June 2, 2017
File No.: 01-2348 (RAL)

To: AC Transit District
Attn.: Mr. Dan Ruslen
Sent via e-mail to DRuslen@actransit.org

From: Ralph Lambert, Regional Water Quality Control Board

SUBJECT: AC Transit District, 1100 Seminary Ave., Oakland, Alameda County – Review of Technical Reports on UST Remediation

Dear Mr. Ruslen:

I have reviewed your recent reports, *ISBR Pilot Study Effectiveness Evaluation*, dated March 30, 2017, and your *2017 Q1 Semi_Annual Groundwater Monitoring Report*, dated April 25, 2017. AC Transit submitted the Effectiveness Evaluation in response to a directive letter from this office dated 10/26/16 requiring AC Transit to evaluate and report on the treatment pilot study under way for the last 2 ½ years. That directive letter said your "…report must include a proposal for expanding the ISBR or must propose an alternative remedy…". AC Transit did neither and is in violation of that directive. Instead AC Transit proposes just to continue the pilot test another two years and sampling again but provides no assurance that sub-surface conditions will improve.

The Evaluation report presented an evaluation of the concentration of diesel range hydrocarbons (TPHd) in soil collected prior to initiation of the ISBR pilot and with data from two years later. AC Transit claims the analysis showed that TPHd in soil from the 6 to 9 foot depths (the most contaminated and where direct contact and vapor exposure may occur) declined an average of 19% over this 2-year period. However, the analysis is flawed and incomplete.

The TPHd data from 2014 is presented using a dry weight basis (which is appropriate) with reported moisture content from 12% to 21%. The 2016 data is reported on a wet weight basis, so the data is not directly comparable to the dry weight data from 2014. The average 2016 TPHd concentration is 1,344 mg/kg from the 6 to 9 foot depths; but assuming a 19% moisture content there is no difference between 2014 and 2016 data. Also, the 2016 lab data reports that the relative percent difference (RPD) between their matrix spike and matrix spike duplicates ranged from 5% to 27% difference (with 30% being acceptable). The laboratory also reports that their acceptable percent recovery for these samples is 50% to 150%. In other words, your percent decline in TPHd concentrations is not as large as reported (due to the wet vs dry weight) and is within the laboratory margin of error.

The data review is incomplete because you only analyzed for TPHd and not the constituents of most concern as far as risk and as listed in the UST Low Threat Closure Policy (LTCP). The LTCP lists specific soil criteria for benzene, ethylbenzene, and naphthalene.

Thirty years after AC Transit removed the USTs, and 2 ½ years after the start of injections for the ISBR pilot test, groundwater concentrations are very high in the nearest monitoring wells. March 2017 groundwater data has the maximum concentration of benzene at 25,000 µg/L (for comparison the drinking water standard is 1 µg/L), ethylbenzene at 2,300 µg/L, gasoline range hydrocarbons at 210,000 µg/L, and TPHd at 78,000 µg/L, which is far above the solubility limit for diesel. These concentrations support my claim that AC Transit has not removed the secondary source to the extent practicable as required by the LTCP.

The Evaluation report says that the pilot injections "…may influence the groundwater elevations of the source zone which could result in the mobilization of concentrations within the capillary fringe…" However, no evidence is supplied to support that this is happening. No unusual water levels are noted at the monitoring wells and none is available at the injection wells. The Evaluation report also says that the microbes from the ISBR pilot release biosurfactants that typically lead to increased groundwater concentrations but that the concentrations are expected to decline. However, there is no cited reference to substantiate these claims.

To address the above issues AC Transit should do the following:

1. Any soil samples collected should be reported on a dry weight basis
2. Any soil sample should be analyzed for all main constituents of concern, namely TPHg, TPHd, BTEX, and naphthalene (see the September 2012 LUFT Guidance Manual and the LTCP) – keep in mind there is no before soils data to use for comparison for all but TPHd
3. Provide reference material where this injectate mixture has caused a substantial increase in groundwater concentrations for >2 ½ years and where those concentrations were subsequently treated to < levels of concern
4. Submit time series graphs for groundwater data that include TPHg and benzene. Data for the last 17 years from MW-2 does not appear to demonstrate substantial natural degradation but rather continued impact from the remaining secondary source
5. Submit an evaluation of alternative remedial method(s) for soil and groundwater to meet LTCP criteria and in compliance with our 10/26/16 directive letter because you have not demonstrated, so far, overall favorable impacts from your pilot test ISBR.

Take care of this site so you do not need to continue monitoring for decades. Let me know if you have any comments or questions prior to me preparing another directive letter.

Copy via Email to:

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Alameda County Environmental Health
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