October 12, 2016

Mr. Paul Cho, P.G.
California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Re: **Response to the Office of Environmental Health Hazard Assessment (OEHHA)**
Comments on the: *Human Health Risk Assessment, DLA-Energy Responsible Area of Eastern Portion, dated May 31, 2016, and Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Soil Closure for the Eastern 15-Acre Parcel*,
dated June 28, 2016

Defense Fuel Support Point Norwalk
15306 Norwalk Boulevard
Norwalk, California

Dear Mr. Cho,

On behalf of the DLA Installation Support for Energy (DLA Energy) and SFPP, L.P. (SFPP), an operating partner of Kinder Morgan Energy Partners (KMEP), The Source Group, Inc. (SGI) a division of Apex Companies, LLC (Apex) and CH2M have prepared this combined response to comments provided by the Office of Environmental Health Hazard Assessment (OEHHA) on the following reports:

- *Human Health Risk Assessment, DLA-Energy Responsible Area of Eastern Portion for the former Defense Fuel Support Point Norwalk (SGI, 2016)*
- *Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Soil Closure for the Eastern 15-Acre Parcel of DFSP Norwalk (CH2M, 2016)*.

OEHHA's comments were provided in separate letters dated August 2, 2016 and were transmitted by your office to DLA Energy and SFPP in a letter dated August 30, 2016.

Background

The former Defense Fuel Support Point Norwalk (DFSP Norwalk) operated as a fuel storage and distribution facility. The site previously contained ten 80,000 and two 55,000-barrel aboveground storage tanks (ASTs) that were used to store and distribute jet propellants 5 and 8 (JP-5 and JP-8). JP-4 was also historically stored at the site. The site was placed into permanent closure in 1999 and the ASTs were drained, cleaned, and marine chemist certified. Within the tank farm, the individual tank lateral pipes were drained, disconnected, and individually cleaned. The ASTs, concrete pads, and connecting pipeline systems were demolished and removed in 2011 and 2012.

SFPP has equipment within 2 acres at the site and easements for its pipelines along the southern and eastern boundaries of the property. Previously, SFPP operated a pump station near the south-central area of the site. The pump station was used to transfer fuel to and from the site, and as an in-line pumping station for portions of the SFPP pipeline network. The pump station was decommissioned in 2001, but three pipelines heading eastward along the

southern boundary of the property (one of which bends at the southeastern corner of the site and continues northward within the eastern easement) remain in service and continue to convey refined petroleum fuels including gasoline, diesel, and jet fuel.

In preparation for future re-use of the property, remedial action plans were developed, submitted, and approved by the RWQCB. The remedial plans were developed assuming future industrial/commercial property re-use. Following U.S. Congressional action, it was determined that the approximately 15 eastern-most acres of the site would be conveyed to the City of Norwalk for recreational park use. However, the eastern 15-acres has been zoned by the City of Norwalk as industrial/commercial as part of the land use and environmental restrictions for this portion of the site. Figure 1 presents a site map and the location of the eastern 15-acre boundary. After completion of the requisite soil remediation activities, DLA Energy and SFPP compiled site data and presented the findings of risk calculations in the two subject documents with the objective of obtaining regulatory closure status of the shallow (0 to 10 feet) soils within the eastern 15 acres of the site.

Response to OEHHA Comments

The remainder of this document provides responses to OEHHA general and specific comments. The responses to OEHHA comments on the report prepared by SGI-Apex, on behalf of the DLA Energy are provided first, with responses to OEHHA comments on the report prepared by CH2M, on behalf of SFPP complete this document.

The following presents each OEHHA comment (italicized) and our response.

DLA ENERGY - GENERAL COMMENTS AND RESPONSES

Due to the errors noted on some of the tables included in the SGI-Apex Human Health Risk Assessment, Tables 1, 2, and 3 were reviewed and revised accordingly to correct any errors and are attached to this letter.

1. *It is unclear why there are overlapping categories of TPH carbon range (C23-C32, C23-C44, and C33-C44).*

   Response:

   The overlapping categories of TPH carbon ranges were presented for the purposes of comparing the total petroleum hydrocarbon (TPH) data with appropriate San Francisco Bay Regional Water Quality Control Board (SFRWQCB), Environmental Screening Levels (ESLs). This is further explained below.

   The analytical data provided by the laboratory did not have overlapping TPH carbon ranges. The carbon ranges provided by the laboratory included the following:

   - C6-C12;
   - C13-C22;
   - C23-C32; and
   - C33-C44.

   For the human health risk assessment, the Site data were compared with SFRWQCB ESLs. On page 6 of Appendix F of SFRWQCB ESL User's Guide (SFRWQCB, 2016), the ESL TPH carbon ranges are defined as the following:

   - "Gasoline is a complex mixture of C_4 to C_{12} hydrocarbons…"
   - "Diesel is a middle distillate mixture of C_8 to C_{21} hydrocarbons…"
   - "Motor oil is a heavy distillate mixture characterized by high molecular weight hydrocarbons with carbon range of C_{18} to C_{34+}…"

   The following table compares the laboratory TPH carbon ranges and the corresponding SFRWQCB ESL TPH carbon ranges considered in the human health risk assessment.

Laboratory TPH Carbon Range	SFRWQCB ESL TPH Carbon Range
C6-C12	TPH Gasoline – C4-C12
C13-C22	TPH Diesel – C8-C21
C23-C32	TPH Motor Oil – C18-C34+
C33-C44	

For the purpose of using the most appropriate SFRWQCB ESL for comparing with the Site data, the laboratory provided TPH carbon range data that most closely matched the SFRWQCB defined TPH carbons ranges for gasoline, diesel, and motor oil were used. As shown in the table above and as presented in the data tables (Table A-1 of Appendix A of Human Health Risk Assessment), the laboratory data for TPH carbon ranges C23-C32 and C33-C44 were added together to represent TPH carbon range C23-C44 for each sample. This TPH carbon range was compared with the ESL for TPH motor oil (C18-C34+).

DLA ENERGY - SPECIFIC COMMENTS AND RESPONSES

Soil Exposure Risk Assessment

2. *The soil screening levels used in Table 1 are tier 1 ESLs (SFRWQCB, 2016). These values are based on unrestricted land use and are more conservative than tier 2 values based on direct exposure to human health.*

   Response:

   Comment noted. The soil exposure point concentrations for all detected compounds were below their respective Tier 1 soil ESL for unrestricted land use.

3. *Table 1. The number of samples and the number of detections for the VOCs (columns 3 and 4 from the left) are incorrect.*

   - *It should be clearly stated in column 4 if there are zero detections for VOCs.*
   - *Column 6 from the left is also incorrect. The arithmetic mean cannot be higher than the maximum detected concentration.*
   - *In Table A-2, OEHHA found multiple concentrations above the listed maximum detected concentration for acetone in Table 1. Please check accordingly for other VOCs.*
     - *The values listed as maximum detected concentrations for the VOCs are incorrect in Table 1. Table A-2 has the same values listed as the mean, not the maximum concentration. Maximum = mean only if all the values are the same.*

   Response:

   For the VOC data in Table 1, the errors referenced above were the result of errors in the external links within the Excel file. The links have been corrected and the revised Table 1 is attached to this letter.

4. *The site-specific cleanup goals for the TPH ranges are inconsistent between Table 1 and Table A-1. OEHHA recommends further transparency.*

   - *Soil screening levels for specific TPHs carbon ranges are not included in the reference cited (SFRWQCB, 2016). Please clarify how those ranges were deduced to match the screening levels for gasoline and diesel.*

   Response:

   In Table 1, the site-specific cleanup goal for TPH carbon range C23-C32 was incorrectly listed as 1,000 mg/kg. As shown in Table A-1 of the Human Health Risk Assessment, the site-specific cleanup goals for TPH carbon ranges C23-C32 and C33-C44 were not available and the site-specific cleanup goal for TPH carbon range C23-C44 is 1,000 mg/kg. Table 1 has been corrected to be consistent with Table A-1, and the revised Table 1 is attached to this letter.

   SFRWQCB does provide information on ESL TPH carbon ranges for gasoline, diesel, and motor oil. See Apex's response to OEHHA's Comment #1 above.

5. *It is a risk management decision whether or not to accept SFRWQCB levels for application to the Site. Other resources like DTSC Note 3, EPA RSLs, or OEHHA CHHSLs also provide soil screening levels.*

   Response:

   Regulatory oversight is provided by the RWQCB; therefore, the SFRWQCB ESLs are assumed to be appropriate for the Site. For most compounds detected in soil and soil vapor at the Site, SFRWQCB ESLs provide the most conservative screening level available.

   A table summarizing the SFRWQCB, DTSC, USEPA, and OEHHA screening levels for the chemicals detected at the Site in soil and soil vapor are provided in Attachment A of this letter. For the compounds detected in soil, the Site-specific cleanup goals and SFRWQCB ESLs were generally equal to or lower than available screening levels from DTSC, OEHHA, and USEPA. For the compounds detected in soil vapor, with the exception of 1,2,4-trimethylbenzene, the SFRWQCB ESLs were generally equal to or less than available screening levels from DTSC, OEHHA, and USEPA. For 1,2,4-trimethylbenzene, SFRWQCB or DTSC screening levels were not available, so the USEPA Regional Screening Level (RSL) was used (Attachment A).

6. *OEHHA checked the maximum detections for the soil COPCs and found them to be under CHHSLs and/or RSLs.*

   Response:

   Comment noted.

7. *The combined (cumulative risks and hazards were not assessed.*

   - *The sum of hazard quotients should be <1.*

   Response:

   The soil exposure point concentration for the compounds detected in soil were well below their respective screening levels; therefore, the cumulative risks and hazards were expected to be well below regulatory thresholds and were not assessed.

In response to OEHHA's Comments #7 and #11, the cumulative risks and hazards for soil and soil vapor were assessed in this letter. Using the SFRWQCB ESLs based on carcinogenic and noncarcinogenic effects, target HI and target excess cancer risk, and exposure point concentrations in soil or soil vapor, the excess cancer risk and noncancer hazard were estimated using the following equations. SFRWQCB ESLs were not available for 1,2,4-trimethylbenzene; therefore, the USEPA RSLs based on carcinogenic and noncarcinogenic effects were used.

Site-Specific Excess Cancer Risk

$$CR_i = \frac{CR_T \times EPC_i}{ESL_{c,i}}$$

Where:

CR_i = *Excess cancer risk for chemical i (unitless).*
CR_T = *Target excess cancer risk (1×10^{-6}), the upper end (most stringent) of CalEPA's risk management range of one-in-ten thousand (1×10^{-4}) to one-in-one-million (1×10^{-6});*
EPC_i = *Exposure point concentration for source for chemical i (mg/kg for soil, µg/m^3 for soil vapor);*
$ESL_{c,i}$ = *SFRWQCB ESL based on carcinogenic effects for chemical i (mg/kg for soil, µg/m^3 for soil vapor).*

Site-Specific Noncancer Hazard

$$HQ_i = \frac{HQ_T \times EPC_i}{ESL_{nc,i}}$$

Where:

HQ_i = *Hazard quotient for chemical i (unitless).*
HQ_T = *Target hazard quotient (1), a HQ less than or equal to 1 indicates that no adverse noncancer health effects are expected to occur (USEPA, 1989; unitless);*
EPC_i = *Exposure point concentration for source for chemical i (mg/kg for soil, µg/m^3 for soil vapor);*
$ESL_{nc,i}$ = *SFRWQCB ESL based on noncarcinogenic effects for chemical i (mg/kg for soil, µg/m^3 for soil vapor).*

SFRWQCB ESLs and USEPA RSLs for noncarcinogenic effects are based on a target hazard quotient of one and screening levels for carcinogenic effects are based on a target excess cancer risk of 1×10^{-6}, which represents the lower end (most stringent) of the CalEPA's risk management range and is the point of departure for risk management decisions for all receptors.

For soil exposures in a residential or commercial scenario, the resulting cumulative noncancer hazard quotients are below the USEPA and CalEPA target level of one and the cumulative excess cancer risk estimates are less than 1×10^{-6}, which is the most stringent end of CalEPA's risk management range of 1×10^{-6} to 1×10^{-4}. Therefore, soil exposures do not pose a human health risk to potential residential or commercial receptors at the Site. The estimated cumulative risks and hazards for soil for residential and commercial exposure scenarios are presented in Attachment B. Cumulative risks and hazards for soil vapor exposures are discussed in Apex's response to OEHHA's Comment #11.

Soil Vapor Risk Assessment

8. *Table 2, soil gas at 5' bgs. The EPC selected for each COPC was the minimum detected concentration, not the maximum detected concentration.*

- *The maximum detected concentrations for all COPC are still below the screening levels and therefore does not impact the overall conclusions.*

Response:

For Table 2, the errors referenced above were the result of errors in the external links within the Excel file. The links have been corrected and the revised Table 2 is attached to this letter.

9. *Benzene levels detected at 10' bgs exceed residential screening levels (SFRWQCB, 2016).*

Response:

Benzene was detected at concentrations above the residential screening level of 48 µg/m^3 in 5 of 26 soil vapor samples collected at 10 feet bgs. In these 5 soil vapor sample locations, benzene was not detected above the detection limit at the same soil vapor locations at 5 feet bgs. Furthermore, no soil vapor samples collected at 5 feet bgs at the Site were detected above the residential screening level of 48 µg/m^3. The maximum detected concentration of benzene at 5 feet bgs was 30 µg/m^3. Based on soil vapor benzene concentrations closest to the surface (at 5 feet bgs), benzene concentrations do not exceed the residential screening levels.

Based on future land use as a park, the use of residential screening levels may be overly conservative. The exposure parameters for a future on-site park visitor receptor would be significantly less than exposure parameters assumed in the development of the screening levels for a long-term resident receptor (24 hours per day for 26 years). For the protection of a future on-site park maintenance worker, the maximum detected benzene concentrations at 5 feet bgs and 10 feet bgs were less than the commercial screening level of 420 µg/m^3.

10. *OEHHA checked all soil vapor EPCs in Tables 2 and 3, and found them to be below CHHSLs.*

Response:

Comment noted. See Apex's response to Comment #5 above.

11. *Cumulative risks and hazards for soil vapor for this site were not assessed.*

Response:

In response to OEHHA's comment, the cumulative risks and hazards were assessed in this letter. The excess cancer risk and noncancer hazard were estimated using the equations presented in Apex's response to OEHHA's Comment #7 above.

For exposure to soil vapor at 5 feet bgs volatilizing into indoor air in a residential or commercial scenario, the resulting cumulative noncancer hazard quotients are below the USEPA and CalEPA target level of one and the cumulative excess cancer risk estimates are less than 1 x 10^{-6}, which is the most stringent end of CalEPA's risk management range of 1 x 10^{-6} to 1 x 10^{-4}.

For exposure to soil vapor at 10 feet bgs volatilizing into indoor air in a residential or commercial scenario, the resulting cumulative noncancer hazard quotients are below the USEPA and CalEPA target level of one and the cumulative excess cancer risk estimates are below or within CalEPA's risk management range of 1 x 10^{-6} to 1 x 10^{-4}. For the commercial exposure scenario, the excess cancer risk estimate of 2 x 10^{-6} is due to benzene (see Apex's response to Comment #9).

Soil vapor exposures do not pose a human health risk to potential residential or commercial receptors at the Site. The estimated cumulative risks and hazards for soil vapor for residential and commercial exposure scenarios are presented in Attachment C.

Editorial Comments

12. *Page 4-1. The definition of exposure point concentration (EPC) is not entirely accurate (the average chemical concentration in an environmental medium).*

    - *An EPC may also represent the maximum detected concentration depending on the nature of the exposure, the number of samples, and chemical distribution. A more appropriate definition may be that the most realistic estimate of an EPC is by using the 95 percent upper confidence limit (95UCL) of the average concentration for each COC if sufficient data are available.*

    Response:

    Comment noted.

13. *The soil vapor levels are below the screening levels of the guidance presented in this report as well as under the CHHSLs.*

    Response:

    Comment noted. Soil vapor concentrations do not pose a human health risk to potential residential or commercial receptors at the Site.

14. *Although OEHHA found the soil EPCs to be below screening levels, OEHHA recommends Table 1 be heavily revised. There are numerous errors and inconsistencies that attribute to a lack of transparency for this risk assessment.*

    Response:

    Table 1 has been revised and is attached to this letter.

15. *An assessment for the noncancer risks (hazards) therefore the level of noncancer adverse effects for this site is unclear.*

    Response:

    In response to OEHHA's comment, the cumulative excess cancer risk and noncancer hazards were estimated. The results indicate that soil and soil vapor exposures do not pose a human health risk to potential residential or commercial receptors at the Site. Please refer to Apex's response to OEHHA's Comments #7 and #11 for a more detailed discussion of the cumulative excess cancer risk and noncancer hazards for soil and soil vapor at the Site.

SFPP - GENERAL COMMENTS AND RESPONSES

1. *There are five soil and three soil vapor sampling locations in an area of 60,000 ft2. If the most northern perimeter is at GMW-SF-10, the area would still be about 40,000 ft2. The limited number of sample locations may not capture all significant contamination in the area of concern. Besides the ten groundwater monitoring wells, there is no evidence that any other previous sampling had taken place within the area.*

   Response:

   The number and locations of soil and soil vapor samples collected as part of the eastern 15-acre investigation were approved by the RWQCB in an email dated, April 15, 2016. Because there is no evidence of significant shallow soil contamination in eastern 15-acre parcel caused by the release of hydrocarbons at the southeastern 24-inch block valve, five soil and three soil vapor sample locations were deemed sufficient. SFPP's previous assessments in the 15-acre parcel was generally limited to the area impacted by its release. Further discussion of previous soil and soil vapor sampling in this area is provided below.

2. *It is unclear what "PZ" for sampling locations stood for.*

   "PZ" is an abbreviation for piezometer or monitoring well.

SFPP - SPECIFIC COMMENTS AND RESPONSES

Soil Assessment

3. *Soil analytical results for TPH and VOCs are compared to the cleanup goals provided by the 1996 RWQCB Interim Site Assessment and Cleanup Guidebook. COPC detections in soil are below cleanup goals. OEHHA recommends more updated screening levels.*

   Response:

   Parsons, DLA Energy's former consultant, calculated soil cleanup goals for the site according to the methods provided in the RWQCB Interim Site Assessment and Cleanup Guidebook (RWQCB, 1996). These goals were approved by the RWQCB in its letter to DLA Energy, dated July 12, 2012 (RWQCB, 2012). The RWQCB also approved DLA Energy's modification of soil cleanup goals for TPH in its letter to DLA Energy, dated July 16, 2015 (RWQCB, 2015). In its letter to the RWQCB, dated January 14, 2013, SFPP provided conditional concurrence with some shallow soil cleanup goals (0.5 foot to 10 feet) that are relevant to SFPP's former releases (CH2M, 2013a).

   OEHHA compared the soil concentrations for COPCs with available CHHSLs and DTSC's screening levels and screening levels for those COPCs were not exceeded.

4. *The five soil sampling locations are more than 100 feet apart from each other. As mentioned previously, potential hot spots may be overlooked with this distance between single sampling locations.*

   Response:

   The occurrence of COPCs in the eastern 15-acre parcel is related to deeper soil (smear zone) and groundwater, rather than from fuel releases in shallow soil, which makes tight spacing of sample locations less critical for assessing risks. As stated above, there is no documentation to support

significant shallow soil contamination in the eastern 15-acre property; therefore, the RWQCB agreed that five soil sample locations would be sufficient. The data collected from the eastern 15-acre parcel and near the southeastern 24-inch block valve (source area) do not support shallow soil contamination.

Previous shallow and deep soil sampling has taken place at or near the eastern 15-acre parcel. Provided below is a summary of soil data collected by SFPP in 1994, 2011, and 2012. The soil results from these past investigations have been incorporated into a composite figure which also contains recent soil data collected as part of the eastern 15-acre investigation. This figure is provided as Attachment D.

1994 Assessment

In response to a fuel release in the southeastern 24-inch block valve area in 1994, discrete depth soil samples were collected from approximately 4 feet below ground surface (bgs) to the top of the water table (30 feet bgs) at eight locations. Five of these borings were converted to monitoring wells. Samples were analyzed for TPH-g, TPH-d, and BTEX. Samples collected at GMW-SF-7 and GMW-SF-8, located in the central portion of the eastern 15-acre parcel, were non-detect for COPCs at all depths sampled. The results of the 1994 subsurface assessment were presented in the report titled, *Site Assessment of Fuel Hydrocarbons in Soil and Groundwater Associated with a Leak in a 24-Inch Block Valve Area* (Geomatrix, 1994). The 1994 report figure showing the analytical results is provided as Attachment E.

2011 Assessment

In January 2011, soil samples were collected from two borings (GB-22 and GB-23) located in the northern portion of the eastern 15-acre parcel (north of SVM-18) as part of an evaluation of soil and groundwater in the offsite southeastern area of the site. Soil samples were collected at discrete depths from approximately 10 to 53 feet bgs and analyzed for VOCs, TPH-g, and TPH quantified as fuel product (TPH-fp). VOCs and TPH-g were non-detect in all samples. TPH-fp was detected at low concentrations in the 22-foot depth of GB-22 (32 μg/L) and the 11-foot depth of GB-23 (21 μg/L). MTBE was also detected in the 53-foot depth of GB-22 (23 μg/L). The results of the 2011 investigation are provided in the report titled, *Results of Step-Out Investigation at the Southeastern Area of the SFPP Norwalk Pump Station, Norwalk, California* (CH2M, 2011). The 2011 report figure showing the analytical results is provided as Attachment F.

2012 Assessment

Deeper soil conditions in the southeastern area were previously documented in a 2012 soil boring investigation, where two soil borings (SB-8 and SB-9) were advanced offsite (in Holifield Park) immediately adjacent to the source area in the vicinity of the southeastern 24-inch block valve. The location of SB-8 and SB-9 is shown in Figure 2 of the Shallow Soil Closure Report (CH2M, 2016). The analytical results show that petroleum hydrocarbon impacts in soil are generally limited to depths below 18 feet bgs, the approximate depth of the top of the smear zone. TPH and VOC concentrations in soil samples shallower than 18 feet bgs were below the laboratory RLs. Maximum TPH, BTEX, and MTBE concentrations were reported at depths between 22 and 24 feet bgs, within the smear zone. TBA was the only other fuel oxygenate detected and was present at a depth approximately 25 feet bgs. The results are discussed further in the report titled, *Results of Soil Boring Investigation, SFPP Norwalk Pump Station, 15306 Norwalk Boulevard, Norwalk, California* (CH2M, 2012). A sample location map with posted soil analytical data and a lithologic cross section for the southeastern area are provided in the 2012 report figures (Attachment G).

In summary, shallow and deeper soil data collected by SFPP at or near the eastern 15-acre parcel between 1994 and 2016 support the conceptual site model (CSM) for this site. Soil impacts related to the 24-inch block valve release (source area) are limited to depths greater than 18 feet bgs, and are related to the hydrocarbon constituents within the smear zone and groundwater.

Soil Vapor Assessment

5. *The rationale for the number and location of samples is not given.*

Response:

The number and locations of soil vapor samples collected as part of the eastern 15-acre investigation were approved by the RWQCB, as stated above. Two soil vapor locations (SVM-17 and SVM-18) were positioned at locations closest to SFPP's active pipeline which runs north-south along the eastern property fence line. SVM-17 is also located just west of the former release area near the southeastern 24-inch block valve. SVM-19 was positioned in the center of the eastern 15-acre parcel to provide representation of the central portion of that area. Although not shown in Figure 2 of the Shallow Soil Closure Report (CH2M, 2016), two additional soil vapor probes (SV-94 and SV-96; see Attachments D and H) were installed by DLA-Energy's consultant approximately 220 feet northeast/southeast of SVM-19 to provide representation of the western portion of the eastern 15-acre parcel. Results from SV-94 and SV-96 are presented in DLA-Energy's Human Health Risk Assessment Report (SGI, 2016). In addition, SVM-9 which is located offsite in Holifield Park just north of the southeastern 24-inch block valve (see Figure 2 of Shallow Soil Closure Report) provides coverage near the source area. This probe is sampled annually and data collected since 2012 have been below screening levels under residential and commercial scenarios.

6. *It should be noted that overall variability of concentrations from a single sampling event may contribute to the potential underestimation of risk*.

Response:

The sampling results from the one event needs to be considered in light of other lines of evidence. Annual sampling near the source area at SVM-9 should also be considered. Data collected from SVM-9 since 2012 have been below screening levels as stated above.

7. *The western side of the Eastern parcel (the area of concern) is not sampled for soil vapor COPCs.*

Response:

As stated above, two additional soil vapor locations (SV-94 and SV-96) within the eastern 15-acre parcel were positioned approximately 220 feet to the northeast/southeast of SVM-19 to provide representation of the western portion of that area. The probes were installed and sampled by DLA-Energy's consultant; results are documented in DLA-Energy's Human Health Risk Assessment Report (SGI, 2016).

8. *Typically, a 100-foot buffer zone beyond the extent of the soil gas plume should be demonstrated at a Site (DTSC, 2011). This 100-foot buffer is warranted due to uncertainty about future soil gas migration upon redevelopment.*

Response:

As discussed in the CSM report (CH2M, 2013b), there have been several rounds of soil vapor monitoring which confirm the limited extent of VOCs in soil vapor potentially arising from volatilization from groundwater. In addition, an assessment of vapor intrusion (VI) was conducted in 2006 (Geomatrix, 2006) in residences adjacent and to the south of the site. The results from this assessment indicated that potential VI pathways did not appear to be complete in those residences. These results represent a second line of evidence along with the soil vapor monitoring results indicating VI exposure pathways are unlikely to be complete. While the 100-ft distance from the extent of groundwater and soil vapor samples represents a boundary for determining when VI should be investigated, there are already multiple lines of evidence for this site which provide an understanding of the potential for VI pathways, both under current or future land use conditions.

9. *In addition, for a residential scenario, there should ideally be a minimum one soil gas sample location for every potential residential building. For comparison, the parcel size for most residential housing tracts in California is approximately one-eighth to one-quarter acre. Hence, the density of soil gas collection for future residential developments should be based on this type of spacing. Bear in mind that the area of concern is 15 acres.*

Response:

The eastern 15-acre parcel is zoned by the City of Norwalk as industrial/commercial, not residential, as noted in the land use restrictions for this area. Therefore, the soil gas spacing requirements under a residential scenario should not apply.

10. *Out of the three soil vapor locations, only one is analyzed for PAHs and PCBs. Please explain.*

Response:

One soil sample was analyzed for PAHs and PCBs at SVM-19 (5-foot depth). These analyses were specifically requested by the RWQCB. Soil vapor samples were analyzed for VOCs and TPH-g only.

11. *Please clarify justification for not using the Johnson & Ettinger (J&E) model to evaluate vapor intrusion of VOCs.*

Response:

It is assumed that OEHHA is referring to the standard Johnson and Ettinger (J&E) model which EPA had supported for many years, and which DTSC makes available on its web site. We note that version of the J&E model, which represents the "standard" approach for calculating attenuation factors (α), overstates potential VI for petroleum hydrocarbons because it does not include any consideration of aerobic biodegradation. EPA in its 2015 petroleum vapor intrusion (PVI) guidance (see Section 12) states that to provide estimates of α that are more suitable for petroleum hydrocarbons, a 3-dimensional computer model was developed to predict the effects of biodegradation in the unsaturated zone below a building on the concentrations of chemicals in indoor air of the building. Modeling simulations were used to generate semi-generic values of α from site-specific information on the vertical separation distance between the receptor building and a source of petroleum hydrocarbons at depth in soil vapor. A conservative assumption for the rate of biodegradation was used based on the range of rates published in the literature, and sandy soil is assumed for purposes of estimating vapor diffusion. The results of this

modeling are presented in the 2015 PVI guidance as Figures 9 and 10, and EPA states these can be used to estimate values for α for situations where the total vapor concentration at the source and the vertical separation between the source and bottom building are known. This approach was used for this site as it is considered more representative for estimating α than the standard J&E model provided by DTSC.

12. *Table 7 results are from EPA's Petroleum Vapor Intrusion model, but there are no calculations to show the derivation of these results.*

    Response:

    The methodology is described in the Shallow Soil Closure Report (CH2M, 2016), but it is summarized below for completeness.

    EPA's PVI guidance (EPA, 2015) provides attenuation factors for assessing PVI based on the vertical separation distance between the petroleum hydrocarbon source and the building, and the source concentration in soil vapor. Soil vapor concentrations were calculated from the most recent and highest detected concentrations in groundwater (well GMW-O-15, sampled April 14, 2016) using the vapor pressures and Raoult's Law, which is used in cases where residual or free-phase hydrocarbons are present. The modeled indoor air concentrations were compared with residential screening levels (DTSC, 2016), as shown in Table 7 of the Shallow Soil Closure Report (CH2M, 2016). The modeled indoor air concentrations from the concentrations in groundwater in GMW-O-15 are lower than the most conservative (residential) screening levels. It should be noted that the eastern 15-acre parcel has been zoned by the City of Norwalk as commercial/industrial, rather than residential.

13. *OEHHA used the J&E model to evaluate the potential risks from vapor intrusion using the COPC groundwater detections from Table 7.*

    Response:

    As stated above, the J&E model used by OEHHA does not address the biodegradation known to occur with petroleum hydrocarbons, and isn't recommended for assessing petroleum hydrocarbon risks. The modeling used in the Shallow Closure Report (CH2M, 2016) is consistent with the guidelines presented in EPA's PVI guidance.

14. *Groundwater concentrations were based on those detected at GMW-O-15. Please explain why concentrations from this particular monitoring well (and not others) were chosen.*

    Response:

    As stated above, groundwater concentrations from GMW-O-15 were selected since this well had the most recent and highest detected concentrations in groundwater and therefore provided the highest overall risk.

15. A current SFPP remediation system is mentioned in the Conclusions of the report, but the types of controls are not explicitly stated or described.

    Response:

    As stated in the Conclusions of the Shallow Soil Closure Report (CH2M, 2016), SFPP's remediation systems in the southeastern area (SVE and total fluids extraction) will continue to operate for

hydrocarbon mass removal and groundwater containment in the uppermost groundwater zone. SFPP currently extracts soil vapors and total fluids (groundwater and free product) from southeastern remediation wells GMW-36, GMW-O-15, and GMW-O-18. Two additional remediation wells (GMW-SF-9 and GMW-SF-10) located in the central portion of the eastern 15-acre parcel are available for groundwater extraction, as needed. SFPP will evaluate the feasibility of biosparge system expansion to the southeastern area as a long-term remediation strategy for enhanced hydrocarbon mass removal in deeper soil and groundwater. SVE operations will continue during biosparging for vapor control. The total fluids extraction system may be decommissioned once dissolved phase concentrations become asymptotic and free product is no longer measurable in the southeastern area.

Editorial Comments

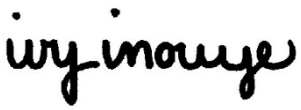
16. *Page 4 of the report states "one ambient air sample was collected on each day of sampling and analyzed." The language indicates that there may be more than one sample collected, but only one ambient air sample is shown in Table 6.*

    Response:

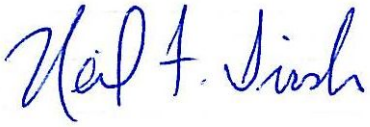
    Comment noted. Only one day was required to complete sampling; therefore, only one ambient air sample was collected.

Please contact the undersigned if you have any questions or comments.

Sincerely,
Apex Companies, LLC



Ivy Inouye
Senior Toxicologist



Neil F. Irish, P.G.
Principal Geologist

CH2M

John Lowe, CIH
Vapor Intrusion Consultant

Dan Jablonski
Project Manager

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Distribution:

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- Molly Black, The Source Group, Inc. (electronic only)
- Neil F. Irish, P.G., The Source Group, Inc. (electronic only)
- Norman Dupont, Esq., Ring Bender Law (electronic only)
- Paul Parmentier, The Source Group, Inc. (electronic only)
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- Walter Scherer, March ARB (electronic only)
- Yahaira Ortiz, Office of State Senator Tony Mendoza (electronic only)

TABLES

Table 1
Statistical Summary of Analytical Data and Screening-Level Risk Assessment for Soil (0 to 10 feet bgs)
Defense Fuel Support Point - Norwalk
Norwalk, California

Chemical[1]	Site-Specific Cleanup Goals[2] (mg/kg)	Soil SL[3] (mg/kg)	Number of Samples	Number of Detections	Frequency of Detection	Arithmetic Mean of Detected (mg/kg)	Standard Deviation of Detected (mg/kg)	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	95 Percent Upper Confidence Limit of the Arithmetic Mean (95UCL)[4] (mg/kg)	Soil Exposure Point Concentration[5] EPC_{soil} (mg/kg)	Does EPC_{soil} Exceed Soil SL?
Total Petroleum Hydrocarbons (TPH)												
Carbon Range (C6-C12)	100	100	360	18	5%	4.2	7.2	0.55	31	1.0	1.0	No
Carbon Range (C13-C22)	100	230	936	277	30%	30	54	0.55	604	14	14	No
Carbon Range (C23-C32)	---	5100	936	497	53%	83	112	0.60	1,200	58	58	No
Carbon Range (C33-C44)	---	5100	936	470	50%	76	104	0.55	1,268	51	51	No
Carbon Range (C23-C44)	1000	5100	923	498	54%	154	202	1.0	1,710	108	108	No
Volatile Organic Compounds (VOCs)												
Acetone	0.994	0.5	942	51	5%	0.071	0.021	0.051	0.13	0.052	0.052	No
tert-Butyl alcohol (TBA)	0.02	0.075	942	1	0%	0.023	NE	0.023	0.023	NE	0.023	No
Ethylbenzene	1.07	1.4	942	10	1%	0.0027	0.0012	0.0020	0.0059	0.0020	0.0020	No
Toluene	0.356	2.9	942	98	10%	0.0029	0.0010	0.0020	0.0073	0.0021	0.0021	No
1,2,4-Trimethylbenzene	0.12	---	942	5	1%	0.0053	0.00022	0.0050	0.0056	0.0050	0.0050	No
o-Xylene	---	2.3	942	13	1%	0.0066	0.0018	0.0025	0.0089	0.0021	0.0021	No
m,p-Xylenes	---	2.3	942	76	8%	0.0055	0.0062	0.0020	0.024	0.0026	0.0026	No
Gasoline Range Organics (GRO)	100	100	942	7	1%	0.77	0.26	0.61	1.3	0.50	0.50	No

Notes:
feet bgs = feet below ground surface.
mg/kg = milligrams per kilogram.
NE = Not estimated due to limitations in database (i.e., not detected in more than one sample).
--- = Not available or not applicable.

[1] Represents statistical summary of chemicals detected in one or more samples.
[2] Represents the final site-specific cleanup goals for soil, approved by the RWQCB in their letter entitled *Approval of Modification to Cleanup Goals*, July 16, 2015.
[3] Represents San Francisco Regional Water Quality Control Board (SFRWQCB) Tier 1 Environmental Screening Levels (ESLs) for soil, dated February 2016 revision 3.
[4] Values are the upper confidence limit on the unknown mean as calculated and recommended by USEPA's ProUCL software. Non-detect results were entered as the detection limit value. UCLs were not calculated for analytes with fewer than five detected concentrations.
[5] Value represents the lesser of the maximum detected concentration and the 95UCL.

Table 2
Statistical Summary of Analytical Data and Screening-Level Risk Assessment for Soil Gas at 5 feet bgs
Defense Fuel Support Point - Norwalk
Norwalk, California

Chemical[1]	Soil Vapor SL Residential[2] ($\mu g/m^3$)	Soil Vapor SL Commercial[2] ($\mu g/m^3$)	Number of Samples	Number of Detections	Frequency of Detection	Arithmetic Mean of Detected ($\mu g/m^3$)	Standard Deviation of Detected ($\mu g/m^3$)	Minimum Detected Concentration ($\mu g/m^3$)	Maximum Detected Concentration ($\mu g/m^3$)	Soil Vapor Exposure Point Concentration[3] EPC_{sv} ($\mu g/m^3$)	Does EPC_{sv} Exceed Soil Vapor SL? ($\mu g/m^3$)
Acetone	16,000,000	140,000,000	29	16	55%	87	43	54	190	190	No
Benzene	48	420	29	3	10%	29	1.0	28	30	30	No
Toluene	160,000	1,300,000	29	6	21%	86	32	40	120	120	No
m,p-Xylene	52,000	440,000	29	3	10%	57	9.0	48	66	66	No

Notes:
feet bgs = feet below ground surface.
$\mu g/m^3$ = micrograms per liter.

[1] Represents statistical summary of chemicals detected in one or more samples.
[2] Represents San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESLs) for soil gas, dated February 2016 revision 3.
[3] Value represents the maximum detected concentration.

Table 3
Statistical Summary of Analytical Data and Screening-Level Risk Assessment for Soil Gas at 10 feet bgs
Defense Fuel Support Point - Norwalk
Norwalk, California

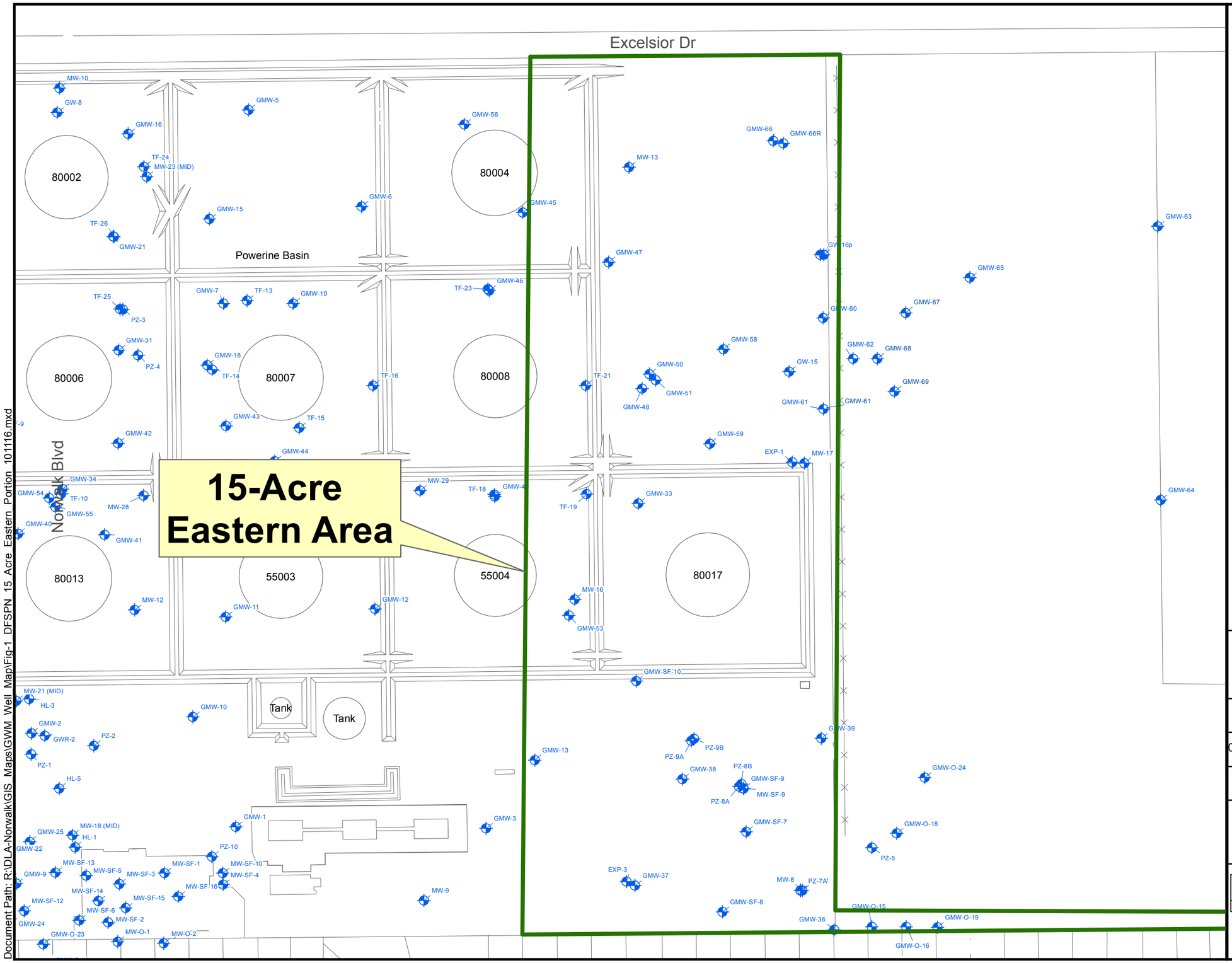
Chemical[1]	Soil Vapor SL Residential[2] ($\mu g/m^3$)	Soil Vapor SL Commercial[2] ($\mu g/m^3$)	Number of Samples	Number of Detections	Frequency of Detection	Arithmetic Mean of Detected ($\mu g/m^3$)	Standard Deviation of Detected ($\mu g/m^3$)	Minimum Detected Concentration ($\mu g/m^3$)	Maximum Detected Concentration ($\mu g/m^3$)	Soil Vapor Exposure Point Concentration[4] EPC_{sv} ($\mu g/m^3$)	Does EPC_{sv} Exceed Soil Vapor SL? ($\mu g/m^3$)
Acetone	16,000,000	140,000,000	27	17	63%	122	123	49	530	530	No
Benzene	48	420	27	13	48%	47	21	18	98	98	Yes (6)
Toluene	160,000	1,300,000	27	15	56%	180	104	40	390	390	No
Ethylbenzene	560	4,900	27	11	41%	36	14	25	69	69	No
m,p-Xylene	52,000	440,000	27	14	52%	103	65	46	270	270	No
o-Xylene	52,000	440,000	27	10	37%	39	15	28	74	74	No
2-Butanone (MEK)	2,600,000	22,000,000	27	2	7%	74	5	70	77	77	No
(4) 4-Ethyltoluene	160,000	1,300,000	27	1	4%	NE	NE	59	59	59	No
(5) 1,2,4-Trimethylbenzene	3,650	31,000	27	1	4%	NE	NE	52	52	52	No

Notes:
feet bgs = feet below ground surface.
$\mu g/m^3$ = micrograms per liter.
NE = Not estimated due to limitations in database (i.e., not detected in more than one sample).

[1] Represents statistical summary of chemicals detected in one or more samples.
[2] Represents San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESLs) for soil gas, dated February 2016 revision 3, unless otherwise noted.
[3] Value represents the maximum detected concentration.
[4] SFRWQCB ESLs were not available for 4-ethyltoluene; therefore, the ESL for toluene was used.
[5] A CRWQCB ESL was not available for 1,2,4-trimethylbenzene. California Department of Toxic Substances (DTSC) modified screening levels (2016) and USEPA Regional Screening Levels (2016) have been developed for indoor air, but not soil vapor. The residential and commercial soil vapor screening levels (SLs) are based on applying a DTSC default attenuation factor to the lowest of DTSC and USEPA air screening levels. The resident air SLs and industrial air SLs were divided by DTSC default attenuation factors of 0.002 and 0.001, respectively (DTSC, 2011). The resulting value is the soil vapor SL.
[6] EPC_{sv} exceeds the soil vapor SL for residential land use.

References:
DTSC. 2011. Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). Department of Toxic Substances Control. October.
DTSC. 2016. Human Health Risk Assessment Note Number 3: DTSC-modified Screening Levels. Department of Toxic Substances Control. June.
USEPA. 2016. Regional Screening Levels (RSLs). May.

FIGURES



Legend

- Former Above Ground Storage Tanks
- Existing Groundwater Monitoring / Extraction Wells
- 15 Acre Expanded Holifield Park Area

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	10/11/2016	PW	PP

0 70 140 280 Feet

15-Acre Eastern Portion

SGI environmental
THE SOURCE GROUP, INC.
1962 Freeman Avenue
Signal Hill, CA 90755
(562) 597-1055

Figure 1

Document Path: R:\DLA-Norwalk\GIS_Maps\GWM_Well_Map\Fig-1_DFSPN_15_Acre_Eastern_Portion_101116.mxd

ATTACHMENT A

SOIL AND SOIL VAPOR SCREENING LEVELS

Soil Screening Levels
Defense Fuel Support Point - Norwalk
Norwalk, California

Chemical	Soil Screening Levels (SLs)									
	Site-Specific Cleanup Goals[1] (mg/kg)	SFRWQCB ESL[2]			OEHHA CHHSL[4]		DTSC HERO[5]		USEPA RSL[6]	
		Tier 1[3] (mg/kg)	Residential (mg/kg)	Commercial (mg/kg)	Residential (mg/kg)	Commercial (mg/kg)	Residential (mg/kg)	Commercial (mg/kg)	Residential (mg/kg)	Commercial (mg/kg)
Total Petroleum Hydrocarbons (TPH)										
Carbon Range (C6-C12)	100	100	740	3,900	---	---	---	---	82 (7)	420 (7)
Carbon Range (C13-C22)	100	230	230	1,100	---	---	---	---	96 (8)	440 (8)
Carbon Range (C23-C32)	---	5100	---	---	---	---	---	---	2500 (9)	33,000 (9)
Carbon Range (C33-C44)	---	5100	---	---	---	---	---	---	---	---
Carbon Range (C23-C44)	1,000	5100	11,000 (10)	140,000 (10)	---	---	---	---	---	---
Volatile Organic Compounds (VOCs)										
Acetone	0.994	0.5	59,000	630,000	---	---	---	---	61,000	670,000
tert-Butyl alcohol (TBA)	0.02	0.075	---	---	---	---	---	---	---	---
Ethylbenzene	1.07	1.4	5.1	22	---	---	---	---	5.8	25
Toluene	0.356	2.9	970	4,600	---	---	1,100	5,400	4,900	47,000
1,2,4-Trimethylbenzene	0.12	---	---	---	---	---	---	---	58	240
o-Xylene	---	2.3	560	2,400	---	---	---	---	650	2,800
m,p-Xylenes	---	2.3	560	2,400	---	---	---	---	550	2,400
Gasoline Range Organics (GRO)	100	100	740	3,900	---	---	---	---	82 (7)	420 (7)

Notes:

mg/kg = milligrams per kilogram.

--- = Not available.

[1] Represents the final site-specific cleanup goals for soil, approved by the RWQCB in their letter entitled *Approval of Modification to Cleanup Goals* , dated July 16, 2015.

[2] Represents San Francisco Bay Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESLs) for soil, dated February 2016 revision 3.

[3] Represents SFRWQCB Tier 1 ESLs for soil, which are based on unrestricted land use.

[4] Represents Office of Environmental Health Hazard Assessment (OEHHA) California Human Health Screening Levels (CHHSLs) for soil, dated September 2010.

[5] Represents Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Note 3 modified screening levels for soil, dated June 2016.

[6] Represents U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) for soil, dated May 2016.

[7] Represents the lowest of the low aliphatic or low aromatic fraction USEPA RSL for TPH carbon range C5 to C8.

[8] Represents the lowest of the medium aliphatic or medium aromatic fraction USEPA RSL for TPH carbon range C9 to C18.

[9] Represents the lowest of the high aliphatic or high aromatic fraction USEPA RSL for TPH carbon range C17 to C32.

[10] Represents SFRWQCB ESL for TPH motor oil carbon range C18 to C34+.

Soil Vapor Screening Levels

Defense Fuel Support Point - Norwalk
Norwalk, California

Chemical	Soil Vapor Screening Levels (SLs)							
	SFRWQCB ESL[1]		OEHHA CHHSL[2]		DTSC HERO[3,5]		USEPA RSL[4,5]	
	Residential ($\mu g/m^3$)	Commercial ($\mu g/m^3$)	Residential ($\mu g/m^3$)	Commercial ($\mu g/m^3$)	Residential ($\mu g/m^3$)	Commercial ($\mu g/m^3$)	Residential ($\mu g/m^3$)	Commercial ($\mu g/m^3$)
Acetone	16,000,000	140,000,000	---	---	---	---	16,000,000	140,000,000
Benzene	48	420	36	120	49	420	180	1,600
Toluene	160,000	1,300,000	140,000	380,000	155,000	1,300,000	2,600,000	22,000,000
Ethylbenzene	560	4,900	420	1,400	---	---	550	4,900
m,p-Xylene	52,000	440,000	320,000	890,000	---	---	50,000	440,000
o-Xylene	52,000	440,000	320,000	890,000	---	---	50,000	440,000
2-Butanone (MEK)	2,600,000	22,000,000	---	---	---	---	2,600,000	22,000,000
(6) 4-Ethyltoluene	160,000	1,300,000	140,000	380,000	155,000	1,300,000	2,600,000	22,000,000
1,2,4-Trimethylbenzene	---	---	---	---	---	---	3,650	31,000

Notes:

$\mu g/m^3$ = micrograms per liter.

--- = Not available.

[1] Represents San Francisco Bay Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESLs) for soil, dated February 2016 revision 3.

[2] Represents Office of Environmental Health Hazard Assessment (OEHHA) California Human Health Screening Levels (CHHSLs) for soil, dated September 2010.

[3] Represents Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) Note 3 modified screening levels for soil, dated June 2016.

[4] Represents U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) for soil, dated May 2016.

[5] California Department of Toxic Substances (DTSC) modified screening levels (2016) and USEPA RSLs (2016) have been developed for indoor air, but not soil vapor. The residential and commercial soil vapor screening levels (SLs) are based on applying a DTSC default attenuation factor to the air screening levels. The resident air SLs and industrial air SLs were divided by DTSC default attenuation factors of 0.002 and 0.001, respectively (DTSC, 2011). The resulting value is the soil vapor SL.

[6] Soil vapor SLs were not available for 4-ethyltoluene; therefore, the SL for toluene was used.

References:

DTSC. 2011. Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). Department of Toxic Substances Control. Oc

DTSC. 2016. Human Health Risk Assessment Note Number 3: DTSC-modified Screening Levels. Department of Toxic Substances Control. June.

USEPA. 2016. Regional Screening Levels (RSLs). May.

ATTACHMENT B

RISK CHARACTERIZATION FOR SOIL

Risk Characterization for Soil for Residential Exposure Scenario
Defense Fuel Support Point - Norwalk
Norwalk, California

Chemical	Soil Screening Level (SL)[1]				Site Data - Soil from 0 to 10 feet bgs		
	Soil SL Based on Carcinogenic Effects (mg/kg)	Soil SL Based on Nonarcinogenic Effects (mg/kg)	Target Cancer Risk (unitless)	Target Noncancer Hazard Index (unitless)	EPC_{soil}[2] (mg/kg)	Cancer Risk[3] (unitless)	Noncancer Hazard Index[4] (unitless)
Total Petroleum Hydrocarbons (TPH)							
Carbon Range (C6-C12)	---	740	1 E-06	1 E+00	1.0	---	1 E-03
Carbon Range (C13-C22)	---	230	1 E-06	1 E+00	14	---	6 E-02
Carbon Range (C23-C32)	---	---	1 E-06	1 E+00	58	---	---
Carbon Range (C33-C44)	---	---	1 E-06	1 E+00	51	---	---
Carbon Range (C23-C44)	---	11,000	1 E-06	1 E+00	108	---	1 E-02
Volatile Organic Compounds (VOCs)							
Acetone	---	59,000	1 E-06	1 E+00	0.052	---	9 E-07
tert-Butyl alcohol (TBA)	---	---	1 E-06	1 E+00	0.023	---	---
Ethylbenzene	5.1	3,100	1 E-06	1 E+00	0.0020	4 E-10	6 E-07
Toluene	---	970	1 E-06	1 E+00	0.0021	---	2 E-06
(5) 1,2,4-Trimethylbenzene	---	58	1 E-06	1 E+00	0.0050	---	9 E-05
o-Xylene	---	560	1 E-06	1 E+00	0.0021	---	4 E-06
m,p-Xylenes	---	560	1 E-06	1 E+00	0.0026	---	5 E-06
Gasoline Range Organics (GRO)	---	740	1 E-06	1 E+00	0.50	---	7 E-04
					Total	**4 E-10**	**7 E-02**

Notes:
bgs = below ground surface.
SL = screening level.
EPC = exposure point concentration.
mg/kg = milligram per kilogram.

[1] Unless otherwise noted, represents the San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Level (ESL) based on noncarcinogenic or carcinogenic effects for direct exposure to shallow soil (SFRWQCB ESLs dated February 2016 revision 3).

[2] Value represents the lesser of the maximum detected concentration and the 95UCL.

[3] Represents the excess cancer risk, based on a target excess cancer risk of one-in-one million (1×10^{-6}).
Excess Cancer Risk for compound *i* = Soil EPC_i x Target Cancer Risk of 1×10^{-6} / Soil SL_i

[4] Represents the noncancer hazard, based on a target hazard quotient of one (1).
Hazard Quotient for compound *i* = Soil EPC_i x Target Noncancer Hazard Index of 1 / Soil SL_i

[5] SFRWQCB ESLs were not available for 1,2,4-trimethylbenzene; therefore, the U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) based on carcinogenic and noncarcinogenic effects were used (USEPA RSLs dated May 2016).

Risk Characterization for Soil for Commercial Exposure Scenario

Defense Fuel Support Point - Norwalk
Norwalk, California

Chemical	Soil Screening Level (SL)[1]				Site Data - Soil from 0 to 10 feet bgs		
	Soil SL Based on Carcinogenic Effects ($\mu g/m^3$)	Soil SL Based on Nonarcinogenic Effects ($\mu g/m^3$)	Target Cancer Risk (unitless)	Target Noncancer Hazard Index (unitless)	EPC_{soil}[2] ($\mu g/m^3$)	Cancer Risk[3] (unitless)	Noncancer Hazard Index[4] (unitless)
Total Petroleum Hydrocarbons (TPH)							
Carbon Range (C6-C12)	---	3,900	1 E-06	1 E+00	1.0	---	3 E-04
Carbon Range (C13-C22)	---	1,100	1 E-06	1 E+00	14	---	1 E-02
Carbon Range (C23-C32)	---	---	1 E-06	1 E+00	58	---	---
Carbon Range (C33-C44)	---	---	1 E-06	1 E+00	51	---	---
Carbon Range (C23-C44)	---	140,000	1 E-06	1 E+00	108	---	8 E-04
Volatile Organic Compounds (VOCs)							
Acetone	---	630,000	1 E-06	1 E+00	0.052	---	8 E-08
tert-Butyl alcohol (TBA)	---	---	1 E-06	1 E+00	0.023	---	---
Ethylbenzene	22	18,000	1 E-06	1 E+00	0.0020	9 E-11	1 E-07
Toluene	---	4,600	1 E-06	1 E+00	0.0021	---	5 E-07
(5) 1,2,4-Trimethylbenzene	---	240	1 E-06	1 E+00	0.0050	---	2 E-05
o-Xylene	---	2,400	1 E-06	1 E+00	0.0021	---	9 E-07
m,p-Xylenes	---	2,400	1 E-06	1 E+00	0.0026	---	1 E-06
Gasoline Range Organics (GRO)	---	3,900	1 E-06	1 E+00	0.50	---	1 E-04
					Total	**9 E-11**	**1 E-02**

Notes:
bgs = below ground surface.
SL = screening level.
EPC = exposure point concentration.
mg/kg = milligram per kilogram.

[1] Unless otherwise noted, represents the San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Level (ESL) based on noncarcinogenic or carcinogenic effects for direct exposure to shallow soil (SFRWQCB ESLs dated February 2016 revision 3).

[2] Value represents the lesser of the maximum detected concentration and the 95UCL.

[3] Represents the excess cancer risk, based on a target excess cancer risk of one-in-one million (1×10^{-6}).
Excess Cancer Risk for compound *i* = Soil EPC_i x Target Cancer Risk of 1×10^{-6} / Soil SL_i

[4] Represents the noncancer hazard, based on a target hazard quotient of one (1).
Hazard Quotient for compound *i* = Soil EPC_i x Target Noncancer Hazard Index of 1 / Soil SL_i

[5] SFRWQCB ESLs were not available for 1,2,4-trimethylbenzene; therefore, the U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) based on carcinogenic and noncarcinogenic effects were used (USEPA RSLs dated May 2016).

ATTACHMENT C

RISK CHARACTERIZATION FOR SOIL VAPOR

Risk Characterization for Soil Vapor for Residential Exposure Scenario
Defense Fuel Support Point - Norwalk
Norwalk, California

Chemical	Soil Vapor Screening Level (SL)[1]				Site Data - Soil Vapor at 5 feet bgs			Site Data - Soil Vapor at 10 feet bgs		
	Soil Vapor SL Based on Carcinogenic Effects ($\mu g/m^3$)	Soil Vapor SL Based on Nonarcinogenic Effects ($\mu g/m^3$)	Target Cancer Risk (unitless)	Target Noncancer Hazard Index (unitless)	$EPC_{soil\ vapor}$[2] ($\mu g/m^3$)	Cancer Risk[3] (unitless)	Noncancer Hazard Index[4] (unitless)	$EPC_{soil\ vapor}$[5] ($\mu g/m^3$)	Cancer Risk[3] (unitless)	Noncancer Hazard Index[4] (unitless)
Acetone	---	16,000,000	1 E-06	1 E+00	190	---	1 E-05	530	---	3 E-05
Benzene	48	1,600	1 E-06	1 E+00	30	6 E-07	2 E-02	98	2 E-06	6 E-02
Toluene	---	160,000	1 E-06	1 E+00	120	---	8 E-04	390	---	2 E-03
Ethylbenzene	560	520,000	1 E-06	1 E+00	---	---	---	69	1 E-07	1 E-04
m,p-Xylene	---	52,000	1 E-06	1 E+00	66	---	1 E-03	270	---	5 E-03
o-Xylene	---	52,000	1 E-06	1 E+00	---	---	---	74	---	1 E-03
2-Butanone (MEK)	---	2,600,000	1 E-06	1 E+00	---	---	---	77	---	3 E-05
(6) 4-Ethyltoluene	---	160,000	1 E-06	1 E+00	---	---	---	59	---	4 E-04
(7) 1,2,4-Trimethylbenzene	---	3,650	1 E-06	1 E+00	---	---	---	52	---	1 E-02
					Total	**6 E-07**	**2 E-02**	**Total**	**2 E-06**	**9 E-02**

Notes:
bgs = below ground surface.
SL = screening level.
EPC = exposure point concentration.
$\mu g/m^3$ = micrograms per cubic meter.

[1] Unless otherwise noted, represents the San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Level (ESL) based on noncarcinogenic or carcinogenic effects (SFRWQCB ESLs dated February 2016 revision 3).

[2] Value represents the maximum detected concentration in soil vapor collected from 5 feet bgs.

[3] Represents the excess cancer risk, based on a target excess cancer risk of one-in-one million (1×10^{-6}).
Excess Cancer Risk for compound *i* = Soil Vapor EPC_i x Target Cancer Risk of 1×10^{-6} / Soil Vapor SL_i

[4] Represents the noncancer hazard, based on a target hazard quotient of one (1).
Hazard Quotient for compound *i* = Soil Vapor EPC_i x Target Noncancer Hazard Index of 1 / Soil Vapor SL_i

[5] Value represents the maximum detected concentration in soil vapor collected from 10 feet bgs.

[6] SFRWQCB ESLs were not available for 4-ethyltoluene; therefore, the ESL for toluene was used.

[7] SFRWQCB ESLs were not available for 1,2,4-trimethylbenzene; therefore, the U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) based on carcinogenic and noncarcinogenic effects were used (USEPA RSLs dated May 2016).

Risk Characterization for Soil Vapor for Commercial Exposure Scenario
Defense Fuel Support Point - Norwalk
Norwalk, California

Chemical	Soil Vapor Screening Level (SL)[1]				Site Data - Soil Vapor at 5 feet bgs			Site Data - Soil Vapor at 10 feet bgs		
	Soil Vapor SL Based on Carcinogenic Effects ($\mu g/m^3$)	Soil Vapor SL Based on Nonarcinogenic Effects ($\mu g/m^3$)	Target Cancer Risk (unitless)	Target Noncancer Hazard Index (unitless)	$EPC_{soil\ vapor}$[2] ($\mu g/m^3$)	Cancer Risk[3] (unitless)	Noncancer Hazard Index[4] (unitless)	$EPC_{soil\ vapor}$[5] ($\mu g/m^3$)	Cancer Risk[3] (unitless)	Noncancer Hazard Index[4] (unitless)
Acetone	---	140,000,000	1 E-06	1 E+00	190	---	1 E-06	530	---	4 E-06
Benzene	420	13,000	1 E-06	1 E+00	30	7 E-08	2 E-03	98	2 E-07	8 E-03
Toluene	---	1,300,000	1 E-06	1 E+00	120	---	9 E-05	390	---	3 E-04
Ethylbenzene	4,900	4,400,000	1 E-06	1 E+00	---	---	---	69	1 E-08	2 E-05
m,p-Xylene	---	440,000	1 E-06	1 E+00	66	---	2 E-04	270	---	6 E-04
o-Xylene	---	440,000	1 E-06	1 E+00	---	---	---	74	---	2 E-04
2-Butanone (MEK)	---	22,000,000	1 E-06	1 E+00	---	---	---	77	---	4 E-06
(6) 4-Ethyltoluene	---	1,300,000	1 E-06	1 E+00	---	---	---	59	---	5 E-05
(7) 1,2,4-Trimethylbenzene	---	31,000	1 E-06	1 E+00	---	---	---	52	---	2 E-03
					Total	**7 E-08**	**3 E-03**	**Total**	**2 E-07**	**1 E-02**

Notes:
bgs = below ground surface.
SL = screening level.
EPC = exposure point concentration.
$\mu g/m^3$ = micrograms per cubic meter.

[1] Unless otherwise noted, represents the San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Level (ESL) based on noncarcinogenic or carcinogenic effects (SFRWQCB ESLs dated February 2016 revision 3).

[2] Value represents the maximum detected concentration in soil vapor collected from 5 feet bgs.

[3] Represents the excess cancer risk, based on a target excess cancer risk of one-in-one million (1×10^{-6}).
Excess Cancer Risk for compound *i* = Soil Vapor EPC_i x Target Cancer Risk of 1×10^{-6} / Soil Vapor SL_i

[4] Represents the noncancer hazard, based on a target hazard quotient of one (1).
Hazard Quotient for compound *i* = Soil Vapor EPC_i x Target Noncancer Hazard Index of 1 / Soil Vapor SL_i

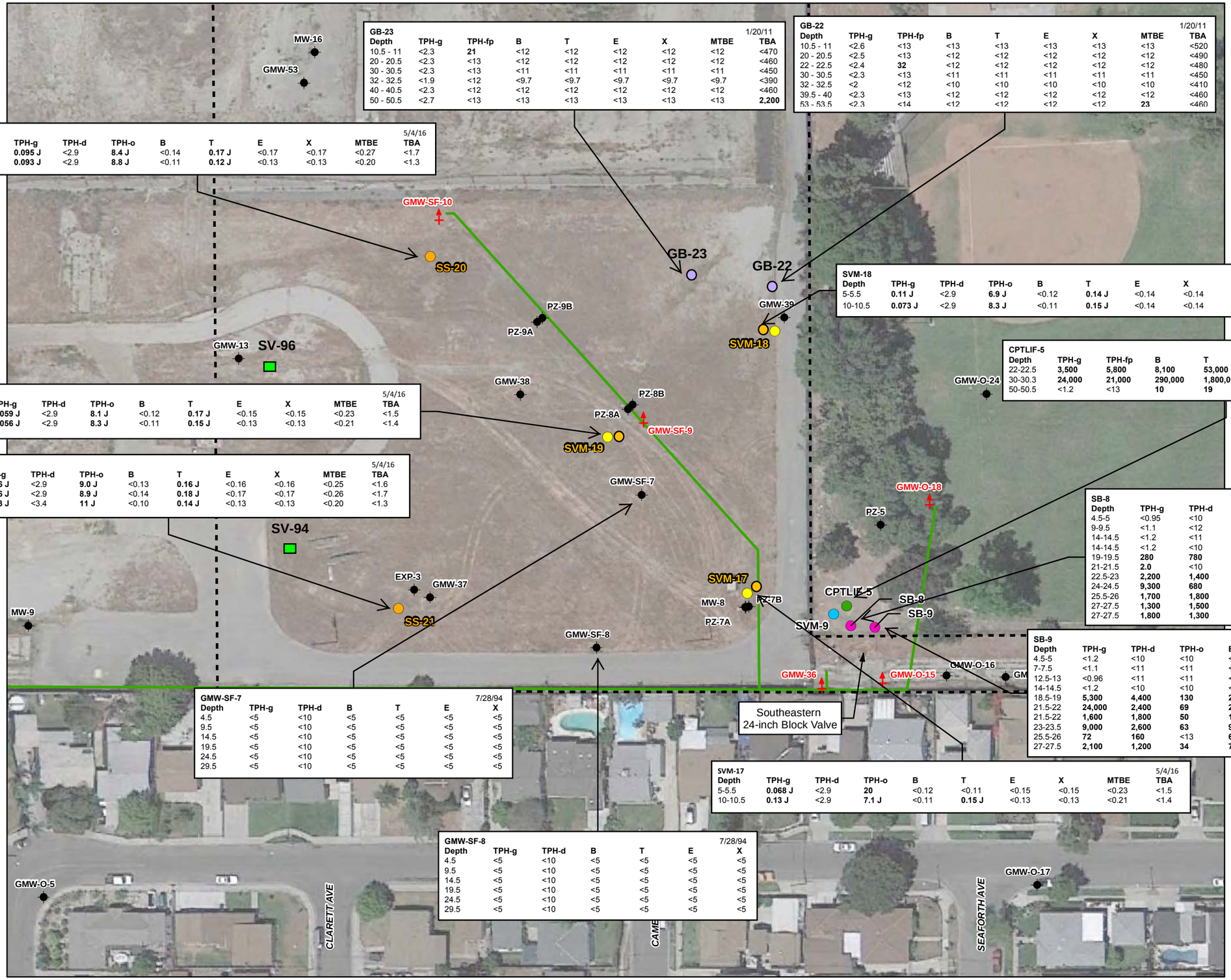
[5] Value represents the maximum detected concentration in soil vapor collected from 10 feet bgs.

[6] SFRWQCB ESLs were not available for 4-ethyltoluene; therefore, the ESL for toluene was used.

[7] SFRWQCB ESLs were not available for 1,2,4-trimethylbenzene; therefore, the U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) based on carcinogenic and noncarcinogenic effects were used (USEPA RSLs dated May 2016).

ATTACHMENT D

HISTORICAL SOIL BORING DATA AND SVM PROBE LOCATIONS



GB-23

Depth	TPH-g	TPH-fp	B	T	E	X	MTBE	1/20/11 TBA
10.5 - 11	<2.3	**21**	<12	<12	<12	<12	<12	<470
20 - 20.5	<2.3	<13	<12	<12	<12	<12	<12	<460
30 - 30.5	<2.3	<13	<11	<11	<11	<11	<11	<450
32 - 32.5	<1.9	<12	<9.7	<9.7	<9.7	<9.7	<9.7	<390
40 - 40.5	<2.3	<12	<12	<12	<12	<12	<12	<460
50 - 50.5	<2.7	<13	<13	<13	<13	<13	<13	**2,200**

GB-22

Depth	TPH-g	TPH-fp	B	T	E	X	MTBE	1/20/11 TBA
10.5 - 11	<2.6	<13	<13	<13	<13	<13	<13	<520
20 - 20.5	<2.5	<13	<12	<12	<12	<12	<12	<490
22 - 22.5	<2.4	**32**	<12	<12	<12	<12	<12	<480
30 - 30.5	<2.3	<13	<11	<11	<11	<11	<11	<450
32 - 32.5	<2	<12	<10	<10	<10	<10	<10	<410
39.5 - 40	<2.3	<13	<12	<12	<12	<12	<12	<460
53 - 53.5	<2.3	<14	<12	<12	<12	<12	**23**	<460

SS-20

Depth	TPH-g	TPH-d	TPH-o	B	T	E	X	MTBE	5/4/16 TBA
5-5.5	**0.095 J**	<2.9	**8.4 J**	<0.14	**0.17 J**	<0.17	<0.17	<0.27	<1.7
10-10.5	**0.093 J**	<2.9	**8.8 J**	<0.11	**0.12 J**	<0.13	<0.13	<0.20	<1.3

SVM-18

Depth	TPH-g	TPH-d	TPH-o	B	T	E	X	MTBE	5/4/16 TBA
5-5.5	**0.11 J**	<2.9	**6.9 J**	<0.12	**0.14 J**	<0.14	<0.14	<0.23	<1.5
10-10.5	**0.073 J**	<2.9	**8.3 J**	<0.11	**0.15 J**	<0.14	<0.14	<0.22	<1.4

CPTLIF-5

Depth	TPH-g	TPH-fp	B	T	E	X	MTBE	10/25/2011 TBA
22-22.5	**3,500**	**5,800**	**8,100**	**53,000**	**47,000**	**320,000**	<1,200	<120,000
30-30.3	**24,000**	**21,000**	**290,000**	**1,800,000**	**390,000**	**2,300,000**	**170,000**	<670,000
50-50.5	<1.2	<13	**10**	**19**	<6.1	<6.1	**18**	<610

SVM-19

Depth	TPH-g	TPH-d	TPH-o	B	T	E	X	MTBE	5/4/16 TBA
5-5.5	**0.059 J**	<2.9	**8.1 J**	<0.12	**0.17 J**	<0.15	<0.15	<0.23	<1.5
10-10.5	**0.056 J**	<2.9	**8.3 J**	<0.11	**0.15 J**	<0.13	<0.13	<0.21	<1.4

SS-21

Depth	TPH-g	TPH-d	TPH-o	B	T	E	X	MTBE	5/4/16 TBA
5-5.5	**0.076 J**	<2.9	**9.0 J**	<0.13	**0.16 J**	<0.16	<0.16	<0.25	<1.6
5-5.5 FD	**0.066 J**	<2.9	**8.9 J**	<0.14	**0.18 J**	<0.17	<0.17	<0.26	<1.7
10-10.5	**0.063 J**	<3.4	**11 J**	<0.10	**0.14 J**	<0.13	<0.13	<0.20	<1.3

SB-8

Depth	TPH-g	TPH-d	TPH-o	B	T	E	X	MTBE	9/21/12 TBA
4.5-5	<0.95	<10	<10	<5.4	<5.4	<5.4	<5.4	<5.4	<27
9-9.5	<1.1	<12	<12	<5.4	<5.4	<5.4	<5.4	<5.4	<27
14-14.5	<1.2	<11	<11	<5.9	<5.9	<5.9	<5.9	<5.9	<29
14-14.5	<1.2	<10	<10	<4.7	<4.7	<4.7	<4.7	<4.7	<23
19-19.5	**280**	**780**	**21**	**1,500**	**28,000**	**5,700**	**45,000**	**390**	<1,200
21-21.5	**2.0**	<10	<10	**72**	**1,900**	**110**	**2,400**	**110**	<33
22.5-23	**2,200**	**1,400**	**38**	**9,000**	**160,000**	**51,000**	**330,000**	<3,200	<16,000
24-24.5	**9,300**	**680**	**18**	**120,000**	**810,000**	**170,000**	**1,000,000**	**17,000**	<3,200
25.5-26	**1,700**	**1,800**	**41**	**19,000**	**120,000**	**25,000**	**160,000**	**50,000**	<3,200
27-27.5	**1,300**	**1,500**	**39**	**3,100**	**57,000**	**19,000**	**130,000**	**1,400**	<3,000
27-27.5	**1,800**	**1,300**	**34**	**5,400**	**100,000**	**35,000**	**230,000**	**2,300**	<7,100

SB-9

Depth	TPH-g	TPH-d	TPH-o	B	T	E	X	MTBE	9/21/12 TBA
4.5-5	<1.2	<10	<10	<6.0	<6.0	<6.0	<6.0	<6.0	<30
7-7.5	<1.1	<11	<11	<5.2	<5.2	<5.2	<5.2	<5.2	<26
12.5-13	<0.96	<11	<11	<5.7	<5.7	<5.7	<5.7	<5.7	<28
14-14.5	<1.2	<10	<10	<5.4	<5.4	<5.4	<5.4	<5.4	<27
18.5-19	**5,300**	**4,400**	**130**	**25,000**	**390,000**	**120,000**	**710,000**	<5,400	<27,000
21.5-22	**24,000**	**2,400**	**69**	**260,000**	**2,000,000**	**410,000**	**2,800,000**	**53,000**	<150,000
21.5-22	**1,600**	**1,800**	**50**	**18,000**	**130,000**	**27,000**	**180,000**	**16,000**	<12,000
23-23.5	**9,000**	**2,600**	**63**	**94,000**	**630,000**	**160,000**	**980,000**	**30,000**	<59,000
25.5-26	**72**	**160**	<13	**6,100**	**11,000**	**760**	**4,800**	**44,000**	**3,100**
27-27.5	**2,100**	**1,200**	**34**	**7,700**	**100,000**	**36,000**	**230,000**	**3,800**	<15,000

GMW-SF-7

Depth	TPH-g	TPH-d	B	T	E	7/28/94 X
4.5	<5	<10	<5	<5	<5	<5
9.5	<5	<10	<5	<5	<5	<5
14.5	<5	<10	<5	<5	<5	<5
19.5	<5	<10	<5	<5	<5	<5
24.5	<5	<10	<5	<5	<5	<5
29.5	<5	<10	<5	<5	<5	<5

GMW-SF-8

Depth	TPH-g	TPH-d	B	T	E	7/28/94 X
4.5	<5	<10	<5	<5	<5	<5
9.5	<5	<10	<5	<5	<5	<5
14.5	<5	<10	<5	<5	<5	<5
19.5	<5	<10	<5	<5	<5	<5
24.5	<5	<10	<5	<5	<5	<5
29.5	<5	<10	<5	<5	<5	<5

SVM-17

Depth	TPH-g	TPH-d	TPH-o	B	T	E	X	MTBE	5/4/16 TBA
5-5.5	**0.068 J**	<2.9	**20**	<0.12	<0.11	<0.15	<0.15	<0.23	<1.5
10-10.5	**0.13 J**	<2.9	**7.1 J**	<0.11	**0.15 J**	<0.13	<0.13	<0.21	<1.4

Legend

- Eastern 15-Acre Soil Sample Location
- Eastern 15-Acre Soil Vapor Monitoring Probe Location
- Offsite Soil Vapor Monitoring Probe Location
- 2011 CPT/LIF Boring
- 2012 Soil Boring Location
- Existing Groundwater Monitoring Well
- Existing Remediation Well
- KMEP Remediation Piping Layout (above ground and below ground)
- Proposed Eastern 15-Acre Property Boundary
- DLA Energy Soil Vapor Monitoring Probe
- 2011 Step-out Boring

Notes:
-TPH in units of mg/kg
-BTEX, MTBE, and TBA in units of ug/kg

Imagery Source:
Google Earth April 17, 2013.

0 37.5 75 150
Feet

1 inch = 75 feet

Attachment D
Historical Soil Boring Data and SVM Probe Locations, Eastern 15-Acre Property
Defense Fuel Support Point, Norwalk
Norwalk, California

ATTACHMENT E
SOIL SAMPLING ANALYTICAL RESULTS
(FROM 1994 GEOMATRIX REPORT)

DEFENSE FUEL SUPPLY CENTER

CITY OF NORWALK PARK

EASEMENT (ASPHALT)

℄ CHESHIRE STREET

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
4.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
9.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
14.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
19.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
24.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
29.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)

GMW-SF-7

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
4.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
9.5	9.3	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
14.5	6700	48,000	14,000	54,000	21,000	2000	1500
19.5	9,700	42,000	11,000	44,000	18,000	1600	1900
24.5	23,000	320,000	39,000	140,000	58,000	7600	3800

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
4.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
9.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
14.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
19.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
24.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
29.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)

GMW-SF-8

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
7	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
10	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
13	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
16	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
19.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
22	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	5.3	ND(5.0)	ND(10)
23	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
26.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
29	ND(5.0)	7.7	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
31	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)

GMW-O-18

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
4.5	ND(5.0)	11	ND(5.0)	16	7	ND(5.0)	ND(10)
9.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
14.5	3800	58,000	10,000	40,000	17,000	1400	1600
19.5	53,000	470,000	62,000	440,000	92,000	15,000	3900
24.5	17,000	110,000	26,000	100,000	41,000	3100	1900
27	39,000	290,000	58,000	220,000	92,000	8000	4200

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
4.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
9.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
14.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
19.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
24.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
29.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)

GMW-O-19

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
4.5	770	1500	810	3600	650	940	9300

SBG-O-1

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
7	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
10	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
14.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
19	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
23.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
26	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
29.5	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)

SBG-O-2

SAMPLE DEPTH	B	T	E	m.p.-X	o-X	TPHg	TPHd
6.5	12	10	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
9.5	24	15	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
12.5	66	22	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(10)
14	48	37	ND(5.0)	26	16	ND(5.0)	ND(10)
15.5	68	120	27	120	62	ND(5.0)	ND(10)
18.5	190,000	860,000	190,000	760,000	300,000	22,000	17,000
21.5	43,000	320,000	53,000	300,000	120,000	23,000	4600
24.5	14,000	2000	240	880	420	33	93
26.5	770	1500	810	1800	650	940	9300
27.5	NA	NA	NA	NA	NA	NA	NA
29.5	810,000	2,400,000	500,000	2,200,000	820,000	65,000	24,000

GMW-O-17

MW-8

MW-36

VE-O-1

VE-O-2

GMW-O-15

GMW-O-16

KEY

SBG-O-1/ VE-O-2	GEOMATRIX EXPLORATORY SOIL BORING (JULY 1994)
GMW-O-18/ GMW-SF-7	GEOMATRIX GROUNDWATER MONITORING WELL (JULY 1994)
VE-O-1	GEOMATRIX VAPOR EXTRACTION WELL (JULY 1994)
GMW-O-15/ MW-36	EXISTING GROUNDWATER MONITORING WELL INSTALLED BY GTI
	24" BLOCK VALVE
	24" SFPP PIPELINE
	FENCE

B	BENZENE (ug/l)
T	TOLUENE (ug/l)
E	ETHYLBENZENE (ug/l)
m.p.-X	m.p.- XYLENES (ug/l)
o-X	o-XYLENES (ug/l)
TPHg	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (mg/l)
TPHd	TOTAL PETROLEUM HYDROCARBONS AS DIESEL (mg/l)
NA	NOT ANALYZED
ND	NOT DETECTED AT NOTED DETECTION LIMIT
ug/l	MICROGRAMS PER LITER
mg/l	MILLIGRAMS PER LITER

SAMPLE DEPTH IS FEET BELOW GROUND SURFACE (BGS)

TPHg ANALYZED USING MODIFIED EPA METHOD 8015 QUANTIFIED USING A GASOLINE STANDARD

TPHd ANALYZED USING MODIFIED EPA METHOD 8015 QUANTIFIED USING A DIESEL STANDARD

BTEX ANALYZED USING EPA METHOD 8020

-N-

0 80

APPROXIMATE SCALE (FEET)

SOIL SAMPLE ANALYTICAL RESULTS

BLOCK VALVE LEAK
Norwalk, CA

09/30/94

GEOMATRIX

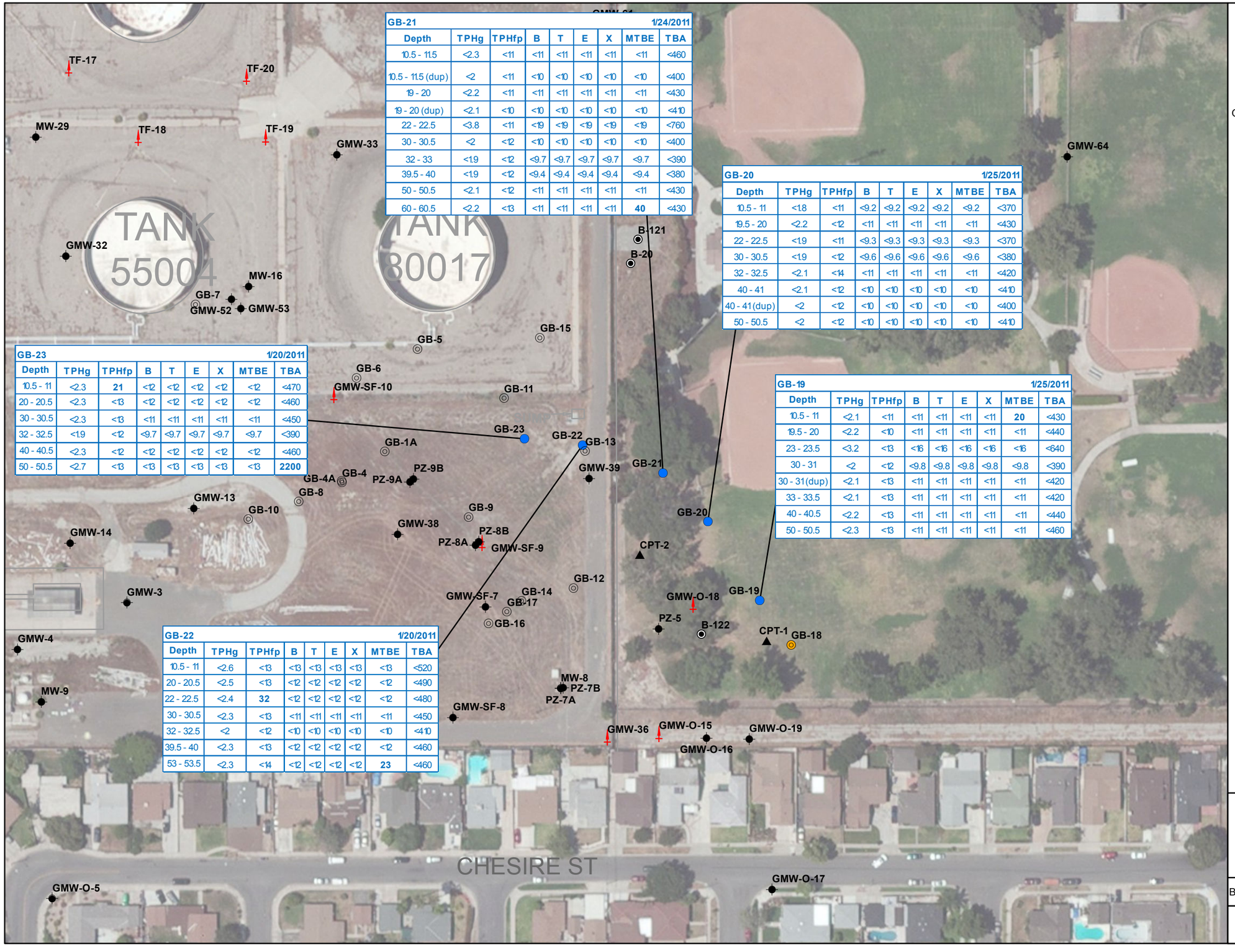
Project No. S1603.11

Attachment E

ATTACHMENT F

SOIL ANALYTICAL RESULTS FROM SE INVESTIGATION

(FROM 2011 CH2M REPORT)



GB-21								1/24/2011
Depth	TPHg	TPHfp	B	T	E	X	MTBE	TBA
10.5 - 11.5	<2.3	<11	<11	<11	<11	<11	<11	<460
10.5 - 11.5 (dup)	<2	<11	<10	<10	<10	<10	<10	<400
19 - 20	<2.2	<11	<11	<11	<11	<11	<11	<430
19 - 20 (dup)	<2.1	<10	<10	<10	<10	<10	<10	<410
22 - 22.5	<3.8	<11	<19	<19	<19	<19	<19	<760
30 - 30.5	<2	<12	<10	<10	<10	<10	<10	<400
32 - 33	<1.9	<12	<9.7	<9.7	<9.7	<9.7	<9.7	<390
39.5 - 40	<1.9	<12	<9.4	<9.4	<9.4	<9.4	<9.4	<380
50 - 50.5	<2.1	<12	<11	<11	<11	<11	<11	<430
60 - 60.5	<2.2	<13	<11	<11	<11	<11	**40**	<430

GB-20								1/25/2011
Depth	TPHg	TPHfp	B	T	E	X	MTBE	TBA
10.5 - 11	<1.8	<11	<9.2	<9.2	<9.2	<9.2	<9.2	<370
19.5 - 20	<2.2	<12	<11	<11	<11	<11	<11	<430
22 - 22.5	<1.9	<11	<9.3	<9.3	<9.3	<9.3	<9.3	<370
30 - 30.5	<1.9	<12	<9.6	<9.6	<9.6	<9.6	<9.6	<380
32 - 32.5	<2.1	<14	<11	<11	<11	<11	<11	<420
40 - 41	<2.1	<12	<10	<10	<10	<10	<10	<410
40 - 41 (dup)	<2	<12	<10	<10	<10	<10	<10	<400
50 - 50.5	<2	<12	<10	<10	<10	<10	<10	<410

GB-19								1/25/2011
Depth	TPHg	TPHfp	B	T	E	X	MTBE	TBA
10.5 - 11	<2.1	<11	<11	<11	<11	<11	**20**	<430
19.5 - 20	<2.2	<10	<11	<11	<11	<11	<11	<440
23 - 23.5	<3.2	<13	<16	<16	<16	<16	<16	<640
30 - 31	<2	<12	<9.8	<9.8	<9.8	<9.8	<9.8	<390
30 - 31 (dup)	<2.1	<13	<11	<11	<11	<11	<11	<420
33 - 33.5	<2.1	<13	<11	<11	<11	<11	<11	<420
40 - 40.5	<2.2	<13	<11	<11	<11	<11	<11	<440
50 - 50.5	<2.3	<13	<11	<11	<11	<11	<11	<460

GB-23								1/20/2011
Depth	TPHg	TPHfp	B	T	E	X	MTBE	TBA
10.5 - 11	<2.3	**21**	<12	<12	<12	<12	<12	<470
20 - 20.5	<2.3	<13	<12	<12	<12	<12	<12	<460
30 - 30.5	<2.3	<13	<11	<11	<11	<11	<11	<450
32 - 32.5	<1.9	<12	<9.7	<9.7	<9.7	<9.7	<9.7	<390
40 - 40.5	<2.3	<12	<12	<12	<12	<12	<12	<460
50 - 50.5	<2.7	<13	<13	<13	<13	<13	<13	**2200**

GB-22								1/20/2011
Depth	TPHg	TPHfp	B	T	E	X	MTBE	TBA
10.5 - 11	<2.6	<13	<13	<13	<13	<13	<13	<520
20 - 20.5	<2.5	<13	<12	<12	<12	<12	<12	<490
22 - 22.5	<2.4	**32**	<12	<12	<12	<12	<12	<480
30 - 30.5	<2.3	<13	<11	<11	<11	<11	<11	<450
32 - 32.5	<2	<12	<10	<10	<10	<10	<10	<410
39.5 - 40	<2.3	<13	<12	<12	<12	<12	<12	<460
53 - 53.5	<2.3	<14	<12	<12	<12	<12	**23**	<460

Explanation

- GB-19 — Soil and Groundwater Sampling Location (CH2M Hill, 2011)
- GMW-39 — Monitoring well
- GMW-O-18 — Remediation Well
- CPT-1 — CPT and Groundwater Sampling Location (AMEC Geometrix, 2008)
- GB-18 — Exposition aquifer groundwater sampling location (AMEC Geomatrix, 2009)
- GB-17 — Groundwater screening sample location (Gematrix, 2002)
- B-122 — Groundwater sampling location (Parsons, 2007)

Depth Sample depth or well screen interval in feet below ground surface

TPHg Total petroleum hydrocarbons quantified using a gasoline standard

TPHfp Total petroleum hydrocarbons quantified using a fuel product standard

B Benzene

T Toluene

E Ethylbenzene

X Total xylenes

MTBE Methy tert-butyl ether

TBA Tert-butyl alcohol

<11 Not detected at or above laboratory reporting limit (RL) shown

DUP Duplicate Sample

Soil analytical results are reported in units of micrograms per kilogram (µg/kg).

N

0 40 80 160 Feet

Soil Analytical Results from SE Investigation

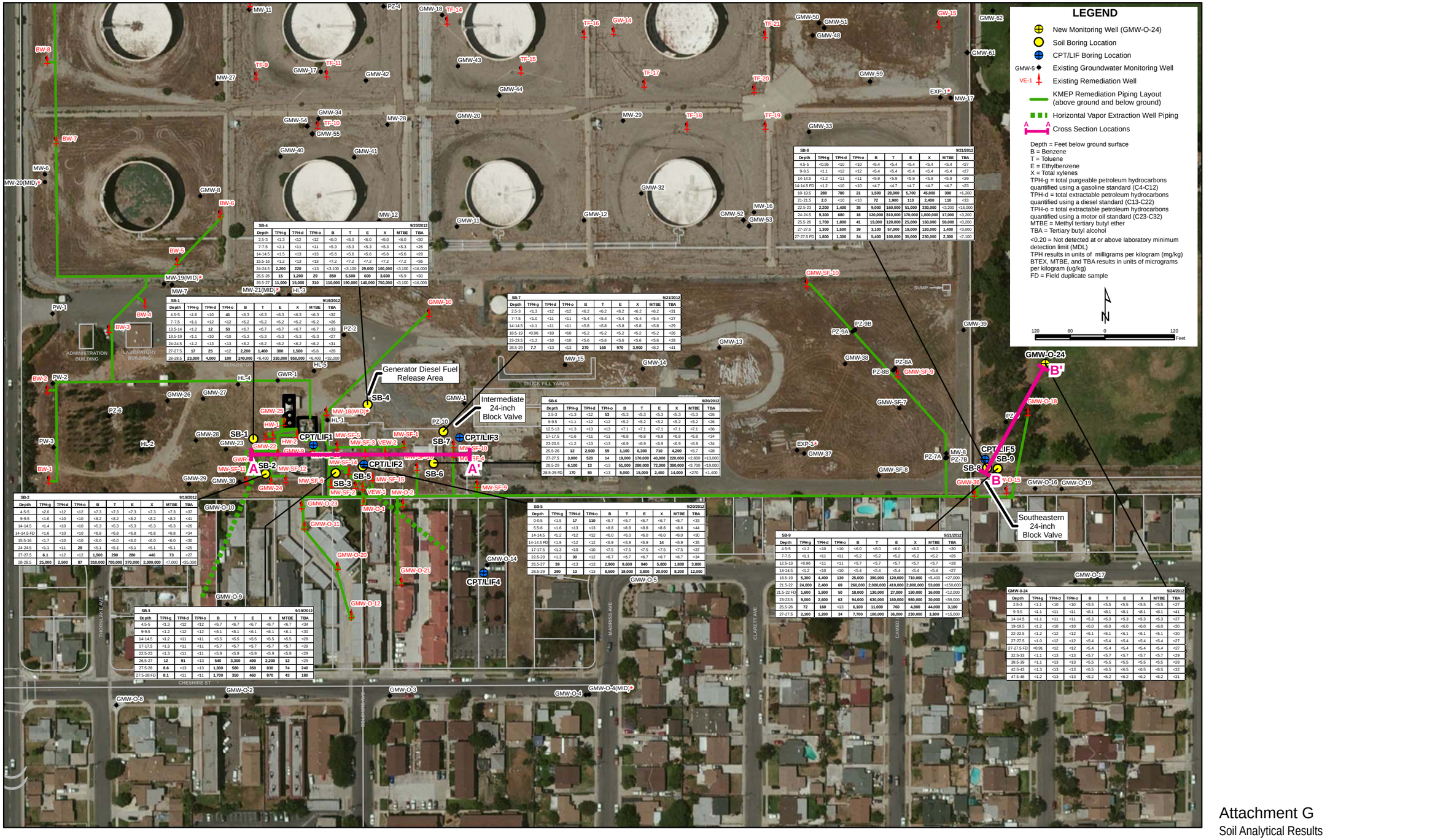
DFSP, Norwalk CA

By: Mike Brown	Date: 08/04/11	PN: 407609
CH2MHILL	Attachment F	

ATTACHMENT G

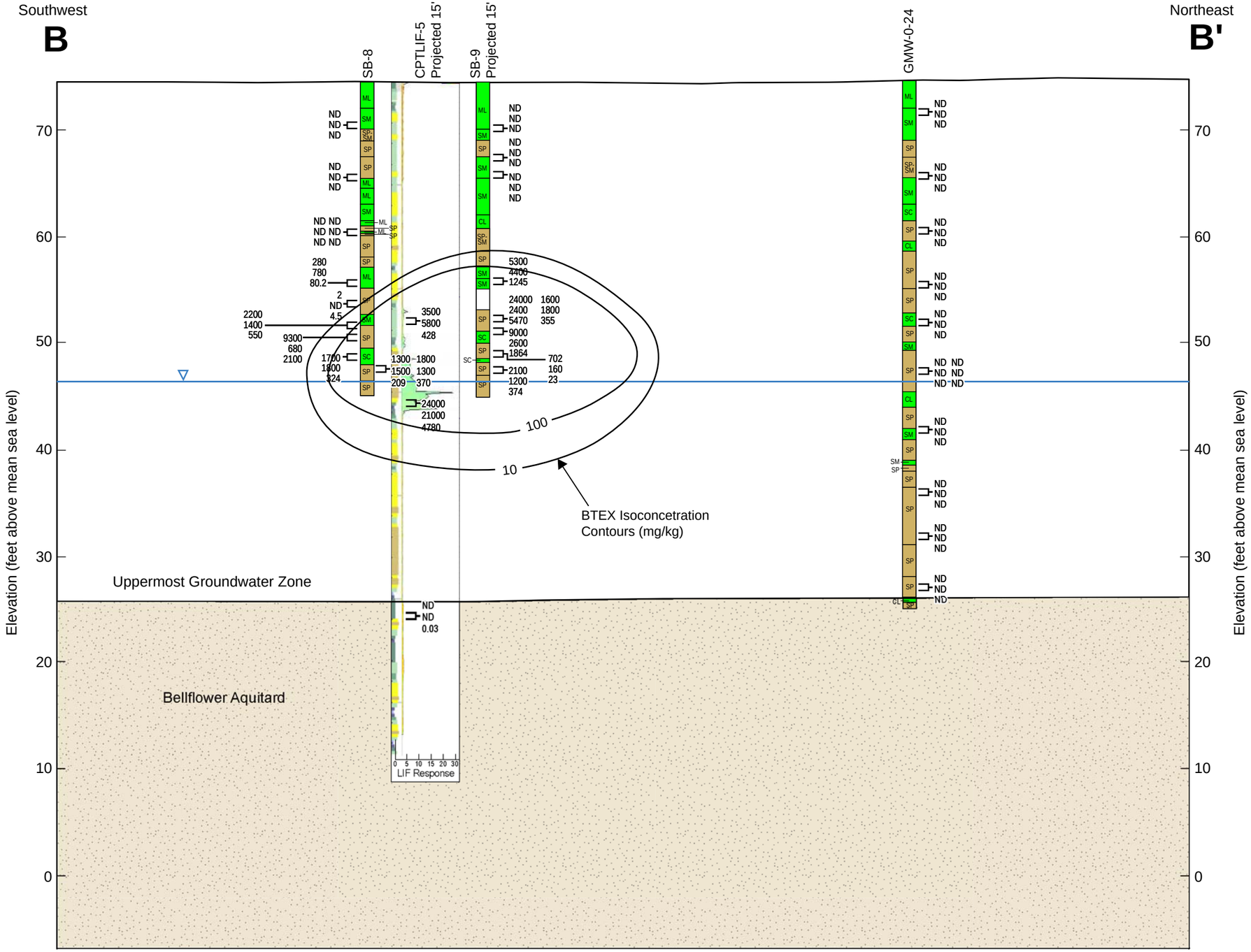
SOIL ANALYTICAL RESULTS AND SOIL BORING CROSS SECTION B-B'

(FROM 2012 CH2M REPORT)



Attachment G
Soil Analytical Results
SFPP Norwalk Pump Station
Norwalk, California

CH2MHILL



Legend

Approximate groundwater elevation in uppermost groundwater zone (Sept 2012)

Soil Analytical Data

Soil Boring		CPTLIF Boring	
2200	TPHg	2400	TPHg
1400 =	TPHd	21000 =	TPH_{FP}
550	BTEX	4780	BTEX

ND = non-detect
Soil concentrations in units of mg/kg

Soil Boring Lithology

= Finer grained material (SL, ML, SC, SM)
= Coarser grained material (SP, SP-SM)
= No Recovery

CL – Lean clay or sandy lean clay
ML – Silt
SM – Silty sand
SP-SM – Poorly graded sand with silt
SP – Poorly graded sand
SC – Clayey sand

Note:
Top of the Bellfower Aquitard was interpreted based on (1) review of the lithological descriptions provided on the select well and boring logs (Preliminary Conceptual Site Model, AMEC Geomatrix, Inc., February 13, 2009) and (2) modified with CPT results.

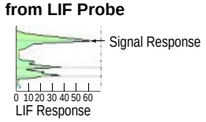
Lithology from CPT Probe

(After Robertson, et al., 1986)

ZONE	SBT
1	Sensitive, fine grained
2	Organic materials
3	Clay
4	Silty clay to clay
5	Clayey silt to silty clay
6	Sandy silt to clayey silt
7	Silty sand to sandy silt
8	Sand to silty sand
9	Sand
10	Gravely sand to sand
11	Very stiff fine grained*
12	Sand to clayey sand*

*over consolidated or cemented

Response from LIF Probe



0 25 50
Approximate scale in feet
Vertical scale 5x Horizontal

Attachment G
Soil Boring Cross Section B-B'
SFPP Norwalk Pump Station
Norwalk, California

CH2MHILL

ATTACHMENT H

SOIL GAS SAMPLING RESULTS (PARK AREA)

(FROM 2016 SGI REPORT)

Excelsior Dr

Norwalk Blvd

515

203

216

218

516

Powerine Basin

Holifield Park Extension (15,000 Acres Added)

80001

80002

80004

80005

80006

80007

80008

80009

80013

55003

55004

80017

Tank

Tank

SV-41
<16 @ 5ft
<16 @ 10ft

SV-38
<16 @ 5ft
<16 @ 10ft

SV-5
<16 @ 5ft
<16 @ 10ft

SV-35
<16 @ 5ft
<16 @ 10ft

SV-1
<16 @ 5ft
98 @ 10ft

SV-14
<16 @ 5ft
<16 @ 10ft

SV-31
<16 @ 5ft
<16 @ 10ft

SV-32
<16 @ 5ft
<16 @ 10ft

SV-29
<16 @ 5ft
<16 @ 10ft

SV-30
<16 @ 5ft
<16 @ 10ft

SV-28
<16 @ 5ft
<16 @ 10ft

SV-27
<16 @ 5ft
<16 @ 10ft

SV-4
<16 @ 5ft
<16 @ 10ft

SV-26
<16 @ 5ft
<16 @ 10ft

SV-24
29 @ 5ft
18 @ 10ft

SV-25
<16 @ 5ft
42 @10ft

SV-22
<16 @ 5ft
53 @ 10ft

SV-21
<16 @ 5ft
72 @ 10ft

SV-19
<16 @ 5ft
38 @ 10ft

SV-23
<16 @ 5ft
39 @ 10ft

SV-20
<16 @ 5ft
65 @ 10ft

SV-3
<16 @ 5ft
<16 @ 10ft

SV-17
<16 @ 5ft
49 @ 10ft

SV-96
<16 @ 5ft
33 @ 10ft

SV-18
30 @ 5ft
34 @ 10ft

SV-94
<16 @ 5ft
31 @ 10ft

Legend

SV-13 — Proposed Soil Vapor Probe Locations

SV-1 — Soil Vapor Probe Locations (SGI 2015)

Surveyed Park Boundary (by Coast Surveying, Inc., Ocober 2015)

203 — Coast Surveying, Inc. Survey Points (October 2015)

Note

<16 @ 5ft: Concentration of Benzene at 5 feet below ground surface is not detected;

49 @ 10ft: Concentration of Benzene at 10 feet below ground surface is 49 µg/m3.

CHHSLs - Commercial Soil Gas for Benzene = 120 µg/m3

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-005	04/07/2016	P. W	N. I

0 70 140 280 Feet

Soil Gas Sampling Results (Park Area)

SGI environmental
THE SOURCE GROUP, INC.
1962 Freeman Avenue
Signal Hill, CA 90755
(562) 597-1055

Attachment H

Document Path: Y:\DLA-Norwalk\GIS_Maps\Park_Area_Maps\Fig-9_Park Area_Soil_Gas_Results_04072016.mxd