CLEANUP ACTION PLAN

Prime Cleaners
VCP #NW2571
18001 Bothell Everett Highway
Bothell, Washington
ZGA Project No. 1001.22B
June 24, 2014

Prepared For:

Mill Creek Crossing LLC
22833 Bothell Everett Highway
Bothell, Washington

Prepared By:

Zipper Geo Associates, LLC
Geotechnical and Environmental Consulting

Zipper Geo Associates, LLC

Geotechnical and Environmental Consulting

June 24, 2014

Mill Creek Crossing LLC
22833 Bothell Everett Highway, Suite 207
Bothell, Washington 98021

Attn: Mr. Nicholas Echelbarger

Re: Cleanup Action Plan
Prime Cleaners
18001 Bothell Everett Highway
Bothell, Snohomish County, Washington
ZGA Project No. 1001.22B

Dear Mr. Echelbarger:

Zipper Geo Associates, LLC (ZGA) is pleased to submit this Cleanup Action Plan for the above referenced site.

We appreciate the opportunity to perform these services for Mill Creek Crossing LLC. Please contact the undersigned at (425) 582-9928 if you have questions regarding the information provided in the report.

Sincerely,

Zipper Geo Associates, LLC

Jon Einarsen, LG
Principal

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1.0 INTRODUCTION

Zipper Geo Associates, LLC has prepared this Cleanup Action Plan (CAP) which describes the proposed remedial activities to address soil and groundwater contamination associated with historical dry cleaning activities at the Mill Creek Crossing retail center, located at 18001 Bothell-Everett Highway in Bothell, Snohomish County, Washington (the Property). This CAP has been prepared in general accordance with WAC 173-340-380. A topographic map and aerial photograph indicating the approximate location of the Mill Creek Crossing retail center and adjoining area are included as Figure 1 and Figure 2 in Appendix A.

ZGA has completed a combined Remedial Investigation/Feasibility Study and Pilot Study (RI/FS/PS) report (ZGA Project #1001.22, dated June 23, 2014). Contaminants of concern (COC) consist of tetrachloroethylene (PCE) and trichloroethylene (TCE) in soil and groundwater. Soil and groundwater sampling locations are indicated in Figure 3 and Figure 4.

The concentrations of PCE (1.3 ug/kg to 560 ug/kg) and TCE (9.2 ug/kg to 38 ug/kg) in soil are relatively low. None of the 78 soil samples analyzed exceed the MTCA Method B cleanup levels for PCE or TCE. Only nine of the 78 soil samples exceed MTCA Method A soil cleanup levels with respect to PCE (50 ug/kg) or TCE (30 ug/kg). All of the exceedances of the Method A cleanup level for soil are within the Property.

The concentration of PCE in groundwater collected from MW-3 (5.6 ug/L to 15 ug/L), MW-4 (44 ug/L to 170 ug/L), and MW-8 (13 ug/L to 36 ug/L) have exceeded the MTCA Method A cleanup level (5 ug/L) for all sampling events. The concentration of PCE in MW-7 (8.0 ug/L) has exceeded the cleanup level in one of three sampling events. TCE was not detected, or was detected in concentrations below MTCA Method A cleanup levels in all of the other wells.

As discussed in the RI/FS/PS, indoor air samples collected for the RI are compromised by the presence of TCE emitters in the Prime Cleaners tenant space. Based on our experience over several years at this Site, it is not practical to effectively remove TCE emitters from the operational dry cleaners, and that indoor air samples should not be used to access the soil and groundwater to indoor air pathway. We therefore propose that the remedial action objectives are to remediate the source area (soil and groundwater) to MTCA Method A cleanup levels.

WAC 173-340-200 defines the Site as “any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, vessel, or aircraft; or any site or area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located”. In accordance with this definition, the Site is located near the southwest corner of Snohomish County Tax Parcel #27051800106300 and extends onto the south adjoining mini-warehouse facility and the west side of the SR 527 right-of-way approximately 500 south of the intersection with 180th Street Southeast. A site plan indicating the approximate location of the “Site” as defined by WAC 173-340-200 is included as Figure 3.

Several requests were made to Advance Management, Inc., the owner of the mini-warehouse property south of the MCC, to authorize access for collecting soil and groundwater samples on that property. The owner did not respond to any requests. Implementation of cleanup actions directly on the south adjoining property and in the SR 527 right-of-way does not appear to be practical at this time. Therefore this CAP addresses a Property Specific cleanup for that part of the Snohomish County Tax Parcel #27051800106300 affected by historical dry cleaning activities (the Property). Nevertheless we anticipate that source area

cleanup activities completed at the Property will have a positive effect on the down gradient part of the Site and that cleanup levels will be achieved throughout the Site within approximately one year.

Several remedial alternatives were evaluated in the RI/FS/PS report. Soil removal is impracticable due to the presence of buildings. Dual phase extraction and bioremediation via enhanced reductive dechlorination were considered in the pilot study. Bioremediation was deemed not practical for the Site due to the dense to very dense nature of the soils – multiple attempts to reach the target depths (about 40 feet beneath the ground surface) using direct-push equipment failed. The pilot study did indicate that dual phase extraction (DPE) appears to be an effective remedial action alternative for the Property.

The proposed DPE remedial activities are anticipated to reduce existing contaminants in soil, soil gas, and groundwater. An additional advantage of implementing DPE at the Site is that the induced vacuum should create a cone of depression near the source area (thus limiting or preventing down gradient migration of contaminated groundwater), and should mitigate the potential for vapor intrusion into tenant spaces overlying the source area.

1.1 Proposed Cleanup Levels

Cleanup levels for COC defined in the CLARC data tables (May, 2014) are identified in Table 1.

Table 1. Prospective Cleanup Levels

Media	PCE			TCE		
	Method A	Method B	Maximum Measured Concentration at the Site	Method A	Method B	Maximum Measured Concentration at the Site
Soil (mg/kg)	0.05	476	0.56	0.03	12	0.038
Groundwater (ug/L)	5	5	170	5	5	3.2

NE – Not established

None of the analytical results for PCE and TCE in soil at the Site exceed the MTCA Method B cleanup levels. However, the soil to groundwater pathway for the Site appears to be complete and the Method A cleanup levels for soil, which are in part established on groundwater protection concerns, are applicable.

The Method A and Method B groundwater cleanup levels for PCE and TCE are identical. The cleanup level goals for the Property and the Site are defined in Table 2.

Table 2. Proposed Cleanup Levels

Media	PCE	TCE
Soil	0.05 mg/kg	0.03 mg/kg
Groundwater	5 ug/L	5 u/L

1.2 Cleanup Action Objectives

The objectives of the cleanup action at the Property are to:

- Remove PCE and TCE in concentrations above the Method A cleanup levels in soil and groundwater within the Property boundary.
- Obtain a Property-specific NFA from Ecology.

1.3 Points of Compliance

The points of compliance are the locations at which cleanup levels for PCE and TCE must be attained to meet the requirements of obtaining a Property Specific NFA. The points of compliance are established in accordance with WAC 173-340-740(6)(b) for soil and WAC 173-340-720(8)(b) for groundwater.

Soil

The point of compliance is based on groundwater protection and protection from vapors and is thus established as all soil throughout the Property.

Groundwater

The point of compliance for groundwater is established as the upper ten feet of the water table on the Property.

Vapor

The vapor intrusion pathway will be considered incomplete when the cleanup action objectives have been achieved at the points of compliance for soil and groundwater on the Property.

2.0 DPE SYSTEM DESCRIPTION

2.1 Proposed DPE Equipment and Configuration

Typical DPE methodology consists of extracting subsurface soil vapors and groundwater simultaneously from a pipe (also referred to as a “stinger”) placed in a well to an elevation below the water table surface. The pipe is connected to a liquid ring vacuum pump which generates a vacuum that extracts groundwater in the well down to the inlet of the stinger. The extraction of groundwater creates a cone of depression, thus exposing more soil for soil vapor extraction. The process stream (vapor phase and groundwater) is directed to a vapor/water separator system which will collect the groundwater. The process groundwater will be directed through an activated carbon treatment process prior to discharge into the sanitary sewer system. The process soil gas air is driven through the blower and into a separate activated carbon treatment system (if necessary) prior to discharge to the atmosphere.

- The DPE system will consist of a 20-horsepower (HP) oil sealed liquid ring pump capable of an applied vacuum of up to 29 inches of mercury.

- The vapor/water separator system will consist of a tank equipped with a pump to deliver separated groundwater to the activated carbon treatment system. The system will be equipped with liquid level switches for automated pump down control and a site tube for visual indication of liquid level.

- The vapor and water treatment system will consist of 1,000-pound granulated activated carbon vessels.

The DPE remediation equipment will be housed in a 10-foot x 8-foot x 8.5-foot steel storage container.

2.2 Proposed DPE Wells

Based on the results of the RI/FS/PS, the source area for the contamination associated with the Site is located on the Property. The approximate extent of soil and groundwater contamination is indicated on Figure 5.

Soil vapor and groundwater will be extracted from one existing 4-inch DPE well (DPE-1, Figure 5) and three new 4-inch DPE wells (DPE-2 to DPE-4, Figure 5). Each well will be completed to a depth of 35 feet, will be screened from 5 feet beneath the ground surface (bgs) to 35 feet bgs, and will be fitted with lockable flush-mount monuments. Process soil vapor and groundwater will be conveyed through underground conduit to the remediation compound as approximately indicated on Figure 6.

Global Remediation Systems reviewed the data for vacuums induced during the dual phase extraction pilot test as described in the RI/FS/PS, and concluded that the estimated radius of influence is 40 feet. Based on this information, it appears that DPE activities in DPE-1 to DPE-4 should influence the residual contamination associated with the historical dry cleaning activities. No additional wells are proposed for installation until DPE remedial activities have been initiated and thoroughly evaluated after the system has been operating for several months. An amended CAP will be prepared if additional DPE wells are determined to be required.

2.3 DPE Equipment Compound

A remediation compound is proposed for construction on the south side of the Property as approximately indicated on Figure 6. The remediation equipment and manifold will be supported by the exiting asphalt pavement. A permanent chain link fence will also be installed to enclose the remediation compound. One approximate 4 feet wide lockable gate will be installed on the west side of the remediation compound to facilitate equipment delivery and access into the compound. Brass pad locks will be installed on the gate for security.

Traffic bollards will be installed outside the west, north and east sides of the remediation compound, at a maximum spacing of five feet, to prevent damage to remediation equipment due to vehicles. It is possible that the location and/or dimensions of the remediation compound may be modified to facilitate tenant and customer traffic or local building codes.

2.4 Electrical Service

The DPE equipment will require electricity to operate. It is anticipated that electrical service shall consist of 100 amp service or larger, 208 volt, and three-phase electricity. Evaluation of electrical service will be discussed with the Property owner, the local utility provider, and the DPE installation contractor to determine the most appropriate method to deliver the required service.

2.5 Piping and Manifold Construction

Trenching to a depth of approximately two feet will be required to install the process soil vapor and groundwater conveyance piping as approximately indicated on Figure 6. Above ground piping inside of the remediation compound will be required to complete the connections to the remediation equipment.

2.6 Management and Disposal of Construction Soil Spoils

We estimate that approximately 25 to 50 cubic yards of soil spoils will be generated associated with the installation of subsurface piping to convey the DPE influent and treated groundwater effluent. ZGA will test the soil for VOC and will arrange for the disposal of the soil in accordance with Washington State solid waste management regulations.

3.0 PERMITTING, INSTALLATION, AND STARTUP

3.1 System Permitting

ZGA has attempted to determine the permits required for implementation of DPE remedial activities. The following permits may be required, at a minimum:

- Building Permit. A building permit will be required from Snohomish County for installation of the remediation system and piping components. The permit provides notification of construction and requires a final inspection of the remediation compound and electrical system. Based on preliminary discussions with Snohomish County Planning and Development Services, a building permit will not be required.

- Puget Sound Energy: Power requirements will need to be evaluated at the site prior to installation of the DPE system. ZGA and a construction contractor will coordinate new utility service for the system, which will need to be inspected.

- Treated Water Discharge: A permit to discharge treated water into the Alderwood Water District (AWD) sanitary sewer system will be required. Because the AWD sanitary sewer in this area is conveyed to the Brightwater treatment plant in King County, permits will be needed from both AWD and King County. In accordance with the permit, treated water discharge will be metered with a mechanical, non-resettable flow meter.

- Treated Soil Vapor Discharge: According to the Puget Sound Air Clean Air Agency a permit is not needed for tetrachloroethylene discharges of less than 500 pounds per year. Based on the results of the DPE pilot study we estimate that annual discharges will be less than 100 pounds per year so a vapor discharge permit may not be required. Discharge rates will be measured after startup and a discharge permit will be acquired if necessary.

3.2 System Installation and Startup

Once final design, permitting, and equipment models have been selected, the remedial system will be installed. The Washington State Department of Ecology, Alderwood Water District, King County Waste Water Treatment Division, and the Puget Sound Clean Air Agency (PSCAA) will be notified prior to startup of the DPE remediation system. It is expected that startup sampling for influent/effluent vapors and groundwater will be required. Startup sampling will verify that remedial components are working correctly and discharge compliance limits are not exceeded. Sampling protocols are discussed in Section 4.

3.3 System Operation and Maintenance

The DPE system will require regular mechanical and electrical maintenance which will include, at a minimum: regular lubrication, regular air filter checks, pump/blower maintenance and flow and pressure optimization adjustments. Regular data collection will include, at a minimum: system flow and vacuum data, volume of groundwater treated, and electrical consumption.

Routine water sampling will be required while the remediation system is in operation. Water discharge sampling will be conducted in accordance with the acquired discharge permit. Although we anticipate that an air discharge permit will not be needed, air discharge sampling will be conducted at a rate agreeable to PSCAA to document compliance with the 500 pound per year exemption for tetrachloroethylene. Air sampling will include samples of vapor influent and effluent.

3.4 Operation and Maintenance Reporting

It is possible that local regulatory agencies or sewer districts may require reporting for the DPE system relative to air and water discharge. These reports may require, at a minimum, the mass of contaminates treated by the DPE system, overall system operation, and associated laboratory analytical results. This information will likely be included in the quarterly groundwater monitoring reports.

3.5 Installation Schedule

It is anticipated that the DPE remediation system could be operating within about three months after notice to proceed.

3.6 Health and Safety

ZGA will prepare a Health and Safety Plan for the installation, operation, and maintenance of the DPE system and for on-going groundwater monitoring. Based on the results of the RI, there is no identified risks to construction workers associated with contact with soil. Therefore the health and safety plan will focus on the prevention of inhalation of soil gas vapors and the ingestion of groundwater.

4.0 PERFORMANCE MONITORING

We anticipate that the DPE system will need to operate for about one year. After that time the system will be shut down but groundwater monitoring will continue for another year to confirm that the cleanup goals have been achieved in groundwater. Performance monitoring will consist of three parts: DPE system performance monitoring, ongoing groundwater monitoring, and confirmation soil sampling upon DPE system shutdown.

4.1 DPE System Performance Monitoring

The DPE system will be monitored for performance and for compliance with waste stream discharge permits. The following parameters will be measured at system startup, 3 days, 7 days, 14 days, 28 days, and weekly thereafter:

- System vacuum.
- System flow rate.
- Vacuum at extraction wells and observation wells.
- System vapor influent concentration (field PID).
- Volume of groundwater extracted and treated.

The following will be measured at system startup, 3 days, 7 days, 14 days, 28 days, and quarterly thereafter:

- Sampling and laboratory analysis of groundwater influent and effluent (EPA Method 8260).
- Sampling and analysis of soil gas influent and effluent (EPA Method TO-15).

This information will be used to calculate the mass of contaminants removed.

4.2 Groundwater Monitoring

The existing ten groundwater monitoring wells will be sounded for groundwater elevation and sampled for VOC (EPA Method 8260) on a quarterly basis for two years.

4.3 Confirmation Soil Sampling

Once the concentration of PCE and TCE has fallen to below cleanup levels in groundwater, five direct-push explorations will be advanced inside each of the Money Tree and Prime Cleaners tenant spaces to collect soil samples. Soil will be analyzed for PCE and TCE using EPA Method 8260 to confirm that concentrations are below MTCA Method A cleanup levels.

4.4 Reporting

ZGA will prepare a report documenting the installation of the DPE system and the first 28 days of system performance data.

Quarterly Performance Monitoring Reports will be prepared. Each report will include presentation of the parameters identified in Section 4.1 and 4.2.

A final report documenting all remedial action activities and petitioning for a NFA will be prepared.

5.0 SUMMARY

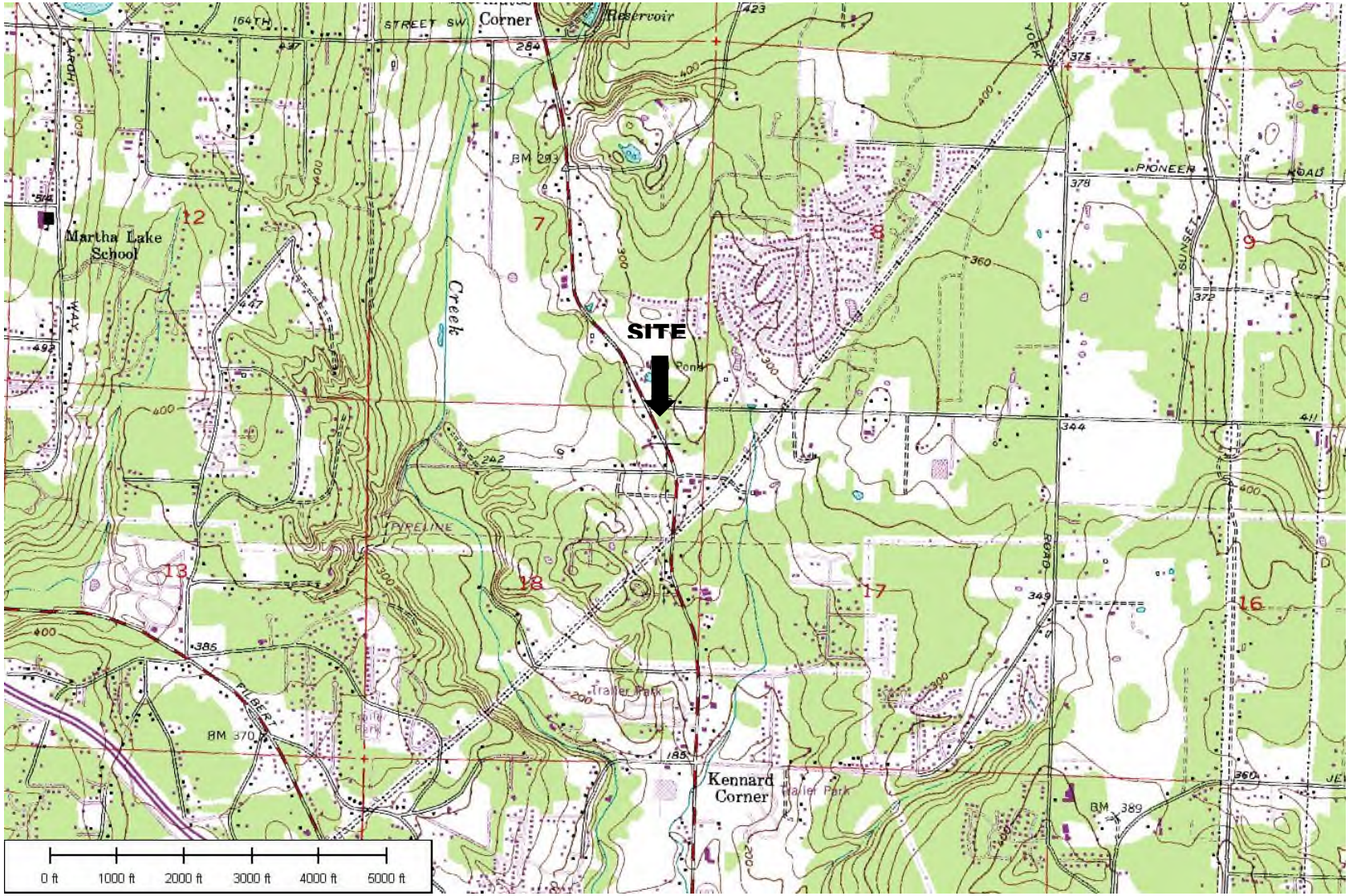
ZGA believes performance of DPE as described above will achieve cleanup levels for soil, groundwater, and indoor air within the Property within about one year. ZGA will perform confirmation monitoring to demonstrate that cleanup goals have been achieved within the Property. Cleanup goals for groundwater throughout the Site will also likely be achieved after source removal within about one year.

6.0 LIMITATIONS

ZGA's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. ZGA makes no warranties, either express or implied, regarding the findings, conclusions or recommendations. Please note that ZGA does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of this CAP.

This report is intended to reduce, but not eliminate, uncertainty regarding contaminant pathways and receptors and the effectiveness of alternative remedial actions. Our findings are based upon information derived from soil, soil gas, and groundwater sampling at the indicated locations and other services performed under this scope of work; such information is subject to change over time. Subsurface conditions may vary from those described herein during future investigations. If different conditions from

those described herein are discovered or presumed based on the performance of the DPE system, ZGA may modify our conclusions and recommendations where necessary.



Project No.	1001.22	Project Manager: JME	
Drawn By:	JME	Scale: As Shown	
Date:	May, 2014	File Name:	
Client: Mill Creek Crossing LLC			

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Figure 1

Topographic Map

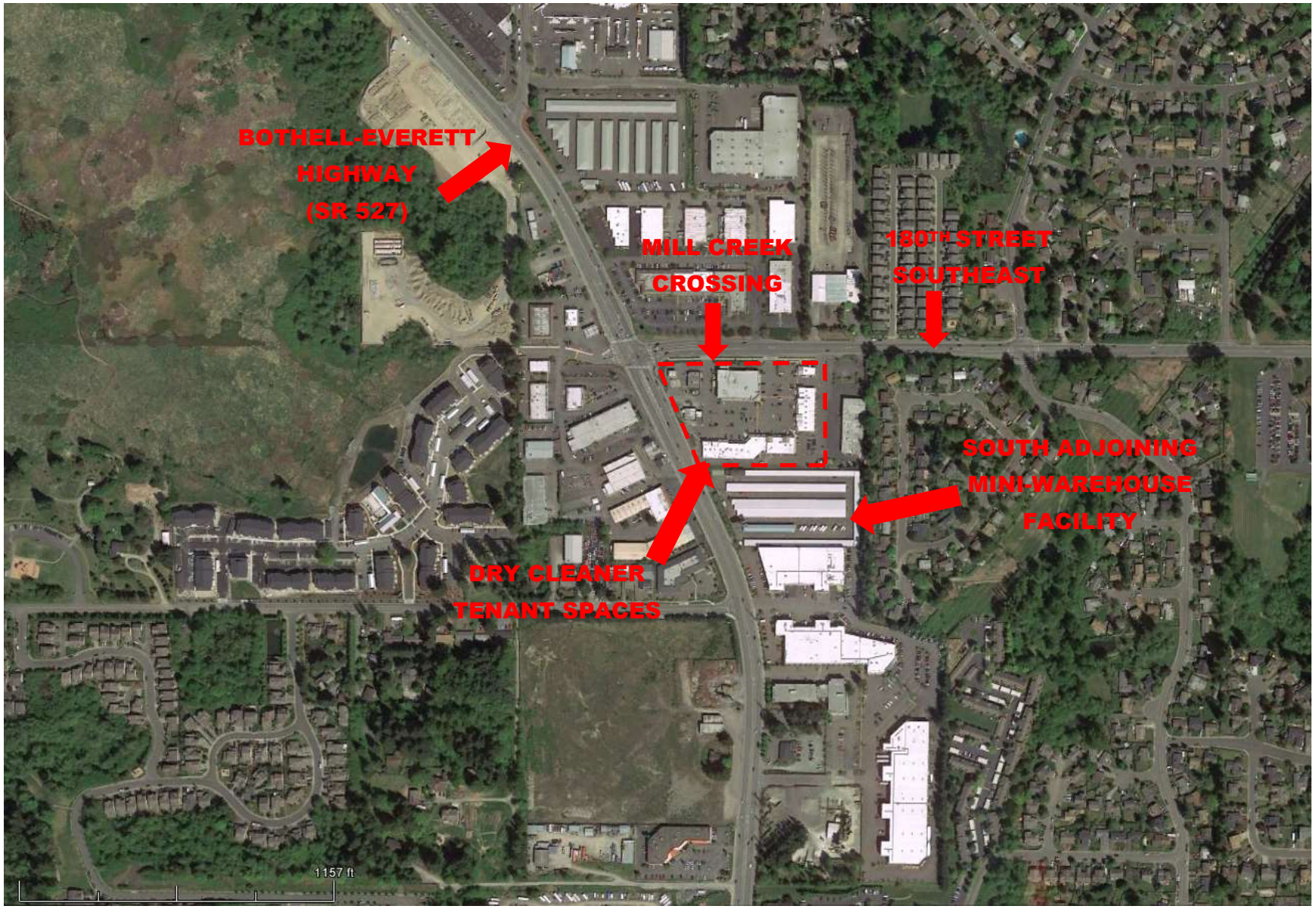

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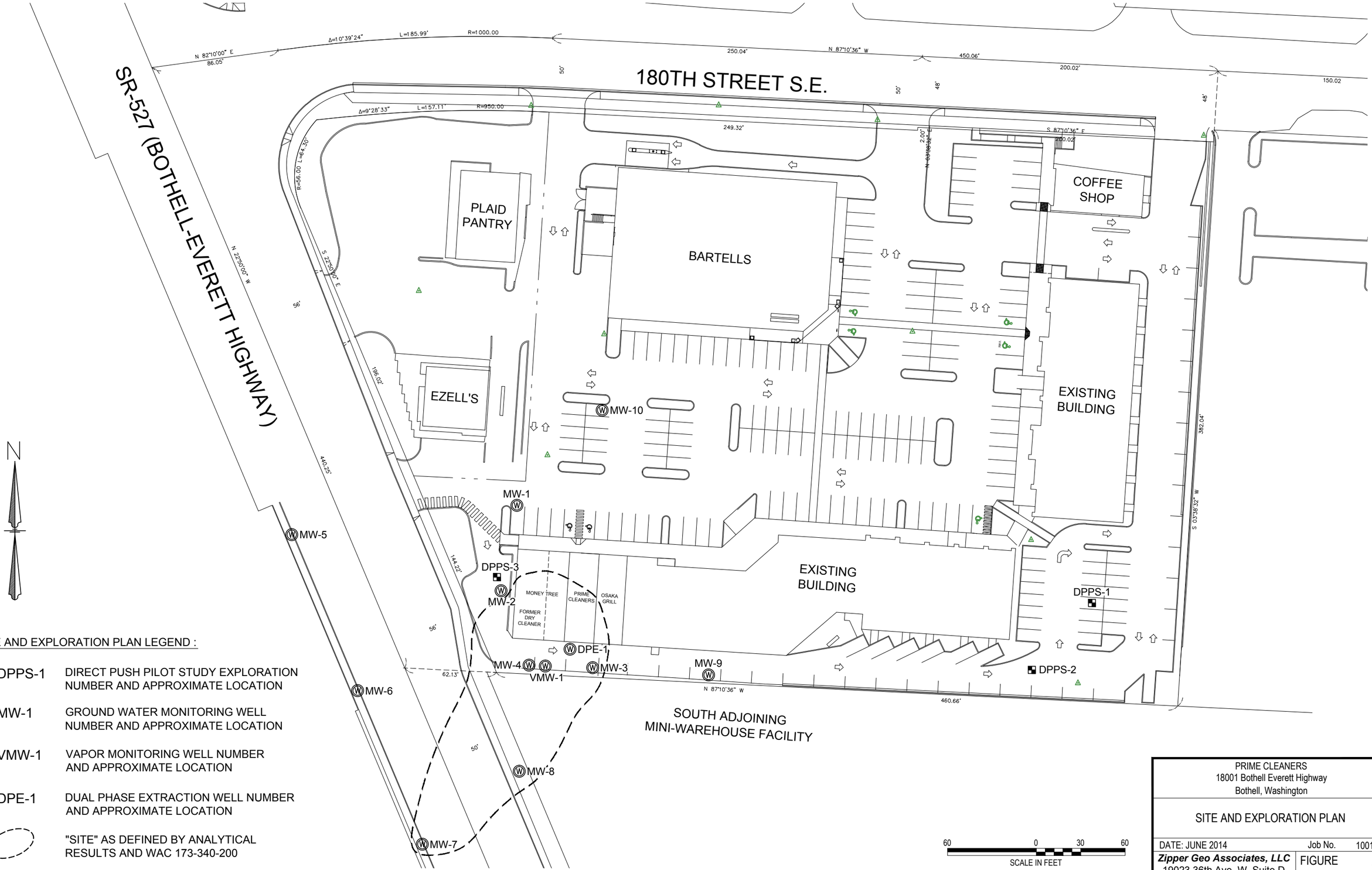
Figure 2

Topographic Map



SITE AND EXPLORATION PLAN LEGEND :

DPPS-1	DIRECT PUSH PILOT STUDY EXPLORATION NUMBER AND APPROXIMATE LOCATION
MW-1	GROUND WATER MONITORING WELL NUMBER AND APPROXIMATE LOCATION
VMW-1	VAPOR MONITORING WELL NUMBER AND APPROXIMATE LOCATION
DPE-1	DUAL PHASE EXTRACTION WELL NUMBER AND APPROXIMATE LOCATION
	"SITE" AS DEFINED BY ANALYTICAL RESULTS AND WAC 173-340-200

PRIME CLEANERS
18001 Bothell Everett Highway
Bothell, Washington

SITE AND EXPLORATION PLAN

DATE: JUNE 2014 Job No. 1001.22

Zipper Geo Associates, LLC
19023 36th Ave. W.,Suite D
Lynnwood, WA

FIGURE 3
SHT.1 of 1

SITE AND EXPLORATION PLAN LEGEND :

B1	DIRECT PUSH SOIL EXPLORATION NUMBER AND APPROXIMATE LOCATION
SP-1	DIRECT PUSH SOIL EXPLORATION NUMBER AND APPROXIMATE LOCATION (ENVIRONMENTAL ASSOCIATES - 1999)
MW-1	GROUND WATER MONITORING WELL NUMBER AND APPROXIMATE LOCATION
MW-4	GROUND WATER MONITORING WELL NUMBER AND APPROXIMATE LOCATION (ADAPT ENGINEERING - 2007)
B-1	BORING NUMBER AND APPROXIMATE LOCATION (ENVIRONMENTAL ASSOCIATES - 1999)
(12') 34 µg/kg	DEPTH OF EXPLORATION SAMPLING, AND MEASURED TCE CONTAMINATION
	APPROXIMATE EXTENT OF TCE ABOVE MTCA METHOD A CLEANUP LEVELS

PRIME CLEANERS
18001 Bothell Everett Highway
Bothell, Washington

ESTIMATED EXTENT OF TCE CONTAMINATION IN SOIL

DATE: JUNE 2014 Job No. 1001.22

Zipper Geo Associates, LLC
19023 36th Ave. W.,Suite D
Lynnwood, WA

FIGURE 4A
SHT.1 of 2

SITE AND EXPLORATION PLAN LEGEND :

B1	DIRECT PUSH SOIL EXPLORATION NUMBER AND APPROXIMATE LOCATION
SP-1	DIRECT PUSH SOIL EXPLORATION NUMBER AND APPROXIMATE LOCATION (ENVIRONMENTAL ASSOCIATES - 1999)
MW-1	GROUND WATER MONITORING WELL NUMBER AND APPROXIMATE LOCATION
MW-4	GROUND WATER MONITORING WELL NUMBER AND APPROXIMATE LOCATION (ADAPT ENGINEERING - 2007)
B-1	BORING NUMBER AND APPROXIMATE LOCATION (ENVIRONMENTAL ASSOCIATES - 1999)
(12') 34 µg/kg	DEPTH OF EXPLORATION SAMPLING, AND MEASURED PCE CONTAMINATION
	APPROXIMATE EXTENT OF PCE ABOVE MTCA METHOD A CLEANUP LEVELS

PRIME CLEANERS
18001 Bothell Everett Highway
Bothell, Washington

ESTIMATED EXTENT OF PCE CONTAMINATION IN SOIL

DATE: JUNE 2014 Job No. 1001.22

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Lynnwood, WA

FIGURE 4B
SHT.2of2

N

MW-1

MW-5

MONEY TREE
(FORMER DRY CLEANER)

EXISTING DRY CLEANER

TERIYAKI

MW-2

DPE-4

40' RADIUS OF DPE INFLUENCE

DPE-3

DPE-1 (EXISTING)

DPE-2

VMW-1

MW-4

MW-3

MW-9

N 87°10'36" W

MW-6

SOUTH ADJOINING MINI-WAREHOUSE FACILITY

MW-8

MW-7

LEGEND :

MW-1	GROUND WATER MONITORING WELL NUMBER AND APPROXIMATE LOCATION
DPE-1	DUAL PHASE EXTRACTION WELL NUMBER AND APPROXIMATE LOCATION
	ESTIMATED EXTENT OF PCE CONTAMINATION IN GROUNDWATER
	ESTIMATED EXTENT OF PCE & TCE CONTAMINATION IN SOIL

25 0 12.5 25
SCALE IN FEET

PRIME CLEANERS
18001 Bothell Everett Highway
Bothell, Washington

PROPOSED DPE WELL LAYOUT

DATE: JUNE 2014 Job No. 1001.22B

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Lynnwood, WA

FIGURE 5
SHT.1 of 1

LEGEND :

MW-1 GROUND WATER MONITORING WELL NUMBER AND APPROXIMATE LOCATION

DPE-1 DUAL PHASE EXTRACTION WELL NUMBER AND APPROXIMATE LOCATION

MW-2

DPE-4

MONEY TREE

FORMER DRY CLEANER

EXISTING DRY CLEANER

TERIYAKI

DPE-3

DPE-1

DPE-2

TO SANITARY SEWER

REMEDIATION SYSTEM PIPING

MW-4

VMW-1

MW-3

10' X 8' REMEDIATION COMPOUND

N

10 0 5 10

SCALE IN FEET

PRIME CLEANERS
18001 Bothell Everett Highway
Bothell, Washington

REMEDIATION COMPOUND AND PIPING DISTRIBUTION

DATE: JUNE 2014 Job No. 1001.22B

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Lynnwood, WA

FIGURE 6

SHT. 1 of 1