GeoEngineers

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December 18, 2009

Tacoma Public Works, Facilities Management
747 Market Street, Room 744
Tacoma, Washington 98402

Attention: Joshua M. Clarke

Subject: Letter Report
Environmental Consultation Services
Pacific Plaza Building
Underground Storage Tank
Tacoma, Washington
File No. 16574-001-03

INTRODUCTION

We are pleased to provide environmental consultation services to the City of Tacoma regarding the former underground storage tank (UST) at the Pacific Plaza building located at 1250 Pacific Avenue in Tacoma, Washington. The property is herein referred to as the "site." See Figure 1 for a Vicinity Map.

Our understanding of this project is based on previous work completed at the site and information provided by you and Calvin Taylor of the City of Tacoma. We understand the Washington State Department of Ecology (Ecology) issued a letter, dated September 17, 2009, to the City of Tacoma indicating the site was added to the State Cleanup Site database.

PURPOSE AND SCOPE OF SERVICES

The purpose of our services was to assist the City of Tacoma in preparing the response letter to Ecology. Our scope of services included the following:

1. Reviewed historical boring logs and geologic maps in the area of the site, as available and appropriate, to evaluate the soil and groundwater conditions.
2. Performed an interview via telephone with Lonnie Sohult of Absher Construction who was on site during construction of the elevator shaft to obtain additional information regarding the soil conditions at the site.
3. Developed a schematic cross section of the soils in the area of the UST based on our research.
4. Attended one meeting with Calvin Taylor, City of Tacoma, to present the schematic cross section and discuss future action.

5. Prepared a draft letter report summarizing the soils and depth of groundwater near the UST for your review and comment.

6. Prepared this final letter report summarizing the soils and depth of groundwater near the UST.

BACKGROUND

A former building was constructed on the site in at least 1885 based on the report titled "*Phase I Environmental Site Assessment, South Park Garage Site"*, dated May 23, 2007 completed by GeoEngineers for the City of Tacoma. The building was demolished in the 1970s and the existing parking structure was constructed. The structure was remodeled in 2008, which included the addition of office space built on top of the parking structure.

One heating fuel/Bunker C single-walled UST was encountered during remodeling of the existing parking garage at the site. The UST was located beneath the Pacific Avenue sidewalk and appeared to be associated with the former building. The UST, approximately 700 gallons of petroleum product, and the majority of the associated petroleum-contaminated soil were removed in April 2008. The UST removal and associated remedial excavation are summarized in the report titled "Underground Storage Tank Removal, Pacific Plaza Garage, 1250 Pacific Avenue, Tacoma, Washington" dated December 31, 2008, completed by GeoEngineers.

Petroleum-contaminated soil was observed in the excavation following removal of the UST. The majority of the petroleum-contaminated soil was removed on April 14, 2008. Additional soil was removed from the bottom of the eastern portion of the excavation on April 15, 2008 prior to backfilling with a controlled density fill (CDF). Approximately 472 tons of petroleum-contaminated soil was removed from the site during the UST closure activities. The extent of the remedial excavation was limited due to the following: 1) a Comcast utility line to the east, 2) column footings to the north and south, 3) the edge of the right-of-way (ROW) to the west and 4) limited access for the construction equipment in the area.

Ten confirmation soil samples were collected from the base and sidewalls of the remedial excavation for chemical analysis. The samples were submitted for analysis of diesel- and oil-range petroleum hydrocarbons by Ecology-approved Method NWTPH-Dx. Two samples were also submitted for RCRA metals by Environmental Protection Agency (EPA) 6000/7000 series, volatile organic compounds (VOCs) by EPA Method 8260 and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270-SIM.

Diesel- and oil-range petroleum hydrocarbons were detected at concentrations (5,790 milligrams per kilogram [mg/kg] and 9,030 mg/kg, respectively) greater than the Model Toxics Control Act (MTCA) Method A cleanup levels (2,000 mg/kg) in soil sample Conf-Btm collected from the base of the eastern portion of the excavation (see Figure 2 and Table 1). Sample Conf-Btm was collected from beneath the UST at a depth of approximately 10.5 feet below ground surface (bgs). Additional excavation occurred to a depth of approximately 11 feet bgs in the area where soil sample Conf-Btm was collected. A soil sample (Conf-Btm-02) was collected at the base of the excavation at a depth of approximately 11 feet bgs following the additional excavation. Diesel- and oil-range petroleum hydrocarbons were detected at concentrations (203 mg/kg and 284 mg/kg, respectively) less than the MTCA Method A cleanup levels in soil sample Conf-Btm-02. Additional potentially contaminated soil was not removed along the eastern portion of the excavation adjacent to Pacific Avenue because of caving of the sidewalls adjacent to the footings and the underground Comcast utility line (see Figure 2).

Oil-range petroleum hydrocarbons were detected in soil at concentrations slightly greater than the MTCA Method A cleanup levels in the northwest portion of the excavation at a depth of approximately 9.5 feet bgs in sample Conf-Btm-NW (2,010 mg/kg). Additional excavation was not feasible in the northwest portion of the excavation because of limited equipment access.

Analytical results for the remainder of the confirmation samples were either not detected or detected at concentrations less than the respective MTCA Method A cleanup levels.

SITE CONDITIONS

Surface Conditions

The site is located within downtown Tacoma. Pacific Avenue, South 13th Street and Commerce Street bound the site to the east, south and west, respectively. The site is bound to the north by a stairway and existing building. The entire site is occupied by the existing structure. The ground surface along 13th Street slopes down to the east. Commerce Street is approximately 15 feet higher than Pacific Avenue. The soil in the vicinity of the building is paved with asphalt/concrete or covered with buildings.

Geologic Review

It is unknown if a geotechnical report was completed for the Pacific Plaza Garage design and construction in the 1970s. The geotechnical report completed for the redevelopment of the building consisted of a review of previous geotechnical reports and did not include additional subsurface explorations. We reviewed the following reports regarding soil and groundwater conditions.

- Foundation Engineering Study, Pacific First Federal Computer Center, Tacoma, Washington, Hart Crowser and Associates, December 10, 1974.
- Geologic Map of the City of Tacoma, Pierce County, Washington, Open File No. 77-9, Mackey Smith Department of Natural Resources, 1977.
- Ground-Water Hydrology of the Tacoma-Puyallup Area, Pierce County, Washington, Water Resources Investigations Report 99-4013, United States Geological Survey, 1999.
- Report – Geotechnical Engineering Services, Wells Fargo Parking Expansion, GeoEngineers, May 7, 2001.
- Draft Geologic Map of the Tacoma North 7.5 Minute Quadrangle, Pierce and King Counties, Washington. Troost, Kathy, and Derek Booth, August 1, 2002.
- Geotechnical Engineering Study, Proposed Burnham and Root Building Improvements, Tacoma, Washington, GeoEngineers, May 30, 2008.

We also interviewed with Lonnie Sohult, foreman of Absher Construction during redevelopment of the site on December 2, 2009. Lonnie was familiar with the soil conditions encountered during the excavation of the elevator shaft during construction. The elevator shaft is located approximately 25 feet west of the UST remedial excavation.

Subsurface Explorations

A total of 14 borings were previously completed by GeoEngineers and others in the vicinity of the site. The depths of the borings ranged between approximately 20 and 40 feet below the Pacific Avenue elevation level at the approximate locations shown on Figure 3. Detailed logs of the borings were not available for all the borings discussed in the Hart Crowser 1974 report, however, the borings were interpreted by Hart Crowser in two cross-sections provided in their report.

Subsurface Conditions

The site and surrounding area is underlain by glacial sediments based on a review of available published geologic maps. The *Geologic Map of the City of Tacoma, Washington* indicates the predominant geologic unit at the project site is glacial till (Qvt). This unit typically is comprised of a poorly sorted, non-stratified mixture of clay, silt, sand, pebbles, cobbles and occasional boulders. The downtown Tacoma area has been remapped in the *Draft Geologic Map of the Tacoma South 7.5 Minute Quadrangle, Washington* (Troost, in review) as ice-contact deposits (Qvi). Ice-contact deposits can consist of several materials including glacial till, fluvial sand and gravel. Both units were deposited during the Fraser glaciations and are compact and characterized as having low infiltration and permeability rates. The glacial till and ice contact deposit units are herein referred to as "dense glacial deposits."

Fill was encountered in the surficial soils to depths ranging from 4 to 10 feet bgs based on our review of the previous borings and observations during the construction activities. The fill consisted of loose to medium dense sand with gravel and silt to silty sand with gravel. The fill was underlain by very dense gray silty sand with gravel. This unit is interpreted as dense glacial deposits. The dense glacial deposits were encountered at a depth of approximately 10 feet bgs during the excavation for the elevator shaft. A stiff to hard gray silt was observed beneath the dense glacial deposits in two borings completed approximately 315 feet southwest and 150 southeast of the former UST. We interpret the gray silt as lacustrine deposits from an ice dam lake. The dense and low permeability soils extended to the depths of the borings explored.

In general, we interpret the soils to consist of fill overlying dense glacial deposits based on observations at the site and our review of the identified documents. Perched groundwater is present within the fill unit overlying the dense glacial deposits at the site. Our interpretation of subsurface conditions in the vicinity of the site is presented in the cross section provided as Figure 4.

Groundwater

The *Ground-Water Hydrology of the Tacoma-Puyallup Area, Pierce County, Washington* indicates a semi-confining unit (Qvt) is present at the surface of the site and a aquifer (Qc1) is present approximately 50 feet below the Qvt. The native soil observed in the vicinity of the subject building is dense glacial deposits typically consisting of very dense silty sand with gravel based on our review of previous geotechnical reports. The dense glacial deposits extend to a depth of at least 35 feet below Pacific Avenue elevation level where a stiff to hard silt was observed. The dense glacial deposits have a low permeability and are considered a semi-confining unit for aquifer (Qc1). Perched groundwater was identified above and within sand/gravel seams in the Qvt/Qvi glacial units based on our review of previous geotechnical reports identified above and observations during UST removal excavation activities.

CONCLUSIONS AND RECOMMENDATIONS

MTCA cleanup levels are based on the three pathways for contaminants to impact human health and the environment: 1) direct contact pathway, 2) vapor pathway and 3) leaching pathway. The following is a discussion of the remedial activities on the site and the risk to the human health and the environment of remaining petroleum-contaminated soil relative to these pathways.

A UST containing Bunker-C was removed from the site in April 2008. The UST was located beneath the sidewalk and was likely unused since at least the 1970s when the former buildings were demolished. The source (700 gallons of product inside the UST) and the majority of the petroleum-contaminated soil (472 tons) were also removed. The excavation was backfilled with about 9.5 to 11 feet of CDF. The new Pacific Plaza building has been built over the excavation area.

Minor oil-range petroleum hydrocarbons remain in soil within the base of the northwest portion of the excacvation at a concentration (2,010 mg/kg) greater than the MTCA Method A cleanup level at a depth of approximately 9.5 feet bgs. Potential petroleum-contaminated soil may exist along the eastern portion of the excavation at a depth of 10.5 to 11 feet bgs. The vertical extent of the petroleum contamination was delineated at 11 feet bgs in the area of the former UST (source). The Bunker-C product does not appear to have migrated below 11 feet bgs based on the esults of our sampling and chemical analysis.

The following is a discussion of the risk to the human health and the environment of remaining petroleum-contaminated soil relative to MTCA cleanup level pathways:

- **Direct Contact Pathway**: The CDF and building provide an institutional control for the petroleum-contaminated soil thereby minimizing the dermal contact (ingestion and dermal absorption) for human health and the environment per MTCA regulations Chapter 173-340 Washington Administrative Code (WAC).
- **Vapor Intrusion Pathway:** VOCs were either not detected or were detected at concentrations less than MTCA Method A cleanup levels in soil samples analyzed (Conf-btm-E and Conf-W. Wall-01) (see Table 2). The base of the excavation is also covered with 9.5 to 11 feet of CDF. The risk of vapors from the Bunker-C product impacting human health and the environment is minimal based on the soil analytical results.
- **Leaching Pathway**: At least 25 feet of dense glacial deposits and approximately 10 feet of stiff to hard silt is located beneath the UST excavation based on our review of the previous geotechnical reports and geologic maps for the area. The dense glacial deposits have a low permeability and are considered a semi-confining unit for aquifer (Qc1). The vertical extent of the petroleum contamination was delineated at 11 feet bgs in the area of the former UST. The potential for the petroleum contamination to migrate vertically to the Qc1 aquifer is minimal based on the following: 1) removal of the source and the majority of the petroleum-contaminated soil, 2) minimal petroleum contamination left at the site, 3) the type of petroleum product (Bunker-C) and extent of migration since at least the 1970s, and 4) the thickness of the dense glacial deposits below the UST (at least 30 plus feet) overlying the aquifer (Qc1).

There is minimal risk to the human health and the environment via the direct contact, vapor, and leaching pathways based on the analytical results, institutional controls in place, migration potential and the interpreted hydrogeologic conditions within the area.

LIMITATIONS

This environmental review has been prepared for use by City of Tacoma. GeoEngineers has performed this environmental review of the Pacific Plaza Building located in Tacoma, Washington, in general accordance with the scope and limitations of our proposal.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted environmental science practices for environmental reviews in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix A titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.

Thank you,

GeoEngineers

Tricia S. DeOme
Environmental Geologist

Terry R. McPhetridge, LG, LHG
Associate

TSD:TRM:tt

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Attachments:

Table 1. Summary Of Chemical Analytical Results For Petroleum And Metals – Soil

Table 2. Summary Of Chemical Analytical Results For VOCs And SVOCs - Soil

Figure 1. Vicinity Map

Figure 2. Site Plan

Figure 3. Cross Section and Previous Boring Locations

Figure 4. Cross Section A-A'

Appendix A. Report Limitations and Guidelines for Use

TABLE 1

SUMMARY OF CHEMICAL ANALYTICAL RESULTS FOR PETROLEUM AND METALS[1] - SOIL

PACIFIC PLAZA BUILDING - UST REMOVAL

TACOMA, WASHINGTON

Sample ID[5]	Sample Date	Approximate Depth (feet bgs)	NWTPH -HCID[2]			NWTPH-Dx[3] (mg/kg)		RCRA[4] Metals (mg/kg)							
			Diesel Range	Oil Range	Gasoline Range	Diesel Range	Oil Range	Arsenic	Barium	Cadmium	Total Chromium	Lead	Mercury	Selenium	Silver
Product Sample															
UST-Product-080410	4/10/08	N/A	U	Detected[6]	U	--	--	--	--	--	--	--	--	--	--
Confirmation Samples															
Conf-Btm-E	4/14/08	10.5	--	--	--	**5,790**	**9,030**	U(5)	34	U(0.3)	19	U(4)	U(0.05)	U(8)	U(0.7)
Conf-Btm-E-02	4/15/08	11	--	--	--	203	284	--	--	--	--	--	--	--	--
Conf-Btm-SW	4/14/08	10.5	--	--	--	U(10.0)	U(100)	--	--	--	--	--	--	--	--
Conf-Btm-NW	4/14/08	9.5	--	--	--	1,340	**2,010**	--	--	--	--	--	--	--	--
Conf-Pipe	4/24/08	3	--	--	--	U(10.0)	U(100)	--	--	--	--	--	--	--	--
Conf-S. Wall	4/14/08	9.5	--	--	--	839	1,060	--	--	--	--	--	--	--	--
Conf-W. Wall -01	4/14/08	10	--	--	--	U(10.0)	U(100)	U(5)	42	U(0.3)	24	U(4)	U(0.05)	U(8)	U(0.7)
Conf-W. Wall -02	4/14/08	9	--	--	--	U(10.0)	U(100)	--	--	--	--	--	--	--	--
Conf- E. Wall	4/14/08	9.5	--	--	--	U(10.0)	U(100)	--	--	--	--	--	--	--	--
Conf-N. Wall	4/14/08	9	--	--	--	U(10.0)	U(100)	--	--	--	--	--	--	--	--
MTCA Method A Soil Cleanup Levels for Unrestricted Land Use (ULU)			N/A	N/A	N/A	2,000	2,000	20	5,600 [7]	2.0	2,000	250	2.0	400 [7]	400 [7]
MTCA Method A Soil Cleanup Levels for Industrial Land Use (ILU)			N/A	N/A	N/A	2,000	2,000	20	245,000 [8]	2.0	2,000	1,000	2.0	17,500 [8]	17,500 [8]

Notes:

[1] Chemical analysis performed by Spectra Laboratories of Tacoma, Washington.

[2] Hydrocarbon identification by Washington State Department of Ecology Method NWTPH-HCID.

[3] Washington State Department of Ecology Method NWTPH-Dx with acid/silica gel cleanup.

[4] Resource Conservation Recovery Act (RCRA) metals analyzed by EPA 6000/7000 Series Method.

[5] Sample ID -Confirmation sample - Wall or bottom - Location or sample number i.e., Confirmation west wall sample = Conf-W. Wall-01.

[6] Laboratory report indicates product sample contains oil-range pretroleum hydrocarbons that appear in the Bunker C-range.

[7] MTCA Method B ULU cleanup level represented because MTCA Method A cleanup level has not been established.

[8] MTCA Method C ILU cleanup level represented because MTCA Method A cleanup level has not been established.

mg/kg = milligram per kilogram

— = Not Analyzed

U = Analyte was not detected at or greater than the listed reporting limit

MTCA = Model Toxics Control Act

bgs = below ground surface

Bold type indicates that the detected concentration is greater than the respective MTCA cleanup level.

TABLE 2

SUMMARY OF CHEMICAL ANALYTICAL RESULTS FOR VOCs AND SVOCs[1] - SOIL

PACIFIC PLAZA BUILDING - UST REMOVAL

TACOMA, WASHINGTON

Chemical	Sample ID[2]		MTCA Method A ULU Cleanup Level	MTCA Method A ILU Cleanup Level
	Conf-W. Wall -01	Conf-Btm-E		
Depth (feet bgs)	10	10.5		
VOCs[3](mg/kg dry weight)				
Benzene	U(0.005)	U(0.025)	30	30
Toluene	U(0.005)	U(0.05)	7,000	7,000
Ethylbenzene	U(0.005)	U(0.025)	6,000	6,000
Total Xylenes	U(0.01)	U(0.05)	9,000	9,000
Methylene chloride	U(0.01)	U(0.10)	20	20
sec-Butylbenzene	U(0.005)	0.75	NE	NE
tert-Butylbenzene	U(0.005)	0.046	NE	NE
N-Propylbenzene	U(0.005)	0.56	NE	NE
1,2,4 Trimethylbenzene	U(0.005)	U(0.025)	4,000[5]	180,000[6]
1,3,5 -Trimethylbenzene	U(0.005)	U(0.025)	4,000[5]	180,000[6]
Isopropylbenzene	U(0.005)	0.318	8,000[5]	350,000[6]
4-Isopropyltoluene	U(0.005)	0.046	NE	NE
n-Butylbenzene	U(0.005)	1.18	NE	NE
Naphthalene	U(0.003)	0.128	5	5
Tetrachloroethene	U(0.005)	U(0.025)	50	50
SVOCs[4] (mg/kg dry weight)				
Acenaphthene	U(0.003)	0.70	4,800 [5]	210,000 [6]
Acenaphthylene	U(0.003)	0.35	NE	NE
Anthracene	U(0.003)	0.13	24,000 [5]	1,050,000 [6]
Benzo (ghi) perylene	U(0.003)	0.036	NE	NE
Fluoranthene	U(0.003)	0.10	3,200 [5]	140,000 [6]
Fluorene	U(0.003)	0.65	3,200 [5]	140,000 [6]
Phenanthrene	U(0.003)	0.50	NE	NE
Pyrene	U(0.003)	0.22	2,400 [5]	105,000 [6]
Benzo (a) anthracene (TEF 0.1)	U(0.003)	0.12	MTCA ULU cleanup level for the sum of all cPAHs is 0.1 mg/kg	MTCA ILU cleanup level for the sum of all cPAHs is 2.0 mg/kg
Benzo (a) pyrene (TEF 1.0)	U(0.003)	0.054		
Benzo (b) fluoranthene (TEF 0.1)	U(0.003)	0.056		
Benzo (k) fluoranthene (TEF 0.1)	U(0.003)	0.032		
Chrysene (TEF 0.01)	U(0.003)	0.21		
Dibenz (a,h) anthracene (TEF 0.1)	U(0.003)	U(0.025)		
Indeno (1,2,3-cd) pyrene (TEF 0.1)	U(0.003)	U(0.025)		
Total TEF of cPAHs (detect only)	--	0.07690	0.1	2.0

Notes:

[1] Chemical analysis performed by Spectra Laboratories of Tacoma, Washington.

[2] Sample ID -Confirmation sample - Wall or bottom - Location or sample number i.e. Confirmation west wall sample = Conf-W. Wall-01

[3] Volatile organic compounds (VOCs) were sampled/analyzed by EPA Method 5035/8260B. Other VOCs were analyzed but not detected.

[4] Semivolatile organic compounds (SVOCs) were analyzed by EPA Method 8270C. CPAHs were analyzed by Method 8270-SIM. Other SVOCs were analyzed but not detected.

[5] MTCA Method B ULU cleanup level represented because MTCA Method A cleanup level has not been established.

[6] MTCA Method C ILU cleanup level represented because MTCA Method A cleanup level has not been established.

MTCA = Model Toxics Control Act TEF = Toxicity Equivalency Factor

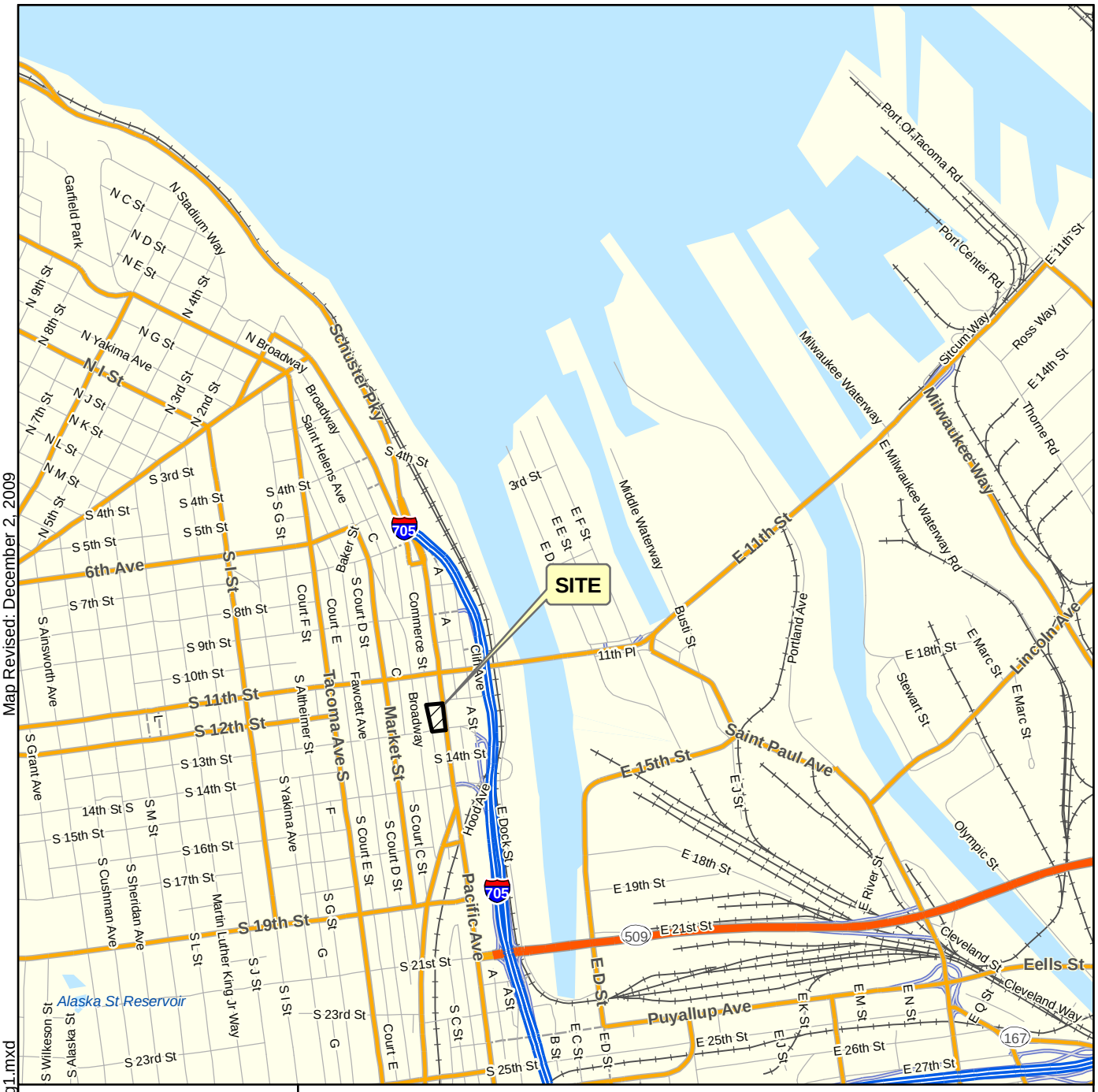
cPAHs = carcinogenic polycyclic aromatic hydrocarbons

mg/kg = milligram per kilogram bgs = below ground surface

ULU = Unrestricted Land Use ILU = Industrial Land Use

NE = Cleanup level not established for this compound

U = Analyte was not detected at or greater than the listed reporting limit



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. can not 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.
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Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Vicinity Map

Pacific Plaza Underground Storage Tank
Tacoma, Washington

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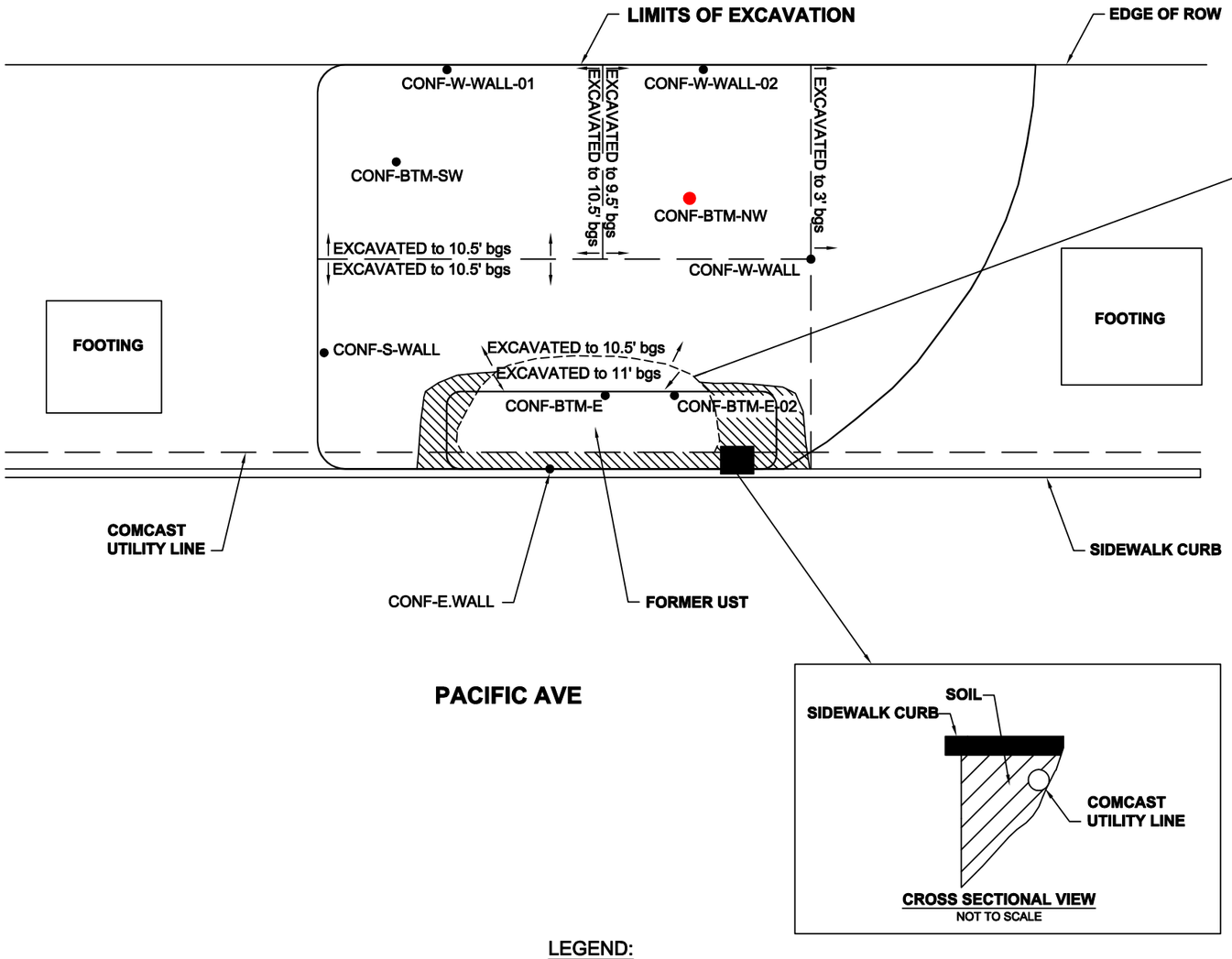
Figure 1

Map Revised: December 2, 2009
Path: P:16/16574001/GIS/16574001 03 fig1.mxd
Office: SEA



Notes:
MTCA = Model Toxics Control Act
BGS = Below Ground Surface
ROW = Right of Way
UST = Underground Storage Tank
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.
Reference: Drawing created by GeoEngineers personnel.

LEGEND:

CONF-W-WALL-02 ●	Soil Sample Location and Label
CONF-BTM-NW ●	Oil-Range Petroleum Hydrocarbons Detected at Concentrations Slightly Greater Than MTCA Method A Cleanup Levels
▨	Potential Area of Petroleum Contaminated Soil Left in Place Because of Limited Access Constraints

Site Plan

Pacific Plaza Underground Storage Tank
Tacoma, Washington

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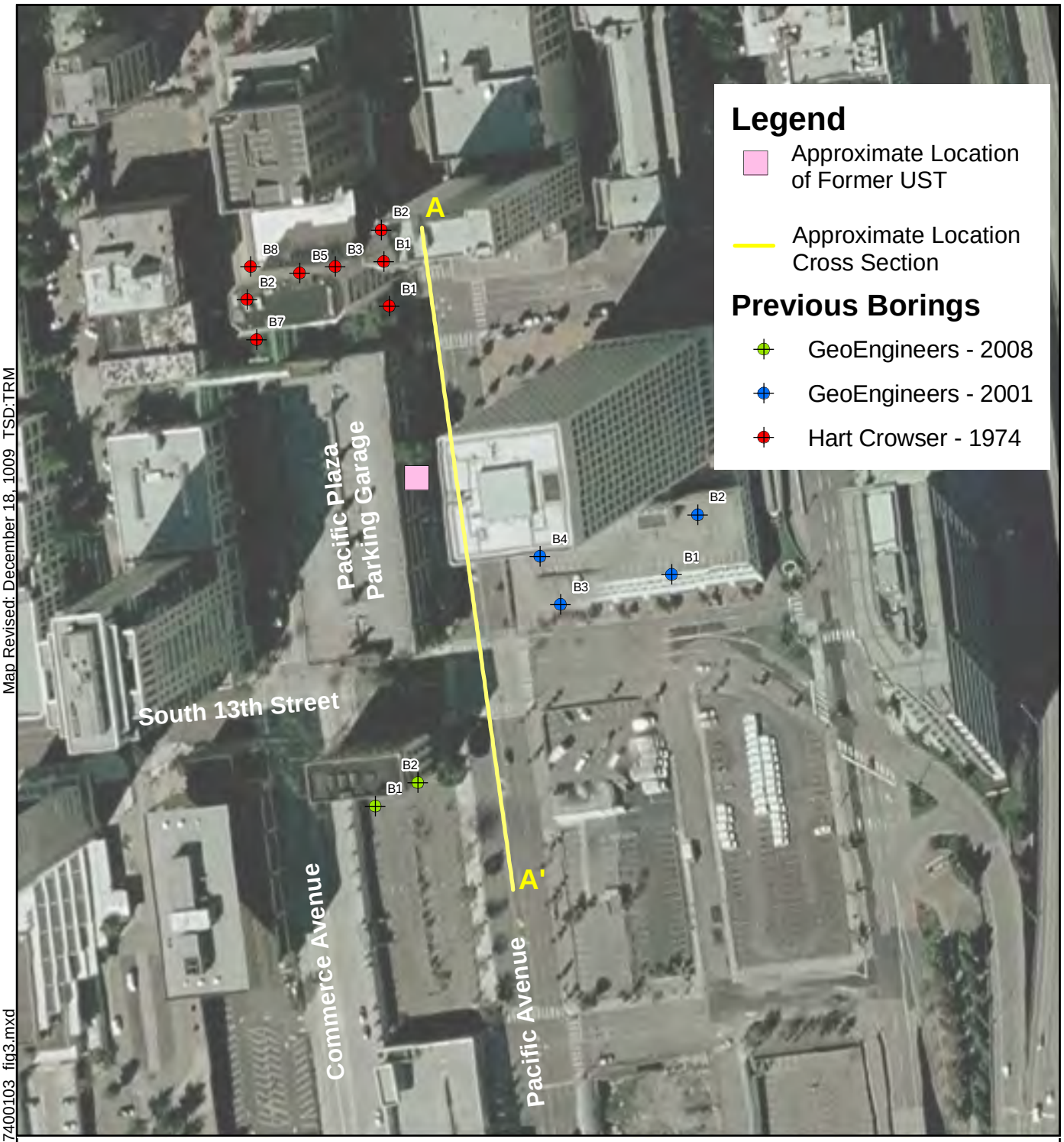
Figure 2



Notes:
UST = Underground Storage Tank
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. can not 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.
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Data Sources: ESRI Data & Maps, Street Maps 2008, 2006 Aerial photograph obtained from http://server.arcgisonline.com/arcgis/services. GeoEngineers 2008 boring locations obtained from Geotechnical Engineering Study, "Proposed Burnham and Root Building Improvements, Tacoma, Washington", GeoEngineers, May 30, 2008. GeoEngineers 2001 borings location obtained from "Report- Geotechnical Engineering Services, Wells Fargo Parking Expansion", GeoEngineers, May 7, 2001. Hart Crowser 1974 boring locations obtained from "Foundation Engineering Study, Pacific First Federal Computer Center, Tacoma, Washington," Hart Crowser and Associates, December 10, 1974.
Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

N W E S

150 0 150
Feet

Cross Section and Previous Boring Locations

Pacific Plaza Underground Storage Tank
Tacoma, Washington

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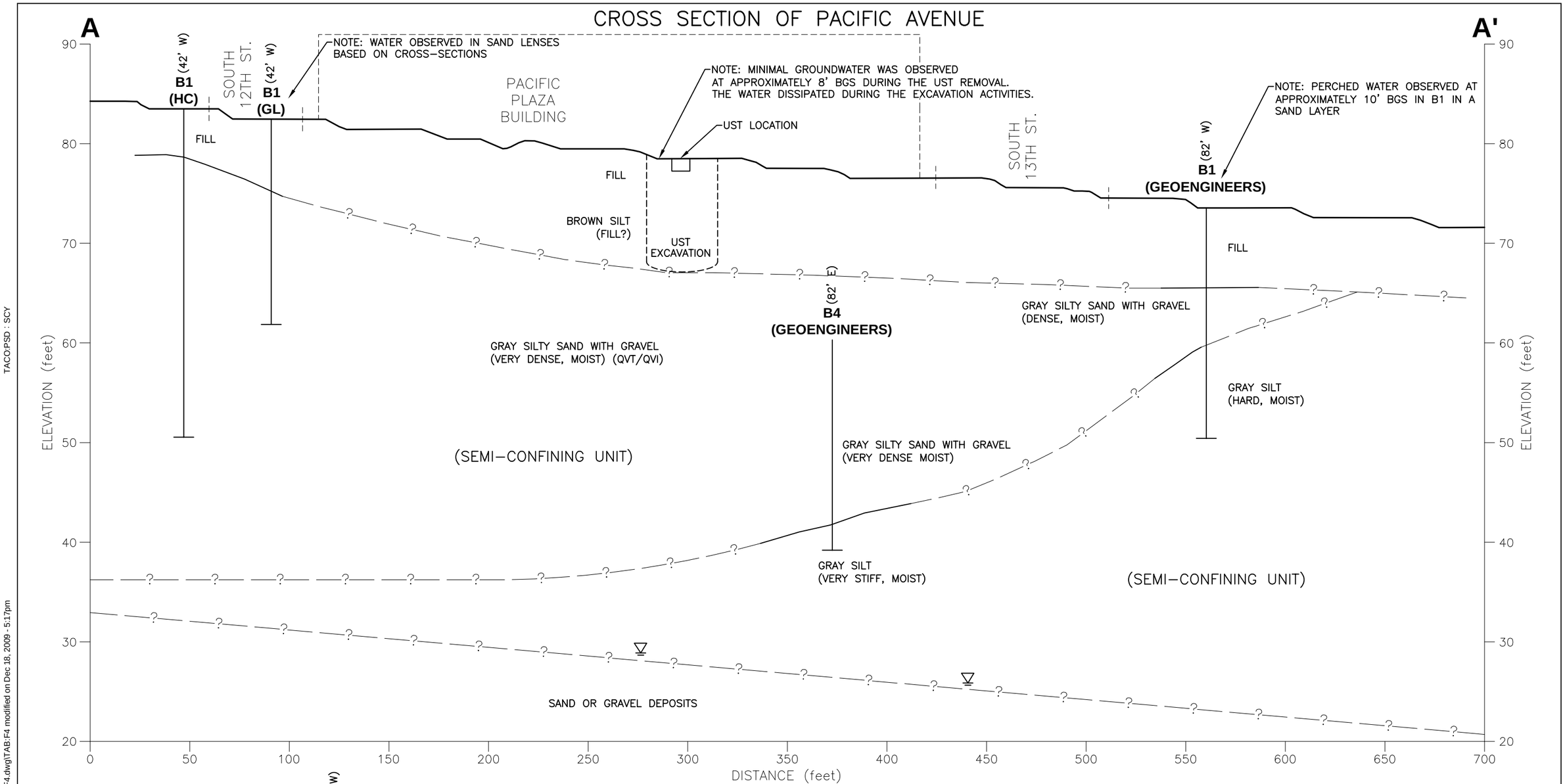
Figure 3

Map Revised: December 18, 1009 TSD:TRM
Path: P/16/16574001/GIS/16574001O3 fig3.mxd
Office: TAC

CROSS SECTION OF PACIFIC AVENUE



EXPLANATION:

B1 (42' W) (HC) — BORING NUMBER AND APPROXIMATE LOCATION

SOIL CONTACT

HC	HARTCROWSER (1974 REPORT)
GL	GEOLAB (OBTAINED IN HC 1974 REPORT)
UST	UNDERGROUND STORAGE TANK
BGS	BELOW GROUND SURFACE

QVT	GLACIAL FILL
QVI	ICE CONTACT DEPOSITS
▽	APPROXIMATE Qc_1 AQUIFER LOCATION

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'
VERTICAL EXAGGERATION: 5X

Notes:
1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate; actual subsurface conditions may vary from those shown.
2. Refer to Figure 2 for location of Section and Source of boring information.
3. 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.
4. Elevations obtained from Light Detection and Ranging(LIDAR) data obtained from Puget Sound LIDAR Consortium.
5. B4 was completed in a basement approximately 15'-20' below the elevation of Pacific Avenue.
6. Qc_1 aquifer is described in the USGS Groundwater Hydrology of Tacoma Puyallup Area, Pierce County, Washington, Water Resources Investigation Report PP-4013, 1999

Cross Section A-A'

Pacific Plaza Underground Storage Tank
Tacoma, Washington

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Figure 4

APPENDIX A
Report Limitations and Guidelines for Use

APPENDIX A
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Environmental Services are Performed For Specific Purposes, Persons and Projects

GeoEngineers has performed this environmental review of the Pacific Plaza Building, at 1250 Pacific Avenue, Tacoma, Washington in general accordance with the scope and limitations of our proposal, dated November 9, 2009. This report has been prepared for use by City of Tacoma. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except City of Tacoma should rely on this environmental report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

This Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the City of Tacoma. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

Most Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

tests are conducted or samples are taken. GeoEngineers reviewed data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Reliance Conditions For Third Parties

If a lending agency or other parties intend to place legal reliance on the product of our services, we require that those parties indicate in writing their acknowledgement that the scope of services provided, and the general conditions under which the services were rendered including the limitation of professional liability, are understood and accepted by them. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

Historical Information Provided By Others

GeoEngineers makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others. The information presented in this report is based on the above-described research. GeoEngineers has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data do not provide definitive information with regard to all past uses, operations or incidents at the site or adjacent properties.

Environmental Regulations Are Always Evolving

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these “Report Limitations and Guidelines for Use” apply to your project or site.