

## State Water Resources Control Board

### UNDERGROUND STORAGE TANK (UST) CASE CLOSURE SUMMARY

#### Agency Information

Agency Name: Colorado River Basin Regional Water Quality Control Board (Colorado River Basin Water Board)	Address: 73-720 Fred Waring Drive, Suite 100 Palm Desert, CA 92260
Agency Caseworker: Jeffrey Fitzsimmons	Case No.: 7DODT2278005

#### Case Information

Global ID: T060719383	Number of Years Case Open: 25
Site Name: Twentynine Palms Marine Corps Air Ground Combat Center (MCAGCC) IR Site UST 10 (Building 1077)	Site Address: Intersection of Del Valle Drive and Agate Road Twentynine Palms, CA 92278 (Site)
Petitioner: United States Department of the Navy Attention: Angela Patterson	Address: Naval Facilities Engineering Command Southwest 750 Pacific Highway San Diego, CA 92132

**GeoTracker Case Record:** <http://geotracker.waterboards.ca.gov/?gid=T060719383>

#### Summary

The Low-Threat Underground Storage Tank Case Closure Policy (Policy) contains general and media-specific criteria, and cases that meet those criteria are appropriate for closure pursuant to the Policy because they pose a low threat to human health, safety, and the environment. The Site meets all of the required criteria of the Policy and therefore, is subject to closure.

The Site is a former commercial petroleum fueling facility located in the Main Gate area of the Twentynine Palms MCAGCC. An unauthorized release of gasoline was reported in March 2000 following repairs performed on the fuel dispensers. Four fuel USTs were removed in October 2010 at the time of the fueling facility decommissioning. The Site is currently used as parking for an adjacent rental car facility.

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A soil vapor extraction (SVE) system was in operation from February 2002 through June 2007 and removed approximately 36,559 pounds of vapor-phase petroleum hydrocarbons from the subsurface. During the 2010 removal of the fuel USTs and decommissioning of the fueling facilities, residual contaminated soil was excavated from around and beneath the USTs to a depth of approximately 21 feet below ground surface (ft bgs). Approximately 5,120 cubic yards of clean overburden and 1,320 cubic yards of petroleum-impacted soil were removed from the UST pit. The impacted soil was transported off-site for disposal. Following confirmation sampling, the Colorado River Basin Water Board approved the use of the clean overburden to be used as part of the backfill of the UST pit to restore the Site. From May through December 2012, injection of chemical oxidants targeted the area with the highest remaining concentrations of dissolved gasoline constituents, primarily benzene and methyl tertiary butyl ether (MTBE). A Corrective Action Plan (CAP) dated February 2018 proposed monitored natural attenuation (MNA) as the final remediation method to mitigate the residual MTBE plume. The CAP proposed a two-year period of groundwater monitoring to verify the stability of the dissolved MTBE plume after which closure would be warranted. Colorado River Basin Water Board staff approved the CAP in a letter dated April 25, 2018.

Soil samples collected up to and during UST removal indicate that historical remediation activities successfully removed the majority of fuel impacts in soil to at least a depth of 21 ft bgs. Chemical oxidation further reduced dissolved benzene concentrations in perched groundwater. Residual fuel impacts are primarily limited to elevated dissolved MTBE concentrations in the localized perched groundwater present at a depth of approximately 68 to 70 ft bgs. Data collected during groundwater verification monitoring performed between 2018 and 2020 indicate the dissolved MTBE plume is stable to decreasing in areal extent. As of the most recent groundwater monitoring event performed in June 2020, MTBE was detected in samples collected from the perched groundwater at concentrations up to 26,000 micrograms per liter ( $\mu\text{g/L}$ ). Benzene was detected in only one groundwater sample collected at a concentration of 28  $\mu\text{g/L}$ .

Prior to the chemical oxidant injections performed in 2012, analysis of groundwater samples collected at the Site included dissolved chromium and hexavalent chromium, among other non-petroleum contaminants. Introduction of chemical oxidants can oxidize chromium metal already present in the subsurface into the more toxic hexavalent state. Data collected indicates that both chromium and hexavalent chromium were present at moderate concentrations both before and after chemical oxidation remediation. The distribution of hexavalent chromium, even before chemical oxidation treatment, is larger than the historical distribution of contaminants associated with the USTs, indicating that the source of the hexavalent chromium is not likely related to the release from the USTs. Though it is known that chemical oxidation remediation can produce hexavalent chromium, the extent of the hexavalent chromium impact appears to be wider than would be expected given the area of influence of the performed remediation. There is no evidence that hexavalent chromium was released from the USTs or by any other operations performed at or near the fueling facility. As such, it is unlikely that hexavalent chromium is related to historical Site operations and may be naturally occurring or a

result of other non-Site anthropogenic sources. Hexavalent chromium concentration trends in the perched groundwater have generally been stable to decreasing since the 2012 treatment. Some localized increases in hexavalent chromium concentrations have been observed, but they are contained within the overall area of the plume and the increase has been less than an order of magnitude. Finally, all dissolved contaminants are isolated in the localized perched groundwater, which has no beneficial use defined in the Colorado River Basin Water Board's Basin Plan.

Remaining contaminants are limited, stable, and decreasing. Additional assessment would be unnecessary and will not likely change the conceptual model. Any remaining contaminants do not pose significant risk to human health, safety, or the environment under current conditions.

### **Rationale for Closure Under the Policy**

- General Criteria – Site **MEETS ALL EIGHT GENERAL CRITERIA** under the Policy.
- Groundwater Media-Specific Criteria – Site **meets the criteria in Class 5**. The regulatory agency determines, based on an analysis of Site-specific conditions that under current and reasonably anticipated near-term future scenarios, the contaminant plume poses a low threat to human health, safety, and to the environment and water quality objectives will be achieved within a reasonable time frame.
- Petroleum Vapor Intrusion to Indoor Air – Site **meets Criteria 2 (a), Scenario 3**. As applicable, the extent of the bioattenuation zone, oxygen concentrations in soil gas, concentrations of total petroleum hydrocarbons as gasoline and diesel combined in soil, and dissolved concentrations of benzene in groundwater meet the Policy.
- Direct Contact and Outdoor Air Exposure – Site **meets Criteria 3 (b)**. Maximum concentrations of petroleum constituents in soil are less than levels that a site-specific risk assessment demonstrates will have no significant risk of adversely affecting human health.

### **Objections to Closure**

In a March 13, 2024 petition response, the Colorado River Basin Water Board provided the following objections to closure. DWQ's response to each objection is provided below:

1. **Objection:** The case does not meet Policy General Criterion (h), which states that "a nuisance as defined by Water Code section 13050 does not exist at the site."

**Response:** The Policy states the conditions presented by the contamination must meet all of the following requirements to be considered a nuisance in accordance with Water Code section 13050:

- 1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
- 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
- 3) Occurs during, or as a result of, the treatment or disposal of wastes.

Conditions at the Site do not meet all of the requirements to be considered a nuisance. There is no evidence that the impacted perched groundwater is currently causing, or will cause, injury or is indecent or offensive to the senses. In addition, as the perched groundwater beneath the Site is unlikely to ever be used as a drinking water source (see below), the contamination does not obstruct the free use of the property nor affect any community or neighborhood. Colorado River Basin Water Board staff are correct that the case meets the third requirement, as the definition of waste for purposes of evaluating nuisance under the Policy includes the petroleum constituents released at this Site; however, the other two criteria are not met and as such, the Site is not considered a nuisance.

2. **Objection:** The case does not meet the Groundwater Media-Specific Criteria of the Policy.

**Response:** Conditions at the Site meet Class 5 of the Groundwater Media-Specific Criteria. The purpose of the verification groundwater monitoring proposed by the CAP was to demonstrate that the plume was stable or decreasing in areal extent. The data collected between 2018 and 2020 demonstrated that the plume is decreasing. Plume stability is a key element of meeting the Groundwater criteria. The wells with residual dissolved MTBE have all demonstrated decreasing concentration trends, and overall, the plume has shown a decrease in areal extent, confirming that natural attenuation is occurring and that the CAP recommendation of MNA is an appropriate corrective action measure.

The Colorado River Basin Water Board's March 13, 2024 petition response states that MTBE concentrations are not likely to achieve the 13 µg/L objective "in the immediate future or any other reasonable timeframe." However, reduction of concentrations to water quality objectives in the "immediate future" is not a condition that has to be achieved to meet Policy criteria. The Policy states, "It is a fundamental tenet of this low-threat closure policy that if the closure criteria described in this policy are satisfied at a petroleum unauthorized release site, attaining background water quality is not feasible, establishing an alternate level of water quality not to exceed that prescribed in the applicable Basin Plan is appropriate, and that water quality objectives will be attained through natural attenuation within a reasonable time, prior to the expected need for use of any affected groundwater." What constitutes a "reasonable time" to meet water quality

objectives must be determined by an evaluation of all relevant factors. ([State Water Resources Control Board Order WQ-98-04 UST \(Matthew Walker\)](#).) [State Water Board Resolution 2009-0081](#) provided that these factors include but are not limited to “whether the residual contamination poses a threat to human health or safety and is localized and unlikely to migrate beyond the current spatial extent, and if the affected groundwater will be used as a source of drinking water or other designated beneficial use in the timeframe required to meet cleanup goals and objectives.”

Based on current Site conditions, hundreds of years could be considered a reasonable timeframe for water quality objectives to be achieved, although Site data indicate it will take far less time. The residual contamination does not pose a threat to human health or safety, it is localized and unlikely to migrate beyond its current spatial extent, and there is no reasonable expectation of the perched groundwater beneath this Site ever being considered a viable water supply for any purposes. There are no drinking water supply wells near the Site that could be impacted by residual petroleum hydrocarbons as the Site. The plume is adequately defined and it is unlikely there is any connection between the perched groundwater and the deeper regional groundwater aquifer, which is situated approximately 160 feet below the perched groundwater encountered at the Site. Furthermore, inorganic chemistry data from groundwater samples demonstrate the perched groundwater meets all the exceptions for beneficial use stated in Colorado River Basin Water Board’s Basin Plan.<sup>1</sup> Colorado River Basin Water Board staff also expressed concern about the presence of seismic fault lines creating pathways for exposure to perched groundwater. Seismic assessment is not among the criteria required for closure under the Policy, nevertheless, based on the separation depth between the perched groundwater and the drinking water aquifer, it is unlikely that any faults located within the vicinity of the Site would cause the perched groundwater to impact the drinking water aquifer. Ultimately, based on an analysis of Site-specific conditions, under current and reasonably anticipated near-term future scenarios, State Water Board staff have determined the contaminant plume poses a low threat to human health, safety, and the environment and water quality objectives will be achieved within a reasonable time frame.

It would be unreasonable to direct remediation of MTBE or hexavalent chromium related to this UST release case. It is State Water Board staff’s opinion also that the data would not support opening a separate Site Cleanup case when there is no known release explaining the presence of chromium/hexavalent chromium in perched groundwater.

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<sup>1</sup> Exceptions for Municipal or Domestic water supply are presented in Chapter 2, Section IV. (Sources Of Drinking Water Policy) on page 2-3 of the *Water Quality Control Plan for the Colorado River Basin Region*, updated on March 30, 2023.

3. **Objection:** The case does not meet the Vapor Intrusion to Indoor Air Media-Specific Criteria of the Policy.

**Response:** In the March 13, 2024 petition response, Colorado River Basin Water Board staff indicated that the petitioner had not demonstrated that soil vapor had been addressed, as directed in their September 26, 2023 closure denial letter. The closure denial letter had directed the petitioner to conduct a soil gas survey to demonstrate the vapor intrusion criteria had been achieved. However, sufficient data already are available to demonstrate the vapor intrusion criteria have been achieved without the need to collect additional soil gas samples. As indicated in the Rationale for Closure Under the Policy section above, the case meets Criteria 2 (a), Scenario 3. Specifically, dissolved benzene concentrations in groundwater beneath the Site are less than 100 µg/L, there is at least a 5-foot separation between groundwater and ground surface, and total petroleum hydrocarbon concentrations in soil are less than 100 milligrams per kilogram throughout the entire depth of the bioattenuation zone. Therefore, State Water Board staff have determined that the vapor intrusion criteria have been met and that additional soil gas sampling would be unreasonable and unnecessary.

4. **Objection:** The case does not meet the Direct Contact and Outdoor Air Exposure Media-Specific Criteria of the Policy.

**Response:** In the March 13, 2024 petition response, Colorado River Basin Water Board staff indicated that the direct contact criteria cannot be verified because there are no soil sample results in the case record for naphthalene in the upper ten feet of soil beneath the Site. However, the relative concentration of naphthalene in soil can be conservatively estimated using the published relative concentrations of naphthalene and benzene in gasoline. Taken from Potter and Simmons (1998), gasoline mixtures contain approximately 2% benzene and 0.25% naphthalene. Therefore, benzene concentrations can be used as a surrogate for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Table 1 of the Policy. Therefore, estimated naphthalene concentrations would meet the thresholds in Table 1 and the Policy criteria for direct contact with a safety factor of eight. It is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold. Based on this comparison, State Water Board staff have determined that maximum concentrations of petroleum constituents in soil are less than levels that a site-specific risk assessment demonstrates will have no significant risk of adversely affecting human health.

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### Recommendation for Closure

The corrective action conducted for this case ensures that any residual petroleum constituents associated with the case pose a low threat to human health, safety, and the environment. The corrective action performed at this Site is consistent with chapter 6.7 of division 20 of the Health and Safety Code, implementing regulations, applicable state policies for water quality control, and applicable water quality control plans. As such, case closure is recommended.

Prepared by:



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02/12/2025

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