



Electronic Copy

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Region Office
PO Box 330316, Shoreline, WA 98133-9716 • 206-594-0000

October 4, 2022

Levi Fernandes
SoundEarth Strategies, Inc.
2811 Fairview Avenue E
Seattle, Washington 98102
(LFernandes@soundearthinc.com)

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

- **Site Name:** Avtech Corp
- **Site Address:** 3400 Wallingford Avenue N, Seattle, WA 98103
- **Facility/Site No.:** 71755531
- **Cleanup Site ID No.:** 12131
- **VCP Project No.:** NW2739

Dear Levi Fernandes:

The Washington State Department of Ecology (Ecology) received your request for an opinion on work planned the Avtech Corp facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70A.305 RCW.

Issue Presented and Opinion

Does the proposed Work Plan *Remedial Injection and Groundwater Monitoring Work Plan, AMLI Wallingford Property, 3400 Wallingford Avenue North, Seattle, Washington, Dated June 13, 2022 (June 2022 Work Plan)* meet the stated objectives with respect to Site data gaps?

NO. Ecology has determined that additional groundwater monitoring and indoor air sampling is necessary to determine compliance with cleanup standards at the Site.

Description of the Site

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

- Tetrachloroethylene (PCE), trichloroethene (TCE), lead, gasoline- (TPH-G) and diesel-range (TPH-D) total petroleum hydrocarbons, benzene, toluene, ethylbenzene, and total xylenes (collectively BTEX), carcinogenic polycyclic aromatic hydrocarbons (cPAHs) into the Soil.
- TCE into the Groundwater.

Enclosure A includes a detailed description and diagrams of the Site, as currently known to Ecology.

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

Basis for the Opinion

This opinion is based on the information contained in the documents listed in **Enclosure B**. A number of these documents are accessible in electronic form from the [Site web page](#)¹. The complete records are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Visit our [Public Records Request page](#)² to submit a public records request or get more information about the process. If you require assistance with this process, you may contact the Public Records Officer at publicrecordsofficer@ecy.wa.gov or (360) 407-6040.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis and Opinion

Based on a review of the *June 2022 Work Plan*, Ecology has determined:

- **Soil contamination at the Site has been sufficiently characterized.**

Prior use of the Site for aerospace electronics manufacturing from 1974 to 2011 resulted in the release of Site contaminants of concern (COCs), including PCE, TCE, lead, TPH-G, TPH-D, BTEX, and cPAHs into the soil. The extent of soil contamination has been defined vertically and laterally to the north, south, east, and west.

Based on the results of excavation performance sampling described in **Enclosure A**, the majority of soil contaminated with Site COCs above MTCA Method A cleanup levels has been removed from the Site. Limited areas of soil with concentrations of TCE above the cleanup level are present in the northern portion of the Site (north of North 34th Street) and a portion of the North 34th Street, as described in **Enclosure A**. The remaining soil contamination is being treated

¹ <https://apps.ecology.wa.gov/cleanupsearch/site/12131>

² <https://ecology.wa.gov/publicrecords>

by a soil vapor extraction (SVE) system operated at the northern portion of Property from January 2017 through December 2020.

Evaluation of post-remediation soil condition is warranted to determine if compliance with the soil cleanup standards has been achieved. The soil cleanup standards were identified in Ecology's *Re: Opinion on Proposed Cleanup of a Property associated with a Site: Avtech Corp, 2400 Wallingford Ave. N, Seattle, WA, dated October 22, 2014 (October 2014 Opinion)*. Demonstration of compliance with the soil cleanup standards may be possible using confirmation soil sampling, empirical demonstration after Site groundwater achieves compliance, or the statistical demonstration as per WAC 173-340-740(7)(d). Please refer to Ecology's [Guidance for Remediation of Petroleum Contaminated Sites, revised June 2016](#)³ for further information on use of the statistical demonstration.

As discussed in the *October 2014 Opinion*, the Site is exempt from the Terrestrial Ecological Evaluation (TEE) process based on its location further than 500 feet away from 1.5 acres of contiguous undeveloped land. Please note that submission of a [TEE Form](#)⁴ is required for consideration of a no further action (NFA) determination.

Additional figures are needed which:

- Clearly display the locations of locations and analytical results of soil samples collected from monitoring wells, borings, and excavation limits in plan and cross section view, including areas with soil remaining above the Method A cleanup level.
- **Additional sampling is necessary to delineate the current extent of TCE in groundwater.**

Groundwater sampling was first conducted at the Site in 2012. Initial results indicated that concentrations of TCE in groundwater exceeded the Method A cleanup level. An extensive monitoring and injection well network was installed between 2012 and 2016 to define the extent of groundwater contaminated with TCE and implement remedial actions to reduce the concentration of TCE below the Method A cleanup level.

Between March 2015 and May 2021, five rounds of in-situ chemical oxidation (ISCO) injections have been performed at the Site. A potassium permanganate solution was injected into select wells at low pressures to aid in biodegradation of TCE. Injection events are described in detail in **Enclosure A**. Performance monitoring has been conducted at Site monitoring wells during and after injection events to assess the effectiveness of ISCO treatments in reducing concentrations of TCE in groundwater. Based on the results of groundwater sampling conducted to date, concentrations of TCE in groundwater exceeding the Method A cleanup level remain at monitoring wells MW05 and MW12.

³ <https://apps.ecology.wa.gov/publications/SummaryPages/1009057.html>

⁴ <https://apps.ecology.wa.gov/publications/SummaryPages/ECY090300.html>

The *June 2022 Work Plan* outlines procedures for injection of a sodium permanganate solution into select injection wells to treat groundwater in the vicinity of MW05 and MW12. Since 2016, groundwater samples have been collected from a limited number of monitoring and injection wells. In addition to MW05 and MW12, monitoring wells MW03, MW04, MW11, MW13, and IW03 have had historic concentrations of TCE above the Method A cleanup level. Samples from these wells which were analyzed for TCE were most recently collected in 2017.

The sampling plan that is proposed in the *June 2022 Work Plan* is not sufficient for monitoring the effectiveness of additional remedial injections. The current extent of the groundwater plume is not delineated upgradient to the northwest, cross-gradient to the east and west, and downgradient to the south. Prior to the proposed injection, Ecology recommends sampling groundwater from all existing monitoring wells and analyzing for TCE, to delineate the extent of groundwater with concentrations of TCE currently exceeding the Method A cleanup level. Depending on the sampling results, additional monitoring wells may be needed to delineate the groundwater plume. Ecology encourages submittal of a work plan for Ecology's review if additional monitoring wells are needed.

Additional figures are needed:

- Include a rose diagram displaying estimated groundwater flow directions for all monitoring events in addition to the groundwater contour map provided in the *June 2022 Work Plan*;
 - Display concentrations of TCE in wells on a time-series plot to show the effectiveness of ISCO treatments in reducing contamination at the Site; and
 - Display the inferred extent of groundwater containing TCE above Method A cleanup levels in plan and cross section view.
- **Vapor Intrusion Evaluation is needed.**

Historic concentrations of TCE in groundwater samples collected from MW03, MW04, MW05, MW07, MW09, MW11, and MW12 exceeded the Method B vapor intrusion screening level for unrestricted use. As documented in the *Cleanup Action Report, AMLI Wallingford Property, 3400 Wallingford Avenue North, Seattle Washington, dated June 19, 2017 (June 2017 CAR)*, an SVE system was installed below the foundation of the building. As of April 17, 2017, the system removed an estimated 1 pound of volatile organic compounds (VOCs) from the soil vapor beneath the building. Current SVE system data should be provided which includes information on operating hours, estimated mass removal rates, and estimated total contaminant mass removal.

The SVE system is no longer running as of December 2020 due to reportedly asymptotic TCE mass removal rates. To date, soil vapor and air sampling has not been conducted at the Site. Ecology recommends collecting vapor samples from SVE system wells on the Property to evaluate the effectiveness of remedial actions in reducing the concentration of TCE in soil vapor and the risk of vapor intrusion. As discussed above, groundwater in the southern portion of the site, south of N 34th Street, has historically exceeded the Method B screening level for vapor intrusion. Please refer to Ecology's [*Guidance for Evaluating Vapor Intrusion in Washington State: Investigation and Remedial Action, revised March 2022*](#)⁵, for further information on evaluating the risk of vapor intrusion at the Site.

- **Environmental Information Management Data Submittal.**

Ecology appreciates your efforts to upload Site data from 2011 to 2017 into Ecology's Electronic Environmental Information Management (EIM) database. Please note electronic submittal of all sampling data into the EIM database is a requirement in order to receive a final Ecology opinion for this Site. Ecology's contact and resource on entering data into EIM is Gaylen Sinclair who can be reached by email at Gaylen.Sinclair@ecy.wa.gov, or via telephone at (360) 480-9224.

- **Next Steps.**

Ecology appreciates your efforts to date in characterizing the extent of Site COCs in soil and groundwater. Remedial actions conducted to date at the Site have removed the source of TCE contamination and reduced concentrations of TCE in groundwater. Focused Site investigation is necessary to demonstrate successful cleanup of the Property.

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 70A.305.040(4).

⁵ <https://apps.ecology.wa.gov/publications/SummaryPages/1909051.html/SummaryPages/0909047.html>

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 70A.305.080 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 70A.305.170(6).

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/vcp. If you have any questions about this opinion, please feel free to contact me by phone at (206) 459-6287 or by email at david.unruh@ecy.wa.gov.

Sincerely,



David Unruh
Site Manager
Toxics Cleanup Program, NWRO

Enclosures (2): A – Description and Diagrams of the Site
 B – Basis for the Opinion: List of Documents

cc: Scott Koppelman, AMLI Residential Partners, (SKoppelman@amli.com)
 Sonia Fernández, VCP Coordinator, (sonia.fernandez@ecy.wa.gov)

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 is defined by releases of the following in Seattle, King County, Washington:

- PCE, TCE, lead, TPH-G, TPH-D, BTEX, and cPAHs into the soil.
- TCE into the groundwater.

The Site is located on the north and south sides of N 34th Street, and consists of the following six parcels (Property, **Figure 1; Figure 2**):

- 408330-6660 (3421 Burke Avenue N; Parcel 1);
- 408330-6670 (3400 Wallingford Avenue N; Parcel 2);
- 408330-6695 (3422 Wallingford Avenue N; Parcel 3);
- 408330-7105 (3325 Wallingford Avenue N; Parcel 4);
- 408330-7155 (3320 Wallingford Avenue N; Parcel 5); and
- 408330-7160 (3320 Wallingford Avenue N; Parcel 6).

The three parcels north of N 34th Street (Parcel 4083306660, 4083306670, and 4083306695) are collectively known as the North Block. The three parcels south of N 34th Street (Parcel 4083307105, 4083307155, and 4083307160) are collectively known as the South Block (**Figure 2**). The Property consists of both the North and South Blocks.

According to MTCA, the Site is defined as all areas where contamination has come to be located. Based on currently available Site investigation data, the Site includes the Property, 1801 N 34th Street (King County Parcel no. 4083307170), N 34th Street, and Burke Avenue N. The Site boundary is not currently completely defined based on the most recent groundwater sampling data.

Area and Property Description: The Site is located in a mixed commercial and residential area in Seattle. The Property is bounded to the south by office buildings, to the east by Burke Avenue N, to the west by Wallingford Avenue N, and to the north by apartment buildings and N 35th Street. The North Block of the Property is developed with a multi-story residential building with one level of underground parking. The South Block of the Property is currently used as multi-story residential buildings. The use of surrounding properties include the following:

- Multi-family residences are located to the north.
- Mixed-use commercial and residential buildings are located to the west.
- A building contractor and marine supply store are located to the east.
- Office buildings are located to the south.

Property History and Current Use: The Property was first developed in the early 1900s with four single-family residences. A two-story concrete factory building (Building 2; **Figure 2**) was constructed on the North Block of the Property in 1909. From the 1909 to the 1940s, Building 2 operated as a shoe manufacturer. From the 1950s to the 1960s, Building 2 was in use as a commercial bakery. An aviation electronics manufacturer (Avtech) occupied the Building 2 from 1974 to 2011.

Two furniture workshop buildings were constructed on the South Block in the 1930s, with an additional single-story warehouse constructed in 1965. Avtech occupied the South Block buildings from the 1980s to 2011.

Avtech ceased operations by 2011 and the North and South Blocks of the Property remained vacant until the buildings were demolished in 2014. The Property was redeveloped with four story multi-family residential buildings with an underground parking structure in 2016.

Sources of Contamination: Documented chemical wastes generated during aviation electronics manufacturing operations at the Property included PCE, TCE, acetone, toluene, ammonium hydroxide, xylenes, methyl isobutyl ketone, varnish, nitric acid, paint etcher, Freon, ethanol, and hydraulic oil. Chemical wastes were reportedly removed regularly from the Property for offsite disposal by a hazardous waste transportation company. A King County Metro sewer discharge permit for chromate plating liquid waste was also issued for the Property.

The source of TCE contamination detected in soil and groundwater is presumed to be from solvent use, storage, and on-site disposal at various locations on the North Block of the Property. The primary source zone is located near the former loading dock on the northeastern portion of Building 2. Other source locations include the chemical storage area, machine shop, and potential leaks from floor drains and sanitary sewer piping (**Figure 2**).

The source of small, localized cPAH contamination on the site may be the result of airfall from the former coal gasification plant located to the south, or from incidental surface spills of oil. The localized shallow lead contamination may result from a release of lead-based paint at a former residence.

Physiographic Setting: In general, the Seattle area sits on a complex and incomplete succession of glacial and nonglacial deposits that overlie an irregular bedrock surface. The City straddles the Seattle uplift, the Seattle fault zone, and the Seattle basin, three major bedrock structures that reflect north-south crustal shortening in the Puget Sound Lowland. The landforms and near-surface deposits that cover much of the Seattle area include the upland glacial till that in many areas was cut into channels during glaciation by recessional melt-water.

The glacial till can display north-south axes oriented in the former ice-flow direction. Glacially overridden deposits underlie most of the uplands, whereas loosely consolidated postglacial deposits fill deep valleys and recessional melt-water channels. Soft organic-rich deposits have filled former lakes, bogs, and sloughs.

The Property is within the northern portion of the Lake Union Depression between Queen Anne Hill and the University of Washington. The Property is located on a southeast-facing hillside, with elevations ranging between 65 feet above mean sea level (amsl) on the south side of the Property to 97 feet amsl on the north.

Surface/Storm Water System: Stormwater runoff on and in the vicinity of the Property disperses via sheet flow to catch basins connected to the City of Seattle stormwater system. The nearest surface water body is Lake Union, located approximately 650 feet south of the Property.

Ecological Setting: The Site is zoned for mixed commercial and residential use. Adjoining properties to the south, east, and west are also zoned for mixed commercial and residential use. Properties to the North are zoned for low-rise residential use. Land surfaces on the Property and adjacent properties are primarily covered by buildings, and asphalt and concrete pavement, with some small landscaped areas.

Geology: The [geologic map of the area](#)⁶ indicates that the Site is underlain by Vashon till, a dense diamict with varying amounts of sand, silt, and gravel. The Property is underlain by fill materials placed to a maximum depth of 7 feet below ground surface (bgs). Fill materials are underlain by very dense, dry to moist silty sands with variable amounts of gravel and cobbles, and local thin sand-rich and silt-rich horizons, interpreted to be Vashon glacial till to depths of approximately 25 to 40 feet bgs. Till deposits are underlain by a dense, stratified, very moist to wet sand with varying amounts of silt and gravel, interpreted to be Vashon-age advance outwash deposits. Advance outwash deposits were encountered at the Site to the maximum explored depth of 75 feet bgs.

Groundwater: From 2011 to 2015, 20 monitoring wells (MW01 through MW18, MW11D, MW16A) were installed at the Site. Among them, 8 monitoring wells (MW01, MW02, MW06, through MW10, MW16) were either decommissioned or destroyed. A total of 12 monitoring wells are currently active (MW03 through MW05, MW-11 through MW15, MW16A, MW17, MW18, and MW11D).

These monitoring wells were installed with 10 to 15-foot screens from 8 to 40 feet bgs. Monitoring well locations are shown on **Figure 3 and Figure 4**.

Groundwater is present at the Site at depths ranging from 23 to 37 feet bgs, generally within Vashon advance outwash deposits. Groundwater flow is oriented roughly to the south-southeast with an average hydraulic gradient of 0.05 feet/foot (**Figure 4**). Slug tests conducted in monitoring wells MW09, MW12, and MW13 in July 2013 yielded average hydraulic conductivity estimates of 0.52 to 1.11 feet/day.

⁶ <https://pubs.usgs.gov/of/2005/1252/>

Water Supply: Drinking water is supplied to the Property by water mains operated by the City of Seattle. Water for the City is sourced from the Cedar and Tolt River watersheds, located approximately 32 miles southeast and northeast of the Site, respectively. The Site is located approximately 7.5 miles from the closest 10-year wellhead protection zone for a municipal water supply well.

Release and Extent of Contamination:

Site conditions prior to the interim remedial actions:

Soil. Subsurface investigations identified the nature and extent of PCE and TCE in soil at the Site. Concentrations of TCE and/or PCE in subsurface soil above the Method A cleanup level were identified primarily near the former loading dock and shipping and receiving room at Building 2 (B14/MW-09, B104, SB201, SB204). TCE concentrations above the Method A cleanup level were also identified near the sanitary sewer lines (SB206, SB209); along the southern boundary of the North Block (MW-16, IW03); and in N 34th Street (B06/MW04, B-18/MW13). Soil contaminated with TCE and/or PCE ranged in depths from 9 to 35 feet bgs in vadose zone soils (**Figure 2; Figure 3**).

A limited area of shallow soil containing lead above the Method A cleanup level was identified near the north boundary of the North Block (P13; **Figure 3**). Two areas of shallow soil contained the cPAH benzo(a)pyrene above the Method A cleanup level at the Site: P10 at 0.5 feet bgs and P12 at 2 feet bgs. P10 is located south of Building 4 on the South Block. P12 is located in the southeast corner of Parcel 1 (**Figure 3**).

Groundwater. Groundwater containing TCE concentrations exceeding the Method A cleanup level is present beneath the southern half of the North Block, and has migrated south under N 34th Street to the South Block and Burke Avenue North. Prior to remedial actions, TCE concentrations in groundwater ranged from below detection limits to 290 micrograms per liter (µg/L) in well MW04 (**Figure 3**).

Interim Remedial Actions.

Soil. Mass excavation of soil contaminated with PCE, TCE, cPAHs, lead, TPH-G, TPH-D, and BTEX occurred from November 2014 to February 2014 as part of redevelopment activities at the Property. A total of 5,414 tons of contaminated soil was excavated and transported off site for disposal at a permitted facility. Excavations were conducted in the areas: A1 through A5, B, C1, C2, EX01, and EX02 (**Figure 5, Figure 6**).

Excavation areas A1 through A5 were completed on the North Block. Soil excavated in these areas contained TCE and/or PCE concentrations above Method A cleanup levels (**Figure 5**). The excavations were completed to total depths ranging from approximately 15 to 25 feet bgs, or 70 to 55 feet amsl. The greatest mass of soil contaminated with TCE above Method A cleanup levels in these areas generally occurred from 10 to 17 feet bgs (approximately 75 to 65 feet amsl). A total of 53 excavation sidewall and bottom confirmation samples were collected from excavation extents. With the exception of one bottom sample, A2-65N85E-68-BTM, all

confirmation samples contained PCE and TCE concentrations below the Method A cleanup levels (**Figure 5**).

Excavation area B was completed near the north boundary of the North Block to remove the previously identified lead contamination. The excavation was completed to approximately 4 feet bgs (approximately 92 feet amsl). All final confirmation samples contained lead concentration below the MTCA Method A cleanup level (**Figure 5**).

Excavation areas C1 and C2 were completed on North and South Block, respectively. These excavations were to remove the previously identified cPAHs contamination. These two excavations were completed to a depth of 4 feet bgs. All confirmation samples contained no detectable concentrations of cPAHs (**Figure 5, Figure 6**).

A previously unknown area of soil containing TPH-G, BTEX, and TCE above the Method A cleanup levels in the central portion of the North Block was identified during mass excavation activities (EX01; **Figure 5**). The excavation was extended to a maximum depth of 75 feet amsl (approximately 10 feet bgs). Final excavation confirmation samples did not contain TPH-G or BTEX above Method A cleanup levels.

During excavation of the South Block, a previously unknown area of apparently contaminated soil was identified along the southern boundary of the South Block (EX02; **Figure 6**). A soil sample collected from the area with the highest field screening results returned concentrations of TPH-G, TPH-D, and BTEX below their respective Method A cleanup levels. Confirmation samples collected from the bottom and southern sidewall of the excavation did not contain TPH-G, TPH-D, or BTEX above Method A cleanup levels (**Figure 6**). Approximately 18 cubic yards of soil were excavated and transported offsite for disposal at a permitted facility.

A 250-gallon residential heating oil underground storage tank (UST) was discovered during mass excavation activities in the northeastern portion of the North Block. No field screening indications of contamination were observed in soil surrounding the UST, and confirmation and composite samples collected from the excavation limits and spoils pile did not contain TPH concentrations above Method A cleanup levels.

Based on the results of soil performance monitoring samples collected during the excavation, soils containing TCE above the Method A cleanup level were removed from the Site with the following exceptions:

- Bottom confirmation sample A265N85E-68-BTM, at an approximate elevation of 68 feet amsl;
- Characterization samples collected from borings SB201 and SB204 at 65 feet amsl;
- Characterization samples collected from boring IW03 at elevations of 70 and 60 feet amsl;
- Characterization samples collected from boring MW16 at elevations of 70, 60, and 55 feet amsl; and

- Characterization samples collected from boring B06/MW04 and B18/MW13 at 35 feet bgs or 50 feet amsl. These two borings are located at N 34th Street.

Groundwater. Between March 2014 and August 2016, 56 permanent injection wells were installed at the Site (IW01 to IW57; **Figure 4, Figure 7, Figure 8**). Injection wells IW01, IW02, IW04, and IW06 were decommissioned in 2015 due to their location within the excavation or damage due to construction activities.

In March 2015, a total of approximately 35,000 gallons of potassium permanganate solution was injected at low pressures into wells IW20 through IW54 to treat groundwater contaminated with TCE across the Site. Injection volumes at each well varied from 52 to 1,443 gallons, with an average of 1,010 gallons injected per well. Following this injection event, injection wells IW20 to IW25, IW27 to IW29, IW31, IW35, IW36, IW38, IW40 to IW43, IW45, IW46, IW48, IW49, and IW52 were decommissioned.

In July 2016, another injection event was conducted at the Site. A total of approximately 18,463 gallons of potassium permanganate solution and 4,000 gallons of fresh water were injected into IW03, IW04A, IW05, IW07, IW09, IW10, IW19, IW28, IW37, IW47, IW49, IW53, and IW55. An additional injection event was conducted in December 2016 at IW56 and IW57. A total of 1,980 gallons of potassium permanganate solution were injected at the two wells. In April 2019, a total of 1,325 gallons of potassium permanganate solution was injected into IW12, IW53, and IW58 to treat groundwater in the vicinity of MW05, MW12, and MW16A. In May 2021, a total of 1,440 gallons of potassium permanganate solution was injected into MW05, MW12, IW03, and IW58 to treat groundwater in the vicinity of MW05 and MW12.

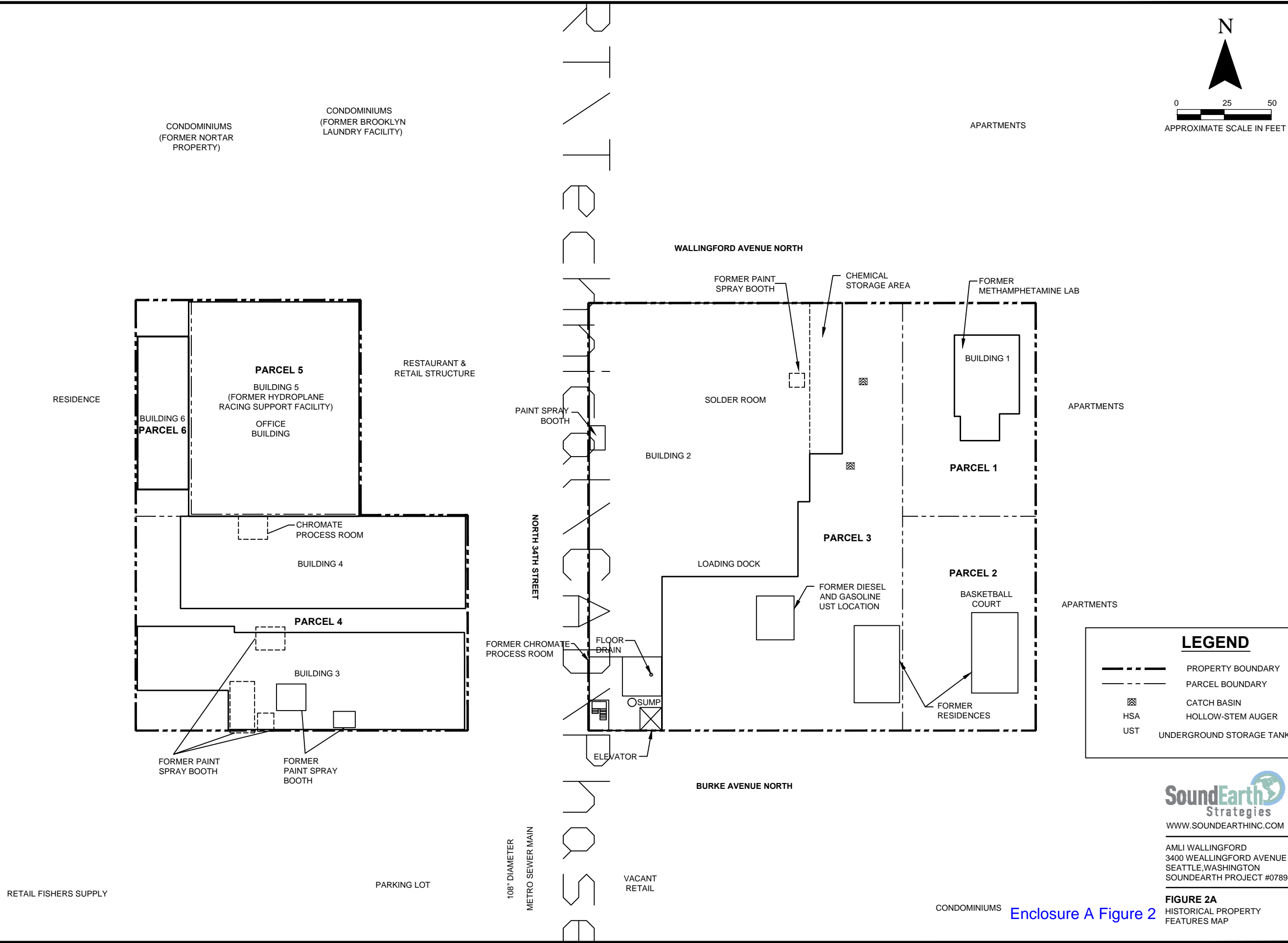
Groundwater sampling was conducted to monitor the performance of injections. Results from samples collected from MW05, MW12, MW16A, MW18, and IW08 indicate a slight decrease in TCE concentrations. The most recent samples collected from wells MW05 and MW12 in December 2021 contained TCE concentrations above the Method A cleanup level (**Figure 4**). The current extent of the TCE plume in groundwater following injections is not delineated to the north, south, east, or west.

Soil Vapor. In March 2015, six vertical and three horizontal soil vapor extraction (SVE) wells were installed on the Property to mitigate potential soil vapors sourced from contaminated groundwater below the Property (**Figure 7**). Vertical SVE wells were installed with 12-13 foot screened intervals installed from approximately 4-18 feet bgs (63 to 50 feet amsl). Horizontal wells were installed at an elevation of approximately 64.6 feet amsl. The SVE system began operation on January 17, 2017 and is currently in operation. The system removed approximately 4.6 pounds of chlorinated solvents from the soil vapor by April 17, 2017. The SVE system was shut down in December 2020.

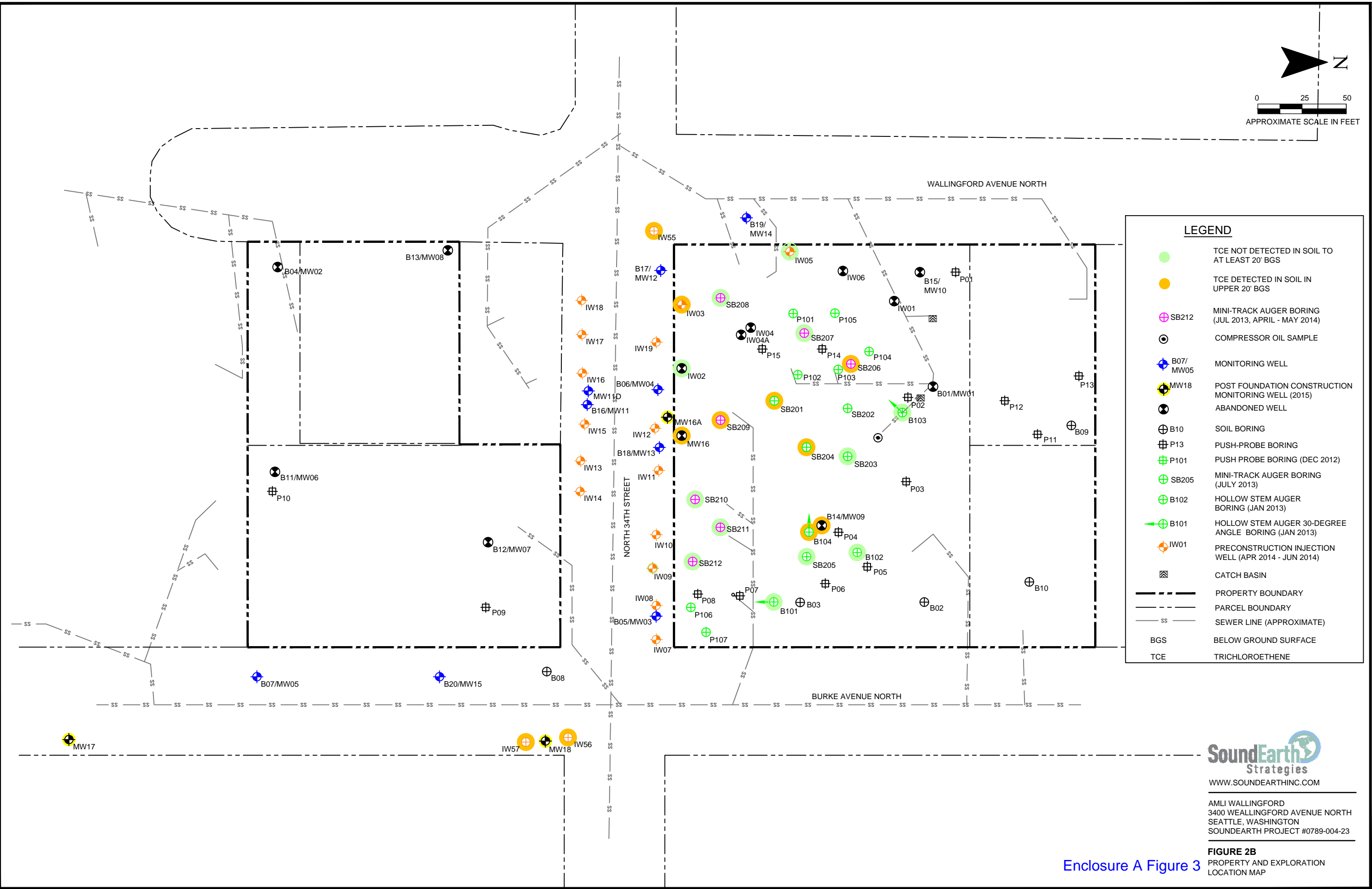
To date, soil vapor at the Site has not been sampled for Site COCs. The most recent groundwater samples collected from MW12 and MW05 contained concentrations of TCE above the Method B screening level for vapor intrusion.



7/9/2015
P:\0789 AMLI RESIDENTIAL\0789-004 AMLI AVTECH\TECHNICAL\CAD\2017 ICAR\0789-004-2015\ICAR_FIG2A.DWG



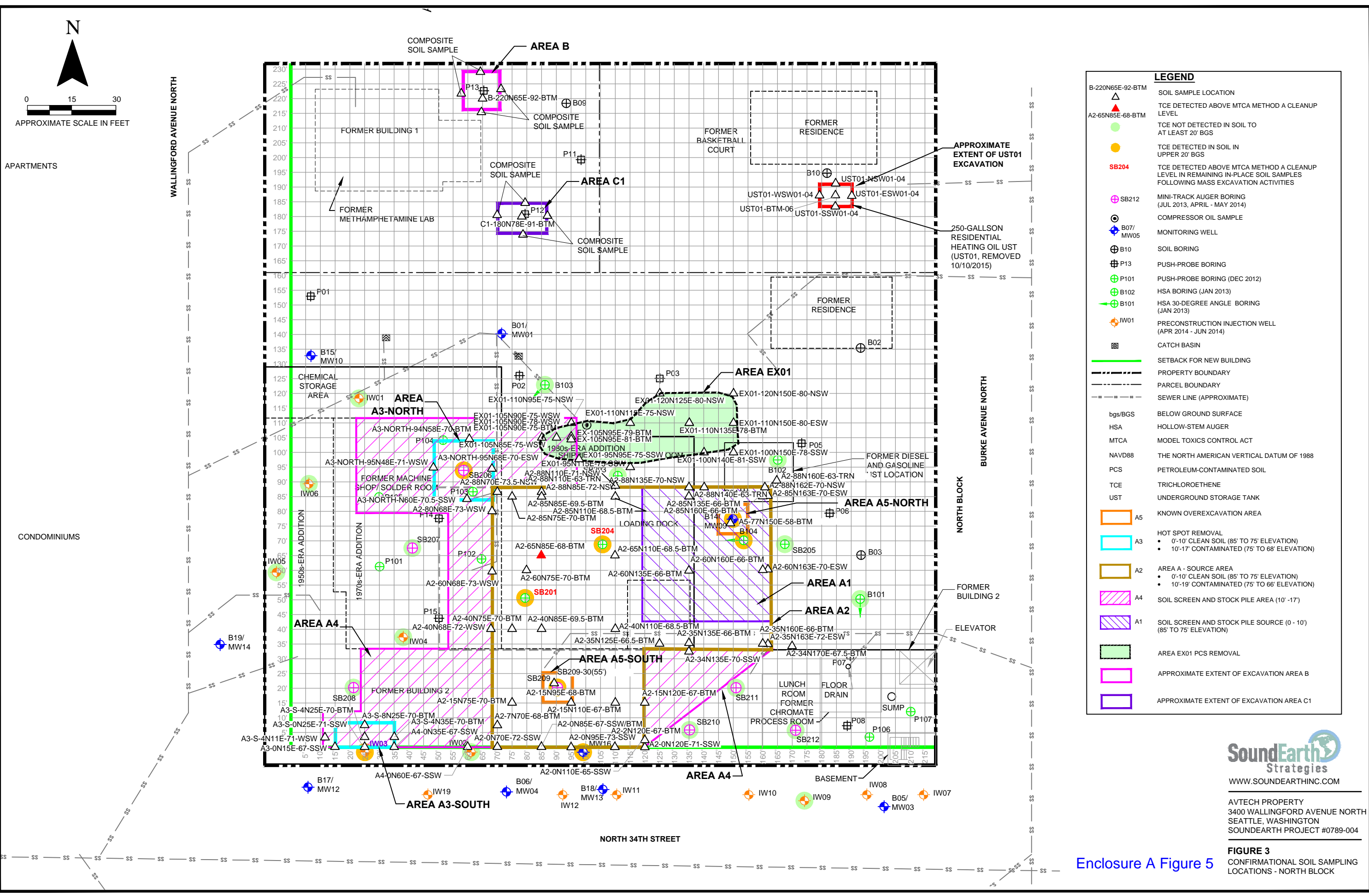
Enclosure A Figure 2



Enclosure A Figure 3

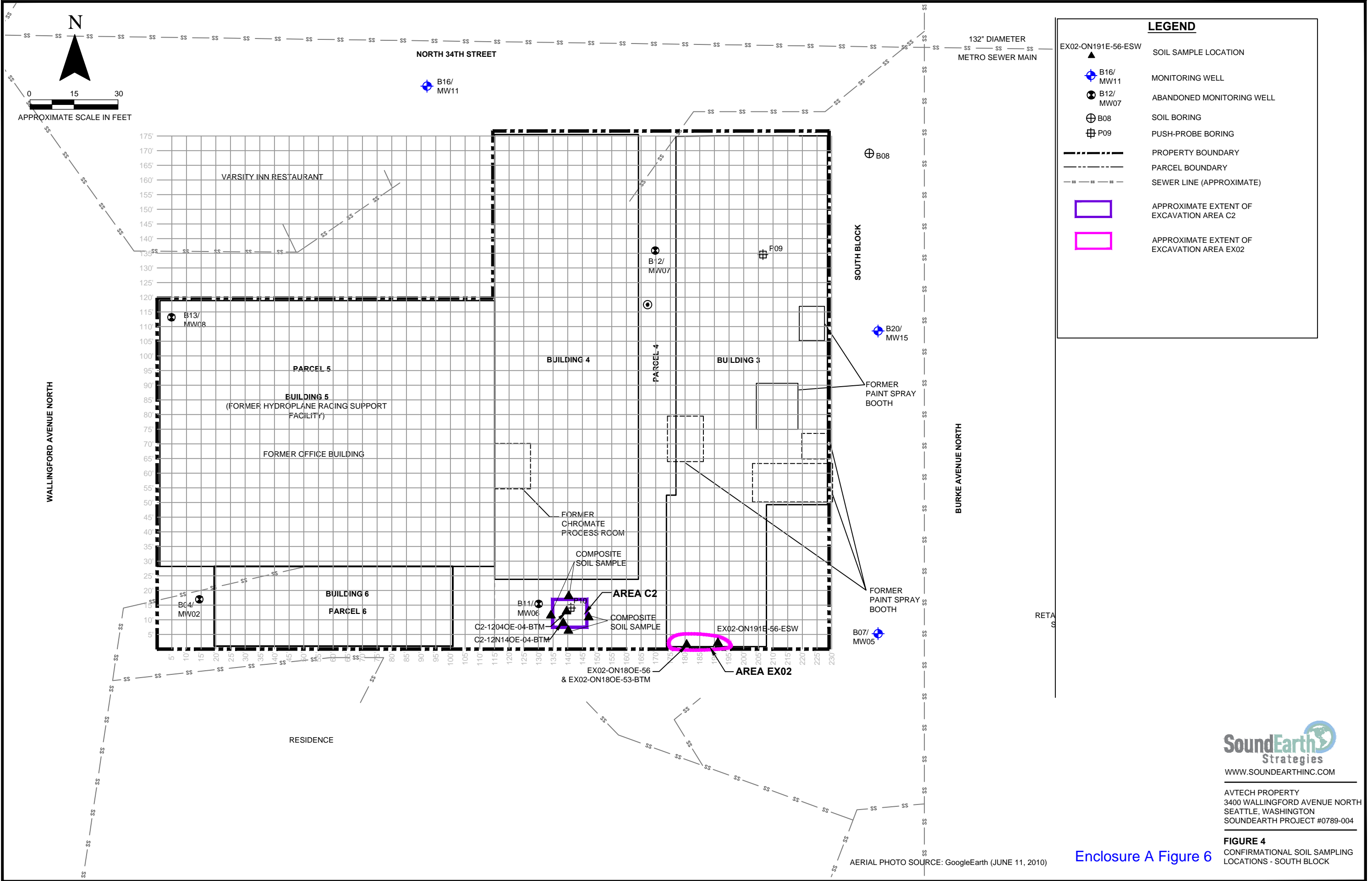


6/7/2017
P:\0789 AMLI RESIDENTIAL\0789-004 AMLI AVTECH\TECHNICAL\CAD\2017 ICAR\0789-004-2015\ICAR_FIG3.DWG



Enclosure A Figure 5

10/22/2015
P:\0789 AMLI RESIDENTIAL\0789-004 AMLI AVTECH\TECHNICAL\CAD\2017 ICAR\0789-004-2015\ICAR_FIG4.DWG

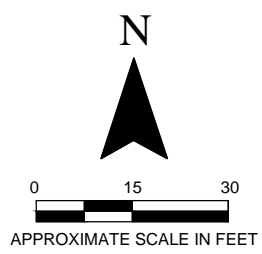
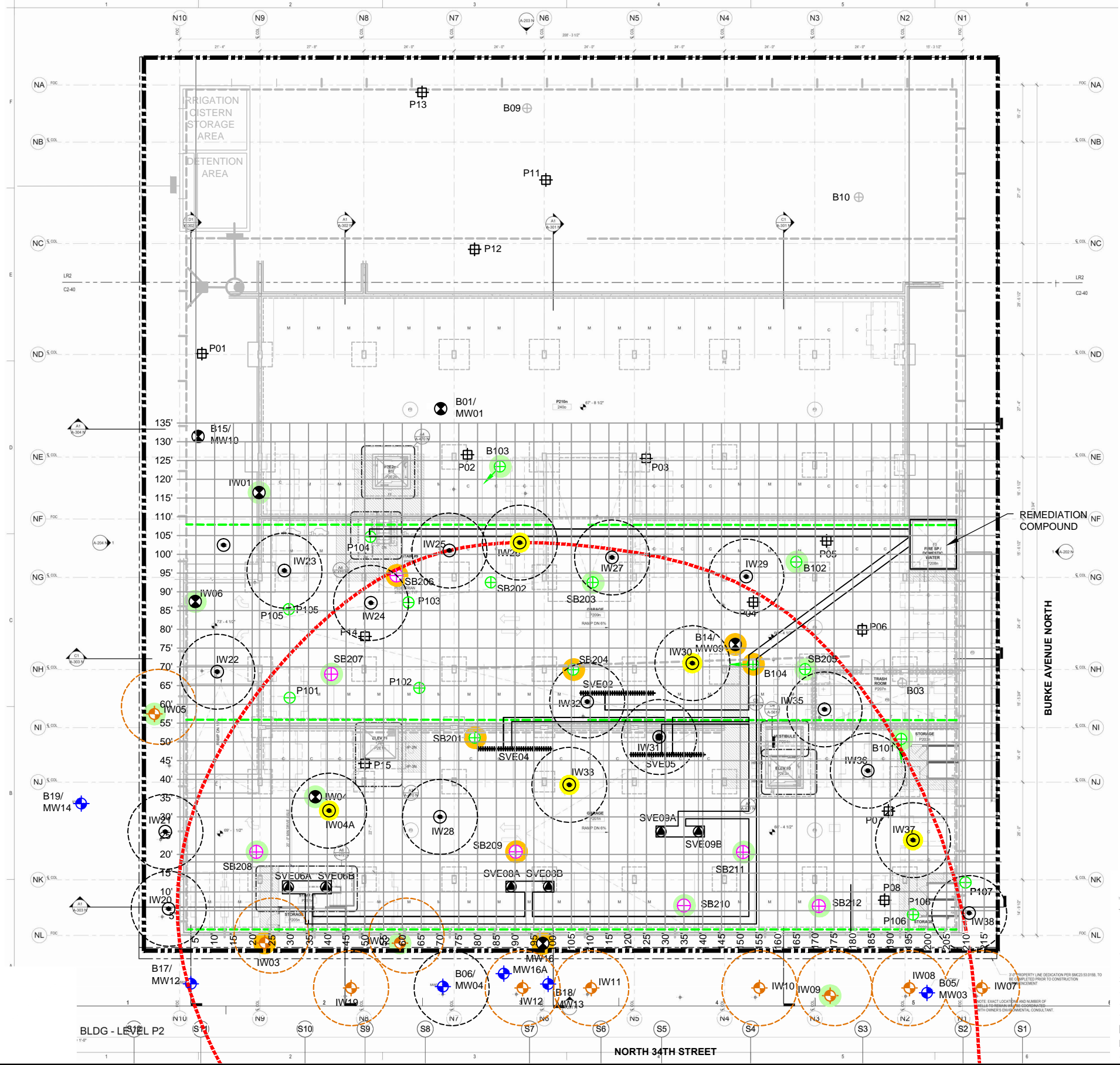


AVTECH PROPERTY
3400 WALLINGFORD AVENUE NORTH
SEATTLE, WASHINGTON
SOUNDEARTH PROJECT #0789-004

LEGEND

- TCE NOT DETECTED IN SOIL TO AT LEAST 20' BGS
- TCE DETECTED IN SOIL IN UPPER 20' BGS
- SVE SOIL VAPOR EXTRACTION WELL
- ⊕ B19/ MW14 MONITORING WELL
- ⊕ B15/ MW10 ABANDONED WELL
- CATCH BASIN
- TCE TRICHLOROETHENE
- FOOTING DRAINS PART OF VAPOR INTRUSION MITIGATION SYSTEM
- HORIZONTAL SVE PIPING
- PROPERTY BOUNDARY
- INJECTION WELL
- RADIUS OF INFLUENCE
- PRECONSTRUCTION INJECTION WELL
- IW22 INJECTION WELL (TEMPORARY)
- IW33 INJECTION WELL (PERMANENT)
- APPROXIMATE EXTENT OF TCE ABOVE MTCA CLEANUP LEVEL (5 µg/L)
- BGS BELOW GROUND SURFACE
- µg/L MICROGRAMS PER LITER

MAP SOURCE: ALTA/ACSM LAND TITLE SURVEY BUSH, ROED & HITCHINGS, INC. FEBRUARY 2012
BLDG PLAN SOURCE: SHEET A-120N, GGLO, JUNE 2014



Enclosure A Figure 7

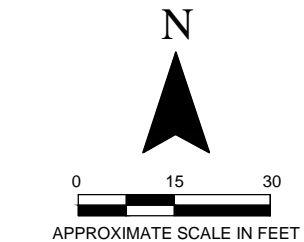
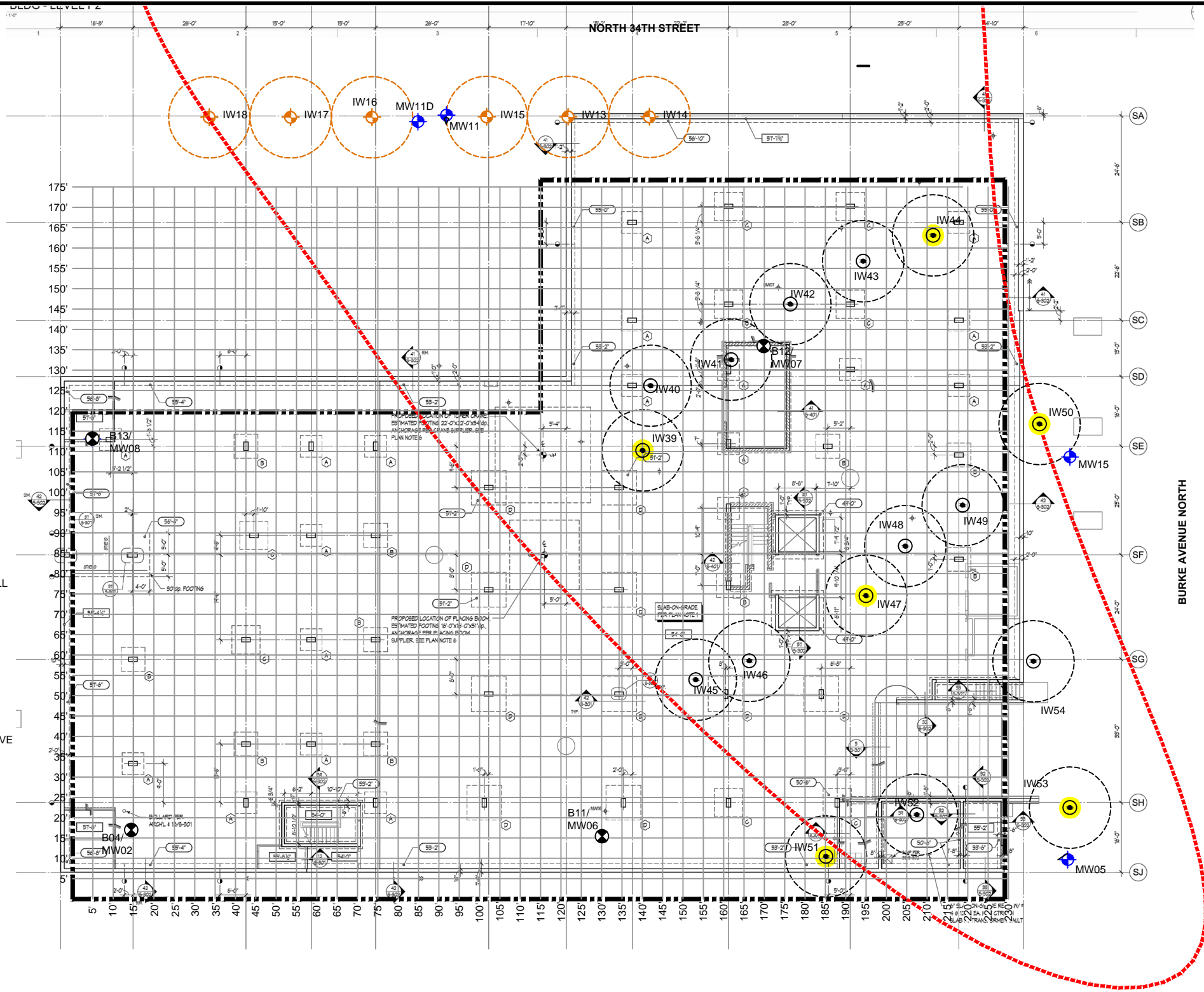
SoundEarth Strategies
WWW.SOUNDEARTHINC.COM
AVTECH PROPERTY
3400 WALLINGFORD AVENUE NORTH
SEATTLE, WASHINGTON
SOUNDEARTH PROJECT #0789-004

FIGURE 5
INJECTION WELL LOCATION AND
SVE SYSTEM MAP - NORTH BLOCK

LEGEND

- MW11 MONITORING WELL
- B13/ MW08 ABANDONED WELL
- CATCH BASIN
- HORIZONTAL SVE PIPING
- PROPERTY BOUNDARY
- INJECTION WELL
- RADIUS OF INFLUENCE
- PRECONSTRUCTION INJECTION WELL
- IW40 INJECTION WELL (TEMPORARY)
- IW39 INJECTION WELL (PERMANENT)
- APPROXIMATE EXTENT OF TCE ABOVE MTCA CLEANUP LEVEL (5 µg/L)
- µg/L MICROGRAMS PER LITER

MAP SOURCE: ALTA/ACSM LAND TITLE SURVEY BUSH, ROED & HITCHINGS, INC. FEBRUARY 2012
BLDG PLAN SOURCE: SHEET A-120N, GGLO, JUNE 2014



Enclosure A Figure 8
FIGURE 6
INJECTION WELL LOCATION MAP - SOUTH BLOCK

Enclosure B

Basis for the Opinion: List of Documents

1. Sound Earth Strategies, Inc., *Remedial Injection and Groundwater Monitoring Work Plan, AMLI Wallingford Property, 3400 Wallingford Avenue North, Seattle, Washington 98103*, June 13, 2022.
2. Sound Earth Strategies, Inc., *Third Quarter 2017 Groundwater Monitoring Report, Former Avtech Property (AMLI Wallingford), 3400 Wallingford Avenue North, Seattle, Washington* October 18, 2017.
3. Sound Earth Strategies, Inc., *Second Quarter 2017 Groundwater Monitoring Report, Former Avtech Property (AMLI Wallingford), 3400 Wallingford Avenue North, Seattle*, August 23, 2017.
4. Sound Earth Strategies, Inc., *Cleanup Action Report, AMLI Wallingford Property, 3400 Wallingford Avenue North, Seattle, Washington 98103*, June 19, 2017.
5. Sound Earth Strategies, Inc., *First Quarter 2017 Groundwater Monitoring Report, Former Avtech Property (AMLI Wallingford), 3400 Wallingford Avenue North, Seattle*, May 16, 2017.
6. Washington State Department of Ecology (Ecology), *Opinion on Proposed Cleanup of a Property associated with a Site: Avtech Corp. 3400 Wallingford Ave. N., Seattle, WA*, October 22, 2014.
7. Sound Earth Strategies, Inc., *RI/FS/CAP Addendum, Avtech Corporation Property, 3400 Wallingford Avenue North, Seattle, Washington*, August 6, 2014.
8. Sound Earth Strategies, Inc., *Draft Cleanup Action Plan, Avtech Corporation, 3400 Wallingford Avenue North, Seattle, Washington 98103*, March 14, 2014.
9. Farallon Consulting, *Comments Regarding Draft Remedial Investigation and Feasibility Study Report, Avtech Site, 3400 Wallingford Avenue North, Seattle, Washington*, March 7, 2014.
10. Sound Earth Strategies, Inc., *Draft Remedial Investigation and Feasibility Study Report, Avtech Property, 3400 Wallingford Avenue North, Seattle, Washington 98103*, January 10, 2014.
11. Sound Earth Strategies, Inc., *Groundwater Monitoring Report – Fourth Quarter 2013, Avtech Property, 3400 Wallingford Avenue North, Seattle, Washington*, January 8, 2014.
12. Sound Earth Strategies, Inc., *Work Plan, In Situ Chemical Oxidation Pilot Test, Avtech Property, 3400 Wallingford Avenue North, Seattle, Washington*, August 20, 2013.
13. Sound Earth Strategies, Inc., *Supplemental Subsurface Soil Assessment – Loading Dock Area, Avtech Wallingford (Building 2), 3400 Wallingford Avenue North, Seattle, Washington*, August 14, 2013.

14. Sound Earth Strategies, Inc., *Groundwater Monitoring Report – Third Quarter 2013, Avtech Property, 3400 Wallingford Avenue North, Seattle, Washington*, August 8, 2013.
15. Sound Earth Strategies, Inc., *Phase II Environmental Assessment, Wallingford Property, 3400 Wallingford Avenue North, Seattle, Washington*, February 17, 2012.