



Linda S. Adams
Secretary for
Environmental Protection

State Water Resources Control Board

Division of Financial Assistance

1001 I Street • Sacramento, California 95814
P.O. Box 944212 • Sacramento, California • 94244-2120
(916) 341-5660 FAX (916) 341-5806 • www.waterboards.ca.gov/cwphome/ustcf



Arnold Schwarzenegger
Governor

EXHIBIT 2 UST Case Closure Summary

This Underground Storage Tank (UST) Case Closure Summary has been prepared in support of a recommendation by the Petroleum Underground Storage Tank Cleanup Fund (Fund) to the State Water Resources Control Board (State Water Board) for closure of the UST case at 908 29th Street, Sacramento, California (Site).

Agency Information

Agency Name: Sacramento County Environmental Management Department (SCEMD)	Address: 10590 Armstrong Avenue, Suite A Mather, CA 95655
--	---

Case Information

SCEMD Case No: 0592	Global ID: T0606700037
Site Name: Lawrence Mayflower Moving and Storage	Site Address: 908 20 th Street, Sacramento, CA 95814
Responsible Party: Barbara Macaulay	Number of Years Case Open: 24
USTCF Claim No.: 3594	USTCF Expenditures to Date: \$679,558

Tank Information

Tank No.	Size in Gallons	Contents	Closed in Place/ Removed/Active ?	Date
T-1	550	Gasoline	Removed	Jul 86
T-2	2,000	Gasoline	Removed	Jul 90

Release Information

- Source of Release: UST System
- Date of Release: 1 August 1986
- Affected Media: Soil and Groundwater

Site Information

- GW Basin: Sacramento Valley
- Beneficial Uses: Municipal and Domestic Supply
- Land Use Designation: Commercial
- Distance to Nearest Supply Well: According to data available in GeoTracker, there are no water Department of Public Health (DPH) supply wells within ½ mile of the Site.
- Minimum Groundwater Depth: 8.89 feet below ground surface (bgs) at monitoring well MW-6.
- Maximum Groundwater Depth: 19.76 feet bgs at monitoring well MW-9.
- Groundwater Flow Direction: Predominately to the south with an average gradient of 0.002 feet/foot (ft/ft).



- Soil Types: The Site is underlain by interbedded and intermixed sand, silt and clay.
- Maximum Depth Sampled: 21 feet bgs

Monitoring Well Information

Well Designation	Date Installed	Screen Interval (feet bgs)	Most Recent Depth To Groundwater (feet bgs) (9/14/10)
MW-1	June 1994	?-29	15.90
MW-2	June 1994	?-29	17.62
MW-3	June 1994	?-28	16.69
MW-4	June 1994	?	NA
MW-5	June 1994	?-26	16.73
MW-6	June 1994	?-27	16.52
MW-9	June 1994	?-26	16.47
MW-10	June 1994	?-21	17.50
MW-11	June 1994	?	16.43
MW-12	June 1994	?-24	16.68
RW-1	June 1994	?-22	17.08
RW-2	June 1994	?-32	16.56

NA: Not Available

Contaminant Concentration

Contaminant	Soil (mg/kg)		Water (µg/L)		WQOs (µg/L)
	Maximum	Latest (October 2002)	Maximum	Latest (9/14/10)	
TPHg	10,000	970	29,000	1,000	5
Benzene	47	0.97	7,800	36	0.15
Toluene	260	4.1	20,000	0.53	42
Ethylbenzene	190	16	2,000	6.5	29
Xylenes	670	81	13,000	7.5	17
MTBE	<0.050	<0.050	1.1	<1.0	5
TBA	<4.0	<4.0	<50	<50	12
1,2-DCA	NA	NA	2.5	1.1	0.4
Naphthalene	NA	NA	230*	32	--

NA: Not Analyzed, Not Applicable or Data Not Available

mg/kg: milligrams per kilogram, parts per million

µg/L: micrograms per liter, parts per billion

WQOs: Water Quality Objectives

*: Hydropunch Sample

Site Description

The Site is located at 908 20th Street in Sacramento, California. The property is bounded on the north by I Street, on the east by 20th Street, on the south by an alley and on the west by a single set of Union Pacific Railroad tracks; a high pressure multi-product fuel pipeline parallels these tracks. Properties surrounding the Site are in commercial use with the exception of the property to the northeast of the Site which is in residential use.

Site History/Assessments

Hydrocarbon impacted soil was discovered in 1986 during a UST removal and assessment activities began. During excavation of petroleum hydrocarbon impacted soil removal activities in 1990 a second UST was discovered and removed. Soil vapor extraction was implemented in March 1989 and was upgraded to include air sparging in March 2000. The remediation system was shut down in September 2000 after removing approximately 1,600 pounds of petroleum hydrocarbons, and the Site has been developed as a paved parking lot.

A single direct-push groundwater sample collected in 2009 from a deeper water bearing zone at a depth of approximately 67 feet, identified petroleum hydrocarbons. The contamination identified in this deeper water bearing zone appears to not be related the shallow groundwater contamination at this site. This conclusion is based on review of the soil boring log from the hydropunch boring that indicates a 14 foot clay layer separates the shallow groundwater from the lower water bearing zone. There is no apparent explanation of how the petroleum hydrocarbons could have been drawn down from the upper to the lower zone through this clay layer. Groundwater has never been deeper than 20 feet bgs during the investigations at this site. The site and adjacent public areas (sidewalks and streets) are paved so there is little surface water infiltration that could drive petroleum hydrocarbon compounds deeper and there is no documentation of pumping wells in the vicinity of the site that could draw the petroleum hydrocarbon compounds down.

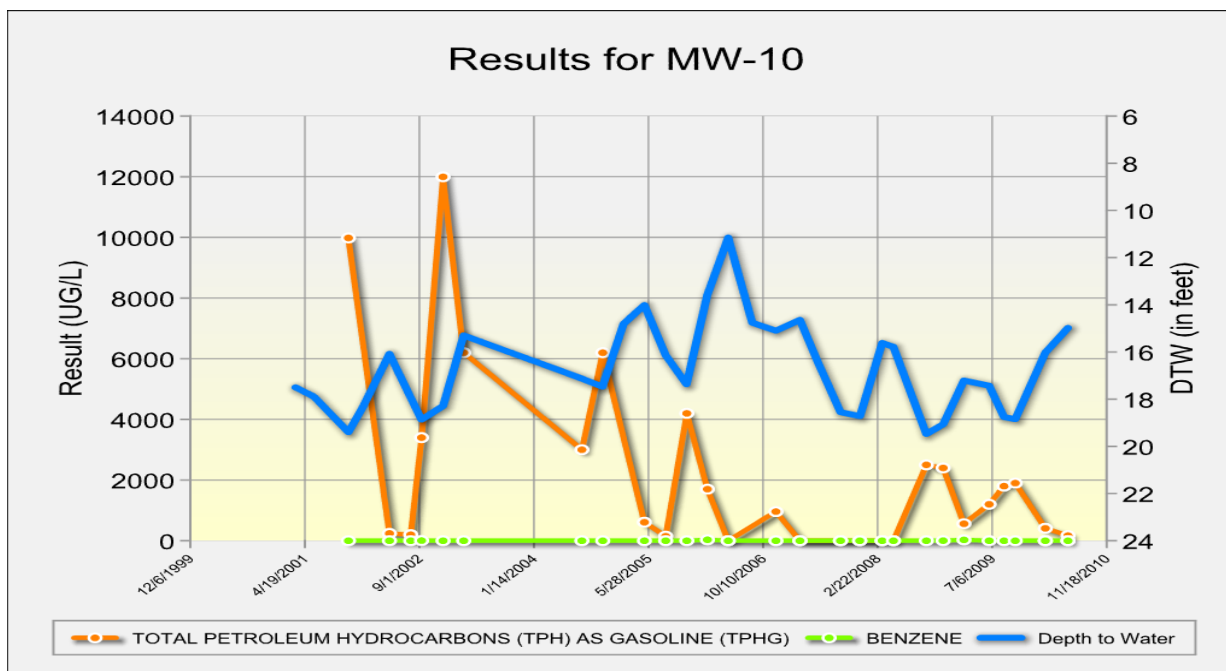
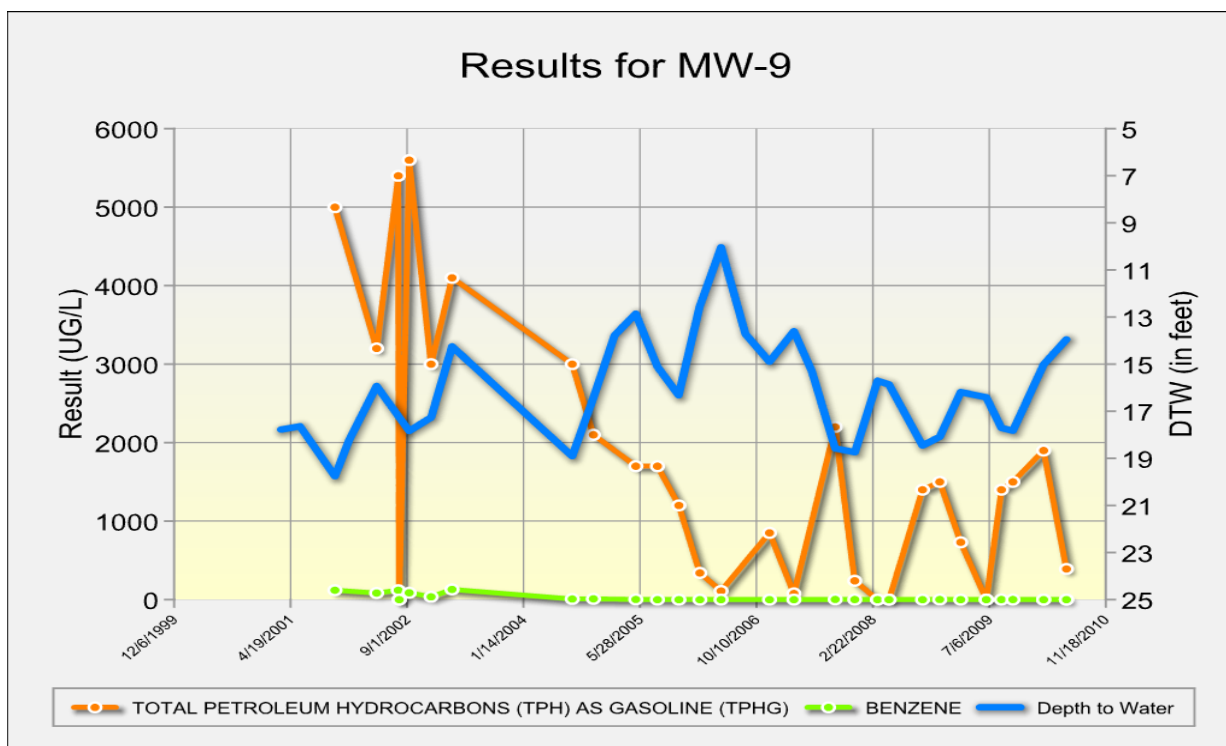
A Site maps showing the location of the former USTs, monitoring wells and groundwater level contours is provided at the end of this case closure summary.

Remediation Summary

- Free Product: No free product was documented throughout the life of this case.
- Soil Excavation: An estimated 2,500 cubic yards of impacted soil were removed and disposed offsite in 1990.
- In-Situ Soil Remediation: Soil vapor extraction, was started March 1998 removing approximately 1,600 pounds of TPHg.
- Groundwater Remediation: Air sparging was added to the soil vapor extraction system in March 2000 and operated through September 2000.

General Site Conditions

- Geology and Hydrogeology: The Site is underlain by interbedded and intermixed silty sand overlying gravely sand and clay. The depth to groundwater varies seasonally between nine to twenty feet bgs and the groundwater gradient is southerly at approximately 0.002 ft/ft.
- Estimate of Hydrocarbon Mass in Soil: Prior to remediation, approximately 5,515 pounds of petroleum hydrocarbons was calculated to be entrained at the Site. After remediation, it is calculated that 488 pounds of petroleum hydrocarbons remain in the soil and groundwater.
- Groundwater Trends: There are more than 21 years of groundwater monitoring data for this Site. The following graphs show analytical data for two of the originally most impacted groundwater monitoring wells (MW-9 and MW-10).



- Water Quality Objectives (WQOs): The WQOs for all constituents remaining in the shallow groundwater will be met within 30 years. The petroleum hydrocarbons identified in the hydropunch sample collected from the deeper water bearing zone in 2009 are believed to be from an off-Site source.

Sensitive Receptor Survey

A records search did not identify DPH listed supply wells in the area or surface water receptors within a 2,000 foot radius of the Site. Drinking water at and near the Site is currently supplied by the City of Sacramento Public Works Department.

Risk Evaluation

As a result of removal of approximately 2,500 cubic yards of impacted soil and 1,600 pounds of soil vapor there is little residual petroleum hydrocarbon in soil at the Site that would pose a threat to groundwater resources, human health, or the environment. The Human Health Risk Assessment conducted by BSK in 2008 indicates that the Hazard Index does not exceed 1.0 for commercial receptors. It is unlikely that residual petroleum hydrocarbon constituents remaining in soil would pose a hazard to on-Site receptors. There are no DPH listed water supply wells or surface water receptors present within 2,000 feet of the Site.

Closure

Does corrective action performed ensure the protection of human health, safety and the environment? Yes.

Is corrective action and UST case closure consistent with State Water Board Resolution 92-49? Yes.

Is achieving background water quality feasible? No.

To remove all traces of residual petroleum constituents at the Site would require significant effort and cost. Removal of all traces of residual petroleum hydrocarbon constituents that contribute to detectable concentrations in shallow groundwater can be accomplished, but would require excavation of additional soil as well as additional remediation of shallow groundwater. The soil excavation could also entail shoring of the excavation due to railroad tracks, high pressure petroleum pipeline and City of Sacramento infrastructure adjacent to the Site. If complete removal of detectable traces of petroleum constituents becomes the standard for UST corrective actions, the statewide technical and economic implications will be enormous. Because of the high costs involved and minimal benefit of attaining further reductions in concentrations of TPHg and benzene at this Site, and the fact that beneficial uses are not threatened, attaining background water quality at this Site is not feasible.

If achieving background water quality is not feasible:

Is the alternative cleanup level consistent with the maximum benefit to the people of the State? Yes.

It is impossible to determine the precise level of water quality that will be attained given the limited residual petroleum hydrocarbons that remain at the Site. In light of all the factors discussed above, and the fact that the residual petroleum constituents will not unreasonably affect present and anticipated beneficial uses of groundwater, a level of water quality will be attained that is consistent with the maximum benefit to the people of the state.

Will the alternative cleanup level unreasonably affect present and anticipated beneficial uses of water? No.

Impacted groundwater is not used as a source of drinking water or any other beneficial use currently. It is highly unlikely that the impacted groundwater will be used as a source of drinking water or any other beneficial use in the foreseeable future.

Will the alternative level of water quality exceed water quality prescribed in applicable Basin Plan? No.

The final step in determining whether cleanup to a level of water quality less stringent than background is appropriate for this Site requires a determination that the alternative level of water quality will not result in water quality less than that prescribed in the relevant basin plan. Pursuant to State Water Board Resolution 92-49, a Site may be closed if the basin plan requirements will be met within a reasonable time frame.

Have factors contained in Title 23 of the California Code of Regulations, Section 2550.4 been considered? Yes.

In approving an alternative level of water quality less stringent than background, the State Water Board considers the factors contained in California Code of Regulations, Title 23, section 2550.4, subdivision (d). As discussed earlier, the adverse effect on shallow groundwater are minimal and localized, given the physical and chemical characteristics of petroleum constituents, the hydrogeological characteristics of the Site and surrounding land, and the quantity of the groundwater and direction of the groundwater flow. In addition, the potential for adverse effects on beneficial uses of groundwater is low the current and potential future uses of groundwater in the area, the existing quality of groundwater, the potential for health risks caused by human exposure, the potential damage to wildlife, crops, vegetation, and physical structures, and the persistence and permanence of potential effects.

Finally, a level of water quality less stringent than background is unlikely to have any impact on surface water quality, in light of the volume and physical and chemical characteristics of petroleum constituents; the hydrogeological characteristics of the Site and surrounding land; the quantity and quality of groundwater and direction of groundwater flow, the patterns of precipitation in the region, and the proximity of residual petroleum to surface waters.

Has the requisite level of water quality been met? No.

WQOs should be attained within 30 years. This is a reasonable period in which to meet the requisite level of water quality because the impacted groundwater is not currently being used as a source of drinking water and it is highly unlikely that impacted groundwater will be used as a source of drinking water in the future. Residential and commercial water users are currently connected to the municipal drinking water supply. Other designated beneficial uses of the impacted groundwater are not threatened and it is highly unlikely that they will be considering these factors in the context of the Site setting, Site conditions do not represent a substantial threat to human health and safety and the environment and case closure is appropriate.

Objections to Closure and Response

The SCEMD objects to UST case closure for this case because petroleum hydrocarbons were detected in a deeper water bearing zone in a borehole advanced with a push point technology.

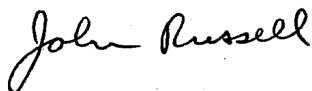
The Fund Manager does not believe that the residual petroleum hydrocarbons at this Site represent a significant risk to human health and safety, and the environment. The discovery of petroleum hydrocarbons in a deeper water bearing zone appears to be from a different source. The log of the hydropunch boring indicates a 14 foot thick clay zone just above the lower water bearing zone. Petroleum hydrocarbons that are light non-aqueous phase liquids need a mechanism to be drawn downward in the water column especially with the clay lens present. No such mechanism exists at or near the Site.

Any residual dissolved petroleum hydrocarbons, in the groundwater at the Site, will be at very low concentrations and will continue to attenuate. In addition, there are no domestic or DPH listed public water supply wells within 2,000 feet of the Site. Water in the vicinity of the Site is provided to water users by City of Sacramento Public Works Department.

The Fund has conducted public notification and the SCEMD has the regulatory responsibility to supervise the abandonment of monitoring wells.

Summary and Conclusion

A leak was identified in August 1986 during a UST removal. Since 1994, 12 monitoring wells have been installed, 2,500 cubic yards of contaminated soil were excavated, soil vapor extraction was conducted for approximately 30 months and air sparging was added for the last six months of operation and a human health risk assessment was conducted. WQOs should be attained within 30 years. To date, \$679,558 in corrective action costs have been reimbursed by the Fund. The nearest DPH listed water supply wells are more than 2,000 feet from the Site. Any impacted groundwater is not currently being used as a source of drinking water or other beneficial uses and water is provided to water users near the Site by the City of Sacramento Public Works. It is unlikely that any impacted groundwater will be used as a source of drinking water or other beneficial use in the foreseeable future. In addition, in the unlikely event that a water supply well is drilled in the future, standard construction practices and requirements would prevent impacts from the contaminated area. Based on available information, the residual petroleum hydrocarbons at the Site do not pose significant risks to human health, safety, and the environment, and the Fund Manager recommends that the case be closed.



John Russell PG No. 8396

December 15, 2010

Date

