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August 21, 2013

Ms. Debra Hamlin
Senior Project Manager - Environmental
Bridgestone Retail Operations, LLC
333 E. Lake Street
Bloomingdale, IL 60108

RE: **Evaluation of 'Subsurface Assessment Data Package' Report**
Westlake Terry and Firestone Sites
400 Westlake Avenue
Seattle, Washington

Dear Ms. Hamlin:

In response to your request, Stantec prepared this letter presenting the results of our evaluation of the *Subsurface Assessment Data Package* report dated July 3, 2013 prepared by SoundEarth Strategies Inc. (SES). The SES report presented results of a subsurface assessment conducted at the intersection of Harrison Street and Westlake Avenue North in Seattle, Washington. The assessment work was performed to investigate the source of gasoline contamination reported to be present in saturated soil and groundwater in the area of the Westlake Terry Block 40 West Building (the Property), located at 320 Westlake Avenue North, and the Firestone Building (Firestone Facility) at 400 Westlake Avenue North.

The SES report contains the following conclusions:

1. **Friedman & Bruya has determined the fuel product identified in soil and groundwater is a leaded, non-reformulated gasoline, and the time period of its release is consistent with both early simple distillation practices for producing gasoline and the period of operation of the Firestone Property UST systems.**

2. **Forensic analyses demonstrate that all of the gasoline in the tested samples from the recent investigation is the same material which originates from a single source.**

3. **The historic groundwater levels show a gradient to the south from the Firestone Property, facilitating migration from the Firestone Property towards and beneath the Westlake Terry Property.**

4. **The concentration gradients for GRPH, TMB, and naphthalene are all consistent, showing a high concentration beneath the north side of Harrison Street (adjacent to the Firestone USTs) that decreases as the contaminated groundwater flows south and away from the identified source area, and then onto and beneath the Westlake Terry Property.**

5. **The concentration gradients for non-reformulated gasoline and coincident non-reformulated gasoline constituents (TMB and naphthalene) confirm the overall site data, which indicate that the former UST systems that operated on the Firestone Property are the source of the petroleum hydrocarbon contamination confirmed within and beneath the downgradient rights of-way and on the Westlake Terry Property.**

Stantec evaluated these conclusions and SES' report as well as various other historic reports summarizing intrusive investigations conducted in the vicinity of the property, including URS' August 29, 2006 report.

Results of Evaluation

The following presents the findings of our evaluation of each of SES' conclusions:

1. **Friedman & Bruya has determined the fuel product identified in soil and groundwater is a leaded, non-reformulated gasoline, and the time period of its release is consistent with both early simple distillation practices for producing gasoline and the period of operation of the Firestone Property UST systems.**

Stantec Evaluation:

SES' report provides a Friedman & Bruya, Inc. (F&B) analytical report dated June 20, 2013 as support for this conclusion. F&B includes only the following interpretation of results:

> *'…..the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that the parent material has undergone substantial degradation*.'
>
> and
>
> *'….the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that the gasoline present has undergone extensive degradation.'*

F&B does not state in their report that the fuel product identified in soil and groundwater is a leaded, non-reformulated gasoline. We presume that this assertion, along with discussions regarding the source or age of the detected gasoline, is based solely on SES's interpretation of the GC traces and other laboratory results.

Stantec has reviewed the provided GC traces and concurs with F&B that chromatographic patterns indicate that the parent material has undergone substantial weathering (degradation). However, discussions regarding source or age of the detected gasoline would be more productive and definitive if conducted on 'free product' rather than gasoline dissolved in groundwater. In addition, best practices for identifying the source or age of petroleum contamination typically include more rigorous and specialized analysis such as paraffin, isoparaffin, aromatic, naphthenic and olefin composition, octane rating, indicators of evaporation, waterwashing and biodegradation and relative abundance of the various ions (m/z) of the approximately 109 typical constituents capable of measurement using a modification of EPA Method 8260. None of these analyses appear to have been requested by SES.

2. **Forensic analyses demonstrate that all of the gasoline in the tested samples from the recent investigation is the same material which originates from a single source.**

Stantec Evaluation:

As discussed in our evaluation of SES' previous conclusion, best practices for identifying the source or age of petroleum contamination typically include more rigorous and specialized analyses, none of which were completed on the samples collected during the recent investigation. The analyses conducted on the recently collected samples are insufficient to support an argument that all of the gasoline in the tested samples is the same material originating from a single source.

3. **The historic groundwater levels show a gradient to the south from the Firestone Property, facilitating migration from the Firestone Property towards and beneath the Westlake Terry Property.**

Stantec Evaluation:

An evaluation of the groundwater gradient and flow direction based on groundwater elevations measured by SES during monitoring events in May 2013 was completed. Depth to groundwater measurements used in the evaluation were collected from newly installed monitoring wells (SMW01, SMW02, SMW03, SMW05, SMW06, SMW07, SMW08 and SMW09) and one previously installed monitoring well (UMW-1). The wells are situated on the Property and in Harrison Street to the north. Results show a groundwater flow direction to the north and northwest (see Figures 2 and 3, attached).

SES assessed the potential for petroleum impacts to the Property migrating from a former gasoline station located northwest of the Property at 401 Westlake Ave N. Results of groundwater sampling show petroleum contamination in the groundwater directly adjacent to 401 Westlake Ave N. It is interesting to note that, while SES does not conclude that contaminants from the former gasoline station at 401 Westlake Ave N may have flowed to the south or southeast, they assert that contaminants from the Firestone Facility, located less than 100 feet east of the former gasoline station, have flowed to the south. It is highly unlikely that two adjacent properties would each feature opposite groundwater flow directions.

URS completed a groundwater assessment in 2006 using three monitoring wells (PZ-1, PZ-2 and PZ-3) installed on the Property. URS concluded the groundwater gradient was to the north based on groundwater level measurements conducted in April to June, 2006. This flow direction is consistent with the inferred northerly groundwater flow direction towards Lake Union.

Based on evidence of a consistent groundwater flow direction to the north and northwest, it is unlikely that subsurface contaminants migrated from the Firestone facility onto and beneath the property.

4. **The concentration gradients for GRPH, TMB, and naphthalene are all consistent, showing a high concentration beneath the north side of Harrison Street (adjacent to the Firestone USTs) that decreases as the contaminated groundwater flows south and away from the identified source area, and then onto and beneath the Westlake Terry Property.**

Stantec Evaluation:

The concentration gradient of contaminants between the Firestone Facility and the Property has not been fully evaluated and is currently indeterminate. The extent of contaminant concentrations in groundwater has been substantively defined to the south, east, and west, but the down gradient extent to the north remains undefined.

Our current understanding of the distribution of dissolved gasoline concentrations is based on groundwater samples collected from monitoring wells situated in Harrison Street and on the Property. Concentrations range from <100 ug/L in SW-08, situated northeast of the Property, to 12,000 ug/L in SW-03, situated midway between the two properties in the approximate center of Harrison street and adjacent to a subsurface utility corridor. The extent of gasoline concentrations to the north towards the Firestone facility remains unknown. The current concentration gradient plume, as depicted in Figure 2 of the SES report shows a teardrop shaped area of contamination, apparently expanding in size as it moves north. The plume is interpreted by SES to extend beyond the reported location of USTs in Harrison Street to the north onto the Firestone Facility. This interpretation is consistent with a northerly groundwater flow direction. This plume shape and distribution is indicative of a potential source south of the Firestone facility flowing from south to north.

5. **The concentration gradients for non-reformulated gasoline and coincident non-reformulated gasoline constituents (TMB and naphthalene) confirm the overall site data, which indicate that the former UST systems that operated on the Firestone Property are the source of the petroleum hydrocarbon contamination confirmed within and beneath the downgradient rights of-way and on the Westlake Terry Property.**

Stantec Evaluation:

As discussed in our evaluation of SES' previous conclusion, the concentration gradient is currently indeterminate and requires further evaluation.

The source of petroleum hydrocarbon contamination beneath Harrison Street and the Property is similarly not confirmed. However, Figures 4 through 6, attached, show interpretations of the extent of impacted soils in the unsaturated zone beneath the Property and a potential route for migration of contaminants from the unsaturated soils to the groundwater beneath the Property. URS' August 29, 2006 report indicates evidence of petroleum contamination in the soil from approximately 17 to 31 feet below ground surface at boring UGP-6, located adjacent to the north limit of the Property. Only one soil sample was submitted for analysis from boring UGP-6. The sample was collected from a depth of 22 feet and contained gasoline-range hydrocarbons at concentrations of 4,300 mg/kg. Depth to groundwater in this location is typically approximately 10 feet deeper than the depth from which the soil sample containing 4,300 mg/kg was collected. It is therefore unlikely that the soils became impacted as a result of contact with contaminated groundwater. Rather, it is likely that the soils were impacted from migration of petroleum hydrocarbons from vadose-zone soils above the sample location and beneath the Property. These results illustrate a potential pathway of petroleum contamination from the unsaturated zone (beneath the Property) to the saturated zone below.

Figure 4 provides a cross-sectional illustration of the likely migratory pathway of petroleum hydrocarbons from the unsaturated zone beneath the Property through the capillary fringe and eventually to the water table. The distribution of petroleum hydrocarbons in the subsurface is influenced by capillary pressure above the groundwater table. In the unsaturated zone, moisture content, size of pores, and orientation of pores primarily affect the penetration of petroleum that is enhanced by dry soil conditions and facilitated by the presence of inclined, relatively permeable pathways, such as fractures, bedding laminations, gravel, or sand lenses. When the petroleum hydrocarbons reach the capillary fringe, the resistance to downward movement increases, so the petroleum hydrocarbons spread laterally and accumulate over the saturated soil. If there is sufficient petroleum hydrocarbon coming from above, the height increases allowing the pressure to increase to the threshold entry pressure at which hydrocarbons will replace water and enter into the largest pores. This phenomenon is illustrated in the cross section provided in Figure 4. We see the petroleum hydrocarbon migrating downward from the property and penetrating the

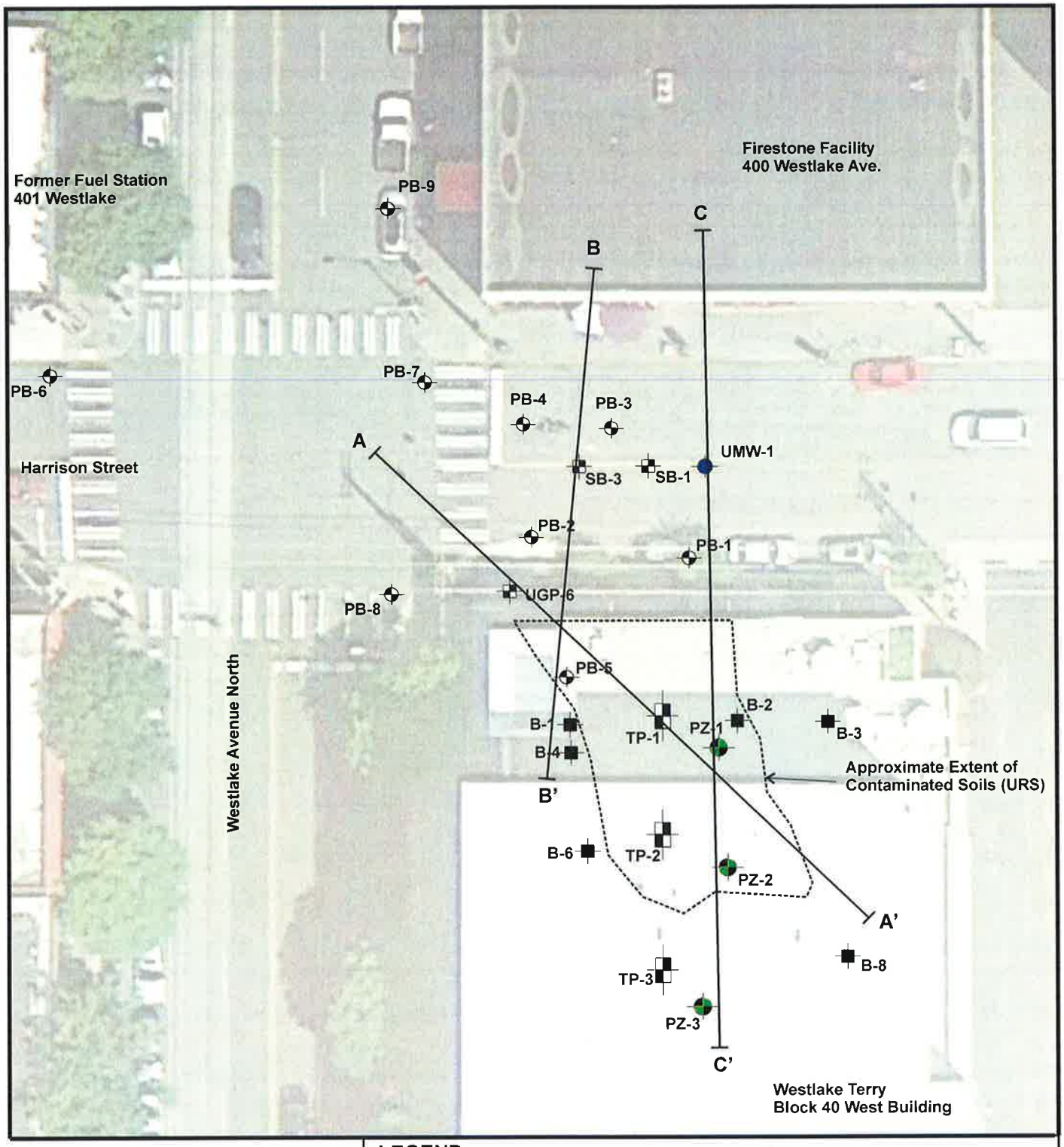
subsurface where enough petroleum hydrocarbon was applied (through a release from above) to overcome capillary forces. This downward migration appears to have occurred in the vicinity of the north limits of the Property as illustrated by evidence of petroleum contamination in the location of the URS-installed soldier piles and the location of UGP-6.

In a similar manner, in the saturated zone, petroleum hydrocarbons will tend to spread laterally over fine grained capillary barriers and move through coarser soils or fractures, if present. The critical hydrocarbon height is generally defined as the minimum height needed to develop adequate pressure to resist the capillary forces. As the capillary forces restrict migration of hydrocarbons into water saturated soils, fine grained layers act as capillary barriers until hydrocarbons can penetrate a saturated sand porous layer, the hydrocarbon height/pressure head must exceed the resistance of the capillary forces. This is evidenced in the cross-sections shown in Figures 4, 5, and 6 where, at the highest point of the hydrocarbon plume in elevation view, we can observe the penetration directly below. In the vicinity of the Property, the plume height decreases towards the northwest and southeast. By this logic, it is likely the petroleum hydrocarbons originating from south of Harrison Street contributed to groundwater impacts because the plume height in soil was highest in that area. The distribution of contamination generally follows soil contacts, which appear to slope steeply toward the north and more shallowly toward the south and from the north end of the 40 block west building area.

Closing

There is insufficient evidence to conclusively identify the source of groundwater contamination identified in saturated soil and groundwater in the area of the Property and the Firestone Facility.

FIGURES



N

Approximate Graphic Scale

15 0 15 30

(In Feet)
1 inch = 30 feet

LEGEND

PB-1	Sound Earth Boring/Well (2013)	
UGP-6	URS Soil Boring (2005)	
UMW-1	URS Monitoring Well (2006)	
B-1	AEI Soil Boring (2012)	
PZ-1	Temporary Well (2006)	
TP-1	Test Pit (2006)	
A / A'	Cross Section	

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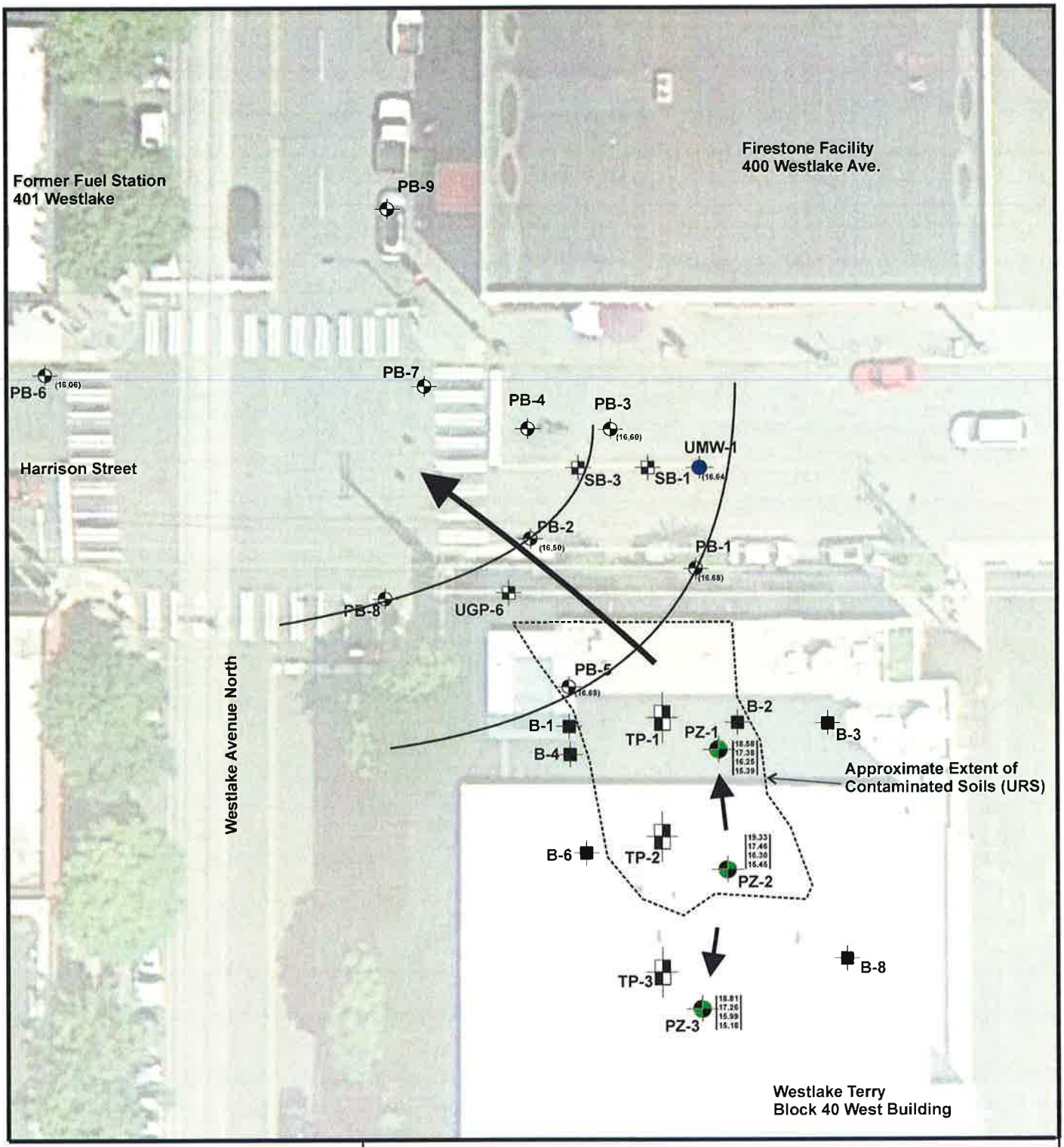
400 Westlake - Westlake Terry Block 40 West - Site Plan

Figure 1

July 25, 2013	Drawn By: PAH	Checked By: MS	Client: BFS Retail and Commercial



N

Approximate Graphic Scale

15 0 15 30

(In Feet)
1 inch = 30 feet

LEGEND

PB-1	Sound Earth Boring/Well (2013)	Groundwater Contour
UGP-6	URS Soil Boring (2005)	
UMW-1	URS Monitoring Well (2006)	Inferred Groundwater Gradient
B-1	AEI Soil Boring (2012)	
PZ-1	Temporary Well (2006)	(16.66) SES Groundwater El. (4/2/13)
TP-1	Test Pit (2006)	URS Groundwater El. (4/17/06, 5/8/06, 5/17/06, 6/1/06)

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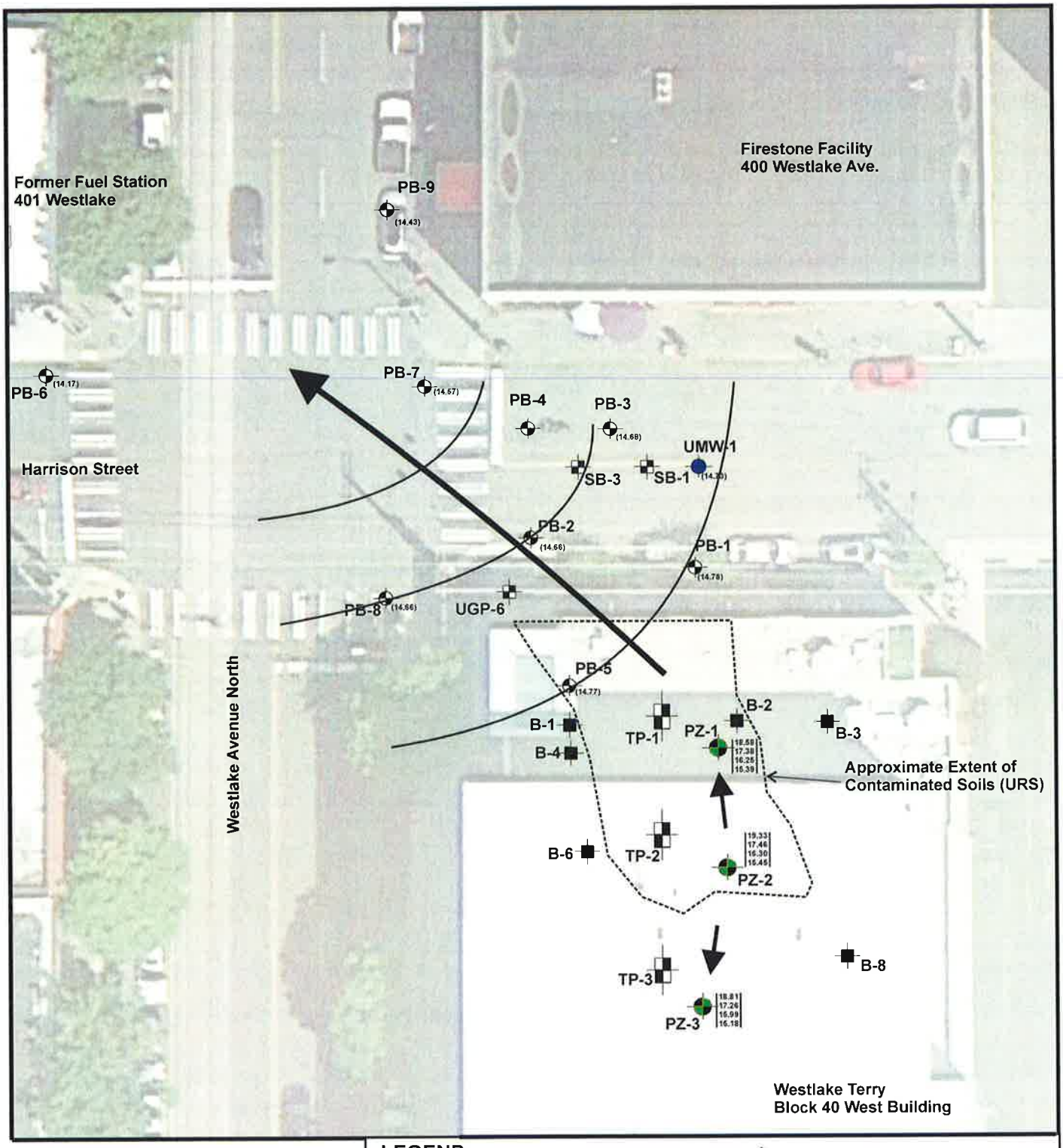
400 Westlake - Westlake Terry Block 40 West - Groundwater Gradient Map (4/2/13)

Figure 2

July 25, 2013 | Drawn By: PAH | Checked By: MS | Client: BFS Retail and Commercial



N

Approximate Graphic Scale

15 0 15 30

(In Feet)
1 inch = 30 feet

LEGEND

PB-1	Sound Earth Boring/Well (2013)	Groundwater Contour
UGP-6	URS Soil Boring (2005)	
UMW-1	URS Monitoring Well (2006)	Inferred Groundwater Gradient
B-1	AEI Soil Boring (2012)	
PZ-1	Temporary Well (2006)	(14.66) SES Groundwater El. (5/10/13)
TP-1	Test Pit (2006)	18.58 / 17.38 / 16.25 / 16.39 URS Groundwater El. (4/17/06, 5/8/06, 5/17/06, 6/1/06)

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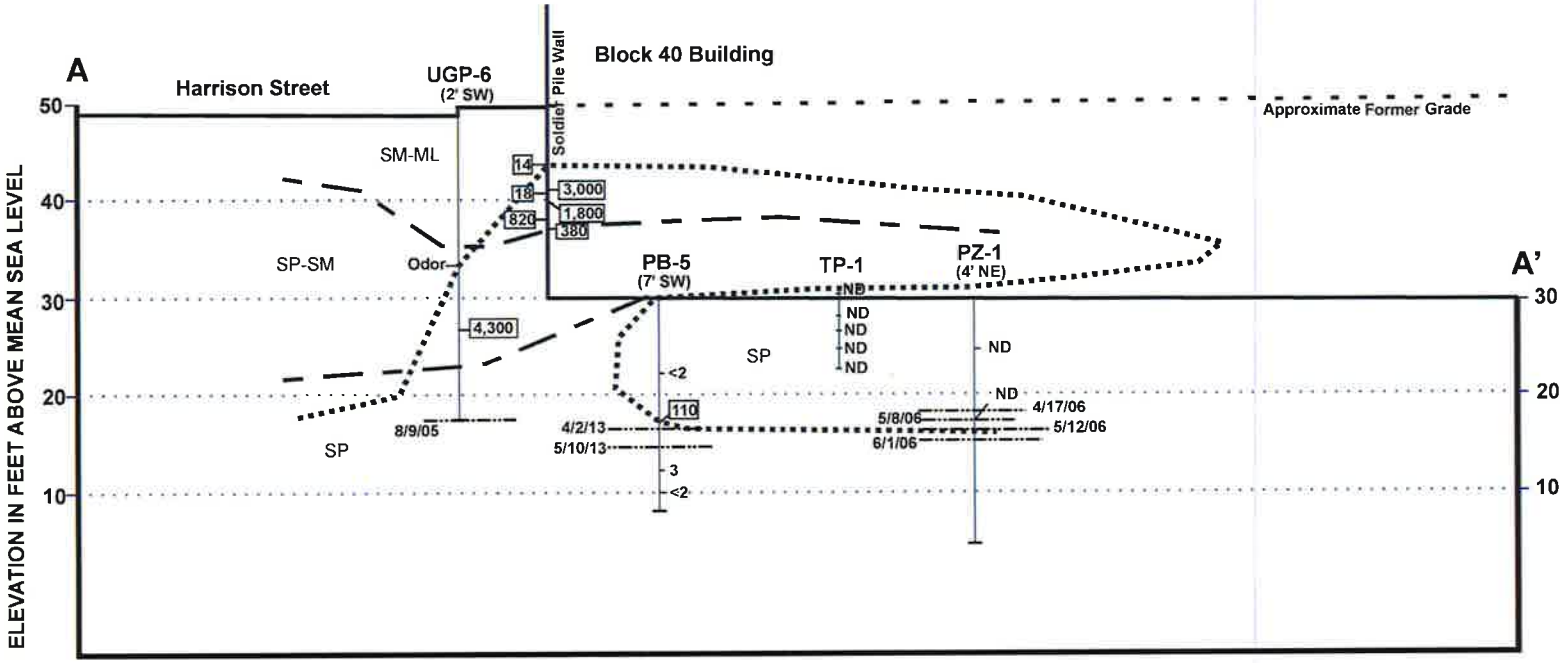
400 Westlake - Westlake Terry Block 40 West - Groundwater Gradient Map (5/10/13)

Figure 3

July 25, 2013	Drawn By: PAH	Checked By: MS	Client: BFS Retail and Commercial



Approximate Graphic Scale

10 0 10 20

(In Feet)
1 inch = 20 feet

Note change in scale from site plan

LEGEND

PB-1	Sound Earth Boring/Well (2013)	4/2/13	Groundwater Elevation & Date Measured
UGP-6	URS Soil Boring (2005)	.....	Approximate Limits of Contamination (based on URS & SES reporting/analytical)
UMW-1	URS Monitoring Well (2006)		
PZ-1	Temporary Well (2006)	— —	Soil Contact
TP-1	Test Pit (2006)	SP	USCS Soil Classification (gradational changes in most areas) SP - Poorly Graded Sand SM - Silty Sand ML - Silt-Sandy Silt
4,300	Gasoline Range Petroleum (mg/kg)		
ND	Nondetect		
<2	Below Lab Reporting Limits		
*	Reported as Stoddard Solvents	(4' W)	Boring Offset from Section

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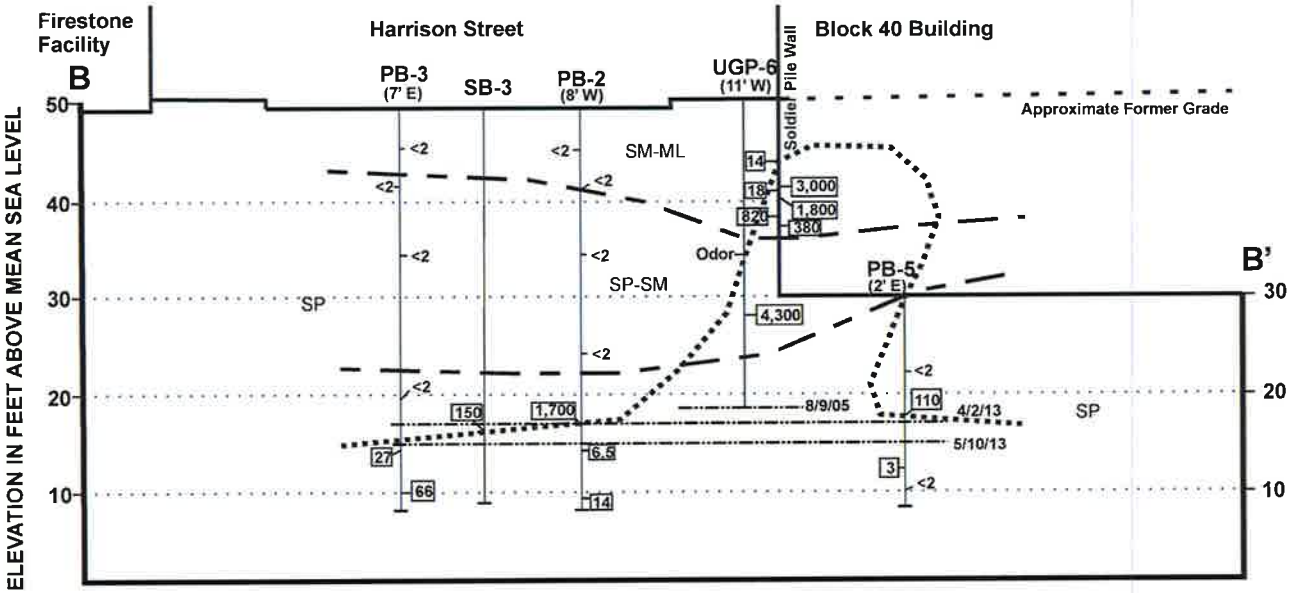
400 Westlake - Westlake Terry Block 40 West - Cross Sections A to A'

Figure 4

July 25, 2013	Drawn By: PAH	Checked By: MS	Client: BFS Retail and Commercial



Approximate Graphic Scale

10 0 10 20

(In Feet)
1 inch = 20 feet

Note change in scale from site plan

LEGEND

PB-1	Sound Earth Boring/Well (2013)	4/2/13	Groundwater Elevation & Date Measured
UGP-6	URS Soil Boring (2005)	.....	Approximate Limits of Contamination (based on URS & SES reporting/analytical)
UMW-1	URS Monitoring Well (2006)		
PZ-1	Temporary Well (2006)	— —	Soil Contact
TP-1	Test Pit (2006)	SP	USCS Soil Classification (gradational changes in most areas) SP - Poorly Graded Sand SM - Silty Sand ML - Silt-Sandy Silt
4,300	Gasoline Range Petroleum (mg/kg)		
ND	Nondetect		
<2	Below Lab Reporting Limits		
*	Reported as Stoddard Solvents	(4' W)	Boring Offset from Section

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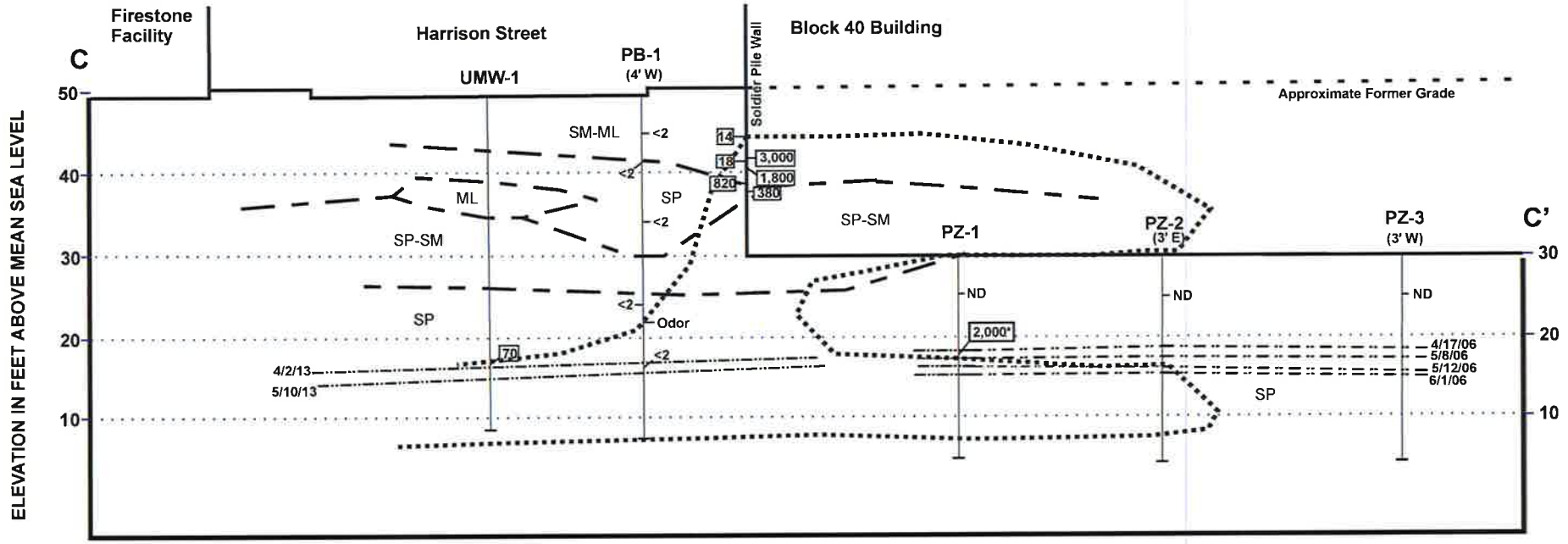
400 Westlake - Westlake Terry Block 40 West - Cross Section B to B'

Figure 5

July 25, 2013 | Drawn By: PAH | Checked By: MS | Client: BFS Retail and Commercial



Approximate Graphic Scale

10 0 10 20

(In Feet)
1 inch = 20 feet

Note change in scale from site plan

LEGEND

PB-1	Sound Earth Boring/Well (2013)	4/2/13	Groundwater Elevation & Date Measured
UGP-6	URS Soil Boring (2005)	.....	Approximate Limits of Contamination (based on URS & SES reporting/analytical)
UMW-1	URS Monitoring Well (2006)		
PZ-1	Temporary Well (2006)	— —	Soil Contact
TP-1	Test Pit (2006)	SP	USCS Soil Classification (gradational changes in most areas) SP - Poorly Graded Sand SM - Silty Sand ML - Silt-Sandy Silt
4,300	Gasoline Range Petroleum (mg/kg)		
ND	Nondetect		
<2	Below Lab Reporting Limits		
*	Reported as Stoddard Solvents	(4' W)	Boring Offset from Section

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400 Westlake - Westlake Terry Block 40 West - Cross Section C to C'

Figure 6

July 25, 2013 | Drawn By: PAH | Checked By: MS | Client: BFS Retail and Commercial