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DEPARTMENT OF ECOLOGY
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March 19, 2019

John Eliason, Development Director
King County Housing Authority
600 Andover Park West
Tukwila, WA 98188

Re: Opinion pursuant to WAC 173-340-515(5) on Remedial Action for the following Hazardous Waste Site:

- **Site Name:** Park Lake Homes Maintenance Shop
- **Site Address:** 9800 8th Avenue SW, Seattle, WA 98106
- **Cleanup Site ID:** 8417
- **Facility/Site No.:** 24359391
- **VCP Project No.:** NW3033

Dear John Eliason:

The Washington State Department of Ecology (Ecology) received your request for an opinion on supplemental ground water characterization work completed at the Park Lake Homes Maintenance Center facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site as characterized to date is defined by the nature and extent of contamination associated with the following releases:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), and TPH as oil (TPHo) releases to Soil.
- TPHd, TPHo, heptachlor epoxide, and highly alkaline pH releases to Ground Water.

The Site is more particularly described in **Enclosure A** to this letter, which includes detailed Site diagrams. The description of the Site is based solely on the information contained in the documents listed below in this letter.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcels associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Emery Bayley, *Site Check/Site Assessment Report, Removal of Underground Storage Tank at Park Lake Homes Maintenance Shop, 9900 8th Ave. SW, Seattle, Washington*, January 7, 1999.

2. GeoEngineers, *Maintenance Center Environmental Soil Sampling, Former Park Lake Homes, 9900 8th Avenue Southwest, Seattle, Washington*, April 14, 2004.

3. GeoEngineers, *Final Cleanup Report, KCHA Maintenance Facility, Former Park Lake Homes, 9900 8th Avenue SW, Seattle, Washington*, September 7, 2005.

4. GeoEngineers, *Post-Cleanup Groundwater Confirmation Sampling Event, King County Housing Authority Former Park Lake Homes Maintenance Center, 9800 8th Avenue SW, Seattle, Washington*, October 27, 2015.

5. Department of Ecology, *Further Action Opinion, Park Lakes Home Maintenance Shop, 9800 8th Avenue SW, Seattle, WA, VCP NW3033*, June 6, 2016.

6. GeoEngineers, *Park Lake Homes Maintenance Shop, KCHA Response to Ecology's June 2016 Further Action Letter*, November 21, 2016.

7. GeoEngineers, *Request for Opinion, Former Park Lake Homes Maintenance Center, 9800 8th Avenue SW, Seattle, Washington, VCP NW3033*, *letter to Department of Ecology*. December 20, 2018.

8. GeoEngineers, *Supplemental Groundwater Characterization, KCHA Former Park Lake Homes Maintenance Center Site, 9800 8th Avenue SW, Seattle, Washington, VCP No. NW3033*. December 30, 2018.

The reports listed above will be kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. You can make an appointment by completing a Request for Public Record form (https://www.ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests) and emailing it to PublicRecordsOfficer@ecy.wa.gov, or contacting the Public Records Officer at 360-407-6040. A number of these documents are accessible in electronic form from the Site web page

(https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=8417).

Analysis of the Cleanup

Based on a review of the *Supplemental Groundwater Characterization* report (GeoEngineers 2018), Ecology has determined:

- The two monitoring wells installed and sampled at the Site (MW-1 and MW-2) provide important information regarding the occurrence and quality of ground water beneath the Site. However, the following data gaps identified in the June 6, 2016 opinion letter from Ecology have not been resolved:
    - Ground water elevations with respect to NAVD88 vertical datum.
    - Ground water elevation contour maps to support delineation of ground water flow directions and calculation of ground water gradients. The assumed ground water flow direction depicted on Site maps must be confirmed with ground water elevation data.
    - A hydrogeologic cross section (NAVD88 vertical scale) showing control points (borings and monitoring wells), stratigraphy, ground water levels, ground water sample results, historical sources of contamination, and limits of prior soil excavation.
    - A Terrestrial Ecological Evaluation (TEE) that meets the requirements of WAC 173-340-7490.
    - Upload of Site soil and ground water data to the Ecology Environmental Information Management (EIM) database. As of the date of this opinion letter, no Site data have been uploaded to EIM.
- The following additional issues regarding Site data require resolution:
    - Determine if evaluation of compliance with the Method A soil and ground water cleanup levels for TPHd and TPHo requires adding concentrations of the two fractions and comparing the result to the cleanup level, per Implementation Memorandum #4, *Determining Compliance with Method A Cleanup Levels for Diesel and Heavy Oil*, Publication No. 04-09-086, June 2004.
    - Two detections of the pesticide heptachlor epoxide in MW-2 were above the Method B cleanup level of 0.00481 µg/L. The Method B cleanup level cited in Table 2 of the *Supplemental Groundwater Characterization* report (0.19 µg/L) is incorrect.

- The field ground water pH measurements for MW-2 (ranging from 12.59 to 12.88) are above the characteristic dangerous waste corrosive threshold of 12.5; therefore, pH is considered to be a water quality parameter of concern at the Site. See WAC 173-303-090(6).

- Please provide documentation of the water volumes, disposal method, and disposal facility for the ground water discharged during the four extraction events at monitoring well MW-2, completed in February and March 2018.

- Ground water sampling results from monitoring well MW-1 show no exceedances of MTCA cleanup levels for four quarterly monitoring events. Ecology therefore concurs with the GeoEngineers recommendation to discontinue ground water sampling from MW-1. However, Ecology does not concur with the GeoEngineers recommendation to decommission MW-1, because water level data from this well will be needed to assess ground water flow directions, as previously discussed in this opinion letter.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at 425-649-7257 or e-mail at michael.warfel@ecy.wa.gov.

Sincerely,

Michael R. Warfel

Michael R. Warfel, Site Manager
NWRO Toxics Cleanup Program

Enclosures (1): A – Description and Diagrams of the Site

cc: Dana Carlisle, GeoEngineers, Inc.
Sonia Fernandez, VCP Coordinator, Ecology

Enclosure A

Description and Diagrams of the Site

Site Description

This section provides Ecology's understanding and interpretation of Site conditions, and is the basis for the opinions expressed in the body of the letter.

Site: The Site as characterized to date is defined by benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), and TPH as oil (TPHo) releases to soil, and releases of TPHd, TPHo, and heptachlor epoxide to ground water. The Site is located on King County tax parcel numbers 2895800960, 2895800180, and 2895800160 (the Property) and covers approximately 1.7 acres of these three parcels which total 1.97 acres in size. The Property street address of record is 9800 8th Avenue SE, Seattle, Washington (**Enclosure A**, **Figure 1**); however, the Property also includes the following addresses on 8th Avenue SE: 9825, 9905, 9910, 9915, 9923, 9929, and 9934.

Area and Property Description: The Property is located in the White Center area of unincorporated King County, between West Seattle to the north and Burien to the south. The following streets bound the Property: 8th Avenue SW, SW 100th Street, 7th Avenue SW, and SW 97th Street. The Property is presently occupied by six three-story residential apartment buildings and associated parking and open space (**Enclosure A, Figure 2**).

Site History and Current Use: The area in White Center that includes the Property was developed in 1943 as a temporary housing complex known as White Center Heights, and consisted of 569 units for workers building warplanes at the nearby Boeing plant in Seattle. The WWII-era units were removed by the King County Housing Authority (KCHA) in 1963 during construction of the Park Lake Homes affordable housing project that included 1,025 units on the 100-acre tract that included the Property. These housing units and associated maintenance buildings were demolished by KCHA in 2005 to construct the present housing development known as Greenbridge, which consists of 165 units in 71 residential buildings and includes the buildings and units on the Property.

Sources of Contamination: The 2003 Phase I Environmental Site Assessment (ESA) identified the following potential former sources of contamination at the Site:

- Multiple shops within the maintenance building, with floor drains and dry wells, for the following functions:
    - Sheet metal fabrication
    - Carpentry
    - Painting
    - Plumbing
    - Electrical

- A 1,000-gallon underground storage tank (UST) with a fuel dispenser stored gasoline for vehicles, lawn mowers, and other maintenance equipment, reportedly installed in 1984 and removed in 1998

- An older UST of unknown size and contents, reportedly removed by KCHA

- Shallow, unlined trench over which vehicle oil changes were performed

- A sub-slab hydraulic hoist with associated fluid cylinders and piping

- Hazardous materials and oil drum storage

Physiographic Setting: The Site is situated at an elevation of approximately 400 feet above mean sea level, on a regional upland ridge that slopes to the west towards Puget Sound and to the east towards the Duwamish River.

Surface/Storm Water System: Storm water on the Site is collected in catch basins, grassy swales (with and without underdrains), retention ponds, and rain gardens. The ground surface is relatively flat with a gentle slope to the southwest. The nearest surface water bodies are four small lakes located 1,000 to 1,500 feet southwest and south of the Site.

Ecological Setting: The Site is located in a developed area and is surrounded by residential land uses. The land surface of the Site and surrounding area is primarily covered with residential housing units and paving, with interspersed landscaping and open spaces. The White Center Pond Natural Area is located 1,000 feet west of the Site.

Geology: Borings drilled on the Site encountered fine to medium sandy silt and silty sand, with varying amounts of gravel and cobbles. Prior to development of the Property, a southward-sloping valley (interpreted as a former channelized erosional surface on top of the dense glacial till that caps the upland area) was reportedly present beneath the Property and was subsequently filled during construction of the original housing units in 1943. Locations of borings and monitoring wells are shown on **Enclosure A**, **Figures 3** and **4**.

Ground Water: Ground water was encountered in borings drilled at the Site at depths of 4 to 10 feet below ground surface (bgs), and ground water seepage was observed in remedial excavations at a depth of 12 to 13 feet bgs. This shallow ground water appears to be perched on top of the underlying dense glacial till. The likely ground water flow direction is to the south, based on the historic land topography (erosional surface on top of the glacial till). Two monitoring wells were installed at the Site in 2017 (see **Enclosure A**, **Figure 2**). Ground water flow directions and gradients have not been confirmed with Site-specific data.

Release and Extent of Contamination: A report of a release from the 1,000-gallon UST fuel system on the Property was received by Ecology on December 23, 1998. The removed UST (installed in 1984) was observed to be in good condition and the documented soil contamination was attributed to fuel spills and overfills around the UST fill pipe.

A subsurface investigation was conducted at the Site in 2004 prior to redevelopment of the Property and included 15 direct-push borings (**see Enclosure A, Figure 3**). Soil samples from four borings showed concentrations of gasoline-, diesel-, and lube oil-range hydrocarbons (TPHg, TPHd, and TPHo, respectively) above MTCA Method A soil cleanup levels for unrestricted land use. Ground water was encountered between depths of 4 and 10 feet bgs during drilling; however, ground water samples were not collected.

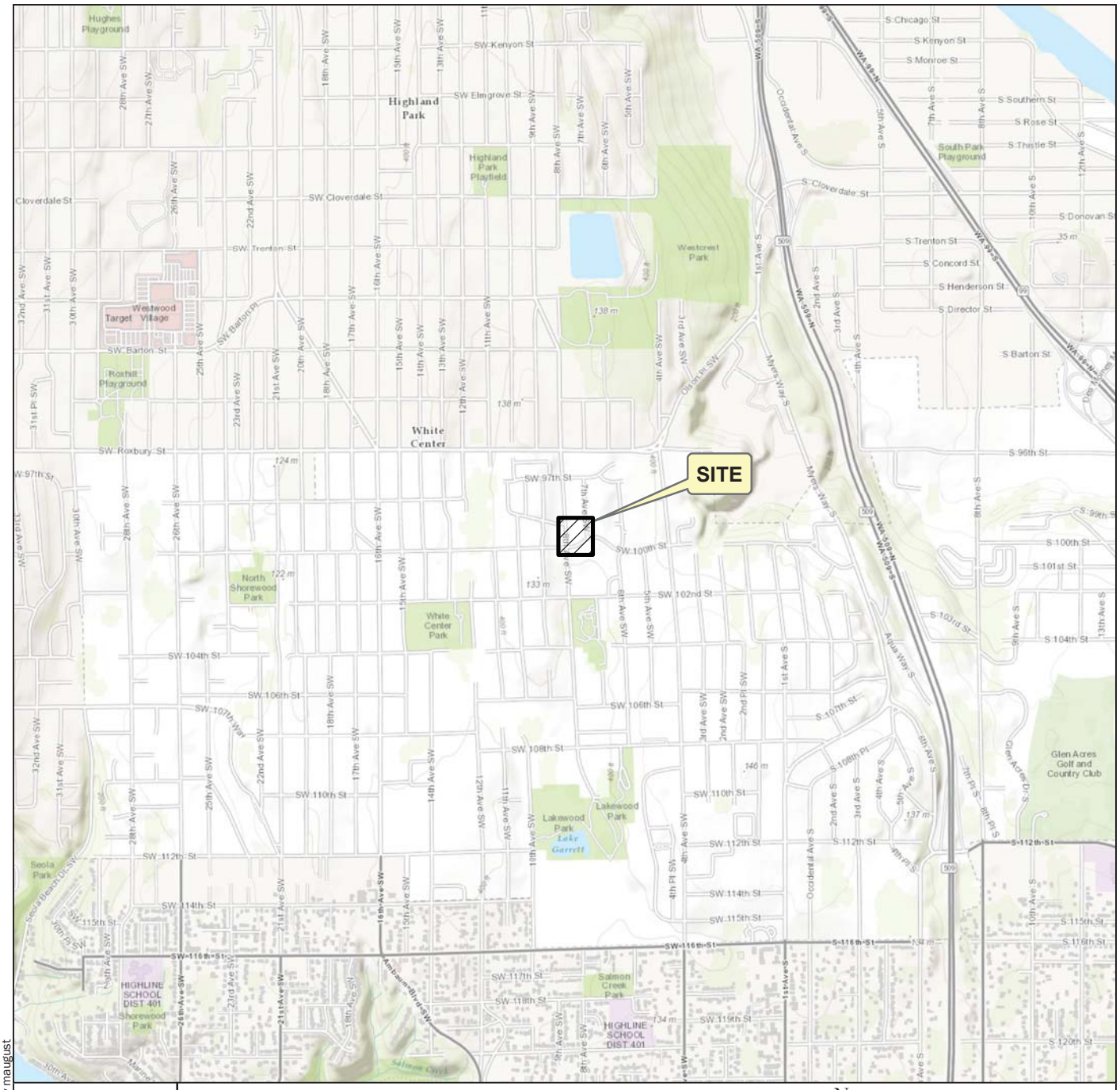
Seven direct-push borings were drilled at the Site in 2015 (see **Enclosure A**, **Figure 4**). Ground water samples were collected from temporary monitoring wells in three of these borings. None of the tested chemical parameters (TPHg, TPHd, TPHo, and volatile organic chemicals) were present in concentrations above MTCA ground water cleanup levels. However, based on the likely southerly shallow ground water flow direction, these temporary monitoring wells appear to be located cross-gradient of former potential contamination sources at the Site.

Two monitoring wells were installed at the Site in July 2017 (see **Enclosure A, Figure 2**). Groundwater samples were collected from these wells in August 2017, December 2017, April 2018, and July 2018. Concentrations of TPHd and TPHo in MW-2 were above MTCA Method A cleanup levels for all four sampling events. The pesticide heptachlor epoxide was above the MTCA Method B cleanup level in MW-2 during two of the sampling events. None of the results for ground water samples from MW-1 were above MTCA cleanup levels.

Interim Cleanup Actions: Four excavations ranging in depth from 4.5 to 18 feet bgs were completed at the Site in 2005 (**Enclosure A, Figure 5**). Confirmation soil samples were tested for BTEX, TPHg, TPHd, and TPHo and showed concentrations below Method A soil cleanup levels for unrestricted land use. A total of 2,296 tons (approximately 1,200 cubic yards) of petroleum-contaminated soil was removed for off-Site disposal. Moderate ground water seepage was observed in two of the four excavations at depths of 12 to 13 feet bgs.

Four 1-day ground water extraction events were completed in monitoring well MW-2, during alternating weeks in February and March 2018. Each event consisted of pumping 900 to 1,000 gallons of ground water from the well with a vactor truck. Details regarding water volumes, disposal method, and disposal facility for the ground water discharged during the four extraction events were not provided to Ecology.

Site Diagrams



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2015

Projection: NAD 1983 UTM Zone 10N

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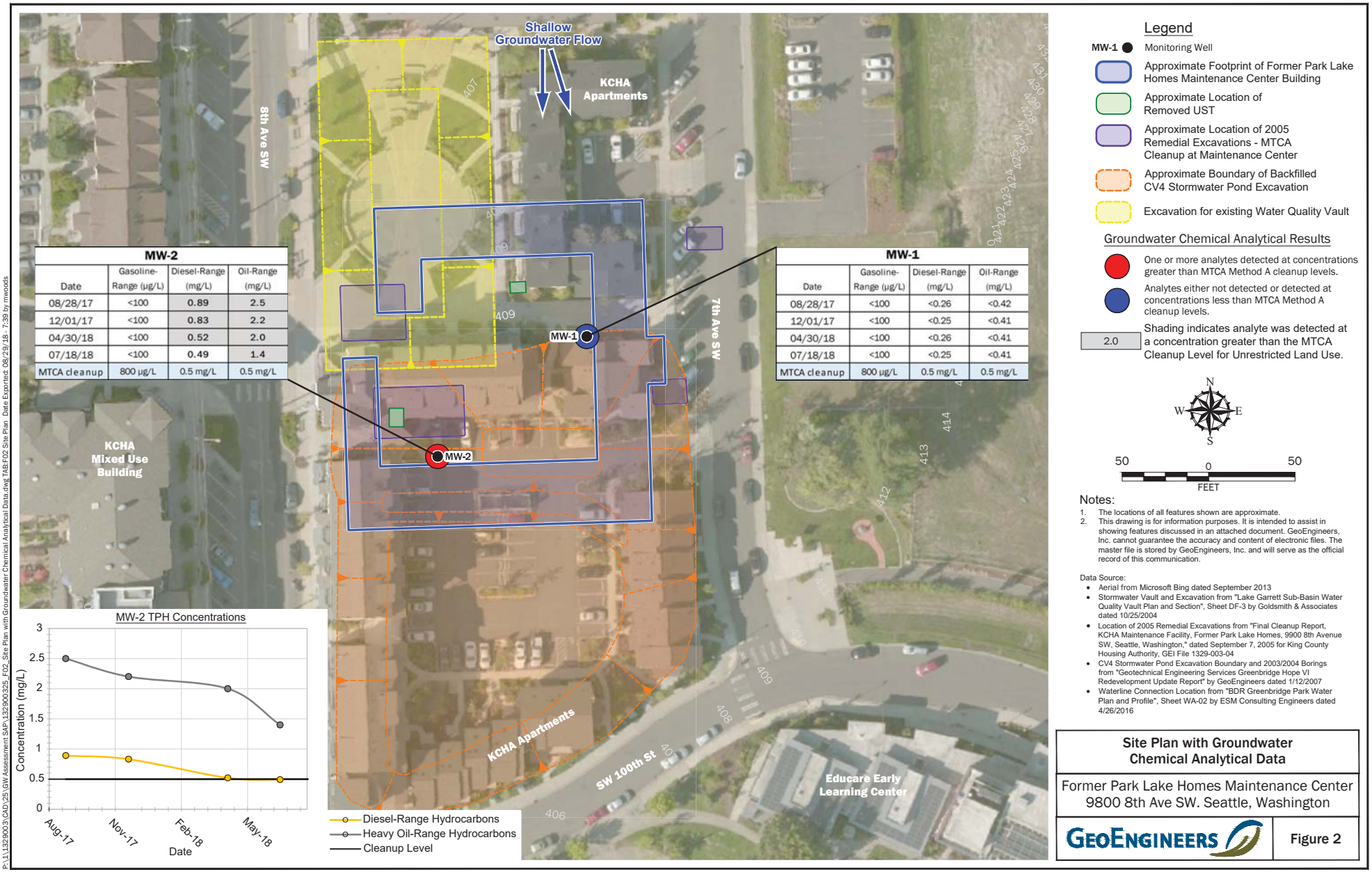
Vicinity Map

Former Park Lake Homes Maintenance Center
Seattle, Washington

GeoEngineers

Figure 1

Enclosure A, Figure 1



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Data Source:

- Aerial from Microsoft Bing dated September 2013
- Stormwater Vault and Excavation from "Lake Garrett Sub-Basin Water Quality Vault Plan and Section", Sheet DF-3 by Goldsmith & Associates dated 10/25/2004
- Location of 2005 Remedial Excavations from "Final Cleanup Report, KCHA Maintenance Facility, Former Park Lake Homes, 9900 8th Avenue SW, Seattle, Washington," dated September 7, 2005 for King County Housing Authority, GEI File 1329-003-04
- CV4 Stormwater Pond Excavation Boundary and 2003/2004 Borings from "Geotechnical Engineering Services Greenbridge Hope VI Redevelopment Update Report" by GeoEngineers dated 1/12/2007
- Waterline Connection Location from "BDR Greenbridge Park Water Plan and Profile", Sheet WA-02 by ESM Consulting Engineers dated 4/26/2016

Site Plan with Groundwater Chemical Analytical Data

Former Park Lake Homes Maintenance Center
9800 8th Ave SW. Seattle, Washington

GeoEngineers | Figure 2

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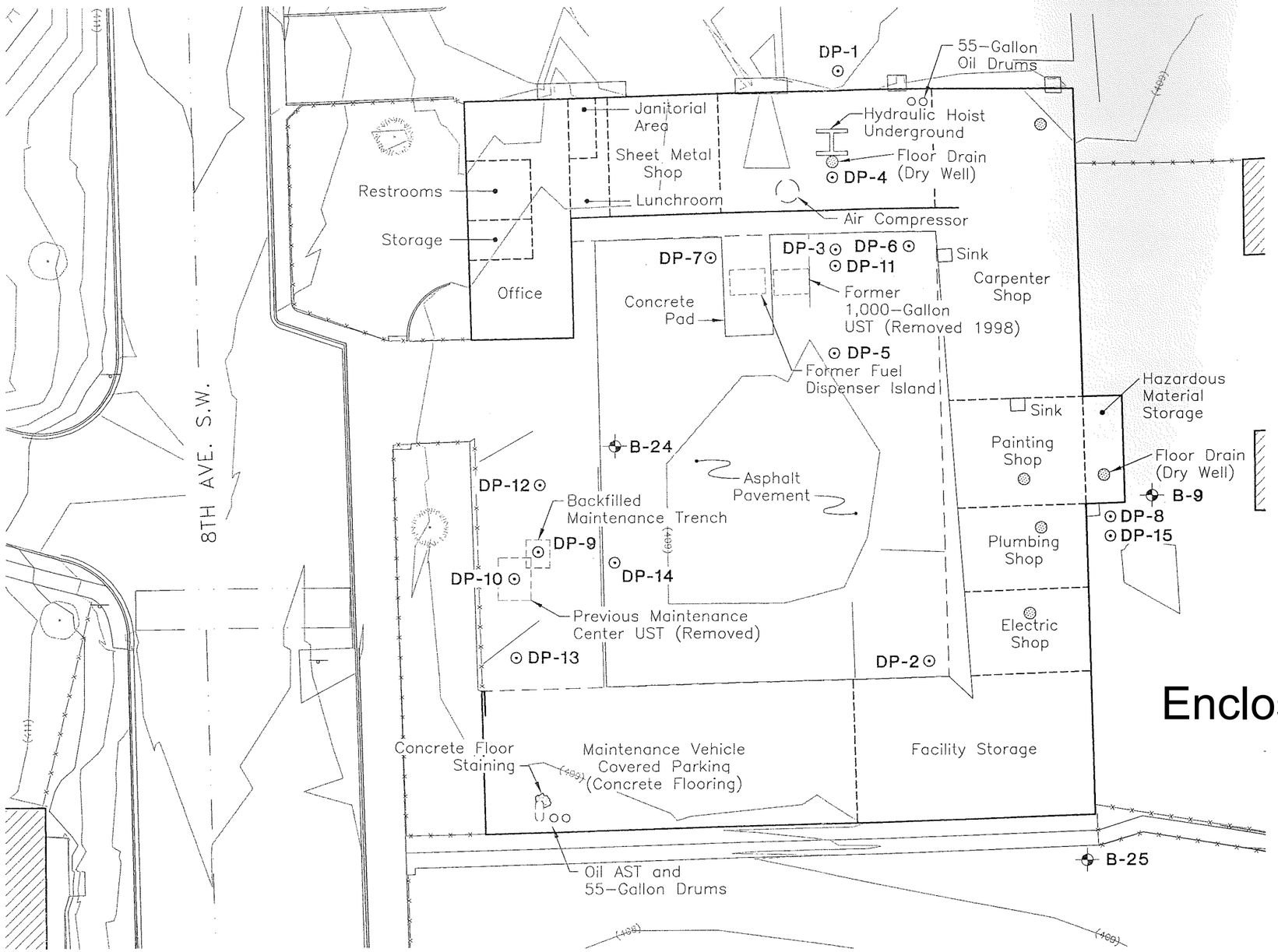
Enclosure A, Figure 2



EXPLANATION:

⊙	FLOOR DRAIN
AST	ABOVEGROUND STORAGE TANK
UST	UNDERGROUND STORAGE TANK
DP-1 ⊙	DIRECT-PUSH BORING
B-9 ⊕	GEOTECHNICAL BORING

Enclosure A, Figure 3

N

0 30 60

SCALE IN FEET

Notes: 1. The locations of all features shown are approximate.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

Reference: Drawing entitled "Cover Sheet King County Housing Authority Vic. SW Roxbury & 8th Ave SW" Sheet 1 of 28 by Bush, Roed & Hitchings, Inc., dated August 2002.

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2004 SITE PLAN, KCHA
MAINTENANCE FACILITY, FORMER PARK LAKE HOMES

FIGURE 2

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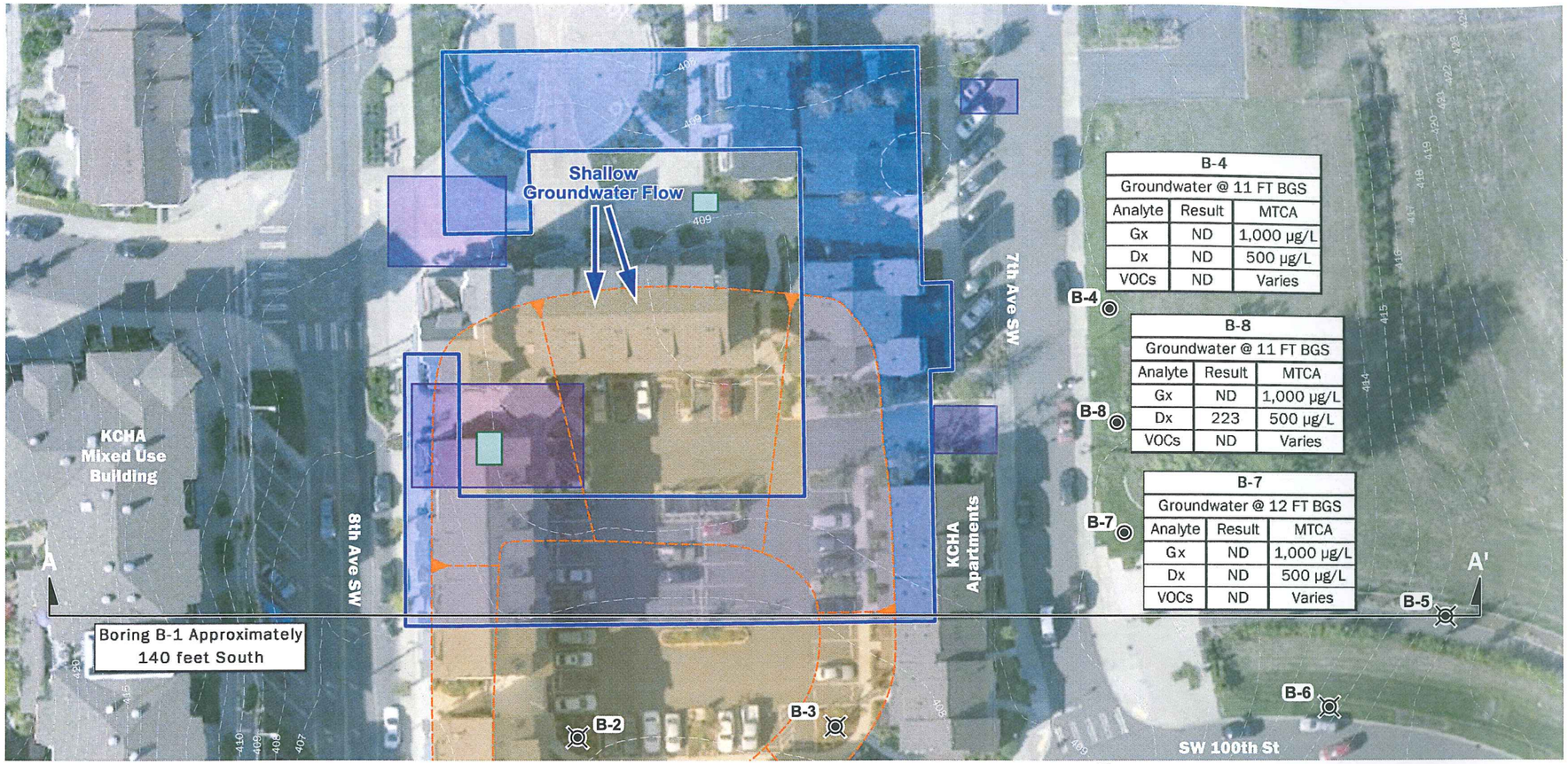


Legend

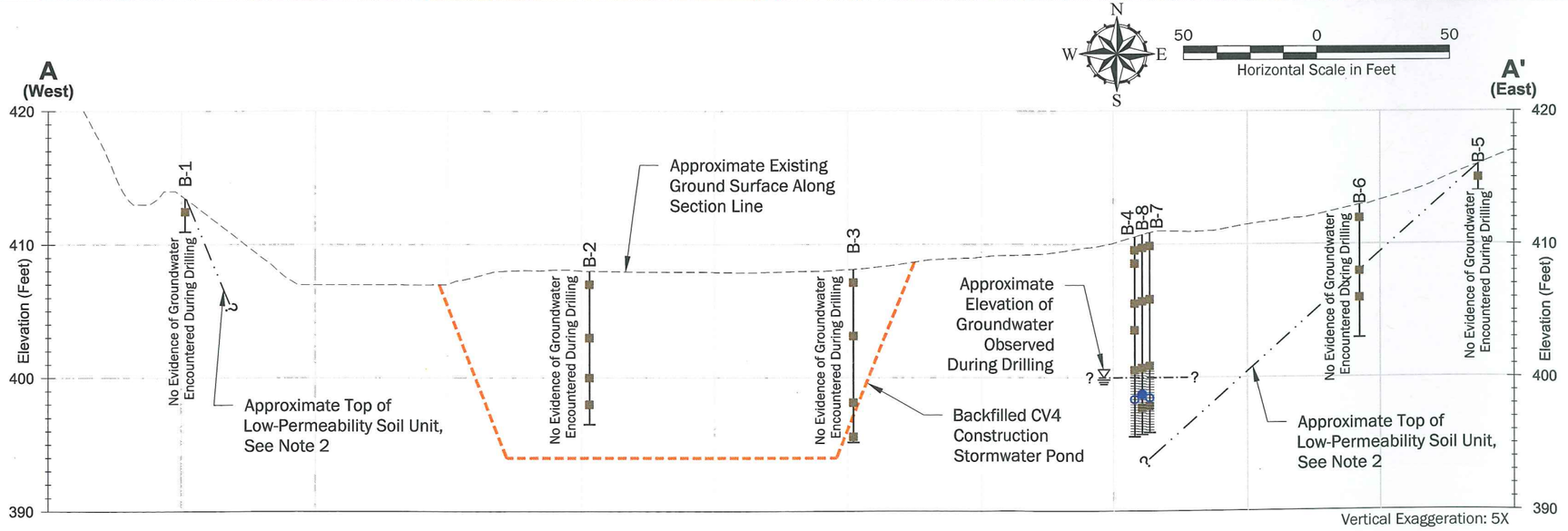
- Direct Push Boring No Groundwater Encountered (GeoEngineers, 2015)
- Direct Push Temporary Groundwater Monitoring Well (GeoEngineers, 2015)
- A A' Cross-Section Location
- Approximate Footprint of Former Park Lake Homes Maintenance Center Building
- Approximate Location of Removed UST
- Approximate Location of 2005 Remedial Excavations - MTCA Cleanup at Maintenance Center
- Approximate July 2007 Soil Excavation Location
- Approximate Boundary of Backfilled CV4 Stormwater Pond Excavation

Section

- Soil Sample with No Field Screening Evidence of Petroleum
- Well Screen
- Groundwater Sample, No Petroleum or VOC Concentrate Detected
- Groundwater Sample, Petroleum Concentrations Detected Less Than MTCA Method A Cleanup Levels

Data Boxes

BGS	Below Ground Surface
ND	Non Detect
VOCs	Volatile Organic Compounds
Gx	Gasoline/BTEX
Dx	Diesel/Heavy Oil



Notes:

1. Borings locations and elevations shown in cross-section are offset from the section line per approximate distances shown in the plan.
2. There is an apparent depression at the top of the low permeability soil unit in the area between 8th Ave SW and 7th Ave SW.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source:
Imagery: Microsoft Bing September 2013
Topography: Puget Sound Lidar Consortium

Projection:
Horizontal: NAD 1983 State Plane Washington North
Vertical: NAVD88

Cross-Section A-A'

Former Park Lake Homes Maintenance Center
Seattle, Washington

GeoEngineers | Figure 3

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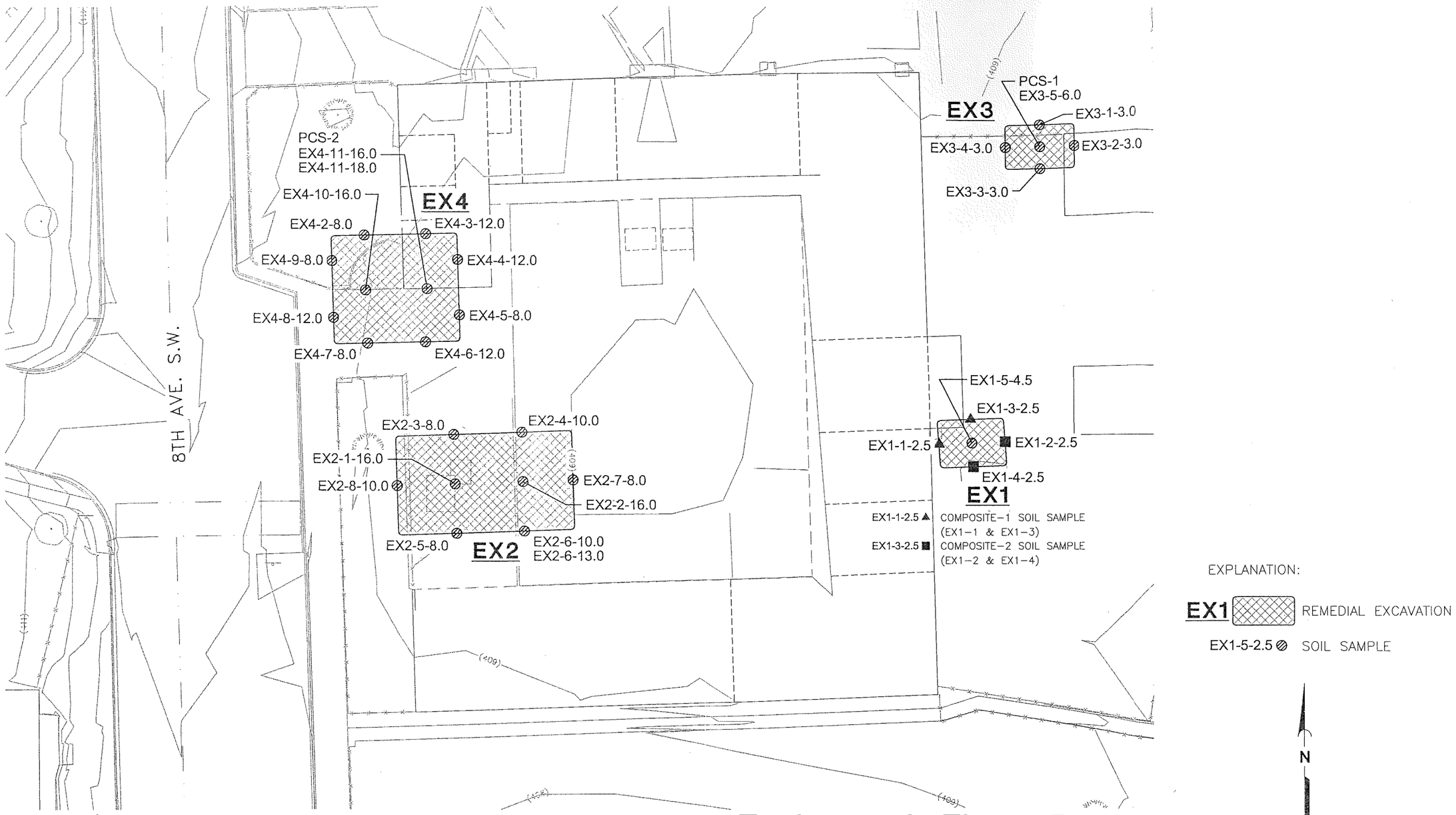
Enclosure A, Figure 4



Enclosure A, Figure 5

Notes: 1. The locations of all features shown are approximate.
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Reference: Drawing entitled "Cover Sheet King County Housing Authority Vic. SW Roxbury & 8th Ave SW" Sheet 1 of 28 by Bush, Roed & Hitchings, Inc., dated August 2002.

GeoEngineers

EXCAVATION AND SAMPLE LOCATIONS, KCHA MAINTENANCE FACILITY, FORMER PARK LAKE HOMES

FIGURE 3

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