DFSP NORWALK
RESTORATION ADVISORY BOARD

Defense Logistics Agency - Energy Update

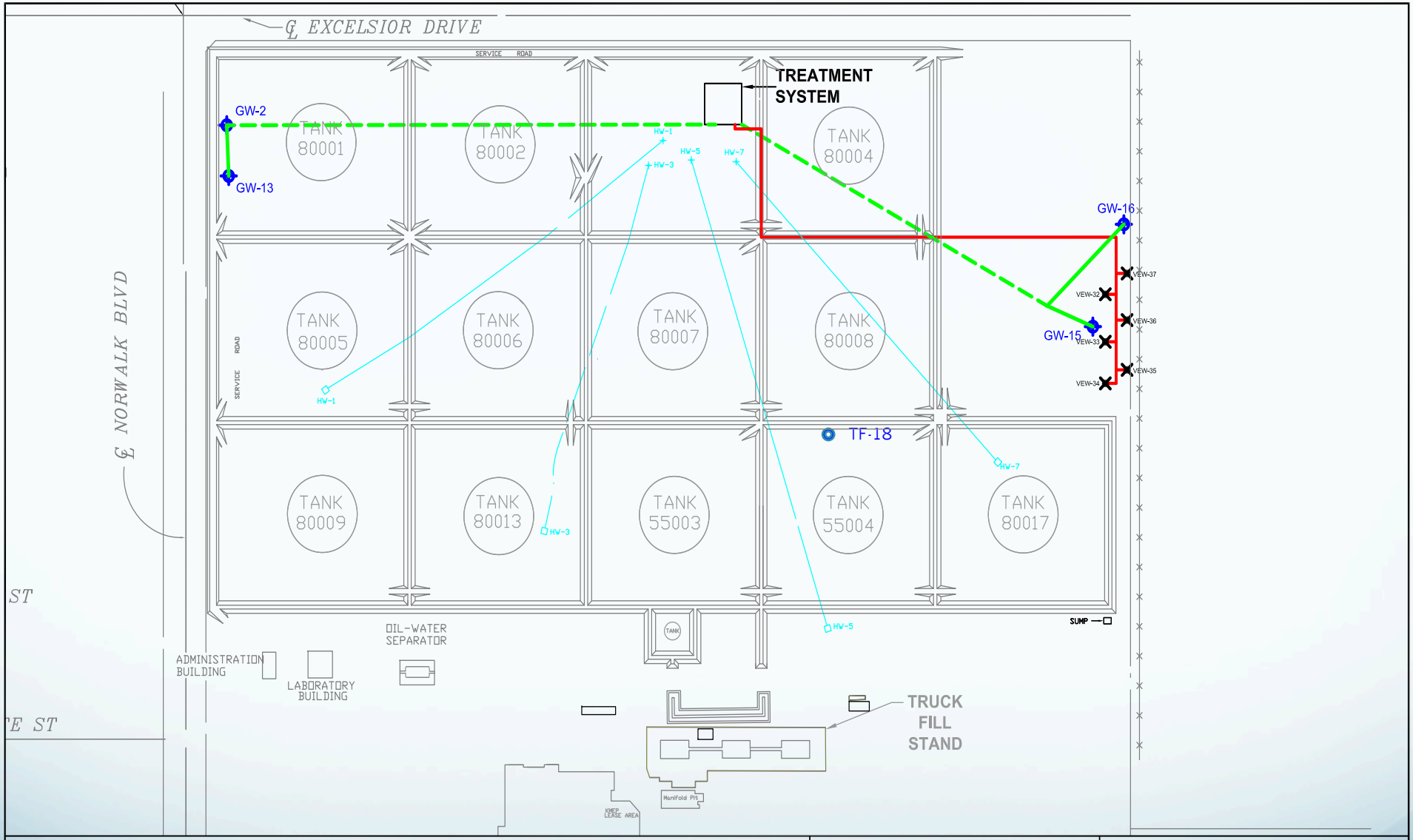
February 25, 2016

SGI environmental THE SOURCE GROUP, INC.

Status of Remediation System

Status of Soil and Groundwater Remediation System

- Groundwater Remediation: Treated 73.9 Million Gallons since April 1996 (2,021,413 gallons in 2015)
- SVE System: Recovered 2.9 million pounds since April 1996 (approximately 20,000 pounds / 3,000 gallons in 2015)
- SVE System is Currently Operating – with Majority of Vapors Drawn From Treatment Cells
  - With Closure of Treatment Cells, Horizontal SVE Wells will be Brought back on line
- LNAPL Recovery: 258.6 gallons in 2015
  - 60% of LNAPL from TF-18



LEGEND

- HW-1 HORIZONTAL VAPOR EXTRACTION WELL
- VEW-32 VERTICAL VAPOR EXTRACTION WELL
- GW-15 GROUNDWATER EXTRACTION WELL

NOTES

Base map and piping from Parsons' *First Quarter 2014 Remediation Progress Report*, dated May 15, 2014

DEFENSE FUEL SUPPORT POINT NORWALK
15306 NORWALK BOULEVARD
NORWALK, CALIFORNIA

PROJECT	DATE	DRAWN BY:	APPROVED BY:
04-NDLA-002	06/15/2015	SM	PP

0 160 320
HORIZONTAL SCALE IN FEET

SITE MAP SHOWING REMEDIATION WELLS AND PIPING LOCATIONS

THE SOURCE GROUP, INC.
1962 FREEMAN AVENUE
SIGNAL HILL, CA 90755

N

FIGURE 2

Soil Remediation – Site Wide

Soil Remediation:

- **Soil Remediation Accomplished by Excavation and On-site Bio-remediation**
- **All Soil Between 0 to 10 feet with *Contamination Above Cleanup Goals* to be Excavated and Treated:**
  - **100% of the Targeted Shallow Soil Excavated from the Future Park Area**
  - **99.5% of the Targeted Shallow Soil Excavated Site-wide**
- **Deeper Soil (> 10 feet) with Highest Concentrations of Contamination (affecting groundwater) were Removed and Treated:**
  - **Tank Basin 80008 and 55004**
  - **Former Truck Rack Area**

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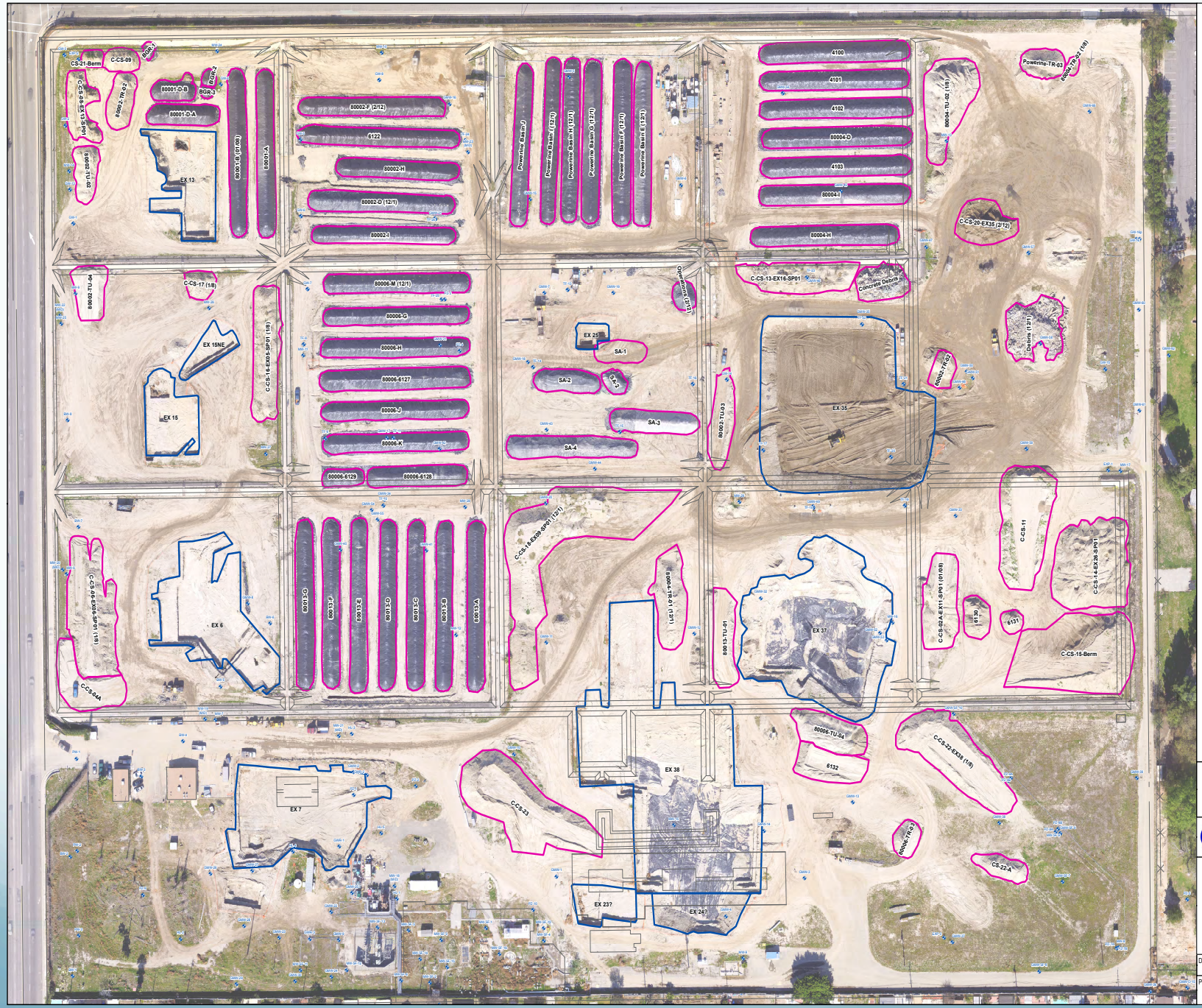


Legend

- DFSP_Nrwlk_GWM_Wells
- Excavations
- Stock_pile

earthforensics, inc.

STOCKPILE LOCATION MAP (02/12/2016)

DFSP-Norwalk
Norwalk, Ca

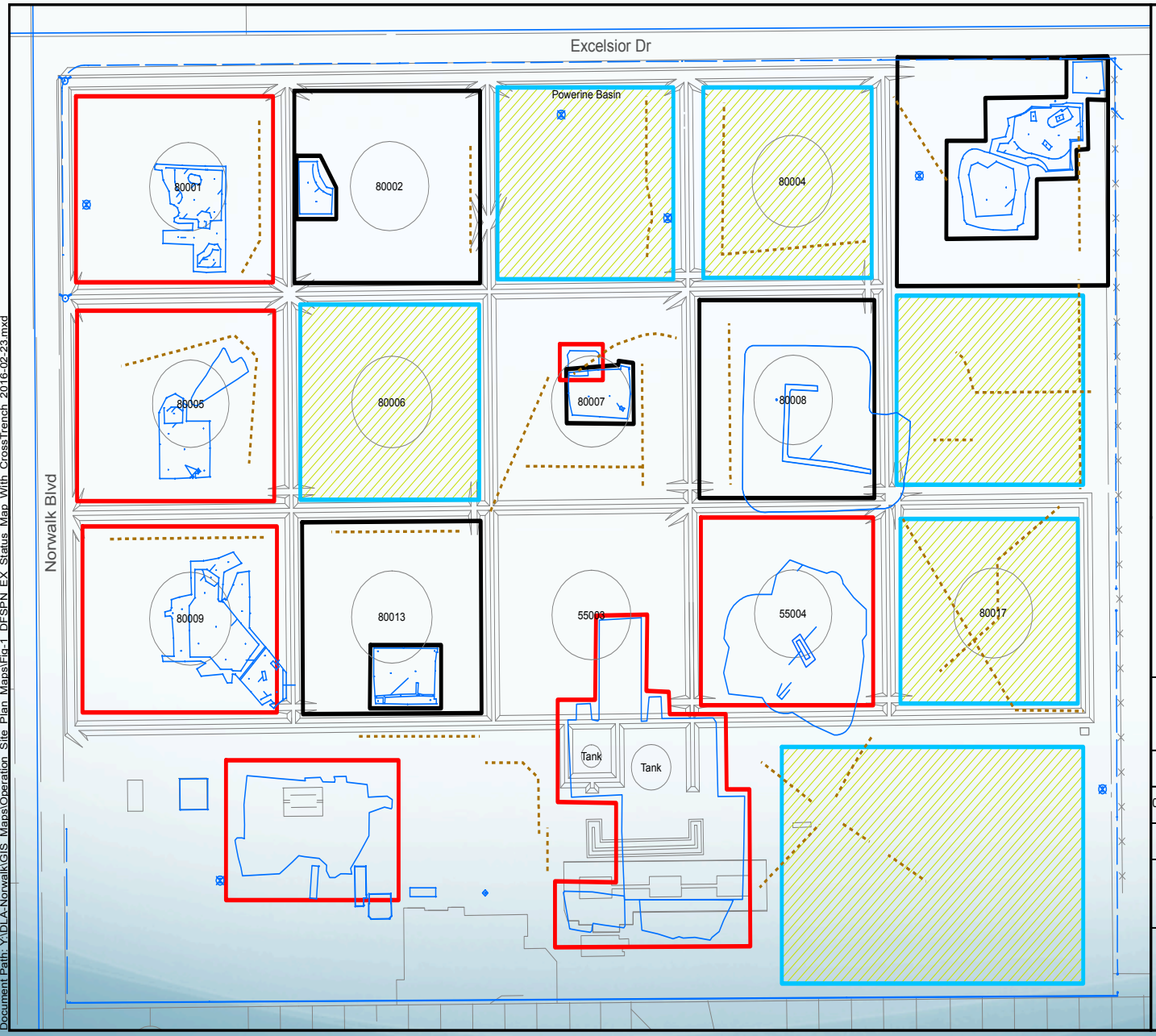
Date:	Project #:	Plate
2/23/2016	2015.150	1

Project Name: DFSP-Norwalk

Soil Remediation – Status

Soil Remediation Project Progress:

- Approximately 120,000 yds^3 of Soil Excavated
- Approximately 65,000 yds^3 (90,000 tons) of Contaminated Soil Excavated and Placed into Treatment:
  - 31,500 yds^3 Treated and OK'd For Backfill
  - 33,500 yds^3 Currently Being Treated
- "Cross Trenches" Have Been Performed – only Minor Amount of Additional Contamination Encountered and Removed
- Focusing on Completing Work on Future Park Land:
  - Excavation 35 (Tank Basin 80008) has been backfilled
  - Excavation 37 (Tank Basin 55004) being backfilled



Document Path: X:\DLA-Norwalk\GIS_Maps\Operation_Site_Plan_Maps\Fig-1_DFSPN_EX_Status_Map_With_CrossTrench_2016-02-23.mxd

Legend

- Former Above Ground Storage Tanks
- Cross Trenches
- Excavation Areas
- Clean Area, Initially No 0-10 Feet TPH
- Remediation Complete and Backfilled
- Contaminated Soil Removed from 0 to 10 Feet; Closure Pending

N

DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California

Project Number:	Date:	Drawn By:	Approved By:
04-NDLA-007	02/23/2016	P. W	N.I

0 70 140 280 Feet

EXCAVATION STATUS MAP WITH CROSS TRENCH (FEBRUARY 2016)

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

Figure 1

Soil Remediation: Next 30 Days

- Complete Backfill of Park Area Excavations
- Perform Soil Gas Survey on Park Area
- Remove Internal Berms from Park Area
- Remove Stockpiled Clean Soil from Park Area
- Transport and Recycle Concrete from Park Area
- Prepare and Submit Case Review Form to RWQCB for Formal Closure of Park Area Soils

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Excelsior Dr
Norwalk Blvd
Powerine Basin
Tank
Tank
80001
80002
80004
80005
80006
80007
80008
80009
80013
55003
55004
80017
SV-1
SV-2
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VMP-36
VMP-37
VMP-38
Legend
SV-13
Proposed Soil Vapor Probe Locations
SV-1
Soil Vapor Probe Locations (SGI 2015)
VMP-20
Soil Vapor Probe Locations (Parsons 2010)
Approximate Park Boundary
N
DFSP Norwalk
15306 Norwalk Boulevard
Norwalk, California
Project Number:
04-NDLA-005
Date:
02/19/2016
Drawn By:
K.R.
Approved By:
P. P
0
70
140
280
Feet
Proposed Soil Gas Locations
SGI environmental
THE SOURCE GROUP, INC.
1962 Freeman Avenue
Signal Hill, CA 90755
(562) 597-1055
Figure
2

Soil Remediation: Next 30 Days

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Soil Remediation – Future Steps

- Continue Treatment of Soil Currently in Cells
- Backfill "Oily Sands" Area to Allow Final Removal of Soil
- Treat Final "Oily Sands" and Place into Treatment Cells
- Backfill Excavations with Treated Soil as Available – Truck Rack Area
- Perform Soil Gas Survey Upon backfill of Final Excavation
- Prepare and Submit Case Review Form to RWQCB for Formal Closure of Remaining Soils

Typical Excavation

View of Soil Movement and Stockpiles

The Earth Cleaning Machine (ECM)

Soil Treatment Cells

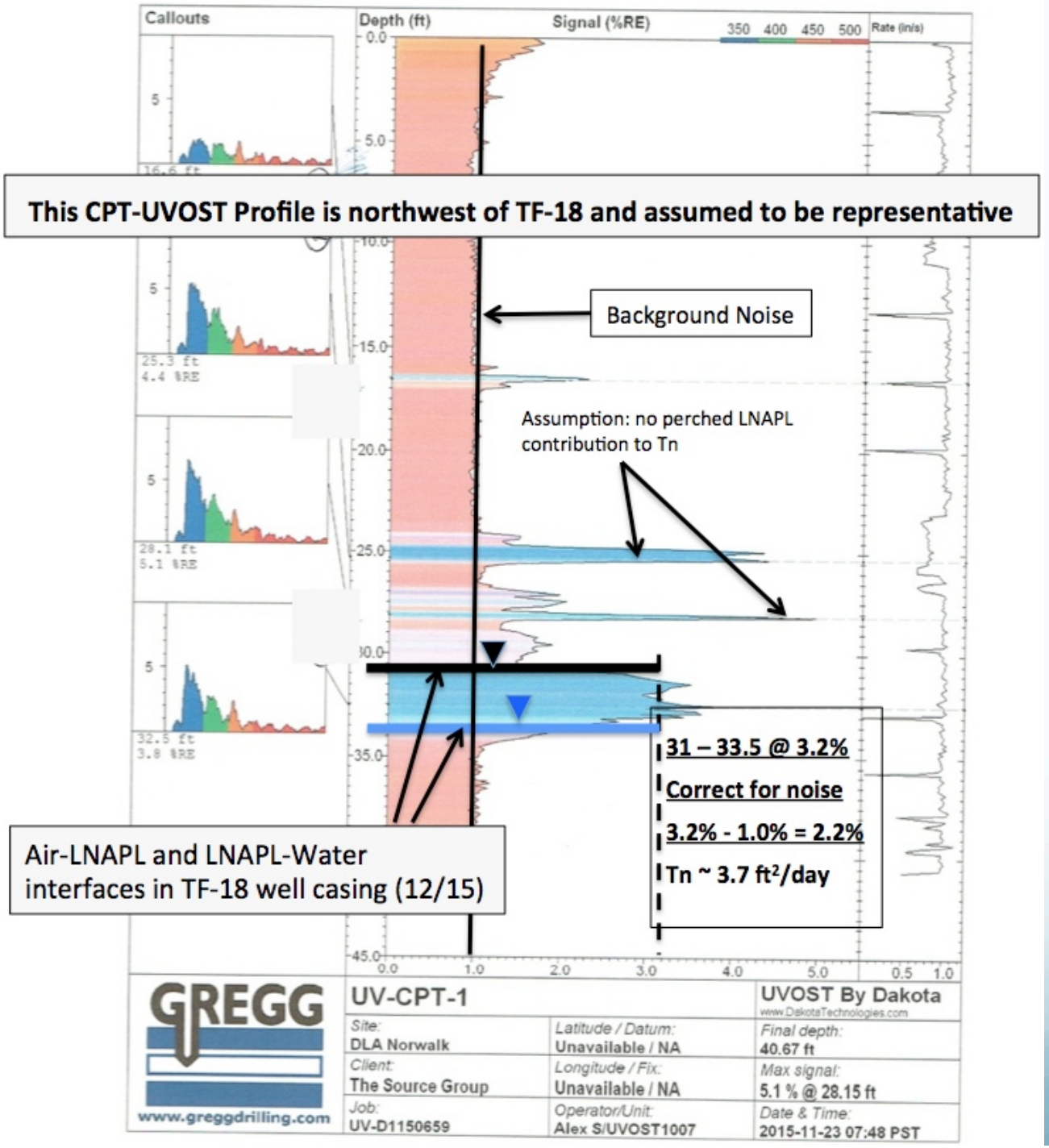
Backfilling – Northeast Corner

Groundwater – Planning for Next Phase

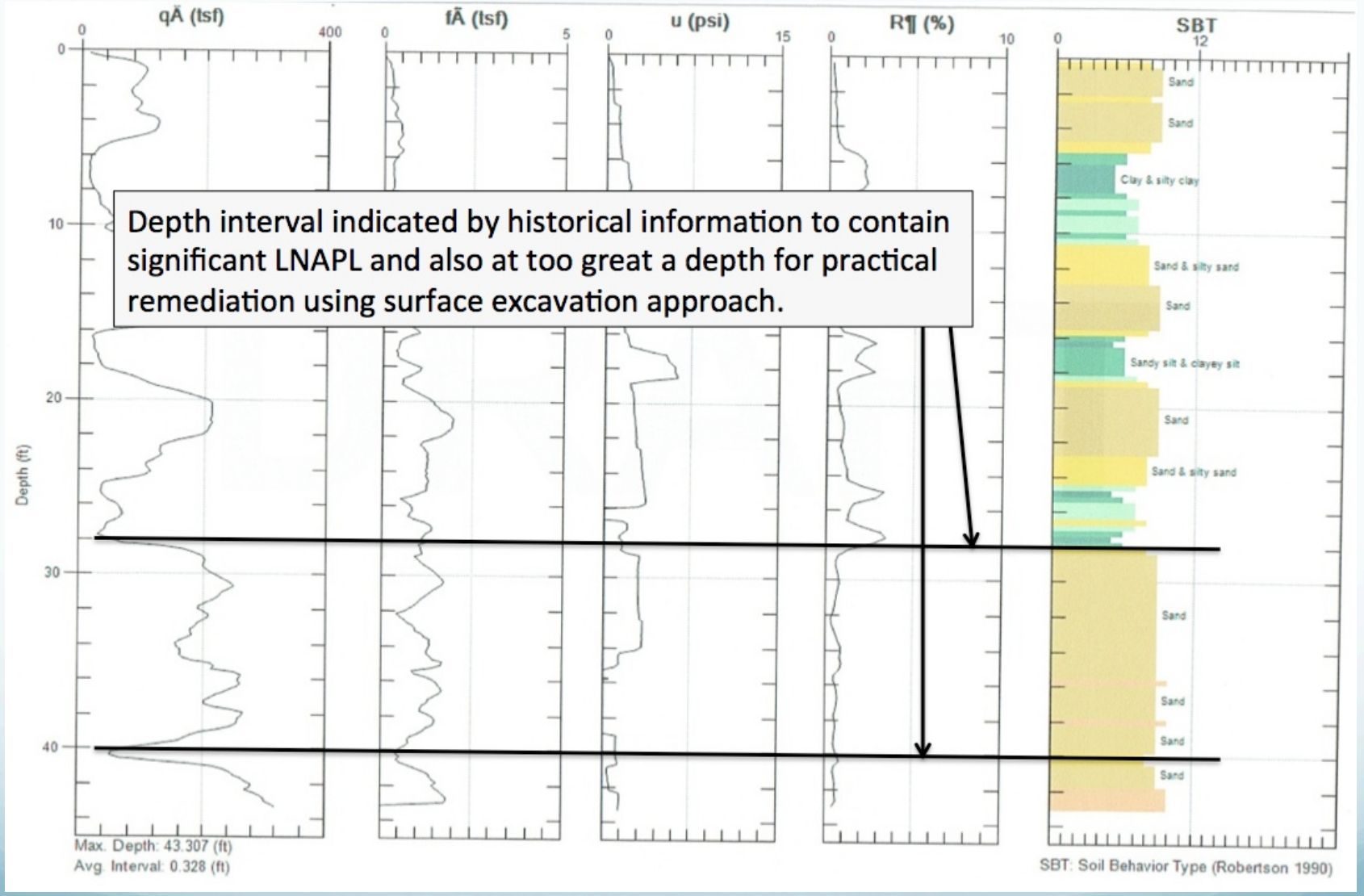
- Install Replacement Groundwater Recovery Wells and Re-configure Extraction System
- Install and Commission Air Sparge Wells
- Northeast Area – GMW-62: Collect Final Data to Demonstrate Residual Hydrocarbon Impact at GMW-62 and Holifield Park
- Install Free Product Wells in Areas Based on UltraViolet Optical Screening Tool (UVOST) Data:
  - Focus will be Those Areas with Recoverable Free Product…
  - …with Soils that Are Amenable to Product Recovery.

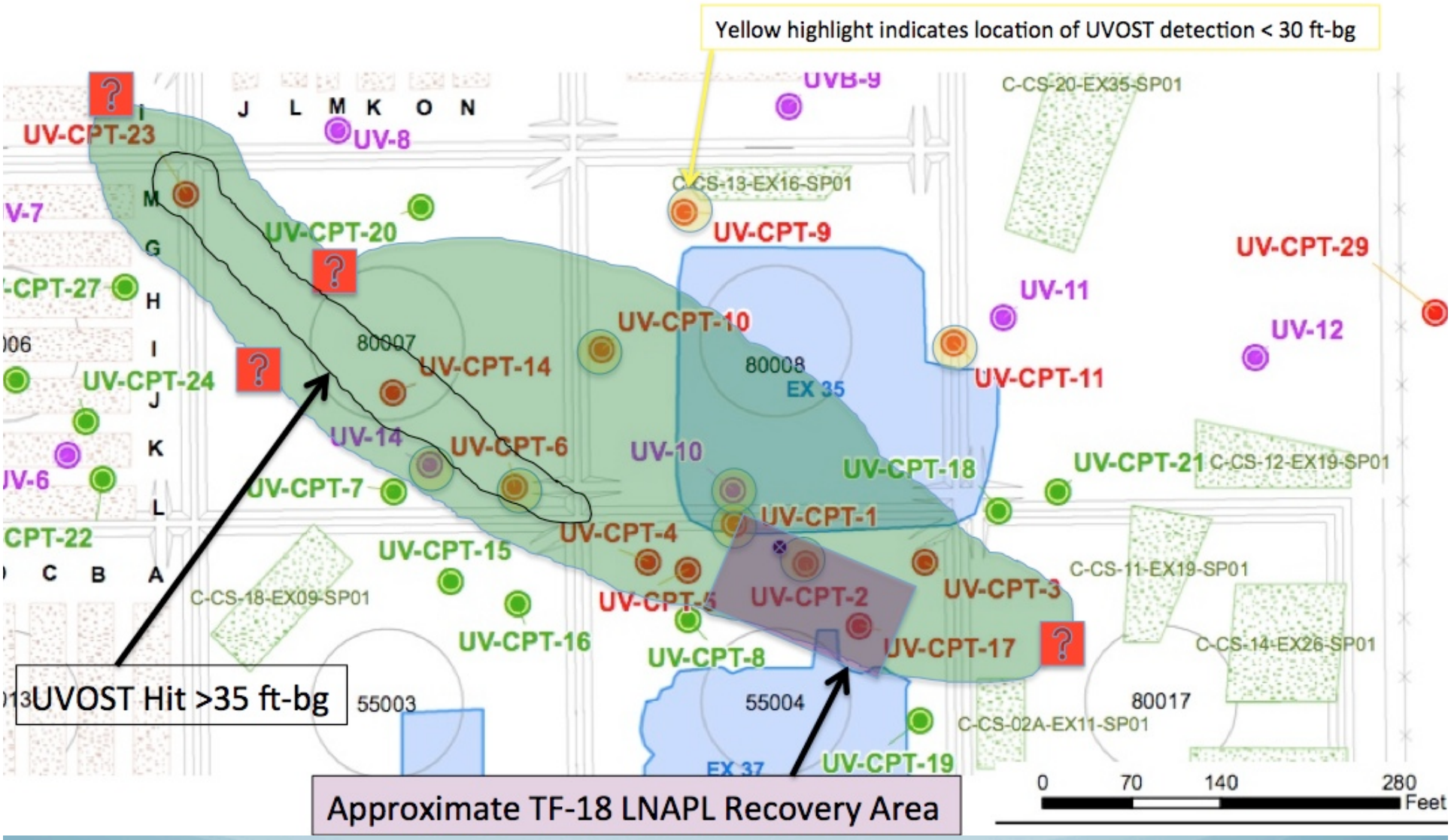
CPT/UVOST Location Map

UVOST Profile – TF-18



CPT – Lithology Log





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DLA Update

- Questions and Discussion

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Second Semiannual 2015 Groundwater Monitoring Event

Presented by Daniel Swensson

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Overview

- Fieldwork was conducted October 19 through November 6, 2015.
- Well gauging and groundwater sample collection was conducted by The Source Group, Blaine Tech, and SFPP.
- 139 wells were gauged (treatment systems were offline).
- Groundwater samples were collected from 95 wells using low-flow methodology (including duplicate and split samples, 109 groundwater samples were analyzed).

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Groundwater Elevations and Gradient – Uppermost Aquifer

- Depth to Groundwater ranged from 26.63 to 38.72 feet below top of well casings.
- Elevations ranged from 38.68 to 47.81 feet above mean sea level.
- Elevations dropped an average of 77 foot since the April 2015 monitoring event.
- Gradients generally converged toward the site from the west, south, and east.
- The dominant gradient direction was northward (northwest to northeast) ranging from 0.001 to 0.002 ft/ft.

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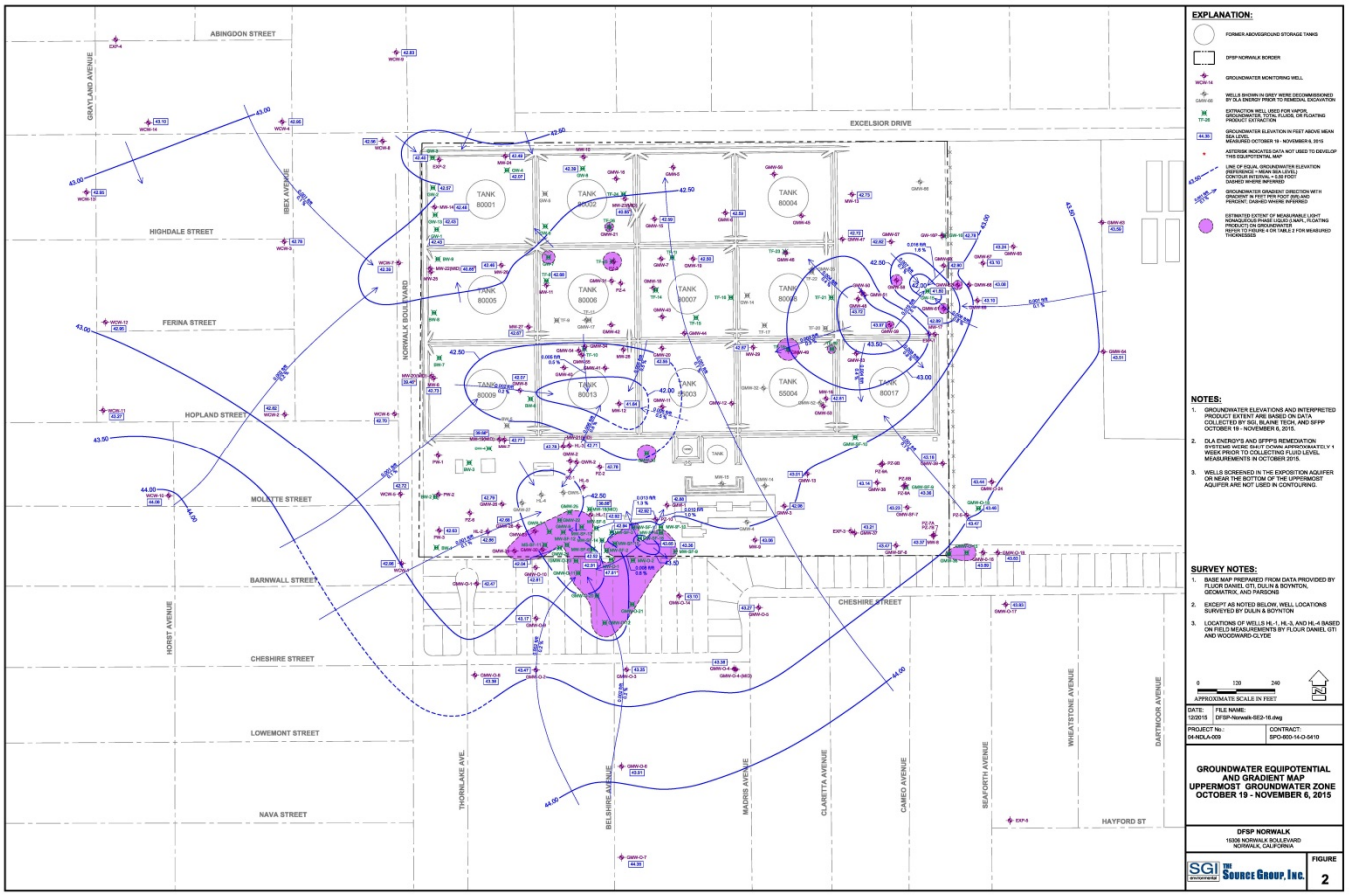
Figure 2: Groundwater Equipotential and Gradient Map – Uppermost Groundwater Zone



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Groundwater Elevations and Gradient – Exposition Aquifer

- Depth to Groundwater ranged from 53.27 to 60.23 feet below top of well casings.
- Elevations ranged from 19.15 to 19.81 feet above mean sea level.
- Elevations dropped an average of 1.57 feet since the April 2015 monitoring event.
- Groundwater gradient was toward the southeast. Beneath the site, the surface of the Exposition Aquifer was very flat. Northwest of the site, the gradient was approximately 0.001 ft/ft.

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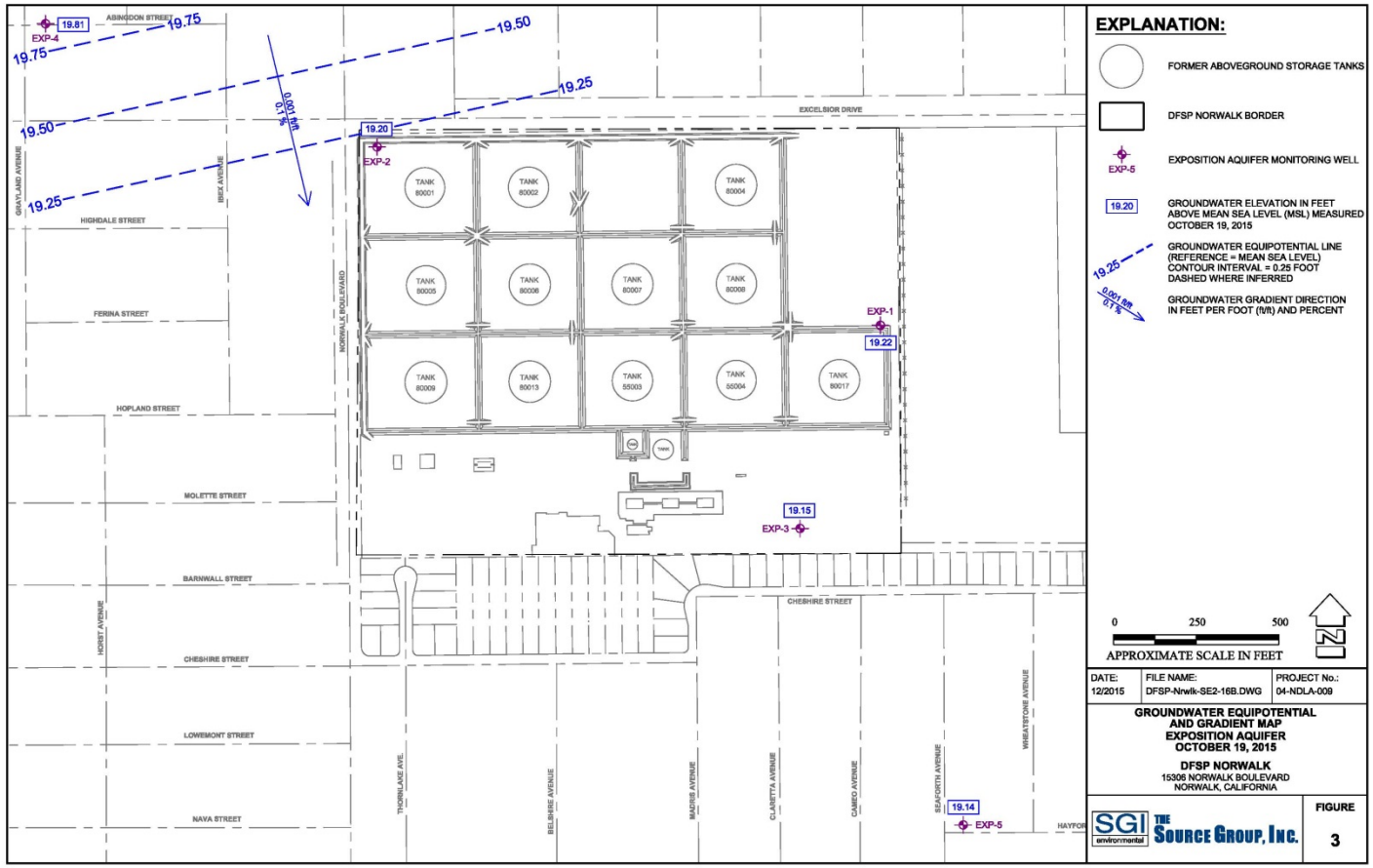
Figure 3: Groundwater Equipotential and Gradient Map – Exposition Aquifer



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Floating Product

- Floating product was measured in 33 of the 139 wells gauged during this monitoring event.
- Since April 2015, measured product thicknesses increased in 14 wells, decreased in 19 wells, and remained the same in GMW-62.
- Product was observed in four areas of the site:
  - North-Central Area: Floating product was measured in five wells ranging from 0.01 to 2.65 feet,
  - Eastern Area: Floating product was present in four wells ranging from a hydrocarbon sheen to 0.07 foot,
  - South-Central Area: Floating product was measured in 22 wells ranging from 0.02 to 6.83 feet, and
  - Southeastern Area: Floating product was measured in two wells (0.39 foot in GMW-36 and 3.02 feet in GMW-O-15).

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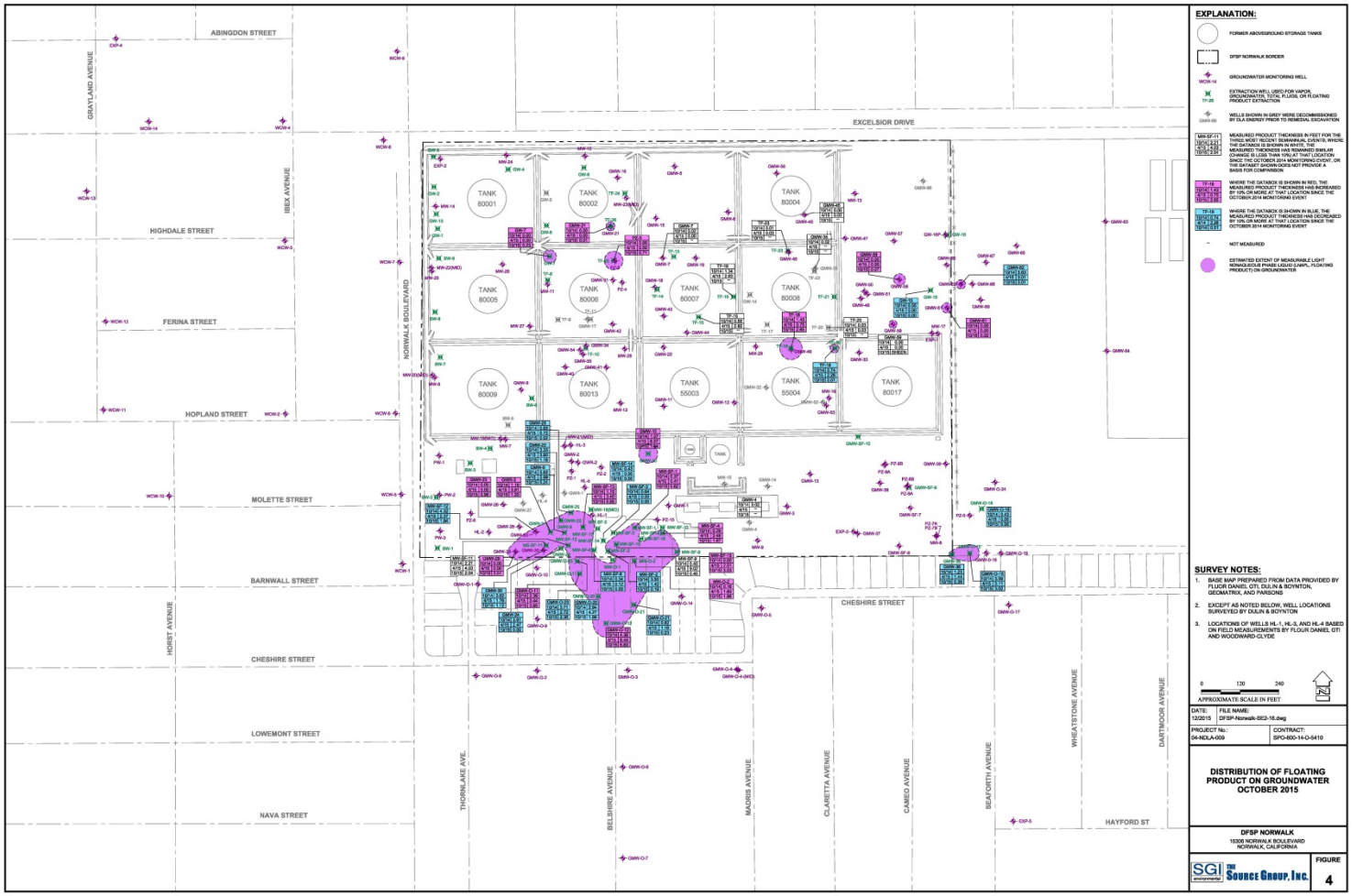
Figure 4: Floating Product Plumes – October 2015



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Groundwater Sampling – Uppermost Groundwater Zone

- Duplicate samples were collected from 16 wells.
- TPH as Gasoline was reported in 29 of the 95 sampled wells (maximum: 280,000 µg/L in MW-SF-3 [0.64 foot product]).
- TPH as Diesel was reported in 40 of the 95 sampled wells (maximum: 490,000 µg/L in GMW-O-15 [3.02 feet product]).
- Benzene was reported in 23 of the 95 sampled wells (maximum: 12,000 µg/L in GMW-O-14 and GMW-O-15).
- 1,2-DCA was reported in 13 of the 95 sampled wells (maximum: 8.7 µg/L in MW-22[MID]).
- MTBE was reported in 25 of the 95 sampled wells (maximum: 8,800 µg/L in GMW-O-15 [3.02 feet product]).
- TBA was reported in 13 of the 95 sampled wells (maximum: 46,000 µg/L in PZ-5).

Groundwater Sampling – Exposition Aquifer

- Split samples were collected from EXP-1, EXP-2, and EXP-3 by both The Source Group and Blaine Tech.
- Samples were collected from EXP-4 and EXP-5 by Blaine Tech.
- All results were non-detect with the following exceptions:
  - 0.73 µg/L Benzene in SGI's sample from EXP-1 (<0.50 µg/L in Blaine Tech's sample), and
  - 2.2 and 1.5 µg/L MTBE in EXP-1.

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Figure 6: Total Petroleum Hydrocarbons in Groundwater – October 2015

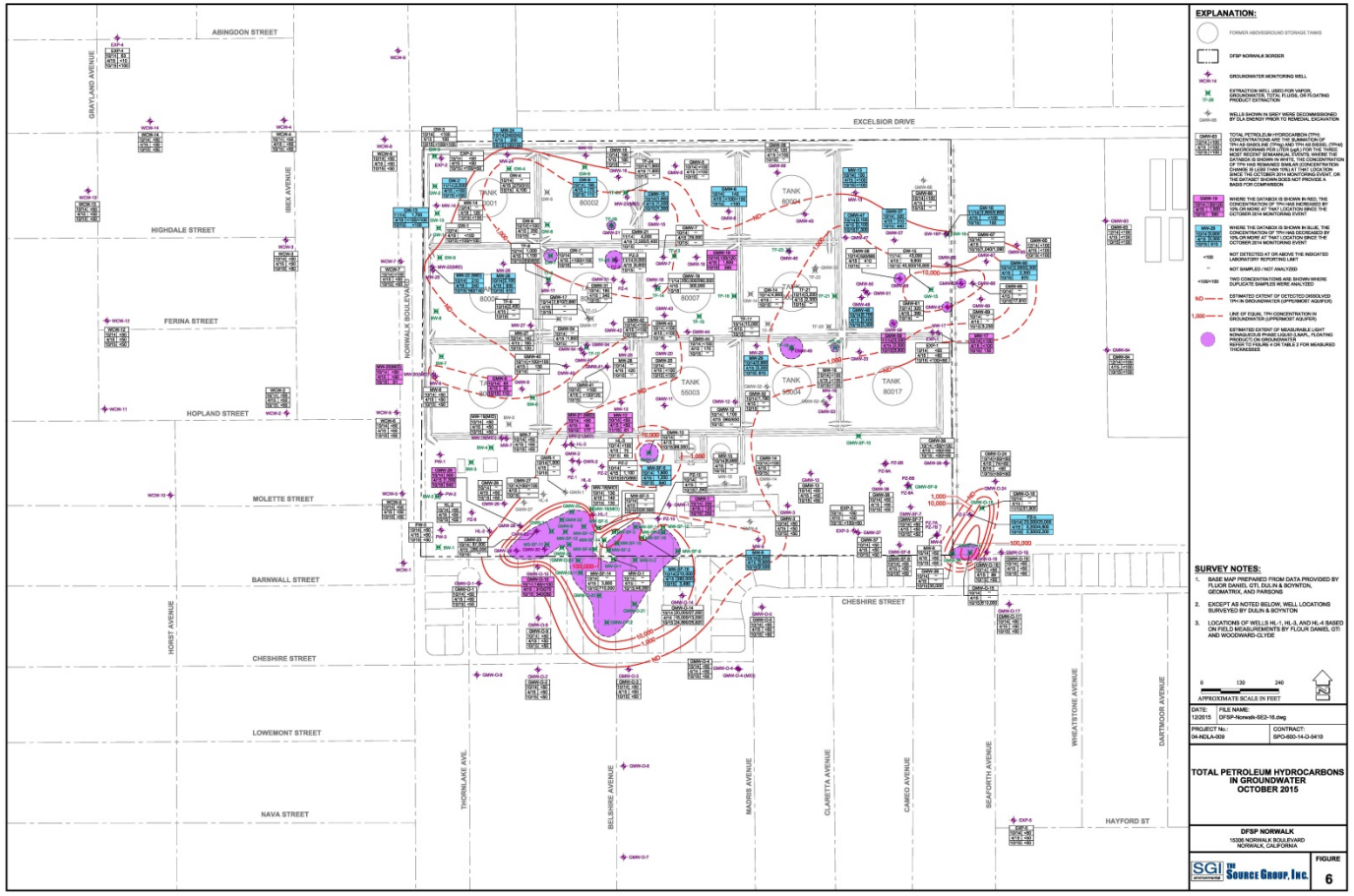

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Figure 7: Benzene in Groundwater – October 2015

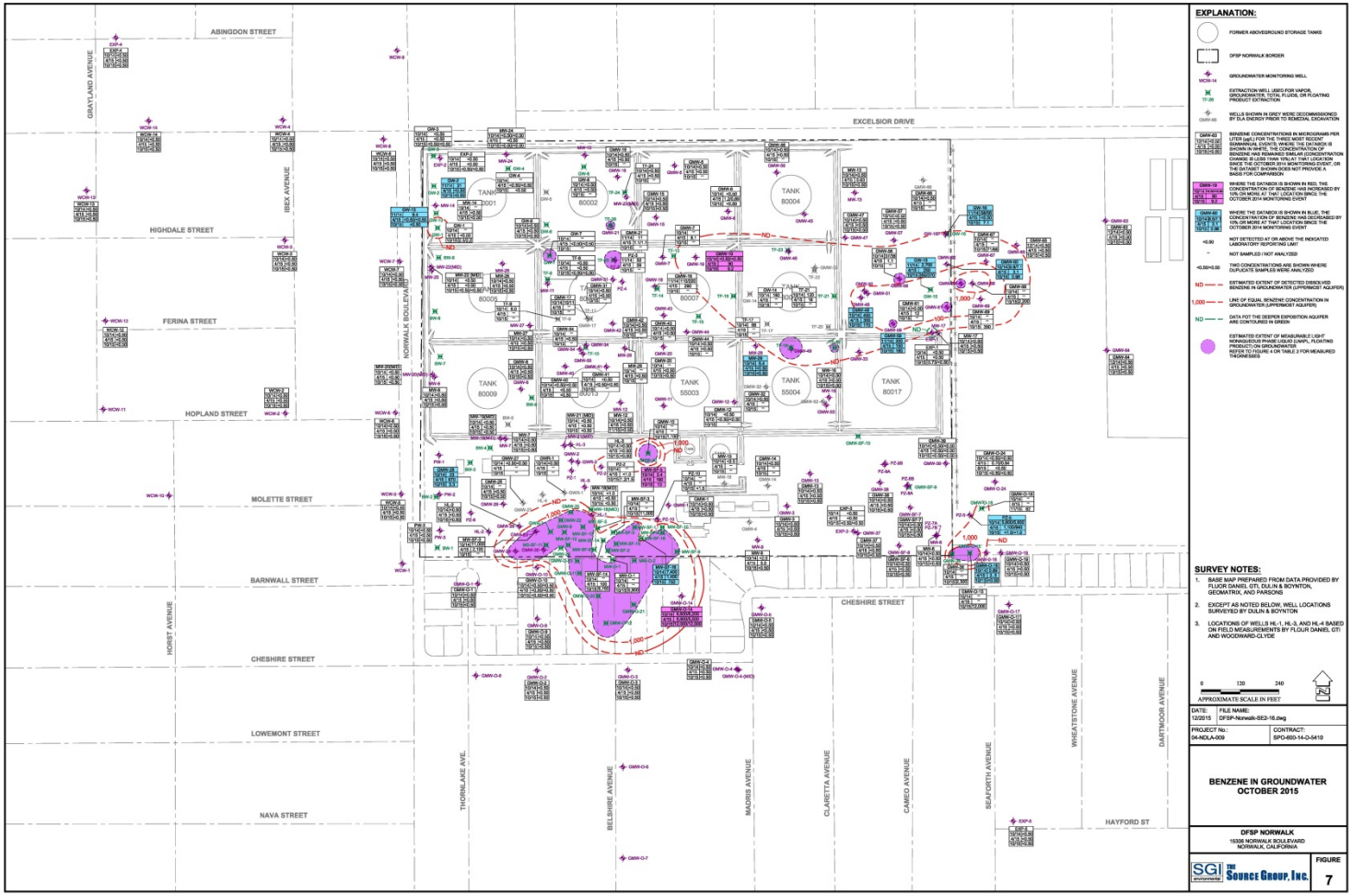

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Figure 8: 1,2-Dichloroethane in Groundwater – October 2015

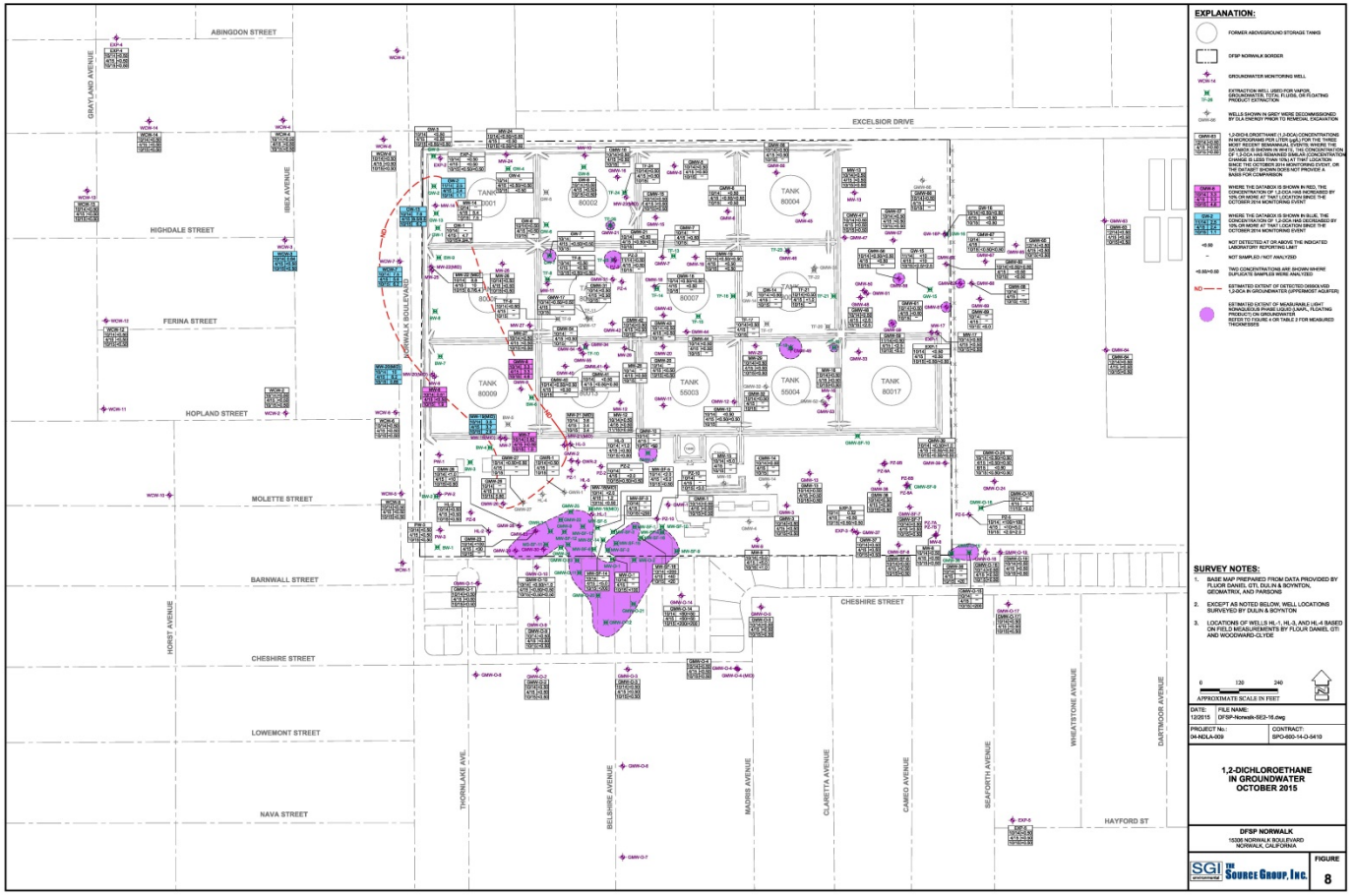

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Figure 9 - Methyl tertiary-Butyl Ether in Groundwater – October 2015

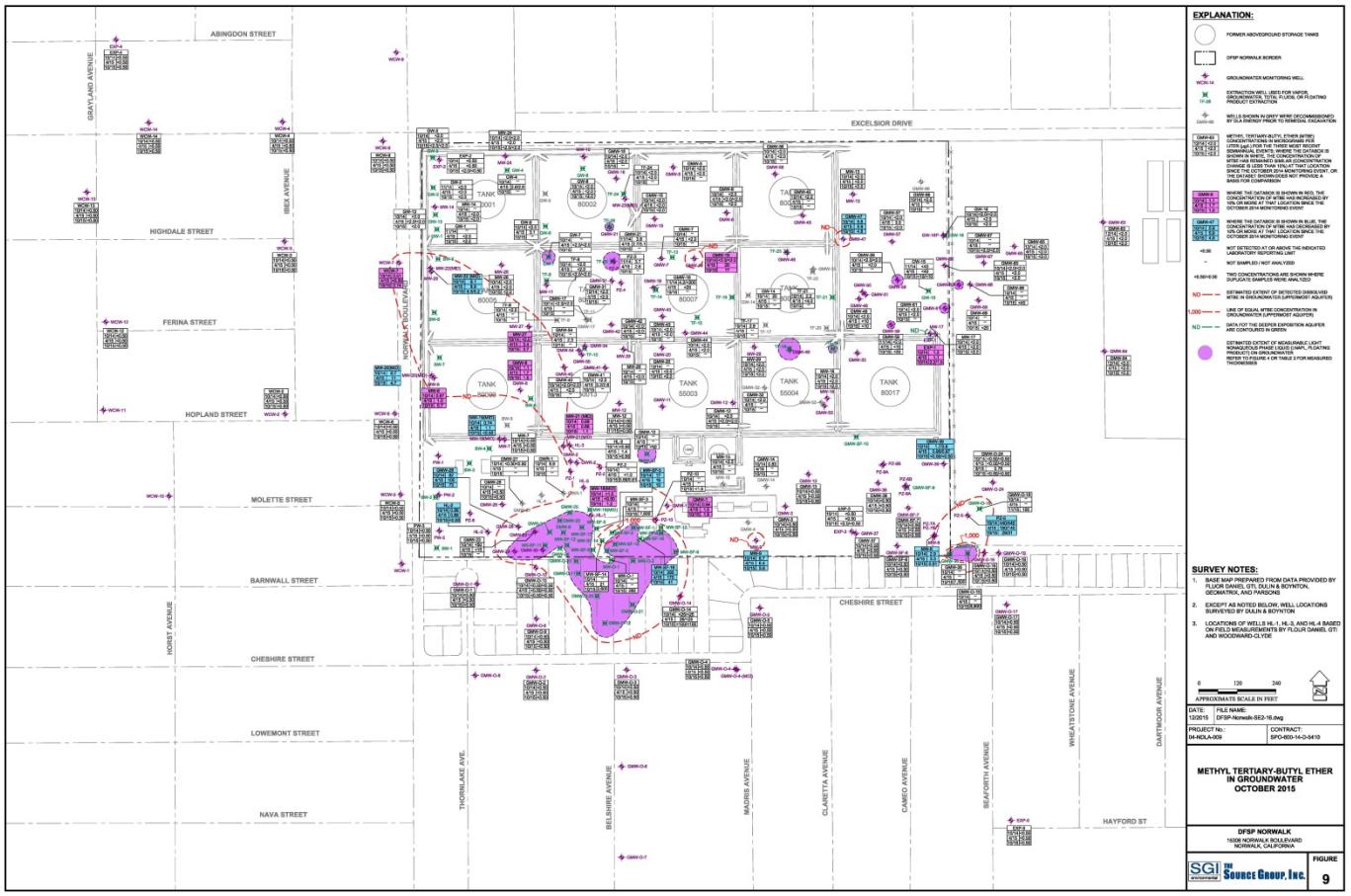

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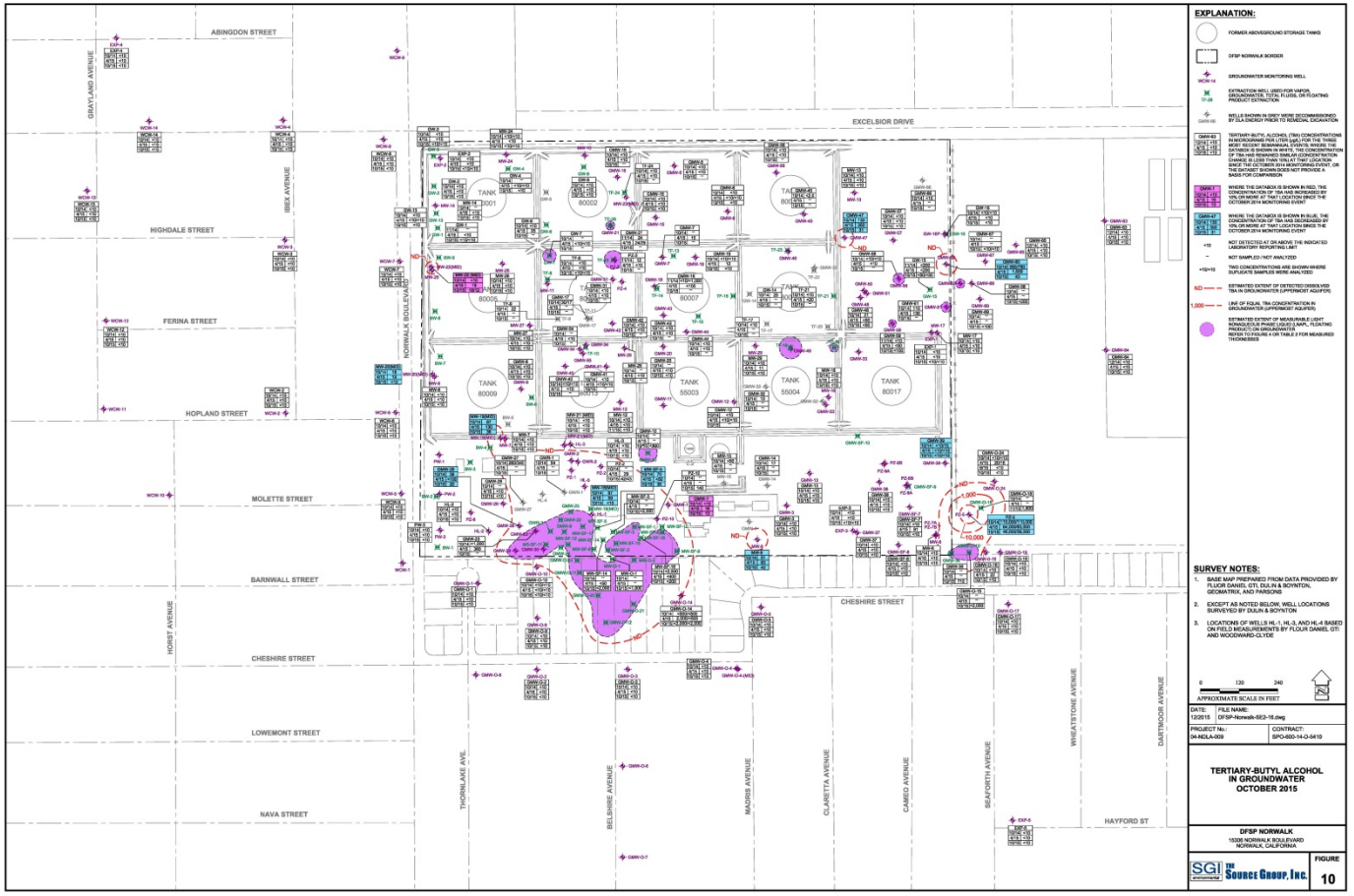
Figure 10: tertiary-Butyl Alcohol in Groundwater – October 2015



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Questions?

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