

STATE OF CALIFORNIA  
REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING MAY 8, 2009

ITEM NUMBER: 10

SUBJECT: Underground Storage Tank Program & MTBE Cases

DISCUSSION

Underground Storage Tank Program & MTBE Cases

*New information for this report in italics*

Central Coast Water Board staff oversees cleanup activities on numerous petroleum underground storage tank (UST) cases involving methyl tertiary-butyl ether (MTBE). Central Coast Water Board staff provides updates on four high profile MTBE cleanup cases below. Staff has also attached a list of sites with MTBE in groundwater providing an overall perspective of the region-wide impact of these releases. The attachment shows maximum MTBE concentrations reported in the third and fourth quarters of 2008. The final attachment is the Underground Tanks Summary Report.

Chevron Service Station, 2194 Main Street, Cambria, San Luis Obispo County [John Mijares (805) 549-3696]

Chevron Cambria service station, located on the corner of Main Street and Burton Drive in Cambria, has been a Central Coast Regional Water Quality Control Board (Central Coast Water Board) lead groundwater investigation and cleanup case since December 1993. In 1995 Chevron Products Company commissioned the removal of a UST system and transferred ownership of the service station to an independent owner/operator who installed a new UST system.

Chevron is cleaning up a petroleum hydrocarbon discharge, including the fuel additive MTBE, from the original UST system. The discharge threatened groundwater in Cambria Community Service District (CCSD) Wells No. 1 and 3, which provide supplemental water to the community of Cambria.

As part of interim corrective action beginning in May 2000, Chevron continuously pumped MTBE-contaminated water from four onsite wells. Currently, there are 15 shallow groundwater extraction wells in operation. Beginning in November 2000, Chevron began full operation of groundwater extraction and high-vacuum, dual-phase extraction systems. Both systems operate continuously, except for periodic system upgrade, mechanical breakdowns, and system maintenance activities. Extracted and treated groundwater is stored in an onsite, 15,000-gallon tank until it is trucked offsite for disposal at the Santa Maria Wastewater Treatment Plant.

During a November 2001 technical work group meeting with Central Coast Water Board staff, CCSD representatives, and Chevron representatives, the CCSD indicated the new temporary high school well had been connected to the Cambria municipal drinking water supply. The CCSD needs the high school well as an alternative water supply. The CCSD installed a wellhead

treatment system on their Santa Rosa Creek wells which will enable well use in the event of an emergency. The Santa Rosa Creek Wells have not been impacted with MTBE.

*On May 18, 2004, the Central Coast Water Board's Executive Officer rescinded Cleanup or Abatement Order (CAO) No. 00-28. The CAO required Chevron to provide CCSD with alternative water supply due to loss of CCSD's Well Nos. 1 and 3. The settlement agreement between CCSD and Chevron explicitly resolves all of CCSD's claims against Chevron, including claims for an alternative water supply.*

Since the Last Staff Report:

*The Fourth Quarter 2008 Groundwater Monitoring and Remediation Status Report indicates the following:*

- *Monitoring wells within the plume boundaries continue to exhibit MTBE and tertiary butyl alcohol (TBA) concentrations exceeding the cleanup goals of 5 micrograms per liter ( $\mu\text{g/L}$ ) and 12  $\mu\text{g/L}$ , respectively; however, current concentrations have decreased significantly compared to historical maximum values. The fourth quarter 2008 maximum MTBE concentration was detected in piezometric well P-5 at 620  $\mu\text{g/L}$  and the maximum TBA concentrations was detected in monitoring well MW-7 at 170  $\mu\text{g/L}$ . Historically, maximum concentrations of MTBE and TBA were as high as 5,500  $\mu\text{g/L}$  and 8,800  $\mu\text{g/L}$ , respectively. Shallow-zone MTBE and TBA isoconcentration maps are shown on Attachments 1 and 2, respectively.*
- *Monitoring wells historically located beyond the plume boundaries continue to be free of detectable concentrations of MTBE and TBA.*
- *The high-vacuum, dual phase extraction system was not operated during the fourth quarter 2008. Chevron started an oxygenated groundwater infiltration system at the site to enhance the biodegradation of the petroleum hydrocarbon plume.*
- *The groundwater extraction and treatment (GWET) system operated during the reporting quarter. The GWET system extracted and treated approximately 15,000 gallons of groundwater during the fourth quarter; 10,000 gallons were aerated and re-infiltrated into the subsurface (as described in the following bullet) and the remaining 5,000 gallons were disposed at the City of Santa Maria wastewater plant.*
- *On October 15, 2008, Stantec Consulting Corporation (Stantec) initiated the infiltration of oxygenated water at the site. Approximately 10,000 gallons of treated and oxygenated groundwater were infiltrated into the source-zone via infiltration wells MW-1R, HVE-4 and HVE-11. Stantec will continue the oxygenated groundwater infiltration activities, sample collection and analysis to evaluate performance of the enhanced in-situ bioremediation technology.*

*Attachment 1: Shallow Zone Groundwater MTBE Isoconcentrations December 2008*

*Attachment 2: Shallow Zone Groundwater TBA Isoconcentrations December 2008*

**California Water Service Supply Wells, Pajaro Street and Bridge Street, Salinas, Monterey County [John Goni (805) 542-4628]**

In February 2002, California Water Service Company (CWSC) in Salinas notified Central Coast Water Board staff that monitoring indicated MTBE in two domestic supply wells in the Salinas area. Central Coast Water Board staff's review of known leaking underground tank cases near the wells found no active cases with high concentrations of MTBE in the area. Further investigation revealed a gasoline distributor (with 100,000 gallons of fuel product storage) close to the well, but a subsequent site investigation showed no evidence of a fuel release to underlying groundwater. Staff continued their investigation and directed other permitted underground tank facilities without previously reported leaks to perform groundwater investigations. These investigations failed to find a release of MTBE of significant size to account for the contaminant in the supply wells.

In an effort to expand the investigation, Central Coast Water Board staff assisted the Monterey County Water Resources Agency (Agency) in applying to the State Water Resources Control Board (State Water Board) for Cleanup and Abatement Account money to fund additional groundwater sampling. The State Water Board approved the allocation of cleanup and abatement funds to perform additional investigation and approved the contract between the Central Coast Water Board and the Agency.

The Agency subsequently hosted an informational meeting for prospective consultants for approximately 25 representatives of potential responsible parties and consulting firms. As a result of the informational meeting, the Agency received and evaluated seven conceptual proposals for the investigation, developed a scope of work, asked for bids, and ultimately executed a contract with Todd Engineers in May of 2008. Todd Engineers completed the work for the first phase of the investigation which included assembling background information, confirming the time line of MTBE occurrences in the Salinas area water supply wells, determining the mass of MTBE intercepted by the wells, and indentifying potential sources of MTBE and potential conduit wells using hydrogeologic and environmental information.

The second phase of the investigation calls for shallow wells to determine if the shallow groundwater zone is a source of MTBE. The investigation will also determine if the water supply wells could be affected by contaminants from the shallow zone. Todd Engineers plans an isotope sampling program for coordinated testing of shallow zone groundwater near the affected water supply wells and known leaking underground tank cases in the area. Common shallow groundwater characteristics identified by the isotope testing will "fingerprint" each groundwater source area. Any common shallow groundwater fingerprints found between the water supply wells and leaking tank cases will indicate possible sources of MTBE.

**Since the Last Staff Report:**

*Todd Engineers completed the monitoring well design and selected well locations. Access arrangements with CWSC are ongoing. The isotope testing will proceed as planned. Todd Engineers plans well installation and isotope sampling for spring 2009.*

**Camp Evers Combined Site (Four Gasoline Service Stations) Mount Hermon Road and Scotts Valley Drive, Scotts Valley, Santa Cruz County [Wei Liu (805) 542-4648]**

Petroleum hydrocarbons including benzene, 1,2-dichloroethane (1,2-DCA) and MTBE were first detected in groundwater beneath the Tosco, Shell, BP, and Chevron service stations located at the intersection of Mount Hermon Road and Scotts Valley Drive in the mid-1990s. Previous onsite corrective actions at the Tosco, Shell, and BP sites included soil vapor extraction, air sparging, dual phase extraction, and/or groundwater extraction to remediate the MTBE plume. Chevron has continued remediation of the benzene plume. The onsite corrective actions have successfully removed MTBE and other gasoline constituents from groundwater directly beneath the four service station sites and onsite remediation has been discontinued at all four sites.

A monitoring event in the late 1990s showed that an MTBE plume mass detached from the original plume and migrated to a downgradient offsite location beneath the nearby King's Village Shopping Center. The historic maximum MTBE concentration, recorded in May 1999, was 38,300 micrograms per liter ( $\mu\text{g/L}$ ). In addition, both benzene and MTBE have been detected in the adjacent Manana Woods water supply well and this well was fitted with a wellhead treatment system to remove these contaminants.

The responsible parties installed a permanent groundwater pumping and treatment system at the King's Village Shopping Center in November 2002, to remediate and hydraulically control the detached plume. Treated groundwater is discharged to the City of Scotts Valley sanitary sewer.

Groundwater generally flows towards the North-Northeast in the Camp Evers area. The following table provides concentration ranges for the furthest well downgradient from the source (CEMW-21A, B, C, see Attachment 3) for the last four quarters of groundwater monitoring:

Volatile Organic Compound	Groundwater Cleanup Goal ( $\mu\text{g/L}$ )	Concentration range in Groundwater – last four quarters ( $\mu\text{g/L}$ )
TPHg	1,000	ND
Benzene	1	<1 – 5.1
Methyl tertiary Butyl Ether (MTBE)	5	<1 – 4.7
Tertiary Butyl Alcohol (TBA)	12	<1 – 7.9
Toluene	150	ND
Ethylbenzene	300	ND
Xylenes	1,750	ND

ND Not detected above Method Detection Limit

Since the Last Staff Report:

*Fourth Quarter 2008 groundwater sample results indicate maximum MTBE concentrations of 41  $\mu\text{g/L}$  in onsite monitoring well (Tosco's) RW-2, and 150  $\mu\text{g/L}$  in offsite monitoring well CEMW-9 which is located upgradient of groundwater extraction well CEEW-1 (see Attachment 3 for well locations). Monitoring results showed a maximum concentration of 1,400  $\mu\text{g/L}$  TBA in downgradient offsite monitoring well CEMW-6. The treatment system has reduced MTBE*

concentrations in well CEMW-6, which historically had the highest MTBE concentrations, from a maximum of 38,300  $\mu\text{g/L}$  in May 1999 to non-detect ( $< 1.0 \mu\text{g/L}$ ). In addition, MTBE concentrations in downgradient offsite well CEMW-16, which is near the groundwater pumping and treatment system, have fallen from 4,710  $\mu\text{g/L}$  in January 2001 to 4.1  $\mu\text{g/L}$ . Wells CEMW-6 and CEMW-16 are located upgradient of groundwater extraction well CEEW-1.

The downgradient offsite remediation system has removed more than 23.7 million gallons of water, 340.4 pounds (lbs) of TPH, 11.4 lbs of benzene, 66.7 lbs of MTBE, and 28 lbs of TBA since November 26, 2002.

Attachment 3: Well Location Map

**Quik Stop Market No. 78, 5505 Soquel Drive, Soquel, Santa Cruz County [Tom Sayles (805) 542-4640]**

Quik Stop Market No. 78 (Quik Stop) is an operating gasoline service station located on the corner of Soquel Drive and Hardin Way in Soquel. The site has been a Central Coast Water Board-lead groundwater investigation and cleanup case since June 1999.

A permanent dual-phase (soil vapor and groundwater) treatment system has been operating at the site since July 5, 2002. Treated groundwater is discharged to the sanitary sewer under a County of Santa Cruz Permit (No. 00002829) and a catalytic oxidizer treatment system operates under a Monterey Bay Unified Air Pollution Control District permit (No. 11054).

Quik Stop installed three additional vapor extraction wells in December 2003 to enhance cleanup system effectiveness. In addition, Quik Stop converted one on-site monitoring well into a 4-inch diameter well to enhance groundwater extraction efficiency. The highest historic concentration of MTBE was 230,000  $\text{pg/L}$  in monitoring well MW-4 (near the source area) on March 2, 2000.

Since the Last Staff Report:

Fourth Quarter 2008 monitoring samples showed a maximum concentration of 2.6  $\mu\text{g/L}$  MTBE in onsite monitoring well MW-4R (see Attachment 4, Site Map). Samples also showed a maximum concentration of 1,780  $\mu\text{g/L}$  TBA in onsite extraction well RW-2. The MTBE and TBA concentrations are highest near the fuel tank complex, which is consistent with past quarters. Quik Stop samples Nobel Creek at four downgradient locations. Quik Stop sampled the creek on December 4, 2008. All creek samples were below detection limits for MTBE and TBA.

Groundwater extraction pumps continue to operate in extraction wells RW-2, RW-3, and MW-4R and cleanup is ongoing.

The remediation system has removed approximately 878,040 gallons of water, 929.83 pounds of MTBE, and 259.63 pounds of TBA since system start up in April 2001. Based on the current data, Central Coast Water Board staff requested Quik Stop to complete an evaluation of the current remedial system and provide a proposal to either enhance the

*current remedial system or propose an alternative remedial action to clean up the remaining contaminants. Water Board staff is currently reviewing Quik Stop's workplan proposal and will update the Board in a subsequent MTBE report*

Attachment 4: Site Map

### **Regionwide MTBE List**

*The Regionwide MTBE Listing and High Priority Sites list is included as Attachment 5. The list shows site names and addresses as well as the priority listing (Rank A, B, or C) based on State Board MTBE guidelines. Central Coast Water Board staff has required accelerated cleanup at some higher priority Rank A sites. We require interim cleanup action as soon as technically feasible until full-scale cleanup activity can begin. MTBE cleanup goals are typically set at the secondary maximum contaminant level (MCL) for drinking water of 5 micrograms per liter ( $\mu\text{g/L}$ ), which is a taste and odor threshold. The primary MCL, based on threat to public health, is 13  $\mu\text{g/L}$ .*

Attachment 5: Region Wide MTBE Listing and High Priority Sites

### **Underground Tanks Summary Report**

Attachment 6 is a summary of Underground Tank Program activities and includes new and closed cases for this fiscal year. The table also shows the number of currently active cases in the the region, the total number of closed cases since the beginning of the program and cases pending closure. Cases pending closure have met closure criteria but will not be officially closed until the responsible party has properly destroyed all monitoring and treatment wells at the site.

Attachment 6: Underground Tanks Summary Report