

**STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD
ORDER: WQ 2008-0003-UST**

In The Matter Of the Petition Of

SHELL OIL PRODUCTS US

For Review of Denial of Petroleum Underground Storage Tank Site Closure

2405 North Sycamore Drive, Simi Valley, California

BY THE BOARD:

Shell Oil Products US. (petitioner) seeks review of the decision that rejects closure of petitioner's case involving an unauthorized release of petroleum from an underground storage tank (UST) at its site located at 2405 North Sycamore Drive, Simi Valley, California. Even though the Ventura County Local Oversight Program (County) agrees that the UST case should be closed, it did not grant closure because the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) objected to UST case closure. For the reasons set forth below, this Order determines that petitioner's case should be closed and no further action related to the release should be required.

I. STATUTORY AND REGULATORY BACKGROUND

Owners and operators of underground storage tanks (USTs) and other responsible parties may petition the State Water Resources Control Board (State Water Board) for a review of their case if they feel the corrective action plan for their site has been satisfactorily implemented, but closure has not been granted. (Health and Saf. Code, § 25296.40, subd. (a)(1).).

Several statutory and regulatory provisions provide the State Water Board, Regional Water Boards, and local agencies with broad authority to require responsible parties to clean up a release from a petroleum UST (e.g., Health & Saf. Code, § 25296.10; Wat. Code, § 13304, subd. (a).) The State Water Board has promulgated regulations specifying corrective action requirements for petroleum UST cases (Cal. Code Regs., tit. 23, §§ 2720-2728). The regulations define corrective action as "any activity necessary to investigate and analyze the effects of an unauthorized release, propose a cost-effective plan to adequately protect human health, safety and the environment and to

restore or protect current and potential beneficial uses of water, and implement and evaluate the effectiveness of the activity (ies)." (Cal. Code Regs., tit. 23, § 2720.) Corrective action consists of one or more of the following phases: (1) preliminary site investigation, (2) soil and water investigation, (3) corrective action plan implementation, and (4) verification monitoring. (Cal. Code Regs., tit. 23, § 2722, subd. (a).)

The preliminary site assessment phase includes initial site investigation, initial abatement actions, initial site characterization and any interim remedial action. (Cal. Code Regs., tit. 23, § 2723, subd. (a).) Corrective action is complete at the conclusion of the preliminary site assessment phase, unless conditions warrant a soil and water investigation. A soil and water investigation is required if any of the following conditions exists: (1) There is evidence that surface water or groundwater has been or may be affected by the unauthorized release; (2) Free product is found at the site where the unauthorized release occurred or in the surrounding area; (3) There is evidence that contaminated soils are, or may be in contact with surface water or groundwater; or (4) The regulatory agency requests an investigation based on the actual or potential effects of contaminated soil or groundwater on nearby surface water or groundwater resources, or based on the increased risk of fire or explosion. (Cal. Code Regs., tit. 23, § 2724).

The purpose of a soil and water investigation is "to assess the nature and vertical and lateral extent of the unauthorized release and to determine a cost-effective method of cleanup." (Cal. Code Regs., tit. 23, § 2725, subd. (a).) Section 13267, subdivision (b) of the Water Code provides that "...the regional board may require that any person discharging or proposing to discharge waste ...that could affect the quality of waters within its region shall furnish ... those technical and monitoring program reports as the Board may specify. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports."

[State Water Board Resolution No. 92-49](#), *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code §13304* also applies to petroleum UST cases. State Water Board Resolution No. 92-49 directs that water affected by an unauthorized release attain either background water quality or the best water quality that is reasonable if background water quality cannot be restored. (State Water Board Resolution No. 92-49, Section III.G.) Any alternative level of water quality less stringent than background must be consistent with the maximum benefit to the people of the state, not unreasonably affect current and anticipated beneficial use of affected water, and not result in water quality less than that prescribed

in the water quality control plan for the basin within which the site is located. (*Ibid.*) Resolution No. 92-49 does not require, however, that the requisite level of water quality be met at the time of site closure. Resolution No. 92-49 specifies compliance with cleanup goals and objectives within a reasonable time frame (*Id.* at section III.A.). Therefore, even if the requisite level of water quality has not yet been attained, a site may be closed if the level will be attained within a reasonable period.

The Los Angeles Water Board's Water Quality Control Plan (Basin Plan) designates existing and potential beneficial uses of unconfined and confined groundwater aquifers of the SimiValley groundwater basin as municipal and domestic supply (MUN), agricultural supply (AGR), industrial process supply (PROC), and industrial service supply (IND) (LARWQCB & SWRCB, Water Quality Control Plan for the Los Angeles Region (1994), pp. 2-16). The Basin Plan specifies a narrative taste and odor water quality objective (WQO) for groundwater with a MUN beneficial use designation as follows: "Waters shall not contain taste or odor-producing substances in concentrations that ... cause nuisance or adversely affect beneficial uses" (*Id.* at p. 3-16.). The Basin Plan also contains the following narrative WQO for "Chemical Constituents": "Water designated for use as Domestic or Municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: ...Table 64444-A of Section 64444 (Organic Chemicals)." (*Id.* at p. 3-8.)

With regard to the WQOs for "Chemical Constituents", the Basin Plan has set Maximum Contaminant Levels for MUN beneficial use waters for benzene, toluene, ethyl benzene, and xylene (BTEX) at 1 ppb, 150 ppb, 700 ppb, and 1,750 ppb, respectively (*Id.* at p. 3-10). The threshold odor concentration of three common petroleum constituents, ethyl benzene, toluene, and xylene are 29 ppb, 42 ppb, and 17 ppb respectively (USEPA, Federal Register, Volume 54, No.97, May 1989). Department of Health Services has set primary and secondary MCLs for methyl-tertiary-butyl-ether (MTBE) at 13 ppb and 5 ppb, respectively.

FACTUAL BACKGROUND

A. Site Setting

Petitioner's site is an active gasoline service station located at 2405 North Sycamore Drive in the city of Simi Valley. Land use in the immediate vicinity of the site is commercial with parking lots, streets, and buildings covering greater than 95 percent of the area on a topographic surface that

slopes to the south with a 2.5% grade. Water table conditions occur at about 85 feet below ground surface (bgs) in coarse grain alluvial sediments. The groundwater flow direction beneath the site is westerly. Groundwater recharge at and in the vicinity of the site is via subsurface inflow and discharge is via subsurface out-flow and evapotranspiration. A drinking water well is located about 850 feet south (cross-gradient) of the site.¹ On a regional scale, groundwater recharge occurs around the basin's periphery where multiple watersheds concentrate rainfall runoff into ephemeral streams that flow across the aquifer's forebay areas; groundwater discharge is to Arroyo Simi, a gaining stream in the western half of the valley, via de-watering wells located in the westernmost portion of the basin, and limited pumping of stand-by wells.²

B. UST Case History

The case was opened under County Local Oversight Program in October 1998 when low concentrations of gasoline constituents were reported for soil samples collected from depths of four to six feet beneath the product dispenser islands and associated piping during UST system upgrades. Between October 1999 and February 2006, corrective actions undertaken by petitioner include advancing 21 borings to depths up to 102 feet and collecting and analyzing 262 soil samples, installing four groundwater monitor wells and collecting and analyzing over 70 groundwater samples, and installing and testing three shallow zone and three deep zone vapor extraction wells.

The initial groundwater samples from site monitor wells MW 1, MW 2, and MW 3, constructed and sampled in December 2001, had concentrations of benzene ranging from 1.5 ppb to 8.5 ppb, toluene from 8 ppb to 34 ppb, ethylbenzene from 4 ppb to 13 ppb, xylenes from 21 ppb to 74 ppb and MTBE from less than 1 ppb to 40 ppb. Groundwater from these wells, when re-sampled in February 2002, had reported nondetectable concentrations of BTEX and MTBE concentrations ranging from non-detect to 29 ppb. In April of 2002, 90 ppb of MTBE was detected in the groundwater sample from MW 3. Continued quarterly groundwater sampling of these wells showed that concentrations of MTBE declined to less than the secondary MCL (5 ppb) by October 2002 and further declined to less than the laboratory detection limit (1.0 ppb) by January 2005. Detectable concentrations of gasoline constituents in initial groundwater samples followed by

¹ Simi Valley relies on imported water for municipal use. This well, as well as others throughout the basin, are kept in service to meet seasonal demands in excess of the imported water supply. When used, the two waters are blended at a ratio of three to four parts imported water to one part basin groundwater.

² Because of the poor quality of the groundwater (TDS \approx 1200 to 2000 ppm) and the consequent limited consumptive use, groundwater discharges to Arroyo Simi and surfaces near the basin's outfall at the western end of the valley. This later discharge creates nuisance conditions for the residents in the area, hence the use of de-watering wells. The pumped groundwater is discharged to Arroyo Simi.

subsequent sampling where reported concentrations are non-detect or demonstrate a rapid decline to non-detect is a consequence of contaminants introduced to the aquifer during the drilling and well installation process, i.e., cross contamination.

In January 2004, petitioner, as directed by the Los Angeles Water Board, began analyzing groundwater samples for perchlorate, a regional groundwater contaminant of undetermined origin. Detectable concentrations, ranging from about 2 ppb to 20 ppb, have been reported for all site monitor wells.³

In January 2004, March 2004, and March 2005, the County referred the case to the Los Angeles Water Board for concurrence with its recommendation for case closure. The Los Angeles Water Board did not concur with these recommendations because of a concern that concentrations of MTBE reported for shallow soil samples represent a potential threat to groundwater.

In October 2004, the dispensers were again upgraded. Of six compliance soil samples obtained from beneath the dispensers, one had elevated concentrations of gasoline constituents. The area of the sample was over excavated to a depth of six feet generating about four cubic yards of soil. The confirmation sample from the bottom of the excavation had reported concentrations of ethylbenzene (0.003 ppm), xylenes (0.002 ppm), and MTBE (0.002 ppm).

In November 2005, petitioner installed six vapor extraction wells (three shallow and three deep zone) to evaluate the feasibility of mitigating the Los Angeles Water Board's concern that site conditions represented a potential threat to groundwater. In December 2005, a vapor extraction pilot test demonstrated that a limited mass of gasoline constituents, including MTBE, were present in shallow soil in a limited area of the site and that based on the very low vapor recovery rate, further corrective actions were not warranted.

In August 2006, the County again referred the case to the Los Angeles Water Board for concurrence with its recommendation for case closure. The Los Angeles Water Board did not concur with this recommendation because of a concern that concentrations of MTBE reported for shallow soil samples represent a potential threat to groundwater.

In December 2006, Petitioner petitioned the State Water Board for case closure.

³ The final primary MCL for perchlorate is 6 ppb.

III. CONTENTIONS AND RESPONSE

A. CONTENTIONS

Petitioner contends that the case does not present a threat to public health and safety, and current or anticipated beneficial uses of groundwater. The County concurs with the Petitioner and concludes that the case should be closed. The Los Angeles Water Board contends that concentrations of MTBE in vadose zone soil in the vicinity of the USTs are a potential threat to the underlying groundwater quality.

B. RESPONSE

Petitioner's contention has merit. Concentrations of MTBE in the vadose zone are limited to the immediate area of the USTs and range from 14 ppm in the finer grained alluvial strata at 10 to 25 feet bgs to less than 0.01 ppm in the more permeable, coarse grained strata at 35 to 45 feet and 55 feet bgs to the water table at about 85 feet bgs. Movement of MTBE in the subsurface is primarily through vapor phase advection and diffusion. The absence of any detectable concentrations of gasoline constituents, including MTBE, in site groundwater and the distribution and concentrations reported in vadose zone soil samples demonstrates that 1) the release is limited in both area and mass, and 2) MTBE present as vapor or dissolved in soil pore water within the vadose zone is effectively isolated from the water table given the current climatic conditions and land use. Given the facts of this case, current and anticipated uses of groundwater are not at risk.

The Los Angeles Water Board contends that the concentrations and distribution of the MTBE reported for soil beneath the site are a potential threat to the underlying groundwater quality. The basis for this concern is the presumption that the infiltration of water from the ground surface, as it flows through soil containing concentrations of MTBE greater than the Los Angeles Water Board's criteria for closing a case, will transport dissolved-phase constituents to the water table. This assumption is not valid in this particular case.⁴

Only precipitation falling on, or irrigation applied to, the ground surface is available to flow vertically to the water table. However, this gravity flow only occurs when the field capacity of a soil profile is exceeded.⁵ A conservative estimate of the field capacity of the 80 to 85 feet of fine- and

⁴ LOS ANGELES REGIONAL BOARD UST CLOSURE CRITERIA (DRAFT) (APRIL 2004, REV SEPT 2006). Table 4-1 Maximum Soil Screening Levels (mg/kg) for TPH, BTEX, and MTBE above Drinking Water Aquifers

⁵ a) Soil water-holding capacity of a soil profile. b) A measure of the change in the soil moisture content after wetting a soil profile. Fine-grained soils retain more water than coarse-grained soils because of their smaller pore spaces and greater capillarity.

coarse-grained alluvial strata above the water table beneath the site is about 15 feet of water; 40 feet of fine-grained soil \approx 12 feet (140 inches) of water, 40 feet of coarse-grained soil \approx 3.5 feet (40 inches of water). Assuming an antecedent soil water content of 50 percent of the field capacity, for gravity flow of water to reach the water table leaching MTBE as it flows, about 90 inches of water would have to be applied to the ground surface over a relatively short period of time. The annual precipitation in Simi Valley infrequently exceeds 25 inches per year.⁶ The excess water that does not flow in engineered or natural drainage courses tributary to Arroyo Simi (run off) or is not evaporated and transpired to the atmosphere (discharge) represents a small percentage of the total capacity of the soil profile to store water (recharge). Because recharge and discharge are dynamic processes and in constant flux, given the local topography, current and future anticipated land use, the field capacity of the soil profile, and the current and future anticipated seasonal precipitation patterns, transport of MTBE to the water table at about 85 feet bgs via gravity flow is not probable.

Even if the site were redeveloped, the limited mass of MTBE in the vadose zone would remain isolated from the water table. Only an unlikely wetland land use or conversion of the site to a storm water retention basin would result in a short lived leaching of the limited mass of MTBE in the vadose zone to the water table at the site. These scenarios would rapidly flush the remaining limited mass of MTBE to the water table and create a groundwater mound. The large influx of percolating surface water and the subsequent radial flow at the water table would dilute and disperse the limited mass of remaining MTBE and not result in an unreasonable threat to human health, safety and the environment given the limited consumptive use of groundwater in the basin and the blending ratio of basin groundwater with imported water required to meet drinking water standards. The period of time it would take to meet requisite level of water quality required under Resolution 92-49 would be relatively short and would be reasonable given the facts and circumstances surrounding this case.

IV. SUMMARY AND CONCLUSIONS

1. Petitioner's site is an active gasoline service station located in Simi Valley. The site and vicinity are commercially developed with parking lots, streets, and buildings covering greater than 95% of the surface area and rain falling on the site and in the vicinity accumulates in drainage courses.

⁶ The mean annual precipitation in Simi Valley is less than 14 inches per year. Mean Annual Precipitation in the California Region. USGS, 1969.

2. Low concentrations of gasoline constituents, including MTBE, were detected in shallow soil during UST system upgrades in 1998. The portion of the site that overlies the impacted soil is paved.
3. Given the site's physical characteristics and the current and future anticipated climatic conditions, it is improbable that the low residual concentrations of MTBE present in the site soil will be mobilized to impact underlying groundwater. In the unlikely event that the MTBE became mobilized (wetland or storm water retention basin scenario), the impact to groundwater would not pose a threat to human health, safety and the environment. Further, if this unlikely event occurred, the short period of time that it would take to meet the requisite level of water quality under Resolution 92-49 would be reasonable.
4. No further corrective action at this site is necessary.
5. The above conclusions are based upon site-specific information relative to this case.

V. ORDER

IT IS THEREFORE ORDERED that petitioner's case be closed and no further action related to the UST be required. The Deputy Director of the Division of Water Quality is directed to issue petitioner a closure letter consistent with Health and Safety Code, section 25296.10, subd. (g)

CERTIFICATION


The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on June 3, 2008.

AYE: Chair Tam M. Doduc
Charles R. Hoppin
Frances Spivy-Weber

NAY: Vice Chair Gary Wolff, P.E., Ph.D

ABSENT: Arthur G. Baggett, Jr.

ABSTAIN: None



Jeanine Townsend
Clerk to the Board