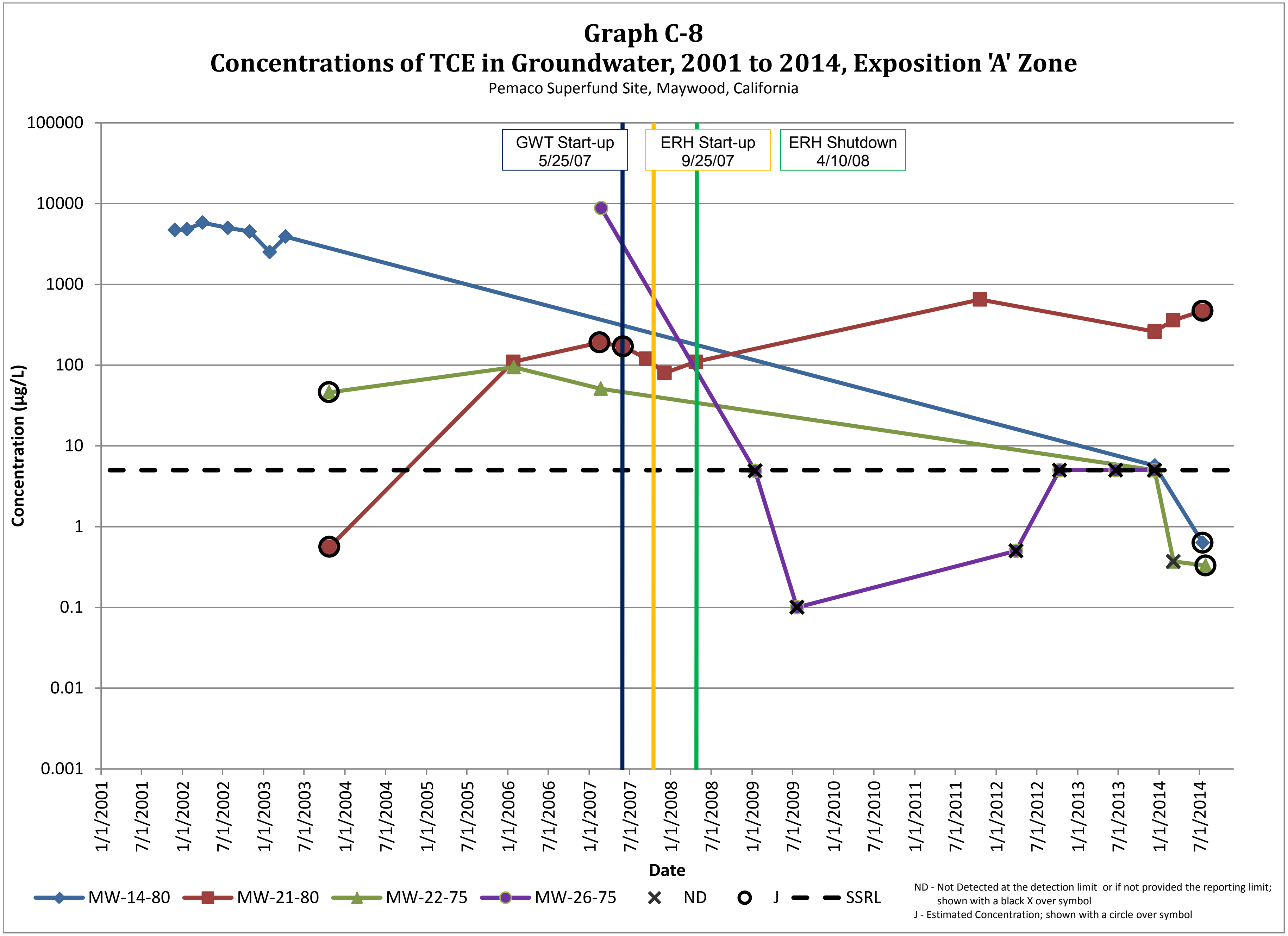
Graph C-6
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'A' Zone

Pemaco Superfund Site, Maywood, California

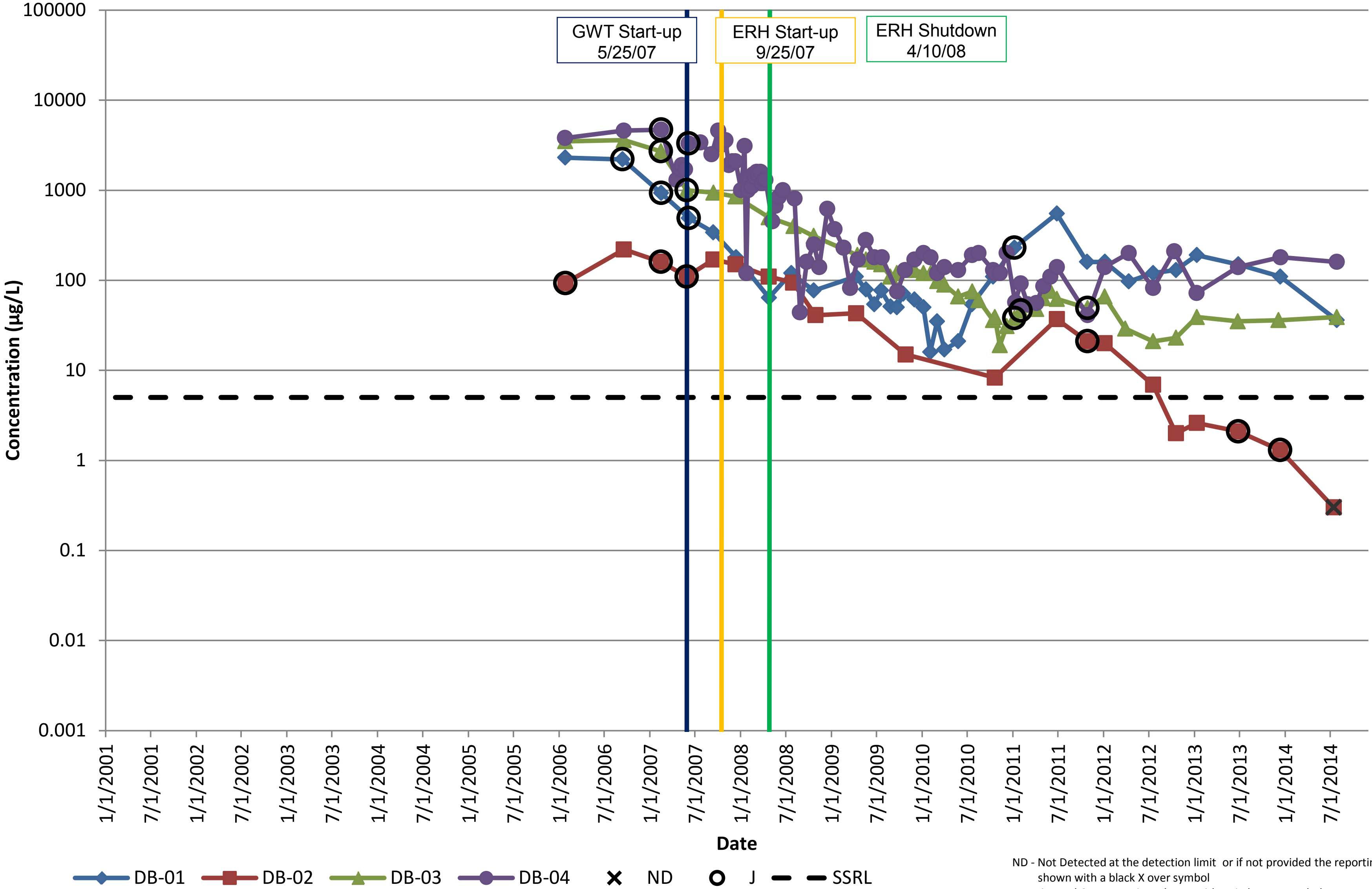




Graph C-7
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'A' Zone
Pemaco Superfund Site, Maywood, California
GWT Start-up 5/25/07
ERH Start-up 9/25/07
ERH Shutdown 4/10/08
Concentration (µg/L)
100000
10000
1000
100
10
1
0.1
0.01
0.001
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
1/1/2005
7/1/2005
1/1/2006
7/1/2006
1/1/2007
7/1/2007
1/1/2008
7/1/2008
1/1/2009
7/1/2009
1/1/2010
7/1/2010
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
Date
DA-08
MW-04-75
MW-07-75
MW-09-70
ND
J
SSRL
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol


Graph C-8
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'A' Zone
Pemaco Superfund Site, Maywood, California
GWT Start-up
5/25/07
ERH Start-up
9/25/07
ERH Shutdown
4/10/08
100000
10000
1000
100
10
1
0.1
0.01
0.001
Concentration (µg/L)
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
1/1/2005
7/1/2005
1/1/2006
7/1/2006
1/1/2007
7/1/2007
1/1/2008
7/1/2008
1/1/2009
7/1/2009
1/1/2010
7/1/2010
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
Date
MW-14-80
MW-21-80
MW-22-75
MW-26-75
ND
J
SSRL
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol

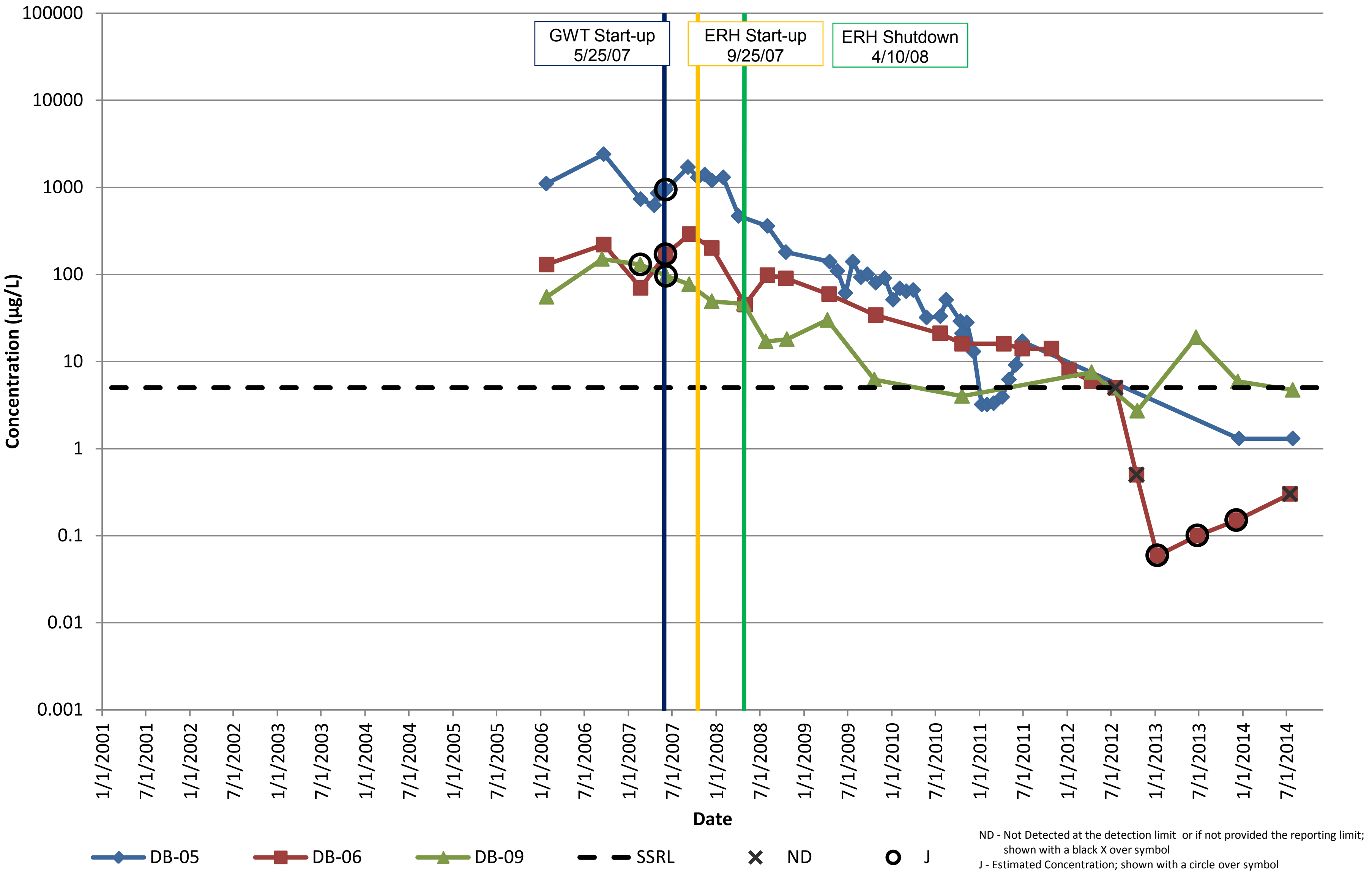
Graph C-9
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California



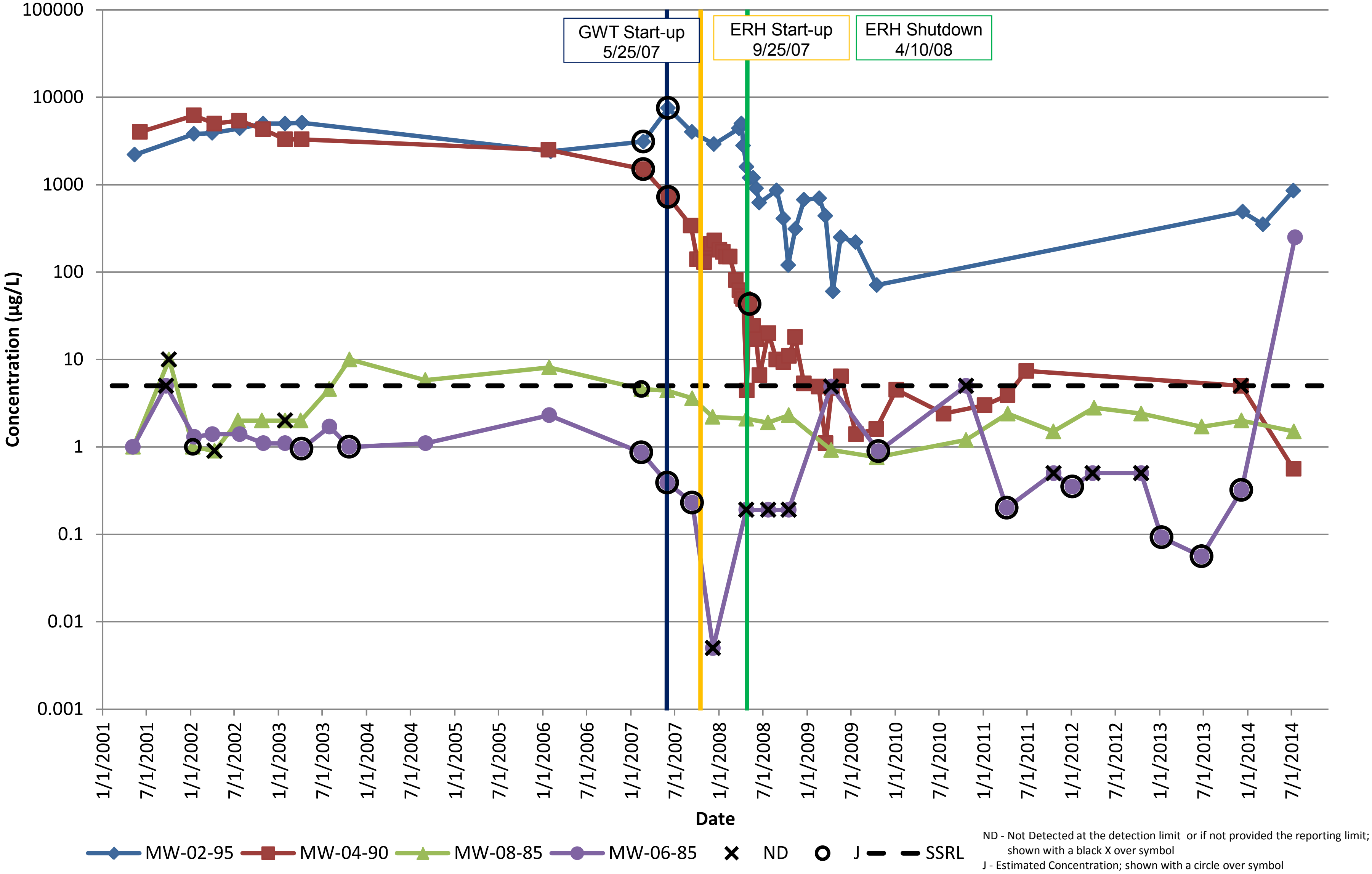
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol

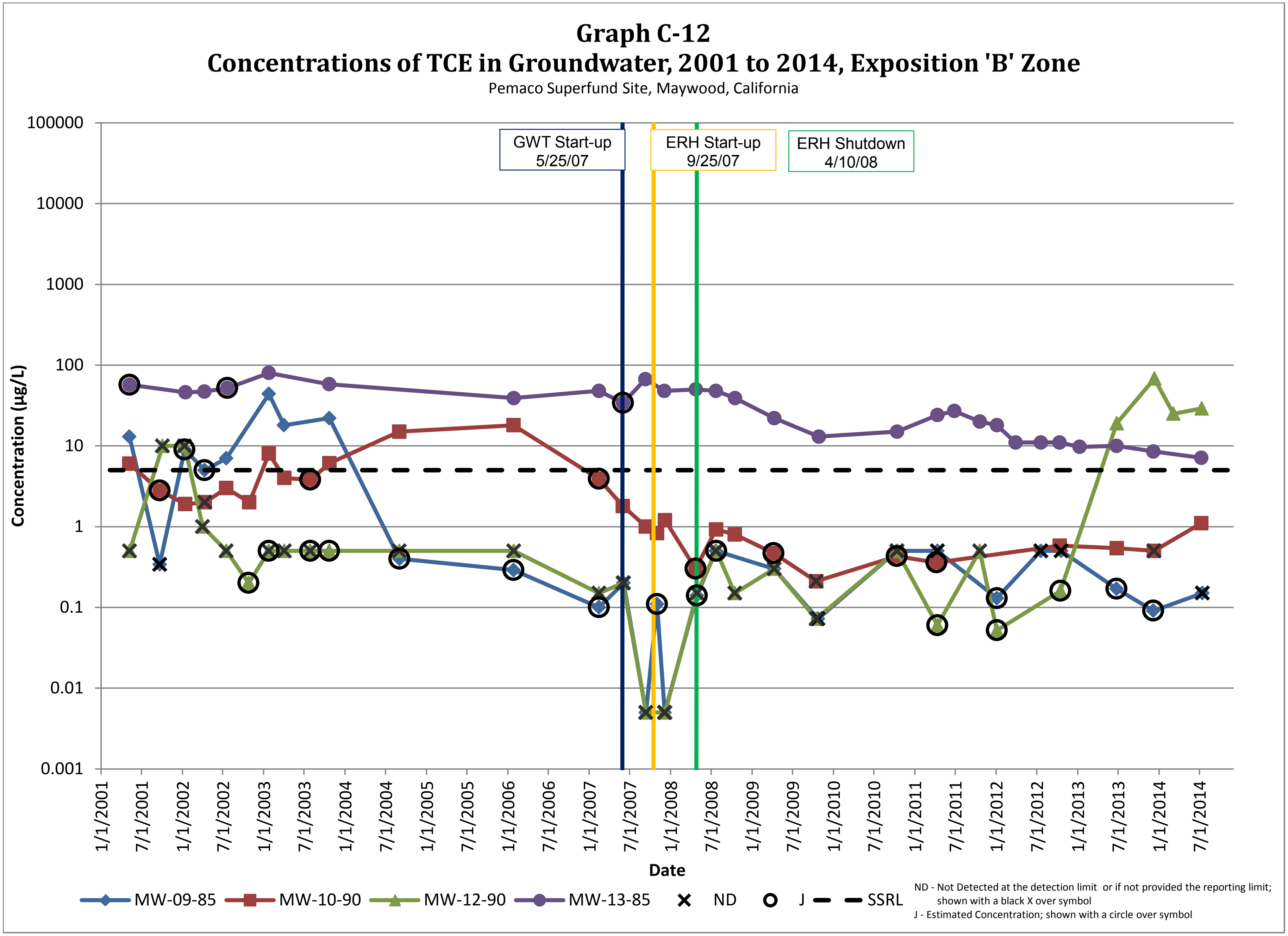
Graph C-10
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'B' Zone

Pemaco Superfund Site, Maywood, California



Graph C-11
Concentrations of TCE in Groundwater, 2001 to 2014, Expostion 'B' Zone
Pemaco Superfund Site, Maywood, California




Graph C-12
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California
Concentration (µg/L)
100000
10000
1000
100
10
1
0.1
0.01
0.001
GWT Start-up 5/25/07
ERH Start-up 9/25/07
ERH Shutdown 4/10/08
Date
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
1/1/2005
7/1/2005
1/1/2006
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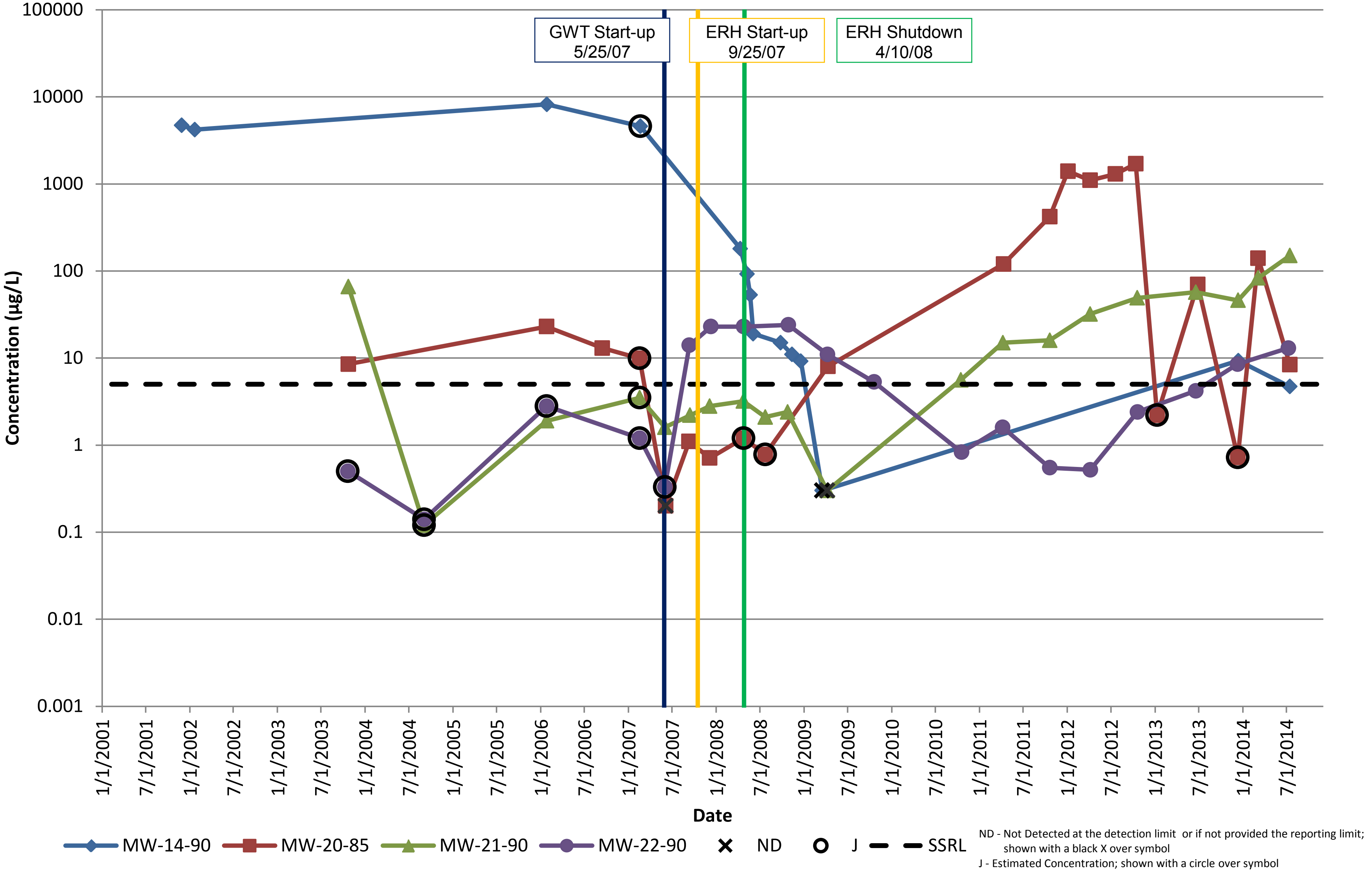
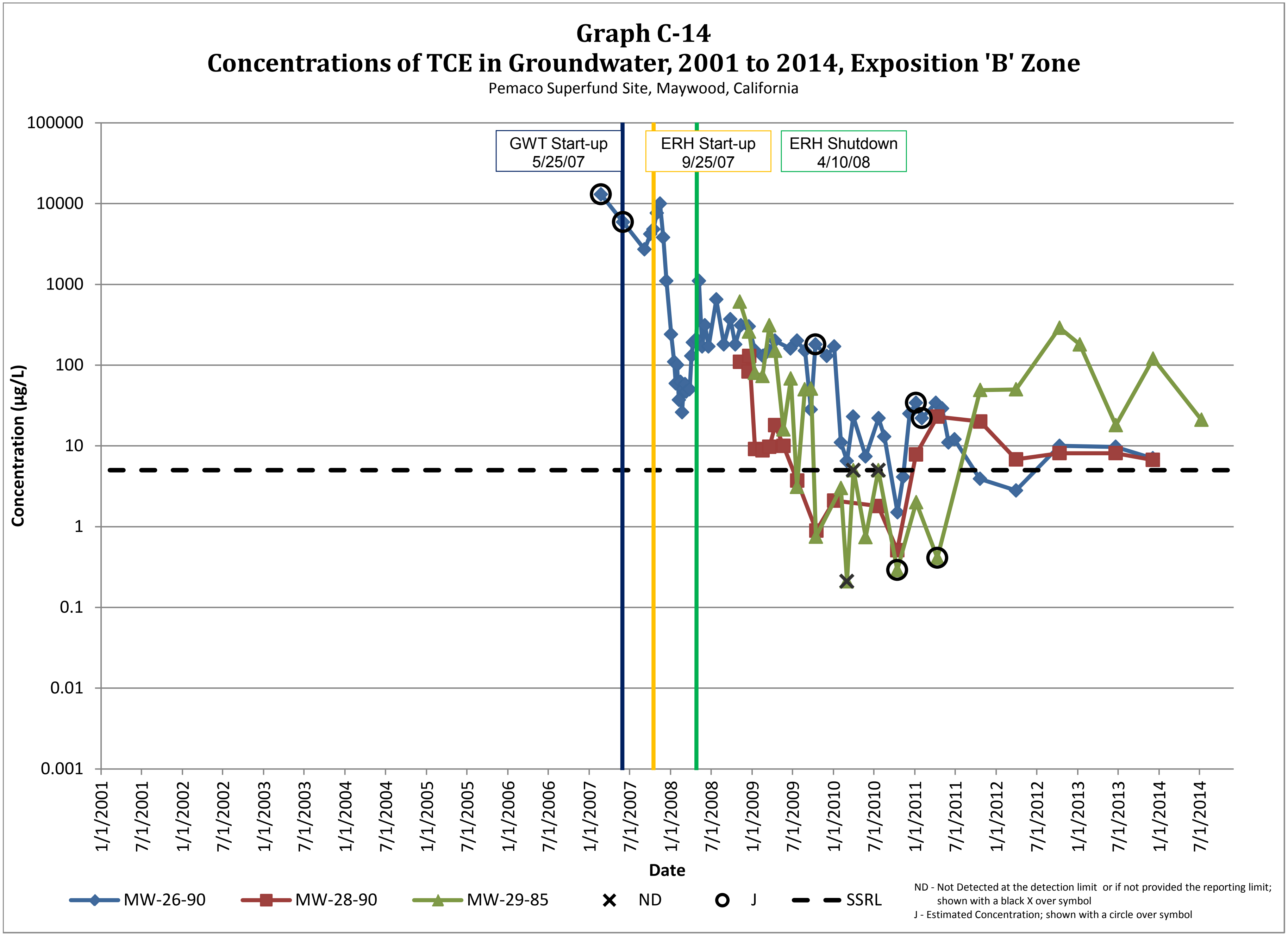
7/1/2010
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
MW-09-85
MW-10-90
MW-12-90
MW-13-85
ND
J
SSRL
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol

Graph C-13
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'B' Zone

Pemaco Superfund Site, Maywood, California




Graph C-14
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California
Concentration (µg/L)
100000
10000
1000
100
10
1
0.1
0.01
0.001
GWT Start-up 5/25/07
ERH Start-up 9/25/07
ERH Shutdown 4/10/08
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
1/1/2005
7/1/2005
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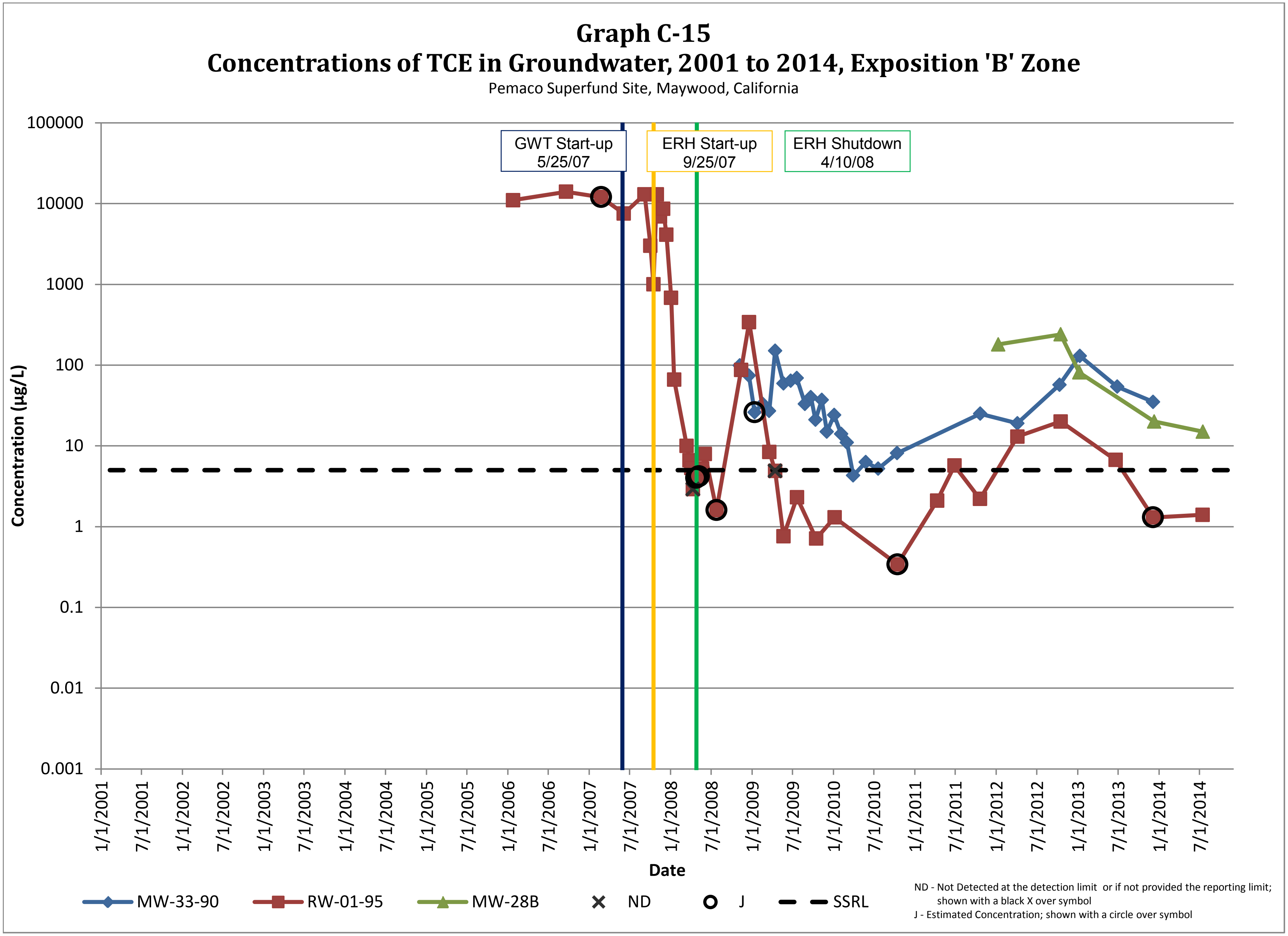
7/1/2008
1/1/2009
7/1/2009
1/1/2010
7/1/2010
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
Date
MW-26-90
MW-28-90
MW-29-85
ND
J
SSRL
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol



Graph C-15
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California
GWT Start-up 5/25/07
ERH Start-up 9/25/07
ERH Shutdown 4/10/08
Concentration (µg/L)
100000
10000
1000
100
10
1
0.1
0.01
0.001
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
1/1/2005
7/1/2005
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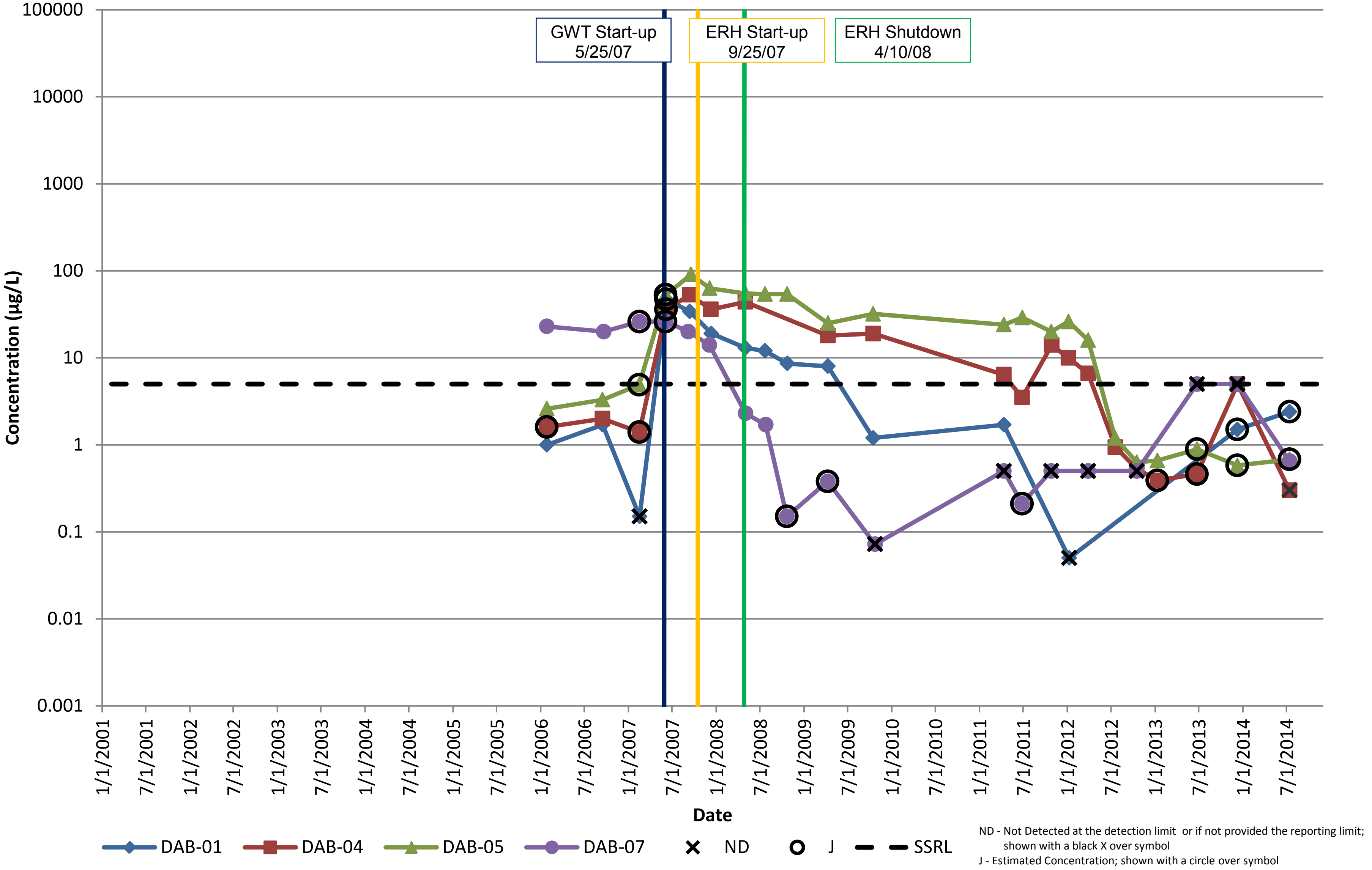
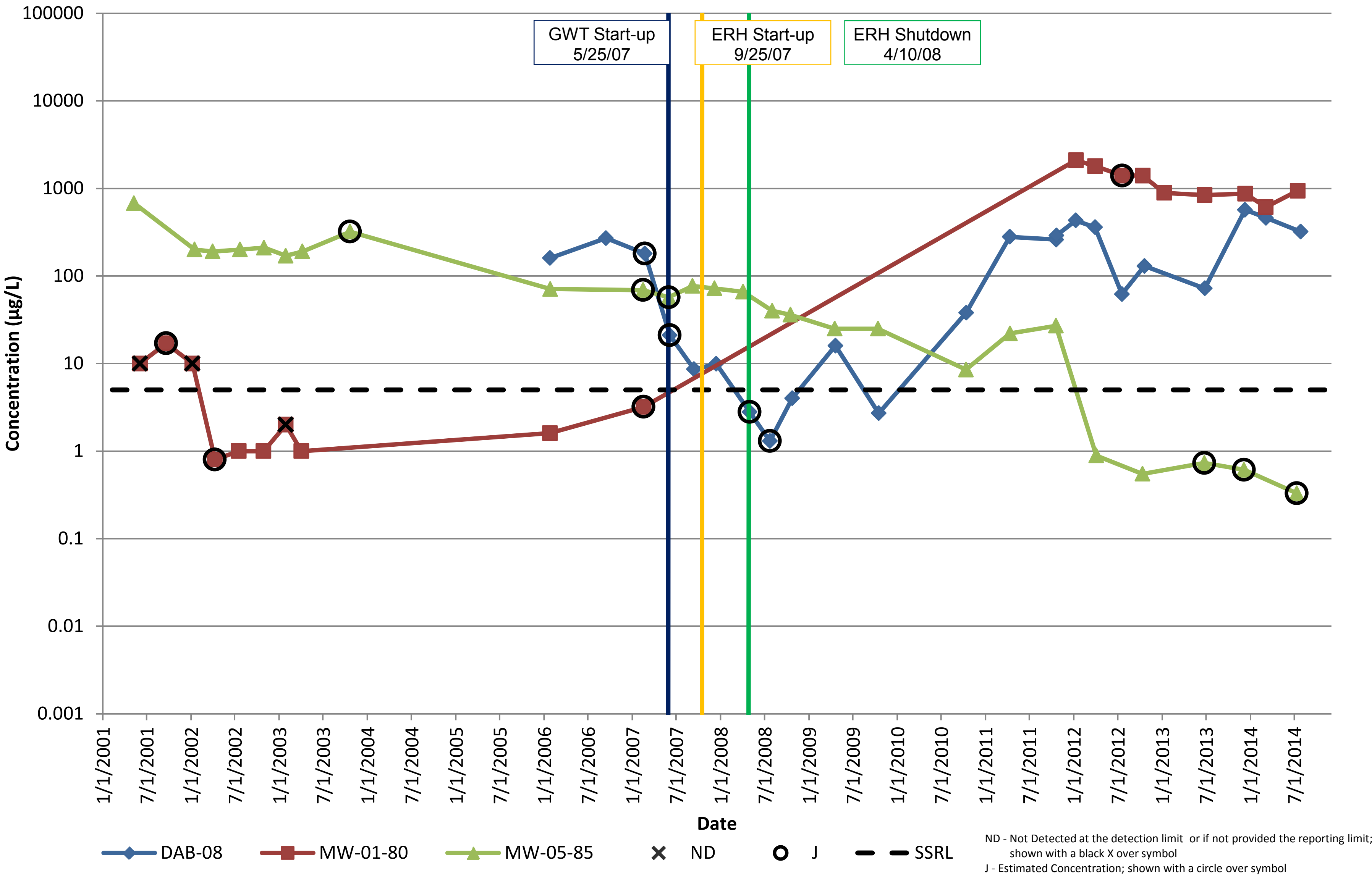
7/1/2010
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
Date
MW-33-90
RW-01-95
MW-28B
ND
J
SSRL
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol

Graph C-16
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'A' & 'B' Zones

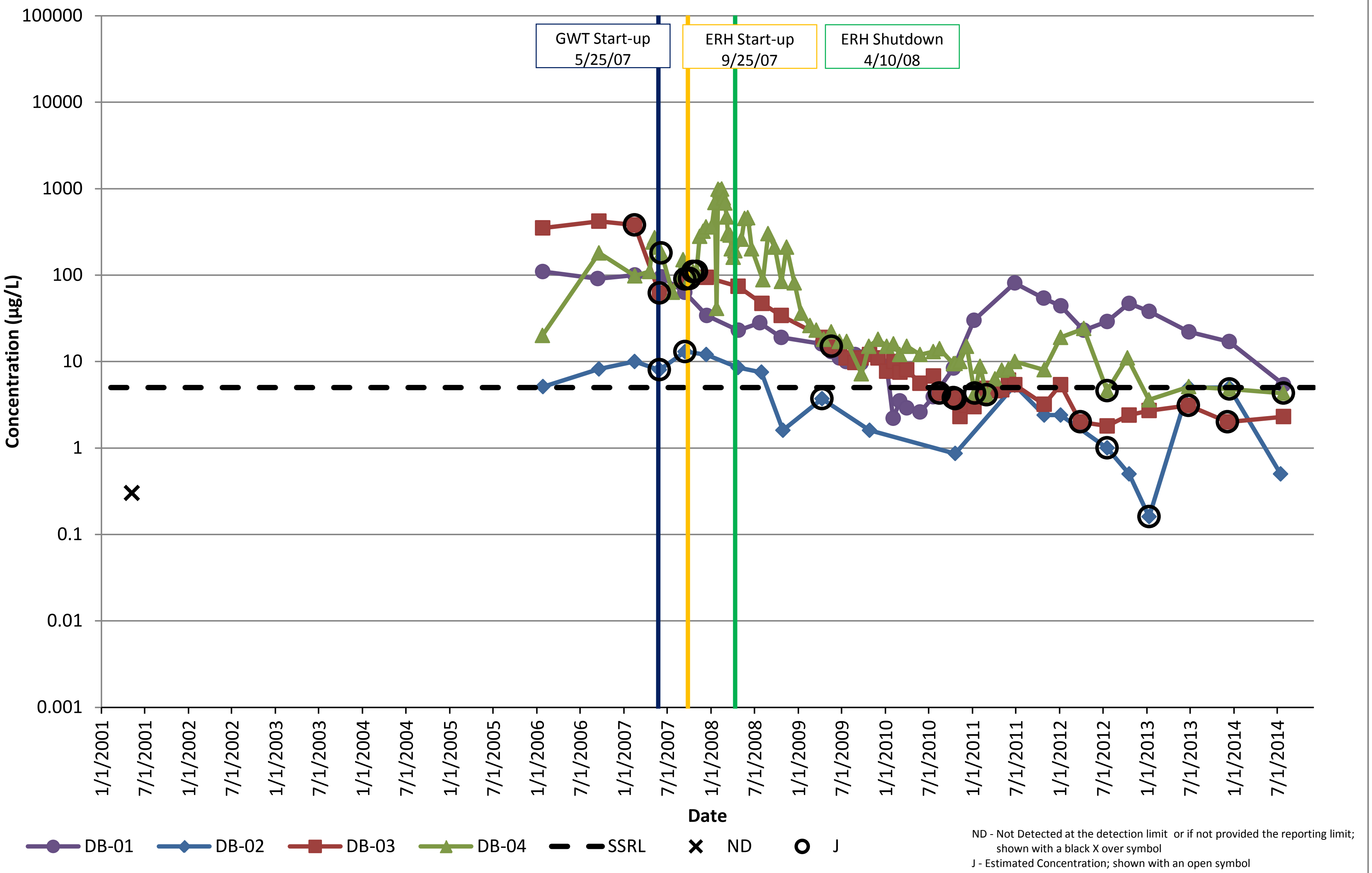
Pemaco Superfund Site, Maywood, California



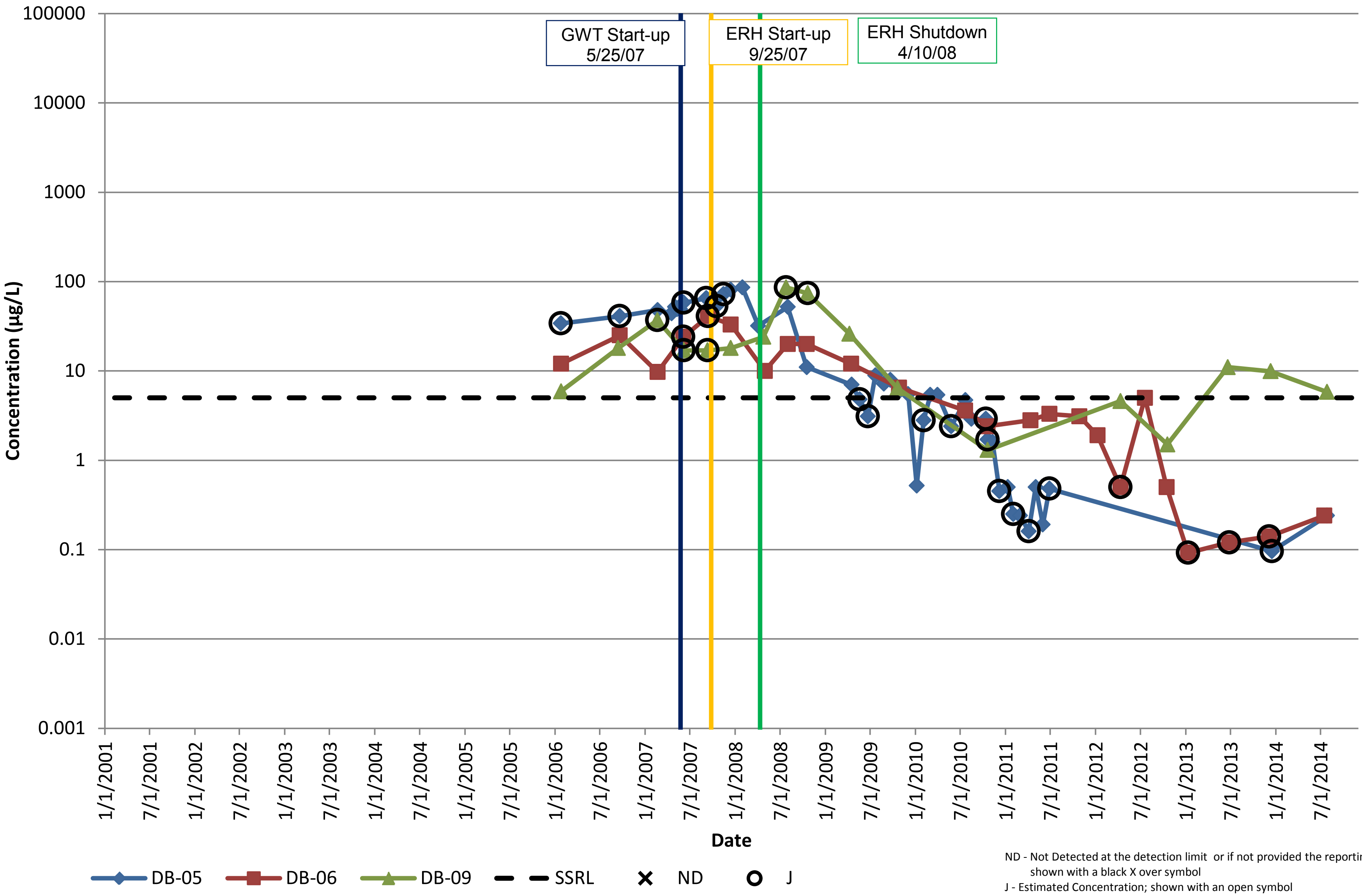
Graph C-17
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'A' & 'B' Zones
Pemaco Superfund Site, Maywood, California



Graph C-18
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California

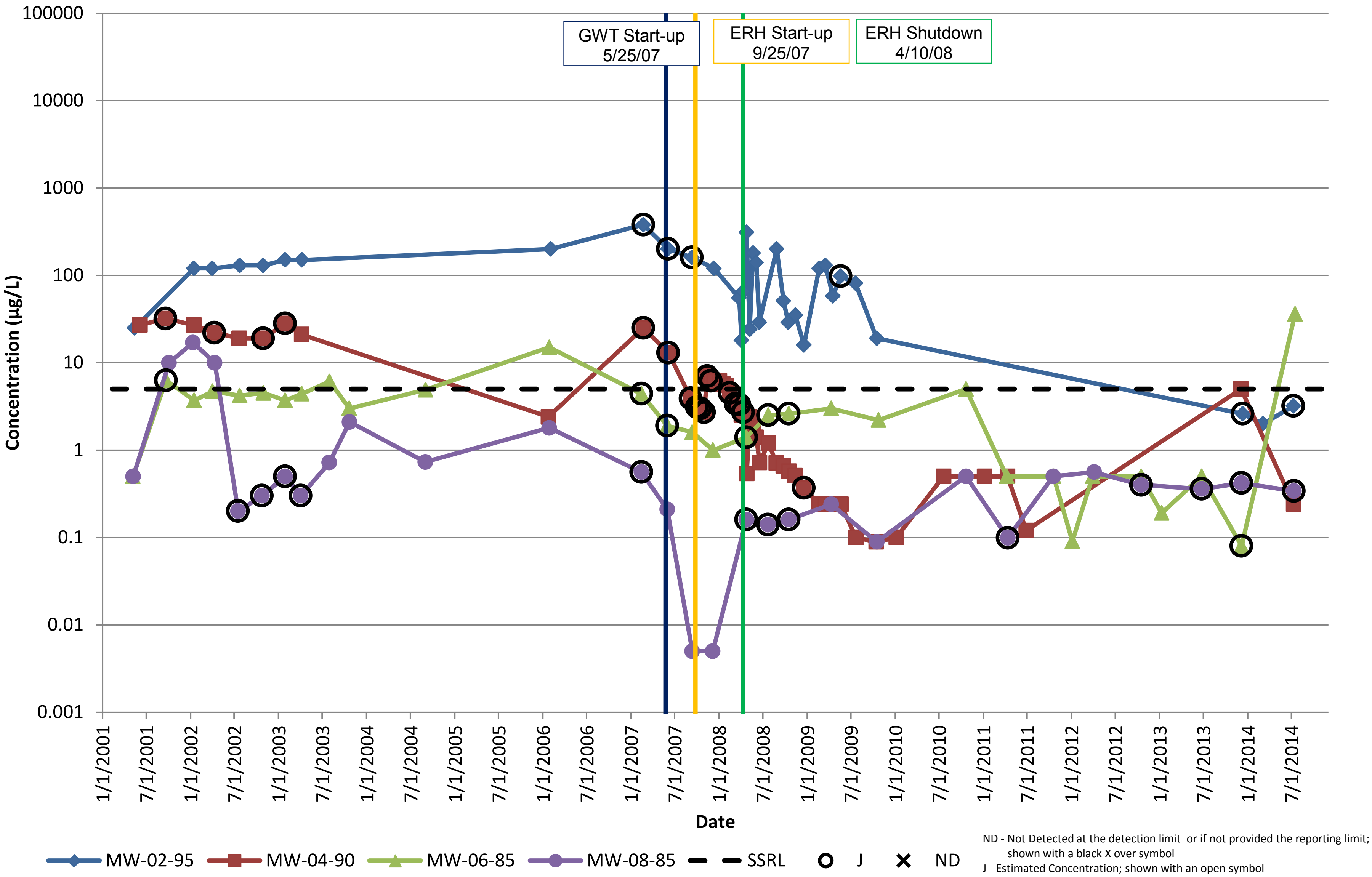


Graph C-19
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California



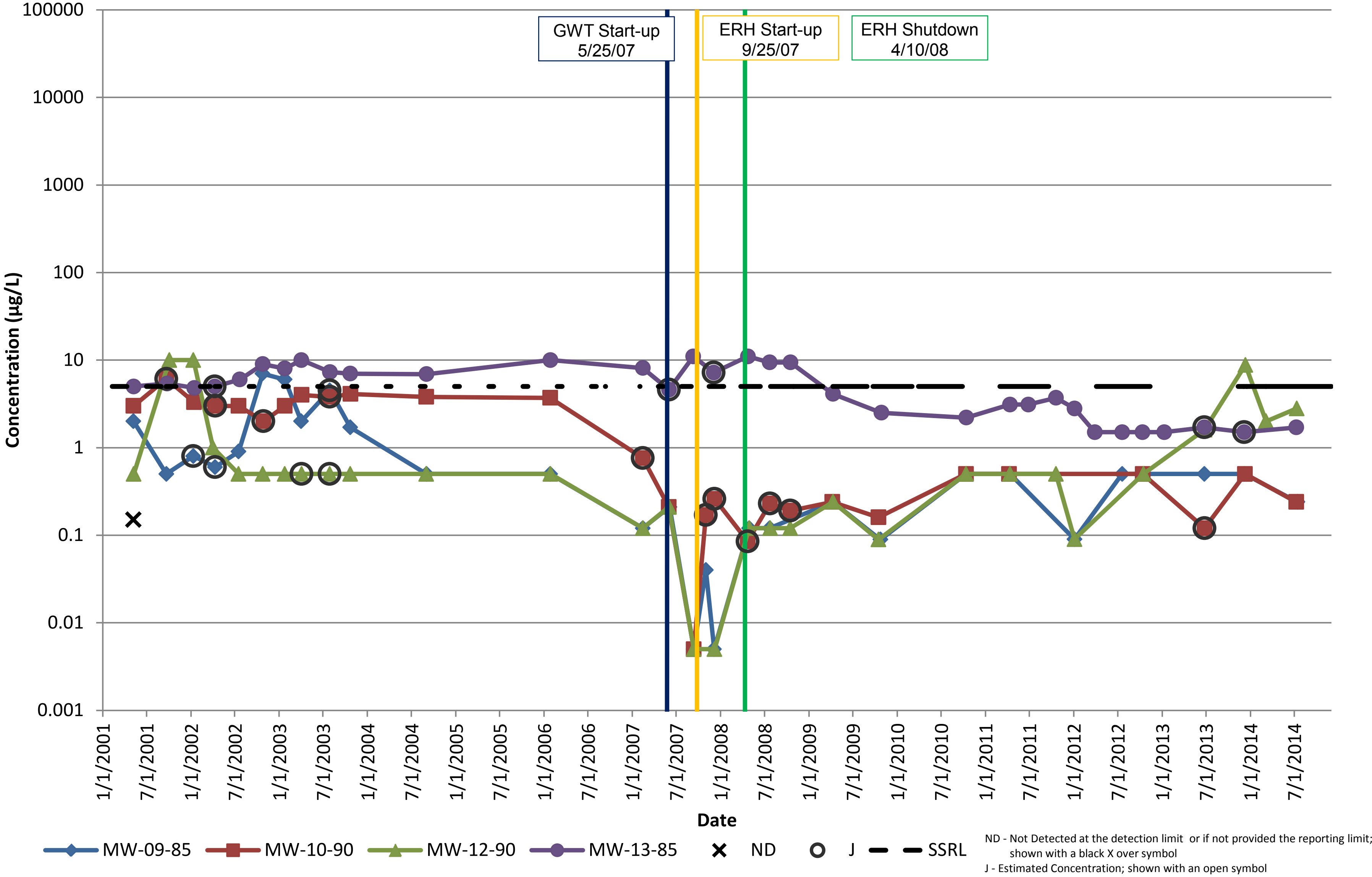
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with an open symbol

Graph C-20
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California

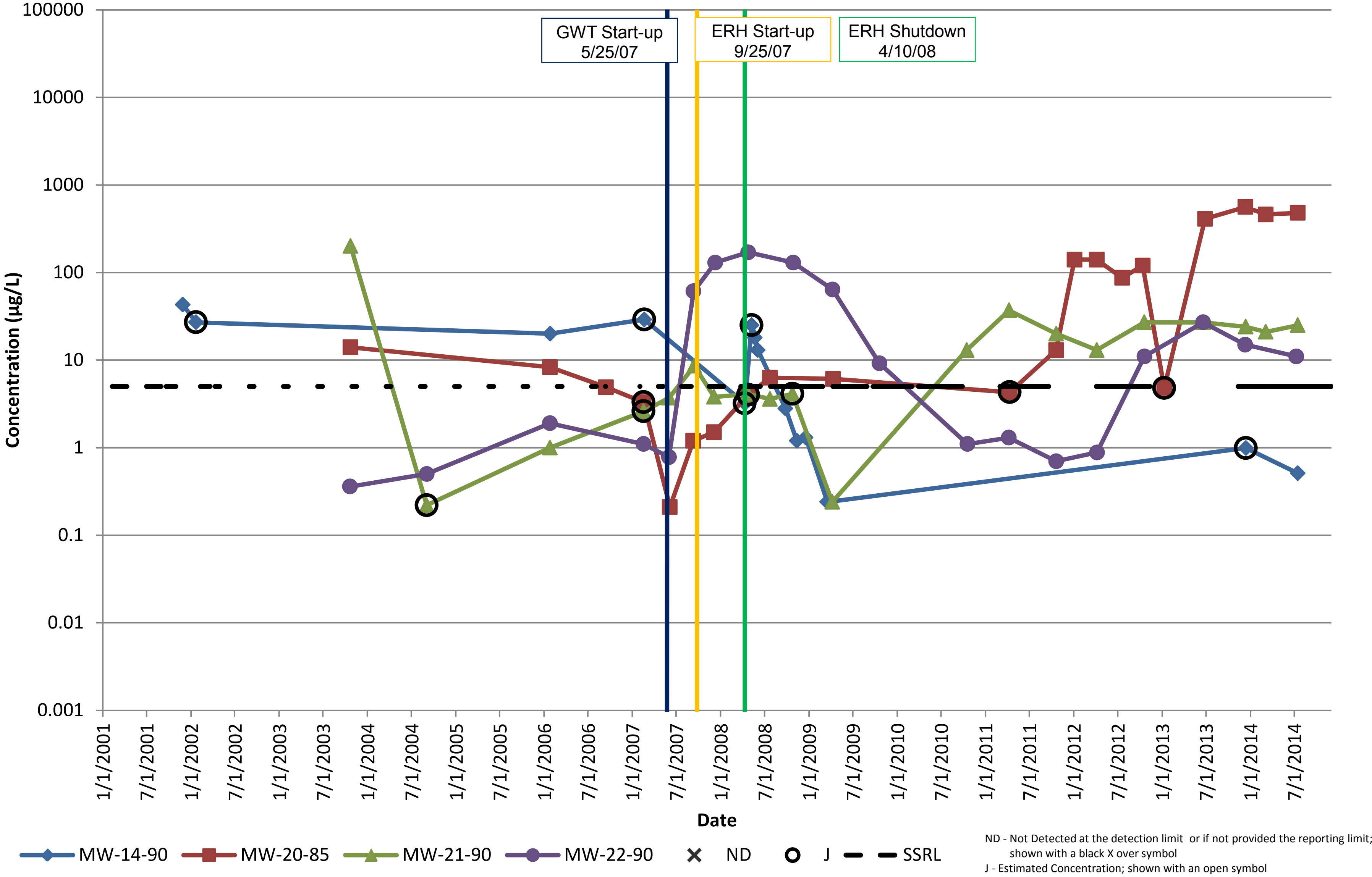


Graph C-21
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'B' Zone

Pemaco Superfund Site, Maywood, California

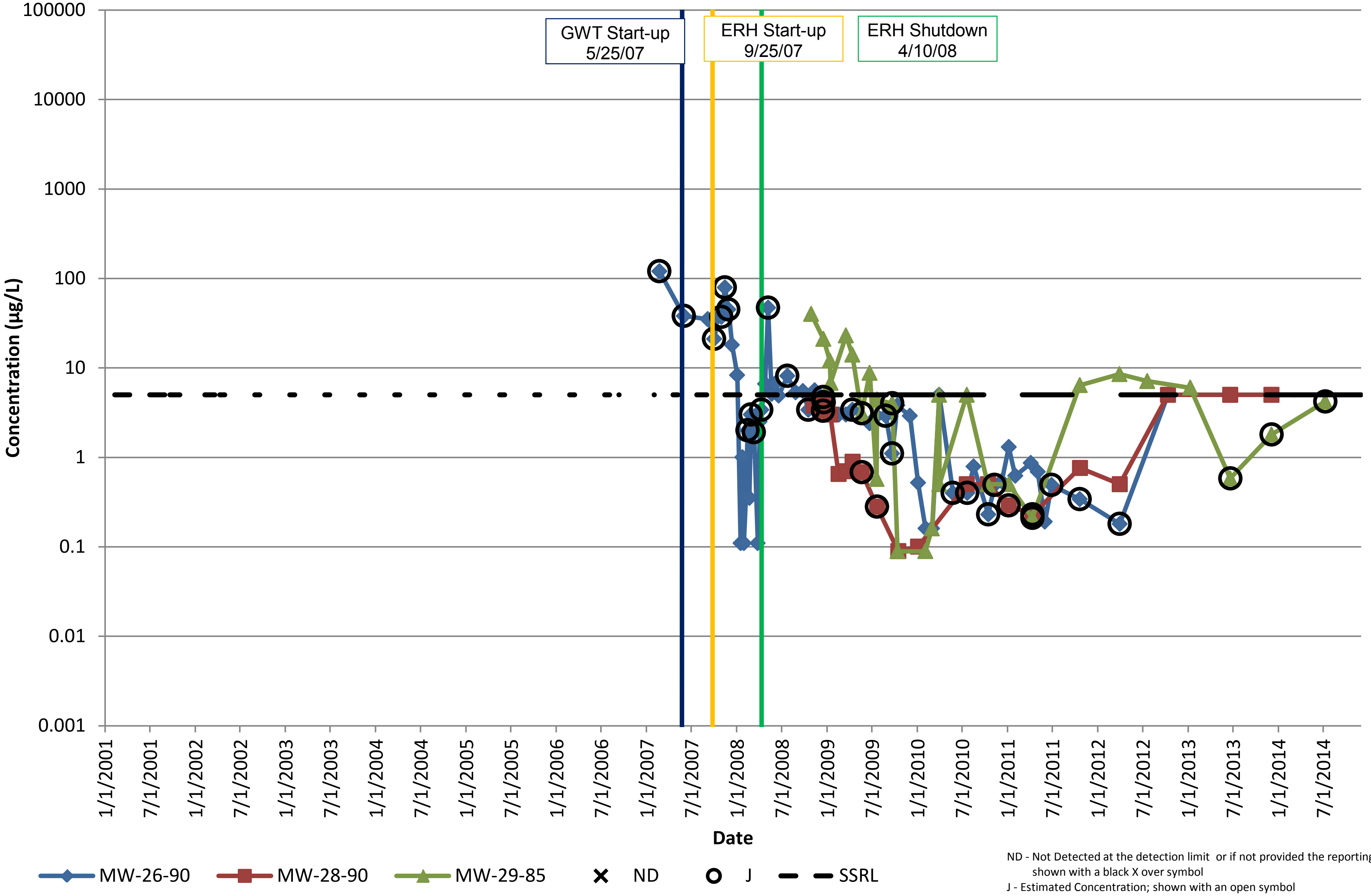


Graph C-22
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California



Graph C-23
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'B' Zone

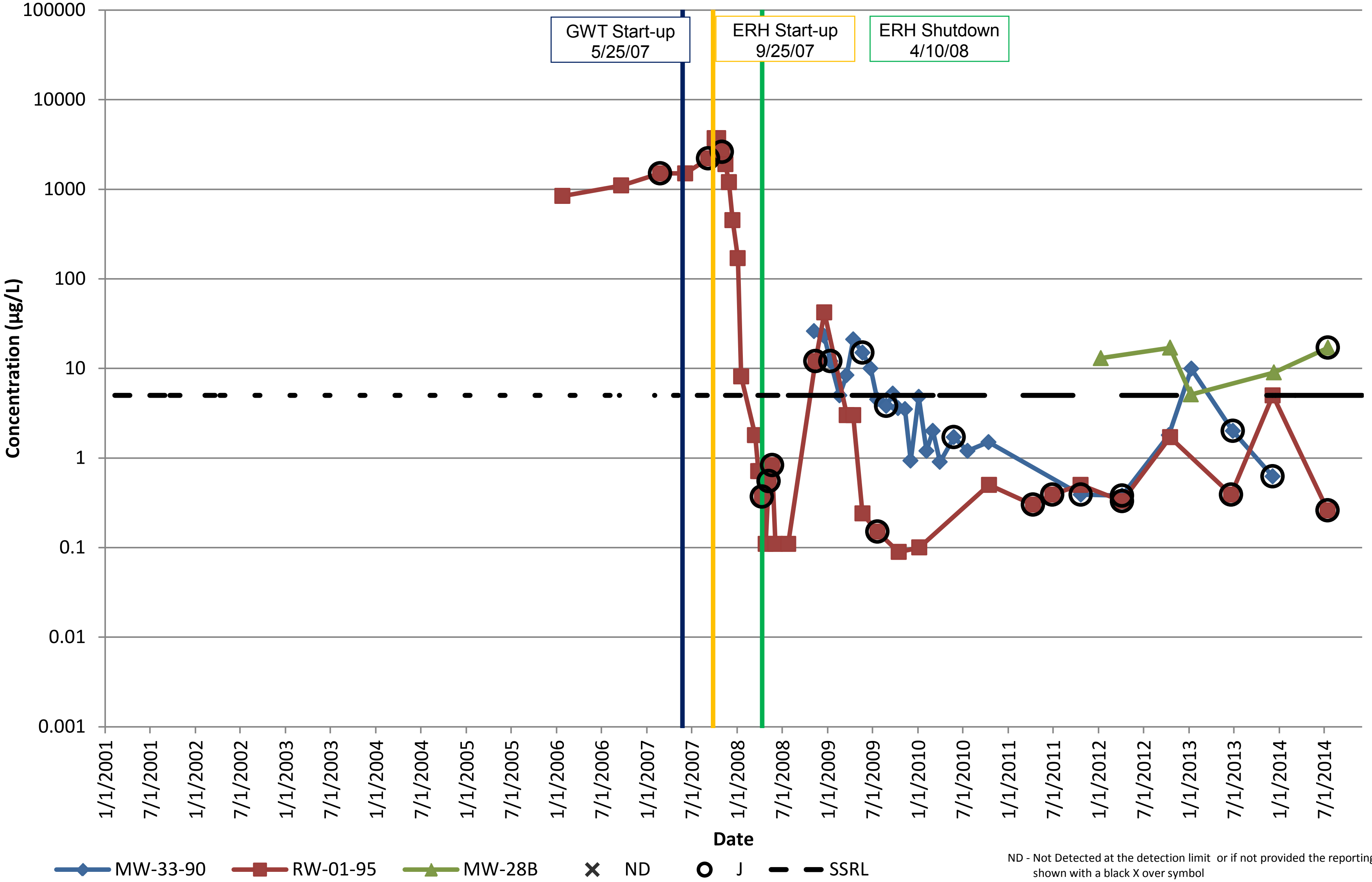
Pemaco Superfund Site, Maywood, California



ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol

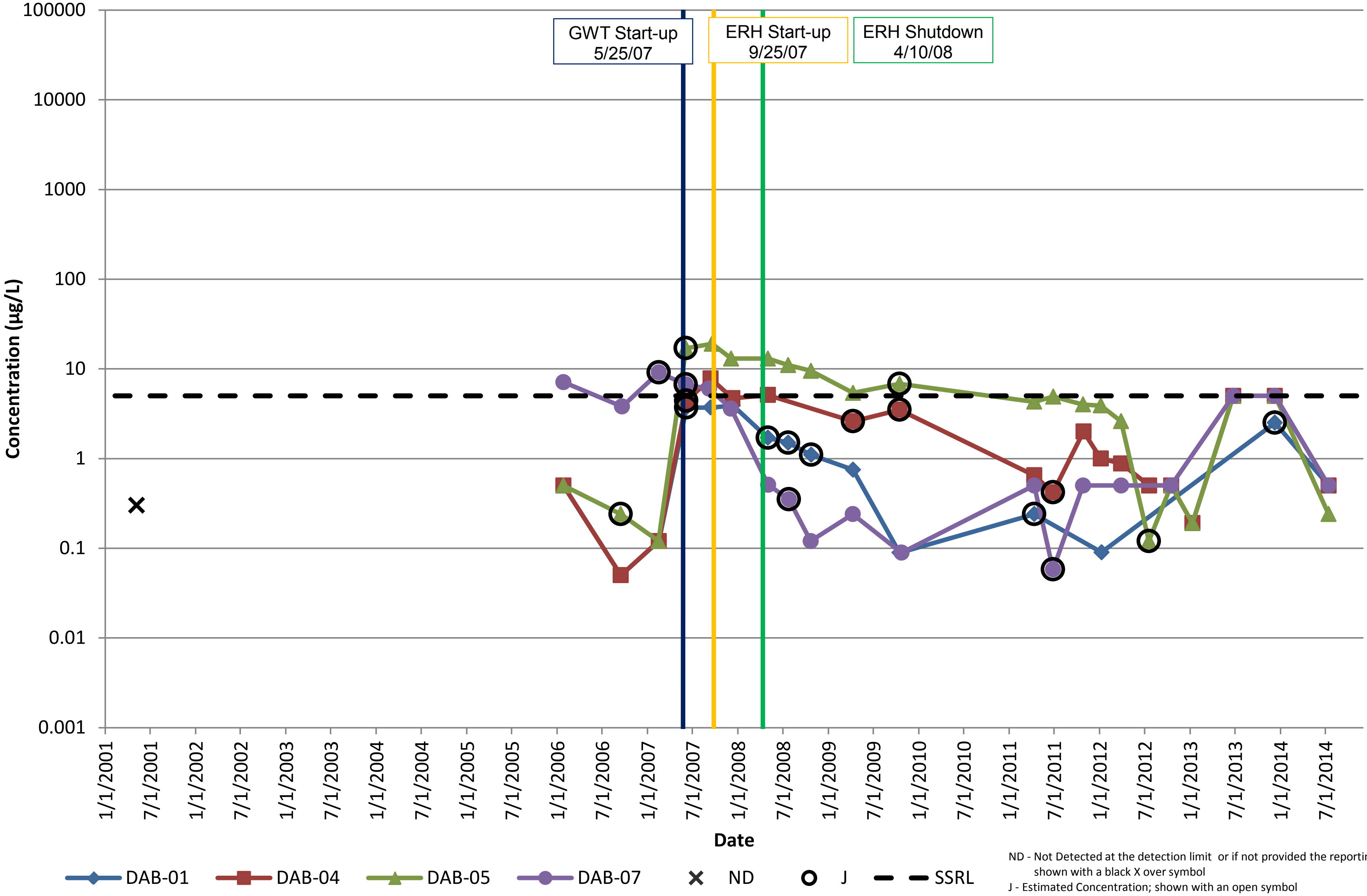
J - Estimated Concentration; shown with an open symbol

Graph C-24
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'B' Zone
Pemaco Superfund Site, Maywood, California



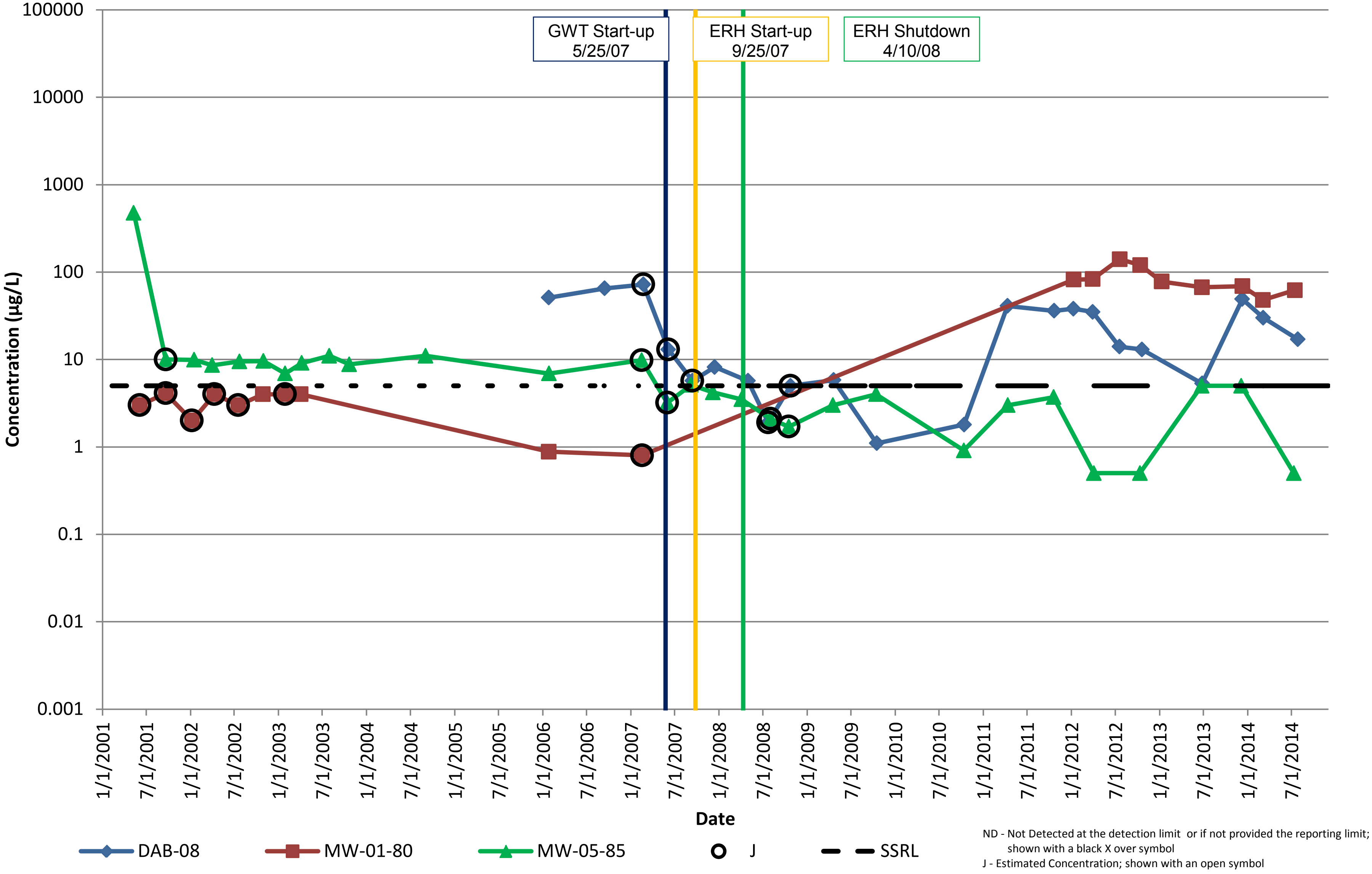
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with an open symbol

Graph C-25
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'A' & 'B' Zones
Pemaco Superfund Site, Maywood, California



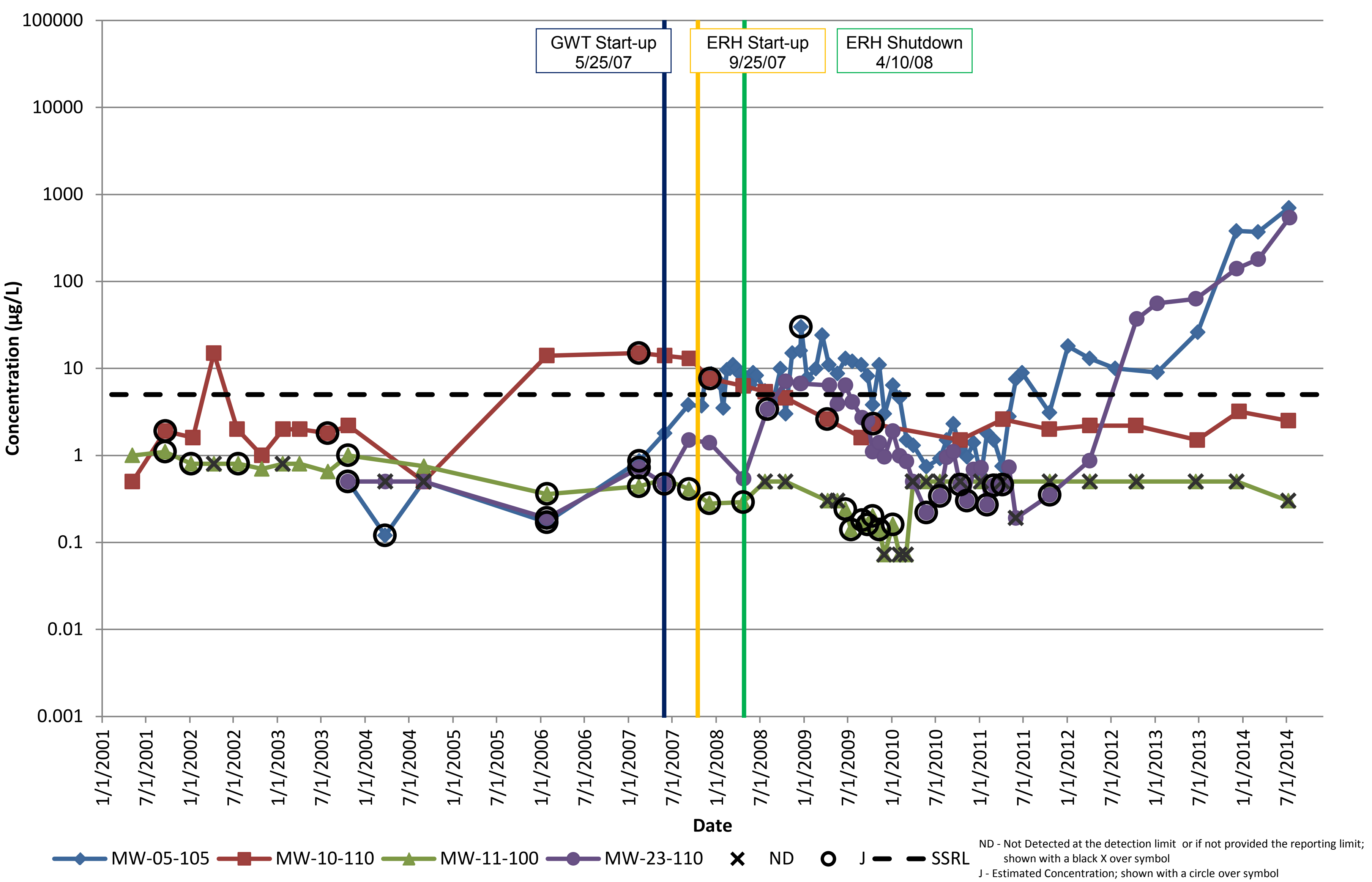
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with an open symbol

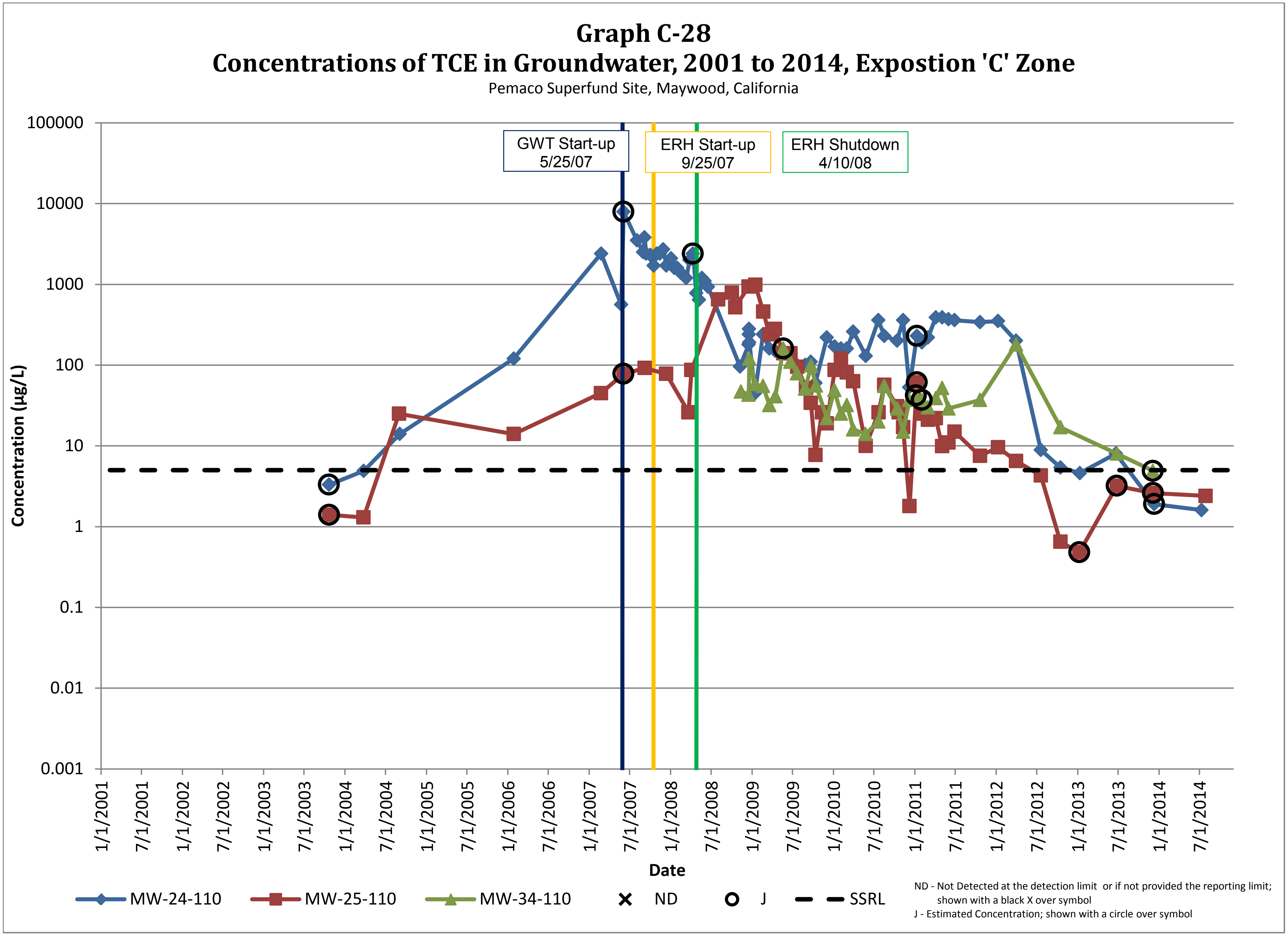
Graph C-26
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'A' & 'B' Zones
Pemaco Superfund Site, Maywood, California



Graph C-27
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'C' Zone

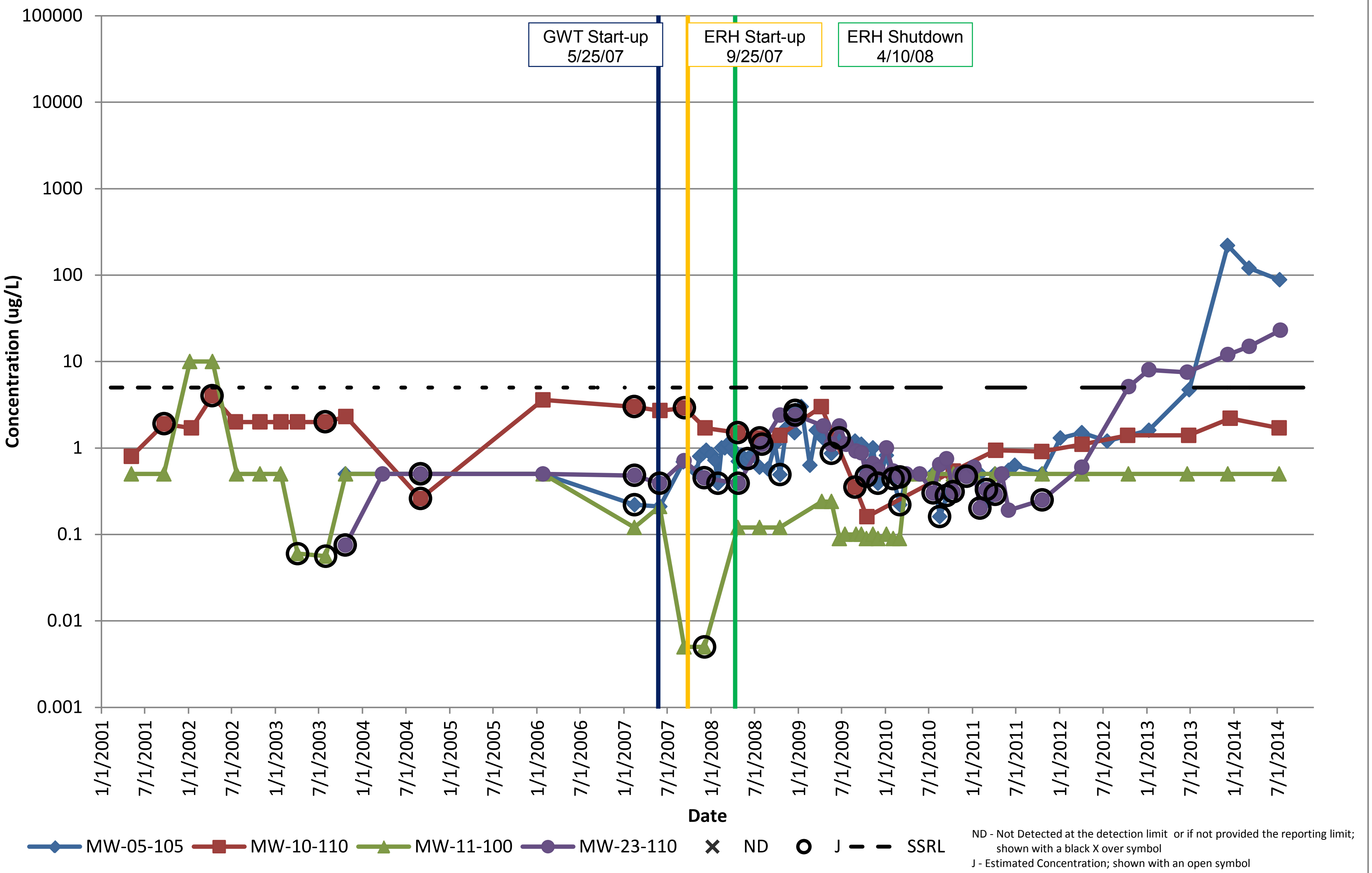
Pemaco Superfund Site, Maywood, California



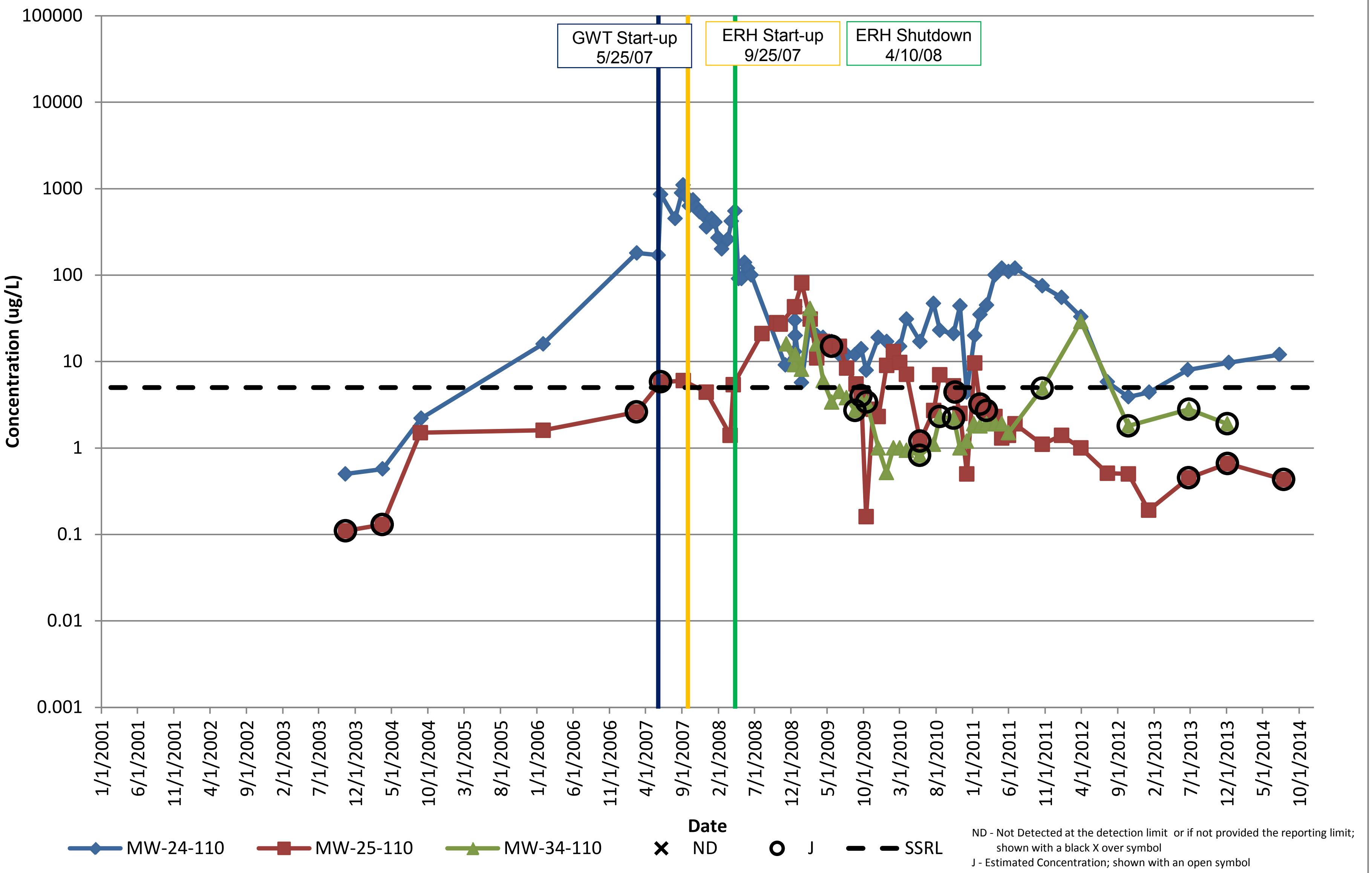


Graph C-28
Concentrations of TCE in Groundwater, 2001 to 2014, Expostion 'C' Zone
Pemaco Superfund Site, Maywood, California
GWT Start-up 5/25/07
ERH Start-up 9/25/07
ERH Shutdown 4/10/08
Concentration (µg/L)
100000
10000
1000
100
10
1
0.1
0.01
0.001
1/1/2001
7/1/2001
1/1/2002
7/1/2002
1/1/2003
7/1/2003
1/1/2004
7/1/2004
1/1/2005
7/1/2005
1/1/2006
7/1/2006
1/1/2007
7/1/2007
1/1/2008
7/1/2008
1/1/2009
7/1/2009
1/1/2010
7/1/2010
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
Date
MW-24-110
MW-25-110
MW-34-110
ND
J
SSRL
ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol

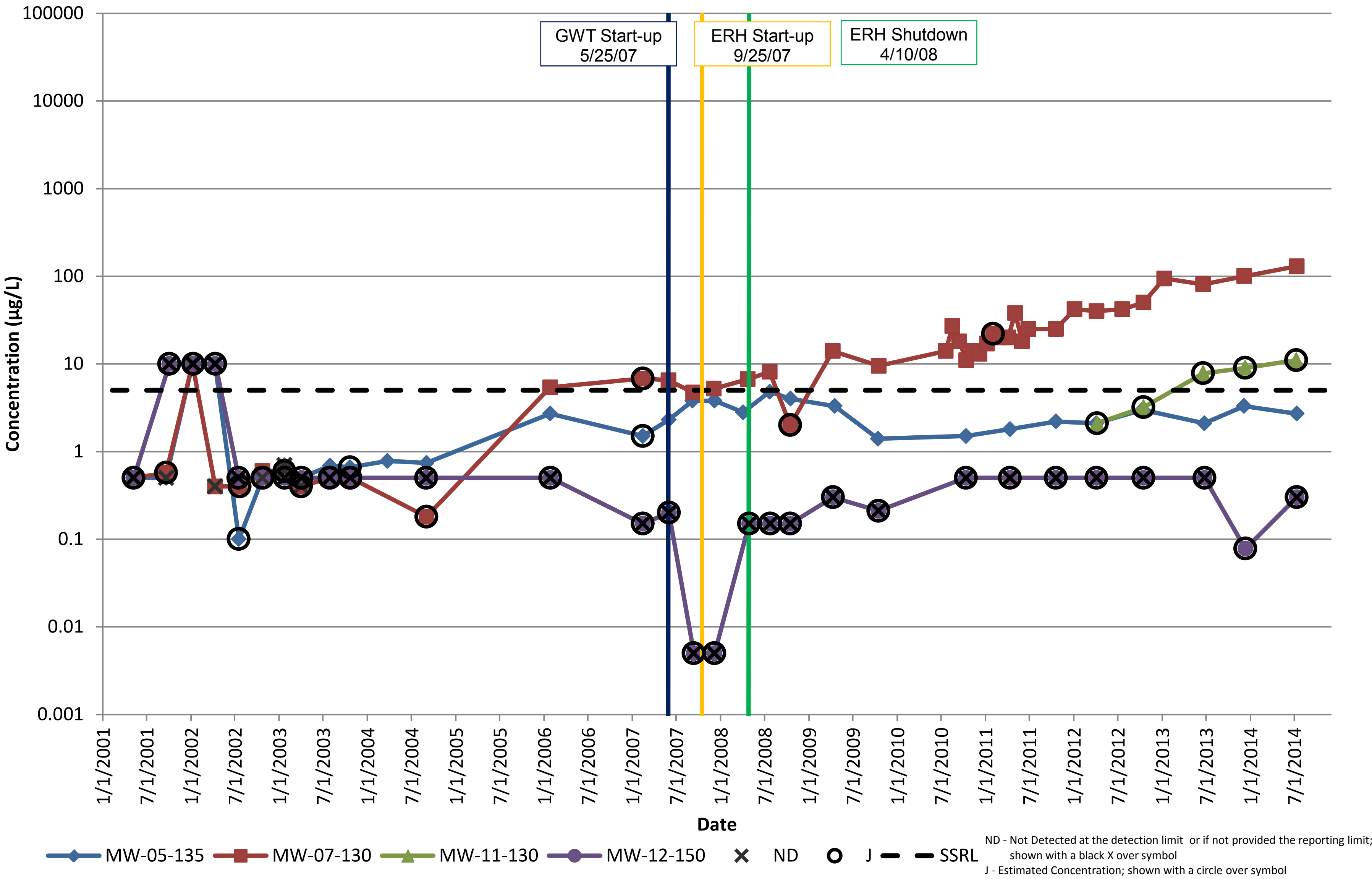
Graph C-29
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'C' Zone
Pemaco Superfund Site, Maywood, California



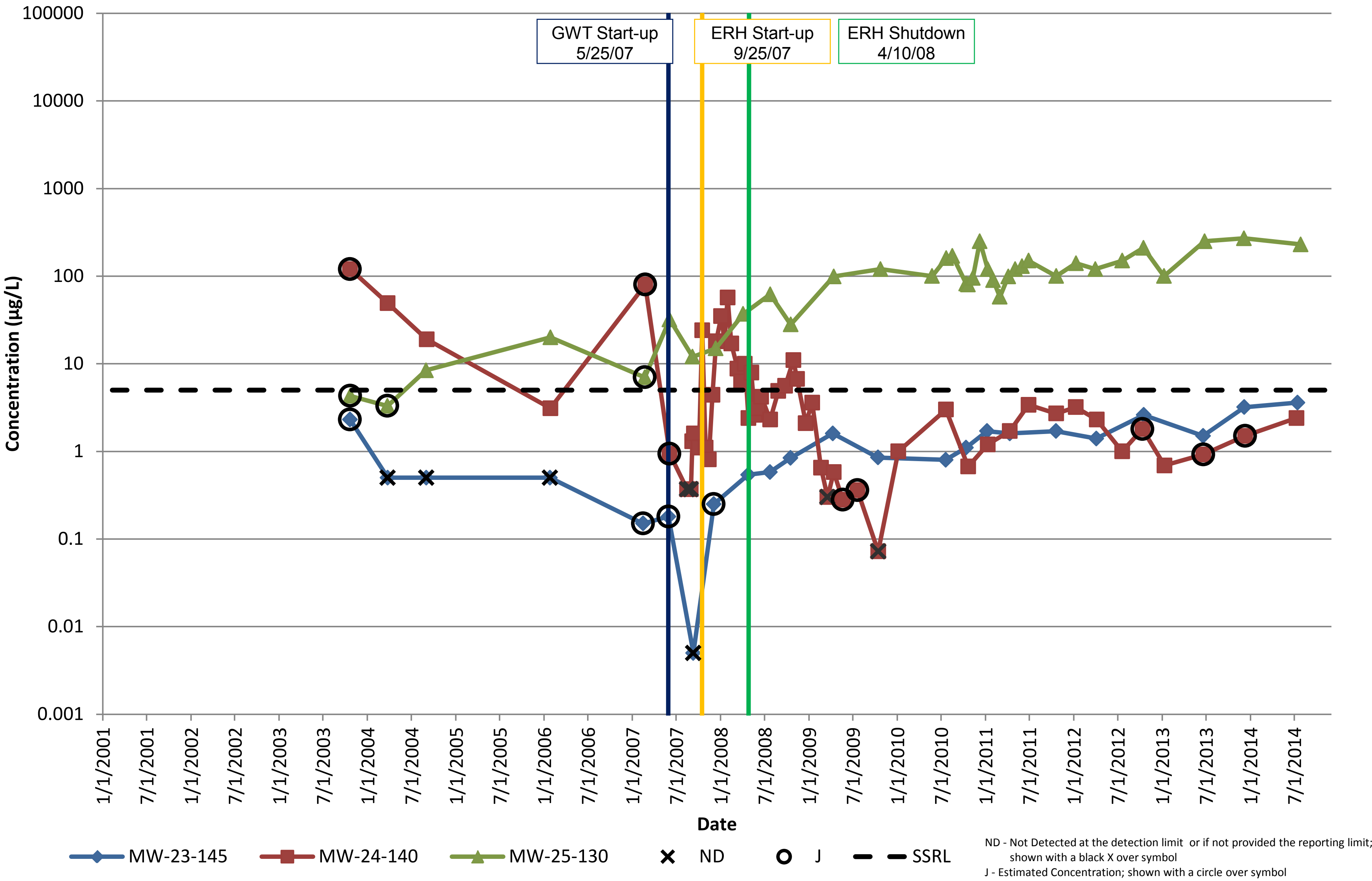
Graph C-30
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'C' Zone
Pemaco Superfund Site, Maywood, California



Graph C-31
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'D' Zone
Pemaco Superfund Site, Maywood, California

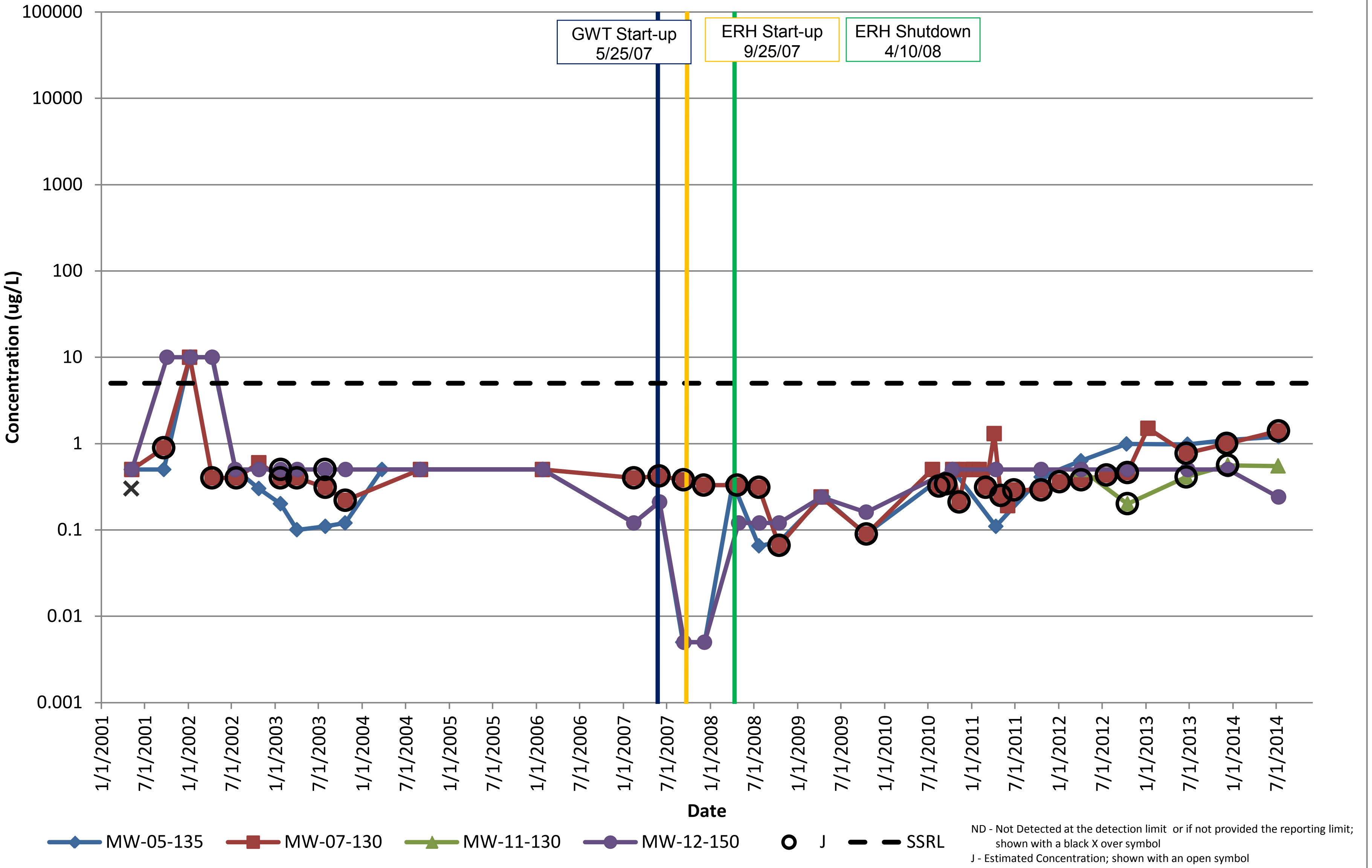


Graph C-32
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'D' Zone
Pemaco Superfund Site, Maywood, California

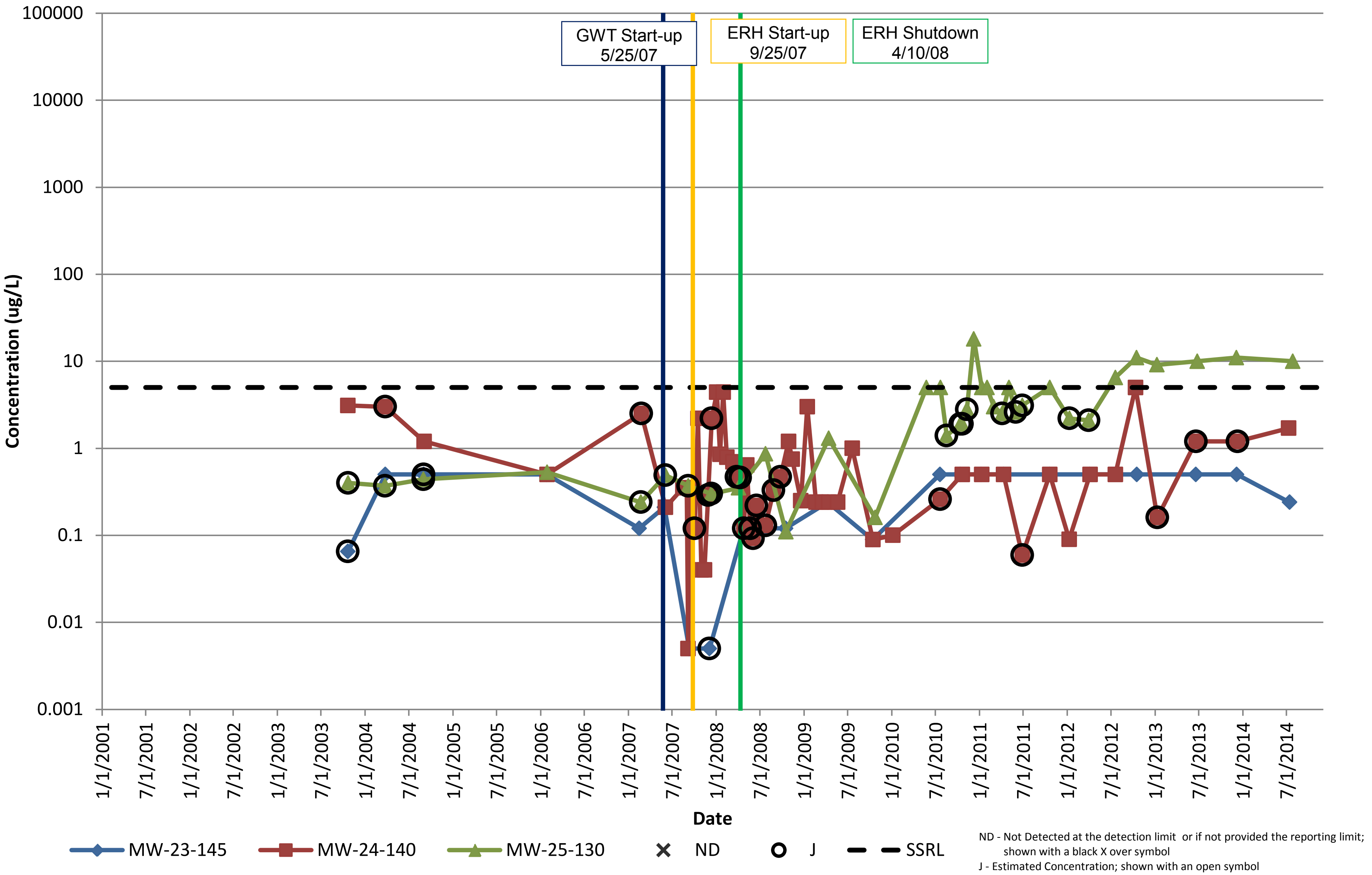


Graph C-33
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'D' Zone

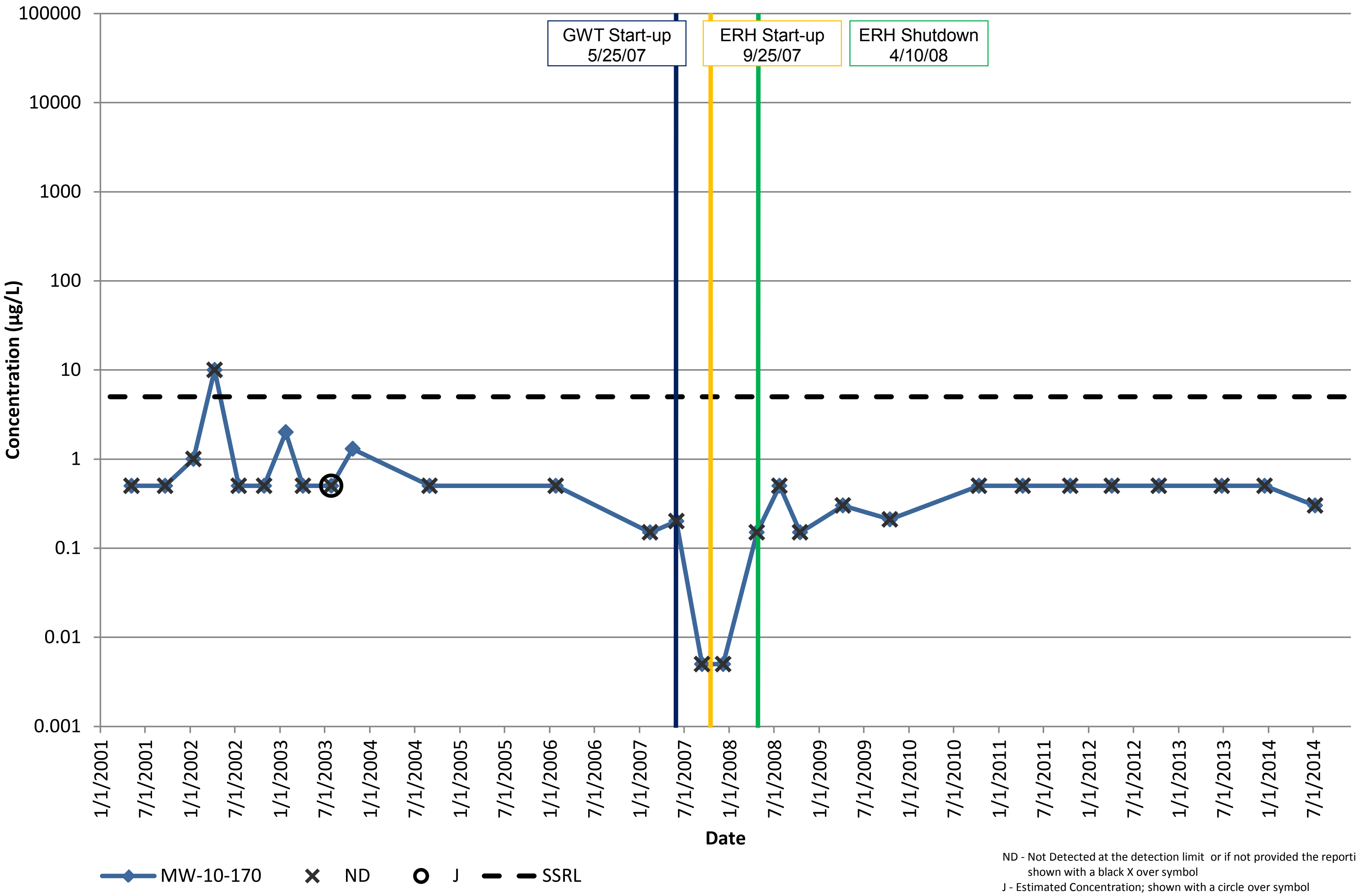
Pemaco Superfund Site, Maywood, California



Graph C-34
Concentrations of c-1,2-DCE in Groundwater, 2001 to 2014, Exposition 'D' Zone
Pemaco Superfund Site, Maywood, California



Graph C-35
Concentrations of TCE in Groundwater, 2001 to 2014, Exposition 'E' Zone
Pemaco Superfund Site, Maywood, California



ND - Not Detected at the detection limit or if not provided the reporting limit; shown with a black X over symbol
J - Estimated Concentration; shown with a circle over symbol

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Tables

List of Tables

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Appendix C
Second Five-Year Review Report
Pemaco Superfund Site, Maywood, California

Table C-1 - Well and Groundwater Analytical Results - Perched Zone

		Sample Location	B-04	B-04	B-10	B-15	B-18	B-20	B-20	B-21	B-27	B-38	B-39	PB-01	PB-02	PB-03	PB-05	PC-05	PC-06	PD-06	SV-01	SV-05
		Zone	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
		Sample ID	Y9K42	Y9K43	Y9K44	Y9KS5	Y9K45	Y9K46	Y9K47	Y9K48	Y9K49	Y9K50	Y9K51	Y9K52	Y9K53	Y9K54	Y9K55	Y9K56	Y9K57	Y9K59	Y9KS6	Y9K60
		Sample Date	7/15/2014	7/15/2014	7/10/2014	7/28/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/11/2014	7/16/2014	7/14/2014	7/14/2014	7/14/2014	7/10/2014	7/10/2014	7/14/2014	7/10/2014	7/28/2014	7/10/2014
		Sample Type	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**																				
1,1,1-Trichloroethane	200*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	1*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	1200*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	5	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	5	µg/L	**0.078 J**	**0.086 J**	0.5 U	**0.12 J**	**0.033 J**	**0.55**	**0.41 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.36 J**	5 U	**0.23 J**	0.5 U	5 U	**0.21 J**	**0.42 J**	0.5 U
1,1-Dichloroethene	6	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**1**	**0.72**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	NC	µg/L	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	0	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	600*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	0.5	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
1,4-Dioxane (P-Dioxane)	3	µg/L	--	--	--	--	--	**10**	**10**	**0.86 J**	--	--	--	**4.2 J**	--	0.35 U	--	--	--	--	--	--
2-Butanone	NC	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	10 U	5 U	5 U	5 U
2-Hexanone	NC	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	10 U	5 U	5 U	5 U
4-Methyl-2-pentanone	2,000	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	10 U	5 U	5 U	5 U
Acetone	5,500	µg/L	**2 J**	**2 J**	5 U	5 U	5 U	**4 J**	5 U	5 U	5 U	5 U	5 U	**2.7 J**	5 U	10 U	5 U	5 U	10 U	5 U	5 U	5 U
Benzene	1	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**1**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Bromochloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Bromoform	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Bromomethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	**0.19 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	**0.13 J**	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	**0.082 J**	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Chloroethane	100	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Chloroform	80	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**1**	0.5 U	0.5 U	**1.1 J**	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Chloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	**0.25 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	6	µg/L	**0.64**	**0.67**	0.5 U	**0.87**	0.5 U	**4**	**3**	**0.53**	**0.072 J**	0.5 U	0.5 U	**0.81**	**120**	**21**	**8**	**0.17 J**	5 U	**0.61**	**0.31 J**	**1**
cis-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.063 J**	**0.058 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	80	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	300	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Isopropanol	NC	µg/L	**16 J**	25 U	25 U	25 U	25 U	**17 J**	25 U	25 U	25 U	25 U	25 U	25 U	25 U	250 U	25 U	25 U	250 U	25 U	25 U	25 U
Isopropylbenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	**0.091 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Methyl Acetate	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	**1**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U

Table C-1 - Well and Groundwater Analytical Results - Perched Zone

		Sample Location	B-04	B-04	B-10	B-15	B-18	B-20	B-20	B-21	B-27	B-38	B-39	PB-01	PB-02	PB-03	PB-05	PC-05	PC-06	PD-06	SV-01	SV-05
		Zone	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
		Sample ID	Y9K42	Y9K43	Y9K44	Y9KS5	Y9K45	Y9K46	Y9K47	Y9K48	Y9K49	Y9K50	Y9K51	Y9K52	Y9K53	Y9K54	Y9K55	Y9K56	Y9K57	Y9K59	Y9KS6	Y9K60
		Sample Date	7/15/2014	7/15/2014	7/10/2014	7/28/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/11/2014	7/16/2014	7/14/2014	7/14/2014	7/14/2014	7/10/2014	7/10/2014	7/14/2014	7/10/2014	7/28/2014	7/10/2014
		Sample Type	N	FD	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N
Analyte Name	SSRL/MCL	Units																				
(Analytes Continued)																						
Methyl tert-Butyl Ether	13	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.23 J**	**0.085 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	5	µg/L	0.5 U	0.035 U	0.033 U	**0.032 J**	0.078 U	0.5 U	0.13 U	0.08 U	0.11 U	0.16 U	0.5 U	0.5 U	0.5 U	5 U	0.12 U	0.14 U	5 U	0.095 U	0.5 U	0.041 U
n-Hexane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Styrene	100*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	5	µg/L	0.5 U	0.5 U	0.5 U	**0.065 J**	**0.26 J**	0.5 U	0.5 U	**0.084 J**	0.5 U	**0.063 J**	0.5 U	0.5 U	0.5 U	**3.4 J**	**0.051 J**	**0.57**	**44**	**4**	**0.037 J**	**0.099 J**
Toluene	150	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.053 J**	**0.052 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.13 J**	5 U	0.087 U	0.5 U	5 U	0.5 U	0.5 U	0.057 U
trans-1,2-Dichloroethene	10	µg/L	0.5 U	0.5 U	0.5 U	**0.05 J**	0.5 U	**0.18 J**	**0.1 J**	**0.073 J**	0.5 U	0.5 U	0.5 U	0.5 U	**0.23 J**	5 U	**0.25 J**	0.5 U	5 U	0.5 U	0.5 U	**0.13 J**
trans-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	5	µg/L	**0.3 J**	**0.2 J**	**0.22 J**	**0.17 J**	**0.37 J**	**0.43 J**	0.22 U	**3**	0.14 U	**0.14 J**	0.5 U	0.5 U	**0.27 J**	**6.7 J**	**0.69**	**0.73**	**4.9 J**	**0.57**	**0.051 J**	**0.055 J**
Trichlorofluoromethane	150*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.5	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**18**	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Xylene, o	1750*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U
Xylenes, m & p	1750*	µg/L	**0.031 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.043 J**	5 U	**0.038 J**	0.5 U	5 U	0.5 U	0.5 U	**0.035 J**

Notes:

1. "*" indicates the MCL was used in the absence of a SSRL.
2. Bold indicates a sample detection.
3. Yellow shading indicates a concentration in excess of SSRL.
4. µg/L = micrograms per liter; ID = identification; J = estimated value; NA = not available; NC = no criteria; SSRL = Site-Specific Remediation Level; SIM = Single Ion Method; Semi-Volatile Organics Analysis = SVOA; U = not detected above reporting limit; UJ = not detected above estimated reporting limit, "--" = not applicable; N = normal sample; FD = field duplicate.
5. Analytical Methods: Samples were analyzed for VOC by the Contract Labotatory Program by method SOM01.2; Samples were analyzed for 1,4-dioxane by the Contract Labotatory Program by method SVOA-SIM and by Calscience Laboratory, Inc. by U.S. EPA method SW8260B-SIM.
6. The SSRL for xylenes is sum of o, m & p isomers
7. The SSRL for 1,4-Dioxane is 3 µg/L; however, the California Department of Public Helath revised its notification level to 1 µg/L in November 2010.

Table C-2 - Groundwater Analytical Results - Exposition 'A' Zone

		Sample Location	**DA-01**	**DA-02**	**DA-03**	**DA-03**	**DA-05**	**DA-08**	**MW-07-75**	**MW-09-70**	**MW-14-80**	**MW-14-80**	**MW-19-70**	**MW-21-80**	**MW-22-75**	**MW-33A**
		Zone	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**
		Sample ID	**Y9KQ7**	**Y9KQ8**	**Y9KQ9**	**Y9KR1**	**Y9KR2**	**Y9JY4**	**Y9JY6**	**Y9JY7**	**Y9JY8**	**Y9JY9**	**Y9KR3**	**Y9JZ1**	**Y9KR4**	**Y9JZ3**
		Sample Date	**7/28/2014**	**7/29/2014**	**7/29/2014**	**7/29/2014**	**7/28/2014**	**7/10/2014**	**7/9/2014**	**7/14/2014**	**7/15/2014**	**7/15/2014**	**7/28/2014**	**7/15/2014**	**7/29/2014**	**7/9/2014**
		Sample Type	**N**	**N**	**N**	**FD**	**N**	**N**	**N**	**N**	**N**	**FD**	**N**	**N**	**N**	**N**
Analyte Name	**SSRL/MCL**	**Units**														
1,1,1-Trichloroethane	200*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	1*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	1,200*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,1,2-Trichloroethane	5*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,1-Dichloroethane	5*	µg/L	**0.28 J**	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	**0.041 J**	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,1-Dichloroethene	6	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	5*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	0.2	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,2-Dibromoethane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,2-Dichlorobenzene	600*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,2-Dichloroethane	0.5	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,2-Dichloropropane	5*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,3-Dichlorobenzene	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,4-Dichlorobenzene	5*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
1,4-Dioxane (P-Dioxane)	3	µg/L	**21**	**1.0**	--	--	--	--	--	--	0.35 U	0.35 U	--	**11**	**1.2**	--
2-Butanone	NC	µg/L	**3.7 J**	5 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U
2-Hexanone	NC	µg/L	5 U	5 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U
4-Methyl-2-pentanone	2,000	µg/L	5 U	5 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U
Acetone	5,500	µg/L	5 U	5 U	10 U	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U
Benzene	1	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Bromochloromethane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Bromodichloromethane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Bromoform	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Bromomethane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Carbon disulfide	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Carbon tetrachloride	0.5*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Chlorobenzene	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Chloroethane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Chloroform	80	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Chloromethane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	6	µg/L	**1.9**	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.052 J**	**0.087 J**	0.5 U	**100**	**0.53**	0.5 U
cis-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	**0.3 J**	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Cyclohexane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	**2**

Table C-2 - Groundwater Analytical Results - Exposition 'A' Zone

		Sample Location	DA-01	DA-02	DA-03	DA-03	DA-05	DA-08	MW-07-75	MW-09-70	MW-14-80	MW-14-80	MW-19-70	MW-21-80	MW-22-75	MW-33A
		Zone	A	A	A	A	A	A	A	A	A	A	A	A	A	A
		Sample ID	Y9KQ7	Y9KQ8	Y9KQ9	Y9KR1	Y9KR2	Y9JY4	Y9JY6	Y9JY7	Y9JY8	Y9JY9	Y9KR3	Y9JZ1	Y9KR4	Y9JZ3
		Sample Date	7/28/2014	7/29/2014	7/29/2014	7/29/2014	7/28/2014	7/10/2014	7/9/2014	7/14/2014	7/15/2014	7/15/2014	7/28/2014	7/15/2014	7/29/2014	7/9/2014
		Sample Type	N	N	N	FD	N	N	N	N	N	FD	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**														
(Analytes Continued)																
Dibromochloromethane	80	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Dichlorodifluoromethane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Ethylbenzene	300*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	**0.032 J**
Isopropanol	NC	µg/L	25 U	25 U	250 U	250 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	500 U	25 U	25 U
Isopropylbenzene	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Methyl Acetate	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Methyl tert-Butyl Ether	13	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Methylcyclohexane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Methylene chloride	5	µg/L	0.5 U	0.5 U	5 U	5 U	**0.037 J**	0.086 U	0.031 U	0.042 U	0.075 U	0.05 U	0.5 U	**6 J**	**0.032 J**	0.5 U
n-Hexane	NC	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Styrene	100*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Tetrachloroethene	5	µg/L	0.5 U	0.5 U	5 U	5 U	**0.059 J**	0.5 U	0.5 U	**0.31 J**	0.5 U	0.5 U	0.5 U	10 U	**0.25 J**	0.5 U
Toluene	150*	µg/L	0.5 U	0.5 U	**0.8 J**	**0.84 J**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	**0.07 J**
trans-1,2-Dichloroethene	10	µg/L	**0.097 J**	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Trichloroethene	5	µg/L	**16**	**0.15 J**	**0.73 J**	**1 J**	**1.8**	0.5 U	0.5 U	0.23 U	**0.63**	**1**	**0.1 J**	**470**	**0.33 J**	0.5 U
Trichlorofluoromethane	150*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Vinyl chloride	0.5	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Xylene, o	1,750*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	0.5 U
Xylenes, m & p	1,750*	µg/L	0.5 U	0.5 U	5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	**0.042 J**

Notes:
1. "*" indicates the MCL was used in the absence of a SSRL.
2. Bold indicates a sample detection.
3. Yellow shading indicates a concentration in excess of SSRL.
4. µg/L = micrograms per liter; FD = field duplicate; ID = identification; J = estimated value; NC = no criteria; N = normal sample; SIM = Single Ion Method; SSRL = Site-Specific Remediation Level; SVOA = Semi-Volatile Organics Analysis; U = not detected above reporting limit; UJ = not detected above estimated reporting limit; VOC = volatile organic compound; "--" = not applicable.
5. Analytical Methods: Samples were analyzed for VOC by the Contract Labotatory Program by method SOM01.2; Samples were analyzed for 1,4-dioxane by the Contract Labotatory Program by method SVOA-SIM and by Calscience Laboratory, Inc. by U.S. EPA method SW8260B-SIM.
6. The SSRL for xylenes is sum of o, m, and p isomers.
7. The SSRL for 1,4-Dioxane is 3µg/LL; however, the California Department of Public Helath revised its notification level to 1 µg/L in November 2010.

Table C-3 - Groundwater Analytical Results - Exposition 'B' Zone

	Sample Location		DB-01	DB-02	DB-03	DB-04	DB-05	DB-06	DB-06	DB-07	DB-09	MW-02-95	MW-04-90	MW-04-90	MW-06-85
	Zone		B	B	B	B	B	B	B	B	B	B	B	B	B
	Sample ID		Y9KR6	Y9K00	Y9KR8	Y9KR7	Y9KR9	Y9K04	Y9K05	Y9KS1	Y9KS2	Y9K09	Y9K12	Y9K13	Y9K14
	Sample Date		7/28/2014	7/15/2014	7/28/2014	7/28/2014	7/28/2014	7/16/2014	7/16/2014	7/28/2014	7/28/2014	7/9/2014	7/10/2014	7/10/2014	7/16/2014
	Sample Type		N	N	N	N	N	N	FD	N	N	N	N	FD	N
Analyte Name	**SSRL/MCL**	**Units**													
1,1,1-Trichloroethane	200*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,1,2,2-Tetrachloroethane	1*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	1,200*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,1,2-Trichloroethane	5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,1-Dichloroethane	5*	µg/L	**1.3 J**	0.5 U	**0.071 J**	5 U	0.5 U	0.5 U	0.5 U	5 U	**0.033 J**	10 U	0.5 U	0.5 U	**0.91 J**
1,1-Dichloroethene	6	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,2,3-Trichlorobenzene	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UJ	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,2,4-Trichlorobenzene	5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,2-Dibromo-3-Chloropropane	0	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,2-Dibromoethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,2-Dichlorobenzene	600*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,2-Dichloroethane	0.5	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	**0.3 J**
1,2-Dichloropropane	5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,3-Dichlorobenzene	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,4-Dichlorobenzene	5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
1,4-Dioxane (P-Dioxane)	3	µg/L	**7.3**	--	**1.2**	**4.0**	**0.72 J**	0.5 U	0.5 U	--	--	--	--	--	**27**
2-Butanone	NC	µg/L	10 U	5 U	5 U	10 U	5 U	5 U	5 U	10 U	5 U	20 U	5 U	5 U	20 U
2-Hexanone	NC	µg/L	10 U	5 U	5 U	10 U	5 U	5 U	5 U	10 U	5 U	20 U	5 U	5 U	20 U
4-Methyl-2-pentanone	2,000	µg/L	10 U	5 U	5 U	10 U	5 U	5 U	5 U	10 U	5 U	20 U	5 U	5 U	20 U
Acetone	5,500	µg/L	10 U	5 U	5 U	10 U	5 U	5 U	5 U	10 U	5 U	20 U	5 U	5 U	20 U
Benzene	1	µg/L	5 U	0.5 U	0.5 U	**0.82 J**	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Bromochloromethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Bromodichloromethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Bromoform	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Bromomethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 UJ	0.5 U	10 UJ	0.5 U	0.5 U	2 U
Carbon disulfide	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Carbon tetrachloride	0.5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Chlorobenzene	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Chloroethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Chloroform	80	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Chloromethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	**1.5 J**	0.5 U	0.5 U	2 U
cis-1,2-Dichloroethene	6	µg/L	**5.4**	0.5 U	**2.3**	**4.3 J**	**0.083 J**	**0.091 J**	**0.098 J**	**21**	**5.8**	**3.2 J**	**0.032 J**	0.5 U	**36**
cis-1,3-Dichloropropene	0.5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Cyclohexane	NC	µg/L	5 U	0.5 U	**0.038 J**	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U

Table C-3 - Groundwater Analytical Results - Exposition 'B' Zone

	Sample Location		DB-01	DB-02	DB-03	DB-04	DB-05	DB-06	DB-06	DB-07	DB-09	MW-02-95	MW-04-90	MW-04-90	MW-06-85
	Zone		B	B	B	B	B	B	B	B	B	B	B	B	B
	Sample ID		Y9KR6	Y9K00	Y9KR8	Y9KR7	Y9KR9	Y9K04	Y9K05	Y9KS1	Y9KS2	Y9K09	Y9K12	Y9K13	Y9K14
	Sample Date		7/28/2014	7/15/2014	7/28/2014	7/28/2014	7/28/2014	7/16/2014	7/16/2014	7/28/2014	7/28/2014	7/9/2014	7/10/2014	7/10/2014	7/16/2014
	Sample Type		N	N	N	N	N	N	FD	N	N	N	N	FD	N
Analyte Name	**SSRL/MCL**	**Units**													
							(Analytes Continued)								
Dibromochloromethane	80	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Dichlorodifluoromethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Ethylbenzene	300*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Isopropanol	NC	µg/L	250 U	25 U	25 U	250 U	25 U	25 U	25 U	250 U	25 U	500 U	25 U	25 U	100 U
Isopropylbenzene	NC	µg/L	5 U	0.5 U	0.5 U	5 U	**0.064 J**	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Methyl Acetate	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Methyl tert-Butyl Ether	13	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Methylcyclohexane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Methylene chloride	5	µg/L	5 U	0.098 U	**0.049 J**	5 U	**0.042 J**	0.18 U	0.12 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
n-Hexane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Styrene	100*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Tetrachloroethene	5	µg/L	5 U	0.5 U	**0.2 J**	5 U	**0.043 J**	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	**0.26 J**
Toluene	150*	µg/L	**0.77 J**	0.5 U	**0.21 J**	**0.81 J**	0.5 U	0.5 U	0.5 U	**0.73 J**	0.5 U	10 U	0.5 U	0.5 U	2 U
trans-1,2-Dichloroethene	10	µg/L	5 U	0.5 U	**0.16 J**	5 U	0.5 U	0.5 U	0.5 U	5 U	**0.036 J**	10 U	0.5 U	0.5 U	**0.69 J**
trans-1,3-Dichloropropene	0.5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Trichloroethene	5	µg/L	**36**	**0.28 J**	**39**	**160**	**1.3**	**0.1 J**	**0.12 J**	**110**	**4.7**	**850**	**0.56**	**0.62**	**280**
Trichlorofluoromethane	150*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Vinyl chloride	0.5	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Xylene, o	1,750*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U
Xylenes, m & p	1,750*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U	10 U	0.5 U	0.5 U	2 U

Table C-3 - Groundwater Analytical Results - Exposition 'B' Zone

	Sample Location		MW-08-85	MW-09-85	MW-10-90	MW-12-90	MW-13-85	MW-14-90	MW-20-85	MW-21-90	MW-22-90	MW-29-85	MW-29-85	RW-01-95	MW-28B
	Zone		B	B	B	B	B	B	B	B	B	B	B	B	B
	Sample ID		Y9K15	Y9K16	Y9K17	Y9K18	Y9K19	Y9K11	Y9K20	Y9K21	Y9K22	Y9K24	Y9K25	Y9K26	Y9K23
	Sample Date		7/11/2014	7/14/2014	7/9/2014	7/11/2014	7/9/2014	7/15/2014	7/15/2014	7/15/2014	7/9/2014	7/10/2014	7/10/2014	7/15/2014	7/16/2014
	Sample Type		N	N	N	N	N	N	N	N	N	N	FD	N	N
Analyte Name	**SSRL/MCL**	**Units**													
1,1,1-Trichloroethane	200*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	1*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	1200*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,1-Dichloroethane	5*	µg/L	**0.15 J**	0.5 U	0.5 U	**0.32 J**	**0.17 J**	0.5 U	**3**	**0.4 J**	**0.35 J**	5 U	5 U	0.5 U	**0.33 J**
1,1-Dichloroethene	6	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**2**	**0.76 J**	**1.1**	5 U	5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 UJ	0.5 U
1,2,4-Trichlorobenzene	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	0	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,2-Dibromoethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	600*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,2-Dichloroethane	1	µg/L	0.5 U	0.5 U	**0.19 J**	**0.073 J**	0.5 U	0.5 U	2 U	**0.19 J**	**0.12 J**	5 U	5 U	0.5 U	**2**
1,2-Dichloropropane	5*	µg/L	**0.18 J**	0.5 U	0.5 U	0.5 U	**0.058 J**	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	**0.16 J**
1,3-Dichlorobenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
1,4-Dioxane (P-Dioxane)	3	µg/L	--	--	--	--	--	**0.76 J**	**20**	**16 J**	**3.3**	--	--	**0.76 J**	**47**
2-Butanone	NC	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	25 U	10 U	5 U	10 U	10 U	5 U	5 U
2-Hexanone	NC	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	25 U	10 U	5 U	10 U	10 U	5 U	5 U
4-Methyl-2-pentanone	NC	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	25 U	10 U	5 U	10 U	10 U	5 U	5 U
Acetone	5,500	µg/L	5 U	5 U	5 U	5 U	5 U	5 U	25 U	10 U	5 U	10 U	10 U	5 U	5 U
Benzene	1	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Bromochloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Bromodichloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Bromoform	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Bromomethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Carbon disulfide	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Chlorobenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Chloroethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Chloroform	80	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Chloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	6	µg/L	**0.34 J**	**0.035 J**	**0.15 J**	**2.8**	**1.7**	**0.51**	**480**	**25**	**11**	**4.2 J**	**3.2 J**	**0.26 J**	**17**
cis-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Cyclohexane	NC	µg/L	0.5 U	0.5 U	0.5 U	**0.12 J**	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	**0.081 J**

Table C-3 - Groundwater Analytical Results - Exposition 'B' Zone

	Sample Location		MW-08-85	MW-09-85	MW-10-90	MW-12-90	MW-13-85	MW-14-90	MW-20-85	MW-21-90	MW-22-90	MW-29-85	MW-29-85	RW-01-95	MW-28B
	Zone		B	B	B	B	B	B	B	B	B	B	B	B	B
	Sample ID		Y9K15	Y9K16	Y9K17	Y9K18	Y9K19	Y9K11	Y9K20	Y9K21	Y9K22	Y9K24	Y9K25	Y9K26	Y9K23
	Sample Date		7/11/2014	7/14/2014	7/9/2014	7/11/2014	7/9/2014	7/15/2014	7/15/2014	7/15/2014	7/9/2014	7/10/2014	7/10/2014	7/15/2014	7/16/2014
	Sample Type		N	N	N	N	N	N	N	N	N	N	FD	N	N
Analyte Name	**SSRL/MCL**	**Units**													
(Analytes Continued)															
Dibromochloromethane	80	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Dichlorodifluoromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Ethylbenzene	300*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Isopropanol	NC	µg/L	25 U	25 U	25 U	25 U	25 U	25 U	130 U	50 U	25 U	250 U	250 U	25 U	25 U
Isopropylbenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Methyl Acetate	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Methyl tert-Butyl Ether	13	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	**0.043 J**	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Methylcyclohexane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Methylene chloride	5	µg/L	0.5 U	0.12 U	0.5 U	0.5 U	0.5 U	0.08 U	2 U	1 U	0.5 U	5 U	5 U	0.09 U	0.5 U
n-Hexane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Styrene	100*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Tetrachloroethene	5	µg/L	**0.22 J**	0.5 U	0.5 U	0.5 U	**0.09 J**	0.5 U	2 U	**0.18 J**	**0.078 J**	5 U	5 U	0.5 U	0.5 U
Toluene	150*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	10	µg/L	0.5 U	0.5 U	0.5 U	**0.27 J**	0.5 U	**0.15 J**	**1 J**	**0.2 J**	**0.18 J**	5 U	5 U	0.5 U	**0.23 J**
trans-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Trichloroethene	5	µg/L	**1.5**	0.15 U	**1.1**	**29**	**7.1**	**4**	**8**	**150**	**13**	**21**	**19**	**1**	**15**
Trichlorofluoromethane	150*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Vinyl chloride	1	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**21**	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Xylene, o	1750*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U
Xylenes, m & p	1750*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2 U	1 U	0.5 U	5 U	5 U	0.5 U	0.5 U

Notes:

1. "*" indicates the MCL was used in the absence of a SSRL.
2. Bold indicates a sample detection.
3. Yellow shading indicates a concentration in excess of SSRL.
4. µg/L = micrograms per liter; FD = field duplicate, December 2013; ID = identification; J = estimated value; MCL - maximum contaminant level; N = normal sample; NA = not available; NC = no criteria; SIM = Single Ion Method; SSRL = Site-Specific Remediation Level; SVOA= Semi-Volatile Organics Analysis;U = not detected above reporting limit; UJ = not detected above estimated reporting limit; VOC = volatile organic compound; "--" = not applicable.
5. Analytical Methods: Samples were analyzed for VOC by the Contract Labotatory Program by method SOM01.2; Samples were analyzed for 1,4-dioxane by the Contract Labotatory Program by method SVOA-SIM and by Calscience Laboratory, Inc. by U.S. EPA method SW8260B-SIM.
6. The SSRL for xylenes is sum of o, m & p isomers
7. The SSRL for 1,4-dioxane is 3 µg/L; however, the California Department of Public Health revised its notification level to 1 µg/L in November 2010.

Table C-4 - Groundwater Analytical Results - Exposition 'A' & 'B' Zones

		Sample Location	DAB-01	DAB-04	DAB-05	DAB-07	DAB-08	MW-01-80	MW-05-85
		Zone	AB	AB	AB	AB	AB	AB	AB
		Sample ID	Y9JZ4	Y9JZ5	Y9JZ6	Y9JZ7	Y9KR5	Y9K08	Y9K10
		Sample Date	7/14/2014	7/14/2014	7/14/2014	7/14/2014	7/28/2014	7/15/2014	7/11/2014
		Sample Type	N	N	N	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**							
1,1,1-Trichloroethane	200*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,1,2,2-Tetrachloroethane	1*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	1,200*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,1,2-Trichloroethane	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,1-Dichloroethane	5*	µg/L	0.5 U	0.5 U	**0.038 J**	0.5 U	**1.6 J**	10 U	0.5 U
1,1-Dichloroethene	6	µg/L	**3**	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,2,3-Trichlorobenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 UJ	5 U	10 U	0.5 U
1,2,4-Trichlorobenzene	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,2-Dibromo-3-Chloropropane	0.2	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,2-Dibromoethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,2-Dichlorobenzene	600*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,2-Dichloroethane	0.5	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,2-Dichloropropane	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,3-Dichlorobenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,4-Dichlorobenzene	5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
1,4-Dioxane (P-Dioxane)	3	µg/L	0.35 U	--	--	0.5 U	**4.4**	--	--
2-Butanone	NC	µg/L	5 U	5 U	5 U	5 U	10 U	20 U	5 U
2-Hexanone	NC	µg/L	5 U	5 U	5 U	5 U	10 U	20 U	5 U
4-Methyl-2-pentanone	2,000	µg/L	5 U	5 U	5 U	5 U	10 U	20 U	5 U
Acetone	5,500	µg/L	5 U	5 U	5 U	5 U	10 U	20 U	5 U
Benzene	1	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Bromochloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Bromodichloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Bromoform	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Bromomethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Carbon disulfide	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Carbon tetrachloride	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U

Table C-4 - Groundwater Analytical Results - Exposition 'A' & 'B' Zones

		Sample Location	DAB-01	DAB-04	DAB-05	DAB-07	DAB-08	MW-01-80	MW-05-85
		Zone	AB	AB	AB	AB	AB	AB	AB
		Sample ID	Y9JZ4	Y9JZ5	Y9JZ6	Y9JZ7	Y9KR5	Y9K08	Y9K10
		Sample Date	7/14/2014	7/14/2014	7/14/2014	7/14/2014	7/28/2014	7/15/2014	7/11/2014
		Sample Type	N	N	N	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**							
(Analytes Continued)									
Chlorobenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Chloroethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Chloroform	80	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	**1.6**
Chloromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
cis-1,2-Dichloroethene	6	µg/L	0.5 U	0.5 U	**0.074 J**	0.5 U	**17**	**62**	0.5 U
cis-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Cyclohexane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Dibromochloromethane	80	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Dichlorodifluoromethane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Ethylbenzene	300*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Isopropanol	NC	µg/L	25 U	25 U	25 U	25 U	250 U	500 U	25 U
Isopropylbenzene	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Methyl Acetate	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Methyl tert-Butyl Ether	13	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Methylcyclohexane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Methylene chloride	5	µg/L	0.1 U	0.1 U	0.12 U	0.11 U	5 U	10 U	0.5 U
n-Hexane	NC	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Styrene	100*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Tetrachloroethene	5	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	**0.035 J**
Toluene	150*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
trans-1,2-Dichloroethene	10	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
trans-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Trichloroethene	5	µg/L	**2**	**0.23 J**	**0.68**	**0.65**	**320**	**940**	**0.33 J**
Trichlorofluoromethane	150*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Vinyl chloride	0.5	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U
Xylene, o	1,750*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U

Table C-4 - Groundwater Analytical Results - Exposition 'A' & 'B' Zones

		Sample Location	DAB-01	DAB-04	DAB-05	DAB-07	DAB-08	MW-01-80	MW-05-85
		Zone	AB	AB	AB	AB	AB	AB	AB
		Sample ID	Y9JZ4	Y9JZ5	Y9JZ6	Y9JZ7	Y9KR5	Y9K08	Y9K10
		Sample Date	7/14/2014	7/14/2014	7/14/2014	7/14/2014	7/28/2014	7/15/2014	7/11/2014
		Sample Type	N	N	N	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**							
(Analytes Continued)									
Xylenes, m & p	1,750*	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	5 U	10 U	0.5 U

Notes:

1. "*" indicates the MCL was used in the absence of a SSRL.
2. Bold indicates a sample detection.
3. Yellow shading indicates a concentration in excess of SSRL.
4. µg/L = micrograms per liter; FD = field duplicate; ID = identification; J = estimated value; N = normal sample; NA = not available; NC = no criteria; SIM = Single Ion Method; SSRL = Site-Specific Remediation Level; SVOA = Semi-Volatile Organics Analysis; U = not detected above reporting limit; UJ = not detected above estimated reporting limit, "--" = not applicable.
5. Analytical Methods: Samples were analyzed for VOC by the Contract Labotatory Program by method SOM01.2; Samples were analyzed for 1,4-dioxane by the Contract Labotatory Program by method SVOA-SIM and by Calscience Laboratory, Inc. by U.S. EPA method SW8260B-SIM.
6. The SSRL for xylenes is sum of o, m & p isomers
7. The SSRL for 1,4-Dioxane is 3 µg/L; however, the California Department of Public Helath revised its notification level to 1 µg/L in November 2010.

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Table C-5 - Groundwater Analytical Results - Exposition 'C' Zone

		Sample Location	MW-05-105	MW-10-110	MW-11-100	MW-23-110	MW-24-110	MW-25-110
		Zone	C	C	C	C	C	C
		Sample ID	Y9K27	Y9K28	Y9K29	Y9K30	Y9K31	Y9KS3
		Sample Date	7/11/2014	7/9/2014	7/9/2014	7/14/2014	7/10/2014	7/29/2014
		Sample Type	N	N	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**						
1,1,1-Trichloroethane	200*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	1*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	1,200*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,1-Dichloroethane	5*	µg/L	5 U	**0.041 J**	0.5 U	5 U	0.5 U	0.5 U
1,1-Dichloroethene	6	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	NC	µg/L	5 U	0.5 U	0.5 U	5 UJ	0.5 U	0.5 U
1,2,4-Trichlorobenzene	5*	µg/L	5 U	0.5 U	0.5 U	5 UJ	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	0.2	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,2-Dibromoethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	600*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,2-Dichloroethane	0.5	µg/L	5 U	**0.14 J**	0.5 U	5 U	0.5 U	0.5 U
1,2-Dichloropropane	5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
1,4-Dioxane (P-Dioxane)	3	µg/L	**4.3**	--	--	**2.2**	--	**0.63 J**
2-Butanone	NC	µg/L	10 U	5 U	5 U	10 U	5 U	5 U
2-Hexanone	NC	µg/L	10 U	5 U	5 U	10 U	5 U	5 U
4-Methyl-2-pentanone	2,000	µg/L	10 U	5 U	5 U	10 U	5 U	5 U
Acetone	5,500	µg/L	10 U	5 U	5 U	10 U	5 U	5 U
Benzene	1	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Bromochloromethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Bromodichloromethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Bromoform	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Bromomethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Carbon disulfide	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Chlorobenzene	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Chloroethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Chloroform	80	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Chloromethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	6	µg/L	**88**	**1.7**	0.5 U	**23**	**12**	**0.43 J**
cis-1,3-Dichloropropene	0.5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Cyclohexane	NC	µg/L	5 U	0.5 U	0.5 U	**5**	0.5 U	0.5 U

Table C-5 - Groundwater Analytical Results - Exposition 'C' Zone

		Sample Location	MW-05-105	MW-10-110	MW-11-100	MW-23-110	MW-24-110	MW-25-110
		Zone	C	C	C	C	C	C
		Sample ID	Y9K27	Y9K28	Y9K29	Y9K30	Y9K31	Y9KS3
		Sample Date	7/11/2014	7/9/2014	7/9/2014	7/14/2014	7/10/2014	7/29/2014
		Sample Type	N	N	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**						
		(Analytes Continued)						
Dibromochloromethane	80	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Dichlorodifluoromethane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Ethylbenzene	300*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Isopropanol	NC	µg/L	250 U	25 U	25 U	250 U	25 U	25 U
Isopropylbenzene	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Methyl Acetate	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Methyl tert-Butyl Ether	13	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Methylcyclohexane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Methylene chloride	5	µg/L	**0.91 J**	0.5 U	0.5 U	5 U	0.5 U	**0.067 J**
n-Hexane	NC	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Styrene	100*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Tetrachloroethene	5	µg/L	5 U	0.5 U	**0.055 J**	5 U	0.5 U	**0.03 J**
Toluene	150*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	10	µg/L	5 U	**0.059 J**	0.5 U	**0.91 J**	**0.29 J**	0.5 U
trans-1,3-Dichloropropene	0.5*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Trichloroethene	5	µg/L	**700**	**2.5**	**0.12 J**	**540**	**1.6**	**2.4**
Trichlorofluoromethane	150*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Vinyl chloride	0.5	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Xylene, o	1,750*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U
Xylenes, m & p	1,750*	µg/L	5 U	0.5 U	0.5 U	5 U	0.5 U	0.5 U

Notes:
1. "*" indicates the MCL was used in the absence of a SSRL.
2. Bold indicates a sample detection.
3. Yellow shading indicates a concentration in excess of SSRL.
4. µg/L = micrograms per liter; FD = field duplicate; ID = identification; J = estimated value; N = normal sample; NA = not available; NC = no criteria; SIM = Single Ion Method; SSRL = Site-Specific Remediation Level; SVOA = Semi-Volatile Organics Analysis; U = not detected above reporting limit; UJ = not detected above estimated reporting limit, "--" = not applicable.
5. Analytical Methods: Samples were analyzed for VOC by the Contract Labotatory Program by method SOM01.2; Samples were analyzed for 1,4-dioxane by the Contract Labotatory Program by method SVOA-SIM and by Calscience Laboratory, Inc. by U.S. EPA method SW8260B-SIM.
6. The SSRL for xylenes is sum of o, m & p isomers
7. The SSRL for 1,4-Dioxane is 3 µg/L; however, the California Department of Public Helath revised its notification level to 1 µg/L in November 2010.

Table C-6 - Groundwater Analtytical Results - Exposition 'D' & 'E' Zone

	Sample Location		MW-05-135	MW-05-135	MW-07-130	MW-11-130	MW-12-150	MW-23-145	MW-24-140	MW-25-130	MW-10-170
	Zone		D	D	D	D	D	D	D	D	E
	Sample ID		Y9K33	Y9K34	Y9K35	Y9K40	Y9K36	Y9K37	Y9K38	Y9KS4	Y9K41
	Sample Date		7/11/2014	7/11/2014	7/11/2014	7/9/2014	7/11/2014	7/14/2014	7/10/2014	7/28/2014	7/9/2014
	Sample Type		N	FD	N	N	N	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**									
1,1,1-Trichloroethane	200*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,1,2,2-Tetrachloroethane	1*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	1,200*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,1,2-Trichloroethane	5*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,1-Dichloroethane	5*	µg/L	**0.22 J**	**0.2 J**	5 U	0.5 U	**0.031 J**	0.5 U	0.5 U	5 U	0.5 U
1,1-Dichloroethene	6	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,2,3-Trichlorobenzene	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	5 U	0.5 U
1,2,4-Trichlorobenzene	5*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,2-Dibromo-3-Chloropropane	0.2	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,2-Dibromoethane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,2-Dichlorobenzene	600*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,2-Dichloroethane	0.5	µg/L	**0.38 J**	**0.35 J**	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,2-Dichloropropane	5*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,3-Dichlorobenzene	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,4-Dichlorobenzene	5*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
1,4-Dioxane (P-Dioxane)	3	µg/L	--	--	--	--	--	--	--	**36**	--
2-Butanone	NC	µg/L	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U	5 U
2-Hexanone	NC	µg/L	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U	5 U
4-Methyl-2-pentanone	2,000	µg/L	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U	5 U
Acetone	5,500	µg/L	5 U	5 U	10 U	5 U	5 U	5 U	5 U	10 U	5 U
Benzene	1	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.95 J**	0.5 U
Bromochloromethane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Bromodichloromethane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Bromoform	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Bromomethane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Carbon disulfide	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Carbon tetrachloride	0.5*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Chlorobenzene	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Chloroethane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Chloroform	80	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Chloromethane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
cis-1,2-Dichloroethene	6	µg/L	**1.2**	**1.1**	**1.4 J**	**0.55**	**0.084 J**	**0.11 J**	**1.7**	**10**	0.5 U
cis-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Cyclohexane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Dibromochloromethane	80	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U

Table C-6 - Groundwater Analtytical Results - Exposition 'D' & 'E' Zone

		Sample Location	MW-05-135	MW-05-135	MW-07-130	MW-11-130	MW-12-150	MW-23-145	MW-24-140	MW-25-130	MW-10-170
		Zone	D	D	D	D	D	D	D	D	E
		Sample ID	Y9K33	Y9K34	Y9K35	Y9K40	Y9K36	Y9K37	Y9K38	Y9KS4	Y9K41
		Sample Date	7/11/2014	7/11/2014	7/11/2014	7/9/2014	7/11/2014	7/14/2014	7/10/2014	7/28/2014	7/9/2014
		Sample Type	N	FD	N	N	N	N	N	N	N
Analyte Name	**SSRL/MCL**	**Units**									
(Analytes Continued)											
Dichlorodifluoromethane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Ethylbenzene	300*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Isopropanol	NC	µg/L	25 U	25 U	250 U	25 U	25 U	25 U	25 U	250 U	25 U
Isopropylbenzene	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Methyl Acetate	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Methyl tert-Butyl Ether	13	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Methylcyclohexane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Methylene chloride	5	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.095 U	0.5 U	5 U	0.5 U
n-Hexane	NC	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Styrene	100*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Tetrachloroethene	5	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Toluene	150*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.73 J**	0.5 U
trans-1,2-Dichloroethene	10	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
trans-1,3-Dichloropropene	0.5*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Trichloroethene	5	µg/L	**2.7**	**2.6**	**130**	**11**	**0.13 J**	**3**	**2.4**	**230**	**0.1 J**
Trichlorofluoromethane	150*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Vinyl chloride	0.5	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Xylene, o	1,750*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U
Xylenes, m & p	1,750*	µg/L	0.5 U	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	5 U	0.5 U

Notes:
1. "*" indicates the MCL was used in the absence of a SSRL.
2. Bold indicates a sample detection.
3. Yellow shading indicates a concentration in excess of SSRL.
4. µg/L = micrograms per liter; FD = field duplicate; ID = identification; J = estimated value; N = normal sample; NA = not available; NC = no criteria; SIM = Single Ion Method; SSRL = Site-Specific Remediation Level; SVOA = Semi-Volatile Organics Analysis; U = not detected above reporting limit; UJ = not detected above estimated reporting limit, "--" = not applicable.
5. Analytical Methods: Samples were analyzed for VOC by the Contract Labotatory Program by method SOM01.2; Samples were analyzed for 1,4-dioxane by the Contract Labotatory Program by method SVOA-SIM and by Calscience Laboratory, Inc. by U.S. EPA method SW8260B-SIM.
6. The SSRL for xylenes is sum of o, m & p isomers
7. The SSRL for 1,4-Dioxane is 3 µg/L; however, the California Department of Public Helath revised its notification level to 1 µg/L in November 2010.

APPENDIX D

Site Inspection Checklist

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Five-Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: Pemaco Superfund Site	**Date of inspection:** December 2, 2014
Location: 5973 South District Blvd, Maywood, CA 90270	**EPA ID:** CAD980737092
Agency, office, or company leading the five-year review:	**Weather/temperature** Rainy 65 degrees

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other:
- ☒ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☐ RCRA-Equivalent Cell

Electrical Resistive Heating and bioremediation. High Vacuum Dual Phase Extraction (HVDPE)

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M Site Manager** Brian Hendron (Name) Environmental Scientist (Title) 12-2-2014 (Date)
   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. 818-717-6597
   Problems, suggestions; ☐ Report attached
   .

2. **O&M staff** ____________ (Name) Civil Engineering Tech (Title) 12-2-2014 (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. 626-401-4094
   Problems, suggestions; ☐ Report attached
   .

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency - CAL-EPA/DTSC

Contact - Lori Parnass	Environmental Scientist	12-2-2014	818-717-6597
Name	Title	Date	Phone No.

Problems/suggestions : Report Attached ☐

Agency - Army Corps of Engineers

Contact – Rick Lainhart	Civil Engineering Tech	12-2-2014	626-401-4094
Name	Title	Date	Phone No.

Problems/Suggestions: Report Attached ☐

Agency - US EPA

Contact – Rose Marie Caraway	Environmental Scientist	12-2-2014	415-972-3158
Name	Title	Date	Phone No.

Problems/Suggestions: Report Attached ☐

4. **Other interviews** (optional) ☐ Report attached.

O&M Manual and as-built drawings are in the plant. Maintenance logs are summarized in the quarterly reports which are located on the SharePoint site. Inspectors verified by checking the SharePoint site during the inspection.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**

☒ O&M manual ☒ Readily available ☒ Up to date ☐ N/A
☒ As-built drawings ☒ Readily available ☒ Up to date ☐ N/A
☒ Maintenance logs ☒ Readily available ☒ Up to date ☐ N/A

Remarks

O&M Manual and as-built drawings are in the plant. Maintenance logs are summarized in the quarterly reports which are located on the SharePoint site. Inspectors verified by checking the SharePoint site during the inspection.

2. **Site-Specific Health and Safety Plan** ☒ Readily available ☒ Up to date ☐ N/A

☒ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A

Remarks

Found in treatment plant and date of plan is August 22, 2014. Contractor will send final to treatment plant. Plans also uploaded on SharePoint site; checked during inspection.

3. **O&M and OSHA Training Records** ☒ Readily available ☐ Up to date ☐ N/A

Remarks

The Pemaco Treatment Plant air effluent complies with the SCAQMD permit guidance for health risk. The only permit currently required for the site is the wastewater discharge permit for the Los Angeles County Sanitation District. Discharge permit number 2099500.

4. **Permits and Service Agreements**

☐ Air discharge permit ☐ Readily available ☐ Up to date ☒ N/A
☒ Effluent discharge permit ☒ Readily available ☒ Up to date ☒ N/A
☒ Waste disposal permit, POTW ☒ Readily available ☒ Up to date ☒ N/A
☐ Other permits______________________ ☐ Readily available ☐ Up to date ☐ N/A

Remarks

The Pemaco Treatment Plant air effluent complies with the SCAQMD permit guidance for health risk. The only permit currently required for the site is the wastewater discharge permit for the Los Angeles County Sanitation District. Discharge permit number 2099500.

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks:

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks:

7.	**Groundwater Monitoring Records** Remarks:	☒ Readily available	☒ Up to date	☐ N/A
8.	**Leachate Extraction Records** Remarks:	☒ Readily available	☒ Up to date	☐ N/A
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☒ Readily available	☐ Up to date	☐ N/A
	Remarks Samples are collected monthly. Information readily available also on the SharePoint web site.			
10.	**Daily Access/Security Logs** Remarks	☒ Readily available	☒ Up to date	☐ N/A

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☒ Other

2. **O&M Cost Records**

☒ Readily available ☒ Up to date ☐ Funding mechanism/agreement in place
Original O&M cost estimate____________________ ☐ Breakdown attached

Total annual cost by year for review period if available

From: January – December, 2010 $1,845,771 Total cost ☐ Breakdown attached
From: January – December, 2011 $1,840,247 Total cost ☐ Breakdown attached
From: January – December, 2012 $2,437,768 Total cost ☐ Breakdown attached
From: January – December, 2013 $1,203,820 Total cost ☐ Breakdown attached
From: January – December, 2014 $991.200 ☐ Breakdown attached
Total Cost $8,318,806

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons:
Not included in costs above are cost for electrode decommissioning which was $723, 801.
Additional work performed during this time includes the investigation of the MW-180 area. Cost estimate for this area is currently $480,808.

V. ACCESS AND INSTITUTIONAL CONTROLS ☐ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☒ N/A

Remarks
Fencing surrounding the site is properly secured.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A

Remarks
New signs posted in 2013 after subcontractor transition. Other security measures are in place.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) -.
Frequency -.
Responsible party/agency -
Contact –

Reporting is up-to-date	☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency	☒ Yes ☐ No ☐ N/A
Specific requirements in deed or decision documents have been met	☐ Yes ☐ No ☒ N/A
Violations have been reported	☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☒ Location shown on site map ☐ No vandalism evident
Remarks
2013 vandals cut the fence in the former ERH area to steal the electrical wires placed in the area by the City of Maywood. In addition, vagrants have left a cat and dog onsite. Most recent dog was adopted by the field Supervisor.

2. **Land use changes on site** ☐ N/A
Remarks
City of Maywood removed the Soil pile during February 5, 2014.

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks
Additional rock base added to the site access road near the treatment plant and inside the gates of the former Electrode area for dust control purposes.

B. Other Site Conditions

Remarks

During 2014 removed all aboveground piping that used to serve the ERH area, removed 58 electrodes, 30 temperature monitoring point wells, 19 vapor recovery wells and electrical conduit along the bike path wall.

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent______________ Depth____________
   Remarks

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths____________ Widths___________ Depths__________
   Remarks

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent______________ Depth____________
   Remarks

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent______________ Depth____________
   Remarks

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established
   ☐ No signs of stress ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent______________ Height____________
   Remarks

8.	**Wet Areas/Water Damage** ☐ Wet areas ☐ Ponding ☐ Seeps ☐ Soft subgrade Remarks	☐ Wet areas/water damage not evident ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map ☐Location shown on site map	 Areal extent_______________ Areal extent_______________ Areal extent_______________ Areal extent_______________
9.	**Slope Instability** ☐ Slides Areal extent_______________ Remarks	☐ Location shown on site map	☐ No evidence of slope instability
B. Benches	☒ N/A	☐ Applicable	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench** Remarks	☐ Location shown on site map	☐ N/A or okay
2.	**Bench Breached** Remarks	☐ Location shown on site map	☐ N/A or okay
3.	**Bench Overtopped** Remarks	☐ Location shown on site map	☐ N/A or okay
C. Letdown Channels	☐ Applicable	☒ N/A	
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** Areal extent_______________ Remarks	☐ Location shown on site map Depth____________	☐ No evidence of settlement
2.	**Material Degradation** Material type________________ Remarks	☐ Location shown on site map Areal extent______________	☐No evidence of degradation
3.	**Erosion** Areal extent_______________ Remarks	☐ Location shown on site map Depth____________	☐ No evidence of erosion

4.	**Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting Areal extent______________ Depth____________ Remarks	
5.	**Obstructions** Type_____________________ ☐ No obstructions ☐ Location shown on site map Areal extent______________ Size____________ Remarks	
6.	**Excessive Vegetative Growth** Type____________________ ☐ No evidence of excessive growth ☐ Vegetation in channels does not obstruct flow ☐ Location shown on site map Areal extent______________ Remarks	
D. Cover Penetrations	☐ Applicable ☒ N/A	
1.	**Gas Vents** ☐ N/A ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration Remarks	
2.	**Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks	
3.	**Monitoring Wells** (within surface area of landfill) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks	
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks	
5.	**Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐N/A Remarks	

E. Gas Collection and Treatment ☐ Applicable ☒ N/A	
1.	**Gas Treatment Facilities** ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance ☐ N/A Remarks
F. Cover Drainage Layer ☐ Applicable ☒ N/A	
1.	**Outlet Pipes Inspected** ☐ Functioning ☐ N/A Remarks
2.	**Outlet Rock Inspected** ☐ Functioning ☐ N/A Remarks
G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A	
1.	**Siltation** ☐ N/A ☐ Siltation not evident Areal extent______________ Depth____________ Remarks
2.	**Erosion** Areal extent______________ Depth____________ ☒ Erosion not evident Remarks
3.	**Outlet Works** ☐ Functioning ☐ N/A Remarks
4.	**Dam** ☐ Functioning ☐ N/A Remarks

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____________ Vertical displacement________________
Rotational displacement_____________
Remarks

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent_______________ Depth_____________
Remarks

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_______________ Type_____________
Remarks

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_______________ Depth_____________
Remarks

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_______________ Depth_____________
Remarks

2. **Performance Monitoring** Type of monitoring -____________________________
☐ Performance not monitored ☐ Evidence of breaching
Frequency_________________________________ Head differential____________________________
Remarks

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines ☒ Applicable ☐ N/A
1. **Pumps, Wellhead Plumbing, and Electrical** ☒ Good condition ☒ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks Information summarized in the Survey Data report for 2013 which is located on the SharePoint site in the Submittals folder.
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☒ Good condition ☐ Needs Maintenance Remarks
3. **Spare Parts and Equipment** ☒ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A
1. **Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)

☐ Metals removal ☐ Oil/water separation ☒ Bioremediation
☐ Air stripping ☒ Carbon adsorbers
☒ Filters____
☒ Additive (*e.g.*, chelation agent, flocculent) ______________________________
☒ Others Sodium Hypochloride____
☒ Good condition ☐ Needs Maintenance
☒ Sampling ports properly marked and functional
☒ Sampling/maintenance log displayed and up to date
☒ Equipment properly identified
☒ Quantity of groundwater treated annually 5.2 million gallons________
☐ Quantity of surface water treated annually_______________________

Remarks

Good Condition

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐N/A ☒ Good condition ☐ Needs Maintenance

Remarks

Good Condition

3. **Tanks, Vaults, Storage Vessels**

☐N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs Maintenance

Remarks

4. **Discharge Structure and Appurtenances**

☐ N/A ☒ Good condition ☐ Needs Maintenance

Remarks

The LACSD sample box in good condition. Recently installed chart recorder in 2013 which was required by LACSD.

5. **Treatment Building(s)**

☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair
☒ Chemicals and equipment properly stored

Remarks

Recently installed fall protection in building.

6. **Monitoring Wells** (pump and treatment remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A

Remarks

A few wells are on list for abandonment. We recently repaired new well boxes and covers. Summarized in Well Inspection and Maintenance Table, dated December 6, 2013. Table can be found at O&M Tracking folder on the SharePoint site. Filed named Well Maintenance List.

D. Monitoring Data

1. Monitoring Data
☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐All required wells located ☐Needs Maintenance ☐N/A
Remarks

X. OTHER REMEDIES

HVDPE has been implemented in tandem with groundwater pump and treat. The HVDPE system is maintained, monitored, and reported-on under the same O&M Work Plan as the groundwater pump and treat and therfore the responses are the same as above for "Groundwater"; that is, the HVDPE system is in good condition, monitored and reported on a monthly basis and is in regulatory conpliance.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

The remedy at the Pemaco site currently protects human health because exposure pathways to contaminated soil and groundwater are being controlled. However, in order for the remedy to be protective in the long-term the following should occur; 1) an investigation of the increasing trends of COCs in some of the groundwater wells; 2)evaluation of whether continued operation of the present treatment system is effective, or if other courses of treatment are necessary; 3) ID the full extent of contamination in each zone; 4) cap and revegetate the ERH area; 5) and finalize Land Use Covenant by DTSC, U.S. EPA and City of Maywood.

B. Adequacy of O&M

The O&M effort is adequate to keep the remedy functioning as intended.

C. Early Indicators of Potential Remedy Problems

D. Opportunities for Optimization

Considering insitu bioremediation (EISB) for improving contaminant mass reduction. Refitting groundwater pumps to improve pumping rates. If EISB is successful in the Perched Zone, then significant energy savings could be realized by turning off the HVDPE.

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APPENDIX E

Interview Forms

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Five-Year Review Interview Record

Site: Pemaco			**EPA ID No:** CAD980737092
Interview Type:	Telephone Call		
Location of Visit:			
Date:	09 December 2014		
Time:	1:00 PM		

Interviewer		
Name: Janice Opperman	**Title:** Project Engineer	**Organization:** USACE
Interviewee		
Name: Lori Parnass	**Title:** Project Manager	**Organization:** DTSC
Telephone: (818) 717-6597	**Email:** Lori.Parnass@dtsc.ca.gov	

Summary of Conversation

1) *What is your current role as it relates to the site? What is your overall impression of the project?*
My role is to represent the State in dealing with the Site. (Local agency representative)
It [The Site] is moving along.

2) *Is the remedy functioning as expected? How well is the remedy performing?*
Remedy is performing within expectation.

3) *What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?*
Yes.

4) *Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence,*
Describe staff and frequency of site inspections and activities.
Yes. Dual phase pump and treat soil vapor extraction and groundwater extraction.

5) *Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? If so, do they affect protectiveness of the remedy? Please describe changes and impacts.*
They took offline the ERH [Electrical Resistive Heating]. We might have to look at something else like bio-augmentation and look to new technologies to supplement.

6) *What are the annual operating costs for your organization's involvement with the site?*
I think $350,000.

7) *Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.*
Yes, ERH. It underperformed.

8) *Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.*
Yes, they took down ERH. We are considering bio-augmentation for improvement.

9) *Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the protectiveness of the remedy?*
No.

10) *Do you have any comments, suggestions, or recommendations regarding the project?*
No.

Additional Site-Specific Questions

11) *Do you have more information on the status of the land use covenant and what we may expect of it?*
Within 2 years, once we figure out if we need bio-augmentation.

Five-Year Review Interview Record

Site: Pemaco		**EPA ID No:** CAD980737092	
Interview Type: **Location of Visit:** **Date:** **Time:**	Telephone Call 08 December 2014 10:15 AM – 10:50 AM		
Interviewer			
Name: Janice Opperman	**Title:** Project Engineer	**Organization:** USACE	
Interviewee			
Name: Brian Hendron	**Title:** Project Superintendent	**Organization:** OTIE	
Telephone: (805) 585-2110	**Email:** BHendron@otie.com		
Summary of Conversation			

1) *What is your current role as it relates to the site? What is your overall impression of the project?*
My current role is Project Superintendent. My overall impression is that I feel very positively about it. I believe based on the remedy for the site that it is going well.

2) *Is the remedy functioning as expected? How well is the remedy performing?*
Yes. Part of the remedy was completed before I came to the site. That was pretty effective. I think the remedy is performing as well as anticipated per the original writing.

3) *What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?*
Monitoring data does show the contaminate levels within the original plume are decreasing.

4) *Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.*
There is a continuous O&M presence. Dedicated staff is now 1 person. Monitoring of remediation equipment, maintenance, and operation of remediation, wells, and equipment.

5) *Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? If so, do they affect protectiveness of the remedy? Please describe changes and impacts.*
Yes, there have been significant changes in the last 5 years.
    - On-site staff reduced from full time staff of 3 to 1
    - The number of remediation wells currently active reduced by 50%.
    - Sampling routine has also been reduced by 50%.
    - Changes to O&M requirements applied over last few years have reduced the effort required for O&M by approximately 50%. The current footprint of active remediation plan allows for less monitoring effort than previous plan with no reduction in the effectiveness of the remedy.

6) *What are the annual operating costs for your organization's involvement with the site?*
I'm not privy to those numbers.

7) *Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.*
We've really have not had anything of major significance. Some issues which have caused

additional manpower effort include high sediment content in groundwater systems causing excessive filter replacement. I can't think of anything else.

8) *What causes the high sediment content?*
When the groundwater wells were put in, the screen size and filter pack were a general size. They should have put a finer screen and by doing that we could have other problems like clogging. That's something we dealt with since Day 1. We have had 1 filter vessel, and we doubled that to 2, which allows us to run longer between filter change outs.

9) *Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.*
Yes, significant effort has been applied to those efforts include:
- Adding additional filter vessels to capture sediment coming into groundwater system. This allows for system to more efficiently capture sediment coming in and run longer between shutdowns or filter change outs.
- Installed variable frequency drive (VFD) on groundwater treatment system booster tank pump to reduce flowrate through groundwater treatment system filter vessel, which allows longer contact time or removable sediment and higher efficiency of filter themselves.
- Installed VFD on vapor extraction system blower to reduce energy consumption and excess vacuum applied to treatment area.
- Continuously review sample data to apply effort to areas of concern.

10) *Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the protectiveness of the remedy?*
No, I'm not.

11) *Do you have any comments, suggestions, or recommendations regarding the project?*
No.

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