Edward C. Ralston
Program Manager
Remediation Management
Phillips 66 Company
76 Broadway
Sacramento, CA 95818
Phone 916.558.7633
ed.c.ralston@P66.com

RECEIVED
By Alameda County Environmental Health 9:36 am, Sep 19, 2017

September 14, 2017

Mr. Keith Nowell
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Modeling Report

76 (Former BP) Station No. 2611117
7210 Bancroft Avenue
Oakland, California
Fuel Leak Case No. RO0000356

Dear Mr. Nowell:

I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website.

If you have any questions or need additional information, please contact Mr. Jeff Freidman at (562) 206-2551.

Sincerely,

Edward C. Ralston
Program Manager
Remediation Management

Antea USA, Inc.
3229 E. Spring Street, Suite 100
Long Beach, California 90806 USA
www.anteagroup.com

September 14, 2017

Mr. Keith Nowell
Hazardous Waste Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: Subsurface Modeling Presentation
76 (former BP) Service Station No. 2611117
7210 Bancroft Avenue
Oakland, California

Dear Mr. Nowell:

The purpose of this letter is to provide the contaminant modeling results requested in your email dated July 7, 2016 (**Appendix A**). The other items requested will be provided in a separate document that will be submitted in the near future. Antea Group delayed its response to the request for the model presentation until the laboratory results were available following the implementation of the soil gas investigation which was another item included in the July 2016 email (submission of a Soil Gas Investigation Work Plan).

In order to develop the presentation included herein, Antea Group utilized boring data, boring location, surface elevation and analytical results to construct a comprehensive three-dimensional (3D) site model. Analytical data was converted to a 3D point files and was interpolated within a hexahedral finite-element grid with kriged nodal values and an output geometry whose elements can be filtered, sliced and rendered to view the distribution on the element surfaces and/or edges. The 3D model was created with Mining Visualization System (MVS) by CTech and the output was converted to 3D PDF.

The laboratory results for gasoline range organic (GRO) compounds was analyzed using available analytical results from past assessment activities. The interpolated extent of GRO was estimated for values greater than 83 milligrams per kilogram. A 3D legend using a color ramp is provided in the attached 3D Adobe file (**Appendix B**) for the correlated range of residual GRO concentration values. A 3D model exhibiting the residual impact of benzene is provided in **Appendix C**. In this case, the interpolated extent of benzene was estimated for values greater than 0.4 milligrams per kilogram.

In order to view **Appendix B** and **Appendix C** the current version of Adobe Flash Player is required.

If you have any questions, please contact Jeffrey Friedman at (626) 408-4534.

Sincerely,

Jeffrey Friedman, P.G.
Senior Project Manager
Antea Group

Attachments:	Appendix A	July 7, 2016 Email
	Appendix B	GRO Model Presentation
	Appendix C	Benzene Model Presentation

Appendix A

July 7, 2016 Email

Nowell, Keith, Env. Health

From:	Nowell, Keith, Env. Health
Sent:	Thursday, July 07, 2016 1:59 PM
To:	Ed.C.Ralston@p66.com; 'lewis.mosconi@P66.com'
Cc:	'Jacob Levy'; 'mike.martinson@anteagroup.com'; Dacre Bush (dacre.bush@anteagroup.com); Mark Mathiowetz; 'jeff.freidman@anteagroup.com'; dehloptoxic, Env. Health; Roe, Dilan, Env. Health
Subject:	Meeting Action Items, Fuel leak case RO356 - BP-11117, 7210 Bancroft Ave., Oakland, GeoTracker Global ID T0600100201

Thank you to Antea Group's (Antea) Dacre Bush, Mark Mathiowetz, Mike Martinson, and Jeff Freidman (via conference call), Jacob Levy representing the property owner, and Phillips 66 representatives Ed Ralston and Lewis Mosconi (both via conference call) for participating the meeting on July 6, 2016 regarding the fuel leak case BP #11117, 7210 Bancroft Avenue, Oakland, Alameda County Department of Environmental Health (ACDEH) case number RO0000356. The purpose of the meeting was to review the current case status and develop a path toward closure in light of the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP).

ACDEH understands the former gas station has been demolished and the site is currently a vacant dirt lot. ACDEH further understands the site has recently been purchased by 7200 Bancroft Avenue LLC who intend to develop the former gas station as a mixed use site.

This email provides a summary of the items discussed during the meeting including but not limited to evaluation of free product mobility, delineation of residual/free product/LNAPL contaminant mass, evaluation of depth to groundwater discrepancies, evaluation of adequacy of monitoring well network to delineate LNAPL and dissolved phase contaminant plumes, evaluation of shallow soil contamination (upper 10 feet) against direct contact criteria and effect on total petroleum hydrocarbons (TPH) concentrations on bioattenuation zone for vapor intrusion, and collection of soil gas data:

Based on the meeting discussion, ACDEH requested the following items be addressed:

1. **Phase 1 Environmental Site Assessment (ESA)** – provide ACDEH a copy of the Phase 1 ESA prepared for the site for new property owner, 7200 Bancroft Avenue LLC. Please provide a copy of the Phase 1 ESA to ACDEH as an electronic mail attachment, Attention Keith Nowell.

2. **Contaminant Modeling** – Antea will provide ACDEH a copy of a three-dimensional (3-D) model of soil contamination. The 3-D model will be provided to ACDEH on a DVD to the attention of Keith Nowell.

3. **Waste Oil Tanks and Hydraulic Hoists**– Perform records review to determine the existence of waste oil underground storage tanks (USTs) and hydraulic hoists. Evaluate if appropriate scope of analysis was performed for these structures if waste oil USTs and/or hydraulic hoists are determined to have been present at the site.

4. **Soil Gas Investigation Work Plan** – Please prepare a work plan for the collection and analysis of soil gas samples to assess the vapor intrusion pathway. Based on the current site status as a vacant lot, ACDEH requests that, at a minimum, soil gas samples are to be recovered from a depth of five (5) feet below the ground surface (bgs). Please analyze samples for TPH as gasoline (TPHg), aromatics and oxygenates, and naphthalene using EPA test method TO-15, and the fixed gases oxygen, carbon dioxide and methane by ASTM method D1946. Additionally, ACDEH requests the analysis for the proposed leak detection tracer compound by the appropriate analysis test method. Please collect the samples in accordance to the July 2015 *Advisory- Active Soil Gas Investigations* prepared by California Environmental Protection Agency/ Department of Toxic Substances Control (Cal EPA / DTSC), and the Regional Water Quality Control Boards of the Los Angeles (LARWQCB) and San Francisco (SFRWQCB) regions. ACDEH requests the concentrations of a selected number of naphthalene samples be corroborated using the EPA TO-17 analysis.

5. **Dual Phase Extraction Test** – Discuss the effectiveness of the dual phase extraction pilot test performed in 2011.

6. **Free Phase Product Bail Down Test** – ACDEH requests a review of the case file to determine if bail down testing was performed to assess the mobility of free phase product reported for the site.

7. **Residual Contamination In Soil** – Perform a case file review to determine if secondary source has been removed. Discuss the distribution of light non-aqueous phase petroleum hydrocarbons (LNAPL) and residual petroleum hydrocarbons in soil.

8. **Residual Contamination In Groundwater** – Prepare contaminant plume maps for petroleum hydrocarbons, benzene, and methyl tertiary butyl ether (MTBE) depicting the extent of the contamination in groundwater. Include the data from the SB soil bores from the 2015 soil and groundwater investigation in text boxes on the plume maps, but only consider groundwater monitoring well data when defining each of the plumes.

9. **Hydrographs** – Please prepare hydrographs for all wells associated with the case and provide to ACDEH prior to the next meeting. Depict if the well screens were appropriate to define plume.

10. **Hydrograph Data Presentation** – Several hydrographs were reviewed at the meeting and comments made regarding the hydrographs are applicable to the others. Please present the periods of time on the appropriate graph when remediation, e.g. dual phase extraction, chemical injection, and batch extraction of groundwater events, was performed at the site.

11. **Depth to Water** – A review of the hydrographs indicate adjustments to the depth to water (dtw) data appears to have occurred. ACDEH requests a review of the case file to evaluate the dtw data to determine what may be the cause of the apparent changes in the dtw data. ACDEH additionally requests the data for the Chevron #9-33322, ACDEH case file number RO0000274 and GeoTracker Global ID T0600102079, 7225 Bancroft Avenue, Oakland, located across Bancroft Avenue, be reviewed for similar changes in groundwater levels.

12. **Sensitive Receptors** – Please conduct a case file review to determine if the Alameda County Public Works Agency (ACPWA) files were reviewed for the well survey. If the ACPWA was not contacted, please update the survey of vicinity wells to include the ACPWA database.

13. **LTCP Direct Contact Criteria** – Please prepare a plan view figure showing the soil concentrations in the 0- to 5-foot and 5- to 10-foot intervals indicating the concentrations of TPHg, TPH as diesel (TPHd), benzene, ethylbenzene, and naphthalene for each soil bore. Include preparation of horizontal cross sections across each of the zones depicting the distribution of contamination.

Thank you for your cooperation. ACEH looks forward to working with you and your consultants to advance the case toward closure. Should you have any questions regarding this correspondence or your case, please call me at (510) 567-6764 or send an electronic mail message at keith.nowell@acgov.org.

Regards,
Keith Nowell

Keith Nowell PG, CHG
Hazardous Materials Specialist
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda , CA 94502-6540
phone: 510 / 567 - 6764
fax: 510 / 337 - 9335
email: keith.nowell@acgov.org

PDF copies of case files can be reviewed/downloaded at:

http://www.acgov.org/aceh/lop/ust.htm

Appendix B

GRO Model Presentation

ATTENTION! This image is an interactive 3D model.
To rotate: hold left mouse button and move mouse.
To pan: hold "Ctrl"+ left mouse button and move mouse.
To zoom: hold right mouse button and move mouse or use mouse scroll wheel.

For a menu of advanced controls, right-click mouse on the 3D image.

NOTE:
You will see the following control bar at the bottom of the page:

From left to right, the functions are:
1) continuous play if multiple frames are in the file;
2) pause;
3) stop;
4) step back;
5) window that will show the frame number; and
6) step forward

THERE ARE 2 FRAMES IN THE MODEL. MAKE SURE YOU SEE ALL OF THEM BY PRESSING THE STEP FORWARD BUTTON.

Frame 1: Soil analytical results: TPH-GRO > 83 mg/kg
Frame 2: : Soil analytical results: TPH-GRO > 83 mg/kg + water level surfaces from August 2011 (historic maximum) and February 2014 (historic minimum)

FIGURE 2
Soil Analytical Results: TPH-GRO
76 (Former BP) Service Station No. 11117
7210 Bancroft Avenue
Oakland, California

antea group

Appendix C

Benzene Model Presentation

ATTENTION! This image is an interactive 3D model.
To rotate: hold left mouse button and move mouse.
To pan: hold "Ctrl"+ left mouse button and move mouse.
To zoom: hold right mouse button and move mouse or use mouse scroll wheel.

For a menu of advanced controls, right-click mouse on the 3D image.

NOTE:
You will see the following control bar at the bottom of the page:

From left to right, the functions are:
1) continuous play if multiple frames are in the file;
2) pause;
3) stop;
4) step back;
5) window that will show the frame number; and
6) step forward

THERE ARE 2 FRAMES IN THE MODEL. MAKE SURE YOU SEE ALL OF THEM BY PRESSING THE STEP FORWARD BUTTON.

Frame 1: Soil analytical results: Benzene > 0.4 mg/kg
Frame 2: : Soil analytical results: Benzene > 0.4 mg/kg + water level surfaces from August 2011 (historic maximum) and February 2014 (historic minimum)

FIGURE 1
Soil Analytical Results: Benzene
76 (Former BP) Service Station No. 11117
7210 Bancroft Avenue
Oakland, California

antea group