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**HEALTH CARE SERVICES**
AGENCY
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12-2-03

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December 1, 2003

Ms. Terry Brazell
State Water Resources Control Board
Underground Storage Tank Program
1001 I Street, Sacramento, CA 95814

Dear Ms. Brazell:

Subject: Naming of Responsible Parties, ROOOOO374, Cal Gas, 15595 Washington Avenue, San Lorenzo, CA 94580

This letter responds to the petitions of Mr. Jeffrey Podawiltz representing ChevronTexaco and the naming of ChevronTexaco as a secondary responsible party for the referenced site; of Ms. Mary Taylor representing Ms. Agnes Calleri and the naming of Ms. Calleri as a secondary responsible party for the referenced site; and it supplements our office's November 3, 2003 response to the petition of Ms. Marjorie Kanyer and the Kubo Trust.

**RESPONSIBLE PARTY IDENTIFICATION**

Alameda County Environmental Health (ACEH) named the Kubo Trust, ChevronTexaco, Mr. and Mrs. Calleri, and Mr. Mohammadian responsible parties, as defined under California Code of Regulations, Title 23, Division 3, Chapter 16 (California Underground Storage Tank Regulations), Article 11, Section 2720. Section 2720 defines a responsible party (RP) as any one of four ways.

- "Any person who owns or operates an underground storage tank used for the storage of any hazardous substance" or
- "In the case of any underground storage tank no longer in use, any person who owned or operated the underground storage tank immediately before the discontinuation of its use" or
- "Any owner of property of property where an unauthorized release of a hazardous substance from an underground storage tank has occurred" or
- "Any person who had or has control over an underground storage tank at the time of or following an unauthorized release of a hazardous substance."

Based on these definitions, ACEH identified responsible parties for this site as follows:

Mr. and Mrs. Calleri owned the property from August 1974 to June 1983. The Calleris were the last owners and operators of the 2nd generation USTs which remained in place at the site through 1986 and from which an unauthorized release was documented in August 1986. Thus the Calleris meet the second definition of an RP.

ChevronTexaco owned the property from June 1983 to December 1986. The 2nd generation of USTs remained in place at the site at this time, however ChevronTexaco reportedly did not store nor dispense fuel at the site during their ownership. ChevronTexaco removed the second generation USTs in 1986. A petroleum release was confirmed in August 1986 when monitoring

wells were installed and soil and groundwater contamination was detected. Thus ChevronTexaco meets the third and fourth definitions.

Mr. Bertram Kubo owned the property from December 1986 to June 1990. Mr. Kubo installed (February 1987), owned, and operated the3rd generation USTs at the site. Thus Mr. Kubo/Kubo Trust meets the third and fourth definitions.

Mr. Mohammadian has owned the property from June 1990 to date. Mr. Mohammadian owned and operated the 3rd generation USTs. In 1998, a significant release(s) of MTBE to groundwater was reported indicating a new unauthorized release occurred at the site. Thus Mr. Mohammadian meets the first, third, and fourth definitions.

Therefore, the County determines that the four responsible parties identified above have been properly named.

Additionally, Cambria and attorneys for Chevron assert that ACEH refused to consider and discuss re-designation of RPs at this site with Chevron. ACEH notes that it had multiple phone conversations with Ms. Karen Streich of Chevron both before and after re-designation of the RPs for this site. Discussions included how RPs were identified for this site as well as the technical merits of Cambria's June 16, 2003 assessment of site conditions.

The SWRCB issued order WOO 2002-0021, which responded to the petition of Mr. Mohammadian for review of Alameda County's Notice of Revision to Responsible Party Designation (to remove Texaco and the Calleris from the list of responsible parties). Item 2 of the order's conclusion states, "It is not appropriate for an LOP agency to remove a person who has been properly named as a responsible party for cleanup of an unauthorized release at a site unless it finds, by a preponderance of the evidence, that constituents from that party's release, when taken in conjunction with commingled constituents from another release(s) that have similar effects on beneficial uses, do not contribute to the need for cleanup at the site." Further, Page 11 of the order states "What the County did not consider, and what must be determined by the County on remand is whether the constituents attributable to the release that occurred during or prior to the Calleri's ownership and which persisted at the site while Texaco owned the property, taken in conjunction with the other constituents at the site having similar effects on beneficial uses, are contributing to the current need for corrective action."

**TECHNICAL COMMENTS**

ACEH staff has reviewed the historical data from the 1986 subsurface investigation for the site and Cambria's June 16, 2003, assessment of site conditions and has determined the following regarding the environmental conditions at the site in 1986:

1) **Groundwater Analytical Data** - Limited groundwater analysis was performed at this site during the initial investigation. A review of data for the site indicates the following:

   - Up to 220 ppb Benzene, 390 ppb Toluene, and 680 ppb Xylene were detected in water samples collected from the site.
   - Water samples were not analyzed for TPHG.
   - Monitoring well were not installed in the area of or immediately downgradient of the location of the highest groundwater contamination detected, north/northwest of the pump islands.
   - Cambria states that hydrocarbons were not detected in groundwater from SB3. ACEH notes that soil and water samples were not collected nor analyzed from SB3,

located downgradient of the USTs. Therefore it cannot be determined whether or not groundwater was contaminated at that location.

2) **Lack of Depth-Discrete Soil Analytical Results** - Although strong petroleum odors were noted in almost all of the boring logs of the wells and borings installed around the 2nd generation USTs and the dispenser islands, no discrete soil samples were collected for chemical analysis. Soil samples collected were composited along the borehole for analysis as a single sample and were ND for total fuel hydrocarbons and BTX. These results cannot reliably represent soil contamination that may have been present at discrete depths.

3) **Soil and Groundwater Investigations Have Been Limited in Depth** - Soil borings were terminated at 15' bgs regardless of whether areas of obvious contamination were observed at the bottom of the borings. The boring logs indicated that obvious contamination was observed at completion depth thereby leaving the vertical extent of contamination undefined. Further, boring logs from subsequent investigations at the site, also of limited depth, indicate the presence of root holes, and increasing sand and gravel content at depths below 16' bgs, suggesting that a more permeable geology may underlie areas where contamination was observed. Thus, the site consultants' investigations may not have been conducted to sufficient depths to determine whether or not underlying more permeable strata may have been impacted. These strata could be preferred pathways for off site migration of dissolved contaminants.

A review of geologic logs from fuel leak sites in the vicinity of the subject site suggest that permeable units are present in the shallow aquifer beneath the subject site. Data from the Shell site at 15275 Washington Avenue document the presence of silty sand and sand at depths of 23' - 25' bgs to boring completion depths of 40' bgs. The likelihood of coarse-grained sediments occurring beneath the shallow fine-grained sediments at the subject site should come as no surprise and should have been anticipated by Cambria and other consultants working at the site; the existence of extensive coarse-grained sediments at depths below 20'-25' bgs throughout the East Bay Plain is well documented in the technical literature[1] resulting from coarse-grained alluvial deposition during the end of the Wisconsin ice age.

The shallow investigative work performed to date, along with the lack of a regional geologic evaluation in Cambria's assessment of site conditions, neglected to consider readily-available regional geologic data. This has resulted in a failure to investigate the uppermost preferential pathway for contaminant migration.

Cambria suggests that the low hydraulic conductivity of the clay and silty clay horizons of the shallow water bearing zone (limited to 20' bgs) will impede groundwater flow and reduce downgradient migration of petroleum hydrocarbons. Again, work performed at this site failed to investigate the uppermost preferential pathway for contaminant migration and there is not sufficient site data to support Cambria's argument.

Additionally, in support of their low hydraulic conductivity argument, Cambia suggests that downgradient migration of MTBE from the subject site is limited and the plume is defined based upon data from the "Preliminary Off-Site Soil and Groundwater Assessment," dated May 15, 2000, prepared by Enviro Soil Tech Consultants (ESTC). Not only was this work limited to shallow depths, a review of ACEH's case file for the subject site indicates that ACEH rejected the 2000 ESTC report for irregularities and non-

[1] Atwater, B.F., C.W. Hedel, E.J.Helley, 1977. Late Quaternary Depositional History, Holocene Sea-Level Changes, and Vertical Crustal Movement, Southern San Francisco Bay, California. U.S. Geological Survey Professional Paper 1014.

standard industry practices during performance of their field work. Hence the data collected from this report are not valid.

To date, vertical definition of source area(s) contamination and the possibility of off-site migration of dissolved contaminants in coarse-grained permeable strata remains undefined.

4) **Vapor Migration Pathway Not Adequately Assessed** - The SWRCB Order WQO 2002-0021 discusses the need to evaluate whether the effects of contaminants from the 2nd generation USTs in conjunction with commingled constituents from another release (i.e., from the 3rd generation USTs) will have similar effects on beneficial uses and are contributing to the current need for corrective action and/or cleanup at the site.

Typically, beneficial use refers to water sources and in the context of the SWRCB's order appear to reference dissolved phase contaminants in groundwater, and in particular MTBE. An additional risk element that was not considered by Cambria (and other consultants who performed work at the site) and the SWRCB (in their order) was migration of contamination via pathways other than the dissolved phase. Therefore, in addition to offsite migration of dissolved contaminants in more permeable strata underlying the shallow clay sediments (affecting beneficial uses); a second migration pathway, vapor migration (affecting human health & safety), must be investigated and evaluated at this site.

ACEH notes that residual NAPL or other high-concentration zones of contamination from the 2nd generation UST system could easily be present at the site within shallow, fine-grained sediments. Resultant migration of vapors, in particular the more toxic constituents of gasoline, emanating from residual contamination at the site could pose an inhalation risk at and/or in the vicinity of the site. Releases from the 2nd generation USTs may not have contained MTBE. But, if vapor migration of other constituents is significant, then the earlier release cannot be ignored since residual and possibly free-phase LNAPL from the earliest releases may still exist in fine-grained strata beneath the site. Data from the 1986 release (and data collected to date) are insufficient to evaluate whether the vapor migration pathway poses a potential threat at this site.

5) **Potential Impacts to Nearby Water Supply Wells Not Adequately Assessed** - Cambria states that groundwater flows westerly at the site and that they have identified no potential receptors downgradient of the site. ACEH notes that the groundwater flow direction has varied from northwest to southwest at the subject site and that there is an active irrigation well 330' southwest (downgradient) of the subject site (reference Chevron petition, Exhibit D, Cambria report dated October 1, 2003). It does not appear that this well has been tested for petroleum hydrocarbons.

As the uppermost preferential pathway for contaminant migration has not been investigated nor sampled at this site, and considering the very close proximity (330' downgradient) of a water supply well, the threat posed by this site from its history of unauthorized releases is unknown.

6) **Cambria's Attenuation Assessment is Unpersuasive** - ACEH has reviewed Cambria's "attenuation assessment" which calculated attenuation rates for TPHG and MTBE for releases from the 3rd generation USTs to estimate attenuation rates for Benzene and Toluene from the 2nd generation USTs. We have significant concerns regarding the scientific rationale Cambria used in their evaluation.

Cambria utilized a graphical method to calculate 1st order decay rates from recent concentration vs. time plots for TPHG and MTBE data from groundwater monitoring

wells. They use the resulting "attenuation rate" to estimate present day concentrations of Benzene and Toluene from an older (2nd generation UST) release and argue that this analysis shows that groundwater contamination resulting from the earlier release would have biodegraded to below MCLs by now. The logic of this approach and the interpretation of data appears flawed for the following reasons:

a) **Causes of Attenuation** - Cambia fails to present a thorough discussion of other possible causes for their apparent "attenuation rate" such as:

- **Source Depletion** - The decrease in contamination concentration could be due to source depletion where the source and the dissolved contaminant is simultaneously decreasing. This is especially relevant in a multi-component NAPL such as gasoline where the individual compounds are depleted according to their effective solubilities. As the mole fraction of the more soluble compound decreases, its effective solubility decreases resulting in declining source concentrations over time. In a downgradient monitoring well, this would be reflected in a plot as declining concentrations of the compound being present in samples from the well over time.

- **Lateral and/or Vertical Plume Migration** - The decrease in contamination concentration could be due to migration of the plume away from the monitoring wells. Dissolved plumes can move laterally and vertically away from a monitoring well with changes in groundwater flow direction. Concentration vs. time plots would show declining concentrations of the compound being present in samples from the well over time. The subject site does not have monitoring wells appropriately located and constructed to evaluate the effects of changing groundwater flow directions on concentrations of contaminants detected in samples collected from monitoring wells over time.

- **Biodegradation** – Declining concentrations could be due to biodegradation. However, biodegradation rates must be increasing over time (or the source depleting) at the monitoring locations to yield plots of decreasing concentrations in samples collected over time. Otherwise, if biodegradation is occurring at a constant rate, the concentrations of the compound in samples from the well would be constant over time (contaminant concentrations equal what is flowing into the monitoring point minus what is being degraded. Additionally, biodegradation would need to be demonstrated by several lines of evidence, such as measurement of by-products, consumption of electron acceptors, concentration versus distance plots using appropriately located and constructed monitoring wells.

b) **Applicability of Cambria's Attenuation Rates** - Cambria's application of their attenuation rates bears some additional considerations.

- **Rates for Apparent MTBE Attenuation** - If the decreases in MTBE concentration over time are due to preferential dissolution of MTBE from the residual NAPL (i.e., source depletion), then the calculated "rates" have nothing to do with biodegradation (as implied in Cambria's arguments). Therefore, it is inappropriate for Cambria to assume that they would be "conservative" in applying the "rates" to the other BTEX compounds. Further, MTBE dissolution rates can be quite rapid at some sites depending on the initial mole fraction and depletion mechanisms (e.g., the rate of groundwater flow through the residual source, whether or not SVE was occurring, ongoing releases, etc.).

The calculation of an attenuation rate for MTBE biodegradation is not as easily determined as has been done in the report. Very little data exists on this rate in regards to MTBE. Research in California has indicated the presence of active microbial populations in lab tests of samples from contaminated sites however; other contaminated sites have not exhibited any native aerobic MTBE degrading capability. Also, many MTBE sites may not be aerobic or aerobic in limited areas which would eliminate or limit any potential natural aerobic biodegradation. There is very little agreement in the literature about possible rates of MTBE transformation under anaerobic conditions. Rates for MTBE biodegradation would be site specific and must be actually measured using field tests and measured data.

- **Applying Rates from New Releases to Old Releases** - Cambria's application of "attenuation rates" from a later release to infer attenuation rates of an earlier release seems flawed. Biodegradation rates at a site can vary. Early releases can be slow to biodegrade simply because the community of hydrocarbon-degrading bacteria is small and not yet acclimated to degrading the contamination. Older sites with a history of releases could have microbial populations sufficient to allow biodegradation to occur more rapidly. Therefore, Cambria cannot assume that the reaction rates from the initial release would be as fast as the reaction rates that they calculated based on recent monitoring data.

- **Assumption that Attenuation Rates Would be Similar at Low Concentrations** - We note that the range of concentrations used by Cambria in their concentration vs. time plots are in the tens of thousands to hundreds of thousands of ppm range. Cambria assumes that their calculated 1$^{st}$ order decay rate is applicable at lower concentrations. However, rates of microbial reactions often decrease at lower concentrations following zero-order kinetic models. This is because the growth and activity of the hydrocarbon-degrading microbial communities decline as the substrate (i.e., the hydrocarbons) becomes limited. Therefore, it is inappropriate for Cambria to extrapolate a "rate" calculated at high concentrations to conditions where concentrations are much lower (i.e., near the MCL), where the low concentrations of the hydrocarbons may be rate limiting.

**CONCLUSIONS**

In considering the above discussion, in 1986 and now, there is not sufficient information to close the 1986 fuel leak case. RPs would be asked to perform additional soil and groundwater sampling and analysis, particularly in source areas, in order for ACEH to evaluate the site. The lack of sufficient technical information regarding the 1986 investigation prevents the case from meeting current case closure standards.

The gasoline release(s) from the 3$^{rd}$ generation UST system have commingled with the release(s) from the 2$^{nd}$ generation UST system. Residual NAPL or high levels of hydrocarbons from the 2$^{nd}$ generation UST system could be present at the site, stored in the shallow, fine-grained sediments. Consequently the RPs for the 2$^{nd}$ generation UST may have some responsibility for remedial activities currently needed at the site. How much of a contribution release(s) from the 2$^{nd}$ generation USTs make to the site in terms of corrective action and costs is uncertain. However, source area pollution from the 2$^{nd}$ generation UST system could contribute some component of cost to the current corrective actions, including remediation of the source area(s).

ACEH has designated Mr. Mohammadian as the primary responsible party for the subject site. Data from the site indicates that an unauthorized release(s) occurred during Mr. Mohammadian's ownership and operation of the USTs. Up to 340,000 ppb MTBE was detected in groundwater samples from the site in 1998. Currently, the lateral and vertical extent of MTBE and petroleum hydrocarbon contamination remains undefined. The elevated levels of MTBE require immediate investigation and remediation of the site, by the primary RP Mr. Mohammadian. Additional investigations should evaluate (1) the vapor pathway and (2) potential off-site migration in permeable strata that most likely underlie the site at relatively shallow depths. Therefore, ACEH considers Mr. Mohammadian as the primary RP who needs to perform the additional work at the site.

You may contact Mr. Barney Chan at (510) 567-6765 if you have any questions.

Sincerely,

Donna L. Drogos, P.E.
LOP Program Manager

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