

STATE WATER RESOURCES CONTROL BOARD  
BOARD MEETING--DIVISION OF WATER QUALITY  
JUNE 16, 2005

**ITEM 9**

**SUBJECT**

PETITION OF DAN THOMAS FOR REVIEW OF DENIAL OF PETROLEUM UNDERGROUND STORAGE TANK SITE CLOSURE AT 596 EAST PERKINS STREET, UKIAH, CALIFORNIA

**DISCUSSION**

Dan Thomas (petitioner) seeks review of the decision of the North Coast Water Board to deny closure of the underground storage tank (UST) case located at 596 East Perkins Street, Ukiah, California.

In 1992 and 1993, USTs and associated piping were removed from the site. Corrective actions initiated in 1993 indicated that a substantial release occurred in the vicinity of the pump island that affected soil on- and off-site beneath the East Perkins Street right-of-way. After two phases of soil removal from the location of the former pump island, the North Coast Water Board informed petitioner that the soil removal phase of corrective actions was complete.

Between May 2000 and October 2003, petitioners requested on four different occasions that the North Coast Water Board close the case citing the extensive corrective actions completed at the site, stability of the plume, and active biodegradation of residual petroleum hydrocarbons in site soil and groundwater. The North Coast Water Board denied each request citing the need for additional data and excavation of on-site affected soil. Petitioner appealed to the State Water Resources Control Board (State Water Board) in May, 2004.

The proposed order finds that as a result of corrective actions conducted at the site, the site does not present risk to human health, safety, and the environment or threaten current or potential beneficial use of groundwater.

**POLICY ISSUE**

Should the State Water Board adopt the proposed order directing closure of the UST case?

**FISCAL IMPACT**

None.

**RWQCB IMPACT**

None.

**STAFF RECOMMENDATION**

That the State Water Board adopt the proposed order.

STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ \_\_ - \_\_ - UST

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In The Matter Of The Petition Of

**DAN THOMAS**

For Review of Denial of Petroleum Underground Storage Tank Site Closure

at 596 East Perkins Street, Ukiah, California

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BY THE BOARD:

Dan Thomas (petitioner) seeks review of the decision of the North Coast Regional Water Quality Control Board (North Coast Water Board) not to close petitioner's case involving an unauthorized release of petroleum at his site located at 596 East Perkins Street, Ukiah, California. 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).)<sup>1</sup> Aggrieved persons, including UST owners, operators, and other responsible parties, may also appeal to the State Water Board for review of certain actions of Regional Water Quality Control Boards (Regional Water Boards) or failures to act (Wat. Code, § 13320, subd. (a).)

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<sup>1</sup> To the extent that the State Water Board may lack authority to review this petition pursuant to Health and Safety Code section 25296.40, subsection (a)(1) because the petitioner did not submit a corrective action plan for the site, the petition is being reviewed on the State Water Board's own motion pursuant to State Water Board Resolution No. 88-23.

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. 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.<sup>2</sup>

The North Coast Water Board Water Quality Control Plan (Basin Plan) designates existing and potential beneficial uses of groundwater in the Russian River Hydrologic Unit as municipal and domestic supply (MUN), agricultural supply (AGR), and industrial process supply (PROC) (North Coast Water Board & State Water Board, Water Quality Control Plan for the North Coast Region (1994) at p.2-6.00.). The Basin Plan specifies a narrative taste and odor water quality objective (WQO) for groundwater with an MUN beneficial use designation as follows: "Groundwaters shall not contain taste- or odor-producing substances at concentrations which cause nuisance or adversely affect beneficial uses" (*Id.* at p. 3-11.) The Basin Plan also contains the following narrative WQO for "Chemical Constituents": "Groundwaters used for domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits cited in CCR, Title 22, Division 4, Chapter 15, Article 4, Section 64435 Tables 2 and 3, and Section 64444.5 (Table 5) and listed in Table 3-2 of this Plan. Groundwaters used for agricultural supply (AGR) shall not contain concentrations of chemical constituents in amounts that adversely affect such beneficial use (*Id.* at p. 3-11.)"

With regard to the WQOs for "Chemical Constituents", the Basin Plan has set "Concentrations Not To Be Exceeded In Domestic or Municipal Supply" for benzene, ethylbenzene, and xylene at 1 ppb, 680 ppb, and 1,750 ppb, respectively (*Id.* at p. 3-8). The threshold odor concentration of

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<sup>2</sup> See for example State Water Board Orders WQ 98-04 UST, WQ 98-10 UST, and WQ 03-0001 UST.

three common petroleum constituents, ethylbenzene, toluene, and xylene are 29 ppb, 42 ppb, and 17 ppb respectively. (USEPA, Federal Register, Volume 54, No.97, May 1989.) The threshold odor concentration of commercial gasoline (measured as total petroleum hydrocarbon gasoline, or TPH-g) is commonly accepted to be 5 ppb, with 10 ppb giving a strong odor. The threshold odor concentration of commercial diesel (measured as TPH-d) is commonly accepted to be 100 ppb. (State Water Board, Water Quality Criteria (2d ed. 1963) p. 230.)

## **II. FACTUAL BACKGROUND**

### **A. Site Setting**

Petitioner's site is a vacant lot located at the northwest corner of the intersection of East Perkins Street and Orchard Avenue, about 500 feet west of the East Perkins Street/US Highway 101 interchange. There are two gasoline service stations across the intersection to the south and southeast; a fast food franchise is located to the east, and a shopping mall to the north and west. Corrective actions are currently underway for a release at the Chevron UST site at the southeast corner of the intersection and a soil and groundwater investigation was recently performed at the Beacon Station to the south. There are no municipal or domestic supply wells located within 2,000 feet of the site and the nearest perennial surface water feature, the Russian River, is located about 4,800 feet to the east; Gibson Creek, an ephemeral stream, is located about 850 feet to the south.

In the vicinity of the site, fine-grained clayey alluvial sediments of the Russian River floodplain, to a depth of about 15 feet below ground surface (bgs), overlie coarse-grained gravelly sediments. The low permeable clayey stratum causes groundwater in the underlying very high permeable sands and gravels, to come under confined conditions during the winter and spring. The potentiometric surface (water level) measured in site monitor wells seasonally fluctuates ten to fifteen feet (from about 8 feet to 21 feet bgs). Groundwater flow is southerly at a gradient of about 0.06 feet/foot.

### **B. UST Case History**

A gasoline service station occupied the site from 1969 through early 1992. In April 1992, four USTs were removed from the northeastern portion of the site (Figure 1, Site Map) and in December 1992, the tank pit was over-excavated. Eight soil samples collected from the final excavation depth of 11 feet to 13.5 feet bgs and analyzed for TPH-g and BTEX tested non-detect for all constituents except one sample that had respective ethylbenzene and xylene concentrations of 0.005 ppm and 0.015 ppm.

In February 1993, monitor wells MW-1, MW-2, and MW-3 were installed around the former UST excavation. Analyses of groundwater samples subsequently collected from these wells tested non-detect for BTEX, and TPH-g; only the sample from well MW-3 had a reported TPH-d concentration of 90 ppb.

In September 1993, the pump islands and associated piping were removed from the southern portion of the site. Ten soil samples were collected from beneath the locations of the pump islands and piping and analyzed for TPH-g and BTEX. One sample from a depth of 5 feet bgs had reported benzene and ethylbenzene concentrations of 0.0095 ppm and 0.0047 ppm, respectively. Ethylbenzene and xylene at 0.0047 ppm and 0.034 ppm were reported for a second sample from a depth of 8 feet bgs, and TPH-g at 3.9 ppm was detected in a third sample from a depth of 4.5 feet bgs.

In October 1993, wells MW-4 and MW-5 were installed to assess groundwater impacts at and east of the pump island. Well MW-4 was placed near the southeast corner of the former pump island and well MW-5 was placed about 35 feet east of MW-4, near the northwest corner of the intersection. The initial analysis of groundwater from well MW-4 had reported concentrations of TPH-g, TPH-d, and benzene of 23,000 ppb, 3,500 ppb, and 900 ppb, respectively. Initial concentrations of TPH-g, TPH-d, and benzene in groundwater samples from well MW-5 were 450 ppb, 240 ppb, and 27 ppb, respectively.

In November 1993, two phases of excavation in the area of the former pump island to depths as great as 25 feet bgs were performed. Soil samples collected at 10.5 to 18 feet bgs from the excavations had reported total BTEX concentrations ranging from 4 ppm to 110 ppm and TPH-g concentrations ranging from 49 ppm to 1,600 ppm.

By letter dated November 9, 1994, the North Coast Water Board Executive Officer concurred with petitioner that further excavation of soil at the site was not feasible, would not be cost effective, or result in improved groundwater conditions.

In May 2000, petitioner submitted to the North Coast Water Board a survey of sensitive receptors near the site, a summary of historic groundwater analytical data, and a request for case closure. The survey documented that there were no municipal or domestic water supply wells within 2,000 feet of the site. By letter dated August 11, 2000, North Coast Water Board staff rejected the closure request because detectable concentrations of dissolved-phase petroleum hydrocarbon constituents in site

groundwater exceeded Basin Plan WQOs. North Coast Water Board staff also commented that the extent of soil and groundwater contamination had not been defined.

In August 2002, two borings were drilled about 30 feet and 120 feet southeast of well MW-4 to assess the extent of affected soil and groundwater beneath the intersection. One of the borings, near the southeast corner of the intersection, was completed as well MW-7. One soil sample collected at 20 feet bgs from boring B-6 had a reported TPH-g concentration of 1.2 ppm; all other soil samples from this boring and from the MW-7 well boring tested non-detect for all gasoline constituents. Concentrations of gasoline constituents in groundwater samples from well MW-7 have ranged from non-detect to about 1 ppb for benzene and xylene and non-detect to 290 ppb and 130 ppb for TPH-g and TPH-d, respectively.

In December 2002, petitioner, citing the results of the August 2002 investigation, recommended case closure. North Coast Water Board staff, in a letter dated January 7, 2003, responded by saying that they did not concur with the closure recommendation based on a review of recent report submittals and the case file. On January 16, 2003, petitioner submitted a report explaining the site conceptual model and recommended case closure. North Coast Water Board staff, in a letter dated January 31, 2003, responded by saying that based on a review of the document and the case file, they did not concur with the closure recommendation.

In March 2003, petitioner collected and analyzed 57 soil samples from ten borings drilled to depths of up to 25 feet bgs south and east of the former pump island excavation. Benzene and MTBE were reported non-detect for all samples, toluene was detected in only one sample at a concentration of 0.005 ppm, ethylbenzene was detected in three samples at 0.0058 ppm to 5.2 ppm, and xylene was detected in seven samples at concentrations ranging from 0.005 ppm to 89 ppm. Concentrations of TPH-g ranging from 1.4 ppm to 1,100 ppm were detected in 34 samples and concentrations of TPH-d, ranging from 1.0 ppm to 100 ppm, were detected in 35 samples. Petitioner submitted a report of the findings and once again requested case closure. North Coast Water Board staff, in a letter dated May 29, 2003, responded by saying that they did not concur with the closure recommendation, noted that it was feasible to excavate some of the remaining contaminated soil, and directed petitioner to submit an interim remedial action plan to address the remaining soil and groundwater contamination.

Petitioner submitted to the North Coast Water Board a Request for Site Closure report dated October 30, 2003. The report presented the rationale that previous excavation of contaminated soil, decreasing concentration trends of dissolved phase constituents in groundwater, and an absence of nearby

down-gradient sensitive receptors, was justification for case closure. North Coast Water Board staff, in a letter dated December 12, 2003, rejected petitioner's closure request. The rationale for the rejection was that case closures are based on meeting Basin Plan WQOs and an absence of soil contamination that would further affect groundwater quality, criteria that petitioner's site did not meet.

By letter dated March 12, 2004, petitioner requested that the North Coast Water Board Executive Officer (EO) confirm staff's denial of case closure so that the decision could be appealed to the State Water Board.<sup>3</sup> By letter dated April 19, 2004, the EO confirmed staff's denial by concluding that: 1) affected soil remains at the site; 2) dissolved phase petroleum hydrocarbon constituents remain above Basin Plan WQOs; and 3) the TPH-d concentration trend for groundwater samples from monitor well MW-4 did not indicate WQOs are achievable via natural attenuation. Petitioner appealed the decision to the State Water Board on May 10, 2004.

In the ten years since groundwater samples from well MW-4 were first analyzed for petroleum hydrocarbons, concentrations of benzene have decreased to "non-detect" and concentrations of TPH-g and TPH-d (1,800 ppb and 530 ppb respectively as of March 2004) have declined by an order of magnitude. Similarly, concentrations of all gasoline constituents in groundwater samples from well MW-5 have tested non-detect since January 2002.

In November 2004, State Water Board staff suggested that petitioner collect data documenting the occurrence of intrinsic bioremediation of residual petroleum hydrocarbons in site soil and groundwater. On December 15, 2004, petitioner obtained groundwater samples from wells MW-1, MW-3, MW-4, and MW-5 and had the samples analyzed for sulfate, nitrate, ferrous iron, and bicarbonate alkalinity, geochemical parameters useful for evaluating microbial metabolism of petroleum hydrocarbons. The analytical data demonstrated that affected groundwater is subject to anaerobic biodegradation via denitrification, and sulfate and iron reduction.

### **III. CONTENTIONS AND RESPONSES**

#### **A. CONTENTIONS**

Petitioner contends that the North Coast Water Board staff's reasons for denying site closure are contrary to the intent of State Water Board Resolution No. 92-49 and are inconsistent with a

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<sup>3</sup> Title 23 CCR Section 2814.6(b)(2) specifies that closure denial must be made by the Regional Water Board EO before one can appeal the decision to the State Water Board.



November 1994 North Coast Water Board directive that acknowledged further excavation at the site was deemed to be economically infeasible and that additional excavation was not required.

North Coast Water Board staff contend that residual petroleum hydrocarbons in site soil will continue to affect groundwater with petroleum hydrocarbon constituent concentrations greater than Basin Plan WQOs. Specifically, the North Coast Water Board contends that with respect to groundwater samples from well MW-4, the concentration of TPH-g remains at 2,600 ppb, and there is no sign that the concentration will decline further, and that there has been no significant decline in TPH-d concentrations in well MW-4 since the year 2000.<sup>4</sup> The North Coast Water Board staff further contend that petitioner has misinterpreted the content of the November 1994 letter.

## B. RESPONSES

With regard to the contention that the North Coast Water Board's actions are contrary to the intent of State Water Board Resolution No. 92-49, petitioner's argument has merit. As explained below, State Water Board Resolution No.92-49 does not require that the requisite level of water quality be met at the time of site closure but allows for compliance with cleanup goals and objectives within a reasonable time frame. Further, residual petroleum hydrocarbon constituents in shallow soil and groundwater at the petitioner's site do not pose a threat to human health and safety, or the environment, and do not adversely affect current or anticipated beneficial use of water for the following reasons:

- The primary sources of the release, the USTs and pump islands, were removed in 1993 in addition to 690 cubic yards of affected soil.
- Available data indicate that groundwater at or immediately down gradient of petitioner's site is not directly being used presently or has any likelihood of being used in the future, for domestic or municipal supply.
- Residual petroleum hydrocarbon constituents in site soil and groundwater are subject to natural attenuation via microbial metabolism.

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<sup>4</sup>As discussed later, in March of 2004, the TPH-g concentration in the groundwater sample from monitor well MW-4 was 1,800 ppb. The North Coast Water Board's contention, that the TPH-g concentration remains at 2,600 ppb, is based on the August 2003 sampling result. Regarding TPH-d, the North Coast Water Board's initial comments on the petition contend that there was an increasing trend in TPH-d concentrations in well MW-4. The North Coast Water Board's TPH-d trend analysis was positively skewed by two early groundwater samples that had reported non-detect concentrations of TPH-d in well MW-4. After submitting its initial comments, the North Coast Water Board removed the two questionable non-

Additionally, the level of site cleanup is consistent with the maximum benefit to the people of the state and the remaining petroleum hydrocarbons in shallow site groundwater will meet the municipal and domestic supply beneficial use WQOs in the North Coast RWQCB's Basin Plan within a reasonable period of time.

North Coast Water Board staff does not dispute petitioner's contention that their case closure denial may be contrary to the intent of State Water Board Resolution No. 92-49, but rather assert that to close the case would be inconsistent with State Water Board Resolution No. 88-63. As explained below, closure of petitioner's case is consistent with State Water Board Resolution Nos. 92-49 and 88-63.

As indicated above, petitioner and the North Coast Water Board have conflicting interpretations of the North Coast Water Board's November 9, 1994, letter concerning additional soil excavation at the site. The question before us is whether closure is appropriate based upon current site conditions, so it is unnecessary to determine the correct interpretation of the November 9, 1994, letter in order to resolve this petition.<sup>5</sup>

**C. DISCUSSION**

In 2002 and 2003, at the behest of North Coast Water Board staff, petitioner drilled two soil borings (well MW-7 and B-6) southeast of the pump island area and ten soil borings (B-101 through B-110) south and east of the limit of the excavation. Soil samples and groundwater samples from these borings were collected and analyzed to assess the extent and magnitude of residual gasoline contamination at and down-gradient of the former pump island. In light of these new data, North Coast Water Board staff concluded that, while all remaining residual gasoline in soil at and near petitioner's site cannot reasonably be excavated, affected soil in the area east of the former excavation and north of the sidewalk can. It is this area North Coast Water Board staff is requiring to be excavated in order to move the site toward closure.

Affected soil in the area north of the sidewalk, with the installation of sheet piling along the edge of the sidewalk, could be removed and the excavation filled with clean soil. However, removal

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detect values from their analysis, and their most recent analysis shows a decreasing trend for TPH-d concentrations in well MW-4.

<sup>5</sup> The State Water Board finds that this issue is insubstantial and inappropriate for State Water Board review. (See *People v. Barry* (1987) 194 Cal.App.3d 158 [239 Cal.Rptr. 349]; Cal. Code Regs., tit. 23, § 2052, subd. (a)(1) and § 2814.7, subd. (d)(4).)

of this soil would not necessarily result in case closure by the North Coast Water Board. Available data indicate that remaining soil contamination beneath the sidewalk and East Perkins Street, and at the base of the former pump island excavation (soil samples from the bottom of the excavation had reported TPH-g concentrations as great as 1,600 ppm), would continue to affect groundwater quality with concentrations of dissolved-phase petroleum hydrocarbons in excess of Basin Plan WQOs.

State Water Board Resolution No. 92-49 does not require that the requisite level of water quality be met at the time of site closure but allows for 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.<sup>6</sup> State Water Board Resolution No. 88-63, the Sources of Drinking Water Policy, takes an inclusive approach to the designation of beneficial use of drinking water. State Water Board Resolution No. 88-63 provides that all water should be considered a source of drinking water unless a specific exception applies. By designating most groundwater as suitable for drinking water, WQOs to protect MUN beneficial use are the minimum WQOs in most cleanup cases. This order applies WQOs that protect MUN beneficial use and is, therefore, consistent with State Water Board Resolution No. 88-63. Consistent with State Water Board Resolution No. 92-49, this order finds that the MUN WQOs need not be met at the time of closure, but within a reasonable period.

Technologies suitable for remediation of the types of affected soil at the site are excavation and natural attenuation. Excavation of all traces of residual petroleum hydrocarbon constituents contributing to detectable concentrations in shallow groundwater is technically feasible and would require removal of soil across the southern portion of the site and beneath the sidewalk and south into the East Perkins Street right-of-way. All parties agree that this alternative is economically infeasible. Additionally, the Ukiah city engineer is on record as opposing any excavation beneath or south of the sidewalk due to concerns for public safety. Removal of the affected soil that North Coast Water Board staff argues for (a portion that excludes the area beneath the sidewalk, East Perkins Street, and the former pump island excavations) is technically feasible, but it is not economically feasible. Approximately 550 cubic yards of contaminated soil would need to be excavated at a cost of about \$80,000 to \$100,000. The corresponding reduction in concentration levels would not be significant because residual petroleum hydrocarbons would remain in soil in the area of the former pump island excavations and beneath the sidewalk and East Perkins Street. By excavating the contaminated soil identified by the North Coast Water Board staff, WQOs for TPH-g and TPH-d would be met sooner than if the soil was not excavated,

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<sup>6</sup> See for example State Water Board Orders WQ 98-04 UST, WQ 98-10 UST, and WQ 03-001 UST.

but it will not result in shallow affected groundwater achieving Basin Plan WQOs in a significantly shorter amount of time. Because of the minimal benefit of attaining further reductions in concentrations of TPH-g and TPH-d at this site and the fact that the use of the groundwater is not affected or threatened, excavating a portion of the soil to reduce the time period in which WQOs will be met in this small volume of groundwater is not economically feasible.

Natural attenuation is a feasible remedial alternative for site conditions. Residual gasoline present in the clayey soil will degrade to carbon dioxide and water and, over time, will cease to affect shallow site groundwater with constituent concentrations that exceed Basin Plan WQOs. The time required to achieve this condition would likely be a few decades.

In their June 28, 2004, response to the petition, North Coast Water Board staff state that "... concentrations of TPH-g in monitoring well MW-4 remain above 2,600ppb and show no signs of dropping." Two months earlier, the North Coast Regional Board seemed to acknowledge that concentrations of TPH-g in groundwater samples from monitor well MW-4 were declining when they stated that "[a] review of all groundwater analytical results to date for monitoring (well) MW-4 indicates that concentrations of TPH-g may achieve water quality objectives within 20 to 25 years." (North Coast Water Board letter dated April 19, 2004, p.2) The North Coast Water Board's own trend analysis demonstrates that concentrations of TPH-g in groundwater samples from well MW-4 are declining. A groundwater sample collected from the well in March 2004 had a reported TPH-g concentration of 1,800 ppb, a value that falls squarely on the trend line of the North Coast Water Board's trend analysis.

The North Coast Water Board contends that there has been no significant decline in TPH-d concentrations in groundwater samples from well MW-4 since the year 2000. Well MW-4 was sampled only once in 2000 (August) and produced a sample with a TPH-d concentration of 1,000 ppb. In thirteen previous samples from well MW-4 between 1994 and 1999, concentrations of TPH-d ranged from 850 ppb to 3,000 ppb. Between 2001 and 2003, the well was sampled eight times and produced samples with TPH-d concentrations ranging from 250 ppb and 1,700 ppb.<sup>7</sup> The concentration data thus show a significant degree of short term and long-term temporal variation. Citing a year when only one sample is collected and comparing it to subsequent years when multiple samples were collected can skew the analysis. When the concentration data are viewed in their entirety and in the context of the documented

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<sup>7</sup> A sample collected from the well in November 2002, had a reported TPH-d concentration of 3,200 ppb. However, it was a "no-purge" sample, i.e., the standard three casing volumes of groundwater were not removed prior to sample collection, and thus not representative of groundwater in the water bearing zone. The subsequent (March 2003) samples collected after well purging had a reported TPH-d concentration of 450 ppb.

bioattenuation, a declining concentration trend is demonstrated. The North Coast Water Board's analysis for TPH-d in well MW-4 shows a decreasing trend in concentration levels.

The remaining concentrations of TPH-g and TPH-d in shallow groundwater in immediate contact with residual TPH-g and TPH-d adsorbed to soil will likely remain above the Basin Plan's municipal and domestic supply beneficial use WQOs in a localized volume of surrounding groundwater for a few decades. Considering the absence of active municipal or domestic supply wells in close proximity to petitioners' site, local hydrogeologic considerations, demonstrated bioattenuation, and standard well construction practices, such a limited, isolated scenario will not unreasonably affect existing or anticipated beneficial uses.

In approving alternative levels of water quality less stringent than background, the State Water Board considers the factors contained in CCR, title 23, section 2550.4, subdivision (d). As discussed earlier, the adverse effect on shallow groundwater will be minimal and localized, given the physical and chemical characteristics of the petroleum constituents, the hydrogeologic characteristics of the site, and surrounding land use. In addition, the potential for adverse effects to beneficial uses of groundwater is low, given: (1) the current and potential future uses of groundwater in the area; (2) the potential for health risks caused by human exposure; (3) the potential damage to wildlife, crops, vegetation, and physical structures; and (4) the persistence and permanence of potential effects, i.e., the environmental fate of the remaining, residual hydrocarbons in site soil and groundwater. Further, a level of water quality less stringent than background is unlikely to have any impact on surface water quality for these same reasons.

The final step in determining whether cleanup to a level of water quality less stringent than background is appropriate under Resolution No. 92-49, 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 Resolution No. 92-49, a site may be closed if the Basin Plan requirements will be met within a reasonable time frame. In this particular case, as discussed above, TPH-g and TPH-d in shallow groundwater in immediate contact with the limited residual petroleum constituents adsorbed to soil will likely remain above their respective 5 ppb and 100 ppb odor threshold for water and thus violate the Basin Plan's narrative odor objective for municipal and domestic supply beneficial use in a localized volume of surrounding groundwater for as long as a few decades. Nonetheless, during this time the residual hydrocarbon concentrations above the narrative odor objective detected in shallow groundwater will not pose a threat to current or anticipated beneficial uses. The limited area where groundwater exceeds

WQOs for municipal and domestic supply beneficial use is located in a commercial area near Highway 101, and it is highly unlikely that a water supply well will be installed in the vicinity of the site during the period that WQOs for municipal and domestic supply beneficial use are exceeded. Even if that unlikely event occurred, standard well construction practices would prevent the shallow affected groundwater from having any adverse effect on deeper groundwater. Further, it is highly unlikely that TPH-g and TPH-d detected in site groundwater will migrate substantially beyond its current limited spatial extent. Though the longer-chain hydrocarbons comprising TPH-g and TPH-d biodegrade more slowly than shorter-chain petroleum constituents such as benzene, they are more recalcitrant and much less mobile (i.e., less volatile, less soluble, and highly absorbent). Thus, the period of time that it will take for water quality in this limited area to meet Basin Plan objectives for municipal and domestic supply beneficial use is a reasonable time frame. Closure of the site, given the facts in this particular case, is appropriate.

#### **IV. SUMMARY AND CONCLUSIONS**

1. Available data indicate that there is no MTBE originating at this site. Residual concentrations of petroleum hydrocarbons, including benzene, at petitioner's site have degraded, and will continue to degrade, due to natural attenuation.
2. Petitioner's site is located in a commercial area. No active water supply wells have been identified within 2,000 feet of the site, and the nearest surface water body (Russian River) is 4,800 feet away.
3. Given the shallowness of the affected soil, the very limited extent of affected groundwater at petitioner's site and minimum well construction standards, the residual, detectable concentrations of petroleum hydrocarbons do not pose a threat to human health and safety, or the environment, and do not adversely affect current or anticipated beneficial uses of water.
4. Soil and groundwater investigations at petitioner's site have been adequate to delineate contamination.
5. The level of site cleanup is consistent with the maximum benefit to the people of the state.
6. Detectable TPH-g and TPH-d in shallow groundwater in immediate contact with the limited, weathered residual petroleum hydrocarbons adsorbed to soil particles will likely remain above Basin Plan objectives (5 ppb and 100 ppb, respectively) for municipal and domestic supply beneficial use and thus may exceed those objectives in a very localized, small volume of surrounding groundwater for a few decades.
7. The determination as to what constitutes a reasonable period must be based on evaluation of all relevant factors, including but not limited to the extent and gravity of any threat to public health and the environment during the period required to meet Basin Plan objectives. Although the time

required to attain objectives will likely be as long as a few decades, it is a reasonable period considering the facts of this case, including that there are no known drinking water wells within 2,000 feet down-gradient of the site; it is highly unlikely that TPH-d and TPH-g detected in localized areas of the site will migrate substantially beyond the current limited spatial extent; and it is highly unlikely that this particular very limited volume of affected shallow groundwater will be used directly as a source of drinking water.

- 8. Therefore, no further corrective action is necessary.
- 9. The above conclusions are based on the 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 Chief 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 19, 2005.

AYE:

NO:

ABSENT:

ABSTAIN:

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Debbie Irvin  
Clerk to the Board