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Report Type:	**Request for Closure**
Report Date:	**4/18/2016**
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Organization Name:	**The Source Group, Inc.**
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DEFENSE LOGISTICS AGENCY
ENERGY
8725 JOHN J. KINGMAN ROAD
FORT BELVOIR, VIRGINIA 22060-6222

April 18, 2016

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

Dear Mr. Cho:

Enclosed is the Shallow Soil Closure Report for the Defense Logistics Agency Energy Responsible Area of the Eastern Portion at Defense Fuel Support Point Norwalk. We have completed the remediation activities in accordance with the approved Remedial Action Plan and hereby request concurrence from the California Regional Water Quality Control Board, Los Angeles Region with the determination that no further action is required for shallow soil.

My point of contact for this matter is Nicholas Carros. He may be contacted at (703) 767-6624 or e-mail: nicholas.carros@dla.mil.

Sincerely,

Digitally signed by FLEMING.LAURA.ANN.1271112625
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=DLA, cn=FLEMING.LAURA.ANN.1271112625
Date: 2016.04.18 10:08:36 -04'00'

Laura A. Fleming
Chief, Environmental Division
DLA Installation Support for Energy

Enclosure
As stated

cc:
DLA Energy-Americas West
Neil Irish, Principal Geologist, APEX LLC

SHALLOW SOIL CLOSURE REPORT
DLA-ENERGY RESPONSIBLE AREA OF
THE EASTERN PORTION

Defense Fuel Support Point Norwalk
15306 Norwalk Boulevard
Norwalk, California

04-NDLA-007

Prepared For:

Defense Logistics Agency - Energy
8725 John J. Kingman Road
Fort Belvoir, Virginia 22060-6222

Prepared By:

SGI environmental THE SOURCE GROUP, INC.

1962 Freeman Avenue
Signal Hill, California 90755

April 18, 2016

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ABBREVIATIONS AND ACRONYMS

1,2-DCA	1,2-dichloroethane
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylenes
cfm	cubic feet per minute
CO_2	carbon dioxide
COPC	chemicals of potential concern
DESC	Defense Energy Support Center
DFSP	Defense Fuel Support Point
DOT	Department of Transportation
GSI	Groundwater Technology Government Services, Inc.
HASP	Health and Safety Plan
HDPE	high-density polyethylene
HSA	hollow stem auger
HW	horizontal well
IDW	investigation-derived waste
JP	jet propellant
KMEP	Kinder Morgan Energy Partners
mg/kg	milligrams per kilogram
MTBE	methyl tert-butyl ether
MW	monitoring well
O_2	oxygen
PPE	personal protective equipment
PID	photoionization detector
PVC	polyvinyl chloride
RWQCB	Regional Water Quality Control Board
SHSO	Site Health and Safety Officer
SVE	soil vapor extraction
SHARP	Site Health and Risk Management Program
TFS	truck fill stand
ThermOx	thermal oxidizer
TPH	total petroleum hydrocarbons
TPHfp	total petroleum hydrocarbons as fuel product
TPHd	total petroleum hydrocarbons as diesel
TPHg	total petroleum hydrocarbons as gasoline
TVH	total volatile hydrocarbons
USEPA	United States Environmental Protection Agency
UST	underground storage tank

UV	ultraviolet
VGAC	vapor-phase granular activated carbon
VW	vapor extraction well
VMP	vapor monitoring point
VOCs	volatile organic compounds

1.0 INTRODUCTION

The Source Group, Inc. (SGI) has prepared this Shallow Soil Closure Report – Defense Logistics Agency Energy (DLA-Energy) Responsible Area of the Eastern Portion (Report) to document the completion of shallow soil remediation activities at the former Defense Fuel Support Point Norwalk facility located at 15306 Norwalk Boulevard in Norwalk, California (Site) (Figure 1). The Eastern Portion of the Site wherein the DLA-Energy is responsible for the restoration of shallow soils and the subject of this Report is depicted on Figure 2. This Report is submitted on behalf of the DLA Energy, lessee of the property currently owned by the United States Air Force.

Between March 2015 and February 2016, soil remediation was performed to address contaminants detected in the soil and soil vapor, principally total petroleum hydrocarbons (TPH), and volatile organic carbons (VOCs). The remediation was performed under the regulatory oversight of the Los Angeles Regional Water Quality Control Board (RWQCB) and in accordance with the *Soil Remedial Action Plan (RAP*), November 30, 2014 and the *Addendum to the Soil Remedial Action Plan*, December 10, 2014. Authorization to proceed with the RAP was provided in the letter from the RWQCB *Review of Soil Remedial Action Plan and Soil Management Plan*, January 7, 2015. A copy of the Soil Remedial Action Plan and Addendum are provided in Appendix A. Copies of other project-related work plans, documents, and communications from the RWQCB are available via the RWQCB's Geotracker website at:

http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SLT43185183

1.1 Organization of the Shallow Soil Closure Report

The purpose of this Report is to summarize the soil remediation activities that were performed at the Site in fulfillment of the Soil RAP and document the existing soil conditions for the purposes of obtaining written confirmation that the soil investigation and remediation has been completed to the satisfaction of the RWQCB.

This Report is organized into six sections as follows:

- Section 1 Introduction - provides presents the objectives and organization of the Report, a site description, and site setting, including local and regional geology and hydrogeology, and.
- Section 2 Site Investigations and Remedial Activities – provides a summary of prior site assessment and previous completed or currently under-way remedial activities, including the collection of soil, soil vapor, and groundwater samples and the installation and operation of remediation systems. This section also describes the, discusses the nature and extent of contamination in shallow soil prior to remediation of the Eastern Portion of Site, and provides a site conceptual model for contaminated soil.
- Section 3 Remedial Objectives and Goals for Soil – provides a description of soil cleanup goals used during soil remediation as provided in the Soil RAP.

- Section 4 Soil Remediation and Post-Remediation Soil Vapor Sampling – provides a description of the excavation procedures for soil remediation employed within the Eastern Portion of the Site. The section also provides procedures and protocols used for soil field screening, soil segregation, exploratory trenching, and confirmation sampling, and documents both on-site soil treatment and the off-site disposal of a minor amount of soil. This section also describes backfilling of excavations and the soil vapor survey procedures and results that occurred post remediation.
- Section 5 Excavation Results and Updated CSM - provides a description of the extent of soil excavation, confirmatory soil sampling and soil vapor sampling results.
- Section 6 References – provides the references cited in the document.

1.2 Site Description and Background

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 former truck loading racks are located in the south-central portion of the site and occupy approximately one acre (Figure 2). In the past, fuel was transferred from the facility via tanker trucks filled at the loading racks, but by the early 1990s, jet fuel was no longer being routinely transferred from the facility via tanker trucks. Subsequently, a 10-inch diameter, government owned multi-product pipeline, carried fuel from DFSP San Pedro to DFSP Norwalk and a 6-inch diameter pipeline carried fuel from DFSP Norwalk to the former El Toro Marine Corp Air Station. Investigations at the site found that releases had occurred at several locations at the facility. 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. Following removal of the tanks and pads, soil confirmation samples were collected from beneath the AST locations and included in the Concrete Demolition and Soil Confirmation Sampling Completion Report (Parsons, 2013b).

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. However, 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. This case summary was prepared specifically to address the 15 eastern acres of the site to allow closure status of the shallow (0 to 10 feet) soils to be granted.

An approximate 2-acre area leased by Kinder Morgan Energy Partner (KMEP) is operated as a pump station along the southern property line. Known releases of automotive gasoline and other fuels have occurred at the KMEP lease area and have been detailed in reports prepared by KMEP. Most recently (February 2003), the 24-inch pipeline running along the southern edge of the site released hydrocarbons near a block valve located at the southeast corner of the Site. The leak was repaired, and the pipeline returned to operation. KEMP investigated this release and has

since installed a soil vapor extraction (SVE) well to remediate the soil in this area. As depicted on Figure 2, KMEP is responsible for the remediation of shallow soil in this portion of the east side of the Site.

Figure 3 shows the multiple wells and borings installed at the site during the numerous investigations and remediation activities conducted during the past 10 years; the details of these past 10 years of investigation and remediation activities are discussed in section 2.

1.3 Site Setting

1.3.1 Regional Geology

DFSP Norwalk is located between the Montebello Forebay and the Downey Plain in the Central Basin pressure area. Approximately 50 to 60 feet of alluvium (primarily sand, gravel, silt, and clay) cover the underlying Lakewood Formation in this area. The Lakewood Formation is composed of marine and continental gravel, sand, silt, and clay deposits. The San Pedro Formation underlies the area, approximately 300 feet below grade, and consists of marine and continental gravel, sandy silt, silt, and clay deposits[1].

Lithologic logs of borings drilled during previous investigations indicate that sediments beneath the site consist of clayey silt, sandy silt, silty sand, medium to coarse-grained sand, and deeper coarse-grained sand with granitic cobbles. The top of a clay layer (preliminarily identified as the uppermost sediment layer of the Bellflower aquitard) was encountered at a depth of approximately 55 to 65 feet during previous investigations. Appendix B details the cross-section of the site.

1.3.2 Hydrogeology

A shallow, semi-perched aquifer, consisting of silts, fine to medium sands, and coarse sands, exists in the alluvial sediments underlying the site. Groundwater from this semi-perched aquifer is found between 31 and 34 feet below grade. Off-site groundwater depth ranges from approximately 26 to 30 feet below grade. The shallow aquifer is approximately 30 to 35 feet thick, based on the inferred presence of the clay layer at approximately 55 to 65 feet below grade. The October/November 2015 Groundwater Equipotential and Gradient Map is included as Figure 4, and suggests that local groundwater flow within the semi-perched aquifer is to the northwest.

The Bellflower Aquitard, composed of approximately 70 feet of interbedded silts and clays with minor gravel and sand, separates shallow groundwater from the deeper Exposition and Gage aquifers of the Lakewood Formation. Near the site, the Exposition and Gage aquifers are found at 150 and 250 feet below grade, respectively[2]. Regional groundwater flow within the Exposition Aquifer is to the southeast. Due to low well yields, local water service companies do not make

1 California Department of Water Resources, Planned Utilization of the Groundwater Basins of the Coastal Plains of Los Angeles County, Groundwater Geology, Appendix A, Bulletin 104, 1961.

2 GTI, Assessment Report, Tank Farm Area, DFSP, October 21, 1994.

extensive use of aquifers in the Lakewood Formation. The deeper San Pedro Formation includes the following aquifers, listed from shallowest to deepest: Hollydale, Jefferson, Lynwood, and Silverado.

The site is located within West Coast Subbasin of the Coastal Plain in Los Angeles County. Groundwater within this basin is designated for municipal, industrial service supply, industrial process supply, and agricultural. The nearest municipal supply well is Park Company Water Well #29K that is located approximately 0.5 miles northwest of the northwest corner of DFSP Norwalk. Water Well #29K is screened in the Silverado Aquifer with a screened production zone approximately between 684 and 718 feet below ground surface.

2.0 SITE INVESTIGATIONS AND REMEDIAL ACTIVITIES

The lateral and vertical extent of hydrocarbon affected soil and groundwater at the Site was initially investigated by various consultants from 1985 to 1995. These investigations identified three principal areas that were impacted with hydrocarbons. The impacted areas consisted of two liquid hydrocarbon plumes in the northern portion of the facility; a dissolved-phase hydrocarbon plume beneath the central portion of the facility; and hydrocarbon impacts located in the unsaturated soil:

a. The two liquid hydrocarbon plumes in the northern portion of the facility consisted of a larger plume and a smaller plume. The larger plume was located beneath tanks 80007 and 80008, southeast of tank 80002, and north and northeast of tank 55004. The smaller plume was located beneath tank 8006 and extended to the southwest of this tank (north central and northwestern plume).
b. The northern and southern dissolved phase hydrocarbon plume and benzene plume commingled beneath the central portion of the facility to form one dissolved-phase plume. The benzene plume did not extend to the northern or western boundaries of the site. But the dissolved phase hydrocarbon plume extended beyond site boundaries. The off-site portion of this dissolved-phase hydrocarbon plume was not associated with the releases from the tank farm.
c. Lastly, vadose zone hydrocarbon impacts were identified near tanks 80006, 80007, 80008, and 55004, and these impacts were located either in the deeper zone or in the shallower zone.

Based on these investigations, a final remedial action plan (RAP) was submitted in 1995, which identified the areas of concern, and proposed a remedial strategy. However, subsequent to the implementation of that RAP, additional areas of concern were identified, including several within the Eastern Portion of Site. A chronology of previous site investigations and remedial activities completed specific to the DLA-Energy responsible area of the Eastern Portion of the Site is provided below.

2.1.1 Summary of Pre–Remediation Soil Data

Data collected at the Site from 1994 to 2015 in multiple soil and groundwater investigative efforts, two rounds of soil vapor sampling, and approximately 25 years of semi-annual groundwater monitoring and sampling indicates that prior operations at the Site resulted in the contamination of soil, groundwater, and soil gas in localized areas within the eastern 15 acres of the Site. The areas of soil impact within the 15 eastern acres include (1) the northeast corner suspected former settling ponds, (2), the eastern boundary and eastern boundary off-site area (within Holifield Park), (3) AST 80008, and (4) AST 55004. Details of these areas follow:

***(1) Northeast Corner*:** During 2010, soil samples were collected in areas where a previously completed (2009) Gore™ soil gas survey within the site's northeast corner had indicated the presence of petroleum contaminants. Review of historical aerial photographs suggested that this

area formerly contained suspected settling ponds. The 2009 survey indicated four general areas containing detectable fuel-related contaminants in the near-surface soil gases. The central portions of these areas were targeted for sampling during 2010 sampling event, but revealed no detectable contaminants in the collected soil samples. With one exception, soil samples collected from borings within this portion of the site have been reported with no detectable contaminants. Soil samples from one soil boring (GMW-66) were reported with gasoline-range hydrocarbons (5-foot sample at 0.35 mg/kg), benzene (10-foot sample at 0.94 µg/kg), and toluene (5- and 10-foot samples at 1.9 and 1 µg/kg, respectively).

(2) Eastern Boundary: During assessment of the site in 1990s and early 2000s, soil boring and groundwater monitoring wells be installed in the along the northern, eastern boundary and off-site to the east within the northwestern portion of the adjacent Holifield Park. These soil borings and monitoring wells found the presence of deep (greater than 20 feet) elevated TPH concentrations in soil. The underlying groundwater was found to be contaminated with both dissolved petroleum hydrocarbons and free product, present on the groundwater table present between 25 and 30 feet bgs along the eastern site boundary. In April 2004, pursuant to the RWQCB's request, two groundwater monitoring wells, designated GMW-60 and GMW-61, were installed along the eastern site boundary. Volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) as JP-5 were detected in some soil and groundwater samples from these two wells. Detected VOCs included lighter-end petroleum compounds, including benzene, toluene, ethylbenzene, and xylenes (BTEX), 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene. No methyl tert-butyl ether (MTBE) was detected in the groundwater samples from GMW-60 or GMW-61. TPH as JP-5 was detected in soil samples collected at 10 and 30 feet below ground surface (bgs) during the installation of GMW-60.

Additional drilling and soil sampling activities were performed west of GMW-60 in the northeastern part of the DFSP Norwalk site in July 2004. No soil impacts were detected during the step-out soil investigation west of GMW-60. However, TPH as gasoline (TPHg), TPH as free product (TPH-FP), and BTEX were detected in the groundwater samples. In a letter dated February 16, 2005, the RWQCB requested that DLA Energy and KMEP investigate the eastern boundary area of the subject site to evaluate the extent of affected groundwater in the eastern area and to identify the source of the impact. Consequently, KMEP and DLA Energy jointly conducted soil and groundwater investigations in the eastern boundary area of the facility in July 2005, and in the eastern boundary area and the adjacent off-site area in the west side of Holifield Park in August 2006. Results from these investigations were presented in the *Eastern Boundary and Eastern Boundary Off- Site Area Soil and Groundwater Preliminary Investigation Report* (Parsons, 2006b). No source area of the LNAPL was identified.

As part of the ongoing evaluation of the occurrence of LNAPL in Holifield Park, groundwater well GMW-62 was installed in 2007. Since shortly after installation, this well has consistently shown the presence of LNAPL. Although the source of the LNAPL present in GMW-62 has not been definitively determined, DLA Energy has assumed the responsibility for the recovery of LNAPL and for conducting the assessment of soil, soil gas, and groundwater conditions as directed by the

RWQCB. Groundwater monitoring wells GMW-63, GMW-64, GSM-65 were subsequently installed between 200 and 500 feet northeast and southeast of GMW-62. Although these wells have contained low concentrations of petroleum hydrocarbons, no LNAPL has been detected.

Additional soil gas, soil, and groundwater investigations were conducted in December 2006 and June/July 2007. The investigation included 168 soil gas samples, 71 soil boreholes, 40 Hydropunch™ groundwater locations, and 15 CPT locations. In addition, a human health screening evaluation (HHSE) was performed. The results of the HHSE indicate that adverse health effects are not expected from exposure to chemicals of potential concern (COPC) in soil gas, soil, and groundwater beneath the main park area under current site conditions. The results of the investigations indicate that select fuel-related VOCs and TPH as gasoline and fuel product in groundwater have migrated off DLA Energy property and into the subsurface beneath the park. The lateral extent of groundwater impacts above screening/action levels is limited to approximately 90 feet east of the property beneath the main park area. Groundwater impacted above screening/action levels does not extend beneath Dolland Elementary School property. In addition, the northern and southern extents of groundwater impacts in Holifield Park are limited to 120 feet to the south and 200 feet to the north of GMW-62.

Soil gas and soil have not been impacted with site related VOCs above screening levels in the main park area. Similarly, no shallow soil impact has been identified and therefore there was no need to excavate or treat shallow soil in the Eastern Portion of the Site. Hence, in the following sections describing the completed soil remedial actions, the Eastern Portion is not discussed further.

(3) Former Above Ground Fuel Storage Tank 80008: AST 80008 Area. Multiple rounds of assessment determined that soil and the underlying groundwater beneath and surrounding AST 80008 had been contaminated by historical fuel releases. Although a specific source or sources was not identified, releases from the base of the tank were suspected to have contributed to the majority of the underlying contaminant mass. The soil CSM demonstrated the presence of soils containing petroleum at concentrations in excess of cleanup goals from 0 to 25 feet bgs, extending to the groundwater table. The highest concentrations and exceedances were detected primarily in samples collected from 18 feet and deeper. Samples collected from ground surface to 15 feet bgs generally had no concentrations above the laboratory detection limit. However there were exceedances of TPH-g at 15 feet bgs (3,000 mg/kg at boring AST-08-08). BTEX exceedances were detected at borings DPT-88, -89, -90, and -91. MTBE exceeded cleanup levels at DPT-88 and -89 at 25 feet bgs (400 µg/kg and 18J µg/kg, respectively), however the MTBE and TBA laboratory method detection limits and reporting limits were too elevated in most of the samples to determine if these compounds were present.

(4) Former Above Ground Fuel Storage Tank 55004: AST 55004 Area. Multiple rounds of assessment determined that soil and the underlying groundwater beneath and surrounding AST 80008 had been contaminated by historical fuel releases. Although a specific source or sources was not identified, releases from the base of the tank were suspected to have contributed to the

majority of the underlying contaminant mass. The soil CSM demonstrated the presence of soils containing petroleum at concentrations in excess of cleanup goals from 0 to 25 feet bgs, especially on the southern side of the tank, extending to the groundwater table. The highest concentrations and exceedances were detected primarily in samples collected from 18 feet and deeper. Exceedances were detected from 10 to 26 feet bgs on the area southeast of former AST 55004. The samples collected beneath the tank were generally reported as non-detectable contaminant concentrations suggesting that a release occurred south or east of the tank. Exceedances at DPT-92, -93, 94, and -95 were limited to TPH. No BTEX, MTBE, or TBA exceedances were detected.

2.1.2 Summary of Pre-Remediation Soil Vapor Data

Soil vapor monitoring was conducted for five consecutive quarters from December 2010 through December 2011 and semiannual reports were submitted on August 29, 2011 (Parsons, 2011a) and February 13, 2012 (Parsons, 2012b). The two semiannual reports provided the air laboratory data collected at the site for the vapor monitoring program as requested by the RWQCB and also presented the site-specific calculated soil gas screening levels for the detected site compounds. The soil vapor samples were collected from seven VMPs that border the northern site property boundary and three vapor monitoring locations in Holifield Park along the eastern park boundary, bordering Dolland Elementary School. The VOC detected at the highest concentration was isobutane at 0.45 µg/L at 15 feet bgs from the fourth quarter 2011. Benzene was not detected.

Concentrations of detected VOCs in soil gas from the five consecutive quarters from December 2010 through December 2011 were all well below their respective proposed screening levels. Based on the CalEPA soil gas advisory (CalEPA 2010), the proposed methane screening level is 1,000 ppm. The highest methane detected was 16 ppm which is well below the screening level. Other non-hydrocarbon volatile organic compounds (VOCs) were detected in at very low level soil vapor samples, but all at concentrations below commercial/industrial CHHSLs. The maximum concentrations of these detected soil vapor VOCs were used in a *Human Health Risk Assessment Mode*l for the Site and *found to pose no unacceptable health risks* to potential residential, commercial or industrial Site receptors.

2.1.3 Summary of Metals, PCBs, and SVOCs Assessment Data

A total of 82 soil samples were collected from 24 direct-push borings throughout the tank farm for metals evaluation in July 2014. The findings of this investigation are available in the document *Non-Petroleum Contaminant Testing Results* report issued October 26, 2015 and are provided in Appendix C. Soil samples were analyzed for 17 metals following the California Assessment Metal (CAM) protocol. Additional soil samples were collected from several soil stockpiles representing the eastern and western portions of the site and submitted for analysis of PCBs and SVOCs. PCBs and SVOCs were not detected at or above laboratory reporting limits in any of the analyzed soil samples, indicating that these compounds are not chemicals of concern at this site.

Metal analytical results were compared with California Human Health Screening Levels (CHHSLs) for industrial/commercial settings and in the case of arsenic, the DTSC School screening level of

12 mg/kg. Arsenic was reported in 80 of the 82 analyzed soil samples at concentrations ranging from 0.56 to 34 mg/kg. Only two arsenic concentrations exceeded the 12-mg/kg concentration accepted by the DTSC and other agencies for school and residential site usage for sites in Southern California. The 95 percent upper confidence level of the mean (95UCL) of the entire arsenic data set is 5.6 mg/kg, well below 12-mg/kg. Cadmium was detected in only two of the 82 analyzed soil samples at 23 and 8.4 mg/kg, exceeding the 7.5-mg/kg commercial/industrial CHHSL for cadmium; the 95UCL of the cadmium data set was the commercial CHHSAL. The maximum reported lead concentration was 206 mg/kg, below the 320-mg/kg commercial/industrial CHHSL.

2.1.4 Summary of Groundwater Data

Figure 4 shows the groundwater elevation based on measurements from October/November 2015. The overall flow in the upper groundwater zone is to the north, with an estimated horizontal hydraulic gradient of approximately 0.003 foot per foot (ft/ft) in the south-central plume area to nearly flat in the truck loading and tank farm north-central areas. Hydraulic conductivity of the unconfined alluvial aquifer has been determined to to range between 12 and 73 feet per day (ft/day) in the south-central area to 20 to 60 ft/day in the southeastern area. Groundwater flow in the underlying Exposition aquifer is generally to the east-southeastward with a horizontal hydraulic gradient of approximately 0.0003 ft/ft. This southeastward flow direction in the Exposition aquifer is roughly opposite the general groundwater flow direction of the uppermost groundwater zone. These distinctly different hydraulic conditions, consistently interpreted over time above and below the Bellflower aquitard, support the interpretation that the Bellflower aquitard in this area is laterally continuous and has a relatively low vertical hydraulic conductivity.

The COPCs for groundwater beneath the site include TPH and several VOCs including BTEX compounds, MTBE, and TBA. Concentrations of TPH as diesel and benzene were utilized as representative of the extents of contamination for the groundwater conceptual site model of dissolved-phase COPCs.

2.2 Initial Remedial Action Plan (Initiated in 1995)

A remedial action plan (RAP)[3] was submitted by GSI in 1995 to address impacts in the shallow aquifer underlying the tank farm only. Conditions in the Exposition aquifer were intentionally not addressed. Furthermore, hydrocarbon plumes (liquid-, adsorbed-, and dissolved-phase) originating from the southern portion of the facility near the SFPP lease area were not addressed in this plan.

The system layout consisted of 16 vertical total fluid recovery wells (TF-8 through TF-11, and TF-13 through TF-24); eight vertical groundwater recovery wells (GW-1 through GW-7, and GW-12); two 30-foot deep vertical vapor extraction wells (VE-01 and VE-02); and up to 11 horizontal vapor extraction wells of which HW-1, HW-3, HW-5 and HW-7 were initially proposed, with three deep wells (HW-2, HW-4 and HW-6) and four shallow wells (HW-S1 through HW-S4) proposed for later.

[3] Groundwater Technology Government Services, *Remedial Action Plan*, September 14 1995

Only four horizontal vapor extraction wells (HW-1, HW-3, HW-5 and HW-7) were installed at the site. The remediation system components included.

a. Vapor, total fluids, and groundwater extraction wells; total fluids and groundwater pumps; and vacuum blowers for hydrocarbon extraction from the subsurface
b. Pumps and blowers to move water and air through the system
c. Oil-water separator and storage tank for liquid hydrocarbon containment
d. Moisture separators, surge tank, pH adjustment tank, and air stripper tower for volatilization of dissolved-phase hydrocarbons
e. A thermal oxidizer and two vapor-phase granular activated carbon (GAC) canisters for vapor abatement
f. Two liquid-phase GAC canisters for water "polishing" prior to discharge.

Following treatment, vapors are discharged to the atmosphere and water is discharged to a storm drain.

The objective of these remediation efforts were to remove liquid hydrocarbons (source) floating on shallow groundwater until only sheen remains upon the water; reduce dissolved-phase concentrations in shallow groundwater to control off-site migration; and reduce dissolved-phase concentrations to below target cleanup levels once they are established. Additionally, the RAP also proposed the initiation of bioventing in the absence of free-phase liquid hydrocarbons when continued operation of the vapor extraction and treatment system is no longer cost effective.

2.3 Site Conceptual Model

The DFSP Norwalk Facility is a 50-acre facility previously occupied by 12 aboveground fuel storage tanks, a truck loading area, and associated piping and facilities. The facility was decommissioned in 2001 and the aboveground fuel tanks, truck loading area, and associated piping have been removed. While the DFSP Norwalk facility is no longer operational, the SFPP (KinderMorgan) leased area contains active fuel-transmission pipelines that traverse the southern and eastern boundaries of the Site. SFPP currently has workers maintaining their pipeline and remediation systems. There are also environmental contractor's onsite performing remediation activities at the DFSP Norwalk facility.

Neither the SFPP staff nor environmental contractors working at the DFSP Norwalk facility are at the site on a full time basis. Thus, under current conditions, the only human receptors at the site are industrial workers. Additionally, trespassers may occasionally visit the site. However, it should be noted that trespasser exposures are considerably lower than industrial workers and, therefore, trespasser exposures are generally not evaluated.

In the future, the eastern 15 acres of DFSP Norwalk will be redeveloped into a public park owned and operated by the city of Norwalk. Thus, future human receptors at the site may include construction workers (i.e., to redevelop the site), commercial/industrial/maintenance workers, and park visitors. As all contaminants have been removed from the future parkland to a depth of 10

feet, one potential route of exposure would be for construction workers, but only if excavations greater than 10 feet are needed. This is considered very unlikely given the future use of the site as park land.

Additionally, some of the contaminants in both soils and groundwater are volatiles. However, the results of historical (pre-soil remediation) and recent (post soil remediation) show that the concentrations of volatile chemicals in site soils are de minimus and thus mitigating this potential risk.

There is no surface water at the site. Further, the nearest surface water bodies are San Gabriel River, located approximately 2 miles west of the site, and North Fork Coyote Creek, located approximately 3 miles to the east of the site. Based on these distances, surface water is not considered a current or future exposure medium for current and future receptors.

3.0 REMEDIAL OBJECTIVES AND GOALS FOR SOIL

Between March 2015 and 2016, the remediation of shallow soils (0 to 10 feet) and in selected areas deeper soil (from 10 feet to 25 feet) was conducted at the facility. This work was conducted under the oversight of the LARWQCB and entailed the excavation, on-site treatment, and re-use of soil. The originally proposed excavations, as provided in the RAP, are shown on the attached Figure 5; Excavations #3, #4, #5, #14, #19, #35, #37 were completed on the 15 eastern-most acres of the site. Soil samples were collected to ensure that site cleanup goals had been achieved in excavation sidewalls and in the treated soil. Additionally, this data was provided in summary reporting documentation submitted to the RWQCB that included the following reports

3.1 Site-Specific Cleanup Levels

Site-specific cleanup levels were calculated using the procedures proscribed in the Regional Water Quality Control Board, Los Angeles Region (Regional Board), *Interim Site Assessment & Cleanup Guidebook* (Guidebook)(1996). Cleanup levels for hydrocarbons (C4-C12, C13-C22, C23-C32) and BTEX compounds were calculated in compliance with Table 4-1 of the Guidebook. Depth to groundwater at the Site was found to be between 25 and 30 feet bgs based on historical and recent groundwater gauging data. Site-specific soil parameters including thickness of the clay, sand, and silt layers were used when calculating attenuation factors - values calculated for the DFSP Norwalk cleanup site were adopted when more conservative (lower). The final cleanup soil cleanup goals were approved by the RWQCB in their letter entitled *Approval of Modification to Cleanup Goals*, July 16, 2015. The following table summarizes the principal soil cleanup goals:

Constituent	Calculated Soil Cleanup Concentrations (mg/kg)		
	0 to 5 ft bgs	5 to 10 ft bgs	11 to 30 ft bgs
TPH (C4-C12)	500	100	100
TPH (C13-C22)	1,000	100	100
TPH (C23-32)	10,000	1,000	1,000
TPH (C33-44)	50,000	10,000	10,000
Benzene	0.013	0.011	0.011
Toluene	0.444	0.356	0.356
Ethylbenzene	1.44	1.07	1.07
Xylenes	3.77	2.76	2.76

4.0 SOIL REMEDIATION AND POST-REMEDIATION SOIL VAPOR SAMPLING

Between March 1, 2015 and December 2015, a total of seven excavations were completed at the Site to remove approximately a total of 47,339 cubic yards of soil from the eastern portion of the DFSP Norwalk site. In accordance with the Soil RAP, all shallow soil (0 to 10 feet bgs) soil present within DLA-Energy Responsible Area of the eastern portion of the Site identified during the previous site investigations above the soil cleanup goals was excavated. Of this volume, a total of 2,408 cubic yards of soil were determined to be clean and potentially suitable for re-use as clean fill (based on the results of post-excavation and stockpiling confirmation soil sampling and analysis), 600 cubic yards of soil were determined not to be amenable for on-site treatment and thus were transported off-site for treatment and recycling, and 44,331 cubic yards of soil were determined to be contaminated and treated on site for eventual on-site reuse.

Previously collected soil data was used to determine the location, depth, and widths of the proposed soil removal areas. These data were augmented in the field through the evaluation of soil for visual and olfactory evidence of contamination. Monitoring with a calibrated PID also allowed the field crew to adjust the configuration of the excavations to conform to conditions encountered in the excavations. After field evidence indicated that sufficient volumes of affected soil had been removed, confirmation samples were collected from the bottom and sidewalls of the excavations and the samples submitted to a laboratory for analysis.

As a final confirmatory step, a series of 10-foot deep trenches were completed within the eastern portion to ensure that areas of previously unidentified petroleum affected soils were not present.

The following is a detailed description of the activities completed.

4.1 Excavation Preparation Activities

4.1.1 Selection of Excavation Areas

Areas proposed for soil excavation and on-site treatment were selected based on existing site data. The locations and expected dimensions and depths of excavations are provided in Figure 5. The locations proposed for excavation were determined by integrating soil analytical data, field observations (PID readings, geologist's observations of stained or odorous soil, etc.), ROST data, and the occurrence of free product on the underlying groundwater.

The location of all proposed excavation areas was pre-marked by a survey crew. Existing survey data was used to ensure that planned excavation areas were centered on known contaminated areas. The bounds of the proposed excavation areas were maintained and used to generate as-built maps at the completion of the removal of soil and to track the expansion of excavations as needed.

Because VOCs had been detected Site soil in excess of 50 parts per million, when measured in the field with a organic vapor analyzer, the use of a SCAQMD Rule 1166 permit was required during the excavation and handling of soil. A photoionization detector was used to measure the

concentrations of VOCs during soil excavation activities. When soil containing VOCs in excess of 50 ppm (as defined in Rule 1166) are encountered, the SCAQMD was contacted and vapor mitigations measured, as dictated by the Rule 1166 conditions, was followed.

Storm water controls and dust mitigation best management practices (BMPs) were implemented and maintained through the duration of the project.

4.1.2 Health and Safety Planning

The site-specific health and safety plan, prepared in accordance with Federal (29 CFR 1910.120) and State (California Code of Regulations, [C.C.R.] Title 8, Section 5192) described methods for protection of site workers and visitors during the remedial activities. The following information was contained in the HASP:

- List of COCs, their characteristics, and potential exposure routes;
- Action levels for various COCs;
- Methods for field monitoring of COCs;
- Emergency procedures and contact information;
- Identification and routes to emergency facilities;
- Identification of potential physical hazards and response actions for specific remedial tasks (job hazard analyses); and
- Personal protective equipment (PPE) for specific remedial tasks.

PPE generally consisted of Level D equipment, including hard hats, steel-toed boots, ear protection, eye protection, and reflective orange vests. Respiratory protection was adopted when particulate dust and/or vapor monitoring indicated such precautions were necessary.

4.1.3 Utility Clearance

Once all excavation areas were marked, Underground Services Alert (USA) was contacted and a ticket number obtained. The USA ticket remained active during all phases of subsurface excavation or any intrusive activities.

4.1.4 Regulatory and Community Notification

Five days prior to the initiation of fieldwork, the city of Norwalk, RWQCB, and SCAQMD were notified of the planned site activities. Additionally, a Fact Sheet was prepared and mailed to residents located within a quarter mile of the DFSP Norwalk facility. The Fact Sheet provided details of the planned work, work schedules, and contact phone numbers for residents to voice concerns or ask questions.

4.1.5 Excavations

All excavations were conducted in accordance with the Soil Management Plan (SMP). The SMP provide details of the design, construction, operation, and closure of areas used for soil treatment by means of bioremediation. The SMP also provides methods and means to be employed while completing the excavation and trenching planned for contaminated areas present at the Site.

Planned activities consist of shallow (0 to 10 feet below grade) and deep (10 to 25 feet below grade) excavations (Figure 5). The purpose of the proposed excavations was to remove soil that contained contaminants with concentrations above the cleanup goals from the shallow soil and to remove contaminants that were a significant source of long-term groundwater degradation from deeper, underlying soils. After removal of contaminated soil and completion of confirmation sampling, all excavations were backfilled and graded to match the surrounding ground surface.

Soil was excavated and temporarily stockpiled on plastic sheeting and covered with plastic sheeting in accordance with the WDR and SCAQMD Rule 1166 conditions. The stockpiles were field labeled and sampled for either treatment, or if clean, for later use for on-site backfilling. Details of proposed sampling frequency of soil stockpiles are provided in the SMP. The sample analytical protocol included analysis of total petroleum hydrocarbon content by EPA Method 8015M (hydrocarbon chain) and volatile organic compounds concentrations by EPA Method 8260B.

4.1.6 Field Methods – Shallow Soil (0 to 10 Feet)

Soil excavation initiated on the eastern portion of the Site with the intent to first remove and treat contaminated soil present on land intended for future park use. Heavy equipment, including excavators, backhoes, loaders, and dump trucks were used for the excavation and handling of soil. Water trucks were used on haul roads and at the excavations to moisten soil with the objective of reducing dust emissions and, when present, to mitigate hydrocarbon vapor emissions.

An on-site geologist, environmental scientist, or engineer, working under the supervision of a California Registered Geologist, was on site during all phases of soil excavation. A California Professional Civil Engineer provided oversight and guidance during the excavation of soil; the California Occupational Safety and Health Administration (CalOSHA) was notified when excavations exceeded a depth of 20 feet.

The on-site geologist was responsible for recording the condition of soils exposed in the excavations, collecting and recording VOC readings with a calibrated photoionization detector (PID), and the collection and mapping of progress soil samples. PID readings and geologist observations were used to segregate clean soil from contaminated soil. This segregation was conducted using the criteria of PID readings (PID readings greater than 50 parts per million (ppm) was indicative of soil requiring treatment), soil coloration (sandy soil exhibiting gray coloration was suspected of being contaminated and placed into soil piles intended for treatment), and odors (hydrocarbons in soil result in a characteristic odor and were a factor in determining soil that required treatment).

Soils were placed on plastic during excavation and were segregated based on field evidence of contamination (and thus soil that required treatment) and soil that was expected to be clean. Regardless of whether the soil was suspected to be contaminated or clean, field handling and storage methods were similar. All soil was placed on plastic to eliminate contact with the ground surface, water mist was used as a vapor and dust suppression technique, and the stockpiles were covered with secured plastic to further mitigate vapor and dust emissions.

Soil that field evidence indicated was contaminated was either temporarily staged on plastic or transported directly to and treated via the Earth Cleaning Machine (ECM; operated initially by F4 Remediation and later by Bulldog Green Remediation).

As described in the SMP, soil placed into "clean" stockpiles was characterized by the collection of soil samples at a frequency of 16 samples per 2,000 cubic yards of soil. Soil samples were collected at a frequency of 10 samples per 400 cubic yards for suspected contaminated soil. Samples were analyzed for total petroleum hydrocarbons, speciated by carbon chain range, using EPA Method 8015 and for VOCs and fuel oxygenates using EPA Method 8260. The results were compared against soil cleanup standards. Based on this comparison, a determination was made as to the future disposition of the soil:

1. Soil treatment was necessary;
2. Soil contains low concentrations of petroleum hydrocarbons but cleanup standards were met and thus the soil may be used for backfill in the upper 10 feet of soil within portions of the site planned for commercial redevelopment; and
3. Soil was clean and can be used without restriction, including shallow excavations at land planned for park use or in the deepest excavations.

4.1.7 Excavation Confirmation Sampling

The collection and analysis of post-excavation confirmation samples and stockpile characterization samples are outlined in detail in Section 6.1 of the SMP. Sidewall samples were collected every 25 linear feet, and excavation bottom samples were collected at a frequency of one sample per 800 square feet of excavation bottom. Each excavation was sampled at least along the four cardinal direction sidewalls, and at least one excavation floor sample was collected, resulting in a minimum of 5 samples per excavation.

All confirmation samples were analyzed for total petroleum hydrocarbons, speciated by carbon chain range using EPA Method 8015 and for VOCs and fuel oxygenates using EPA Method 8260B.

4.1.8 Exploratory Trenching

Exploratory trenching to 10 feet bgs was also completed. The objective was to ensure the absence of soil contamination in areas that did not require excavation. Excavations were advanced to a depth of 10 feet using a tracked excavator. As the soil was being removed, it was field screened

using a PID and was inspected for stain and odor by an on-site environmental professional. The locations of these trenches are shown on Figure 6. These trenches did not find evidence of additional hydrocarbon contamination and thus verified that earlier site characterization activities had adequately defined the nature and extent of contamination at the Site.

4.2 Excavations Completed within the DLA-Energy Responsible Area of Eastern Portion

This section provides details as to the location, volumes, and other key factors pertaining to the excavation of contaminated soil from the DLA-Energy responsible area of the eastern portion of DFSP Norwalk. These excavation areas are the Northeastern Corner (Section 4.2.1), Former AST 80008 (Section 4.2.2), and Former AST 55004 (Section 4.2.3). A summary of Eastern portion of excavations is provide in Table 1, including volumes of excavations, number of confirmation samples collected, and comments.

4.2.1 Northeastern Corner (Excavations #3/#14, #4 and #5)

4.2.1.1 Excavation Areas

Figure 7 presents a site map that provides the locations of Excavations #3/#14, #4 and #5 that were completed in the Northeastern Portion of the Site.

4.2.1.2 Description of Excavations

Soil removal in Excavation #3 was conducted in March 2015. A total of 1,042 cubic yards were excavated, with 435 cubic yards segregated in the field as clean soil, an estimated 597 cubic yards observed in the field to be contaminated based on observations of hydrocarbons, and 10 cubic yards exceeding 50 ppmv as measured by a field Photo Ionization Detector (PID) (thus, a total 607 cubic yards generated at Excavation #3 required on site treatment). The excavation #3 was later further expanded and integrated into excavation #14 which was wider and deeper than excavation #3, therefore, excavation #3 is considered non-existent and incorporated into the later, larger excavation #14. Similarly, excavations #14 and #4 were joined during soil removal, as shown on Figure A-1.

Soil removal in Excavation #4 was also conducted in March 2015. A total of 1,845 cubic yards were excavated, with 143 cubic yards segregated in the field as clean soil, 1,564 cubic yards observed in the field to be contaminated based on observations of hydrocarbons, and 138 cubic yards exceeded 50 ppmv based on PID readings. During soil removal at excavation #4, approximately 600 cubic yards of soil (790 tons) was observed to contain oily material with low volatility and a tarry appearance. This soil was segregated separately, tested and profiled, and hauled off site for disposal (see Section 4.3). At two locations in Excavation #4, the initial floor samples were found to contain hydrocarbons above cleanup goals. Accordingly, additional soil was removed from these locations and new floor confirmation samples were collected and demonstrated that cleanup goals had been reached. A total of approximately 964 cubic yards of soil removed from Excavation #4 were treated on site.

Soil removal in Excavation #14 was conducted in March 2015. A total of 2,112 cubic yards were excavated, with 942 cubic yards segregated in the field as clean soil and 1,170 cubic yards observed in the field to be contaminated based on observations of hydrocarbons and were thus treated on site.

Soil removal in Excavation #5 was conducted in April 2015. Excavation #5 was approximately 40 feet long in an east-west direction and 40 feet north-south, with a depth of 5 feet. Of the total soil volume—approximately 340 cubic yards—315 cubic yards was segregated in the field as clean soil; 25 cubic yards were observed in the field to be contaminated based on observations of hydrocarbons; of this volume 10 cubic yards exceeded 500 ppmv based on PID readings. Excavation #5 targeted hydrocarbons identified in direct push boring in DPT-156, which also documented the absence of detectable hydrocarbons in deeper samples at 10, 15 and 19.75 feet below grade.

4.2.1.3 Confirmation Sampling Results

Excavation #3/#14, and #4:

Figure A-1 shows the plan view outline of Excavations #3/#14 and #4. Figures A-1-A through A-1-C are "box" completion diagrams of the final completed excavations prior to backfilling with the location of confirmation samples. The actual shape of each final excavation is not a symmetrical box. The purpose of the diagram is to facilitate the visualization and interpretation of the final sidewall and bottom characterization of each excavation area prior to backfill. Soil samples were analyzed for total petroleum hydrocarbons (TPH - carbon chain characterization) using EPA Method 8015M and for volatile organic compounds (VOCs), including benzene, toluene, ethyl benzene, and xylenes, and gasoline range organics (GRO) using EPA Method 8260B. Tables A-1 and A-2 present the results of confirmation samples and comparison with the Cleanup Goals for Total Petroleum Hydrocarbons (TPH) and Volatile Organic Compounds (VOCs) and are included in Attachment A.

- 132 sidewall samples were collected, including 12 samples collected on July 1, 2015 as validation samples or as additional samples requested by RWQCB. All sidewall samples were found to be below cleanup goals
- 29 final floor samples were collected including 2 samples collected on July 1, 2015 as validation samples or as additional samples requested by RWQCB. At two locations in excavation 4 (F4 and F10; Figure A-1-C), the initial floor samples were found to contain hydrocarbons above cleanup goals, and the soil was excavated, and new floor confirmation samples were collected. All floor samples were found to be below cleanup goals

Excavation #5

Figure A-1-D is a "box" completion diagram of the final completed Excavation #5 prior to backfilling showing the confirmation samples locations. Soil samples were analyzed for total petroleum hydrocarbons (TPH - carbon chain characterization) using EPA Method 8015M and for volatile

organic compounds (VOCs), including benzene, toluene, ethyl benzene, and xylenes, and gasoline range organic (GRO) using EPA Method 8260B. Tables A-1 and A-2 presents the results of confirmation samples and comparison with the Cleanup Goals.

- 28 sidewall samples were collected from Excavation #5, including 4 samples collected on July 1, 2015 as validation samples or as additional samples requested by RWQCB. All sidewall samples from the north were found to be below cleanup goals.
- Four floor samples were collected from Excavation #5, including one samples collected on July 1, 2015 as an additional samples requested by RWQCB. All floor samples were found to be below cleanup goals

4.2.1.4 Excavation Confirmation Sampling Summary

The results of confirmation sampling conducted after the completion of soil removal activities in Excavations #3, #4, #5 and #14 confirm that soil containing TPH and VOC at concentrations above Site cleanup goals have been successfully removed from the 0- to 10-foot soil interval.

The results of confirmation sampling of shallow soil (0 to 10 feet below grade) indicate that all contaminated soil in the excavations was removed laterally to non-detectable sidewall sample concentrations. Field observations and the results of deeper samples indicate that deeper soil locally contains residual hydrocarbons above cleanup goals, but the completed removal of high concentration soil in the vadose zone in these two excavations represents a significant removal of hydrocarbon mass from the subsurface.

Residual concentrations in the vadose zone below a depth of 10 feet will be addressed as part of the site-wide LNAPL remediation approach required by the RWQCB. The Soil RAP (Section 7.11) included a provision for additional SVE, groundwater treatment and air sparging as potential technologies for addressing residual hydrocarbons after shallow soil removal. As described in the Soil RAP, additional remediation methods of saturated zone remediation, LNAPL removal and groundwater remediation will be evaluated to address residual contamination.

4.2.2 Former AST 80008 (Excavations #16/#26, #27 and #35)

Figure 7 presents a site map that provides the locations of Excavations #16/#26, #27, #35 that were completed within the location of the former AST 80008. Because these individual excavations merged into one large excavation and for conciseness, these excavations will be referred to as #35 within this report.

OSHA was notified of the deep excavation, and inspections were conducted to ensure safe slopes, and restricted access was maintained by fencing around each excavation at the end of each day. The initial removal of hydrocarbon-contaminated soil was expanded laterally and vertically to address soil with high photo-ionization detector (PID) field readings, with soil exposed in many sections of the excavations registering PID readings of over 10,000 ppm.

4.2.2.1 Description of Excavations

Soil removal in Excavation #35 was started in April 2015. The removal of soil in Excavation #35 targeted hydrocarbons identified in previous soil boring DPT-88, DPT-89, DPT-90, DPT-91, DPT-140, DPT-141 and DTP-145, which contained petroleum hydrocarbons at concentrations above cleanup goals at depths of 10.5 feet to 25 feet below grade.

The final Excavation #35 encompassed an area of approximately 50,500 square feet, reaching a maximum depth of 25 feet in the center of the excavation; excavation sidewalls were completed with a two-to-one slope to ensure safe work conditions. The total soil volume removed from Excavation #35 is estimated to be approximately 29,000 cubic yards. Approximately 550 cubic yards of soil were segregated in the field as clean, with the remaining balance of soil determined to be contaminated and thus treated on site.

After reaching the final total depths, exploratory trenches were completed in the bottoms of Excavations #35. The purpose of these trenches was to confirm soil lithology extending from the base of the excavations (which was composed largely of silty sands) to the underlying sand horizon that previous borings indicated was present at approximately 30 feet below surface grade. When completed, the exploratory trenches were approximately 5 feet in depth and 5 feet in width, with the trenches oriented north-south and east-west. Upon completion of these exploratory trenches, native site soil (previously analyzed and confirmed to meet the most-stringent site cleanup cleanup goals) was used as backfill. The backfilling of the exploratory trenches was conducted under the oversight of a third-party geotechnical engineer.

4.2.2.2 Excavation #35 Sampling Results

Excavation confirmation samples were collected in accordance with the Revised Field Sampling and Analysis Plan and Sampling Strategy (SGI, 2015a). The collection of confirmation soil matrix samples focused on documenting soil conditions from the surface to a depth of 10 feet. Thus, 0-10 feet soil confirmation samples were collected after field measurements indicated that the lateral extent of contamination to 10 feet below grade had been removed. Soil exposed in excavation sidewalls at depths greater than 10 feet were noted by field measurements to contain residual hydrocarbons, particularly at depths nearing the shallowest historical groundwater (approximately 25 feet below grade) and at deeper levels. A limited number of soil samples were collected from excavation sidewalls and/or bottoms at below 10 feet below grade to allow documentation of the residual concentrations of petroleum hydrocarbons that remain in the subsurface.

Soil samples were analyzed for total petroleum hydrocarbons (TPH - carbon chain characterization) using EPA Method 8015M and for volatile organic compounds (VOCs), including benzene, toluene, ethyl benzene, and xylenes, and gasoline range organics (GRO) using EPA Method 8260B with 5035 3-VOCs sample preservation method.

The results of the soil matrix samples analyses are listed in Tables A-1 (TPH) and A-2 (VOCs).

Excavation #35 Sampling (Figure A-2)

- 117 initial sidewall samples were collected at depths of 3, 6, and 9 feet below the initial ground surface. Two samples in the east wall of the excavation (locations E5-3 and E5-6) were found to contain VOCs or hydrocarbons in excess of cleanup goals and therefore, additional soil was excavated and the locations were resampled. Additional step-out confirmation samples (E12-3 and E12-6) were found to contain VOCs and hydrocarbons at concentrations below cleanup goal. These results indicate that all shallow (0-10 ft) soil contamination has been removed in Excavation 35.
- Deeper sidewall samples collected for documentation of residual deeper hydrocarbon concentrations included:
    - Two additional samples (B00040 and B00041) were collected from the south end at depths of 30 and 33;
    - 9 floor samples (EX-35-FL-1 to EX-35-FL-9) were collected from the floor of the excavation at a depth of 25 feet. These samples were found to contain TPH or VOC concentrations above cleanup goals.

4.2.2.3 Confirmation Sampling Results

Figure A-2 is a completion diagram of the final completed excavations prior to backfilling with the location of confirmation samples and former above ground storage tanks. The purpose of each diagram is to facilitate the visualization and interpretation of the final sidewall and bottom characterization of each excavation area prior to backfill. Tables A-1 and A-2 present the results of confirmation samples and comparison with the cleanup goals for TPH and VOCs.

The results of confirmation sampling of shallow soil (0 to 10 feet below grade) indicate that all contaminated soil in the excavations was removed laterally to non-detectable sidewall sample concentrations. Field observations and the results of deeper samples indicate that deeper soil locally contains residual hydrocarbons above cleanup goals, but the completed removal of high concentration soil in the vadose zone in these two excavations represents a significant removal of hydrocarbon mass from the subsurface.

Residual concentrations in the vadose zone below a depth of 10 feet will be addressed as part of the site-wide LNAPL remediation approach required by the RWQCB. The Soil RAP (Section 7.11) included a provision for additional SVE, groundwater treatment and air sparging as potential technologies for addressing residual hydrocarbons after shallow soil removal. As described in the Soil RAP, additional remediation methods of saturated zone remediation, LNAPL removal and groundwater remediation will be evaluated to address residual contamination.

The results of confirmation sampling conducted after the completion of soil removal activities in Excavation #35 confirm that soil containing TPH and VOC at concentrations above Site cleanup goals have been successfully removed from the 0- to 10-foot soil interval.

4.2.3 Former AST 55004 (Excavations #11 and #19/#37)

Figure 7 presents a site map that provides the locations of Excavations #11 and #19/#37 that were completed within the location of the former AST 55004. Because these individual excavations merged into one large excavation and for conciseness, these excavations will be referred to as #19#37 within this report.

4.2.3.1 Excavation Areas

Figure 7 presents a site map that provides the locations of Excavations #19/#37 that were completed within the location of the former AST 55004. OSHA was notified of the deep excavation, and inspections were conducted to ensure safe slopes, and restricted access was maintained by fencing around each excavation at the end of each day. The initial removal of hydrocarbon-contaminated soil was expanded laterally and vertically to address soil with high photo-ionization detector (PID) field readings, with soil exposed in many sections of the excavations registering PID readings of over 10,000 ppm.

4.2.3.2 Description of Excavations

Soil removal in Excavation #19#37 was started March 31 2015. Excavation #19/#37 targeted hydrocarbon identified in previous boring DPT-92, DPT-93, DPT-94, DPT-152, DPT-153 and DPT-154, which contained petroleum hydrocarbons at concentrations above cleanup goals at depths ranging from 0.5 feet to 25 feet below grade.

The original excavation, based on previous soil sampling data was named Excavation #19 and with a planned total depth of 10 feet. However, based on field observations made during the removal of contaminated soil that indicated high concentrations of residual petroleum contamination in sidewalls and the excavation floor, the excavation was expanded, with the deeper and expanded excavation referred to as Excavation #37. The final Excavation #19/#37 encompassed an area of 35,000 square feet, reaching a maximum depth of 25 feet. An estimated total of approximately 13,000 cubic yards were excavated from Excavations #19/#37, with 23 cubic yards segregated in the field as clean soil, with the remaining balance of soil determined to be contaminated and thus treated on site

After reaching the final total depths, exploratory trenches were completed in the bottoms of Excavations #19/#37. The purpose of these trenches was to confirm soil lithology extending from the base of the excavations (which was composed largely of silty sands) to the underlying sand horizon that previous borings indicated was present at approximately 30 feet below surface grade. When completed, the exploratory trenches were approximately 5 feet in depth and 5 feet in width, with the trenches oriented north-south and east-west. Upon completion of these exploratory trenches, native site soil (previously analyzed and confirmed to meet the most-stringent site cleanup cleanup goals) was used as backfill. The backfilling of the exploratory trenches was conducted under the oversight of a third-party geotechnical engineer.

4.2.3.3 Excavations #19/#37 Sampling Results

Excavation confirmation samples were collected in accordance with the *Revised Field Sampling and Analysis Plan and Sampling Strategy* (SGI, 2015a). The collection of confirmation soil matrix samples focused on documenting soil conditions from the surface to a depth of 10 feet. Thus, 0-10 feet soil confirmation samples were collected after field measurements indicated that the lateral extent of contamination to 10 feet below grade had been removed. Soil exposed in excavation sidewalls at depths greater than 10 feet were noted by field measurements to contain residual hydrocarbons, particularly at depths nearing the shallowest historical groundwater (approximately 25 feet below grade) and at deeper levels. A limited number of soil samples were collected from excavation sidewalls and/or bottoms at below 10 feet below grade to allow documentation of the residual concentrations of petroleum hydrocarbons that remain in the subsurface.

Soil samples were analyzed for total petroleum hydrocarbons (TPH - carbon chain characterization) using EPA Method 8015M and for volatile organic compounds (VOCs), including benzene, toluene, ethyl benzene, and xylenes, and gasoline range organics (GRO) using EPA Method 8260B with 5035 3-VOCs sample preservation method.

The results of the soil matrix samples analyses are listed in Tables A-1 (TPH) and A-2 (VOCs).

Excavation #19/#37 Sampling

- 42 initial sidewall samples were collected at depths of 3, 6 and 9 feet in the west wall and north wall on September 1, 2015. 45 sidewall samples were taken at depths of 3, 6, and 9 feet from the east wall and south wall on December 7, 2015. With the exception of sample S5-9, all shallow (<10 feet) sidewall samples indicated TPH and VOC concentrations below cleanup goals;
- At location S5-9, the soil around a 9-ft deep sample location on the southern wall of the excavation was further excavated on December 20, 2015. An additional confirmation sample, labeled S5-9A, was collected on December 21, 2015, analyzed, and the results indicate hydrocarbon concentrations below cleanup goals.
- These results indicate that all shallow (0-10 ft) soil contamination has been removed in Excavation #19/#37.
- Eight deeper samples (B00083 to B00090) were also collected at depths of 15 and 20 feet to document the residual hydrocarbons in deeper soil. Six samples (B80084 to B80089) were found to contain VOCs or TPH in excess of cleanup goals;
- On November 19, 2015, four soil borings were also conducted to evaluate the lateral extent of deeper hydrocarbons. Two borings were located within Excavation #19/#37 area and two borings were located north of Excavation #19/#37. Twelve samples were collected at multiple depths from 12-25 feet below grade. The results of analyses of these samples are also listed on Tables A-1 and A-2.

4.2.3.4 Confirmation Sampling Results

Figure A-7 is a completion diagram of the final completed excavations prior to backfilling with the location of confirmation samples and former above ground storage tanks. The purpose of each diagram is to facilitate the visualization and interpretation of the final sidewall and bottom characterization of each excavation area prior to backfill. Tables A-1 and A-2 present the results of confirmation samples and comparison with the cleanup goals for TPH and VOCs.

The results of confirmation sampling of shallow soil (0 to 10 feet below grade) indicate that all contaminated soil in the excavations was removed laterally to non-detectable sidewall sample concentrations. Field observations and the results of deeper samples indicate that deeper soil locally contains residual hydrocarbons above cleanup goals, but the completed removal of high concentration soil in the vadose zone in these two excavations represents a significant removal of hydrocarbon mass from the subsurface.

Residual concentrations in the vadose zone below a depth of 10 feet will be addressed as part of the site-wide LNAPL remediation approach required by the RWQCB. The Soil RAP (Section 7.11) included a provision for additional SVE, groundwater treatment and air sparging as potential technologies for addressing residual hydrocarbons after shallow soil removal. As described in the Soil RAP, additional remediation methods of saturated zone remediation, LNAPL removal and groundwater remediation will be evaluated to address residual contamination.

The results of confirmation sampling conducted after the completion of soil removal activities in Excavation #19/#37 confirm that soil containing TPH and VOC at concentrations above Site cleanup goals have been successfully removed from the 0- to 10-foot soil interval.

4.3 On-Site Treatment of Excavated Soil

Soils were treated via the use of F4 Remediation and later Bulldog Green Remediation (BGR) technologies that entail the use proprietary blends of hydrocarbon-degrading bacteria (different strains of naturally occurring, non-pathogenic Pseudomonas bacteria and nutrients) and chemistry (surfactants and compounds). The application of this “green remedial” approach has been proven to clean soil contaminated by petroleum hydrocarbons and other volatile organic compounds while avoiding the need for off-site transportation or expensive on-site treatment via thermal or other desorptive techniques.

The bacteria are produced in an off-site laboratory and then freeze-dried to place the bacteria into an inactive, yet vital state. By freeze-drying the bacteria, they can be preserved until needed. The bacteria are shipped to the project site in a solid powdered state, within a vacuum-sealed container, and kept frozen. The surfactant consists of a non-ionic alcohol ethoxelate surfactant solution. Alcohol ethoxelates have been determined by the US EPA to be a safe and preferable surfactant for use in numerous applications.

The practical application of the F4 and BGR technologies requires the excavation of the contaminated soil, processing of the soil to add surfactants to reduce volatility and desorb

hydrocarbons from the soil matrix and the addition of bacteria to facilitate bio-treatment. Once treated with the surfactants and bacteria, the soil was placed into biotreatment soil piles to provide adequate time (several weeks to weeks, depending on the degree and type of contamination – heavier [longer chain] hydrocarbons biodegrade more slowly) for the bacteria to destroy the hydrocarbons.

All soil treatment operations were conducted in accordance with the *Soil Management Plan: Treatment Cell Operation and Site Excavation* (SGI, 2014). This SMP presented the design, construction, and management of the of the on-site treatment areas. It also explained the excavation treatment process, soil monitoring, and post-remediation closure of the areas used for soil treatment.

Approximately 20,000 to 35,000 tons of soil was treated in engineered treatment cells at any given time during the project. As confirmation soil sampling was conducted, soil was removed from the treatment cells and relocated on site for either immediate use as backfill or for stockpiling for later use on site. After removal of the treated soil, additional soil was added to the treatment cells and a new batch of soil was treated.

Because the soil remediation project occurred within the South Coast Air Quality Management District (SCAQMD) the excavation and treatment of the soil were completed in accordance with permits obtained from that agency. Vapor control measures implemented throughout the project duration included the addition of vapor suppressants to soil being removed and from the working face of excavations. Post treatment, the soil was placed into soil treatment cells that were designed and constructed in accordance with SCAQMD requirements for vapor control.

Furthermore, the construction, maintenance, and sampling of the soil treatment cells were done per the requirements of a site-specific Waste Discharge Requirements (WDR) permit issued by the Los Angeles Regional Water Quality Control Board.

Project permits included:

- Form 200 and supporting information to apply for a Waste Discharge Requirement (WDR) under General WDR, Order No. 90-148; General Waste Discharge Requirements for Land Treatment of Petroleum Hydrocarbon Contaminated Soil in Los Angeles and Santa Clara River Basins.
- A permit application (Application Number 566483) has been submitted for the excavation and handling of VOC-contaminated soil in accordance with Rule 1166 Contaminated Soil Mitigation Plan (1166 Plan). In addition, a modification to the existing permit to operate the existing SVE system (PTO G12863) application number 518989, has been submitted for approval to allow the operation and maintenance of the soil treatment cells.
- The City of Norwalk required an excavation plan in order to obtain an excavation permit.
- Soil excavation, handling, and stockpiling was conducted in accordance with the existing DSFP Norwalk Storm Water Pollution Prevention Plan

4.4 Off-Site Disposal of Excavated Soil

As stated above, during soil removal at excavation #4, approximately 600 cubic yards of soil (790 tons) was observed to contain oily material with low volatility and a tarry appearance. This soil was segregated separately, tested and profiled, and hauled off site for disposal. The stockpiled tarry soils were transported from the Site under non-hazardous manifests to the Thermal Remediation Solutions soil recycling facility located in Azusa, California. Copies of the transport manifests are attached as Appendix D.

4.5 Excavation Backfill

All excavations were backfilled with soil that originated at the Site. No backfill material was transported onto the site. The soil that was used for backfill was of two specific origins: either clean overburden or treated soil that met unrestricted use cleanup targets. Only clean, untreated soil was used from surface to 10 feet bgs to fill excavations. Deeper intervals (greater than 10 feet) were filled either clean or treated soil. In either case (clean or treated soil), pre-use confirmation soil samples were collected, analyzed, and reported to the RWQCB prior to use. Tables 2-3 provides a summary of the origin and ultimate disposition of all soil used for backfill within the DLA-Energy responsible area of the eastern portion of the Site. The table provides the following information in the indicated columns reading from left to right:

Origin of Soil: This column summarizes the name of the excavation from which soil was originally excavated. The numbered excavations referenced in Tables 2 and 3 are shown in Figure 7.

Initial Stockpile or Soil Treatment Cell: This column indicates the name of the soil pile where either clean overburden has been stockpiled prior to confirmation sampling to determine applicability for reuse (the *Initial Stockpile*) or, if the soil was contaminated and processed in the ECM, where it was placed for biologic processing (the *Soil Treatment Cell*). The numbered soil stockpiles and/or soil treatment cells referenced in Tables 2 and 3 are shown in Figure 8.

Number of Samples Submitted for Approval: This column indicates that number of confirmation soil samples that were collected and submitted to the laboratory to confirm that the clean overburden or treated soil met Site cleanup goals and was therefore suitable for on-site reuse.

RWQCB Approved Volume for Unrestricted Use as Backfill: This column provides the volume of soil (in cubic yards) present in the initial stockpile or treatment cell that soil sampling and analysis has confirmed can be used as unrestricted backfill.

Post-Treatment Stockpile: This column provides the name of a temporary soil pile where treated soil that has been confirmed to be suitable for re-use has been placed pending placement into an excavation for backfill.

Phase: This column indicates the phase of the soil excavation, treatment, and sampling results included in an associated report to submit to the RWQCB for review and concurrence that site cleanup goals have been achieved.

Report Name: This column provides the name of the summary report submitted in conjunction with each phase of soil excavation, treatment, and sampling.

Report Date: This column provides the date that the Phase report was submitted to the RWQCB.

RWQCB Approval Date: This column provides the date that the RWQCB provided written approval of the Phase report.

Destination Excavation: This column provides the name of the excavation where the soil generated from the locations provided in the *Origin of Soil* column was re-used. Note that in some instances, treated soil was used to partially backfill the upper (0 to 10-foot) intervals of Excavation 37. This treated soil was used only in the western portions of the excavation, and therefore was not used under land intended for eventual conveyance to the City of Norwalk for parkland use.

Date Used as Backfill: This column provides the date or date range during which this soil was added to the destination excavation.

4.5.1 Summary of Backfilled Excavations

The northeastern excavations (#5 and #3, #4, and #14 combined) were backfilled from July 20 to 27, 2015. Backfilling included addition of water to ensure compaction and the placement of soil in approximate one-foot thick lifts. Third-party oversight of all compaction activities and the performance of confirmation testing to ensure a minimum of 90% of Standard Proctor were provided by Albus-Keefe & Associates of Anaheim, CA.

Excavation #35 was backfilled from February 3, 2016 to February 25, 2016. Backfilling included addition of potable water to ensure compaction and the placement of soil in approximate one-foot thick lifts. Third-party oversight of all compaction activities and the performance of confirmation testing to ensure a minimum of 90% of Standard Proctor were provided by Albus-Keefe & Associates of Anaheim, CA.

Excavation #19/#37 was backfilled from February 25, 2016 to March 8, 2016. Backfilling included addition of potable water to ensure compaction and the placement of soil in approximate one-foot thick lifts. Third-party oversight of all compaction activities and the performance of confirmation testing to ensure a minimum of 90% of Standard Proctor were provided by Albus-Keefe & Associates of Anaheim, CA.

4.6 Post-Remediation Soil Vapor Survey

In November 2015, SGI supervised the installation and sampling of 12 soil gas probes located throughout the site. These were drilled as an initial screening of soil gas concentrations. These

2015 locations, in addition to previously installed probes, were utilized for the future collection of Site soil vapor data. The data and a map illustrating sample locations from the November 2015 soil gas sampling event are included as Appendix E.

On March 7th and 8th, 2016, 66 temporary soil gas probes were installed at 22 locations (SV-14, SV-17 through -32, SV-35, SV-38, SV-41, SV-94, and SV-96) at intervals of 5, 10, and 15 feet bgs on the eastern portion of the Site.

Soil gas samples were collected from the 5 and 10 foot intervals at each new soil gas probe location and from four existing soil gas probe locations (SV-1, SV-3, SV-4, and SV-5) installed in 2015. All soil sampling occurred at locations within the footprint of the proposed park (Appendix E).

The 2015 soil gas probes were installed by Environmental Support Technologies (EST) as reported in SGI's February 2016 *Updated Work Plan for Post-Excavation Soil Gas Sampling*.

The 2016 soil gas probes were installed in the eastern part by H&P Mobile Geochemistry (H&P), a California C-57 licensed drilling company. The soil gas probes were installed and sampled using methods consistent with the July 2015 *Advisory - Active Soil Gas Investigations* published by the California Environmental Protection Agency (CalEPA). SGI specified a general probe location density of one soil gas location per quarter acre (in accordance to the Department of Toxic Substances Control [DTSC] 2005 Interim Final Guidance for the Evaluation of Subsurface Vapor Intrusion to Indoor Air). This probe density corresponds to approximately 5 sampling locations per former petroleum tank storage basin. Soil gas probes were generally installed in the corners and center of each former fuel tank basin.

All field activities and sampling procedures were completed in accordance with the July 2015, California Environmental Protection Agency Department of Toxic Substances Control (CalEPA/DTSC) update of its 2012 *Advisory for Active Soil Gas Investigations*. The CalEPA/DTSC technical guidance document was used to guide the performance and reporting of the post-remediation soil vapor survey. Vapor samples were analyzed for VOCs and TPH-gasoline in accordance with USEPA Test Method 8260B.

Between March 8th and March 11th, 2016, 56 soil gas samples (including 4 duplicate soil gas samples) were collected from the soil gas probes SV-1, SV-3, SV-4, SV-5, SV-14, SV-17 through -32, SV-35, SV-38, SV-41, SV-94, and SV-96 and analyzed on-site by H&P's mobile laboratory (Appendix F**)**. At each location, soil gas samples were collected at the 5 foot and 10 foot intervals. The 15 foot interval was not sampled since analytical results for benzene at the shallower intervals were below the commercial California Human Health Screening Level (CHHSL) of 120 µg/m^3 by 1 to 2 orders of magnitude.

Acetone, benzene, toluene, ethylbenzene, xylenes, 2-butanone (MEK), 4-ethyltoluene, and 1,2,4-trimethylbenzene were the only VOCs detected in the soil gas samples. The benzene concentrations in soil gas are illustrated on Figure 9.

Benzene was detected in 16 samples from 12 of the 14 probe locations surrounding basin number 80017 in the central/southern portion of the investigated area (Figure 9). At the 5-foot interval,

benzene was detected at SV-18 and SV-24 at concentrations of 30 µg/m^3 and 29 µg/m^3, respectively. At the 10-foot interval, benzene was detected a concentrations ranging from 18 µg/m^3 to 98 µg/m^3. Benzene was not detected above the laboratory reporting limit of 16 µg/m^3 at any the remaining 12 probe locations in the northern portion of the investigated area.

Toluene and total xylenes were typically detected across the Site at locations where benzene was found, with maximum concentrations of 390 µg/m^3 and 344 µg/m^3, respectively. Ethylbenzene was detected in 11 samples with concentrations ranging from 25 µg/m^3 to 69 µg/m^3. MEK was detected in one sample (SV-96-10) at a concentration of 77 µg/m^3. In one sample (SV-25-10), 4-ethyltoluene and 1,2,4-trimethylbenzene were detected at concentrations of 59 µg/m^3 and 52 µg/m^3, respectively. Acetone was detected in 33 samples across the Site with concentrations ranging from 49 µg/m^3 to 530 µg/m^3. H&P indicated that such low concentrations of acetone are common and typically associated with the decomposition of organic matter and may not be related to the petroleum contamination.

Table 4 presents a summary of the detected soil gas analytical results. The laboratory analytical report is provided in Appendix F.

The concentrations of volatile organic compounds (VOCs) detected in soil gas were compared with regulatory screening criteria developed for the protection of human health under a commercial exposure scenario. As presented in Table 4, the following screening criteria were used for the risk evaluation:

- Office of Environmental Health Hazard Assessment California Human Health Screening Levels (CHHSLs; OEHHA, 2010);
- U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs; USEPA, 2015);
- Department of Toxic Substances Control Screening Levels (DTSC, 2016); and
- California Regional Water Quality Control Board Environmental Screening Levels (ESLs; CRWQCB, 2016).

OEHHA CHHSLs were last updated in 2010 and more recently published soil gas screening levels are available from USEPA, DTSC, and CRWQCB. DTSC recommends the use of the DTSC screening levels and the use of USEPA RSLs, in the absence of a DTSC screening level. The USEPA/DTSC soil gas screening level is calculated by dividing the USEPA/DTSC industrial air screening level by the DTSC (2011) default attenuation factor of 0.001 for an existing commercial building scenario. Similarly, the CRWQCB soil gas screening level is calculated by dividing the industrial air screening level by the DTSC (2011) default attenuation factor of 0.001.

These screening levels were used for evaluating the potential for subsurface vapor intrusion to indoor air from volatile compounds in soil gas. As shown in Table 4, no VOCs were detected at a concentration exceeding the screening levels. Based on this soil gas investigation, VOC concentrations in soil gas do not pose a risk to potential commercial/industrial receptors at the Site.

4.7 Post-Remediation Treatment Area Soil Confirmation Sampling

As part of the soil treatment WDR, pre- and post-treatment soil sampling and analyses were required for the areas used for on-site soil treatment. A portion of the DLA-Energy Responsible Area of the Eastern Portion of the site was used for on-site soil treatment (specifically the eastern portion of the former AST 80004 basin. The pre-treatment soil samples (collected prior to deploying the impermeable liner that underlain each of the treatment piles) were analyzed for TPH and VOCs in accordance with project sampling plans and the WDR. The results of this pre-treatment sampling as well as post treatment soil sampling and analysis will be submitted under separate cover and as an addendum to this report.

5.0 EXCAVATION RESULTS AND REQUEST FOR CLOSURE

Summary of Conclusions

The remediation of soil containing chemicals of concern at concentrations above site cleanup goals have been excavated and treated on site. Summary of sidewall confirmation samples are provided in the attached figures (Figures A-1 though A-3) and tables. These figures demonstrate that all confirmation sidewall samples have achieved the site cleanup goals. Excavation bottom samples do, in some instances, exceed the shallow soil cleanup goals (see attached figures x through x where the bottom depths are indicated on the figures). However, these samples were all collected from the bases of excavations that were in excess of 10 feet. After backfilling with clean soil, all shallow soil (the upper 10 feet of soil) have met the cleanup goals.

The remediation of the shallow (upper 10 feet of soil) has resulted in the elimination of all but the lowest concentrations of chemicals of concern in the shallow soil. The use of clean, uncontaminated soil to fill the upper 10 feet of all soil excavations present with the 15 acres of land slated for the future park has resulted in the near 100% elimination of hydrocarbons from the upper 10 feet of soil on the future park land. Further, the chemicals of concern at the site were associated with petroleum fuels – principally military grade jet fuels. The chemicals that comprise these fuels are biodegradable and thus any residual concentrations of hydrocarbons in the shallow soil will with reduce in concentration with time due to the effects of naturally occurring soil bacteria. The results of pre- and post-soil remediation soil gas testing indicate that the levels of VOCs are below commercial/industrial use CHHSLs.

Based on the information provided in this report and the completion of soil remediation activities in accordance with the RAP, on behalf of DLA Energy, no-further action closure of shallow (0 to 10 feet) within the DLA-Responsible Area of Eastern Portion of DFSP Norwalk is hereby requested.

6.0 REFERENCES

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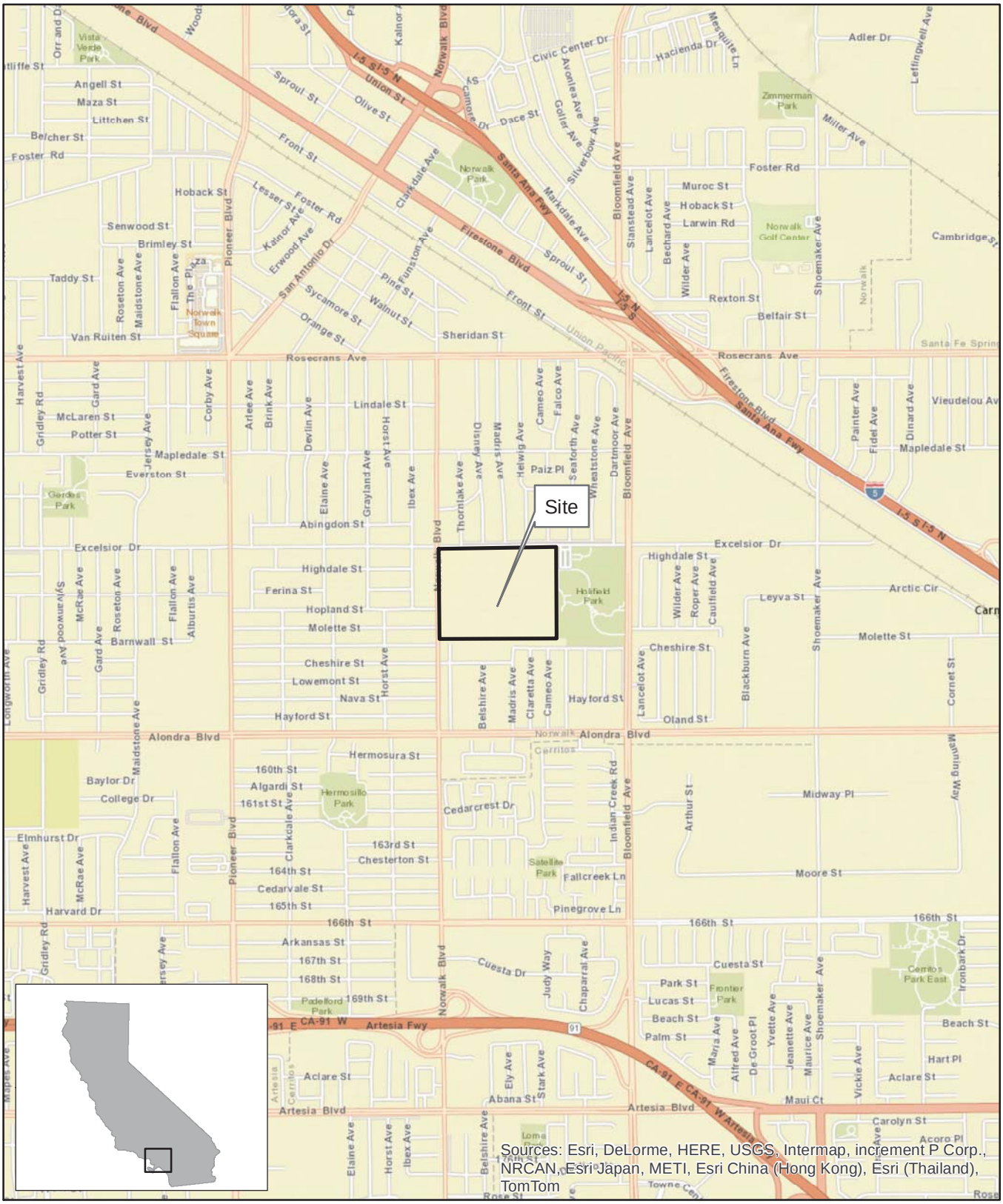
7.0 LIMITATIONS

This document was prepared for the exclusive use of the Defense Logistics Agency - Energy (DLA Energy) and the California Regional Water Quality Control Board, Los Angeles Region (RWQCB) for the express purpose of complying with a client or regulatory directive for environmental investigation or restoration. SGI and DLA Energy must approve any re-use of this work product in whole or in part for a different purpose or by others in writing. If any such unauthorized use occurs, it shall be at the user's sole risk without liability to SGI or DLA Energy. To the extent that this report is based on information provided to SGI by third parties, including DLA Energy, their direct contractors, previous workers, and other stakeholders, SGI cannot guarantee the completeness or accuracy of this information, even where efforts were made to verify third-party information. SGI has exercised professional judgment to collect and present findings and opinions of a scientific and technical nature. The opinions expressed are based on the conditions of the Site existing at the time of the field investigation, current regulatory requirements, and any specified assumptions. The presented findings and recommendations in this report are intended to be taken in their entirety to assist DLA Energy and RWQCB personnel in applying their own professional judgment in making decisions related to the property. SGI cannot provide conclusions on environmental conditions outside the completed scope of work. SGI cannot guarantee that future conditions will not change and affect the validity of the presented conclusions and recommended work. No warranty or guarantee, whether expressed or implied, is made with respect to the data or the reported findings, observations, conclusions, and recommendations.

FIGURES



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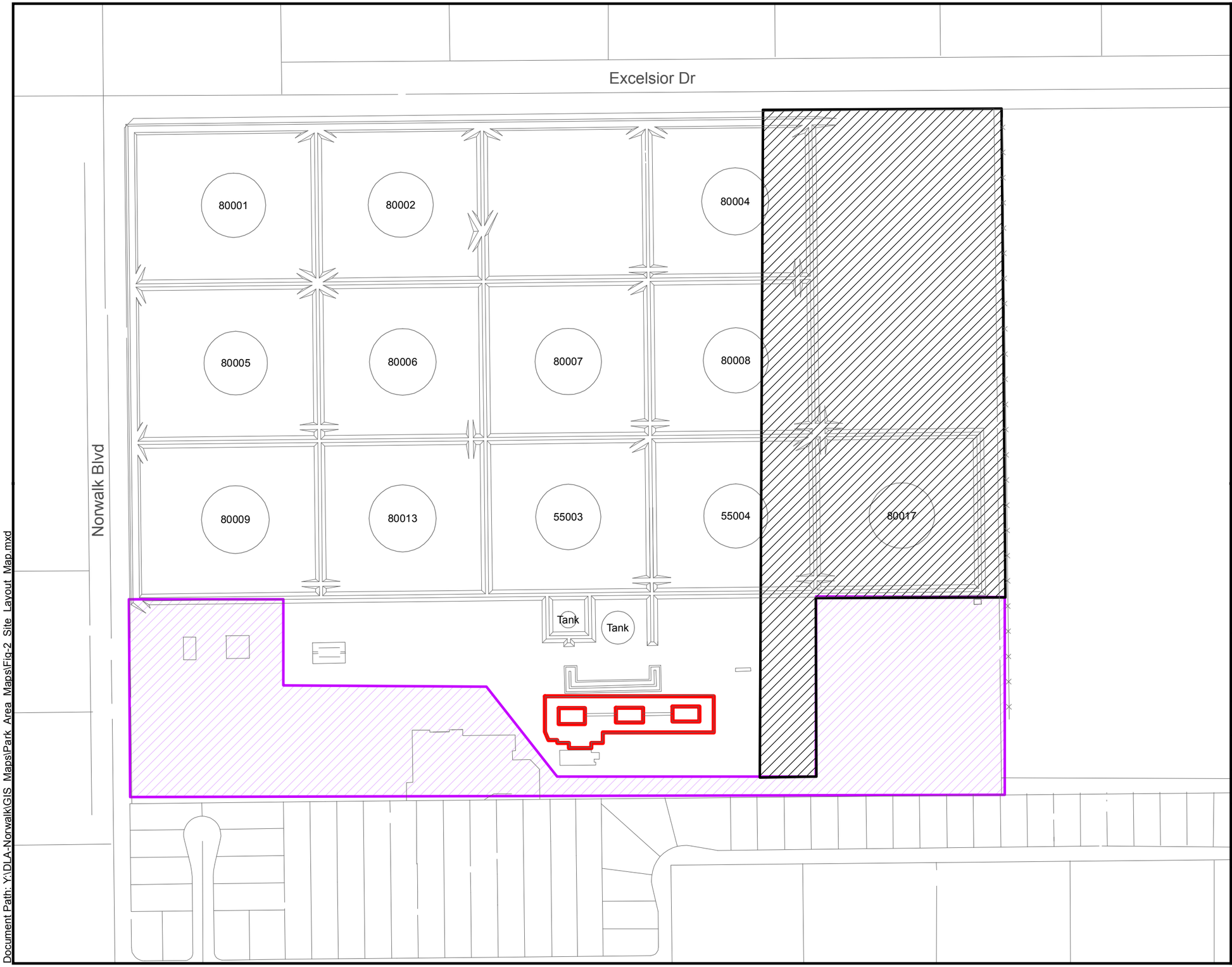
SGI environmental THE SOURCE GROUP, INC.
1962 FREEMAN AVENUE
SIGNAL HILL, CA 90755
(562) 597-1055

DEFENSE FUEL SUPPORT POINT NORWALK
15306 NORWALK BOULEVARD
NORWALK, CALIFORNIA

SITE LOCATION MAP

FIGURE **1**

Document Name: Fig-1 Norwalk Site Location Map



Legend

- Former Above Ground Storage Tanks
- DLA Responsible Area - Eastern Portion of DFSP Norwalk
- Former Truck Loading Racks
- Kinder Morgan Responsible Area

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	04/07/2016	P. Wu	N. Irish

0 90 180 360 Feet

Site Layout Map

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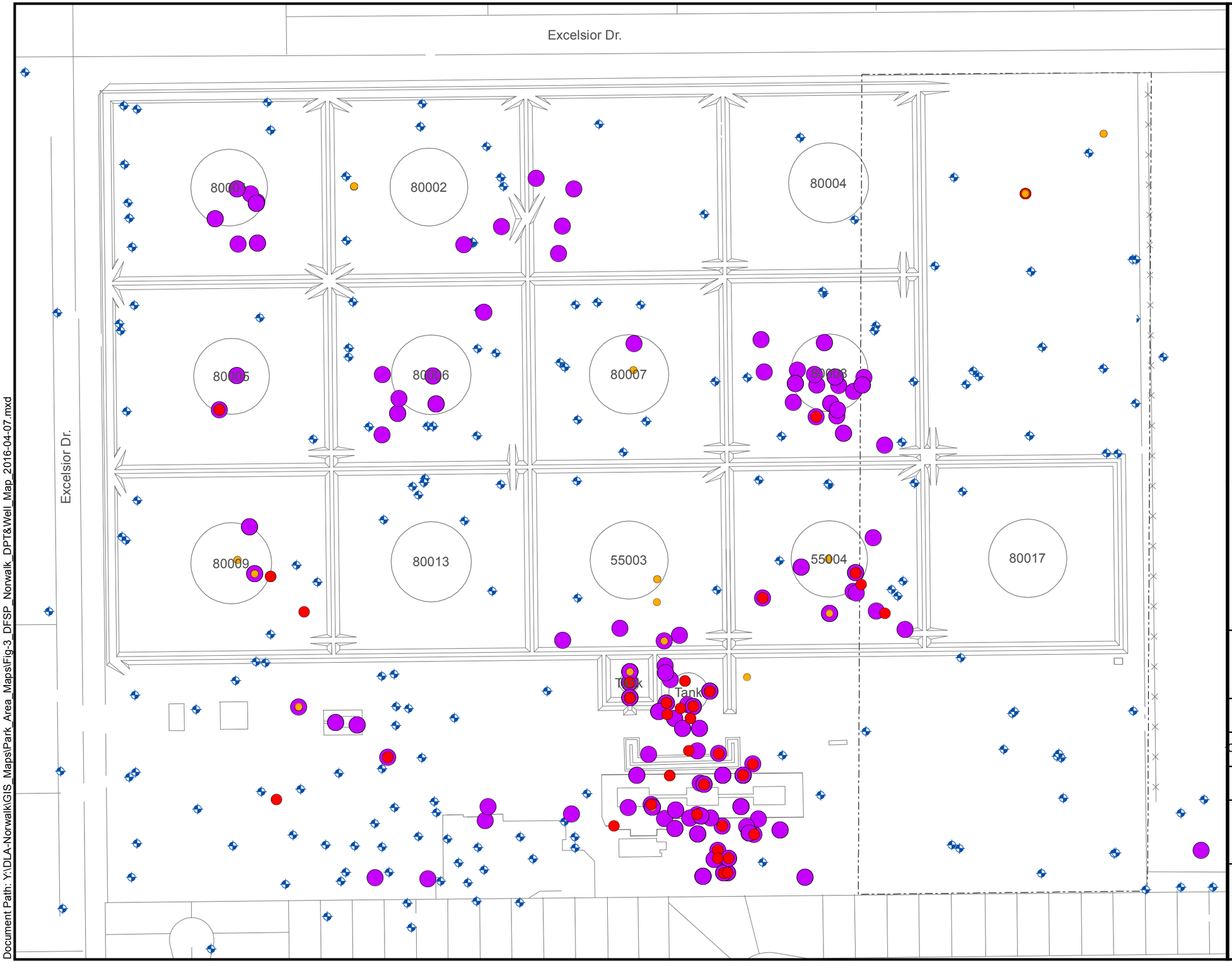
1962 Freeman Avenue
Signal Hill, CA 90755
(562) 597-1055

Figure 2

Document Path: Y:\DLA-Norwalk\GIS Maps\Park Area Maps\Fig-2 Site Layout Map.mxd



Legend

- Former Above Ground Storage Tanks
- DFSP Norwalk Border
- Expanded Holifield Park Boundary
- Groundwater Monitoring Well Locations
- Concentrations Exceeding Cleanup Goals of 500 mg/kg for TPHg or JP-5 or 100 mg/kg for TPHd in Soil 0 to 5 ft bgs
- Concentrations Exceeding Cleanup Goal of 100 mg/kg for TPHg or JP-5 or TPHd in Soil 5.5 to 10 ft bgs
- Concentrations Exceeding Cleanup Goal of 100 mg/kg for TPHg or JP-5 or TPHd in Soil 10.5 to 25 ft bgs

Notes:

Los Angeles Regional Water Quality Control Board 2012 Cleanup Goals

TPHg = Total Petroleum Hydrocarbons as Gasoline

JP-5 = Jet Propellant-5 (Jet Fuel)

TPHd = Total Petroleum Hydrocarbons as Diesel

bgs = Below Ground Surface

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	04/07/2016	A. Czuba	N. Irish

0 75 150 300 Feet

Locations of Groundwater Monitoring Wells and Soil Borings

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Figure 3

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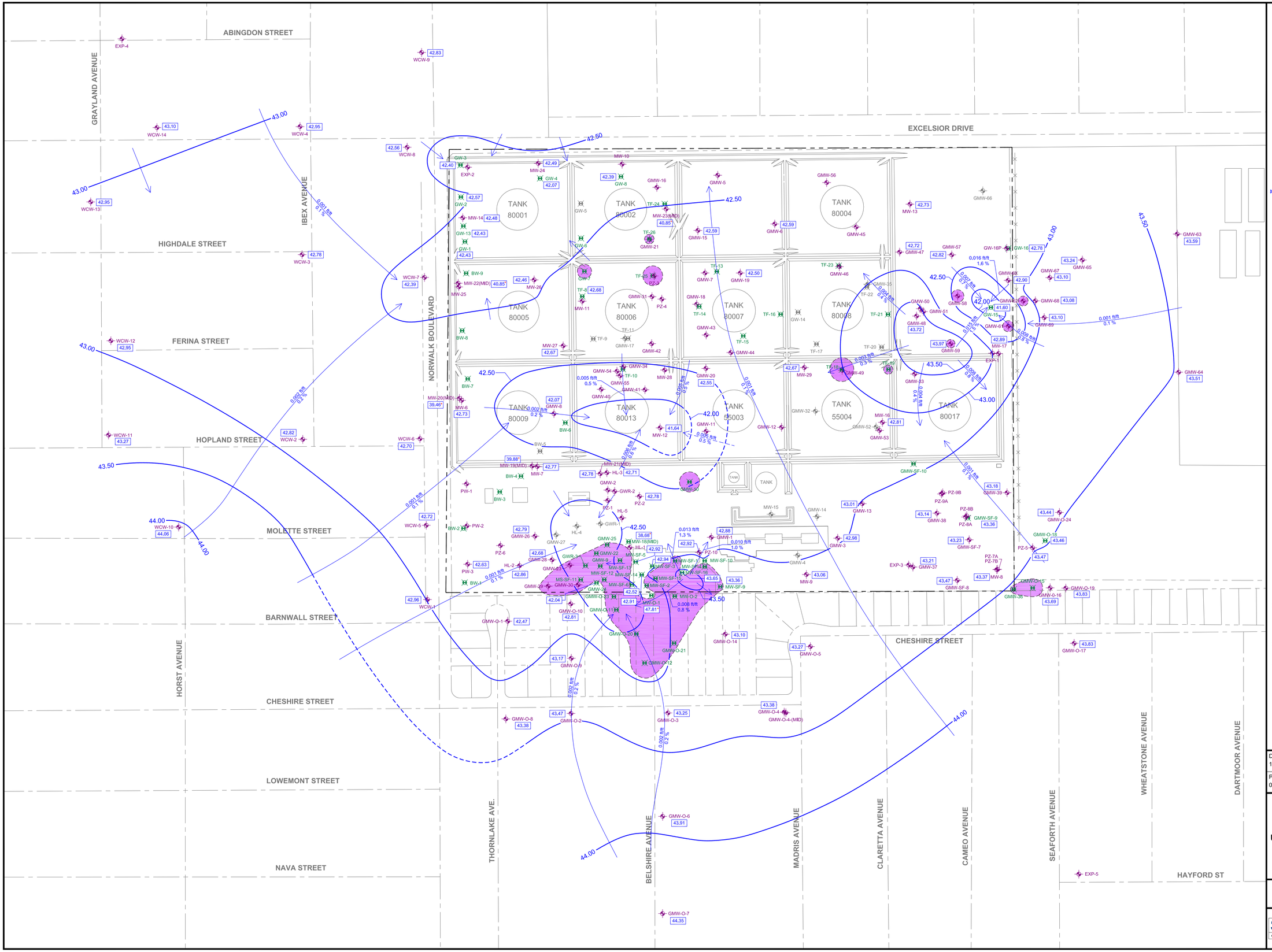


EXPLANATION:

- FORMER ABOVEGROUND STORAGE TANKS
- DFSP NORWALK BORDER
- WCW-14 — GROUNDWATER MONITORING WELL
- GMW-66 — WELLS SHOWN IN GREY WERE DECOMMISSIONED BY DLA ENERGY PRIOR TO REMEDIAL EXCAVATION
- TF-26 — EXTRACTION WELL USED FOR VAPOR, GROUNDWATER, TOTAL FLUIDS, OR FLOATING PRODUCT EXTRACTION
- 44.35 — GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL MEASURED OCTOBER 19 - NOVEMBER 6, 2015
- * — ASTERISK INDICATES DATA NOT USED TO DEVELOP THIS EQUIPOTENTIAL MAP
- 43.50 — LINE OF EQUAL GROUNDWATER ELEVATION (REFERENCE = MEAN SEA LEVEL) CONTOUR INTERVAL = 0.50 FOOT DASHED WHERE INFERRED
- 0.001 ft/ft 0.1 % — GROUNDWATER GRADIENT DIRECTION WITH GRADIENT IN FEET PER FOOT (ft/ft) AND PERCENT; DASHED WHERE INFERRED
- ESTIMATED EXTENT OF MEASURABLE LIGHT NONAQUEOUS PHASE LIQUID (LNAPL, FLOATING PRODUCT) ON GROUNDWATER REFER TO FIGURE 4 OR TABLE 2 FOR MEASURED THICKNESSES

NOTES:

1. GROUNDWATER ELEVATIONS AND INTERPRETED PRODUCT EXTENT ARE BASED ON DATA COLLECTED BY SGI, BLAINE TECH, AND SFPP OCTOBER 19 - NOVEMBER 6, 2015.
2. DLA ENERGY'S AND SFPP'S REMEDIATION SYSTEMS WERE SHUT DOWN APPROXIMATELY 1 WEEK PRIOR TO COLLECTING FLUID LEVEL MEASUREMENTS IN OCTOBER 2015.
3. WELLS SCREENED IN THE EXPOSITION AQUIFER OR NEAR THE BOTTOM OF THE UPPERMOST AQUIFER ARE NOT USED IN CONTOURING.

SURVEY NOTES:

1. BASE MAP PREPARED FROM DATA PROVIDED BY FLUOR DANIEL GTI, DULIN & BOYNTON, GEOMATRIX, AND PARSONS
2. EXCEPT AS NOTED BELOW, WELL LOCATIONS SURVEYED BY DULIN & BOYNTON
3. LOCATIONS OF WELLS HL-1, HL-3, AND HL-4 BASED ON FIELD MEASUREMENTS BY FLOUR DANIEL GTI AND WOODWARD-CLYDE

0 120 240
APPROXIMATE SCALE IN FEET

N

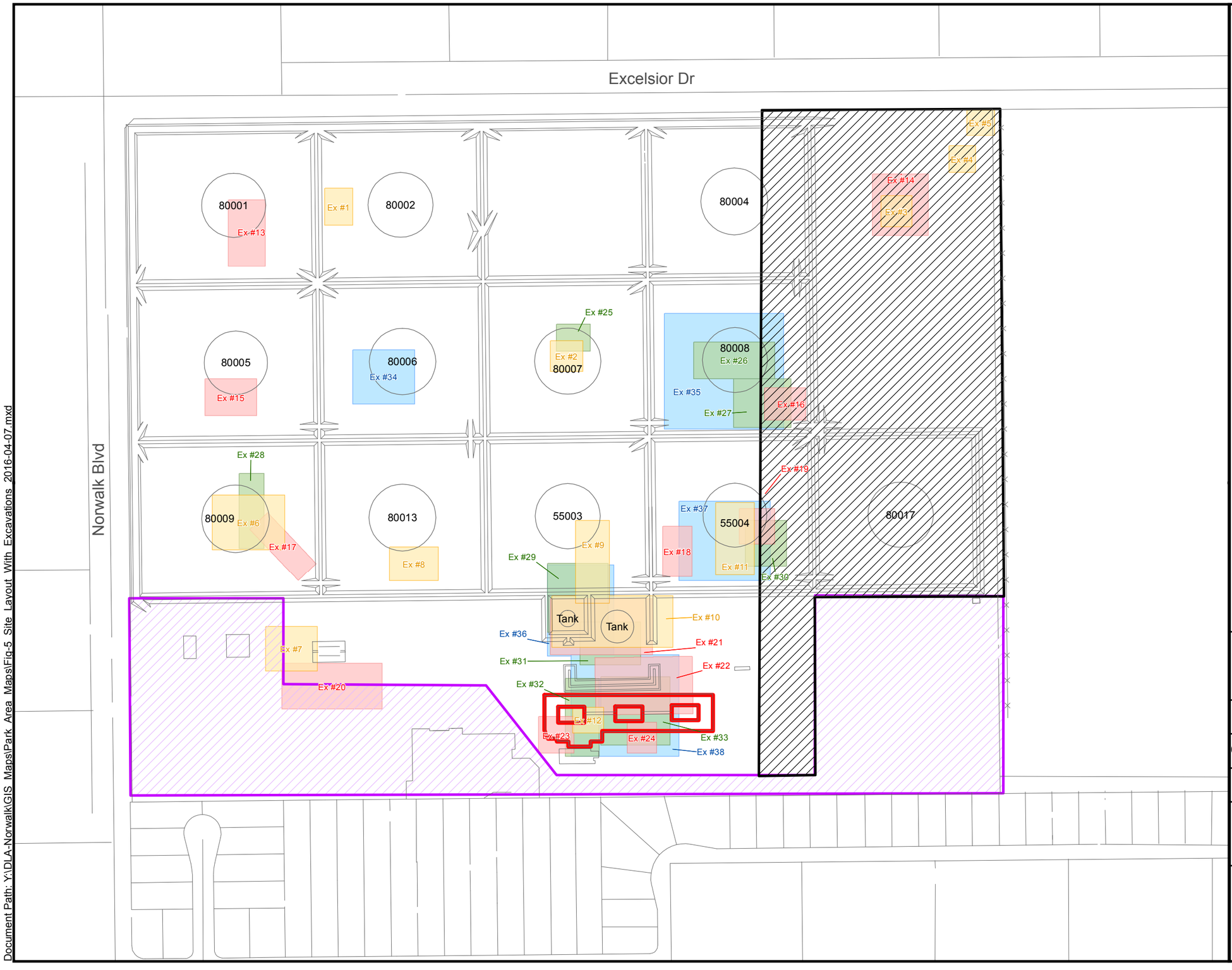
DATE: 12/2015	FILE NAME: DFSP-Norwalk-SE2-16.dwg
PROJECT No.: 04-NDLA-009	CONTRACT: SPO-600-14-D-5410

GROUNDWATER EQUIPOTENTIAL AND GRADIENT MAP UPPERMOST GROUNDWATER ZONE OCTOBER 19 - NOVEMBER 6, 2015

DFSP NORWALK
15306 NORWALK BOULEVARD
NORWALK, CALIFORNIA

SGI environmental — THE SOURCE GROUP, INC.

FIGURE 4



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Legend

- Former Above Ground Storage Tanks
- EX # 12 — Excavations 0-5ft bgs
- EX # 24 — Excavation 5-10ft bgs
- EX # 33 — Excavation 10-15ft bgs
- EX # 38 — Excavation 15-25ft bgs
- DLA Responsible Area - Eastern Portion of DFSP Norwalk
- Former Truck Loading Racks
- Kinder Morgan Responsible Area

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	04/07/2016	P. Wu	N. Irish

0 90 180 360 Feet

Site Layout with Proposed Excavations

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Signal Hill, CA 90755
(562) 597-1055

Figure 5

Excelsior Dr

Norwalk Blvd

Powerine Basin

80001

80002

80004

80005

80006

80007

80008

80009

80013

55003

55004

80017

Tank

Tank

EX 5

EX 3/EX 14

EX 4

EX 35

EX 19/EX 37

Legend

- Former Above Ground Storage Tanks
- Cross Trenches (Completed by SGI/DLA)
- Excavation Areas
- Buildings
- Kinder-Morgan Conveyance Area (Soil Conceptual Site Model, Parsons, September 4, 2012)
- Surveyed Park Boundary (by Coast Surveying, Inc., October 2015)

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	04/07/2016	P. W	N. I

0 70 140 280 Feet

EXCAVATION MAP WITH PARK AREA CROSS TRENCHES

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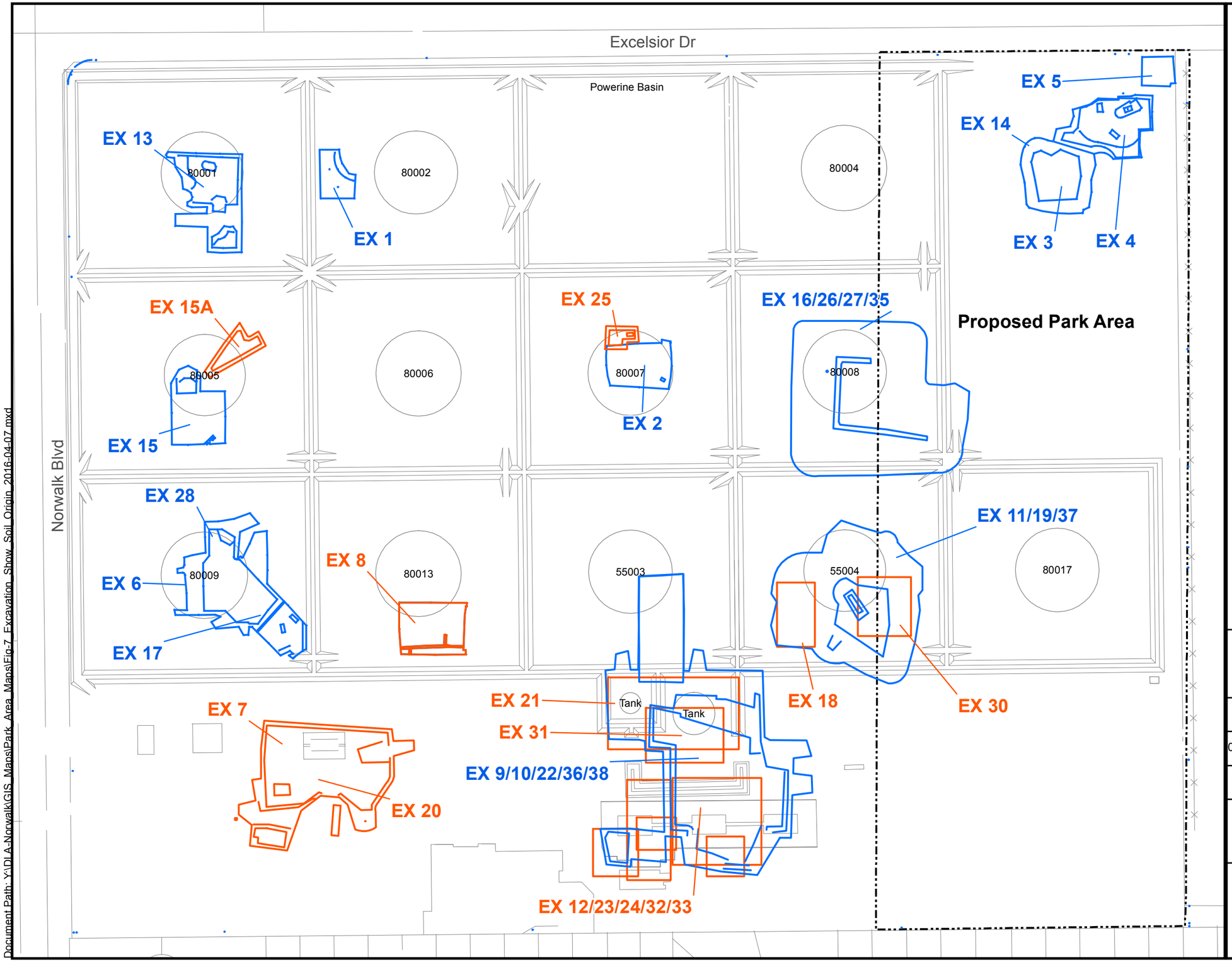
1962 Freeman Avenue
Signal Hill, CA 90755
(562) 597-1055

Figure 6

Document Path: Y:\DLA-Norwalk\GIS Maps\Park Area Maps\Fig-6 DFSPN EX Map CrossTrench 2016-04-07.mxd



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Legend

- Former Above Ground Storage Tanks
- Soil from excavations were fully or partially used as backfill for the proposed park
- Soil from excavations were not used as backfill for the proposed park
- Surveyed Park Boundary (by Coast Surveying, Inc., October 2015)

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

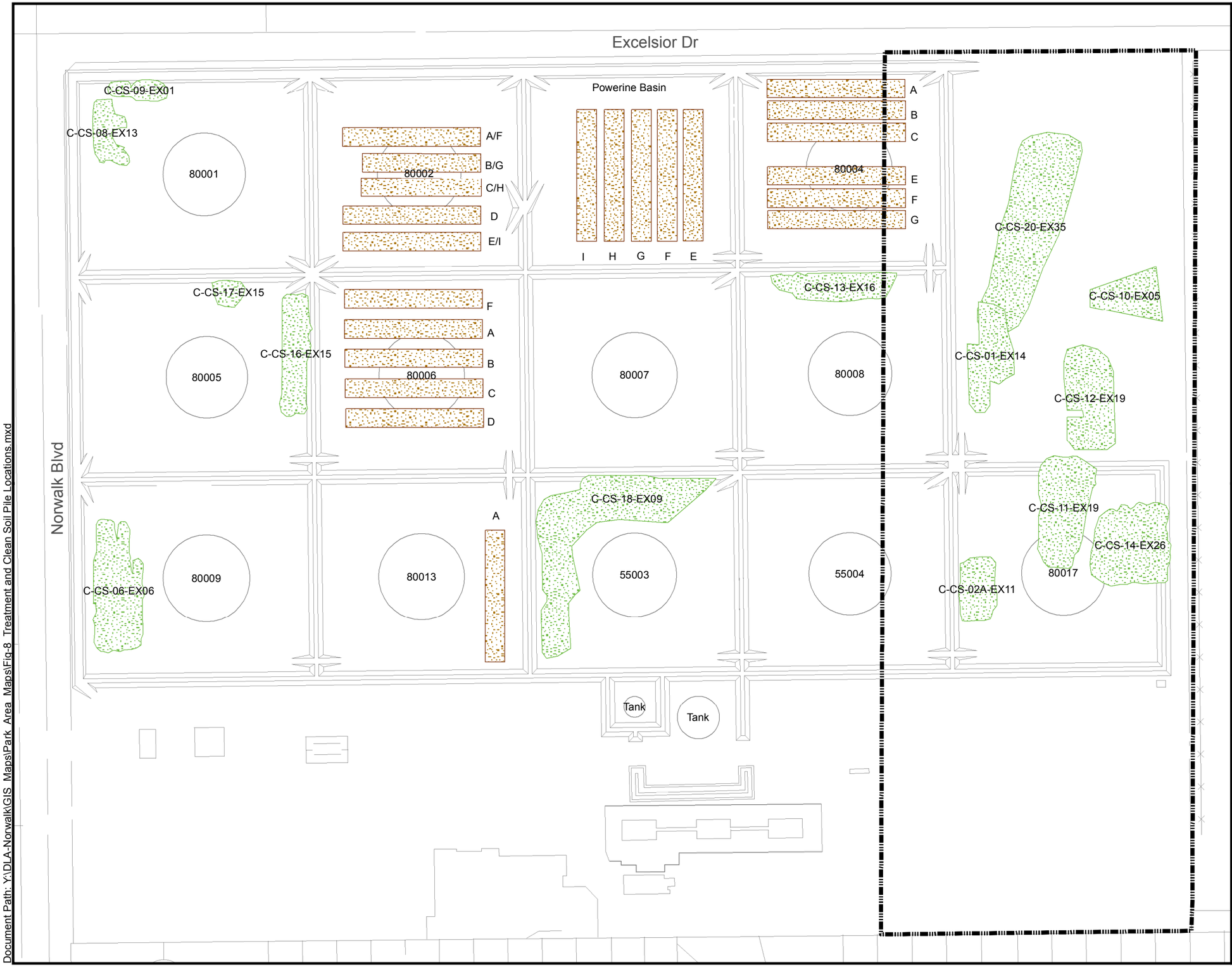
Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	04/07/2016	A. C	N. I

0 70 140 280 Feet

EXCAVATION MAP WITH PARK AREA BACKFILL ORIGINS

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

Figure 7



Document Path: Y:\DLA-Norwalk\GIS Maps\Park Area Maps\Fig-8 Treatment and Clean Soil Pile Locations.mxd

Legend

- Former Above Ground Storage Tanks
- Surveyed Park Boundary (by Coast Surveying, Inc., October 2015)
- Clean Stock Piles that Used to Proposed Park Area
- E — Treatment Piles that Used to Proposed Park Area

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	04/07/2016	P. W	N. I

0 70 140 280 Feet

Clean Stockpile and Treatment Stockpile Location

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

Figure 8

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-96
<16 @ 5ft
33 @ 10ft

SV-94
<16 @ 5ft
31 @ 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-18
30 @ 5ft
34 @ 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

Figure 9

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

TABLES

TABLE 1
SUMMARY OF EXCAVATIONS
(Proposed Park Area)

Excavation Number	Excavation Volumes (yds^3)	Number of Sidewall Confirmation Samples	Number of Floor or Deep Sidewall Confirmation Samples	Total Number of Confirmation Samples	Status (March 2016)	Comments
Excavation #3	1,042	24	6	30	Backfilled	Excavations #3, #4, and #14 combined
Excavation #4	1,845	50	17	67	Backfilled	Excavations #3, #4, and #14 combined
Excavation #14	2,112	82	12	94	Backfilled	Excavations #3, #4, and #14 combined
Excavation #5	340	28	4	32	Backfilled	
Excavation #35	29,000	119	9	128	Backfilled	Excavations #16, #26 and #27 combined to Excavation #35
Excavation #19/#37	13,000	88	8	96	Backfilled	Excavations #11, #18, #19 and #30 combined and expanded to Excavation #37
Total	**47,339**	**391**	**56**	**447**		

Notes:
yds^3 = cubic yards

TABLE 2
SUMMARY OF EASTERN AREA SOIL CLEAN FILL ORIGIN
DEFENSE FUEL SUPPORT POINT - NORWALK
NORWALK, CALIFORNIA
(March 30, 2016)

Phase	Initial Stockpile	Origin of Soil	Number of Samples Submitted for Approval	RWQCB Approved Volume for *Unrestricted Use as Backfill (cb yds)	Report Name	Report Date	RWQCB Approval Date	Destination Excavation	Date Used as Backfill
Phase 1	Clean Soil Pile CS-01	Excavations 2, 3 and 14	34	933	Phase 1 Excavation and Stockpiles Confirmation Sampling Report	07/14/15	07/22/15	Excavations 3, 4, 5 and 14	July 20-27, 2015
Phase 1	Clean Soil Pile CS-02A	Excavation 11, berm soil 80008	39	900	Phase 1 Excavation and Stockpiles Confirmation Sampling Report	07/14/15	07/22/15	Excavations 3, 4, 5 and 14	July 20-27, 2015
Phase 1	Clean Soil Pile CS-10	Excavation 4 and 5	35	600	Phase 1 Excavation and Stockpiles Confirmation Sampling Report	07/14/15	07/22/15	Excavations 3, 4, 5 and 14	July 20-27, 2015
Phase 1	Clean Soil Pile CS-12 (partially used for backfilling of Exc 3, 4, 14)	Excavations 16, 26, 27 and 19	46	40	Phase 1 Excavation and Stockpiles Confirmation Sampling Report	07/14/15	07/22/15	Excavations 3, 4, 5 and 14	July 20-27, 2015
Phase 1	Clean Soil Pile CS-12 (residual after backfilling of Exc 3, 4, 14)	Excavations 16, 26, 27 and 19	32	4,510	Phase 1 Excavation and Stockpiles Confirmation Sampling Report	07/14/15	07/22/15	EX 35 (<10ft)	February 10-16
Phase 1	Clean Soil Pile CS-14	Excavations 26, 27	44	2,460	Phase 1 Excavation and Stockpiles Confirmation Sampling Report	07/14/15	07/22/15	Excavations 3, 4, 5 and 14	July 20-27, 2015
Phase 2	Clean Soil Pile CS-11	Excavation 19	31	1,850	Phase 2 Excavation and Stockpiles Confirmation Sampling Report	07/30/15	08/13/15	Excavations 3, 4, 5 and 14	July 20-27, 2015
Phase 2	Clean Soil Pile CS-13	Excavation 16	29	1,130	Phase 2 Excavation and Stockpiles Confirmation Sampling Report	07/30/15	08/13/15	Excavations 3, 4, 5 and 14	July 20-27, 2015
Phase 4	Clean Soil Pile CS-06	Excavations 6, 17 and 28	27	1,746	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 37 (>10ft)	February 25, 2016
Phase 4	Clean Soil Pile CS-08	Excavation 13	21	550	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (<10ft)	February 25, 2016
Phase 4	Clean Soil Pile CS-17	Excavation 15	10	239	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (<10ft)	February 25, 2016
Phase 4	Clean Soil Pile CS-18	Excavations 9, 10 and 22	37	7,000	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (<10ft)	February 18-24, 2016
Phase 5	Clean Soil Pile CS-09	Excavation 1	20	500	Phase 5 Excavation and Stockpiles Confirmation Sampling Report	11/13/15	01/12/16	EX 35 (<10ft)	February 25, 2016
Phase 5	Clean Soil Pile CS-16	Excavation 15	28	1,200	Phase 5 Excavation and Stockpiles Confirmation Sampling Report	11/13/15	01/12/16	EX 35 (>10ft)	February 24-25, 2016
Phase 5	Clean Soil Pile CS-20	Excavations 15, 17, 35 and 37	43	8,000	Phase 5 Excavation and Stockpiles Confirmation Sampling Report	11/13/15	01/12/16	EX 35 (>10ft)	February 10-12, 2016
		Totals:	**476**	**31,658**					

Notes:
* Unrestricted-for use as backfill between 0.5 ft-bgs and total excavation depth in western portion of site, and between 10 ft-bgs and total excavation depth in eastern portion of site.
**Restricted-for use as backfill between 0.5 and 5 ft-bgs in western portion of site. Not used for backfill in eastern portion of site.

TABLE 3
SUMMARY OF EASTERN AREA SOIL TREATED FILL ORIGIN AND REUSE
DEFENSE FUEL SUPPORT POINT - NORWALK
NORWALK, CALIFORNIA
(March 30, 2016)

Phase	Origin of Soil	Initial Stockpile or Soil Treatment Cell	Number of Samples Submitted for Approval	Stockpile		Report Name	Report Date	RWQCB Approval Date	Destination Excavation	Date Used as Backfill
				RWQCB Approved Volume for *Unrestricted Use as Backfill (cb yds)	Post-Treatment Stockpile					
Phase 2	Excavation 3 and 14	Treated Stockpile Powerine-D Partial	35	699	Powerine TU-03	Phase 2 Excavation and Stockpiles Confirmation Sampling Report	07/30/15	08/13/15	EX 35 (>10ft)	February 3, 2016
Phase 3	Excavation 4, 13 and 26	Treated Stockpile 80002-A	35	606	80002-TU-1	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 3-4, 2016
Phase 3	Excavation 19	Treated Stockpile 80002-B	35	760	80002-TU-1	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 3-4, 2016
Phase 3	Excavation 19	Treated Stockpile 80002-C	35	808	80002-TU-1	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 3-4, 2016
Phase 3	Excavation 19	Treated Stockpile 80002-D	35	0	80002-TU-1	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 3-4, 2016
Phase 3	Excavations 11 and 19	Treated Stockpile 80002-E	35	652	80002-TU-1	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 3-4, 2016
Phase 3	Excavation 13 and 15	Treated Stockpile 80006-A	35	731	80006-TU-1-TU-3	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 4-9, 2016

TABLE 3
SUMMARY OF EASTERN AREA SOIL TREATED FILL ORIGIN AND REUSE
DEFENSE FUEL SUPPORT POINT - NORWALK
NORWALK, CALIFORNIA
(March 30, 2016)

Phase	Origin of Soil	Initial Stockpile or Soil Treatment Cell	Number of Samples Submitted for Approval	Stockpile		Report Name	Report Date	RWQCB Approval Date	Destination Excavation	Date Used as Backfill
				RWQCB Approved Volume for *Unrestricted Use as Backfill (cb yds)	Post-Treatment Stockpile					
Phase 3	Excavation 13	Treated Stockpile 80006-B	35	761	80006-TU-1-TU-3	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 4-9, 2016
Phase 3	Excavation 13	Treated Stockpile 80006-C	35	689	80006-TU-1-TU-3	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 4-9, 2016
Phase 3	Excavation 13	Treated Stockpile 80006-D	35	768	80006-TU-1-TU-3	Phase 3 Excavation and Stockpiles Confirmation Sampling Report	09/03/15	09/21/15	EX 35 (>10ft)	February 4-9, 2016
Phase 4	Excavation 22	Treated Stockpile 80006-F	35	834	80006-TU-1 -TU-3	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (>10ft)	February 4-9, 2016
Phase 4	Excavation 6 and 17	Treated Stockpile 80004-A	35	764	80004-TU-1-TU-2	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (>10ft)	February 9-10, 2016
Phase 4	Excavation 6 and 28	Treated Stockpile 80004-B	35	794	80004-TU-1-TU-2	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (>10ft)	February 9-10, 2016
Phase 4	Excavation 17 and 28	Treated Stockpile 80004-C	35	725	80004-TU-1-TU-2	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (>10ft)	February 9-10, 2016

TABLE 3
SUMMARY OF EASTERN AREA SOIL TREATED FILL ORIGIN AND REUSE
DEFENSE FUEL SUPPORT POINT - NORWALK
NORWALK, CALIFORNIA
(March 30, 2016)

Phase	Origin of Soil	Initial Stockpile or Soil Treatment Cell	Number of Samples Submitted for Approval	Stockpile		Report Name	Report Date	RWQCB Approval Date	Destination Excavation	Date Used as Backfill
				RWQCB Approved Volume for *Unrestricted Use as Backfill (cb yds)	Post-Treatment Stockpile					
Phase 4	Excavation 17	Treated Stockpile 80004-E	35	876	80004-TU-1-TU-2	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (>10ft)	February 9-10, 2016
Phase 4	Excavation 10 and 28	Treated Stockpile 80004-F	35	250	80004-TU-1-TU-2	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (>10ft)	February 9-10, 2016
Phase 4	Excavation 10 and 28	Treated Stockpile 80004-G	35	743	80004-TU-1-TU-2	Phase 4 Excavation and Stockpiles Confirmation Sampling Report	11/04/15	12/29/15	EX 35 (>10ft)	February 9-10, 2016
Phase 5	Excavation 22	Treated Stockpile Powerine-E	35	731	Powerine-TU-4 -TU5	Phase 5 Excavation and Stockpiles Confirmation Sampling Report	11/13/15	01/12/16	EX 35 (>10ft)	February 2-3, 2016
Phase 5	Excavation 22	Treated Stockpile Powerine-F	35	795	Powerine-TU-4 -TU5	Phase 5 Excavation and Stockpiles Confirmation Sampling Report	11/13/15	01/12/16	EX 35 (>10ft)	February 2-3, 2016
Phase 5	Excavation 22	Treated Stockpile Powerine-G	35	857	Powerine-TU-4 -TU5	Phase 5 Excavation and Stockpiles Confirmation Sampling Report	11/13/15	01/12/16	EX 35 (>10ft)	February 2-3, 2016
Phase 5	Excavation 22	Treated Stockpile Powerine-H	35	981	Powerine-TU-4 -TU5	Phase 5 Excavation and Stockpiles Confirmation Sampling Report	11/13/15	01/12/16	EX 35 (>10ft)	February 2-3, 2016

TABLE 3
SUMMARY OF EASTERN AREA SOIL TREATED FILL ORIGIN AND REUSE
DEFENSE FUEL SUPPORT POINT - NORWALK
NORWALK, CALIFORNIA
(March 30, 2016)

Phase	Origin of Soil	Initial Stockpile or Soil Treatment Cell	Number of Samples Submitted for Approval	Stockpile		Report Name	Report Date	RWQCB Approval Date	Destination Excavation	Date Used as Backfill
				RWQCB Approved Volume for *Unrestricted Use as Backfill (cb yds)	Post-Treatment Stockpile					
Phase 5	Excavations 10 and 36	Treated Stockpile Powerine-I	35	758	Powerine-TU-4 -TU5	Phase 5 Excavation and Stockpiles Confirmation Sampling Report	11/13/15	01/12/16	EX 35 (>10ft)	February 2-3, 2016
Phase 6	Excavation 35	Treated Stockpile 80002-G	35	621	80002-TU-3	Phase 6 Excavation and Stockpiles Confirmation Sampling Report	01/06/16	02/23/16	37 (5-10ft) Weste	March 10, 2016
Phase 6	Excavation 35	Treated Stockpile 80002-F	35	816	80002-TU-4	Phase 6 Excavation and Stockpiles Confirmation Sampling Report	01/06/16	02/23/16	EX 37 (<10ft)	March 3, 2016
Phase 6	Excavation 35	Treated Stockpile 80002-H	35	909	80002-TU-4	Phase 6 Excavation and Stockpiles Confirmation Sampling Report	01/06/16	02/23/16	EX 37 (<10ft)	March 3, 2016
Phase 6	Excavation 35	Treated Stockpile 80002-I	35	907	80002-TU-2	Phase 6 Excavation and Stockpiles Confirmation Sampling Report	01/06/16	02/23/16	EX 37 (<10ft)	March 3, 2016
Phase 6	Excavations 35, 37 and 38	Treated Stockpile 80013-A	35	675	80013-TU-1	Phase 6 Excavation and Stockpiles Confirmation Sampling Report	01/06/16	02/23/16	37 (5-10ft) Weste	March 8, 2016
		Total:	**945**	**19,510**						

Notes:
* Unrestricted-for use as backfill between 0.5 ft-bgs and total excavation depth in western portion of site, and between 10 ft-bgs and total excavation depth in eastern portion of site.
**Restricted-for use as backfill between 0.5 and 5 ft-bgs in western portion of site. Not used for backfill in eastern portion of site.

Table 4
ANALYTICAL RESULTS FOR
DETECTED VOLATILE ORGANIC COMPOUNDS IN SOIL GAS
Defense Fuel Support Point Norwalk
15306 Norwalk Blvd, Norwalk, CA 90650

Sample ID	Depth (ft bgs)	Date Sampled	Acetone ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	Toluene ($\mu g/m^3$)	Ethylbenzene ($\mu g/m^3$)	m,p-Xylene ($\mu g/m^3$)	o-Xylene ($\mu g/m^3$)	2-Butanone (MEK) ($\mu g/m^3$)	4-Ethyltoluene ($\mu g/m^3$)	1,2,4-Trimethylbenzene ($\mu g/m^3$)
CHHSLs - Commercial Soil Gas [1]			*NA*	*1.2E+02*	*3.8E+05*	*1.4E+03*	*8.9E+05*	*8.9E+05*	*NA*	*NA*	*NA*
CRWQCB ESLs - Commercial Soil Gas [2]			*1.4E+08*	*4.2E+02*	*1.3E+06*	*4.9E+03*	*4.4E+05*	*4.4E+05*	*2.2E+07*	*NA*	*NA*
USEPA/DTSC Screening Levels - Commercial Soil Gas [3]			*1.4E+08*	*4.2E+02*	*1.3E+06*	*4.9E+03*	*4.4E+05*	*4.4E+05*	*2.2E+07*	*NA*	*3.1E+04*
Soil Probe Installed in 2016											
SV-14-5	5	03/09/16	**61**	<16	<38	<22	<44	<22	<60	<50	<50
SV-14-10	10	03/09/16	**96**	<16	**110**	**29**	**66**	**31**	<60	<50	<50
SV-17-5	5	03/09/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-17-10	10	03/09/16	**59**	**49**	**200**	**27**	**75**	**28**	<60	<50	<50
SV-18-5	5	03/08/16	**83**	**30**	**120**	<22	**66**	<22	<60	<50	<50
SV-18-10	10	03/08/16	**69**	**34**	**130**	**27**	**60**	**31**	<60	<50	<50
SV-19-5	5	03/09/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-19-10	10	03/09/16	**51**	**38**	**200**	**33**	**93**	**35**	<60	<50	<50
SV-19-10 REP	10	03/09/16	**49**	**34**	**190**	**27**	**86**	<22	<60	<50	<50
SV-20-5	5	03/09/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-20-10	10	03/09/16	**77**	**65**	**390**	**56**	**170**	**48**	<60	<50	<50
SV-21-5	5	03/09/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-21-10	10	03/09/16	**63**	**72**	**380**	**43**	**190**	**51**	<60	<50	<50
SV-22-5	5	03/09/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-22-10	10	03/09/16	**100**	**53**	**230**	**36**	**120**	**34**	<60	<50	<50
SV-23-5	5	03/08/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-23-10	10	03/08/16	**72**	**39**	**150**	<22	**48**	<22	<60	<50	<50
SV-24-5	5	03/10/16	**86**	**28**	**110**	<22	**57**	<22	<60	<50	<50
SV-24-5 REP	5	03/10/16	**170**	**29**	**110**	<22	**48**	<22	<60	<50	<50
SV-24-10	10	03/10/16	**320**	**18**	**96**	<22	**51**	<22	<60	<50	<50
SV-25-5	5	03/09/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-25-10	10	03/09/16	<48	**42**	**260**	**69**	**270**	**74**	<60	**59**	**52**
SV-26-5	5	03/09/16	**67**	<16	<38	<22	<44	<22	<60	<50	<50
SV-26-10	10	03/09/16	<48	<16	<38	<22	**46**	<22	<60	<50	<50
SV-27-5	5	03/08/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-27-10	10	03/08/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-28-5	5	03/10/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-28-10	10	03/10/16	**150**	<16	<38	<22	<44	<22	<60	<50	<50
SV-29-5	5	03/08/16	**58**	<16	**40**	<22	<44	<22	<60	<50	<50
SV-29-10	10	03/08/16	<48	<16	**41**	<22	<44	<22	<60	<50	<50
SV-30-5	5	03/08/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-30-10	10	03/08/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-31-5	5	03/10/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-31-10	10	03/10/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-32-5	5	03/08/16	**55**	<16	**66**	<22	<44	<22	<60	<50	<50
SV-32-5 REP	5	03/08/16	**63**	<16	**70**	<22	<44	<22	<60	<50	<50
SV-32-10	10	03/08/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-35-5	5	03/11/16	**54**	<16	<38	<22	<44	<22	<60	<50	<50
SV-35-10	10	03/11/16	**52**	<16	<38	<22	<44	<22	<60	<50	<50
SV-38-5	5	03/10/16	**190**	<16	<38	<22	<44	<22	<60	<50	<50
SV-38-10	10	03/10/16	**91**	<16	**40**	<22	<44	<22	<60	<50	<50
SV-41-5	5	03/10/16	**100**	<16	<38	<22	<44	<22	<60	<50	<50
SV-41-10	10	03/10/16	**100**	<16	<38	<22	<44	<22	<60	<50	<50
SV-94-5	5	03/10/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-94-10	10	03/10/16	<48	**31**	**140**	**26**	**89**	**28**	<60	<50	<50
SV-96-5	5	03/10/16	<48	<16	<38	<22	<44	<22	<60	<50	<50
SV-96-10	10	03/10/16	<48	**33**	**140**	**25**	**84**	**29**	**77**	<50	<50
Soil Probe Installed in 2015											
SV-1-5	5	03/11/16	**140**	<16	<38	<22	<44	<22	<60	<50	<50
SV-1-10	10	03/11/16	<48	**98**	<38	<22	<44	<22	<60	<50	<50
SV-3-5	5	03/11/16	**59**	<16	<38	<22	<44	<22	<60	<50	<50
SV-3-10	10	03/11/16	**57**	<16	<38	<22	<44	<22	<60	<50	<50
SV-4-5	5	03/11/16	**75**	<16	<38	<22	<44	<22	<60	<50	<50
SV-4-10	10	03/11/16	**130**	<16	<38	<22	<44	<22	<60	<50	<50
SV-5-5	5	03/11/16	**54**	<16	<38	<22	<44	<22	<60	<50	<50
SV-5-5 REP	5	03/11/16	**75**	<16	<38	<22	<44	<22	<60	<50	<50
SV-5-10	10	03/11/16	**530**	<16	<38	<22	<44	<22	**70**	<50	<50

NOTES:
Analytes detected during this investigation in soil are included in this table.
Detected concentrations are shown in **bold**.
All analytical results presented in micrograms per liter ($\mu g/m^3$).
VOCs = volatile organic compounds.
-- = not applicable.
bgs = below ground surface.
$\mu g/m^3$ = micrograms per cubic meter.
<48 = not detected at or above the indicated laboratory reporting limit.
CHHSLs = Office of Environmental Health Hazard Assessment California Human Health Screening Levels (OEHHA, 2010).
CRWQCB ESLs = California Regional Water Quality Control Board Environmental Screening Levels (CRWQCB, 2016)
USEPA/DTSC Screening Levels = U.S. Environmental Protection Agency Regional Screening Levels (RSLs; USEPA, November 2015) and Department of Toxic Substances Control alternative screening levels (DTSC, January 2016)
[1] OEHHA CHHSLs for soil gas under a commercial/industrial scenario for buildings constructed without engineered fill below sub-slab gravel.
[2] CRWQCB soil gas screening level is calculated by dividing the air screening level for industrial air by the California Department of Toxic Substances Control (DTSC, 2011) default attenuation factor of 0.001 (existing building).
[3] USEPA/DTSC soil gas screening level is calculated by dividing the air screening level for industrial air by the California Department of Toxic Substances Control (DTSC, 2011) default attenuation factor of 0.001 (existing building).