Earth Solutions NW LLC

Geotechnical Engineering
Geology
Environmental Scientists
Construction Monitoring

CLEANUP ACTION PLAN
PROPOSED POTALA VILLAGE
1006 TENTH AVENUE SOUTH, 21 TENTH AVENUE SOUTH, AND 6700 LAKE WASHINGTON BLVD.
KIRKLAND, WASHINGTON

ES-2880

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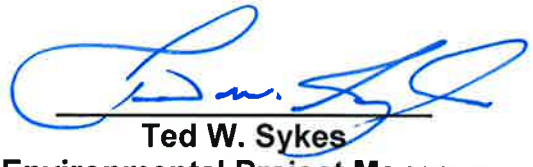
PREPARED FOR

POTALA VILLAGE KIRKLAND, LLC

September 19, 2013



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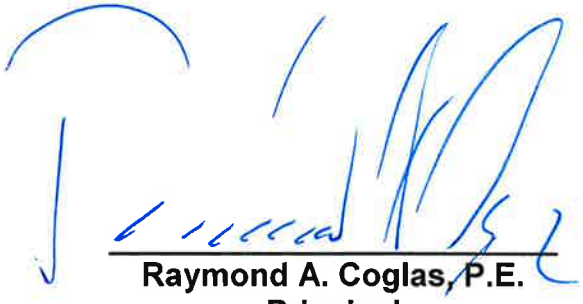

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EXECUTIVE SUMMARY

Earth Solutions NW, LLC (ESNW) has prepared this Cleanup Action Plan for the Potala Village property, located at 1006 Lake Street South, 21 Tenth Avenue South, and 6700 Lake Washington Boulevard in Kirkland, Washington (the Property), on behalf of Potala Village Kirkland, LLC. This Cleanup Action Plan (CAP) was prepared in general accordance with the Washington State Model Toxics Control Act promulgated in Chapter 173-340-380 of the Washington Administrative Code.

The Property consists of three tax parcels that cover approximately 1.21 acres of land situated southwest of the intersection between Lake Street South and tenth Avenue South in Kirkland, Washington. The Property is currently developed with a 2,114 square foot commercial building occupied by a dry cleaner and a restaurant, and a 2,370 square foot residential home. The remaining areas of the site are currently undeveloped.

The commercial building currently occupying the site was constructed in 1958 with additions to the eastern and southern parts of the building during the 1960s. A commercial tire store (called "OK Tire Store") operated on the property from 1958 until the mid-1970s. According to historical records, OK Tire Store provided the following services: new tires, tire recapping, wheel alignment, and sale of automotive batteries. Reportedly no hydraulic lifts were on record as being used with the tire service. Other records indicated that the current restaurant tenant (Asia Kitchen) and the dry cleaning tenant (Michaels Fine Dry Cleaning) began occupying the site in the mid-1970s and mid-1990s, respectively.

In addition to the commercial building, a gasoline service station was constructed on the property in 1957. Agency records indicated the station was equipped with two 4,000 gallon and one 275 gallon underground storage tanks (USTs) and one hydraulic hoist. The service station was reportedly demolished during the early 1970s and the USTs were reportedly decommissioned by filling with sand.

The present-day residential home occupying the site was constructed in 1953. Tax assessor records indicated the home was heated by a pressure oil burning furnace and a suspect underground heating fuel storage tank was discovered on the property. There were no records indicating that the heating fuel tank was decommissioned.

Subsurface investigations conducted on the property between 2006 and 2008 have confirmed that the historical use of chlorinated solvents by the current dry cleaning tenant has impacted groundwater quality underlying the property. As established in Washington Administrative Code 173-340-200, the site is defined by the full lateral and vertical extent of contamination in soil and groundwater that has resulted from the historical operation of a dry cleaning facility on the property. No remedial activities have taken place at the site.

This CAP has been prepared based on the results of the 2006 and 2008 subsurface investigations conducted at the site. The CAP presents the methods proposed to remediate the chlorinated solvent contaminated groundwater and soil on the property.

This executive summary is presented solely for introductory purposes, and the information contained in this section should be used only in conjunction with the full text of this report. A complete description of the project, Site conditions, investigative methods, and investigation results is contained within this report.

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GRAPHICS

1.0 INTRODUCTION

Earth Solutions NW, LLC (ESNW) has prepared this Cleanup Action Plan (CAP) on behalf of Potala Village Kirkland, LLC for the Potala Village property, located at 1006 Lake Street South, 21 – 10th Avenue South, and 6700 Lake Washington Boulevard in Kirkland, Washington (the Property), as shown on Plate 1. The three-parcel subject property (King County Tax Parcel Nos. 93549002200, 0825059233, and 9354900240) comprises a collective total of approximately 1.21 acres of land area. For the purposes of this CAP, the three parcels are designated as Parcels 'A', 'B', and 'C'. Parcel A (1006 Lake Street South) includes a 2,114 square foot single-story building with two commercial tenants, a restaurant and a dry cleaners. Parcel B (6700 Lake Washington Boulevard) is currently a vacant lot. Parcel C (21 – 10th Avenue South) includes a 2,370 square foot residence with basement.

This CAP was prepared for submittal to the City of Kirkland, and it was developed to meet the general requirements of a CAP as defined by the Washington State Model Toxics Control Act (MTCA) Regulation in Chapter 173-340-380 of the Washington Administrative Code (WAC 173-340-380).

As established in WAC 173-340-200, the site is defined by the full lateral and vertical extent of contamination in soil and groundwater that has resulted from the historical operations of a dry cleaning facility. Based on the information gathered to date, the site includes the confirmed presence of tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2-dichloroethene (cis-1,2-DCE) contaminated groundwater beneath Parcel A in the area of the dry cleaning machine. The concentrations of PCE were identified to be above the MTCA Method A groundwater cleanup level. The concentrations of TCE and cis-1,2-DCE were identified to be below their corresponding MTCA Method A groundwater cleanup levels. Reportedly, groundwater contamination has not migrated off-site. The site also includes possible gasoline and diesel range petroleum hydrocarbon impacted soil and groundwater beneath Parcel B where a former gasoline service station existed and possible diesel range petroleum hydrocarbon contaminated soil and groundwater associated with a suspected heating fuel underground storage tank located on Parcel C where a residential home currently exists.

This CAP addresses the PLANNED remediation of PCE impacted soil and shallow groundwater, and possible petroleum hydrocarbon contamination in soil and shallow groundwater beneath the property during site redevelopment activities. Remediation at the site will coincide with the redevelopment excavation work. This CAP also includes a discussion of the property background, previous investigations, the selected cleanup action, completed remedial actions, and the remaining steps required to implement this plan.

1.1 DOCUMENT PURPOSE

The purpose of this CAP is to satisfy the specific requirements of MTCA in accordance with WAC 173- 340-380 and to eventually obtain a No Further Action (NFA) determination from Washington State Department of Ecology (Ecology).

1.2 ORGANIZATION

Section 2.0, Background. This section provides a description of the property location, features, and historical land uses; the geologic and hydrogeologic setting of the site; previous investigations conducted on the site, the distribution of known contamination, chemicals of concern (COCs), media of concern, and the site definition.

Section 3.0, Technical Elements. This section presents the applicable or relevant and appropriate requirements (ARARs) for the Site, the development of cleanup standards, and the remedial action objectives (RAOs).

Section 4.0, Selected Cleanup Action. This section presents the cleanup action objectives, the cleanup action alternatives that have been selected, and the cleanup action components that are proposed to be implemented for the property.

Section 5.0, Remaining Cleanup Action Components. This section provides a description of the remaining cleanup action components to remediate COCs on the property.

Section 6.0, Compliance Monitoring. This section describes the performance and confirmation sampling that will be conducted as part of the CAP.

Section 7.0, Documentation Requirements. This section describes the documentation to be provided for the cleanup action and includes a discussion of document management, waste disposal tracking information, and compliance reports.

Section 8.0, References. This section lists references cited in this document.

Section 9.0, Limitations. This section discusses document limitations.

2.0 BACKGROUND

The following section provides a summary of current and historical land use on the property and the site vicinity, the geologic and hydrogeologic setting of the property, previous investigations conducted at the property, the COCs, the media of concern, and the site definition.

2.1 SITE LOCATION AND DESCRIPTION

The site is defined as the area shown on the Site Diagram (see Plate 2). The site is further defined by the following:

1. PCE-contaminated groundwater beneath Parcel A in the area of the dry cleaning machine. Reportedly, groundwater contamination has not migrated off-site.

2. Possible existence of underground fuel storage tanks and possible petroleum hydrocarbon impacts to soil and groundwater beneath Parcel B from historic use as a gasoline service station.

3. Suspected existence of a residential home underground heating fuel storage tank and possible petroleum hydrocarbon impacts to soil and groundwater beneath Parcel C.

2.1.1 Property Description

The property includes three tax parcels (King County Tax Parcel Nos. 9354900220, 0825059233, and 9354900240) as shown on Plate 2 that cover approximately 52,600 square feet (1.21 acres) of land. The property is currently listed as 1006 Lake Street South, 21 – 10th Street South, and 6700 Lake Washington Boulevard, Kirkland, Washington. The property is currently developed with a commercial building occupied by a restaurant and a dry cleaning facility (located on Parcel A). A single family residential home is located on Parcel C and Parcel B is currently undeveloped (Plate 2).

Sewer and water services are provided to the Property by the City of Kirkland.

2.1.2 Property Land Use History

According to an October 15, 2010 *Phase I Environmental Site Assessment* (ESA) prepared by Aspect Consulting (Aspect), the commercial building occupying Parcel A was constructed in 1958 with additions to the eastern and southern parts of the building during the 1960s. A commercial tire store (called "OK Tire Store") operated on the property from 1958 until the mid-1970s. According to historical records, OK Tire Store provided the following services: new tires, tire recapping, wheel alignment, and sale of automotive batteries. Reportedly no hydraulic lifts were on record as being used with the tire service. Other records indicated that the current restaurant tenant (Asia Kitchen) and the dry cleaning tenant (Michaels Fine Dry Cleaning) began occupying the site in the mid-1970s and mid-1990s, respectively.

With regard to Parcel B, a gasoline service station was constructed on the property in 1957. Agency records indicated the station was equipped with two 4,000 gallon and one 275 gallon underground storage tanks (USTs) and one hydraulic hoist. The service station was reportedly demolished during the early 1970s and the USTs were reportedly decommissioned by filling with sand. Parcel B has remained vacant since the service station was demolished.

The present-day residential home occupying Parcel C was constructed in 1953. Tax assessor records indicated the home was heated by a pressure oil burning furnace and a suspect underground heating fuel storage tank was discovered on the property. There were no records indicating that the heating fuel tank was decommissioned.

2.2 GEOLOGIC AND HYDROGEOLOGIC SETTING

The following sections provide a summary of the geologic and hydrogeologic conditions beneath the property.

2.2.1 Regional Geology and Hydrogeology

Geologic information for the site vicinity includes *Geologic Map of* The Kirkland Quadrangle (Minard, J.P., 1983). Based on this reference, native surficial soils in the site vicinity include thin patchy glacial till deposits and recessional outwash deposits from the Vashon glaciation. According to the map, the glacial till consists of a mixture of clay, silt, sand, gravel, cobbles and boulders. Recessional outwash typically consists of loose to medium dense, stratified sand and gravel with minor silt and clay layers.

2.2.2 Site Geology

According to a December 1, 2010 Geotechnical Engineering Services report prepared for the subject property by GeoEngineers, soil conditions generally concur with the mapped conditions noted above. Specifically, the site is underlain by fill and patchy glacial soils. The glacial soils generally consist of recessional outwash, till and transitional bed deposits. Recessional outwash deposits exist immediately below the topsoil and asphalt pavement to ten feet below the ground surface (bgs). The recessional outwash deposits are underlain by glacial till and transitional bed deposits.

2.2.3 Site Hydrology

According to a December 1, 2010 Geotechnical Engineering Services report prepared for the subject property by GeoEngineers, groundwater seepage zones occur between depths of approximately 4 to 9 feet bgs on the property within the very dense, relatively impermeable glacial till. In groundwater monitoring wells located on the Property, saturated soil conditions were not encountered during drilling; however, given time to equilibrate, water levels rose to a depth of approximately 2 feet bgs, indicating low permeabilities in the glacial till.

Based on groundwater elevation data, groundwater flow across the site is generally to the west, with a slight northward component.

2.3 PREVIOUS INVESTIGATIONS

The following section describes a summary of previous investigations performed at the site. Exploratory locations are shown on Plate 2.

2.3.1 2006 Subsurface Investigation (Environmental Associates, Inc.)

In July 2006, Environmental Associates, Inc. (EAI) completed four direct push borings in the area of the dry cleaning facility. Two borings (B-3 and B-4) were completed inside the dry cleaning facility. Two additional borings (B-1 and B-2) were completed outside the facility to the west and south of the dry cleaners, respectively. Due to the dense nature of the subsurface soils, borings were advanced between 3.5 and 11 feet bgs. Groundwater was encountered in boring B-4 inside the facility at a depth of approximately 4 feet bgs.

Samples were collected from each boring and submitted for laboratory analysis of volatile organic compounds (VOCs) by EPA Method 8260B. One groundwater sample was also collected from boring B-4 and submitted for analysis of VOCs. VOCs were not detected in any of the soil samples at concentrations exceeding the laboratory reporting limits. Three chlorinated VOCs associated with dry cleaning were detected in the groundwater sample collected from boring B-4. Detected VOCs included PCE at a concentration of 10 micrograms per liter (µg/L), TCE at a concentration of 2.8 µg/L, and cis-1,2-DCE at a concentration of 5 µg/L. The concentrations of PCE exceeded the Washington State Model Toxics Control Act (MTCA) Method A groundwater cleanup level of 5 µg/L. Detected concentrations of TCE and cis-1,2-DCE were below their respective cleanup levels. Based on these results, EAI concluded that a release of dry cleaning solvents had occurred, "resulting in adverse environmental impacts in the vicinity of the dry cleaning machine."

2.3.2 2008a Subsurface Investigation (Aspect Consulting, LLC)

In January 2008, Aspect Consulting, LLC (Aspect) conducted a subsequent subsurface investigation to "evaluate whether the release of dry cleaning solvents had affected a broader area of the site." Five soil borings (B-5 through B-9) were completed at the site (see Plate 2 for boring locations). Borings B-6 through B-9 were completed using a Geoprobe drill rig. Boring B-5, located behind the dry cleaning building, was drilled using a hand auger due to access limitations for a drill rig. Due to the dense nature of the soil, borings were advanced to a depth of 4.5 to 8 feet bgs. Water was encountered in only one boring (B-5) advanced adjacent to the sanitary sewer line at the site.

One soil sample was collected from boring B-5 and two soil samples each were collected from borings B-6 through B-9. One water sample was also collected from boring B-5 using a temporary PVC well screen. Soil and water samples were submitted for VOCs analysis using EPA Method 8260B. Reportedly, VOCs were not detected in any of the soil or water samples.

2.3.3 2008b Subsurface Investigation (Aspect Consulting, LLC)

Following the January 2008 subsurface investigation, Aspect completed an additional groundwater investigation at the site in April 2008 using drill equipment capable of penetrating the dense till at the site to evaluate whether dry cleaning activities had impacted groundwater quality. Three groundwater monitoring wells (MW-1 through MW-3) were installed at locations shown on Plate 2. Soils encountered during drilling generally consisted of dense silty sand and stiff to hard sandy silt, which was interpreted as a native glacial till unit. The till unit extended to at least 45 feet bgs on Parcel A.

Well MW-1 was screened between 25 and 45 feet bgs and wells MW-2 and MW-3 were screened between 10 and 30 feet bgs. While water was not observed in the borings during drilling, the wells reportedly filled with water after drilling was completed. Static water levels were between 1 and 2 feet bgs. Groundwater samples were collected from the three wells and were analyzed for VOC concentrations using EPA Method 8260B. Laboratory analytical results indicated that VOCs were not detected in any of the groundwater samples collected from wells MW-1 through MW-3.

2.3.4 2010 Phase I Environmental Site Assessment (Aspect Consulting, LLC)

In October 2010, Aspect completed a Phase I Environmental Site Assessment (ESA) of the site and identified the current dry cleaners, former gasoline service station, and suspected heating fuel UST associated with the current residential home at the site as recognized environmental conditions. There were no recommendations listed as part of Aspect's Phase I ESA report.

2.4 INTERIM CLEANUP ACTIVITIES

No interim cleanup activities or quarterly monitoring of wells existing at the site have been conducted.

2.5 DISTRIBUTION OF CONTAMINATION

Elevated concentrations of PCE were identified in a groundwater sample collected four feet bgs from a soil boring (B-4) advanced immediately adjacent to the dry cleaning machine within the dry cleaning tenant space of Parcel A. Reportedly, a soil sample collected from the same borehole ("B-4" at 4 feet bgs) did not contain PCE, TCE, or cis-1,2-DCE at concentrations exceeding the analytical reporting limits. Additionally, all other soil and groundwater samples collected at the site during previous investigations (refer back to Section 2.3) did not contain VOCs that exceeded MTCA Method A soil and groundwater cleanup levels. Based on the results of previous site investigations, impacts associated with a release of dry cleaning solvents appears to be limited to an area near the dry cleaning machine.

2.6 CHEMICALS OF CONCERN

Based on the findings of the investigations conducted on the Property, the COCs for the site include the chlorinated solvent chemicals that were detected in shallow groundwater at concentrations exceeding the applicable cleanup levels. The COCs include PCE and the possible presence of petroleum impacted soil and groundwater associated with the former gasoline service station at Parcel B and a possible heating fuel UST located at Parcel C.

2.7 MEDIA OF CONCERN

Based on the findings of the subsurface investigations conducted by Environmental Associates (2006) and Aspect Consulting (2008), groundwater is the affected media at the site. Due to the presence of PCE groundwater contamination at the site, ESNW suspects that PCE impacted soil will be another affected media at the site.

2.8 SITE DEFINITION

Based on the findings from the investigations conducted by Environmental Associates and Aspect Consulting between 2006 and 2010, the site includes PCE-impacted groundwater and soil in the area of the dry cleaning machine located on Parcel A.

2.9 TECHNICAL ELEMENTS

The technical elements are those items necessary for the development and screening of remedial action alternatives including a summary of the RAOs, ARARs, COCs, media of concern, interim remediation levels, and cleanup standards.

3.0 REMEDIAL ACTION OBJECTIVES

RAOs are general administrative goals for a cleanup action that address the overall MTCA cleanup process. The purpose of establishing RAOs for a site is to provide remedial alternatives that protect human health and the environment (WAC 173-340-350). In addition, RAOs are designated in order to:

1. Implement administrative principles for cleanup (WAC 173-340-130).

2. Meet the requirements, procedures, and expectations for conducting a feasibility study and developing cleanup action alternatives as discussed in WAC 173-340-350 through 173-340- 370.

3. Develop cleanup levels (WAC 173-340-700 through 173-340-760) and remedial alternatives that are protective of human health and the environment.

In particular, RAOs must include the following threshold requirements from WAC 173-340:

1. Protect human health and the environment.

2. Comply with applicable cleanup levels.

3. Comply with applicable state and federal laws.

4. Provide for compliance monitoring.

The key components for remediation of impacted soil and groundwater on the property include the following:

1. Reduce concentrations of COCs in soil and groundwater beneath the property to below their respective cleanup levels to the extent practicable.

2. Mitigate exposure pathways to soil situated beyond the radius of influence of the completed and planned remedial actions.

3. Implement institutional controls on the property (if necessary) to provide long-term maintenance of the risk management procedures in accordance with WAC 173-340-440, which may include deed restrictions for soil and prohibiting the domestic use of groundwater beneath the property.

Section 3.2 discusses ARARs for the cleanup actions at the property, per the requirements specified under MTCA and applicable state and federal regulations.

3.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Under WAC 173-340-350 and 173-340-710, applicable requirements include regulatory cleanup standards, standards of control, and other environmental requirements, criteria, or limitations established under state or federal law that specifically address a contaminant, remedial action, location, or other circumstances at a site.

MTCA defines relevant and appropriate requirements as:

"those cleanup action standards, standards of control, and other human health and environmental requirements, criteria or limitations established under state and federal law that, while not legally applicable to the hazardous substance, cleanup action, location, or other circumstances at a site, the department determines address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site. The criteria specified in WAC 173-340-710(3) shall be used to determine if a requirement is relevant and appropriate."

Remedial actions conducted under MTCA must comply with the substantive requirements of the ARARs but are exempt from their procedural requirements (WAC 173-340-710[9]). Specifically, this exemption applies to state and local permitting requirements under the Washington State Water Pollution Control Act, Solid Waste Management Act, Hazardous Waste Management Act, Clean Air Act, State Fisheries Code, and Shoreline Management Act.

ARARs were screened to assess their applicability to the property. The following table summarizes the preliminary ARARs for the Property.

Preliminary ARARs for the Property	
Preliminary ARAR	**Citation of Source**
MTCA	Chapter 70.105 of the Revised Code of Washington (RCW)
MTCA Cleanup Regulation	WAc 173-340
Ecology, Toxics Cleanup Program – Guidance To Be Considered	*Guidance for Evaluation Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, Review DRAFT, October 2009, Publication No. 09-09-047
State Environmental Policy Act	RCW 43.21C
Washington State Shoreline Management Act	RCW 90.58; WAc 173-18, 173-22, and 173-27
The Clean Water Act	33 United States Code (USC) 1251 et seq.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980	42 USC 9601 et sew. And Part 300 of Title 40 of the Code of Federal Regulations (40 CFR 300)
The Fish and Wildlife Coordination Act	16 USC 661 – 667e; the Act of March 10, 1934; ch. 55; 48 stat. 401
Endangered Species Act	16 USC 1531 et seq.; 50 CFR 17, 225, and 402
Native American Graves Protection and Reparation Act	25 USC 3001 through 3013; 43 CFR 10 and Washington's Indian Graves and Records Law (RCW 27.44)
Archaeological Resources Protection Act	16 USE 470aa et seq.; 43 CFR 7
Washington Dangerous Waste Regulations	WAc 173-303
Solid Waste Management Act	RCW 70.95; WAc 173-304 and 173-351
Occupational Safety and Health Administration Regulations	29 CFR Parts 1910, 1926
Washington Department of Labor and Industries Regulations	WAc 296
Water Quality Standards for Surface Waters of the State of Washington	RCW 90.48 and 90.54; WAc 173-201A
Water Quality Standards for Ground Water	WAc 173-200
Department of Transportation Hazardous Materials Regulations	40 CFR Parts 100 through 185
Washington State Water Well Construction Act	RCW 18.104; WAc 173-160
City of Kirkland regulations, codes, and standards	All applicable or relevant and appropriate regulations, codes, and standards
King County regulations, codes, and standards	All applicable or relevant and appropriate regulations, codes, and standards

3.2 CHEMICALS AND MEDIA OF CONCERN

The COCs for the property are those compounds that were detected at concentrations exceeding their respective cleanup levels. The COCs and the media where the COCs were detected above the respective analytical detection limits are listed below:

1. PCE in groundwater and soil.
2. Gasoline and diesel range petroleum hydrocarbons possibly existing in soil and groundwater.

3.3 CLEANUP STANDARDS

The selected cleanup alternative must comply with the MTCA cleanup regulations specified in WAC 173- 340 and with applicable state and federal laws. The associated media-specific cleanup levels for the identified COCs are summarized in the following Section 3.4.1 below.

3.3.1 Cleanup Levels

The proposed cleanup levels for the Property are the MTCA Method A Unrestricted Land Use Cleanup Levels for soil and MTCA Method A Cleanup Levels for Unrestricted Land Use for COCs in groundwater. If there is no promulgated Method A cleanup level for a particular COC for a given chemical or medium in soil or groundwater, the proposed cleanup level is the MTCA Method B Standard Formula Value for carcinogenic or noncarcinogenic compounds, depending upon the carcinogenic properties of the compound.

3.3.2 Points of Compliance

The points of compliance are the locations at which cleanup levels for the COCs in each medium of concern must be attained to meet the requirements for obtaining an NFA determination from Ecology.

3.3.2.1 Points of Compliance for Groundwater

The points of compliance for property groundwater are achieved when concentrations of COCs in groundwater at the property are below their applicable MTCA Method A cleanup levels, in accordance with WAC 173-340-720(8). Compliance monitoring wells will be installed downgradient along the property boundary and will be used to evaluate whether compliance has been achieved for the property.

3.3.2.2 Point of Compliance for Soil

The point of compliance for soil within the property boundary is achieved when concentrations of COCs in soil beneath the property are below the applicable MTCA Method A cleanup levels, in accordance with WAC 173-340-740(6).

In accordance with the property development plans, a large area of property will be excavated to a depth of approximately 15 feet bgs (or deeper). Confirmation soil samples will be collected following completion of the excavation to evaluate remaining soil concentrations. Areas excavated deeper than 15 feet bgs (to remove deeper contaminants, if present) will be backfilled with structural materials.

4.0 SELECTED CLEANUP ACTION

This section presents the cleanup action objectives, the cleanup action alternatives that have been selected, and the cleanup action components that will be implemented for the property.

4.1 CLEANUP ACTION OBJECTIVES

The purpose of the planned cleanup action is to restore beneficial uses of soil and groundwater at the points of compliance, to protect human health and the environment, and to obtain an NFA determination from Ecology. In establishing the objectives of the cleanup action, the characteristics of the identified media of concern and COCs for the property and the potential migration and exposure pathways to sensitive receptors were taken into consideration. The specific objectives of the cleanup action include the following:

1. Eliminate the potential for direct human contact with soil having concentrations of COCs that exceed established MTCA Method A cleanup levels.

2. Prevent or minimize the potential for direct human contact with and ingestion of groundwater with concentrations of COCs that exceed the MTCA Method A cleanup levels.

3. Prevent discharges into the storm sewer system or sanitary sewer system that exceed Surface Water ARARs or King County Wastewater Discharge Screening Levels, respectively.

4. Protect beneficial uses of soil and groundwater by eliminating the potential for transfer of concentrations of COCs from soil to groundwater or from groundwater to soil.

5. Restore beneficial uses of soil and groundwater at the points of compliance.

4.2 EVALUATION OF CLEANUP ACTION ALTERNATIVES FOR THE PROPERTY

The planned redevelopment involves the excavation of soil to a depth of 15 feet bgs (or deeper) across the property. The cleanup action alternatives were developed based on this assumption. A summary of the property cleanup action alternatives are provided below:

Cleanup Action Alternative 1, Excavation and Land Disposal of Soil with Enhanced Reductive Dechlorination of Groundwater. This alternative includes the excavation of PCE- impacted soil to a depth of 15 feet (or deeper, if necessary) and the treatment of groundwater via enhanced reductive dechlorination (ERD), if necessary. An emulsified oil substance (EOS) will be injected into perforated pipes that will be placed along the bottom of the excavated area. The EOS will provide a food source for the existing microbial population and promote bioremediation of COCs within the dissolved-phase plume.

Cleanup Action Alternative 2, Excavation and Land Disposal of Soil with Groundwater Pump and Treat System. This alternative involves the same limits of excavation as Cleanup Action Alternative 1. The remedial component that differs is that the groundwater will be captured and treated above ground by a pump and treat system.

Cleanup Action Alternative 3, Excavation and Land Disposal of Soil with Electrical Resistive Heating and Vapor Extraction for Groundwater Treatment. The excavation and land disposal component of this alternative is the same as Cleanup Action Alternatives 1 and 2. The groundwater will be treated using electrical resistive heating, which will heat the groundwater in the treatment zone and volatilize the COCs from the groundwater, and the vapor extraction system will capture the vapor for treatment and discharge to the atmosphere.

Cleanup Action Alternative 4, Excavation and Land Disposal of Soil—Deep Excavation for Treatment of Groundwater. This alternative involves the removal of PCE-impacted soil in the vadose and saturated zones up to the property boundary. There is no groundwater treatment component to this alternative because the deeper excavation will remove any saturated soil impacted by COCs.

4.3 SELECTED CLEANUP ACTION FOR THE PROPERTY

After a review of the proposed cleanup action alternatives for the Property (and based on review of the prior technical reports), ESNW concluded Cleanup Action Alternative 1, Excavation and Land Disposal of Soil with Reductive Dechlorination of Groundwater was the most feasible technology and least expensive. The excavation will remove the source area material and the edible oil injections will enhance the reductive conditions if present in groundwater underlying the property following excavation activities.

5.0 REMAINING CLEANUP ACTION COMPONENTS

This section provides a description of the remaining cleanup action components to remediate elevated concentrations of COCs on the property. The remaining cleanup action will consist of the following components:

1. Excavation and disposal of soil containing elevated concentrations of PCE and possibly petroleum hydrocarbons to a maximum depth of 15 feet bgs (or deeper).

2. Treatment of the on-property groundwater contaminant plume (if present) by injecting EOS into a groundwater infiltration system installed beneath the site.

3. Quarterly groundwater monitoring along the downgradient property boundary until results from four consecutive monitoring events demonstrate that the cleanup standards have been achieved at the points of compliance.

4. Documentation of the activities and results from implementing the site cleanup actions.

5.1 PROPERTY PREPARATION

Prior to conducting any excavation activities, property preparation activities will be conducted, including decommissioning underground utilities, the removal of underground fuel storage tanks (if present), the decommissioning of any monitoring wells located within the excavation area, and installing fencing and signage, erosion and stormwater control, and excavation shoring measures, as necessary, to ensure the protection of workers within the work zones.

5.2 REMOVAL OF PCE-IMPACTED SOIL

The planned soil removal includes excavation of PCE-impacted soil and possible petroleum hydrocarbon impacted soil at the property in conjunction with construction of a one-story underground parking garage for the building, to a planned depth of 15 feet bgs. Existing soil analytical data indicate that there are no VOC constituents (including PCE) exceeding MTCA Method A soil cleanup levels. However, since groundwater is reportedly impacted with elevated concentrations of PCE, ESNW assumes PCE soil contamination will be encountered during excavation activities.

All contaminated soil will be excavated as part of the property redevelopment and transported directly to an approved Resource Conservation and Recovery Act (RCRA) Subtitle C landfill or Subtitle D municipal landfill. Confirmation soil samples will be collected from the excavation floor and sidewalls in accordance with procedures detailed in Section 6.3 below.

5.2.1 Soil Classification Procedures

Determination of soil classification for disposal of the soil is dependent upon the analytical results of soil samples collected during previous investigations and the field screening during the planned excavation activities.

5.3 GROUNDWATER REMEDIATION

After completion of PCE-impacted soil removal, the remediation of groundwater on the property will be conducted via injections, if necessary.

5.4 CLEANUP ACTION SCHEDULE

The cleanup action for the property will be completed during property redevelopment. Following completion of these remedial activities, a Cleanup Action Report for the property will be submitted to the City of Kirkland.

Groundwater quality along the downgradient property boundary will be monitored on a quarterly basis until four consecutive monitoring events demonstrate that the cleanup standards have been achieved at the conditional points of compliance for the property.

Cleanup Action Reports will be prepared following completion of compliance groundwater monitoring for a minimum of four consecutive quarters with results demonstrating that the cleanup standards have been achieved at the points of compliance. Following completion of these remedial activities, the Cleanup Action Reports for the property will be submitted to the City of Kirkland.

6.0 COMPLIANCE MONITORING

There are three types of compliance monitoring identified for remedial cleanup actions performed under MTCA (WAC 173-340-410): protection, performance, and confirmational monitoring. A paraphrased definition for each is presented below (WAC 173-340-410[1]).

Protection Monitoring. To evaluate whether human health and the environment are adequately protected during construction and the operation and maintenance period of an interim action or cleanup action.

Performance Monitoring. To document that the interim action or cleanup action has attained project remediation goals.

Confirmational Monitoring. Testing the excavated site area to evaluate the long-term effectiveness of the interim action or cleanup action once cleanup standards or other performance standards have been attained.

6.1 PROTECTION MONITORING

A site-specific Health and Safety Plan (HASP) will be prepared for the remedial action at the property. The HASP will identify the known physical, chemical, and biological hazards; hazard monitoring protocols; and administrative and engineering controls required to mitigate the identified hazards.

6.2 SOIL CONFIRMATIONAL MONITORING FOR PROPERTY CLEANUP ACTION

Compliance monitoring for soil will be conducted at the completion of the excavation of PCE- impacted soil and possible petroleum impacted soil and will include collection of confirmation soil samples from the final limits of the floor and sidewalls of the excavation. These data will be used to confirm residual soil concentrations at the excavation boundaries in order to document that the standard soil point of compliance for the direct contact pathway has been achieved.

Compliance monitoring will be performed in accordance with the requirements of WAC 173-340-410 and will address protection, performance, and confirmational monitoring.

6.3 GROUNDWATER PERFORMANCE/CONFIRMATIONAL MONITORING

Compliance groundwater monitoring for the property will be conducted following completion of the soil excavation and groundwater remediation activities.

Existing (applicable) monitoring wells and monitoring wells that will be installed along the downgradient property boundary will serve as the points of compliance for collection of groundwater samples. Groundwater will be monitored quarterly for one year following cleanup activities until results from four consecutive monitoring events demonstrate that the cleanup standards have been achieved at the points of compliance. Data from these monitoring wells will be used to evaluate groundwater quality and the direction and gradient of groundwater flow at the site.

Wastewater generated during the development and purging of the compliance monitoring wells will be stored temporarily in labeled 55-gallon drums on the property pending receipt of the analytical results for waste profiling. The wastewater will be removed by a subcontractor on a semiannual basis and will be transported to a permitted treatment, storage, and disposal facility for proper disposal.

7.0 DOCUMENTATION REQUIREMENTS

Documentation of the successful completion of the indicated cleanup action components is necessary to meet MTCA requirements. Upon client review and approval, all applicable and relevant documentation generated for the cleanup action will be submitted to Ecology in Cleanup Action Report.

7.1 DOCUMENTATION MANAGEMENT

An established document control system to be implemented during the remedial activities includes the following elements, as appropriate: field documentation, boring and well logs, well purging and sampling documentation, sampling event data documentation, Chain of Custody forms, waste inventory documentation, waste management labels, sample labels, and waste disposal tickets. Disposal tickets/documents for the soils generated by the excavations on the property will be maintained and will be submitted with the project documentation.

7.2 WASTE DISPOSAL TRACKING

Specific documentation requirements will be met for transportation and disposal of the soil and groundwater generated from the removal action. The waste disposal tracking documentation requirements are summarized below.

7.2.1 Land Ban and Listed Waste Soil Tracking

The Hazardous Waste Manifest provided by the RCRA Subtitle C facility will be used to track the transport and disposal of Land Ban and Listed Waste soils, if encountered. Copies of the signed originating manifests will be provided to the City of Kirkland in the Cleanup Action Report for the property.

7.3 CLEANUP ACTION REPORTS

A Cleanup Action Report for the property will be prepared following remediation activities. At a minimum, the report will include the following:

1. A description of the property preparation activities and excavation of impacted soil.

2. A summary of the compliance sampling analytical results for soil and groundwater samples collected during cleanup action, including summary tables of the analytical results.

3. Documentation of waste disposal tracking for the excavated PCE-impacted soil and groundwater from the property.

4. Figures depicting limits of the excavation and confirmation sample locations.

5. ESNW's conclusions pertaining to the cleanup action following completion of the soil removal action.

6. A description of existing and newly installed groundwater monitoring wells.

7. A summary of completed groundwater injection events (if necessary).

8.0 REFERENCES

Environmental Associates, Inc., 2006, *Preliminary Subsurface Sampling & Testing, Dry Cleaning Facility, 1006 Lake Street South, Kirkland, Washington, dated August 8, 2006.*

Aspect Consulting, 2008a, Soil and Groundwater Sampling Results, 1006 Lake Street, Kirkland, Washington, dated February 27, 2008.

Aspect Consulting, 2008b, Additional Groundwater Sampling Results, 1006 Lake Street, Kirkland, Washington, dated April 25, 2008.

Aspect Consulting, 2010, Phase I Environmental Site Assessment, Potala Village, 1006 Lake Street South, 21 Tenth Avenue South, and 6700 Lake Washington Boulevard, Kirkland, Washington, dated October 15, 2010.

Washington State Department of Ecology (Ecology). 1991. *Guidance for Site checks and Site Assessments for Underground Storage Tanks.* Publication No. 90-52. February.

9.0 LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, expressed or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others or the use of segregated portions of this report.

Plates

ES-2880

Reference:
King County, Washington
Map 536
By The Thomas Guide
Rand McNally
32nd Edition

NORTH

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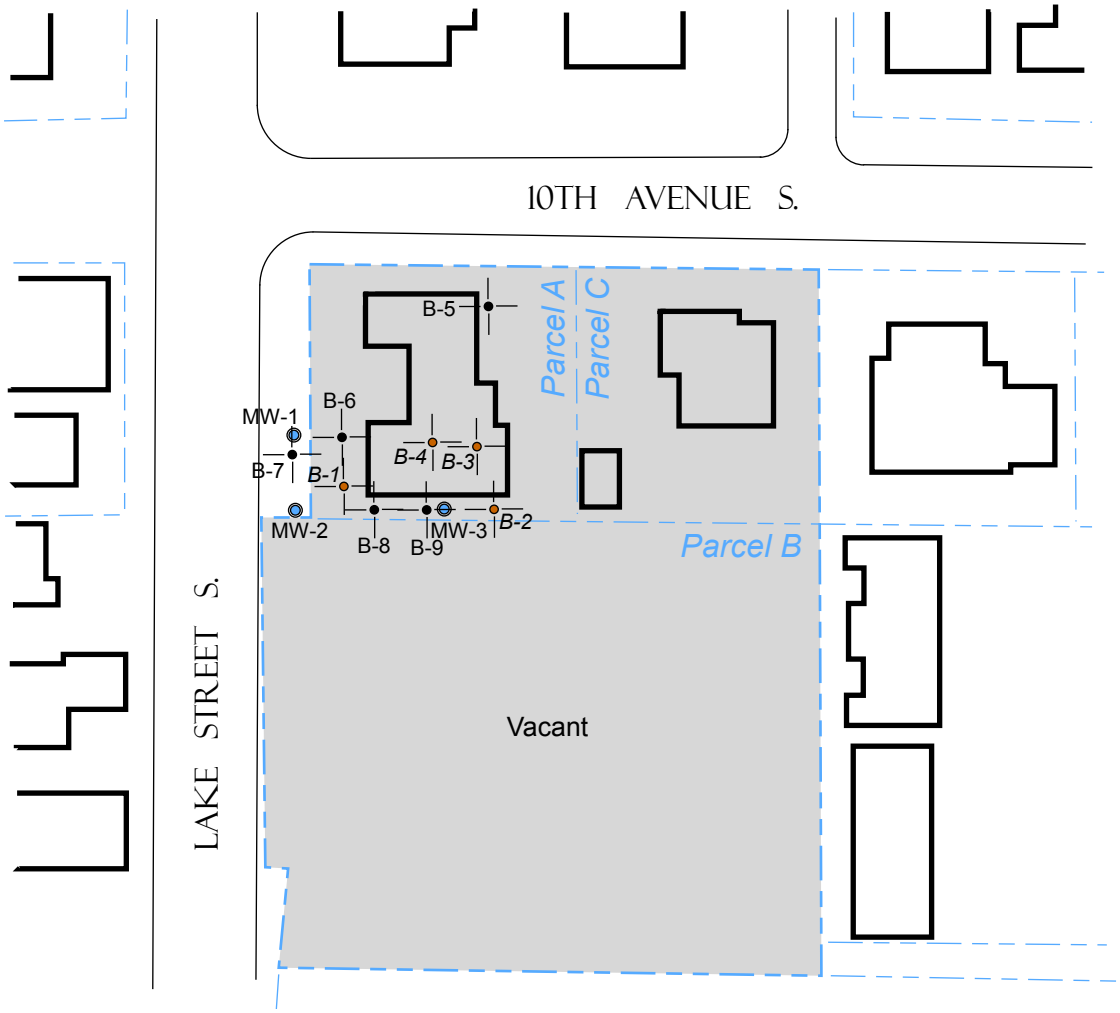
Earth Solutions NW LLC
Geotechnical Engineering, Construction Monitoring and Environmental Sciences

Vicinity Map
Potala Village
Kirkland, Washington

Drwn.	GLS	Date	09/05/2013	Proj. No.	2880
Checked	TWS	Date	Sept. 2013	Plate	1



LEGEND

- Subject Site
- Existing Building
- MW-1 — Approximate Location of Monitoring Well (Aspect, 2008)
- B-6 — Approximate Location of Soil Boring (Aspect, 2008)
- B-1 — Approximate Location of Soil Boring (EAI, 2006)

NORTH

Not - To - Scale

NOTE: The graphics shown on this plate are not intended for design purposes or precise scale measurements, but only to illustrate the approximate test locations relative to the approximate locations of existing and / or proposed site features. The information illustrated is largely based on data provided by the client at the time of our study. ESNW cannot be responsible for subsequent design changes or interpretation of the data by others.

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Earth Solutions NW LLC

Geotechnical Engineering, Construction Monitoring and Environmental Sciences

Site Plan
Potala Village
Kirkland, Washington

Drwn. GLS	Date 09/05/2013	Proj. No. 2880
Checked TWS	Date Sept. 2013	Plate 2

Distribution

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