SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102

April 27, 2015

Ms. Glynis Carrosino
Washington State Department of Ecology
Toxic Cleanup Program
3190 160th Avenue Southeast
Bellevue, Washington 98008

SUBJECT: REMEDIAL ALTERNATIVES - DISPROPORTIONATE COST ANALYSIS
Smokey Point Retail Center
2707 171st Place Northeast
Marysville, Washington 98271
Project Number: 0918-001-07

Dear Ms. Carrosino:

On behalf of the Smokey Point Retail Center, SoundEarth Strategies, Inc. (SoundEarth), is submitting a remedial alternatives and disproportionate cost analysis to the Washington State Department of Ecology (Ecology) as part of efforts to select a cleanup remedy for Smokey Point Retail Center (SPRC) located at 2707 171st Place Northeast in Marysville, Washington (the SPRC Property; Figure 1).

The SPRC Property was enrolled in Ecology's Voluntary Cleanup Program (VCP - #NW2833) in 2014, with the stated objective of obtaining a Property-Specific No Further Action (NFA) determination from Ecology. The purpose of the remedial alternative and disproportionate cost analysis is to provide the Ecology with feasible potential remedies for the entire Site and their comparative costs, with the objective of implementing a remedy that is protective of human health and the environment and consistent with regulatory requirements, including the requirement that the selected remedy be reasonable and cost effective given the current and future land use at the SPRC Property. See WAC 173-340-360(3)(e).

The Site includes the SPRC Property and the upgradient Source Property, located at 2804 172nd Street Northeast, Marysville, Washington. The Source Property is the former Smokey Point Chevron on the adjoining property to the north, which is the confirmed source of the groundwater contamination beneath the SPRC Property. The Source Property is currently listed with Ecology as a leaking underground storage tank (UST) site and was enrolled in the Voluntary Cleanup Program (VCP) in 2009 (VCP#NW2174).

The Site is defined by the full lateral and vertical extent of contamination that has resulted from the former operations at and releases of contamination on and beneath the Source Property. Figure 1 shows the extent of known soil and groundwater contamination at the Site.

Presented below is a discussion of the Site background, the current extent of contamination in the media of concern, three remedial alternatives and their associated costs, and the preferred remedy based on multiple factors including protectiveness relative to current and future land use throughout the Site, permanence, cost of implementation, effectiveness over the long-term, management of short-term risks, implementability, restoration timeframe, and consideration of public concerns.

SITE BACKGROUND

Source Property—Smokey Point Chevron

Smokey Point Chevron was built on the adjoining property to the north of the SPRC Property in 1978. The fueling station included three 12,000-gallon gasoline USTs. In 1997, Environmental Management Resources Inc. conducted a subsurface investigation, identifying petroleum-impacted soil and groundwater in the area between the USTs and the convenience store building.

In 2003, Associated Environmental Group, LLC (AEG) installed three monitoring wells on the north, south, and east sides of the USTs (MW-1 through MW-3, shown on Figure 1). Groundwater collected from all three AEG wells contained concentrations of gasoline-range petroleum hydrocarbons (GRPH) and benzene, toluene, ethylbenzene, and xylenes (BTEX) above Model Toxics Control Act (MTCA) Method A cleanup levels.

In September 2006, GeoScience Management (GSM) conducted a subsurface investigation that included installation of 11 monitoring wells at Smokey Point Chevron (MW-101 through MW-111), and 9 direct-push probe borings at the SPRC Property (GP-1 through GP-9, shown on Figure 1). Petroleum-impacted soil was not identified in any of the probe borings conducted on the SPRC Property. However, groundwater collected from all 9 of the probe borings on both properties contained concentrations of gasoline and/or benzene exceeding the MTCA cleanup levels.

Smokey Point Chevron operated until mid-2008. The three USTs and associated petroleum-contaminated soil (PCS) were removed in 2009. PCS was excavated to a depth of approximately 7 feet below grade. Groundwater infiltrated the remedial excavation at a depth of 5.5 feet. Brown frothy material and sheens were observed on the surface of the excavation water and removed by skimmers, absorbents, and vacuum truck. A total of 1,767 tons of PCS and 4,900 gallons of excavation water were removed during remediation. Soil samples collected from the south side of the excavation at a depth of 5 feet exceeded MTCA cleanup levels. Further excavation was not conducted due to presence of the convenience store building, such that PCS was left beneath the building. PCS also appears to have been left in-place at the base of the excavation, as the cleanup report does not indicate any samples were collected deeper than 6 feet, and very few verification samples were collected from the bottom-center of the excavation. A PVC-pipe infiltration gallery was installed in the excavation prior to backfilling. However, no additional remediation has been conducted at the Smokey Point Chevron site since 2009.

On August 29, 2013, ESN Northwest, under the direction of SoundEarth, advanced eight push-probe borings (P01 through P08) inside the Smokey Point Chevron building (Figure 2). Borings P01 through P05 were advanced to a depth of 16 feet. Borings P06 through P08 were advanced to depths of 4 to 8 feet to evaluate the extent of near-surface impacts near the northeast corner of the building. Gasoline odors were noted in all deep borings from approximately 6 to 12 feet. Gasoline odors were also noted in boring P02 from the surface to 16 feet, and in boring P03 from 7 to 16 feet. Concentrations of GRPH

exceeding the MTCA Method A cleanup level were detected in one or more samples collected from all 8 borings. The highest concentrations of GRPH (6,060 milligrams per kilogram [mg/kg]) and benzene (12.3 mg/kg) were detected at a depth of 7 feet below grade. The lower depth of contamination was not well defined, but appeared to attenuate at approximately 12 feet below grade. Groundwater was present at approximately 6 feet. The results of the push-probe assessment were summarized by SoundEarth in a Subsurface Soil Investigation report dated October 8, 2013.

Smokey Point Retail Center (SPRC)

The SPRC Property remained as undeveloped land until the SPRC was constructed in 2008. At that time, approximately 5 feet of native soil was removed across the site and backfilled with material more amenable to surface water infiltration, as required by local building codes.

During construction, the general contractor (Pennon Construction) installed an infiltration gallery along the common boundary between the SPRC Property and the Source Property. Installation consisted of excavating a trench approximately 4 feet deep, placing a layer of pea gravel in the trench bottom, and then laying the piping on the pea gravel. The piping consisted of schedule 40 PVC blank, attached to 20-foot long sections of 20-slot PVC screen. The piping was then covered with approximately 1 foot of additional pea gravel. A geotextile fabric was placed on top of the pea gravel, and the trench was then backfilled with the trench spoils. No odors, stained soil, or groundwater was encountered in the trench. Each set of infiltration piping was stubbed up against the fence along the common property line and capped. These pipe stubs were to be used in the future to introduce solutions to enhance biological degradation of hydrocarbon compounds in groundwater.

To mitigate the potential for soil vapor concerns, a Stego Wrap vapor barrier was also installed beneath both buildings prior to construction. The polyolefin-based vapor barrier is 15 mils thick and meets the requirements of American Society for Testing and Materials specification E1745 Class A vapor barrier. The Stego vapor barrier is designed to control radon, methane, and petroleum byproduct gases. Photographs taken during installation show that the vapor barrier was installed beneath the perimeter footings and under utility vaults prior to pouring the slab and that pipe penetrations and seams in the slab were taped with Stego tape. In addition, a layer of 10-mil plastic sheeting was installed over the vapor barrier. The vapor barriers beneath Buildings #1 and #2 prevent the potential intrusion of impacted subsurface vapors into interior spaces. Photographs of the installation, and product specifications were included in the report titled *Vapor Intrusion Study, Smokey Point Retail Center 2707 171st Place Northeast, Marysville, Washington*, prepared by SoundEarth and dated April 2, 2015 (discussed below). The vapor barriers have not been altered since installation.

In November 2008, GSM installed 7 monitoring wells on the SPRC Property (MW-112 through MW-118; Figure 1). Soil encountered in the borings was 5 to 6 feet of fill (imported prior to construction as described above) overlying 4 to 5 feet of gravelly sand and silty sand, underlain by coarse-grained sand and gravel to 15.5 feet. Saturated soil was encountered at approximately 4.5 to 5.5 feet. Based on previous testing and recent site backfilling, no soil samples were submitted for analysis. Concentrations of benzene exceeding MTCA levels were detected in all of the wells. Gasoline was detected in 6 of the 7 wells, but only exceeded MTCA in one well (MW-118).

Groundwater quality at the SPRC Property has been monitored by SoundEarth and others from 2008 to 2014. The highest historical concentrations of gasoline at the SPRC Property were detected in April 2011 at MW-111 (4,500 micrograms per liter [µg/L]) and MW-113 (4,000 µg/L). The most recent groundwater sampling and monitoring events at the SPRC Property in August 2014, show that concentrations of GRPH and BTEX in groundwater samples collected from monitoring wells MW-112, MW-113, and MW-114 exceed applicable MTCA Method A cleanup levels. Concentrations of GRPH and BTEX in the remaining monitoring wells within the monitoring well network were not reported above laboratory reporting limits and/or were less than applicable MTCA cleanup levels.

Concentrations of GRPH and BTEX in the groundwater at the SPRC Property change by factors of up to 10 times in response to seasonal changes in the depth to groundwater. For example, groundwater levels in April 2011 were typically 3 feet below grade, approximately 2 feet higher than during other sampling events. This fluctuation is likely due to wet seasonal condition. Concentrations of gasoline were typically less than 200 µg/L during the lower groundwater level events.

The groundwater at the SPRC Property flows generally to the south-southwest with a hydraulic gradient of approximately 0.002 feet per foot between wells MW118 and MW116. Figure 1 shows the location of monitoring well network at the SPRC Property and the direction of groundwater flow in August 2014. No contamination has been released on the SPRC Property, and SPRC has not caused, contributed to or exacerbated any of the contamination throughout the Site. All contamination on and beneath the Site is the result of releases on the Source Property and migration via groundwater. A summary of groundwater quality results are presented in the *Third Quarter 2014 Groundwater Monitoring Smokey Point Retail Center 2707 171st Place Northeast Marysville, Washington,* prepared by SoundEarth and dated April 21, 2015.

On February 19, 2015, SoundEarth collected one indoor and one outdoor ambient air sample from the northernmost building (Building 1) on the SPRC Property. Analytical results for air samples indicate that concentrations of BTEX in the indoor air are less than the applicable MTCA Method B indoor air cleanup levels when corrected for the background outdoor ambient air BTEX concentrations. Any potential impact to indoor air quality from concentrations of BTEX in groundwater below Building 1 is further mitigated by the presence of the vapor barrier.

Based on findings from the vapor intrusion study and the presence of the vapor barrier, there are no impacts to indoor air quality as a result of petroleum-contaminated groundwater migrating from the adjoining Source Property. A detailed discussion the vapor intrusion study at the SPRC Property is presented in the *Vapor Intrusion Study, Smokey Point Retail Center 2707 171st Place Northeast, Marysville, Washington*, prepared by SoundEarth and dated April 2, 2015.

REMEDIAL ALTERNATIVES & DISPROPORTIONATE COST ANALYSIS

SoundEarth prepared this remedial alternatives and disproportionate cost analysis with the objective of providing Ecology with viable remedial alternatives and relevant cost estimates, in order to provide a preferred remedy that would address potential exposure issues and allow Ecology to issue a Property-Specific NFA for the SPRC Property. SoundEarth's analysis focused on remedial alternatives that are practicable, implementable, and effective at addressing petroleum contamination in the affected media on and beneath the SPRC Property. Each of the selected remedies is protective of human health and the

environment at the SPRC Property given the current concentrations of chemicals of concern (COCs), the extent of the groundwater plume (Figure 1), and absence of exposure pathways at the SPRC Property. Each of the selected remedies was evaluated based on the current understanding that the owner of the Source Property does not possess the financial resources to conduct remedial activities in order to address the source contamination that has migrated and will continue to migrate onto the SPRC Property. No active remedial measures were proposed for the SPRC Property only due to the high likelihood for recontamination due to the residual contamination located on the Source Property.

Remedial Alternative 1 - Source Soil Removal at Source Property

Remedial Alternative 1 includes removing of approximately 2,700 cubic yards of PCS on the Source Property. The alternative would include demolition of the existing building, removal of 4 feet of overburden, and excavation of PCS to depths generally ranging from 4 to 12 feet below grade (approximate area is shown on Figure 2). Prior to excavation, an additional subsurface investigation would be conducted to further define the extent of the PCS and limits of the remedial excavation. In addition, this remedial alternative would require temporary sheet pile shoring for Building 1 on the SPRC Property, dewatering during excavation, temporary water storage, and disposal of the water to the municipal sewer system, assuming a permit can be obtained. The remedial excavation would be backfilled and compacted and the site would be left undeveloped.

Based on current circumstances, there is no available source of funding for the owner of the Source Property to perform the proposed work. Additionally, the proposed work could only be performed by Ecology or a third party if written approval were obtained from the owner of the Source Property.

The present worth cost estimate to implement Remedial Alternative 1 is approximately $1,032,000 (Table 1).

Remedial Alternative 2 - Air Sparge/Soil Vapor Extraction for Source Property

Remedial Alternative 2 involves the installation of an air sparge (AS) and soil vapor extraction (SVE) system across the groundwater impact area on the Source Property to reduce concentrations of COCs in the vadose zone and groundwater to below the applicable MTCA Method A and/or B cleanup levels over a period of 5 years. The combined AS/SVE system would purge volatile COCs from the groundwater and capture and remove petroleum hydrocarbon vapors in the vadose zone. Implementation of SVE involves the installation of vertical wells within the zone of contamination and the application of a vacuum to the vadose zone to induce the flow of air and enhance the recovery of contaminated vapors in the vadose zone. AS involves injecting air into the groundwater to induce convective airflow through the soil column. This condition creates an underground air stripping mechanism to remove COCs. The injected air effectively transports the stripped contaminants into the vadose zone wherein they can be captured and removed by the SVE system. The AS/SVE remediation system would be installed throughout the Source Property (Figure 3). Pilot testing would be required to determine the effective radius of influence of the SVE wells and develop design specifications for full-scale implementation of the AS/SVE remediation system. However, it is estimated that approximately 39 sparge points would be needed.

Based on current circumstances, there is no available source of funding for the owner of the Source Property to perform the proposed work. Additionally, the proposed work could only be performed by Ecology or a third party if written approval were obtained from the owner of the Source Property.

The present worth cost estimate to implement Cleanup Alternative 2 is approximately $883,000 (Table 2).

Remedial Alternative 3 - Institutional Controls and Environmental Covenant at SPRC Property

Remedial Alternative 3 includes at least three (3) but likely five (5) years of semi-annual groundwater monitoring using the existing groundwater monitoring well network on the SPRC Property combined with the filing of a restrictive covenant for the SPRC Property. The SPRC Property already maintains engineering controls that restrict access to subsurface soil and groundwater using the existing asphalt parking lot and the buildings with vapor barriers as an engineered cap. The proposed remedial alternative includes inspection maintenance of these engineering controls on an annual basis for 5 years. Groundwater monitoring will include sampling and analysis to confirm that the groundwater plume is not migrating off the SPRC Property, evaluation of plume stability over time using trend analysis, and use of field parameters (e.g., dissolved oxygen, pH, and oxidation-reduction potential) to confirm the groundwater continues to be capable of intrinsic bioremediation of the COCs.

The present worth cost estimate to implement Cleanup Alternative 3 is approximately $91,900. (Table 3).

COMPARISON OF REMEDIAL ALTERNATIVES

This section presents the comparison of the remedial alternatives described above. The comparison is based on the following criteria:

- **Protectiveness.** Remedial Alternative 1 is the most protective of the three alternatives because it eliminates the source of groundwater contamination. Remedial Alternative 2 is less protective that Remedial Alternative 1 because it eliminates the source contamination over a longer time period. Alternative 3 is the least protective of the three remedial alternatives because it relies on institutional controls to protect human health and the environment over the long term. However, all three Remedial Alternatives are considered to be fully protective of human health and the environment.
- **Permanence.** Remedial Alternative 1 is the most permanent of the three alternatives because it removes the source for groundwater contamination. Remedial Alternative 2 requires ongoing operation and monitoring with a less predictable restoration timeframe. Alternative 3 relies on institutional controls and long-term monitoring to protect human health and the environment with no specific restoration time frame, but provides for stable long-term protection of human health and the environment through monitoring and annual maintenance of existing engineering controls.
- **Cost.** Remedial Alternative 1 is most expensive of the three proposed remedial alternatives because the cost to implement this alternative includes shoring, dewatering, treatment of the groundwater prior to discharge, handling, hauling, and transportation of contaminated soil, and SPRC Property restoration. Remedial Alternative 2 is slightly less expensive, as the AS/SVE system would likely operate for at least 5 years. As noted previously, the current owners/operators of the Source Property have no available funds and therefore no plans to perform or implement any active remedial measures at the Site. Remedial Alternative 3 is least

expensive of the three remedial alternatives, even if institutional controls and engineering controls are maintained indefinitely.

- **Effectiveness over the Long Term.** Remedial Alternative 1 would have the highest degree of certainty and reliability to succeed in restoring the Site in reasonable restoration time frame, if the owner of the Source Property had any funds to implement the proposed remedy. Similarly, Remedial Alternative 2 provides an effective remedial alternative for restoration of groundwater quality at the SPRC Property, but it may be necessary to operate and maintain the AS/SVE system in perpetuity and there are no available funds available to implement that system. Remedial Alternative 3 will only lead to reduction in concentration of COCs in the groundwater by intrinsic bioremediation. However, as a result of institutional controls and maintenance of engineering controls, this alternative will effectively manage long-term risks to human health and the environment posed by COCs remaining at the SPRC Property.
- **Management of Short-Term Risks.** Remedial Alternative 1 includes a number of short-term risks to construction and environmental workers compared to Remedial Alternatives 2 and 3. These risks are associated with excavation of contaminated soil, soil handling, installation of shoring, construction dewatering, confirmation soil sampling, and exposing workers to volatile COCs. Alternative 2 includes risks to drillers and environmental workers during the installation of AS/SVE system. Additionally, installing the AS/SVE system could result in the release of volatile COCs to the atmosphere and requires personal protection for workers during the installation of the AS/SVE remediation system. Alternative 3 has the least short-term risks of the three alternatives.
- **Implementability.** It is our understanding that Alternatives 1 and 2 are <u>not</u> implementable at this time or in the foreseeable future due to lack of financial resources for the owner of the Source Property. Remedial Alternative 1 has the least ability to be implemented because the current owners and/or operators of the former Smokey Point Chevron property do not have the financial resources to implement the cleanup relative to overall value of the property. Remedial Alternative 2 is technically and administratively implementable on paper, but without removal of the source area on the Source Property, the AS/SVE system will likely operate in perpetuity. Remedial Alternative 3 is the most technically and administratively implementable of the three remedial alternatives because it easily integrated into the existing operations at the SPRC Property and is fully protective of human health and the environment.
- **Consideration of Public Concerns.** The three remedial alternatives equally address any individual, community groups, local governments, tribes, federal and state agencies, or other organizations regarding the presence of contamination at the site and its potential impact to human health and the environment.

RECOMMENDED REMEDIAL ALTERNATIVE

After performing a comparative analysis of the Remedial Alternatives, the recommended remedy for the SPRC Property is Remedial Alternative 3.

Remedial Alternative 3 is recommended because it is protective of human health and the environment on the SPRC Property through the use of institutional controls and engineering controls. Encapsulating residual contamination beneath existing engineering controls on the SPRC Property does not pose an

unacceptable threat to human health or the environment given the current land use of the SPRC Property in conjunction with the planned institutional controls. Alternative 3 also exhibits the lowest cost of three alternatives given the fact that there are no resources available for active remediation of contamination located on and beneath the Source Property.

Since the owner of the Source Property does not have the financial resources required for a source cleanup, Alternatives 1 and 2 are not implementable at this time, or in the foreseeable future. As such, it is not technically or administratively possible to implement a more permanent cleanup action for all or a portion of the Site. Therefore, the incremental costs of Alternatives 1 and 2, which cannot be implemented, far exceed the incremental degree of benefits achieved compared to Alternative 3, which can be implemented. Any alternative providing active remediation of just the SPRC Property is inconsistent with MTCA requirements on both technical grounds (due to the high likelihood of recontamination) and legal grounds (due to the liability protection provided under RCW 70.105D.020(22)(b)(iv)).

Because of the proposed use of institutional controls, SPRC intends to provide sufficient financial assurances as required under WAC 173-340-440(11) to ensure that engineering controls are maintained for as long as the institutional controls remain in place.

CLOSING

We appreciate the opportunity to provide Ecology with environmental information for this project. We look to forward to your opinion regarding a path forward toward an NFA for the SPRC Property. If you have any questions, please contact the undersigned at 206-306-1900.

Respectfully,

SoundEarth Strategies, Inc.

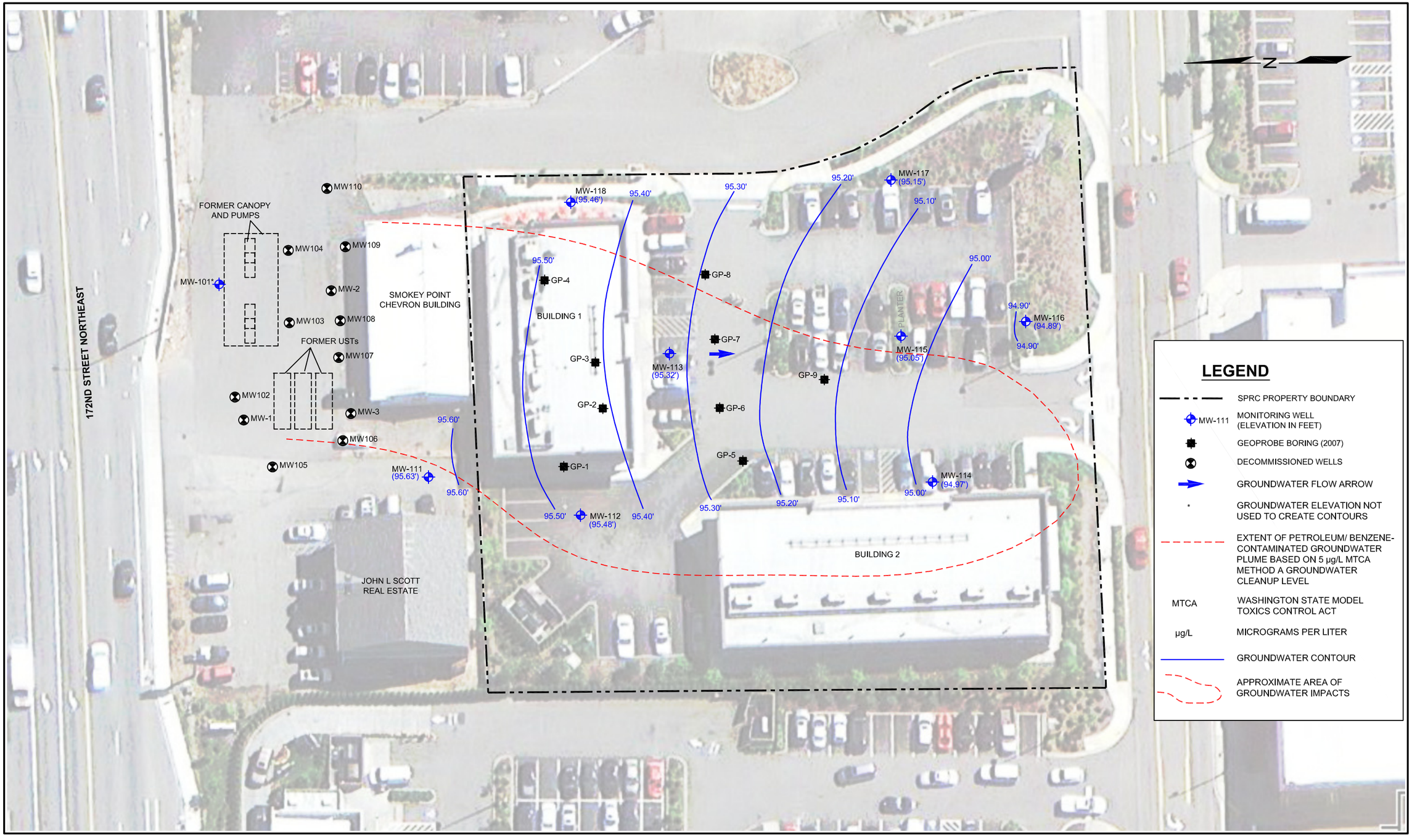
Rob Roberts
Senior Scientist

Attachments: Figure 1, SPRC Property Plan and Groundwater Contour Map
Figure 2, Source Removal Alternative 1—Soil Excavation to 12 feet
Figure 3, Alternative 2—Air Sparge with Soil Vapor Extraction
Figure 4, Alternative 3—Institutional Controls for SPRC Property
Table 1, Planning Level Cost Estimate for Alternative 1: Large Excavation
Table 2, Planning Level Cost Estimate for Alternative 2: AS/SVE System
Table 3, Cost Estimate for Alternative 3: SPRC Property NFA with Covenant and Engineering Controls

CER/JRF:amr

FIGURES

4/20/2015



LEGEND

- SPRC PROPERTY BOUNDARY
- MW-111 — MONITORING WELL (ELEVATION IN FEET)
- GEOPROBE BORING (2007)
- DECOMMISSIONED WELLS
- GROUNDWATER FLOW ARROW
- * — GROUNDWATER ELEVATION NOT USED TO CREATE CONTOURS
- EXTENT OF PETROLEUM/ BENZENE-CONTAMINATED GROUNDWATER PLUME BASED ON 5 µg/L MTCA METHOD A GROUNDWATER CLEANUP LEVEL
- MTCA — WASHINGTON STATE MODEL TOXICS CONTROL ACT
- µg/L — MICROGRAMS PER LITER
- GROUNDWATER CONTOUR
- APPROXIMATE AREA OF GROUNDWATER IMPACTS

SoundEarth Strategies
WWW.SOUNDEARTHINC.COM

DATE: 04/20/15
DRAWN BY: JQC
CHECKED BY: CER
CAD FILE: 0918-001_FIG1

PROJECT NAME: SMOKEY POINT
PROJECT NUMBER: 0918-001
STREET ADDRESS: 171ST PLACE NORTHEAST
CITY, STATE: MARYSVILLE, WASHINGTON

REGION:

0 20 40 80
APPROXIMATE SCALE IN FEET

FIGURE 1
SPRC PROPERTY PLAN AND GROUNDWATER CONTOUR MAP

P:\0918 MADISON DEVELOPMENT\0918-001 SMOKEY POINT\TECHNICAL\CAD\2015\0918-001_FIG1.DWG

N

SMOKEY POINTS CHEVRON PROPERTY

PROPOSED CLEANUP AREA TO 12' WITH 4' OF "CLEAN" OVERBURDEN

FORMER CANOPY AND PUMPS

FORMER USTs

STORAGE

EXISTING SMOKEY POINT CHEVRON BUILDING

COOLERS

P01 P02 P03 P04 P05 P06 P07 P08

SMOKEY POINT RETAIL CENTER BUILDING 1

TEMPORARY SHEET PILE SHORING WALL

172ND STREET NORTHEAST

LEGEND

- PROPERTY BOUNDARY
- 2009 PCS CLEANUP AREA TO 5 FEET
- P01 SOIL PROBE LOCATION (SOUNDEARTH 2013)

SoundEarth Strategies
WWW.SOUNDEARTHINC.COM

DATE: 4/20/15
DRAWN BY: JQC
CHECKED BY: CER
CAD FILE: 0918-001_RO_FIG2

PROJECT NAME: SMOKEY POINT
PROJECT NUMBER: 0918-001
STREET ADDRESS: 171ST PLACE NORTHEAST
CITY, STATE: MARYSVILLE, WASHINGTON

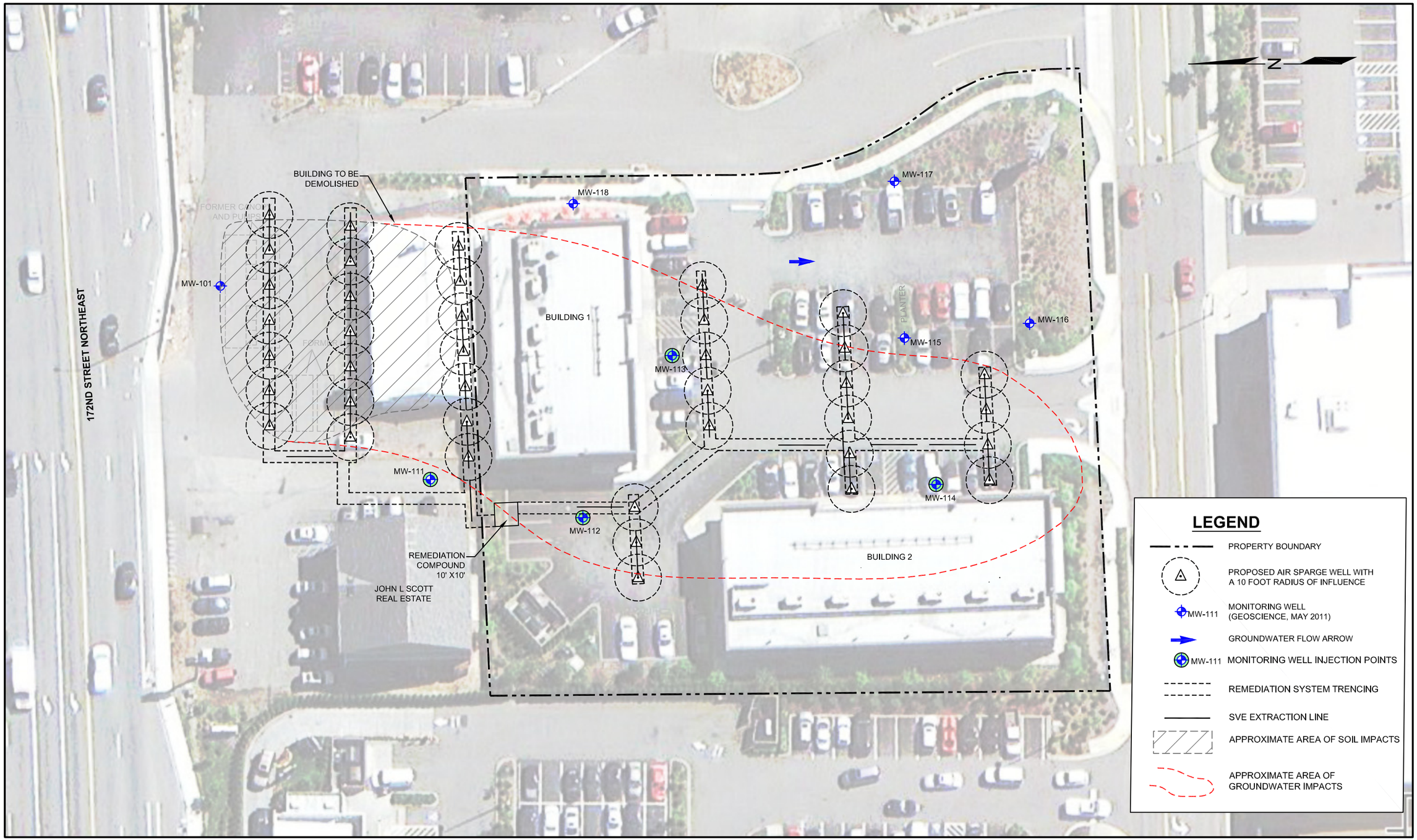
REGION:

0 10 20 40
APPROXIMATE SCALE IN FEET

FIGURE 2
SOURCE REMOVAL
ALTERNATE 1, SOIL EXCAVATION TO 12 FEET

4/20/2015

P:\0918 MADISON DEVELOPMENT\0918-001 SMOKEY POINT\TECHNICAL\CAD\2015 AS-SVE\0918-001_RO_FIG3.DWG



SoundEarth Strategies
WWW.SOUNDEARTHINC.COM

DATE: 4/20/15
DRAWN BY: TGO
CHECKED BY: SES
CAD FILE: 0918-001_RO_FIG3

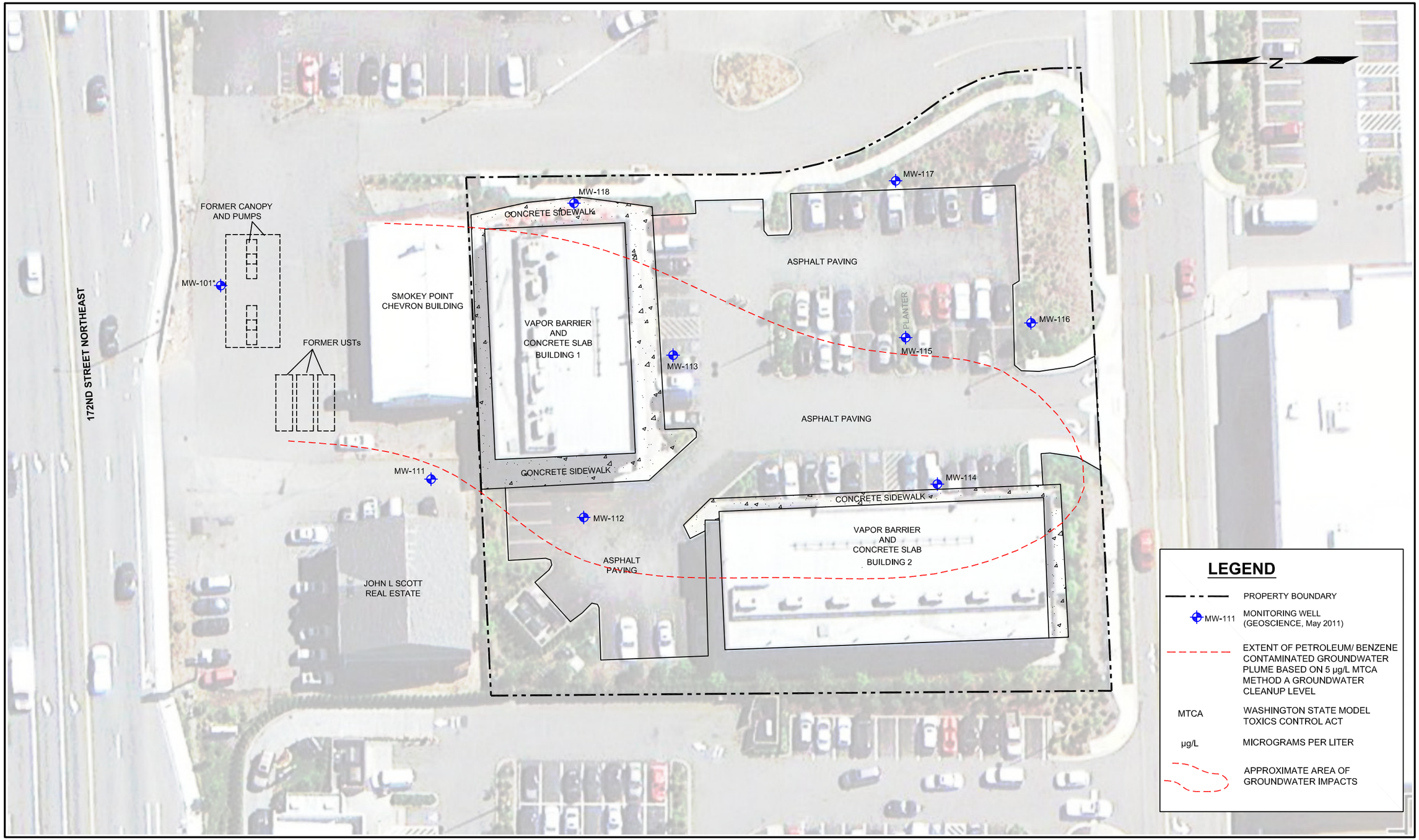
PROJECT NAME: SMOKEY POINT
PROJECT NUMBER: 0918-001
STREET ADDRESS: 171ST PLACE NORTHEAST
CITY, STATE: MARYSVILLE, WASHINGTON

REGION:

0 20 40 80
APPROXIMATE SCALE IN FEET

FIGURE 3
ALTERNATE 2
AIR SPARGE WITH
SOIL VAPOR EXTRACTION

4/20/2015



SoundEarth Strategies
WWW.SOUNDEARTHINC.COM

DATE: 04/20/15
DRAWN BY: JQC
CHECKED BY: CER
CAD FILE: 0918-001_FIG4

PROJECT NAME: SMOKEY POINT
PROJECT NUMBER: 0918-001
STREET ADDRESS: 171ST PLACE NORTHEAST
CITY, STATE: MARYSVILLE, WASHINGTON

REGION:

0 20 40 80
APPROXIMATE SCALE IN FEET

FIGURE 4
ALTERNATE 3 - INSTITUTIONAL CONTROLS FOR SPRC PROPERTY

P:\0918 MADISON DEVELOPMENT\0918-001 SMOKEY POINT\TECHNICAL\CAD\2015\0918-001_FIG4.DWG

WWW.SOUNDEARTHINC.COM

TABLES

SoundEarth Strategies

Table 1
Planning Level Cost Estimate for Alternative 1: Large Excavation
Petroleum-Contaminated Soil Source Removal - Smokey Point Chevron
Marysville, Washington
April 15, 2015

WORK TASK & NUMBER		TASK SUMMARY COSTS: Total Professional Fees	Total Expenses	Task Subtotals	NOTES and ASSUMPTIONS
TASK 1, Permitting for Grading/Demolition and Meetings					
1.1	Permit Application Support and Fees	$5,700	$1,000	$6,700	
1.2	Project Management, Meetings, Cost Estimate	$3,000	$250	$3,250	
	TASK 1 TOTAL:	**$8,700**	**$1,250**	**$9,950**	
TASK 2, Geoprobe Bounding Assessment (completed in 2013)					
2.1	8 borings to 16 feet, Limited Access Rig	$0	$0	$0	1 Day in field includes concrete cores, NWTPH-Gx/BTEX analysis, includes travel time and mileage; assumes double door access for drill rig.
2.2	Lab Analysis (10 samples for NWTPH-Gx/BTEX)	$0	$0	$0	
2.3	Utility Check	$0	$0	$0	
2.4	Project Management and Memo Report	$0	$0	$0	Task Completed.
	TASK 2 TOTAL:	**$0**	**$0**	**$0**	
TASK 3, Asbestos Removal					
3.1	3,400 SF of ACM floor tile	$3,500	$17,100	$20,600	Assumes summary letter to document ACM removal and minimal coordination with contract and limited observation. Assumes $4/SF (contractor bids may vary).
	TASK 3 TOTAL:	**$3,500**	**$17,100**	**$20,600**	
TASK 4, Remedial Action Planning, Preparation, and Permitting					
4.1	Health and Safety Plan	$2,000	$30	$2,030	
4.2	Project Management and Coordination	$2,000	$50	$2,050	
	TASK 4 TOTAL:	**$4,000**	**$80**	**$4,080**	
TASK 5, Remedial Action - Excavation to 12 feet, Assumes a 90x100 foot area.					
5.1	Mobilization, Demobilization, and Site Security	$2,000	$7,500	$9,500	
5.2	Utility Disconnects	$0	$2,000	$2,000	
5.3	Building Demolition	$0	$19,500	$19,500	Includes slab demolition.
5.4	Additional Geoprobe Assessment for bounding the parking lot area	$5,500	$9,000	$14,500	
5.5	Permitting and Engineering plans/dewatering for large Excavation	$0	$20,000	$20,000	
5.6	Shoring on south side of excavation (90 feet to 12 feet)	$5,000	$136,000	$141,000	$80/SF, sheetpile shoring 100 foot section to 17 feet.
5.7a	Excavation of 2,700 Cubic Yards of PCS from 4 to 12 feet (10 days)	$18,000	$36,000	$54,000	$9 per Ton for excavation of PCS. 2,700 cy (4,000 tons) assumes excavation of 100' x 90' depth ranging from 4' to 12', 10-day schedule. Extent first to be confirmed by Geoprobe assessment of the parking lot area.
5.7b	Excavation of overburden, stockpile, assumes reuse as backfill (top 4 feet)	$2,000	$40,000	$42,000	$20/ton includes excavation, stockpile, backfill. Assumes 2000 Tons (1.5 tons per cubic yard)
5.8	Transport and Disposal of PCS (4,000 tons export)	$7,500	$280,000	$287,500	$70/ton for transport/disposal to CEMEX Everett. Assumes 4,000 tons PCS.
5.9	Fencing, Equipment, miscellaneous costs	$1,000	$4,000	$5,000	
5.10a	Dewatering pilot test, design, and well installation (assumes 4 wells)	$9,000	$24,000	$33,000	Number of wells and water volume to be confirmed by hydrogeologist.
5.10b	Dewatering (2 Baker tanks and sewer disposal assumed)	$0	$25,000	$25,000	Assumes a 10-day excavation schedule and permission to dispose to sewer.
5.11	Soil Confirmation Testing (50 samples)	$0	$8,000	$8,000	24- to 48-hour rush analysis.
5.12	Backfill and compact (4,000 Tons)	$0	$112,000	$112,000	$28/Ton. 85% compaction. Does not include repaving and site restoration.
5.13	Project Management, Field Coordination, PCS management, Client Updates and Administrative	$15,000	$1,000	$16,000	Assumes 2 weeks in the field and 2 weeks of setup/closure. 25 hours of PM per week, 15 hours Principal total.
	TASK 5 TOTAL:	**$65,000**	**$724,000**	**$789,000**	
	TASKS 1 THROUGH 5 SUBTOTAL:	**$81,200**	**$742,430**	**$823,630**	
TASK 6, Post Remedial Reporting					
6.1	Remedial Investigation/Feasibility Study/Cleanup Action Plan	$25,000	$500	$25,500	
6.2	Cleanup Action Report for Ecology	$15,000	$500	$15,500	
6.2	Project Management and Administrative	$10,000	$0	$10,000	
	TASK 6 TOTAL:	**$50,000**	**$1,000**	**$51,000**	
TASK 7, Regulatory Closure					
7.1	Ecology Correspondence, Meetings, and Regulatory Fees	$6,500	$5,000	$11,500	Assumes existing VCP Application, 4 meetings at Ecology, 50 hours Ecology PM.
7.2	Persulfate Injections (2 rounds to gallery and wells)	$15,000	$45,000	$60,000	Treatment to Smokey Point Retail Property only.
7.3	Groundwater monitoring (4 years: 8-Quarterly Events, 6 Semiannual Events = 14 Events/Well; 5 wells x 12 = 70 samples); Lab: NWTPH-Gx/BTEX, NWTPH-Dx, and Reporting	$60,000	$24,000	$84,000	
7.4	Project Management, Admin, and Client Meetings (5 years post cleanup)	$25,000	$2,000	$27,000	
	TASK 7 TOTAL:	**$106,500**	**$76,000**	**$182,500**	

SUMMARY OF ESTIMATED COSTS:		
	SoundEarth Professional Fees:	$238,000
	Subcontractors, Analytical, Field Equipment, and ODCs:	$819,000
	Contingency (20%):	$211,400
	TOTAL:	**$1,268,400**

Cost and Budget Assumptions

- Geoprobe assessment needed to confirm extent of petroleum impacts.
- Dewatering methods and costs require additional engineering.
- Costs assume SoundEarth manages the removal.
- No hazardous waste is generated.

NOTES:

ACM = asbestos-containing material

BTEX = benzene, toluene, ethylbenzene, and total xylenes

ODC = other direct cost

PCS = petroleum-contaminated soil

PM = project manager/project management

SF = square feet

VCP = Voluntary Cleanup Program

SoundEarth Strategies

Table 2
Planning Level Cost Estimate for Alternative 2: AS/SVE System
Smokey Point Chevron Groundwater Plume and Source Area
Marysville, Washington
April 15, 2015

	WORK TASK & NUMBER	TASK SUMMARY COSTS: Total Professional Fees	Total Expenses	Task Subtotals	NOTES and ASSUMPTIONS
TASK 1, Permitting for Demolition and Meetings					
1.1	Permit Application Support and Fees	$2,200	$2,000	$4,200	Assumes demolition permit only, no grading or building permit required.
1.2	Project Management, Meetings, Cost Estimate	$3,000	$0	$3,000	
	TASK 1 TOTAL:	**$5,200**	**$2,000**	**$7,200**	
TASK 2, Geoprobe Bounding Assessment (completed in 2013)					
2.1	8 borings to 16 feet, Limited Access Rig	$0	$0	$0	1 Day in field includes concrete cores, NWTPH-Gx/BTEX analysis, includes travel time and mileage. Assumes double door access for drill rig.
2.2	Lab Analysis (10 samples for NWTPH-Gx/BTEX)	$0	$0	$0	
2.3	Utility Check	$0	$0	$0	
2.4	Project Management and Memo Report	$0	$0	$0	
	TASK 2 TOTAL:	**$0**	**$0**	**$0**	
TASK 3, Asbestos Removal					
3.1	3,400 SF of ACM floor tile	$3,500	$17,100	$20,600	Assumes summary letter to document ACM removal and minimal coordination with contract and limited observation. Assumes $4/SF (contractor bids may vary).
	TASK 3 TOTAL:	**$3,500**	**$17,100**	**$20,600**	
TASK 4, Remedial Action Planning, Preparation, and Permitting					
4.1	Health and Safety Plan	$2,000	$0	$2,000	
4.2	Project Management and Coordination	$2,000	$0	$2,000	
	TASK 4 TOTAL:	**$4,000**	**$0**	**$4,000**	
TASK 5, Remedial Action - Air Sparging (AS) and Soil Vapor Extraction (SVE)					
5.1	Mobilization, Demobilization, and Site Security	$2,000	$3,000	$5,000	Includes fencing and signage.
5.2	Utility Disconnects	$0	$2,000	$2,000	
5.3	Building Demolition	$1,500	$19,500	$21,000	Includes slab demolition
5.4	Additional Geoprobe Assessment for parking lot area	$5,500	$11,500	$17,000	Assumes 3 days with geoprobe rig.
5.5	Permitting and engineering plans	$0	$10,000	$10,000	
5.6	Air Discharge Permit Preparation and Submittal	$6,500	$2,500	$9,000	Assumes that the SEPA checklist has already been prepared for this Site. Covers air discharge permit fees for 1 year. Assumes no air discharge permit necessary after year 1.
5.7	Air Sparge and Soil Vapor Extraction System Design	$15,000	$0	$15,000	
5.8	Installation of Air Sparge Wells	$25,000	$89,800	$114,800	Assumes the installation of 40 air sparge wells to a depth of 15-17 feet below ground surface. Assumes 4 wells per day, total installation time of 10 days. 2 people for 10 days and the collection of 2 samples per boring (80 samples analyzed for GRPH/BTEX).
5.9	AS/SVE System installation and start up	$40,000	$250,000	$290,000	Assumes 15 days for system installation and 5 days associated with power hookup, inspections and start up activities (total 20 days). Assumes $150,000 for system installation and $100,000 for equipment skid, vapor phase GAC and pad.
5.10	New Temporary power service	$1,100	$10,000	$11,100	Assumes a new temporary power pole and meter base to be set.
5.11	System Operations and Maintenance - 5 years	$56,000	$14,320	$70,320	Assumes monthly O&M for year 1 and quarterly site visits years 2-5 for a total of 20 site visits.
5.12	Utility Fees for System Operations - 5 years	$0	$60,000	$60,000	Assumes $1,000 per month to operate AS and SVE blowers.
5.13	Vapor Carbon Change out and profiling	$2,750	$9,500	$12,250	Assumes vapor carbon treatment required for year 1, 1 carbon change out, profile and removal of carbon.
5.14	Project Management, Field Coordination, PCS management, Client Updates and Administrative	$20,000	$0	$20,000	Assumes 6 weeks in the field with 15 hrs of PM per week, 10 hours Principal total.
	TASK 5 TOTAL:	**$175,350**	**$482,120**	**$657,470**	
	TASKS 1 THROUGH 5 SUBTOTAL:	**$188,050**	**$501,220**	**$689,270**	
TASK 6, Post Remedial Reporting					
6.1	Remedial Investigation/Feasibility Study/Cleanup Action Plan	$25,000	$500	$25,500	
6.2	Cleanup Action Report for Ecology	$15,000	$500	$15,500	
6.3	Project Management and Administrative	$2,500	$0	$2,500	
	TASK 6 TOTAL:	**$42,500**	**$1,000**	**$43,500**	
TASK 7, Regulatory Closure					
7.1	Ecology Correspondence, Meetings, and Regulatory Fees	$9,000	$8,000	$17,000	Assumes existing VCP Application, 4 meetings at Ecology, 50 hrs Ecology PM
7.2	Persulfate Injections (2 rounds to gallery and wells)	$15,000	$25,000	$40,000	Treatment to Smokey Point Retail Property only
7.3	Groundwater monitoring 6 years; Lab: BTEX only	$47,000	$24,000	$71,000	6 Years (Years 1 and 6 quarterly - 8 events; Years 2 through 5 semiannual events - 8 events) - total of 16 events for 5 wells.
7.4	Project Management, Admin, and Client Meetings (5 years post cleanup)	$20,000	$2,000	$22,000	
	TASK 7 TOTAL:	**$91,000**	**$59,000**	**$150,000**	

SUMMARY OF ESTIMATED COSTS:		
	SoundEarth Professional Fees:	$322,000
	Subcontractors, Analytical, Field Equipment, and ODCs:	$561,000
	Contingency (20%):	$176,600
	TOTAL:	**$1,059,600**

Cost and Budget Assumptions

- Preliminary estimates for planning level purposes
- This cost estimate does not account for inflation from years 1 through 6 or a net present value.

NOTES:

AS = air sparge
ACM = asbestos-containing material
BTEX = benzene, toluene, ethylbenzene, and total xylenes
GRPH = gasoline-range petroleum hydrocarbons
O&M = operation & maintenance
ODC = other direct cost
PCS = petroleum-contaminated soil
PM = project manager/project management
SEPA = State Environmental Policy Act
SF = square feet
VCP = Voluntary Cleanup Program

Table 3
Planning Level Cost Estimate for Alternative 3:
SPRC Property NFA with Covenant and Engineering Controls
Smokey Point Retail Center
171st Place Northeast
Marysville, Washington
April 4, 2015

	WORK TASK & DESCRIPTION	TASK SUMMARY COSTS: Total Professional Fees	Total Expenses	Task Sub-Totals
TASK 1, Meetings and Attorney Communications				
1.1	Site meetings and Ecology Communications	$800	$100	$900
1.2	Attorney Client meetings and follow-up	$730	$0	$730
1.3	Work Plans	$1,660	$0	$1,660
	TASK 1 TOTAL:	**$3,190**	**$100**	**$3,300**
TASK 2, Indoor Air Sampling (SUMMA) - North Building				
2.1	Field Coordination, tenant contacts, and equipment setup	$1,260	$0	$1,260
2.2	SUMMA deployment and retrieval, obtain "As-Builts" for vapor barrier	$2,040	$200	$2,240
2.3	L:ab Fees and Data Evaluation	$2,080	$2,000	$4,080
2.4	Report for Ecology	$4,800	$0	$4,800
	TASK 2 TOTAL:	**$10,180**	**$2,200**	**$12,400**
TASK 3, VCP Management, NFA Request, Covenant, and Ecology Meetings				
3.1	VCP Management	$660	$0	$660
3.2	NFA Request with Supporting documentation and Reports	$820	$100	$920
3.3	Covenant text and figure	$3,800	$0	$3,800
3.4	Ecology meetings and responses to covenant and VCP reports	$2,120	$0	$2,120
3.5	Task Management	$820	$0	$820
	TASK 4 TOTAL:	**$8,220**	**$100**	**$8,320**
TASK 4, Project Management				
4.1	Client Meetings and communications	$6,045	$0	$6,045
4.2	Project management (5 years)	$10,890	$0	$10,890
	TASK 5 TOTAL:	**$16,935**	**$0**	**$16,935**
TASK 5, Monitoring and Maintenance				
5.1	Work plans and tenant coordination (5 events)	$3,300	$0	$3,300
5.2	Annual monitoring (5 years) 5 wells - 25 well events	$7,950	$4,500	$12,450
5.3	Groundwater reports (5 reports) review	$14,600	$1,000	$15,600
5.4	Vapor Barrier O&M Checks (annual for 5 years)	$9,775	$500	$10,275
5.5	Ecology communications	$9,300	$0	$9,300
	TASK 5 TOTAL:	**$44,925**	**$6,000**	**$50,925**

SUMMARY OF ESTIMATED COSTS:	**SoundEarth Professional Fees:**	$83,450
	Subcontractors, Analytical, Field Equipment, and ODCs:	$8,400
	Total Budget:	**$91,900**

Cost and Budget Assumptions

- SoundEarth 2015 rates and 2015 Lab fees.

NOTES:
NFA = No Further Action
O&M = operation and maintenance
SPRC = Smokey Point Retail Center
VCP = Voluntary Cleanup Program