

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

STAFF REPORT FOR REGULAR MEETING OF MARCH 20-21, 2008
Prepared on February 11, 2008

ITEM NUMBER: 25

SUBJECT: Direct Staff Whether to Pursue Removing the Beneficial Use Designation (Basin Plan Amendment) and Whether to Consider Institutional Controls as part of the Site Closure Strategy

KEY INFORMATION

Location: Former Vapor Cleaners
951 Del Monte Avenue, Monterey, Monterey County (Site)
Type of Discharge: Unauthorized Release of Tetrachloroethene (PCE)
Existing Orders: Cleanup or Abatement Order (CAO) No. R3-2006-0021
Monitoring and Reporting Program (MRP) No. R3-2003-0101
State Water Board WQ Order No. 2006-0010

This Action: Direct Staff on Whether or Not to: a) Proceed with a Basin Plan Amendment to Remove the Municipal and Domestic Supply Beneficial Use Designation for this Site, and b) Use Institutional Controls for Site Closure

SUMMARY

A dry cleaning business has operated at 951 Del Monte Avenue, Monterey (Site) since the early 1900s. See Attachments 1, 2, and 3 for applicable maps. The dry cleaner operators likely used Stoddard solvent (a petroleum product) until the 1950s, and then used tetrachloroethene (PCE), a chlorinated solvent for cleaning textile products. From 1974 to 2000, Mr. Quinones owned the property and operated a dry cleaner business, Vapor Cleaner's Inc. In 1987, petroleum products and chlorinated solvents were discovered in Site soil and groundwater. As part of cleanup efforts, Mr. Quinones and Vapor Cleaners, Inc. have operated a soil vapor extraction system, removed five underground storage tanks (USTs), and removed waste from soil and groundwater. In 2000, Mr. Quinones and Vapor Cleaners, Inc. sold the property to the City of Monterey. Currently the property is part of a city park called Window on the Bay.

In 2004, Mr. Quinones and Vapor Cleaners, Inc. filed a petition with the State Water Resource Control Board (State Water Board) because the Executive Officer did not close the Site Cleanup Program Case as requested. In 2005, the State Water Board dismissed the petition. In February 2006, the Executive Officer issued Cleanup or Abatement Order No. R3-2006-0021 (Recent Cleanup Order, Attachment 4) to Mr. Quinones, Vapor Cleaners, Inc., and the City of Monterey (hereafter referred to as Dischargers), which Mr. Quinones petitioned to the State Water Board. The State Water Board acted on the second petition and issued WQ Order 2006-0010 (State Board Order, Attachment 5). The State Board Order requires the Central Coast Water Board to:

1. Consider amending its Basin Plan to de-designate groundwater beneath the Site for municipal and domestic supply (MUN); and
2. Consider alternatives to remediation and continued monitoring, including deed restrictions or other institutional controls.

Central Coast Water Board Staff (hereafter Staff) request the Central Coast Water Board to provide direction regarding State Board Order requirement numbers 1 and 2.

To comply with State Board Order requirement number 1, the Central Coast Water Board may:

1. Consider the existing record and direct Staff not to prepare a Basin Plan amendment that would remove the MUN use. **This is Staff's recommendation.**
2. Defer making a decision now, but direct Staff to collect and consider additional evidence before recommending a course of action to the Central Coast Water Board.
3. Consider the existing record and direct Staff to prepare a Basin Plan amendment that removes the MUN use.

To comply with State Board Order requirement number 2, the Central Coast Water Board may:

1. If the Central Coast Water Board retains the MUN use:
 - a. Require the Dischargers to proceed with characterization and cleanup. Direct Staff to apply the water quality objective [e.g. Department of Health Services maximum contaminant level (MCL)] rather than background (i.e., apply State Water Board Resolution No. 92-49) as the cleanup goal.
 - i. If cleanup proceeds to reduce waste constituent concentrations below or at the MCLs, the Executive Officer would be able to close the case and no institutional controls will be needed because the Site would have unrestricted use.
 - ii. If cleanup proceeds to reduce waste constituent concentrations near but above the MCLs and Staff determine that there is no current threat to human health or the environment, the Central Coast Water Board would determine whether closure is appropriate and would require institutional controls since the Site would not have unrestricted use.

This is Staff's recommendation.

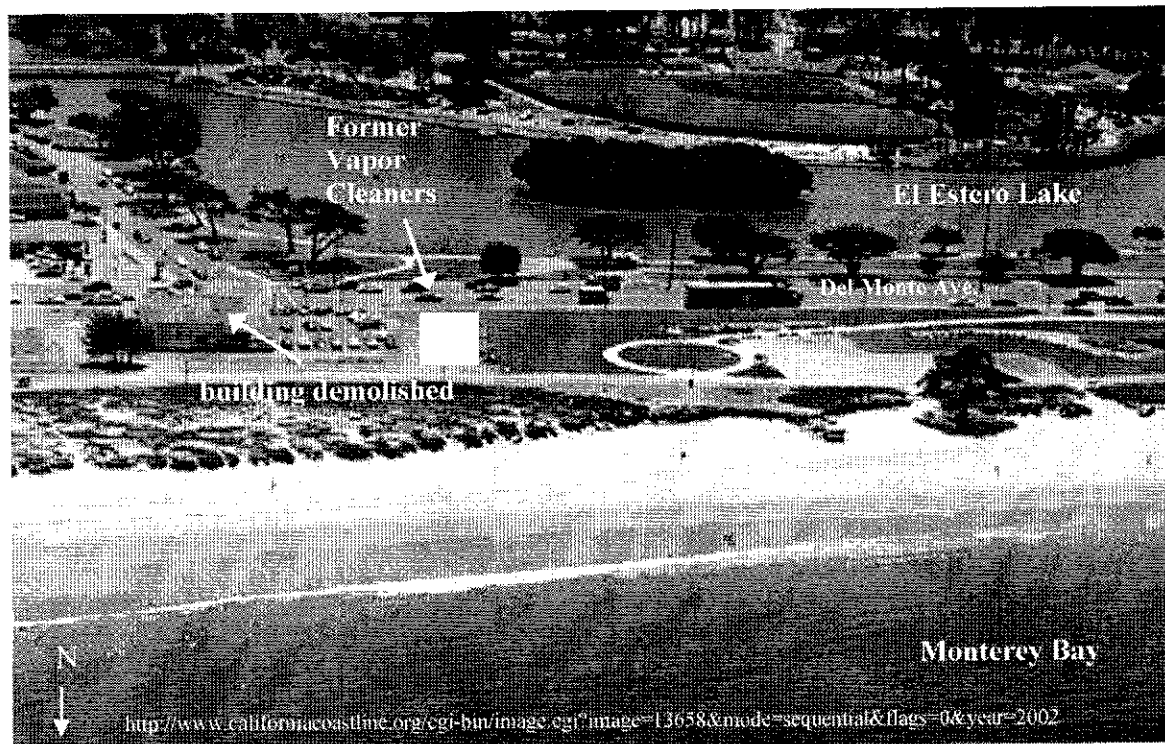
- b. If the Dischargers can show the waste will be contained naturally or by institutional controls, establish a Containment Zone in accordance with State Water Board's Resolution No. 92-49 in lieu of further cleanup. The Central Coast Water Board would need to require institutional controls to protect human health and the environment.
2. If the Central Coast Water Board removes the MUN use, the Central Coast Water Board may require the Dischargers to obtain institutional controls to eliminate human health risks (e.g., vapor intrusion, drinking contaminated groundwater, etc.) and prevent activities that could cause the existing waste to migrate (e.g., pumping groundwater). When institutional controls are in place, the Central Coast Water Board could direct Staff to close the Site Cleanup Program case.

BACKGROUND

Site Use and Site Description:

As mentioned above, a dry cleaner has operated at the Site from the early 1900s to 2000. No one reported Stoddard or chlorinated solvent spills at the Site. However, spills can occur during dry cleaner operations due to human error, mechanical equipment failures, improper disposal of waste products, leaking USTs and associated piping, etc. In addition to PCE used in the dry cleaning equipment, PCE waste, such as drums and used filters, was reportedly stored near the dumpster area north of the former dry cleaning building. In 2000, Mr. Quinones and Vapor Cleaners, Inc. sold the Site to the City of Monterey and demolished the dry cleaning facility. Currently, the Site is part of an open-space park known as Window on the Bay (Figure 1 below). The closest nearby structure is a gas station located on the corner of Camino Aguajito and Del Monte Avenue, about 150 feet southeast from the Site. The Site is located between El Estero Lake to the south and Monterey Bay to the north,

Figure 1



Site Investigation and Cleanup:

The local water agency, California-American Water Company (CalAm), discovered chlorinated solvent wastes in soil in 1987 when the workers became ill from working on a water main north of the Site. Mr. Quinones' and Vapor Cleaners, Inc.'s consultants (hereafter Consultants) initiated investigating PCE wastes by collecting and analyzing soil, soil vapor, and groundwater samples. Consultants used soil vapor data to determine the extent of the PCE waste in soil and groundwater. On May 4, 1987, the Executive Officer issued Cleanup and Abatement Order No. 87-99 (Old Order). The Old Order required Vapor Cleaners, Inc. to design and initiate cleanup for chlorinated solvents in soil and groundwater. Subsequently in 1987, Consultants installed three groundwater monitoring wells (see Attachment 2): MW-1 near the source area, MW-2 near Monterey Bay, and MW-3 near El

Estero Lake. As part of this investigation, Consultants discovered the presence of petroleum waste constituents in groundwater but attributed this waste to other nearby businesses. In 1988, the Consultants installed two additional groundwater monitoring wells (MW-4 and MW-5) and began regularly monitoring groundwater for chlorinated solvents.

The Consultants operated a soil vapor extraction system from August 1990 to July 1991 to reduce chlorinated solvent wastes found near the water main. The extraction system decreased soil vapor concentrations from about 12,000,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) PCE to below 109,000 $\mu\text{g}/\text{m}^3$ PCE. For reference, the California Human Health Screening Level for PCE in soil vapor is 603 $\mu\text{g}/\text{m}^3$ for commercial land use. Additionally, soil vapor extraction reduced concentrations of PCE in soil from 560 milligrams/kilogram (mg/kg) to 25 mg/kg. The Monterey County Department of Environmental Health (MCDEH) set a cleanup goal of 450 mg/kg PCE in soil. The MCDEH developed this cleanup goal based on protection of marine waters. Thus in July 1991, the MCDEH authorized the Consultants to cease soil vapor extraction operations. In 1991, CalAm finished the water main work begun in 1987. CalAm trenched and removed soil and allowed the trench to remain open for about a month to allow the soil to aerate.

In August 1991, Consultants destroyed monitoring wells MW-1, MW-2, and MW-3; replacing MW-1 with a new monitoring well MW-6. See Attachment 3 for a current site map. The Consultants performed groundwater monitoring for chlorinated solvents until 1992.

The MCDEH closed the soil portion of this case on January 16, 1996, because the Site met the County cleanup goal of 450 mg/kg PCE in soil. The Central Coast Water Board did not concur with the MCDEH closure at that time. For reference, the San Francisco Bay Water Board's Environmental Screening Level (ESL) for PCE in soil is 0.7 mg/kg to protect groundwater from pollution. The San Francisco Bay Water Board's ESL for PCE in soil is 0.24 mg/kg for commercial/industrial land use and 0.087 mg/kg for residential land use. In addition, Region 9 of the USEPA has established Preliminary Remediation Goals (PRGs), and the PRG for PCE is 1.3 mg/kg for industrial soil and 0.48 mg/kg for residential soil.

The Consultants resumed groundwater monitoring for chlorinated solvents again in 1998.

In April 2001, after the facility building was demolished, the City of Monterey discovered five previously unknown USTs. Former dry cleaner operators supposedly stored Stoddard solvent in two of the tanks and heating oil in one other tank. The heating oil was most likely used to fuel the boiler. These USTs were the source for the previously discovered petroleum waste. In 2001, Consultants analyzed data from nineteen soil borings, including 36 soil samples and seven grab groundwater samples to assess the Stoddard solvent waste.

In October and November 2002, Consultants implemented a Corrective Action Plan (CAP) targeting Stoddard solvent waste constituents. The CAP included excavating and removing soil along with dewatering the groundwater from the excavation. The Consultants removed 1,200 cubic yards of impacted soil. Since some of the chlorinated solvents were co-located with the Stoddard solvent, chlorinated solvent waste constituents were also removed as a result of the CAP work. Because this work targeted removal of waste originating in USTs, Mr. Quinones and Vapor Cleaners Inc. applied for and received reimbursement from the UST Reimbursement Program for about \$400,000. After the excavation in 2002, Consultants collected confirmation soil samples from the excavation and analyzed them for both Stoddard solvent and chlorinated solvents. In December 2002, Consultants installed four new groundwater wells (MW-7, MW-8, MW-9, and MW-10) for post-remediation monitoring purposes.

Since the 2002 soil excavation, Consultants analyzed groundwater samples from the existing monitoring wells for Stoddard solvent. In a letter dated September 8, 2004, the Executive Officer required no further cleanup action regarding the petroleum wastes, and in a letter dated June 6, 2006, the Central Coast Water Board allowed the Dischargers to discontinue groundwater monitoring for petroleum wastes.

Since 2002, Consultants have used monitored natural attenuation as the cleanup remedy for remaining chlorinated solvent wastes in soil and groundwater. Consultants were performing semiannual groundwater monitoring for chlorinated solvents until December 2006.

Current Conditions:

Site Groundwater

Table 1 below lists the maximum waste constituent concentrations in groundwater detected during the last sampling event on August 24, 2006. Additionally, Attachment 6 shows these data on a site map. Since the Basin Plan designates MUN as a beneficial use for groundwater underlying the Site, the applicable water quality objectives are the MCLs. Table 1 also lists these values for comparison.

Table 1

Constituent	Monitoring Well	Concentration* (ppb)	Water Quality Objectives (ppb)
tetrachloroethene (PCE)	MW-7	16,000	5
trichloroethene	MW-7	8,500	5
cis-1,2-dichloroethene	MW-6	33,000	6
trans-1,2-dichloroethene	MW-6	1,400	10
vinyl chloride	MW-6	5,900	0.5

*Remediation Testing and Design's October 17, 2006 *3rd Quarter 2006 Semi-Annual Monitoring Report*

Nearby Surface Water Bodies

El Estero Lake:

El Estero Lake, a stormwater surface impoundment in the Park located about 200 feet across Del Monte Avenue south of the Site (see Figure 1), provides wildlife habitat. The Basin Plan designates municipal and domestic supply, groundwater recharge, water contact recreation, non-contact water recreation, wildlife habitat, cold fresh water habitat, warm fresh water habitat, fish spawning, and commercial and sport fishing as beneficial uses for El Estero Lake. However, El Estero Lake is impacted by pollutants in stormwater runoff, and has very high coliform levels since it serves as waterfowl habitat. A paddleboat concession operates on the Lake, so a current non-contact recreational beneficial use exists, in addition to the wildlife uses.

Monterey Bay:

Monterey Bay is located about 200 feet directly north of the Property. According to the Basin Plan and the Ocean Plan, the beneficial uses of Monterey Bay include water contact recreation, non-contact water recreation, industrial service supply, navigation, marine habitat, shellfish harvesting, commercial and sport fishing, wildlife habitat, mariculture, fish migration, and fish spawning.

Requests for Closure:

From 2000 to 2005, Mr. Quinones and Vapor Cleaners, Inc.'s consultants and legal counsels have requested case closure multiple times for several reasons; most frequently because no one was using Site groundwater as a drinking water source. Staff responded to these written closure requests explaining that the Central Coast Water Board's Water Quality Control Plan (Basin Plan), Chapter 2, Subsection I, page II-1, requires protection of current and anticipated beneficial uses of groundwater and thus designates all groundwater in the region as having MUN beneficial uses. Therefore, Water Board staff's position is that the Dischargers are required to clean up the Site to meet applicable drinking water standards.

Petition File No. A-1671:

In the Central Coast Water Board's September 8, 2004 letter, the Executive Officer denied Site closure. On October 8, 2004, Mr. Quinones and Vapor Cleaners Inc. filed a petition to the State Water Board because the Petitioners believed they had done enough to clean up the Site, the residual waste was not currently affecting beneficial uses and would naturally degrade, and they had complied with the Old Order and implemented a Corrective Action Plan. On June 27, 2005, the State Water Board reviewed the petition (File No. A-1671). Staff provided a response to the State Water Board, which explained the following: 1) Impacts are not limited and it is unknown whether they are localized; 2) Beneficial uses of the groundwater are specified in the Central Coast Water Board's Basin Plan; 3) Natural attenuation would likely not occur in a reasonable amount of time; 4) Monitoring is necessary in order to confirm progress toward background conditions; 5) The Corrective Action Plan was implemented, but it only targeted petroleum waste constituents; and 6) Petitioner has not complied with the groundwater remediation requirement in Cleanup and Abatement Order No. 87-99. On October 5, 2005, the State Water Board dismissed the petition because it failed to raise substantial issues.

Recent Cleanup Order / Petition File No. A-1740:

On February 9, 2006, the Executive Officer issued the Recent Cleanup Order to the Dischargers. The Recent Cleanup Order (Attachment 4) imposes deadlines for submitting and implementing a characterization plan, submitting a feasibility study to delineate waste near El Estero Lake and Monterey Bay, and monitoring and reporting requirements. On March 7, 2006, Mr. Quinones and Vapor Cleaners Inc. petitioned the Recent Cleanup Order to the State Water Board because they thought the Recent Cleanup Order was unwarranted and that there were factual inaccuracies in the Recent Cleanup Order findings. Mr. Quinones and Vapor Cleaners Inc. requested the State Water Board rescind the Recent Cleanup Order and close the case.

In our April 21, 2006 response to the State Water Board regarding Petition A-1740, Staff argued that the Recent Cleanup Order was warranted in requiring further characterization and a feasibility study in accordance with State Water Board Resolution No. 92-49, and that the Recent Cleanup Order findings were sufficient to prove a condition of pollution.

State Water Board WQ Order 2006-0010:

In 2006, the State Water Board adopted WQ Order 2006-0010 (State Board Order), which is included as Attachment 5. The State Board Order focuses primarily on the exceptions in State Water Board Resolution No. 88-63. At the hearing on the petition, State Water Board members expressed reservations about requiring groundwater cleanup in light of State Water Board staff's conclusion that site groundwater would never be used as drinking water.

The Sources of Drinking Water Policy¹ requires each regional board to designate all groundwater as MUN unless the groundwater falls within several stated exceptions. The relevant exceptions are:

1. The total dissolved solids (TDS) exceed 3,000 milligrams per liter (mg/L) (or electrical conductivity of 5,000 microSiemens per centimeter [uS/cm]) and it is not reasonably expected by Regional Boards to supply a public water system, or
2. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

The State Water Board concluded that the aquifer could yield 200 gallons per day, but TDS would exceed the above limit. Central Coast staff argued that this water could still be usable given the potential availability of desalination.² The State Water Board did not consider desalination and focused primarily on the exceptions in State Water Board Resolution No. 88-63, even though the State Board Order noted that the Porter-Cologne Water Quality Control Act protects both existing and *potential* uses. The State Board Order requires the following:

1. *The Central Coast Water Board shall consider amending its Basin Plan to de-designate groundwater beneath the Site for municipal and domestic supply.*
2. *The Central Coast Water Board members shall consider alternatives to remediation action and continued monitoring, including deed restrictions or other institutional controls.*³
3. *Compliance dates for a work plan for site characterization and submission of a list of property owners within 500 feet of the Site are extended until 90 days following any final decision of the Central Coast Water Board on amending the Basin Plan designation or 90 days following consideration of alternatives such as institutional controls, whichever is later.*
4. *Monitoring and Reporting Program (MRP) No. R3-2003-0101 shall be suspended during the period described in Paragraph No. 3 above.*

Staff requests Central Coast Water Board direction regarding requirement numbers 1 and 2. Staff discusses the Central Coast Water Board's options and applicable statewide policies further in the Discussion section below.

DISCUSSION

The following section describes: (1) the Central Coast Water Board's options to comply with State Board Order requirement numbers 1 and 2; (2) applicable policies that govern the requirements of the Central Coast Water Board's options; (3) implications of the Central Coast Water Board's decision; and (4) Staff's rationale for its recommendations.

Central Coast Water Board Options:

¹ State Water Board Order No. 88-63, incorporated into the Basin Plan as Appendix A-9, and implemented in Chapter 2, Section I.

² No such facility is proposed, and no pilot studies have been conducted, but there are desalination facilities in similar locations nearby.

³ Despite the directive in the State Board Order, using institutional controls as the sole cleanup strategy would violate current law if the MUN use is not removed.

To comply with State Board Order requirement number 1, the Central Coast Water Board may:

1. Consider the existing record and direct Staff not to prepare a Basin Plan amendment that would remove the MUN use. **This is Staff's recommendation.**
2. Defer making a decision now, but direct Staff to collect and consider additional evidence before recommending a course of action to the Central Coast Water Board.
3. Consider the existing record and direct Staff to prepare a Basin Plan amendment that removes the MUN use.

To comply with State Board Order requirement number 2, the Central Coast Water Board may:

1. If the Central Coast Water Board retains the MUN use:
 - a. Require the Dischargers to proceed with characterization and cleanup. Direct Staff to apply the water quality objective (MCL) rather than background (i.e., apply State Water Board Resolution No. 92-49) as the cleanup goal.
 - i. If cleanup proceeds to reduce waste constituent concentrations below or at the MCLs, the Executive Officer would be able to close the case and no institutional controls will be needed because the site would have unrestricted use.
 - ii. If cleanup proceeds to reduce waste constituent concentrations near but above the MCLs and Staff determine that there is no current threat to human health or the environment, the Central Coast Water Board would determine whether closure is appropriate and would require institutional controls since the Site would not have unrestricted use.
This is Staff's recommendation.
 - b. If the Dischargers can show the waste will be contained naturally or by institutional controls, establish a Containment Zone in accordance with State Water Board's Resolution No. 92-49 in lieu of further cleanup. The Central Coast Water Board would need to require institutional controls to protect human health and the environment.
2. If the Central Coast Water Board removes the MUN use, the Central Coast Water Board may require the Dischargers to obtain institutional controls to eliminate human health risks (e.g., vapor intrusion, drinking contaminated groundwater, etc.) and prevent activities that could cause the existing waste to migrate (e.g., pumping groundwater). When institutional controls are in place, the Central Coast Water Board could direct Staff to close the Site Cleanup Program case.

Requirements for Removing MUN Designation:

If the Central Coast Water Board determines the MUN designation is not appropriate, the Central Coast Water Board may direct Staff to prepare a Basin Plan Amendment to remove that use. To remove the MUN use, the Central Coast Water Board must consider the (1) Antidegradation Policy (i.e., State Water Board Resolution No. 68-16); (2) the factors set forth in California Water Code Section 13241; and (3) the Sources of Drinking Water Policy (i.e., State Water Board Resolution No. 88-63).

1. Antidegradation Policy

State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality of Waters in California" or "Antidegradation Policy") permits a Water Board to allow degradation of "high quality" waters as long as the Board makes certain findings. A high quality water is one that is of better quality than required by applicable policies or objectives. High quality waters are determined based on specific properties or characteristics. Therefore, waters can be of high quality for some constituents or beneficial uses, but not for others.⁴ With respect to polluted groundwater, a portion of the aquifer may be polluted with waste while another portion of the same aquifer may not be polluted with waste. The unpolluted portion is high quality water within the meaning of State Water Board Resolution No. 68-16. A water's high-quality status is determined as of the time the applicable policy or objective was adopted. Since the State Water Board adopted the Antidegradation Policy in 1968, "degradation" means allowing the groundwater to have a quality less than the best water quality that has existed since 1968.⁵ Since limited data are available, the Central Coast Water Board would have to use its professional judgment and estimate past water quality based on known land uses, including discharges from the Discharger's facility, over the past four decades. Staff anticipates groundwater degradation was already in place by 1968 because the facility likely started using PCE in the 1950s and discharges of waste most likely followed shortly thereafter.

To allow degradation of any high quality water, the Central Coast Water Board must find that "any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies [i.e., applicable water quality objectives]." The Antidegradation Policy applies on a constituent-by-constituent basis. If removal of the MUN use will allow an increase in constituents other than PCE and its toxic breakdown products, the Central Coast Water Board must make findings justifying those increases as well.

2. Water Code Section 13241

Water Code Section 13241 requires the Central Coast Water Board to consider the following factors when establishing or removing water quality objectives:

- Past, present, and probable future beneficial uses of water.
- Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
- Economic considerations.
- The need for developing housing within the region.
- The need to develop and use recycled water.

⁴ SWRCB Order No. WQ 91-10

⁵ Administrative Procedures Update 90-004, p. 4. If a regional board permitted degradation after 1968 then the "baseline" for the antidegradation analysis is the permitted level of lowered water quality. *Ibid.* Since the PCE discharges at issue in this case were unpermitted, 1968 water quality is the standard for antidegradation.

3. Sources of Drinking Water Policy

Finally, before removing the MUN use, the Central Coast Water Board must determine whether the groundwater fits within an exception to State Water Board Resolution No. 88-63 (i.e., Sources of Drinking Water Policy). The Sources of Drinking Water Policy requires each Regional Board to designate all groundwater as MUN unless the groundwater falls within several stated exceptions (i.e., high TDS concentrations or low groundwater yield).

The Central Coast Water Board's Basin Plan incorporated State Water Board Order No. 88-63 as Appendix A-9, and implemented it in Chapter 2, Section 1 by designating all groundwater within the region to have the MUN beneficial use.

State Water Board staff's Technical Report (Attachment 7) identified that Site groundwater may meet several exceptions of State Water Board Resolution No. 88-63. The Technical Report concluded that the aquifer is not a potential drinking water source because the groundwater TDS level "...varies spatially, seasonally, and historically..." The Technical Report also concluded that "a domestic supply well (with a 20 foot sanitary seal) constructed at the site would likely be capable of producing greater than 500 gallons per day. However, the water produced would, likely have a TDS concentration of 5,000 to 10,000 ppm."

Staff does not agree that the groundwater could not be used as a drinking water source; however, Staff would need to consider it further if the Central Coast Water Board provides direction to pursue de-designation. Staff would need to gather information regarding volume and TDS concentrations of potential yields, evidence of the feasibility and likelihood of desalination at the Site, the need to protect the aquifer's availability for such use, and how large an area should be de-designated. It is likely that field studies, such as aquifer pump tests, would be needed to gather this information.

Requirements for Applying Institutional Controls:

The Central Coast Water Board must consider Water Code Section 13307.1(c) when determining whether to require deed restrictions.

1. Water Code Section 13307.1(c)

Water Code Section 13307.1(c) requires Water Boards to record a land-use restriction (e.g., deed restriction) on a property before closure if the Water Board finds that the property is not suitable for unrestricted use (i.e., there exists a potential threat to public health, safety, or the environment).

Implications of the Board's Decision Regarding the MUN Designation:

Retain MUN Use

If the Central Coast Water Board retains the MUN designation, the Discharger must clean up the waste to meet water quality objectives or meet the Containment Zone requirements.

As required by State Water Board Resolution No. 92-49, cleanup orders for solvent sites generally require the discharger to undertake active remediation to achieve water quality objectives within a reasonable time. The Central Coast Water Board must determine what is reasonable, considering demands made, or to be made, on the waters, public health and environmental risks, and the need to mitigate those risks, the discharger's financial and technical resources with respect to time schedules only, and environmental characteristics of the hydrogeologic unit (see Resolution No. 92-49, Finding 5.d and Section III.H).

Cleanup levels may exceed water quality objectives if the discharger can meet the Containment Zone requirements of State Water Board Resolution No. 92-49. The Containment Zone requirements include that the discharger demonstrate and maintain containment of the plume within a containment zone. Other requirements include removal of waste constituents from soil and groundwater to the extent reasonable; mitigation of public health impacts; a management plan to assess, cleanup, abate, manage, monitor, and mitigate the remaining significant human health, water quality, and environmental impacts; mitigation measures, which may include off-site cleanup; and containment of the waste within the designated containment zone.

Remove MUN Use

If the Central Coast Water Board removes the MUN designation, it must reconsider the Recent Cleanup Order requirements under State Water Board Resolution No. 92-49.

State Water Board Resolution No. 92-49 is the State Water Board's policy for site cleanup. It stipulates that the Water Board requires the Dischargers to clean up waste to background levels, unless background levels cannot be restored. "Background" generally means solvents are removed to non-detect levels. If background levels cannot be restored, State Water Board Resolution No. 92-49 requires the cleanup to achieve the level that is economically and technically feasible and meets the applicable water quality objectives. If the MUN use were removed, there would be no applicable groundwater water quality objectives. If the groundwater plume discharges to surface waters, the impact on surface water beneficial uses and corresponding water quality objectives must be considered in determining the cleanup level. The Central Coast Water Board would also have to consider whether leaving the waste in place would create a nuisance. Given the high levels of PCE that remain, there is a high likelihood that indoor air vapors would pose an unacceptable health risk in any structures overlying the plume. The Central Coast Water Board can mitigate these risks through the use of institutional controls, which are discussed below.

After considering these factors, the Central Coast Water Board could require further monitoring and/or some additional cleanup. For example, the Central Coast Water Board could require removal of some of the waste in order to reduce indoor air intrusion, but not require cleanup to achieve non-detect concentrations. Alternatively, the Central Coast Water Board could close the Site with no further action. In the latter case, the Central Coast Water Board should require a deed restriction and/or local zoning ordinances in the City of Monterey and Monterey County as a condition of a no-further-action letter.

Institutional Controls

Under either of the above scenarios, the Central Coast Water Board must require the current property owner, the City of Monterey, to record a deed restriction before closing the Site with waste in place, and should consider other types of restrictions.

To comply with the State Board Order, the Central Coast Water Board must "consider alternatives to remediation action and continued monitoring, including deed restrictions or other institutional controls."

Because institutional controls would not achieve water quality objectives, these controls alone would not satisfy State Water Board Resolution No. 92-49 or the Antidegradation Policy unless the Central Coast Water Board removes the MUN use. If the Central Coast Water Board decides not to remove the use designation, the Central Coast Water Board may consider institutional controls as a means to justify using the water quality objective rather than background (i.e., complete removal) as the cleanup goal. Institutional controls are

usually considered at the conclusion of a cleanup, not at the outset, except to control access while the cleanup is ongoing.

Even if the MUN use is removed, the Central Coast Water Board has to comply with California Water Code Section 13307.1(c). If the high solvent concentrations below the Site create a public health risk, the Central Coast Water Board must obtain appropriate institutional controls from the current owner of the Site and, depending on the size of the plume, neighboring property owners. If the Central Coast Water Board cannot obtain these controls, the Water Code prohibits site closure.

The following restrictions may be applicable to Site, which is currently owned by the City of Monterey:

- Development of the property shall be restricted to open space (i.e., no structures).
- No subsurface excavation work shall be conducted without a local permit and written approval by the Central Coast Water Board's Executive Officer. Any contaminated soils brought to the surface shall be managed and disposed of in accordance with all applicable local, state, and federal laws.
- No wells within a specified distance may be used or constructed for domestic, industrial, or agricultural water supply.
- A representative of the Central Coast Water Board shall have reasonable access to the property.

The City of Monterey also owns properties adjacent to the Site. Third parties own other parcels that may be impacted by chlorinated solvent waste in groundwater, which may pose contact or indoor air exposures. At this time, Staff does not know the extent of chlorinated solvent impacts under these properties. Additional investigation is needed to determine whether the plume poses potential health risks in these locations, including risks due to indoor air exposure.⁶ Staff has notified the Discharger that Staff will not recommend closing the Site without these data. In the event that data show that there are soil and/or groundwater impacts, deed restrictions will likely be required for those properties.

Groundwater pumping outside of the Site could cause the solvent plume to migrate off the property. Staff is not aware of anyone currently pumping nearby groundwater, but it could occur in the future. In order to ensure containment of the plume to properties with appropriate deed restrictions, the City of Monterey would have to adopt and enforce a well prohibition zone ordinance. The boundary line of the zone would be determined based on several factors, including the aquifer characteristics. The ordinance would prohibit construction or use of groundwater extraction wells within the prohibition zone. A Cleanup and Abatement Order or other enforceable order of the Central Coast Water Board would be necessary to ensure the City of Monterey properly implemented this requirement unless the City of Monterey and Central Coast Water Board obtained deed restrictions over these parcels.

Additionally, Monterey County may have to participate in a groundwater well prohibition zone since it is the agency that issues well construction permits. If any well permits resulted in, or threatened to cause, migration of the plume, Monterey County would be permitting the discharge of waste, as would the well users. This would subject Monterey County and well

⁶ AB 422 recently added Water Code section 13304.2, which allows the Water Board to require a health risk assessment for a "brownfield" and specifies what the assessment must include. This site is not a brownfield as defined in AB 422, but may fit the definition if the City of Monterey proposes to redevelop the site.

users to potential cleanup liability. However, until such uses were occurring or threatened, the Central Coast Water Board lacks jurisdiction over Monterey County and potential well users.

On October 3, 2007, Staff sent a letter to the City of Monterey (current property owner) to request input on their position regarding potentially using institutional controls as part of the final cleanup remedy for the Site. The letter requested the City of Monterey's response to potential proposals for institutional controls as outlined above. Staff has not received a written response to our request, but Staff understands that the City of Monterey is planning to take the matter before their City Council in March. If Staff obtains further information from the City of Monterey before March 21, 2008, Staff will provide the information to the Central Coast Water Board for consideration with this item. Additionally, Staff understands that the City of Monterey does not foresee a problem allowing institutional controls on the properties they own but is unsure about proceeding with a well prohibition zone, if one is necessary.

Staff's Rationale for Recommendations:

Staff recommends the Central Coast Water Board retain the MUN beneficial use designation for groundwater under this Site for several reasons:

1. The groundwater could potentially be used for MUN use in the future using desalination treatment, as is evidenced by numerous desalination projects along the Monterey Bay margin.
2. The extent of waste constituents and potential health and ecological risks are unknown.
3. Dense non-aqueous phase liquid (DNAPL) is present in Site soil and groundwater. Thus, leaving waste constituents in place without further cleanup could impact the groundwater for hundreds of years or more.
4. The Discharger has not removed the source of chlorinated solvents, nor provided a feasibility study to show that doing so would be technically or economically infeasible.
5. The action might set precedence for the many other active cleanup sites with similar saline groundwater conditions throughout the Central Coast Region.

Additionally, Staff recommends the Central Coast Water Board require the Dischargers to clean up waste to, at a minimum, water quality objectives in accordance with State Water Board Resolution No. 92-49.

1. Desalination

As water demand escalates, saltwater desalination is an increasingly popular drinking water supply alternative. Various entities in the Monterey Bay Area are already implementing or planning to use this technology. Current desalination plants on Monterey Bay include Marina Coast Water District, Moss Landing Power Plant, and Monterey Bay Aquarium.¹ In addition, planned desalination plants include City of Santa Cruz, California American Water Company's Coastal Water Project, Pajaro Sunny Mesa's Monterey Bay Regional Desalination Project, Marina Coast Water District, City of Sand City Water Supply Project, Monterey Peninsula Water Management District's Sand City Desalination Project, and Ocean View Plaza.¹ The Ocean View Plaza project is located only about one mile northwest of this Site. This Central Coast Water Board has already permitted the seawater intake and

¹ http://www.ambag.org/Desal%2006/AMBAG_DRAFT_Desal_Study.pdf

brine discharge from several of these desalination plants. Note that many of these proposed facilities, including Ocean View Plaza, have located their saltwater intake points below ground surface to mitigate species entrapment/entrainment impacts resulting from open water intakes.

Currently this Site is zoned for open space. However, it is possible that a water supply entity could construct a desalinization plant near the Site. The plant could use beach wells for intake water, similar to both the Marina and Sand City desalination plants. Thus, Staff does reasonably expect that the groundwater could supply a public water system, and therefore does not qualify for exemption under State Water Board Resolution No. 88-63. The beach wells could capture the solvent waste from the Site, thereby requiring the water supplier to treat the solvents in conjunction desalination. The necessity for additional treatment would put an unreasonable cost burden on the water supplier.

2. Extent of Waste Constituents

As explained above, the Recent Cleanup Order required further characterization of the extent of chlorinated solvents in soil and groundwater. The Dischargers have not collected sufficient data to determine whether contaminated groundwater is discharging into either El Estero Lake or Monterey Bay. If either case occurs, there might be human or ecological risks associated with the discharge and degradation of beneficial uses in those water bodies. In 1987, Consultants constructed three monitoring wells (see Attachment 2), MW-1 near the source area, MW-2 near Monterey Bay, and MW-3 near El Estero Lake. MW-2 contained a concentration of 11.3 ppb total volatile organic compounds (VOCs) and MW-3 did not contain detectable VOCs. The Consultants reportedly destroyed both MW-2 and MW-3 in 1991 because they believed that these wells were located too far from the Site to be of any importance. As such, groundwater in those areas has not been monitored since 1991. The Consultants have analyzed two samples from El Estero Lake in 1987 and 1997; both surface water samples did not contain detectable VOCs. Monitoring wells MW-6 and MW-7 are currently the closest monitoring wells to Monterey Bay and El Estero Lake, respectively. Both MW-6 and MW-7 continue to contain high chlorinated solvent concentrations (the highest concentrations of all existing monitoring wells). Therefore, Staff believes further characterization and confirmation sampling of groundwater near El Estero Lake and Monterey Bay is necessary to confirm these surface water bodies are not being impacted by the chlorinated solvent waste.

3. Presence of Dense Non-Aqueous Phase Liquid

DNAPL is a liquid phase product that is denser than water and thus sinks within a groundwater aquifer or attaches to soil and fills aquifer voids as it is sinking. Liquid phase PCE discharged at this Site is considered a DNAPL. As water passes the DNAPL source, some of the product dissolves into the groundwater. Dissolved-phase PCE concentrations found in groundwater at the Site have been up to 170,000 ppb in MW-7 (December 2002). The solubility of PCE in water is 200,000 micrograms/liter ($\mu\text{g/L}$ or ppb). Groundwater concentrations at or near the solubility of PCE indicate the presence of DNAPL. Additionally, Remediation Testing and Design reported observation of a product "sheen" in a grab groundwater sample taken on November 13, 2001, indicative of DNAPL presence. The Dischargers have not characterized the DNAPL source or determined that the DNAPL is limited in extent.

4. Cleanup Feasibility/Natural Attenuation

Additionally, Dischargers have not removed the DNAPL source area. As mentioned in the Site Investigation and Cleanup section before, Dischargers have performed the following

cleanup activities targeted at removing solvent waste: trenching, soil vapor, and some soil and groundwater removal. No active cleanup, since the vapor extraction, has targeted removing the chlorinated solvents. So, as part of the Recent Cleanup Order, the Dischargers are required to submit a cleanup feasibility study, which would evaluate the types of cleanup technologies available and the economic and technical feasibility for each technology. If the Central Coast Water Board were to consider a Containment Zone, State Water Board Resolution No. 92-49 would also require the Dischargers to perform chlorinated solvent source removal.

Without any further source removal, it will take a very long time for all the DNAPL to actually dissolve into water and attenuate (disperse, dilute, vaporize, degrade, adhere to soil, etc.). Natural Attenuation is usually only a successful final cleanup remedy after the source of waste has been removed. The residual DNAPL is expected to affect the volume of surrounding groundwater for a significant period of time. Both Central Coast Water Board and State Water Board staff estimate natural attenuation of the waste at the Site may take hundreds of years or more.

5. Set Precedence

De-designating the MUN beneficial use for this groundwater might set precedence for the many other active cleanup sites with similar saline groundwater conditions in our region. Since our region is a coastal one, many of our coastal communities currently have cleanup sites within groundwater that is saline or limited in extent. Previously, Staff and this Central Coast Water Board have determined cleanup in accordance with State Water Board Resolution No. 92-49 and our Basin Plan (which states all groundwater [except for the Soda Lake Sub-Basin] as having the present and potential MUN beneficial use).

CONCLUSION

The Central Coast Water Board may retain the MUN use designation, consider removing the MUN use after Staff develops a Basin Plan Amendment, or direct Staff to study the issue in more detail before making a decision.

If the Central Coast Water Board removes the MUN use, it may close the Site without further cleanup, as long as appropriate deed restrictions and protection of public health and the environment are implemented. In order to determine which properties the deed restrictions should cover, Staff recommends the Central Coast Water Board require further health risk analysis.

If the Central Coast Water Board does not remove the MUN use, it may either require additional cleanup that attains water quality objectives, or establish a Containment Zone that complies with State Water Board Resolution No. 92-49.

RECOMMENDATION

Staff recommends retaining the MUN designation for groundwater under this Site for the reasons identified above. Staff recommends the Central Coast Water Board require the Dischargers to clean up waste to meet water quality objectives. If the Central Coast Water Board directs Staff to retain the MUN use, the Dischargers will be required to comply with the Recent Cleanup Order requirements according to the timeframe established in the State Board Order.

ATTACHMENTS

1. Overview Map
2. Historical Site Map
3. Current Site Map
4. Recent Cleanup Order
5. State Board Order
6. Map with August 24, 2006 data
7. State Water Board's Technical Report

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