FINAL DRAFT CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
18115 62ND AVENUE NE
KENMORE, WASHINGTON

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May 23, 2000

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1.0 INTRODUCTION

Farallon Consulting LLC (Farallon) has prepared this Final Draft Cleanup Action Plan (CAP) for the cleanup of pesticides in soil and perched groundwater in the vadose zone at the Able Pest Control Site located at 18115 62nd Avenue NE in Kenmore, Washington (herein referred to as the site, Figure 1). The site is defined as the area where concentrations of pesticides were detected above the applicable cleanup levels in soil and includes all of the property located at 18115 62nd Avenue NE (62nd Avenue Property), a portion of the storm water drainage ditch located on the east side of the 62nd Avenue Property, the northwest portion of the property located adjacent – south of the 62nd Avenue property at 6124 NE 181st Street (Preschool Property), and a small portion of the adjacent-north property in Kenmore Washington (Figure 2).

1.1 PURPOSE

This CAP has been developed in accordance with the Washington State Department of Ecology (Ecology) *Model Toxics Control Act Cleanup Regulation* (MTCA), Chapter 173-340 of the Washington Administrative Code (WAC). In accordance with WAC 173-340-360(2), the selected cleanup action presented in the RI/FS will meet the applicable cleanup levels at the defined points of compliance, protect human health and the environment, comply with applicable state and federal laws, and provide for compliance monitoring.

This CAP provides specific detail for the implementation of Alternative No. 5: Soil Excavation and Off-Site Disposal at an Approved Landfill and/or Incineration which includes excavation and off-site disposal of soil with concentrations of one or more of the target pesticides above the applicable cleanup levels, as well as monitoring for concentrations of pesticides in perched groundwater in the vadose zone after completion of the soil removal.

This alternative was presented in the RI/FS which was conducted under the Ecology Voluntary Cleanup Program (VCP). The RI/FS was reviewed by Ecology in January 2000. Ecology has confirmed that the RI/FS adequately characterizes the site and provides sufficient information for selection of a cleanup alternative. The site cleanup will be conducted under an Agreed Order No. OOTC PNR – 1151 (Agreed Order) with Ecology to meet the requirements of the Agreed Order for removing the site from the Hazardous Site List in accordance with WAC 173-340-330 (4).

1.2 CLEANUP ACTION PLAN ORGANIZATION

Combined within this CAP, either directly or by reference, are the following three documents which have been developed for proceeding with soil cleanup at the site: (1) Engineering Design Report (WAC 173-340-400[4][a]), (2) Sampling and Analysis Plan (WAC 173-340-820) and Compliance Monitoring Plans (WAC 173-340-410) (combined), and (3) Safety and Health Plan (WAC 173-340-810). These documents have been combined into one comprehensive CAP to minimize duplication of effort and to expedite the cleanup action.

The CAP has been organized into the following sections:

- **Section 2.0 - Background:** Section 2.0 provides a description of the site, background, and a summary of previous work conducted at the site. The previous work included the site location and description, geologic and hydrogeologic setting, a summary of previous subsurface assessment investigations, and RI/FS activities.

- **Section 3.0 –Technical Elements:** Section 3.0 provides a summary of the technical elements for the CAP, including a discussion of the applicable or relevant and appropriate requirements (ARARs), constituents and media of concern, applicable cleanup levels, and points of compliance.

- **Section 4.0 – Design and Implement:** Section 4.0 describes the components of the cleanup action consistent with the requirements of the Engineering Design Report.

- **Section 5.0 – Confirmational Sampling:** Section 5.0 references compliance sampling requirements provided in the SAP.

- **Section 6.0 – Schedule:** Section 6.0 provides a preliminary construction schedule.

- **Section7.0 – Documentation Requirements:** Section 7.0 summarizes the documentation to be provided.

- **Section 8.0 – References:** Section 9.0 lists the references sited in this CAP.

2.0 BACKGROUND

This section provides a brief summary of previous work completed at the site. A more detailed summary of the results of previous site investigations is provided in the RI/FS report. A list of references is included in Section 9.0 of this CAP.

2.1 SITE LOCATION AND DESCRIPTION

The entire site consists of a residential lot located at 18115 62nd Avenue Northeast, the northwest portion of the Preschool Property located at 6124 NE 181st Street and a small portion of the property adjacent and north of the 62nd Avenue Property in Kenmore, Washington (Figure 1 and 2). The portion of the site addressed by this CAP is the area where soil contains concentrations of one or more of the target pesticides above the applicable cleanup levels. This includes the 62nd Avenue Property and a small potion of the north-adjacent property (referred to as the site in this CAP). As discussed below, interim actions conducted at the Preschool Property have cleaned up the soils in this portion of the site.

The site is located approximately 1,200 feet from the northern end of Lake Washington and is currently zoned for residential use by the city of Kenmore. Land use surrounding the site includes single-family residences to the northwest and east; a vacant, vegetated lot to the north; a multi-unit condominium building to the west-southwest; and a preschool to the south (Figure 2). Residences in the vicinity of the site are connected to the municipal water supply and the sewer discharges to King County Department of Natural Resources, Industrial Waste Program. The future land use of the immediate site area is projected to remain single family or multi-unit residential.

The legal description for the 62nd Avenue Property is:

The portion of Government Lot 3, Section 11, Township 26 North, Range 4 East W.M.,
in King County, Washington, described as follows:

Beginning at the north quarter corner of said Section,
Thence south 2^0 41' 16" W along the centerline of said Section, a distance of 1000.151 feet;
Thence west 30.03 feet to the true point of beginning;
Thence west 152.705 feet;
Thence south 99.33 feet;
Thence north 87^0 14' 47" E to a point from which the true point of beginning bears north $2^0$41'16"E;
Thence north 2^0 41' 16" E to the true point of beginning;
(Being known as Lot 2, Block 8, Waverly Park, according to the unrecorded plat thereof, except the southerly 85.00 feet, as measured along the west line thereof, and Lot 3 in said block, except the northerly 65.00 feet as measured along the west line thereof).

The 62nd Avenue Property is currently developed with a residential home with ground level and second-floor living units and a separate two-car, dirt-floor garage. The floor of the ground-level

apartment is a concrete slab approximately two to three feet below the outside grade. A gravel driveway is located along the northern portion of the 62nd Avenue Property. Lawn, shrubs, or other vegetation covers the remaining areas of the site.

2.2 HISTORIC USE

Mr. Sheridan Martin owned the 62nd Avenue Property between 1969 and 1986 and operated a pest control company called Able Pest Control, Inc. from the residence. In late 1985, Mr. Martin sold Able Pest Control, Inc. to Mr. Tom E. Reed and Mr. James W. Nation. Mr. Reed and Mr. Nation formed a corporation named Able Pest Control, Inc. This corporation operated at the 62nd Avenue Property between November 1985 and January 1986. Operations at the 62nd Avenue Property conducted by both corporations involved storing and dispensing pesticides for off-site use. The pesticides were stored and dispensed in an area underneath the back porch located at the southwestern corner of the building.

The 62nd Avenue Property was sold to Ms. Schlittenhard on November 14, 1986. Ms. Schlittenhard converted the residence into two apartments, one on the ground-floor level and the other on the upper level of the residence. In 1994, during expansion of the ground-floor apartment, soil was excavated from the former pesticide storage and dispensing area located at the southwest corner of the residence to construct a concrete floor slab. The excavated soil was reportedly placed in the southwestern corner of the 62nd Avenue Property adjacent to the fenced property line with the Preschool Property. Prior to the interim remedial action program (SECOR, January 15, 1999), the ground surface in this area was either exposed soil or covered by grass, blackberries, and other vegetation, and it sloped towards the south-southwest with a small (<1 foot) drop at the property line.

2.3 SUMMARY OF PREVIOUS WORK

The RI/FS report contains a detailed description of the work completed to date at the site. This section provides a brief overview of the previous work.

2.3.1 Pre-RI/FS Investigations

Previous investigations at the site included limited soil sampling by Ecology and Seattle-King County Department of Public Health (SKCDPH), soil sampling during excavation adjacent to the residence on the 62nd Avenue Property by Pacific Groundwater Group (PGG), and analysis of household material samples collected by a former tenant of the basement apartment. Results of the previous investigations are described in the RI/FS Report.

2.3.2 Interim Actions

Investigations completed prior to the RI/FS detected concentrations of one or more of the target pesticides in soil above applicable cleanup levels in limited areas of the Preschool Property and throughout the southwest portion of the 62nd Avenue Property. In response to these discoveries, several interim remedial actions were implemented at the site under

the terms of an Emergency Agreed Order issued by Ecology. A detailed discussion of the interim actions completed at the site prior to the RI/FS is included in the RI/FS Report.

As discussed in the RI/FS Report, a buffer zone was constructed between the 62nd Avenue and the Preschool Properties in August 1998. A perched groundwater in the vadose zone interceptor trench was subsequently installed in the buffer zone in May 1999 to capture perched groundwater in the vadose zone that possibly contained concentrations of pesticides that may migrate from contaminated areas of the 62nd Avenue Property to the Preschool Property. Increased infiltration of surface water to the vadose zone during the 1999/2000 wet season resulted in an increased volume of water extracted from the interceptor trench. An Industrial Waste Discharge Authorization was received from the King County Department of Natural Resources, Industrial Waste Program for direct discharge of the extracted water from the vadose zone interceptor trench to the sanitary sewer. Monthly water samples have been collected from the vadose zone extraction system, analyzed for the target pesticides, and reported to King County Industrial Waste and Ecology. The perched groundwater in the vadose zone extraction system is currently operational and will remain in-place until the final cleanup is completed.

Soil samples have been collected from the buffer zone on a quarterly basis during 1998 and 1999 to evaluate whether concentrations of pesticides continue to migrate from the 62nd Avenue Property to the Preschool Property. During December 1999, soil samples were collected from the Preschool Property south of the buffer zone to evaluate whether concentrations of pesticides were present. Several soil samples in the northwest corner of the Preschool Property contained concentrations of the target pesticides above the MTCA Method B soil cleanup levels. Therefore, as an interim action, additional excavation was performed to remove the contaminated soil from the Preschool Property. Approximately six cubic yards of soil was excavated from the Preschool Property and is currently stockpiled at the 62nd Avenue Property on visqueen plastic pending disposal during the final cleanup. Soil samples were collected from the Preschool Property which confirmed removal of contaminated soils prior to backfill and re-sodding of the remediated area. Since January 1999, the buffer zone has been monitored on a monthly schedule. Compliance monitoring to be conducted after completion of the soil removal is discussed in Section 5 of this CAP and the SAP included in Appendix C.

During January 2000, an interim action to limit the volume of surface water runoff on the site was installed by Farallon. The interim action included re-routing the roof drain lines from the residence and garage to discharge off-site to the storm water drainage ditch along 62nd Avenue.

Exploratory Boring SB-1 (Figure 2) was completed at the site as part of an interim action to evaluate the local stratigraphy/hydrogeology to address Ecology's concerns that concentrations of pesticides in the shallow subsurface soils may affect groundwater underlying the site. The results of the soil boring confirmed that impermeable glacial till extends from the surface to 49.5 feet below ground surface (bgs) beneath the site. A groundwater-bearing interval was not encountered in Boring SB-1 to the total depth explored of 49.5 feet bgs.

2.3.3 Remedial Investigation/Feasibility Study

The information obtained from the prior investigations and interim remedial measures conducted at the site were used to develop the scope of work for the RI/FS of the site. The purpose of the RI/FS was to ascertain the distribution of pesticides on the site by collecting and analyzing a sufficient number of soil samples to fully characterize the soil conditions. A total of 226 soil samples were collected for the RI/FS from 58 separate locations on the site. Over 100 of these soil samples were submitted to an approved laboratory for chemical analysis. The analytical results from these soil samples, together with the information obtained during previous investigations, fully characterized the distribution of pesticides in the soil at the site.

The results of the RI/FS determined that the concentrations of pesticides in the soil are widespread over most of the 62nd Avenue Property. No pesticides were detected above applicable cleanup levels on any of the properties adjacent to the 62nd Avenue Property except: a soil sample collected from the wooded portion of the property directly to the north that contained a single pesticide in concentrations slightly above applicable cleanup levels, and a soil sample collected by Ecology in the storm water drainage ditch located on the east side of the site.

The concentrations of pesticides at the 62nd Avenue Property decrease rapidly with depth. Within 1 to 2 feet of the surface, less than 1/3 of the 62nd Avenue Property contains pesticide concentrations above applicable cleanup standards. Within 2 to 3 feet of the surface, there are only 7 very limited and discrete areas containing pesticide concentrations above applicable cleanup standards. Below three feet of the surface, there are no pesticide concentrations above applicable cleanup standards.

The information derived from the RI/FS was used to evaluate technically feasible remedial action alternatives applicable to the site. A broad range of technologies were identified that could meet the remedial action objectives for the site. These technologies were evaluated and compared based on the criteria set forth in WAC 173-340-360. Protection of human health and the environment was the most important criterion used to evaluate and compare the various alternatives. This evaluation process resulted in the selection of a preferred remedial alternative. All other remedial alternatives were ruled out because they were either technically impractical, inconsistent with current or planned future uses of the property, or disproportionately expensive.

The RI/FS selected Alternative 5, which includes the excavation and off-site disposal of soil from the site that contains concentrations of one or more of the target pesticides above the MTCA Method B residential soil cleanup levels based on the carcinogenic formula values listed in CLARC II is described in Section 4.1 of this CAP. A total volume of 1,400 tons of soil is estimated for removal from the site.

2.4 ENVIRONMENTAL SETTING

2.4.1 Geology

According to geologic mapping by Galster and Laprade (1991) and Minard (1983), the site is located on the Kenmore Upland ridge which is underlain by Vashon Till. This till is locally underlain by the Esperance Sand and the Lawton Clay (Galster and Laprade, 1991).

The Esperance Sand outcrops to the east and south of the site in the valleys and lowlands along the margins of Lake Washington. The Lawton Clay outcrops in the creek that forms the small valley trending north-south approximately 300 feet west of the site parallel to 61st Avenue NE.

Exploratory Boring SB-1 was advanced at the site as part of an interim action to evaluate the local stratigraphy and hydrogeology. An interval of glacial till extending from the surface to 49.5 feet bgs was encountered in Exploratory Boring SB-1. These results are consistent with regional geologic mapping.

2.4.2 Hydrology

Groundwater migration in the Puget Sound Region is generally confined to the most recent alluvial deposits overlaying the glacial till or over-consolidated sands and gravels (Esperance Sand) which underlie the glacial till. The dense and relatively impermeable nature of the till and the commonly discontinuous lateral continuity of the groundwater-bearing materials impede lateral and vertical migration of the groundwater. Documented laboratory testing has shown that the permeability of glacial till typically ranges from 10^{-5} to 10^{-7} centimeters per second. This permeability range is considered to be relatively low. The Esperance Sand represents the first possible significant water-bearing zone underlying the site vicinity.

Perched groundwater in the vadose zone encountered within the upper 3 feet of soil underlying the site appears to be limited to the wet season based on observations by Farallon during the summer and early fall of 1999. The extensive drilling program conducted at the site for the RI/FS and subsequent exploratory boring (SB-1) did not encounter nor observe a definite perched groundwater zone. Based on the soil boring (SB-1), moist conditions were observed in the vadose zone which is characteristic of separate perched groundwater. Neither the Esperance Sand nor a groundwater-bearing interval was encountered in boring SB-1 to the total depth explored of 49.5 feet bgs.

2.4.3 Land Use

The site and surrounding properties are zoned and used for residential development. The future and continued use of the area will be residential. The Preschool Property will continue to be a preschool for young children.

2.4.4 Surface Water

The site and other properties in the vicinity slope to the south and west. Surface water runoff from the northern, and southwestern, sides of the 62nd Avenue Property flows to the south-southwest into the buffer zone and is captured in the interceptor trench. Surface water from the southern eastern portion of the 62nd Avenue Property flows to the south, towards the driveway of the Preschool Property. Surface water from the eastern portion of the 62nd Avenue Property flows to the ditch on the west side of 62nd Avenue. During January 2000, an interim action was implemented to limit the volume of surface water runoff flowing toward the buffer zone and to re-route the roof drain lines from the residence and garage to discharge off-site to the storm water drainage ditch on the east side of the site.

3.0 TECHNICAL ELEMENTS

This section provides a summary of the technical elements applicable to the cleanup of the site that are discussed in more detail in the RI/FS. This section summarizes the applicable or relevant and appropriate requirements (ARARs); the soil categories defined in the Environmental Media Management Plan (EMMP) prepared by Farallon dated April 6, 2000 (Appendix A); constituents and media of concern; and the selected cleanup levels.

3.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

A detailed evaluation of ARARs was presented in the RI/FS. Cleanup of the site will be conducted under an Agreed Order with Ecology which has incorporated the requirements of the ARARs for the site. Ecology will be the lead agency for compliance with the State Environmental Protection Act (SEPA) and will determine the substantive requirements of local permits. As defined in the EMMP, Ecology has agreed to specific criteria for waste management of contaminated soil generated from the site to obtain the contained-in designation for some of the soil to be excavated from the site. The EMMP has grouped the contaminated soils into four categories based on *in-situ* soil sampling analytical results, and it has provided criteria for the classification and disposal of each category of contaminated soil in accordance with the principles of the contained-in policy and dangerous waste regulations. A copy of the EMMP is included in Appendix A.

ARARs identified for the site in the RI/FS include:

- MTCA (Chapter 70.105D RCW);
- MTCA Cleanup Regulations (Chapter 173-340 WAC);
- MTCA Cleanup Levels and Risk Calculations Update (CLARC II);
- Hazardous Waste Management Act (Chapter 70.105 RCW);
- Dangerous Waste Regulations (Chapter 173-303 WAC);
- Ecology "Contained-In" Policy;
- State Environmental Policy Act (Chapters 197-11 and 173-802 WAC);
- King County Industrial Waste Regulations (Ordinance No. 11034);
- City of Kenmore Grading Permit;
- Health and Safety-29 CFR Part 1910.120; 8 CCR 5192 and USEPA Standard Operating Safety Guides for Hazardous Waste Operations (1986); and,
- Minimum standards for Construction and Maintenance of Wells (Chapter 173-160 WAC).

The primary ARARs that are applicable to the site are:

- MTCA Cleanup Regulations (Chapter 173-340 WAC);
- MTCA Cleanup Levels and Risk Calculations Update (CLARC II);
- Dangerous Waste Regulations (Chapter 173-303 WAC); and,
- Ecology "Contained-In" Policy.

The applicability of the primary ARARs to the site cleanup and disposal options is discussed below.

3.1.1 MTCA

The multiple constituents and residential land use and zoning of the site requires the use of MTCA Method B residential soil cleanup levels (WAC 173-340-700(3)(b)). MTCA Method B has been selected as the primary ARAR for selection of cleanup levels based on the multiple chemicals detected within the soil, the uses of the site, and applicable zoning regulations. The MTCA Method B residential soil cleanup levels used for this CAP are based on the carcinogenic formula values set forth in the MTCA Cleanup Levels and Risk Calculations (CLARC II) updated February 1996.

3.1.2 Dangerous Waste Regulations

Based on the identified chemicals used at the site, the dangerous waste regulations (Chapter 173-303 WAC) are applicable to the off-site disposal of contaminated soil removed from the site. The following chemicals of concern identified in the RI/FS are listed wastes under the Discarded Chemical Products List (WAC 173-303-9903):

Compound	Dangerous Waste No.
Aldrin	P004
Chlordane	U036
DDT	U061
Dieldrin	P037
Endrin Ketone	P051
Heptachlor	P059

Based on Discarded Chemical Products, WAC 173-303-081, soil waste with concentrations of one or more of these compounds generated from the site cleanup would be designated a dangerous waste and would be subject to the restrictions of Chapter 173-303 WAC. These restrictions would include a land-ban disposal of all the soil waste generated from the site, thus requiring incineration as the only disposal option; however, Ecology has confirmed that a Contained-In Determination is applicable to some of the soils to be excavated from the site, as discussed below.

3.1.2.1 Contained-In Designation

The applicability of the Contained-In Designation by Ecology to some of the soil to be excavated from the site is based on the following soil categories for contingency management:

- Concentrations of one or more of the target pesticides in the soil do not exceed the Dangerous Waste Characteristics levels (WAC 173-303-090); and,

- Concentrations of one or more of the target pesticides in the soil do not exceed the Dangerous Waste Criteria levels (WAC 173-303-100).

Based on these criteria, Ecology, in consultation with the United States Environmental Protection Agency (EPA), has agreed to apply the Contained-In Designation to some of the soil waste to be excavated from the site (Ecology letter dated March 7, 2000) as discussed in the EMMP.

3.1.2.2 Soil Categories

Farallon has prepared an EMMP (Appendix A) that provides a detailed discussion of the contingency management plan for the handling, transporting, and disposing of the soil waste generated from the site in order to meet the requirements of the Contained-In Designation by Ecology. The EMMP defines the disposal facility and categories of soil for handling and transportation. The determination of the soil category for the soil waste is dependent on the analytical result of *in-situ* soil samples. Category 1 and 2 Soils will be designated as contained-in and disposed of as non-dangerous waste in accordance with the EMMP. Collection and analysis of *in-situ* soil samples for Toxicity Characteristic Leaching Potential (TCLP) is necessary to determine the disposal option for the Category 3 Soils. Category 4 Soils will be designated as dangerous waste and disposed of in accordance with the Chapter 173-303 requirements as defined in the EMMP.

The analytical results of soil samples summarized in the RI/FS with concentrations of one or more of the target pesticides above the MTCA Method B cleanup levels are summarized on the attached Table 1. Table 1 also includes the equivalent concentrations for state toxicity criteria for pesticide constituents in each soil sample. A summary of the analytical results of all soil samples collected at the site, laboratory analytical reports, and sample locations are included in the RI/FS Report. The following soil categories have been defined for the site:

Category 1 Soils:

- Concentrations of one or more of the target pesticides are above the MTCA Method B residential soil cleanup levels;
- Concentrations of dieldrin are equal to or less than 1,300 micrograms/kilogram (ug/kg);
- Concentrations of chlordane are equal to or less than 2,600 ug/kg;
- Equivalent concentration for state-only toxicity is equal to or less than 0.01%; and,
- Total halogenated organic compounds (HOCs) for state-only persistence is less than 0.01%.

The analytical results of soil samples collected from the site that meet the criteria of Category 1 Soils are summarized on Table 2.

Category 2 Soils:

- Concentrations of one or more of the target pesticides are above the MTCA Method B residential soil cleanup levels;
- Concentrations of dieldrin are greater than 1,300 ug/kg, but equal to or less than 10,000 ug/kg;
- Concentrations of chlordane are greater than 2,600 ug/kg, but equal to or less than 15,000 ug/kg;
- Equivalent concentration for state-only toxicity is equal to or less than 0.01%; and,
- Total HOCs for state-only persistence is less than 0.01%.

The analytical results of soil samples collected from the site that meet the criteria of Category 2 Soils are summarized on Table 3.

Category 3 Soils:

- Concentrations of one or more of the target pesticides are above MTCA Method B residential soil cleanup levels;
- Concentrations of dieldrin are equal to or less than 10,000 ug/kg;
- Concentrations of chlordane are greater than 15,000 ug/kg, but pass the TCLP criteria;
- Equivalent concentration for state-only toxicity is equal to or less than 0.01%; and,
- Total HOCs for state-only persistence is less than 0.01%.

The analytical results of soil samples collected from the site that meet the criteria of Category 3 Soils are summarized on Table 4.

Category 4 Soils:

Category 4 Soils are designated as dangerous waste, which contains concentrations of one or more target pesticides above MTCA Method B residential soil cleanup levels and meets any one of the following criteria:

- Concentrations of dieldrin are greater than 10,000 ug/kg; or,
- Concentrations of chlordane are greater than 15,000 ug/kg, and fail the TCLP criteria; or,
- Equivalent concentration for state-only toxicity is greater than 0.01%; or,
- Total HOCs for state-only persistence is equal to or greater than 0.01%.

The analytical results of soil samples collected from the site that meet the criteria of Category 4 Soils are summarized on Table 5.

3.2 LOCAL PERMITS/SUBSTANTIVE REQUIREMENTS

The site cleanup will be performed under an Agreed Order with Ecology. When site cleanup is performed under an Agreed Order, compliance with the procedural aspects of certain state permits and all local permits or approvals is not required. Instead, Ecology determines and applies the substantive requirements of the local permits or approvals. Included with this CAP are the permit applications that would be required by local regulatory agencies in the absence of the Agreed Order exemption as described below.

3.2.1 Grading Permit

The city of Kenmore requires a grading permit for excavations greater than 50 cubic yards, a State Environmental Protection Act (SEPA) checklist and a determination of non-significance (DNS) for excavations greater than 500 cubic yards. The expected volume of soil to be excavated from the site is greater than the 500 cubic yards and would require the SEPA determination from the city of Kenmore. Under the Agreed Order, Ecology will be the lead agency for approval of the substantive equivalent permit requirements. A copy of the substantive requirements under the grading permit application and SEPA checklist are attached in Appendix B. A 30-day public comment period is required for the SEPA checklist. The 30-day public comment period will run concurrently with the comment period required by the Agreed Order. Ecology will issue a DNS for the site cleanup at the end of the 30-day comment period unless Ecology determines that public comment or other concerns require a different result.

3.2.2 Wastewater Disposal Permit

Disposal of wastewater generated from the site, which will include decontamination washwater, recovered perched groundwater in the vadose zone, and captured stormwater, requires a Discharge Authorization (DA) with King County Department of Natural Resources Industrial Waste Program. A DA has been obtained for the Interim Actions at the site and will be extended under the Agreed Order for the site cleanup. A copy of which is attached in Appendix B. The discharge and monitoring requirements of the DA will be followed during the site cleanup.

3.3 CONSTITUENTS OF CONCERN

The constituents of concern (herein referenced as the target pesticides) were identified based on a comparison of the analytical results of soil samples collected by the previous investigations, interim actions and the RI/FS with MTCA Method B residential soil cleanup levels, ARARs, and discussions with Ecology. A total of nine pesticides with established MTCA Method B residential soil cleanup levels, per the formula values listed in CLARC II, Chapter 173-340 WAC, were detected in soil samples collected during the previous investigations, the interim actions, and the RI/FS.

These nine pesticides comprise the constituents of concern (target pesticides):

- chlordane (alpha and gamma isomers);
- dieldrin;
- aldrin;
- endrin;
- heptachlor;
- heptachlor epoxide;
- DDT;
- DDD; and,
- gamma and delta hexachlorocyclohexane (lindane and delta BHC).

3.4 MEDIA OF CONCERN

3.4.1 Soil

Soil has been identified as the medium of concern based on results of prior investigations, interim actions, and the RI/FS.

Groundwater was not encountered during any of the previous investigations, interim actions, or the RI/FS. The regional groundwater-bearing zone is expected to occur at depths greater than 50 feet bgs beneath a relatively impermeable layer of glacial till. The results of a soil boring (SB-1) conducted at the site subsequent to completion of the RI/FS, the characteristic limited mobility of pesticides in soil, the low permeability of the soil, regional depth to groundwater, and the results of soil sampling at depth, suggest that groundwater beneath the site is probably not affected by pesticides from the site and does not appear to be a medium of concern.

3.4.2 Perched Groundwater in the Vadose Zone

The perched groundwater in the vadose zone has been identified as a medium of concern based on the analytical results of perched groundwater in the vadose zone samples collected from the buffer zone interceptor trench. The perched groundwater in the vadose zone appears to be limited to the wet season based on observations and perched groundwater in the vadose zone monitoring by Farallon during 1999.

3.5 CLEANUP STANDARDS

Cleanup standards for the site, as defined in WAC 173-340-700, include establishing cleanup levels and points of compliance at which the cleanup levels will be attained for the site to meet the requirements of the Agreed Order. The cleanup standards have been established for the site in accordance with MTCA (WAC 173-340-700 through WAC 173-340-760) which are protective of human health and the environment and comply with the cleanup standards and ARARs to meet the requirements of satisfaction of the Agreed Order.

3.5.1 Cleanup Levels

Cleanup levels are the concentrations of the target pesticides that will be met at the points of compliance defined for the site to meet the requirements of the Agreed Order. Cleanup levels have been established for the target pesticides in soil and perched groundwater in the vadose zone. The cleanup levels are presented by media of concern in the following sections.

3.5.1.1 Soil

The cleanup levels for soil applicable to the site are based on MTCA Method B residential soil cleanup levels using the carcinogenic formula values listed in CLARC II. The carcinogenic formula values were selected because they are more conservative and more protective of human health and the environment than the non-carcinogenic formula values. This higher level of protection is warranted because of the existing and planned future residential use of the site and site vicinity. The cleanup levels for the target pesticides are included in table 6.

3.5.1.2 Perched Groundwater in the Vadose Zone

Perched groundwater in the vadose zone cleanup levels applicable to the site are the MTCA Method B cleanup groundwater levels. The cleanup levels for the constituents of concern for each respective compound are included on table 6.

3.6 POINTS OF COMPLIANCE

The points of compliance are the locations where cleanup levels for the media and constituents of concern must be attained to meet the requirements of the Agreed Order. This CAP has established points of compliance for perched groundwater in the vadose zone [WAC 173-340-720(6)] and soil [WAC 173-340-740(6)] at the site.

3.6.1 Soil

The points of compliance for soil at the site are defined as all soils within the site where analytical results of *in-situ* soils samples detect concentrations of one or more of the target pesticides above MTCA Method B residential soil cleanup levels shown on table 6.

3.6.2 Perched Groundwater in the Vadose Zone

The points of compliance for perched groundwater in the vadose zone are defined as sumps to be located on the west, south, and east property boundaries of the 62nd Avenue Property. The sump locations, construction details, and sampling protocols are summarized in more detail in the SAP in Appendix C.

3.7 SITE CLOSURE

The requirements for a site closure and removal from The Hazardous Site List by Ecology will be met by the completion of the cleanup action. All soil with concentrations of one or more of the target pesticides above the applicable cleanup levels will be removed from the site. Compliance monitoring will be conducted to confirm the long term effectiveness of the cleanup action on soil and Perched groundwater in the vadose zone. The cleanup action will meet the requirements of the Agreed Order and will not include a deed restriction or institutional controls once the cleanup levels are met at the defined points of compliance.

4.0 DESIGN AND IMPLEMENTATION

The selected cleanup alternative to be implemented under the Agreed Order with Ecology, is Alternative 5, that was presented in the RI/FS. This alternative includes excavation and off-site disposal of soil with concentrations of one or more of the target pesticides above the selected cleanup levels. Additional details regarding the design and installation of the cleanup alternative are presented in the following sections.

4.1 DESCRIPTION OF CLEANUP ACTION

The final cleanup action involves the excavation and off-site disposal and/or incineration of soil with concentrations of one or more of the target pesticides above the MTCA Method B residential soil cleanup levels shown on Table 6. The final cleanup action consists of the following elements:

- Collection of soil samples from the Category 3 Soils sampling locations prior to excavation for Toxicity Characteristic Leaching Procedure (TCLP) analysis;
- Excavation of soil from the site to a maximum depth of three feet bgs unless the analytical results of compliance samples indicate that deeper excavation is necessary. An estimated 1,400 tons of soil will be excavated and disposed of off-site or incinerated;
- Disposal of the soil waste in accordance with the dangerous waste regulations and/or the Contained In determination requirements;
- Compliance sampling and analysis to confirm that the soils meet the cleanup levels at the defined points of compliance;
- Restoration of the site to the existing conditions prior to the soil excavation and removal; and,
- Compliance monitoring of perched groundwater in the vadose zone as described in the SAP to confirm that the perched groundwater in the vadose zone meets the cleanup levels at the defined points of compliance.

4.1.1 Cleanup Objectives

The objective of the cleanup described in this CAP is to meet the requirements of MTCA 4WAC 173-340 for completion of the cleanup actions required by the Agreed Order. This will be achieved through a final cleanup of the site by excavation and off-site disposal or incineration of all soils with concentrations of one or more of the target pesticides above the MTCA Method B cleanup level for soil. Monitoring of the perched groundwater in the vadose zone will be performed to confirm that concentrations in the perched groundwater are below the selected cleanup levels of all of the target pesticides. No pesticides at concentrations above applicable cleanup standards will remain on the site upon the completion of the final cleanup action. The final cleanup action will be

protective of both human health and the environment and will result in a permanent and final cleanup solution for the site.

4.1.2 Restoration Time Frame

The site cleanup is scheduled for late June to early July 2000. Farallon estimates approximately 6 to 8 weeks to complete the soil removal and site restoration. A preliminary construction schedule is shown on Table 7. The perched groundwater in the vadose zone sumps will be decommissioned in accordance with WAC 173-160 at the completion of the perched groundwater monitoring.

4.1.3 Final Closure

The site will be removed from the Hazardous Sites List once confirmation soil and perched groundwater in the vadose zone sampling and monitoring have been completed and validates that the cleanup levels for soil and perched groundwater have been met at the defined points of compliance. A final removal of the site from the Hazardous Site List will be provided by Ecology once perched groundwater compliance sampling confirms that the cleanup levels for perched groundwater have been met at the defined points of compliance.

4.2 DEFINITION AND DELINEATION OF EXCAVATION AREAS

The soil categories agreed to by Ecology and defined in the EMMP will determine the specific excavation, handling, transportation, and disposal requirements as defined in the EMMP and discussed in more detail in this CAP. The results of the site soil sampling have been used to define the distribution of the soil types at the site. The distribution of each soil category on-site and its estimated volume is discussed below.

4.2.1 Category 1 Soils

The analytical results of soil samples that meet the criteria of Category 1 Soils are summarized on Table 2. The areas with soil that meet the criteria for Category 1 Soils from surface to a depth of one-foot bgs (Lift 1) are shown on Figure 3. The Category 1 Soils from 1 to 2 feet bgs (Lift 2) or from 2 to 3 feet bgs (Lift 3) are shown on Figures 4 and 5. Based on the distribution of soil that meet the criteria of Category 1 Soils, Farallon has estimated that a total of 400 tons of Category 1 Soils will be excavated from the site.

4.2.2 Category 2 Soils

The analytical results of soil samples that meet the criteria of Category 2 Soils are summarized on Table 3. The areas with soil that meet the criteria for Category 2 Soils in Lift 1 are shown on Figure 3. The areas of soil that meet the criteria for Category 2 soils

in Lift 2 are shown on Figure 4, and those in Lift 3 are shown on Figure 5. Farallon has estimated that a total of 725 tons of Category 2 Soils will be excavated from the site.

4.2.3 Category 3 Soils

The analytical results of soil samples that meet the criteria of Category 3 Soils are summarized on Table 4. The areas with soil that meet the criteria for Category 3 Soils in Lift 1 are shown on Figure 3. There are no Category 3 Soils in Lift 2 or Lift 3. Farallon has estimated that a total of 25 tons of Category 3 Soils will be excavated from the site.

Additional soil samples will be collected for TCLP analysis at the sample locations that meet the criteria for Category 3 Soils, as discussed in the SAP. The analytical results of the TCLP analysis will be evaluated to determine whether the soil will be handled as a contained-in soil similar to Category 2 Soils, or if it will be designated as a dangerous waste for incineration similar to Category 4 Soils.

4.2.4 Category 4 Soils

The analytical results of soil samples that meet the criteria of Category 4 Soils are summarized on Table 5. The areas with soil that meet the criteria for Category 4 Soils in Lift 1 are shown on Figure 3. There are no Category 4 Soils in Lift 2 or Lift 3. Farallon has estimated a total of 250 tons of Category 4 Soils will be excavated from the site.

4.3 PRE-EXCAVATION SITE PREPARATION

Prior to excavation at the site, the following will be completed:

4.3.1 Protection Monitoring Instruments

The Health and Safety Plan (HASP) included in Appendix D requires personal protection equipment (PPE) during the site excavation that includes continuous dust (protection) monitoring apparatus. To monitor airborne dust, a Miniram PDM-3 air sampling instrument will be used at the site to monitor air quality in the breathing zone during cleanup activities. The Miniram instrument will be used to monitor air quality and the airborne particulate material during the final cleanup activities. The specific air monitoring instrument, operating and monitoring procedures, and documentation are defined in the site-specific HASP.

4.3.2 Installation of Erosion Control Measures

Erosion control measures will be required to mitigate any potential for off-site migration of pesticide-laden sediments during the site excavation. A detailed Erosion and Sedimentation Control Plan is included with the Grading Permit Application attached in Appendix B. The Erosion and Sediment Control Plan provides specific construction

details for erosion control during the site excavation. Erosion control to be installed prior to excavation will include:

- Control and containment of stormwater runoff
- Control and containment of dust
- Control and containment of mud on equipment and truck tires
- Control and containment of decontamination washwater

Location of underground utilities will be completed on-site with the erosion control. It is likely that the underground utilities will be disconnected and temporarily capped during the excavation.

4.3.3 Collection of Category 3 Soils Samples

In-situ soil samples will be collected from the soil sample locations that meet the criteria for Category 3 Soils. The soil samples will be collected in accordance with the SAP, and will be analyzed for TCLP. The analytical results will be reviewed to determine if the soils meet the criteria for the Contained-In Determination, or if they will meet the criteria as a dangerous waste.

4.3.4 Removal of Garage, Vegetation, and Concrete Paving

The existing garage will be demolished. The demolition debris and all above-grade vegetation and concrete paving will be removed and disposed of off-site. This will include all trees, shrubs, concrete walkways, and other debris currently stockpiled on-site. These materials will be disposed of in a suitable landfill as construction debris . Care will be taken during this task not to disturb the surface and shallow subsurface soils.

4.3.5 Construction of Contamination Reduction Corridor/Support Zone

A contamination reduction corridor (CRC) will be constructed in the area of the former garage and driveway along the northern side of the site (Figure 6). Contaminated soil in this area will be removed during the first phase of excavation to provide an area of clean soil for a CRC, a staging area for soil disposal drop boxes, and a support zone excluded from the contaminated portions of the site during cleanup activities. The total area of the CRC will be approximately 4,550 ft^2 extending approximately 150 feet from the northeast corner of the site toward the western property line, as shown on Figure 6.

Contaminated soils will be excavated from the CRC to clean soils, as discussed below in more detail. Once the analytical results of confirmation soil samples collected in accordance with the SAP are confirmed, the CRC area will be constructed. An impermeable liner of geotextile fabric will be placed on clean backfill and overlain with crushed rock to provide a support zone for completion of the site cleanup, as well as a clean, stable platform for staging of soil bins and dump trucks.

4.3.6 Delineation of Loading and Holding Areas

An area within the CRC will be designated for the Category 4 Soils locked drop-box, drop-off, storage, and pick-up area. The designated space will be used as a holding area while soil drop boxes are filled with Category 4 Soils. Figure 6 shows the proposed soil drop box holding area.

A specific area within the CRC will be constructed for loading of Category 1 and 2 Soils directly into dump trucks. The CRC will be constructed such that non-excavation equipment, such as dump trucks, drop box loading trucks, and support vehicles, do not come in contact with contaminated soil and only drive on clean backfill.

4.3.7 Decontamination Truck Wash Area

A truck wash area and decontamination washwater containment area will be constructed within the CRC to avoid any potential for contaminated soils to be transported off-site by truck wheels. The proposed truck wash area is shown on Figure 6 and will consist of an area for visual inspection of all truck wheels by on-site personnel. Soils will be swept off by hand prior to the truck leaving the CRC to the public street. If wet soils have adhered to the truck wheels, a power washer system will be used to clean the truck prior to departure from the site. Decontaminated washwater will gravity flow to a plastic- lined and bermed catch basin pending disposal.

4.4 SOIL EXCAVATION/HANDLING AND SEQUENCING

The Category 1 and 2 Soils will be managed as dangerous waste during excavation to eliminate the potential exposure pathways and associated risks to human health and the environment. However, Ecology has designated the Category 1 and 2 Soils as contained-in for disposal at an appropriate landfill, as discussed in the EMMP. The Category 4 Soils will be designated dangerous waste and will be handled, transported, and disposed of in accordance with the restrictions imposed by WAC 173-303.

The different designation of the soil categories and distribution at the site will dictate the overall excavation and handling approach used for cleanup of the site. Detailed and careful procedures as defined in this CAP will be employed to segregate each soil type during excavation to meet the requirements of the Contained-In Determination. A backhoe will be used for the majority of the excavation; however, the limited soil excavation inside the existing residence will be performed manually due to the access limitations within the residence.

The site was delineated into subareas to guide the sampling for the RI/FS (RI/FS Subareas). To help guide the excavation, The RI/FS Subareas have been modified into different Subarea definitions. The site has been delineated into the following horizontal areas to guide the excavation: The CRC Subarea, Exterior Subarea, and Interior Subarea (Figure 6). The vertical distribution of the concentrations of the target pesticides is limited to a maximum depth of 3-feet bgs based on the results of previous soil sampling and analysis. The actual depth of the final

excavation will be defined by the results of the performance sampling. Thus the site has been delineated into vertical areas to guide the excavation: Lift 1 - surface to 1 foot bgs; Lift 2 – 1 to 2 feet bgs; and Lift 3 – 2 to 3 feet bgs. The areal and vertical distribution of the soil categories is shown on Figures 3, 4, and 5.

The excavation procedures to be used for the site cleanup will be staged by horizontal and vertical subarea.

4.4.1 Soil Category Handling Procedures

Categories 1, 2, 3, and 4 soils occur throughout the site in Lift 1. Only Category 2 soils occur in Lift 2 throughout the site. Lift 3 contains limited areas of Category 1 and 2 soils.

4.4.1.1 Category 1 Soils

Category 1 Soils will be excavated and loaded directly into dump trucks staged in the CRC. The dump trucks will be equipped with tarp covers for transportation to an approved landfill.

4.4.1.2 Category 2 Soils

Category 2 Soils will be excavated and loaded directly into lined and diapered dump trucks staged in the CRC. The dump trucks will be equipped with tarp covers for transportation to an approved landfill.

4.4.1.3 Category 3 Soils

Category 3 Soils that have TCLP concentrations below the threshold limit will be loaded directly into lined and diapered dump trucks equipped with tarp covers for transportation to an approved landfill. Category 3 Soils that have TCLP concentrations above the threshold limit will be loaded directly into locked drop boxes stored in the CRC for transportation to an incinerator.

4.4.1.4 Category 4 Soils

Category 4 Soils will be excavated and loaded directly into locked drop boxes staged in the CRC. Category 4 Soils will be temporarily stored in the drop boxes on-site in the CRC holding area until the particular drop box is full. Full drop boxes will be covered for transportation to an incinerator.

4.4.2 Excavation Sequencing

The sequencing of soil excavation will include five separate phases: 1) Excavation of Lifts 1, 2, and 3 in the CRC Subarea; 2) Excavation of Lifts 1, 2, and 3 in the Interior Subarea; 3) Excavation of Lift 1 in the Exterior Subarea; 4) Excavation of Lift 2 in the Exterior Subarea; and 5) Excavation of Lift 3 in the Exterior Subarea. The areas of Lift 1

with Category 4 Soils will be excavated first, in the CRC and exterior subareas, followed by areas with Category 2 Soil, and completed with Category 1 Soils. This procedure will be utilized for each lift in each Subarea until the site cleanup is completed. The excavation will be guided by performance soil sampling to delineate the extent of the areas with each soil category type based on *in-situ* samples as defined in the SAP. Analytical results of performance samples that are non-detect will be considered compliance samples and will be used for site closure. A detailed discussion of the performance sampling/compliance protocols is provided in the SAP.

4.4.2.1 CRC Subarea Excavation

The CRC Subarea is shown on Figure 6. The distribution of the soil categories within each lift are shown on Figures 3, 4, and 5. Following excavation of the CRC Subarea, compliance soil samples will be collected in accordance with the SAP to confirm that all of the contaminated soil has been removed and that the CRC can be constructed.

Category 3 Soils located in Lift 1 on the northwest side of the garage (RI/FS sample location B5, Figure 3) will be resampled prior to excavation of the CRC Subarea. If the analytical results are below the TCLP levels, the soil will be excavated and handled as Category 2 Soil. If the analytical results are above the TCLP levels, the soil will be excavated and handled as Category 4 Soil, as discussed below.

The first phase of excavation to prepare the CRC will include excavating portions of the CRC area to a proposed total depth of three feet bgs. The two small areas of Category 4 Soils adjacent to the north side of the garage and residence in Lift 1 (Figure 3) will be excavated and placed directly into locked drop boxes for transport and incineration off-site. The Category 2 Soils in Lifts 1, 2, and 3 will be excavated and loaded directly into lined and diapered dump trucks equipped with tarp covers for immediate transport off-site to an approved disposal facility. The Category 1 Soils in Lifts 1 will be excavated and loaded directly into covered dump trucks equipped for immediate transport off-site to an approved disposal facility.

The CRC area will be backfilled with clean imported material after compliance sampling results confirm that all contaminated soil has been removed. The CRC staging area will be constructed as discussed above after placement of the backfill in order to continue the site cleanup.

4.4.2.2 Interior Subarea

The Interior Subarea is defined as the area located on the southwest portion of the residential building interior (Figure 6) which was the RI/FS Subarea 1. Excavation of the interior subarea will require saw cutting of the concrete floor

slab and removal of the concrete debris. The concrete debris will be disposed of off-site as construction debris.

The soils underlying the concrete slab area will be excavated by hand to approximately two feet below the bottom of the slab elevation (Figures 3 and 4). The RI/FS results indicate that the soils in this area meet the criteria as Category 2 or 3 Soils. Additional soil samples will be collected from this Subarea prior to excavation to determine the specific handling and disposal requirements. Soil that meets the criteria as a Category 2 Soils will be excavated by hand and will be stockpiled outside of the building and transported from the stockpile by backhoe to lined and diapered dump trucks for immediate off-site disposal. Soil that meets the criteria of a Category 4 Soils will be transported from the hand-excavated stockpile to locked drop boxes staged in the CRC for off-site disposal.

The excavation will be backfilled with clean imported soils after the cleanup of the Exterior Subarea is completed. The backfill will be compacted and a new concrete slab will be placed.

4.4.2.3 Exterior Subarea

This Subarea comprises the entire area outside of the residence excluding the CRC. The Subarea includes the RI/FS Subareas 2, 3, 4, and the Buffer Zone. This Subarea also includes the stormwater drainage ditch on the west edge of 62nd Avenue NE (Figure 6). The Exterior Subarea will be excavated using a rubber-tired backhoe and a front-end loader.

Excavation of Lift 1

Excavation of Lift 1 includes the removal of Category 1, 2, 3, and 4 Soils as shown on Figure 3. Performance sampling defined in the SAP will delineate the lateral extent of each soil type within Lift 1. The preliminary lateral delineation shown on Figure 3 is based on the results of the RI/FS and provides a useful guide for the excavation. The exact limit of each soil category will be defined during the excavation by the results of the performance sampling.

Category 4 Soils will be excavated first, starting with the four areas located in the western portion of the site, followed by excavation of the areas located on the east side of the residence (Figure 3). The Category 4 soils will be excavated and placed in locked drop boxes temporarily stored on-site in the CRC pending off-site disposal once the locked drop boxes are full.

Category 3 Soils located on the southwest side of the site (sample location S-10 and B-18, Figure 3) will be resampled prior to excavation of Lift 1 of the Exterior Subarea. If the analytical results are below the TCLP levels, the soil will be excavated and handled as a Category 2 Soil. If the analytical results are above the

TCLP levels, the soil will be excavated and handled as a Category 4 Soil, as discussed below.

Category 2 Soils will be excavated from Exterior Subarea from the areas shown on Figure 3 and loaded directly into lined and diapered dump tucks for off-site disposal.

The Category 1 Soils to be excavated from the areas shown on Figure 3 and loaded directly into dump trucks for off-site disposal.

Compliance/performance sampling results will be collected at the base of the excavation completed for Lift 1 to determine the soil categories in each area and areas where deeper excavation is necessary well as. The results of the RI/FS will be incorporated with the cleanup compliance/performance sampling results to guide the excavation for Lift 2.

Excavation of Lift 2

The results of the RI/FS indicate that there are limited areas of soil that will require cleanup in Lift 2 of the Exterior Subarea, all of which meet the criteria for a Category 2 Soils (Figure 4). The soil excavated from Lift 2 of the Exterior Subarea will be loaded directly into lined and diapered dump trucks for off-site disposal.

Compliance/performance sampling results will be collected at the base of the excavation completed for Lift 2 to determine the soil categories in each area and where deeper excavation is necessary . The results of the RI/FS will be incorporated with the cleanup compliance/performance sampling results to guide the excavation for Lift 3.

Excavation of Lift 3

The results of the RI/FS indicate that there are very limited areas of soil which will require cleanup in Lift 3 of the Exterior Subarea, all of which meet the criteria for a Category 1 Soils (Figure 5). The Category 1 Soils excavated from Lift 3 of the Exterior Subarea will be loaded directly into dump trucks for off-site disposal.

Compliance/performance sampling results will be collected at the base of the excavation completed for Lift 3 to determine the soil categories in each area and areas where deeper excavation is necessary. The results of the RI/FS indicated that deeper excavation will not be necessary.

4.5 WASTE DISPOSAL

4.5.1 Soil Waste Disposal

The selected disposal facility for the soil waste generated from the site cleanup has been agreed to by Ecology and is defined by each soil category in the EMMP. The following disposal facilities will be used for disposal of the waste soil excavated from the site:

4.5.1.1 Category 1 Soils

Category 1 Soils will be disposed of as non-dangerous waste at a landfill that meets the requirements of Chapter 173-351 WAC (within Washington State) and/or a Subtitle D landfill (outside Washington State).

4.5.1.2 Category 2 Soils

Category 2 Soils will be disposed of as a contained-in waste soil at a RCRA Subtitle C landfill. The landfill will be instructed that these soils are not to be used for daily landfill cover.

4.5.1.3 Category 3 Soils

Category 3 Soils with the analytical results of *in-situ* soil samples collected prior to excavation that are below the TCLP levels will be disposed of as a contained-in waste soil at a RCRA Subtitle C landfill. The landfill will be instructed that these soils are not to be used for daily landfill cover. Category 3 Soils with the analytical results of *in-situ* soil samples collected prior to excavation that are above the TCLP levels will be disposed by incineration.

4.5.1.4 Category 4 Soils

Category 4 Soils will be disposed of by incineration.

4.5.1.5 Selected Disposal Facilities

The RCRA Subtitle D landfill selected for disposal of the Category 1 Soils is the Regional Disposal Company Roosevelt Regional Landfill, Permit #CU 92-14. A copy of the Permits and Certifications for the Roosevelt Regional Landfill dated December 1999 is retained on file at the Farallon office. Farallon is currently evaluating costs associated with alternative Subtitle D landfills. Ecology will be notified if an alternative Subtitle D landfill is selected for disposal of the Category 1 Soils.

The RCRA Subtitle C landfill selected for disposal of the Category 2 Soils and Category 3 soils that do not fail the TCLP is the Waste Management Industrial Services Subtitle C Landfill located in Arlington, Oregon. A copy of the

Arlington Facility Guidebook is retained on file at the Farallon office. Farallon is currently evaluating costs associated with alternative Subtitle D landfills. Ecology will be notified if an alternative Subtitle C landfill is selected for disposal of the Category 2 Soils.

The Category 4 Soils and Category 3 Soils that fail the TCLP analysis will be transported to Onyx Environmental Services Incineration Facility in Texas. A copy of the permitting information for this facility is retained on file at the Farallon office. Farallon is currently evaluating costs associated with alternative incineration facilities. Ecology will be notified if an alternative incineration facility is selected for disposal of the Category 4 Soils.

4.5.2 Waste Water Disposal

Wastewater, including extracted perched groundwater in the vadose zone, surface water, and decontamination washwater, will be disposed of to the sanitary sewer in accordance with the existing DA. Batch sampling, as defined in the SAP, will be conducted to confirm compliance with the discharge limits. A temporary inlet will be created at the edge of the site to allow for the excavation.

4.6 SITE RESTORATION

The site restoration will include returning the site to a condition similar to those prior to the site cleanup. The site will be backfilled to a level grade similar to the pre-excavation grade. Hydroseeding will be placed on exposed soil to prevent excess erosion and potential runoff. The erosion control measures will be left in place until vegetation has been re-established.

4.6.1 Backfill

The Exterior Subarea will be backfilled to within 6-inches of the final grade with a non-select material compacted to a non-yielding state. A 6-inch lift of clean topsoil will be placed on the entire site.

The Interior Subarea will be backfilled with a Class B Pit run to the bottom of slab elevation. A 6-inch thick reinforced replacement concrete slab will be doweled into the existing slab.

The geotextile liner and gravel surfacing will be left in place within the CRC Subarea.

4.6.2 Hydroseeding/Landscaping

Exposed backfill in the Exterior Subarea will be hydroseeded with a residential seed mixture. Planting of ornamental landscaping is not included with this CAP, nor is replacement of concrete walkways.

4.6.3 Reconstruction of Garage

Reconstruction of the garage will be performed once the hydroseeding is completed. A structure similar to the previous two-car garage will be constructed in the same general area as the former garage. Farallon will consult with the property owner to obtain final approval of the site restoration plans.

5.0 COMPLIANCE MONITORING

The Compliance Monitoring Plan is incorporated with the SAP in Appendix C. The Compliance Monitoring Plan includes the methods and procedures for:

- Performance Monitoring-Confirm during active remediation that the excavation meets the requirements of the cleanup action by removal of all soil with concentrations of one or more of the target pesticides above the selected cleanup level.

- Confirmational Monitoring-Confirm that the Cleanup Action meet the requirements of the Agreed Order by meeting the cleanup levels for soil and perched groundwater in the vadose zone at the defined points of compliance.

Protection monitoring is addressed in the HASP in Appendix D.

5.1 COMPLIANCE MONITORING

Sampling and analysis plan (WAC 173-340-820) and the Compliance Monitoring Plan (WAC 173-340-410) have been combined in the SAP for the cleanup action and included in Appendix C. The SAP provides a detailed description of the specific procedures to ensure the collection, handling, and analysis of sufficient soil and perched groundwater in the vadose zone samples to confirm that the final cleanup action meets the requirements of the Agreed Order.

6.0 SCHEDULE

The proposed schedule for the site cleanup is based on a normal five-day workweek. All work will be performed during daylight hours with a standard 8-hour workday. A contingency of one week has been included in the estimated schedule to compensate for periods when wet weather conditions preclude excavation or exposure of the contaminated subsurface soils at the site.

Based on the preliminary schedule agreed upon with Ecology, the site cleanup is scheduled to begin in late June or early July 2000. All work will be done when the preschool is not in operation. Table 7 provides the proposed project schedule.

6.1 PRE-EXCAVATION ACTIVITIES

Pre-excavation activities will be initiated approximately two weeks in advance of the soil excavation. Approximately 12 days will be required to collect and analyze soil samples from the Category 3 Soils areas. During the period of time necessary to complete the laboratory analysis, the perimeter silt fence will be installed, all the above-ground vegetation and concrete paving will be cleared and removed from the site, the garage will be demolished and the construction debris will be transported off-site and disposed of as non-hazardous solid waste, and the debris piles on-site will be removed. A utilities location will be performed for both the private property and the public utilities that may potentially be affected by the cleanup activities, and existing utility services will be shut-off.

6.2 SOIL EXCAVATION AND DISPOSAL

Soil excavation and disposal activities will require approximately 3 to 4 weeks to complete and will be contingent on attaining confirmational soil samples from the proposed areas of excavation that are below the approved cleanup levels for the site. Adverse weather conditions may have a significant effect on this schedule.

6.3 SITE RESTORATION

Once results of the final confirmation soil samples are received, site restoration activities will be initiated. The backfill and grading of the site will take approximately one week to complete, followed by one day for hydroseeding the site. Reconstruction of the garage will be completed in approximately two weeks.

7.0 DOCUMENTATION REQUIREMENTS

Documentation will be necessary to meet the requirements of the Agreed Order with Ecology. All documentation generated for this cleanup will be submitted directly to Ecology, the PLPs, and their representatives with the weekly reports. Copies will be retained in Farallon files for a minimum of 10 years after completion of the project.

7.1 WEEKLY REPORTING

Daily field reports and field notebooks will be completed by Farallon field personnel for the site cleanup. Copies of all field reports will be kept on-site during the cleanup, with originals retained in Farallon files. Copies of the daily reports will be provided with the weekly summary report.

Weekly reports will be provided during the active remediation of the site and will be discontinued once the site restoration is completed. Weekly reports will be provided to Ecology in the form of a technical memorandum and will include: an update on the cleanup progress and any deviations from the CAP because of changing site conditions, available analytical data from performance and compliance sampling, and available waste manifests as per the EMMP.

7.2 QUARTERLY REPORTING

Quarterly reports will be prepared for the on-going interim actions and once the cleanup has been initiated. Quarterly reports will summarize activities performed during the quarter and planned activities for the following quarter. The quarterly reports will be submitted to Ecology within two weeks after the end of the quarter.

7.3 MANIFESTING AND WASTE DISPOSAL TRACKING

Specific documentation requirements will be met for transportation and disposal of the soil and wastewater generated from the site cleanup. The waste disposal tracking documentation requirements are defined in the EMMP (Appendix A) and are summarized below.

7.3.1 Category 1 and 2 Soils

The Uniform Hazardous Waste Manifest will be used for the transport and disposal of the Category 1 and 2 Soils, with the description of the waste as being "contaminated soils, not regulated by Washington Dangerous Waste Regulations." Copies of signed Manifests will be provided to Ecology within 15 calendar days of disposal with the weekly reports.

7.3.2 Category 4 Soils

Category 4 Soils will be manifested with the RCRA Identification Number WAH 000 005 421, that was issued by Ecology for the site on June 16, 1998. The RCRA Identification Number will be used on all annual reports, manifests, and documents that are required by the incineration facility. Copies of the signed manifests will be provided to Ecology within 15 days of disposal with the weekly reports.

7.4 FINAL CLOSURE REPORT

A final closure report will be prepared once there is sufficient data for soil and perched groundwater in the vadose zone to confirm that the cleanup levels at the defined points of compliance have been met and the requirements of the Agreed Order have been completed. The final closure report will be submitted as Final Draft report for Ecology review and comment.

8.0 REFERENCES

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TABLES

FIGURES

APPENDIX A
ENVIRONMENTAL MEDIA MANAGEMENT PLAN (EMMP)
FINAL DRAFT CLEANUP ACTION PLAN
ABLE PEST CONTROL
18115 62ND AVE NE
KENMORE, WA.
FARALLON PN: 602-002

MAY 23, 2000

APPENDIX B
GRADING PERMIT AND SEPA CHECKLIST
FINAL DRAFT CLEANUP ACTION PLAN
ABLE PEST CONTROL
18115 62ND AVE NE
KENMORE, WA.
FARALLON PN: 602-002

MAY 23, 2000

APPENDIX C
SAMPLING AND ANALYSIS PLAN (SAP)
FINAL DRAFT CLEANUP ACTION PLAN
ABLE PEST CONTROL
18115 62ND AVE NE
KENMORE, WA.
FARALLON PN: 602-002

MAY 23, 2000

APPENDIX D
HEALTH AND SAFETY PLAN (HASP)
FINAL DRAFT CLEANUP ACTION PLAN
ABLE PEST CONTROL
18115 62ND AVE NE
KENMORE, WA.
FARALLON PN: 602-002

MAY 23, 2000

APPENDIX E
QUALITY ASSURANCE PROJECT PLAN
FINAL DRAFT CLEANUP ACTION PLAN
ABLE PEST CONTROL
18115 62ND AVE NE
KENMORE, WA.
FARALLON PN: 602-002

MAY 23, 2000

TABLE 1
CLEANUP ACTION PLAN
ANALYTICAL RESULTS SUMMARY TABLE
ABLE PEST CONTROL SITE
FARALLON PN: 602-002

Sample	Chlordane[2]		Dieldrin		Heptachlor[2]		Aldrin		Endrin[2]		DDT		DDD		Sulfan		BHC		Equivalent Concentrations[5]	
	µg/kg[3]	%[4]	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	Total	State Only Toxicity[6] >0.01%
Subarea 1																				
B1-3	11,100	0.00111%	[8]		1,010	0.00010%					280	0.00003%	120	0.00001%	57	0.00001%			0.00126%	**NO**
B1-12	4,300	0.00043%			570	0.00006%					100	0.00001%	45	0.00000%					0.00050%	**NO**
B2-3	16,300	0.00163%	740	0.00007%	400	0.00004%					380	0.00004%	190	0.00002%	89	0.00001%			0.00181%	**NO**
B2-3d	12,300	0.00123%	440	0.00004%	2,000	0.00020%					300	0.00003%	140	0.00001%	69	0.00001%			0.00152%	**NO**
B3-3	15,000	0.00150%			1,240	0.00012%					390	0.00004%	190	0.00002%	79	0.00001%			0.00169%	**NO**
B3-12	480	0.00005%			24	0.00000%													0.00005%	**NO**
Subarea 2																				
B1-3	510	0.00005%	8,200	0.00082%	21	0.00000%	120	0.00001%	278	0.00003%			22	0.00000%					0.00092%	**NO**
B2-3	6,300	0.00063%	13,000	0.00130%	171	0.00002%	470	0.00005%	570	0.00006%	780	0.00008%	310	0.00003%					0.00216%	**NO**
B2-24			180	0.00002%															0.00002%	**NO**
B3-3	2,400	0.00024%	16,000	0.00160%	540	0.00005%													0.00189%	**NO**
B4-3	560	0.00006%	1,700	0.00017%	22	0.00000%			30	0.00000%	960	0.00010%	250	0.00003%					0.00035%	**NO**
B4-3d	450	0.00005%	1,500	0.00015%	17	0.00000%			39	0.00000%	1,600	0.00016%	390	0.00004%					0.00040%	**NO**
B5-3	1,930	0.00019%	2,800	0.00028%	67	0.00001%	15	0.00000%			470	0.00005%	180	0.00002%					0.00055%	**NO**
B6-3	214	0.00002%	160	0.00002%															0.00004%	**NO**
B7-3	1,650	0.00017%	3,200	0.00032%	47	0.00000%	18	0.00000%			550	0.00006%	140	0.00001%					0.00056%	**NO**
B8-3	2,180	0.00022%	230	0.00002%	120	0.00001%					260	0.00003%	150	0.00002%					0.00029%	**NO**
B9-3	233	0.00002%	240	0.00002%							43	0.00000%							0.00005%	**NO**
B10-3	5,500	0.00055%	540	0.00005%	180	0.00002%	32	0.00000%			1,000	0.00010%	370	0.00004%					0.00076%	**NO**
B11-3	164,000	0.01640%			1,390	0.00014%					1,400	0.00014%	750	0.00008%	200	0.00002%			0.01677%	**YES**
B12-3	2,800	0.00028%	220	0.00002%	65	0.00001%					94	0.00001%	35	0.00000%					0.00032%	**NO**
B13-3	690	0.00007%	1,200	0.00012%			20	0.00000%			65	0.00001%	27	0.00000%					0.00020%	**NO**
B14-3	8,300	0.00083%	1,800	0.00018%	349	0.00003%							160	0.00002%	45	0.00000%			0.00107%	**NO**
B15-3	1,120,000	0.11200%			190,000	0.01900%					26,000	0.00260%	13,000	0.00130%	4,900	0.00049%			0.13539%	**YES**
B16-3	580	0.00006%	88	0.00001%	19	0.00000%					29	0.00000%							0.00007%	**NO**
B17-3	39,000	0.00390%	2,200	0.00022%	120	0.00001%			1,300	0.00013%			920	0.00009%	280	0.00003%			0.00438%	**NO**
B18-3	27,000	0.00270%			1,920	0.00019%					1,500	0.00015%	390	0.00004%			280	0.000028%	0.00311%	**NO**
B18-3D	15,600	0.00156%	710	0.00007%	1,010	0.00010%					980	0.00010%	340	0.00003%			16	0.000002%	0.00187%	**NO**
S-5	24	0.000002%	800	0.00008%															0.00008%	**NO**
S-7	4,100	0.000410%			770	0.00008%													0.00049%	**NO**
S-8	64	0.000006%	400	0.00004%															0.00005%	**NO**
S-9	1,130	0.000113%	5,200	0.00052%	36	0.00000%	500	0.00005%	128	0.00001%	360	0.00004%							0.00074%	**NO**
S-10	21,800	0.002180%	830	0.00008%	1,120	0.00011%													0.00238%	**NO**
S-11	3,300	0.000330%	1,700	0.00017%	196	0.00002%													0.00052%	**NO**
S-12	2,900	0.000290%	170	0.00002%	155	0.00002%													0.00032%	**NO**
S-13	175,000	0.017500%			21,130	0.00211%											1,415	0.000142%	0.01975%	**YES**
Subarea 3																				
B1-3	152	0.00002%	1,900	0.00019%					50	0.00001%									0.00021%	**NO**
B2-3	470	0.00005%	64,000	0.00640%	21	0.00000%	2,800	0.00028%	1,440	0.00014%	130	0.00001%	86	0.00001%	120	0.00001%			0.00691%	**NO**
B3-3	860	0.00009%	28,000	0.00280%	35	0.00000%	3,400	0.00034%	870	0.00009%	200	0.00002%	110	0.00001%					0.00335%	**NO**
B3-24			250	0.00003%															0.00003%	**NO**
B3-24D	85	0.00001%	2,200	0.00022%			140	0.00001%	33	0.00000%									0.00025%	**NO**
B4-3	110	0.00001%	3,400	0.00034%					37	0.00000%									0.00035%	**NO**
B4-24			230	0.00002%															0.00002%	**NO**
B5-3	650	0.00007%	64,000	0.00640%	20	0.00000%	1,500	0.00015%	1,169	0.00012%	140	0.00001%	120	0.00001%					0.00676%	**NO**
B5-3D	630		65,000	0.00650%	16	0.00000%	870	0.00009%	930	0.00009%	110	0.00001%	110	0.00001%					0.00670%	**NO**
B5-24			260	0.00003%															0.00003%	**NO**
B6-3	1,140	0.00011%	4,300	0.00043%	62	0.00001%	38	0.00000%	93	0.00001%	170	0.00002%	63	0.00001%					0.00059%	**NO**
B6-24			67	0.00001%															0.00001%	**NO**
B7-3	550	0.00006%	33,000	0.00330%	26	0.00000%	390	0.00004%	540	0.00005%	170	0.00002%	57	0.00001%					0.00347%	**NO**
SEDTEC[8]	7,500	0.000750%	80	0.00001%	8	0.00000%							32	0.00000%					0.00076%	**NO**

TABLE 1
CLEANUP ACTION PLAN
ANALYTICAL RESULTS SUMMARY TABLE
ABLE PEST CONTROL SITE
FARALLON PN: 602-002

Sample	Chlordane[2]		Dieldrin		Heptachlor[2]		Aldrin		Endrin[2]		DDT		DDD		Sulfan		BHC		Equivalent Concentrations[5]	
	µg/kg[3]	%[4]	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	Total	State Only Toxicity[6] >0.01%
Subarea 4																				
B1-3	720	0.00007%	72	0.00001%	40	0.00000%					48	0.00000%							0.00009%	**NO**
B4-3	3,500	0.00035%	4,800	0.00048%	120	0.00001%	53	0.00001%	204	0.00002%	130	0.00001%	70	0.00001%					0.00089%	**NO**
B5-3	3,300	0.00033%	1,000	0.00010%	110	0.00001%	18	0.00000%			110	0.00001%							0.00045%	**NO**
B5-24	168	0.00002%	100	0.00001%															0.00003%	**NO**
B6-3	2,800	0.00028%	4,800	0.00048%	90	0.00001%	89	0.00001%	161	0.00002%	140	0.00001%	64	0.00001%					0.00081%	**NO**
B7-3	3,200	0.00032%	2,400	0.00024%	110	0.00001%	59	0.00001%	46	0.00000%	94	0.00001%	45	0.00000%					0.00060%	**NO**
B8-3	580	0.00006%	2,300	0.00023%	17	0.00000%	69	0.00001%	27	0.00000%	62	0.00001%	25	0.00000%					0.00031%	**NO**
Subarea 5																				
B1-3	600	0.00006%	600	0.00006%	42	0.00000%			28	0.00000%	110	0.00001%	26	0.00000%					0.00014%	**NO**
B3-3	6,900	0.00069%	730	0.00007%	560	0.00006%	120	0.00001%			340	0.00003%	170	0.00002%	50	0.00001%	110	0.000011%	0.00090%	**NO**
B4-3	37,000	0.00370%			3,600	0.00036%					2,000	0.00020%	710	0.00007%	220	0.00002%	360	0.000036%	0.00439%	**NO**
B5-3	19,600	0.00196%	1,300	0.00013%	3,870	0.00039%					450	0.00005%	240	0.00002%	82	0.00001%	396	0.000040%	0.00259%	**NO**
B6-3	32,000	0.00320%			5,800	0.00058%					570	0.00006%	360	0.00004%					0.00387%	**NO**
B6-24	6,700	0.00067%			900	0.00009%					110	0.00001%	82	0.00001%					0.00078%	**NO**
B8-3	45,000	0.00450%			3,400	0.00034%					730	0.00007%	400	0.00004%	150	0.00002%			0.00497%	**NO**
Subarea 6																				
B1-3	5,900	0.00059%	420	0.00004%	110	0.00001%			32	0.00000%	210	0.00002%	71	0.00001%					0.00067%	**NO**
B4-3	3,100	0.00031%			240	0.00002%					88	0.00001%	27	0.00000%					0.00035%	**NO**

1- Analytical results of all soil samples collected, sample locations, cleanup levels and laboratory reports are provided in the *Remedial Investigation/Feasibility Study, Able Pest Control Site* dated December 6, 1999 prepared by Farallon.

2- Chlordane = Total Chlordane; Heptachlor = Heptachlor and Heptachlor Epoxide; Endrin = Endrin and Endrine Ketone.

3- µg/kg = micrograms per kilogram (ppb)

4- % = percent by volume

5- Equivallent concentrations calculated in accordance with WAC 173-303-100 (5)(b)(ii)

6- State-only toxicity set forth in WAC 173-303-100 (5)(b)(iii)

7- Blank cells = non-detect above laboratory PQL.

8- Sample collected by Ecology 2/15/00.

TABLE 2
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
ANALYTICAL RESULTS[1]
CATEGORY 1 SOILS
FARALLON PN: 602-002

Sample	Chlordane[2]		Dieldrin		Heptachlor[2]		Aldrin		Endrin[2]		DDT		DDD		Sulfan		BHC		Equivalent Concentrations	
	µg/kg[3]	%[4]	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	Total	State Toxicity[6] >0.01%
Subarea 1																				
B3-12	480	0.00005%	[7]		24	0.00000%													0.00005%	**NO**
Subarea 2																				
B2-24			180	0.00002%															0.00002%	**NO**
B6-3	214	0.00002%	160	0.00002%															0.00004%	**NO**
B8-3	2,180	0.00022%	230	0.00002%	120	0.00001%					260	0.00003%	150	0.00002%					0.00029%	**NO**
B9-3	233	0.00002%	240	0.00002%							43	0.00000%							0.00005%	**NO**
B13-3	690	0.00007%	1,200	0.00012%			20	0.00000%			65	0.00001%	27	0.00000%					0.00020%	**NO**
B16-3	580	0.00006%	88	0.00001%	19	0.00000%					29	0.00000%							0.00007%	**NO**
S-5	24	########	800	0.00008%															0.00008%	**NO**
S-8	64	########	400	0.00004%															0.00005%	**NO**
Subarea 3																				
B3-24			250	0.00003%															0.00003%	**NO**
B4-24			230	0.00002%															0.00002%	**NO**
B5-24			260	0.00003%															0.00003%	**NO**
B6-24			67	0.00001%															0.00001%	**NO**
Subarea 4																				
B1-3	720	0.00007%	72	0.00001%	40	0.00000%					48	0.00000%							0.00009%	**NO**
B5-24	168	0.00002%	100	0.00001%															0.00003%	**NO**
Subarea 5																				
B1-3	600	0.00006%	600	0.00006%	42	0.00000%			28	0.00000%	110	0.00001%	26	0.00000%					0.00014%	**NO**

1- Analytical results of all soil samples collected, sample locations, cleanup levels and laboratory reports are provided in the *Remedial Investigation/Feasibility Study, Able Pest Control Site* dated December 6, 1999 prepared by Farallon.

2- Chlordane = Total Chlordane; Heptachlor = Heptachlor and Heptachlor Epoxide; Endrin = Endrin and Endrine Ketone.

3- µg/kg = micrograms per kilogram (ppb)

4- % = percent by volume

5- Equivallent concentrations calculated in accordance with WAC 173-303-100 (5)(b)(ii)

6- State-only toxicity set forth in WAC 173-303-100 (5)(b)(iii)

7- Blank cells = non-detect above laboratory PQL.

TABLE 3
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
ANALYTICAL RESULTS[1]
CATEGORY 2 SOILS
FARALLON PN: 602-002

Sample	Chlordane[2]		Dieldrin		Heptachlor[2]		Aldrin		Endrin[2]		DDT		DDD		Sulfan		BHC		Equivalent Concentrations[5]	
	µg/kg[3]	%[4]	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	Total	State Only Toxicity[6] >0.01%
Subarea 1																				
B1-3	11,100	0.00111%	[7]		1,010	0.00010%					280	0.00003%	120	0.00001%	57	0.00001%	[8]		########	**NO**
B1-12	4,300	0.00043%			570	0.00006%					100	0.00001%	45	0.00000%					########	**NO**
B2-3d	12,300	0.00123%	440	0.00004%	2000	0.00020%					300	0.00003%	140	0.00001%	69	0.00001%			########	**NO**
Subarea 2																				
B1-3	510	0.00005%	8,200	0.00082%	21	0.00000%	120	0.00001%	278	#######			22	0.00000%					########	**NO**
B4-3	560	0.00006%	1,700	0.00017%	22	0.00000%			30	#######	960	0.00010%	250	0.00003%					########	**NO**
B4-3d	450	0.00005%	1,500	0.00015%	17	0.00000%			39	#######	1,600	0.00016%	390	0.00004%					########	**NO**
B5-3	1,930	0.00019%	2,800	0.00028%	67	0.00001%	15	0.00000%		#######	470	0.00005%	180	0.00002%					########	**NO**
B7-3	1,650	0.00017%	3,200	0.00032%	47	0.00000%	18	0.00000%			550	0.00006%	140	0.00001%					########	**NO**
B10-3	5,500	0.00055%	540	0.00005%	180	0.00002%	32	0.00000%			1,000	0.00010%	370	0.00004%					########	**NO**
B12-3	2,800	0.00028%	220	0.00002%	65	0.00001%					94	0.00001%	35	0.00000%					########	**NO**
B14-3	8,300	0.00083%	1,800	0.00018%	349	0.00003%							160	0.00002%	45	0.00000%			########	**NO**
S-7	4,100	########			770	0.00008%													########	**NO**
S-9	1,130	########	5,200	0.00052%	36	0.00000%	500	0.00005%	128	#######	360	0.00004%							########	**NO**
S-11	3,300	########	1,700	0.00017%	196	0.00002%													########	**NO**
S-12	2,900	########	170	0.00002%	155	0.00002%													########	**NO**
SEDTEC[8]	7,500	########	80	0.00001%	8	0.00000%							32	0.00000%					########	**NO**
Subarea 3																				
B1-3	152	0.00002%	1,900	0.00019%					50	#######									########	**NO**
B3-24D	85	0.00001%	2,200	0.00022%			140	0.00001%	33	#######									########	**NO**
B4-3	110	0.00001%	3,400	0.00034%					37	#######									########	**NO**
B6-3	1,140	0.00011%	4,300	0.00043%	62	0.00001%	38	0.00000%	93	#######	170	0.00002%	63	0.00001%					########	**NO**
Subarea 4																				
B4-3	3,500	0.00035%	4,800	0.00048%	120	0.00001%	53	0.00001%	204	#######	130	0.00001%	70	0.00001%					########	**NO**
B5-3	3,300	0.00033%	1,000	0.00010%	110	0.00001%	18	0.00000%			110	0.00001%							########	**NO**
B6-3	2,800	0.00028%	4,800	0.00048%	90	0.00001%	89	0.00001%	161	#######	140	0.00001%	64	0.00001%					########	**NO**
B7-3	3,200	0.00032%	2,400	0.00024%	110	0.00001%	59	0.00001%	46	#######	94	0.00001%	45	0.00000%					########	**NO**
B8-3	580	0.00006%	2,300	0.00023%	17	0.00000%	69	0.00001%	27	#######	62	0.00001%	25	0.00000%					########	**NO**
Subarea 5																				
B3-3	6,900	0.00069%	730	0.00007%	560	0.00006%	120	0.00001%			340	0.00003%	170	0.00002%	50	0.00001%	110	########	########	**NO**
B6-24	6,700	0.00067%			900	0.00009%					110	0.00001%	82	0.00001%					########	**NO**
Subarea 6																				
B1-3	5,900	0.00059%	420	0.00004%	110	0.00001%			32	#######	210	0.00002%	71	0.00001%					########	**NO**
B4-3	3,100	0.00031%			240	0.00002%					88	0.00001%	27	0.00000%					########	**NO**

1- Analytical results of all soil samples collected, sample locations, cleanup levels and laboratory reports are provided in the *Remedial Investigation/Feasibility Study, Able Pest Control Site* dated December 6, 1999
2- Chlordane = Total Chlordane; Heptachlor = Heptachlor and Heptachlor Epoxide; Endrin = Endrin and Endrine Ketone.
3- µg/kg = micrograms per kilogram (ppb).
4- % = percent by volume.
5- Equivallent concentrations calculated in accordance with WAC 173-303-100 (5)(b)(ii).
6- State-only toxicity set forth in WAC 173-303-100 (5)(b)(iii).
7- Blank cells = non-detect above laboratory PQL.
8- Sample collected by Ecology 2/15/00.

TABLE 4
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
ANALYTICAL RESULTS[1]
CATEGORY 3 SOILS
~~**FARALLON PN: 602-002**~~

Sample	Chlordane[2]		Dieldrin		Heptachlor[2]		Aldrin		Endrin[2]		DDT		DDD		Sulfan		BHC		Equivalent Concentrations[5]	
	µg/kg[3]	%[4]	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	Total	State-only Toxicity[6] >0.01%
Subarea 1																				
B2-3	16,300	0.00163%	740	0.00007%	400	0.00004%	[7]				380	0.00004%	190	0.00002%	89	0.00001%	[7]		0.00181%	**NO**
B3-3	15,000	0.00150%			1,240	0.00012%					390	0.00004%	190	0.00002%	79	0.00001%			0.00169%	**NO**
Subarea 2																				
B18-3	27,000	0.00270%			1,920	0.00019%					1,500	0.00015%	390	0.00004%			280	########	0.00311%	**NO**
B18-3D	15,600	0.00156%	710	0.00007%	1,010	0.00010%					980	0.00010%	340	0.00003%			16	########	0.00187%	**NO**
S-10	21,800	########	830	0.00008%	1,120	0.00011%													0.00238%	**NO**
Subarea 5																				
B5-3	19,600	0.00196%	1,300	0.00013%	3,870	0.00039%					450	0.00005%	240	0.00002%	82	0.00001%	396	########	0.00259%	**NO**

1- Analytical results of all soil samples collected, sample locations, cleanup levels and laboratory reports are provided in the *Remedial Investigation/Feasibility Study, Able Pest Control Site* dated December 6, 1999 prepared by Farallon.

2- Chlordane = Total Chlordane; Heptachlor = Heptachlor and Heptachlor Epoxide; Endrin = Endrin and Endrine Ketone.

3- µg/kg = micrograms per kilogram (ppb).

4- % = percent by volume.

5- Equivallent concentrations calculated in accordance with WAC 173-303-100 (5)(b)(ii).

6- State-only Toxicity set forth in WAC 173-303-100 (5)(b)(iii).

7- Blank cells = non-detect above laboratory PQL.

TABLE 5
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
ANALYTICAL RESULTS[1]
CATEGORY 4 SOILS
FARALLON PN: 602-002

Sample	Chlordane[2]		Dieldrin		Heptachlor[2]		Aldrin		Endrin[2]		DDT		DDD		Sulfan		BHC		Equivalent Concentrations[5]	
	µg/kg[3]	%[4]	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	µg/kg	%	Total	State Toxicity[6] >0.01%
Subarea 2																				
B2-3	6,300	0.00063%	13,000	0.00130%	171	0.00002%	470	0.00005%	570	#######	780	#######	310	0.00003%	[7]				0.00216%	**NO**
B3-3	2,400	0.00024%	16,000	0.00160%	540	0.00005%													0.00189%	**NO**
B11-3	164,000	0.01640%			1,390	0.00014%					1,400	#######	750	0.00008%	200	0.00002%			0.01677%	**YES**
B15-3	######	0.11200%			190,000	0.01900%					26,000	#######	13,000	0.00130%	4,900	0.00049%			0.13539%	**YES**
B17-3	39,000	0.00390%	2,200	0.00022%	120	0.00001%			1,300	#######			920	0.00009%	280	0.00003%			0.00438%	**NO**
S-13	175,000	########			21,130	0.00211%											1,415	########	0.01975%	**YES**
Subarea 3																				
B2-3	470	0.00005%	64,000	0.00640%	21	0.00000%	2,800	0.00028%	1,440	#######	130	#######	86	0.00001%	120	0.00001%			0.00691%	**NO**
B3-3	860	0.00009%	28,000	0.00280%	35	0.00000%	3,400	0.00034%	870	#######	200	#######	110	0.00001%					0.00335%	**NO**
B5-3	650	0.00007%	64,000	0.00640%	20	0.00000%	1,500	0.00015%	1,169	#######	140	#######	120	0.00001%					0.00676%	**NO**
B5-3D	630		65,000	0.00650%	16	0.00000%	870	0.00009%	930	#######	110	#######	110	0.00001%					0.00670%	**NO**
B7-3	550	0.00006%	33,000	0.00330%	26	0.00000%	390	0.00004%	540	#######	170	#######	57	0.00001%					0.00347%	**NO**
Subarea 5																				
B4-3	37,000	0.00370%			3,600	0.00036%					2,000	#######	710	0.00007%	220	0.00002%	360	########	0.00439%	**NO**
B6-3	32,000	0.00320%			5,800	0.00058%					570	#######	360	0.00004%					0.00387%	**NO**
B8-3	45,000	0.00450%			3,400	0.00034%					730	#######	400	0.00004%	150	0.00002%			0.00497%	**NO**

1- Analytical results of all soil samples collected, sample locations, cleanup levels and laboratory reports are provided in the *Remedial Investigation/Feasibility Study, Able Pest Control Site* dated December 6, 1999 prepared by Farallon.

2- Chlordane = Total Chlordane; Heptachlor = Heptachlor and Heptachlor Epoxide; Endrin = Endrin and Endrine Ketone.

3- µg/kg = micrograms per kilogram (ppb).

4- % = percent by volume.

5- Equivallent concentrations calculated in accordance with WAC 173-303-100 (5)(b)(ii).

6- State-only Toxicity set forth in WAC 173-303-100 (5)(b)(iii).

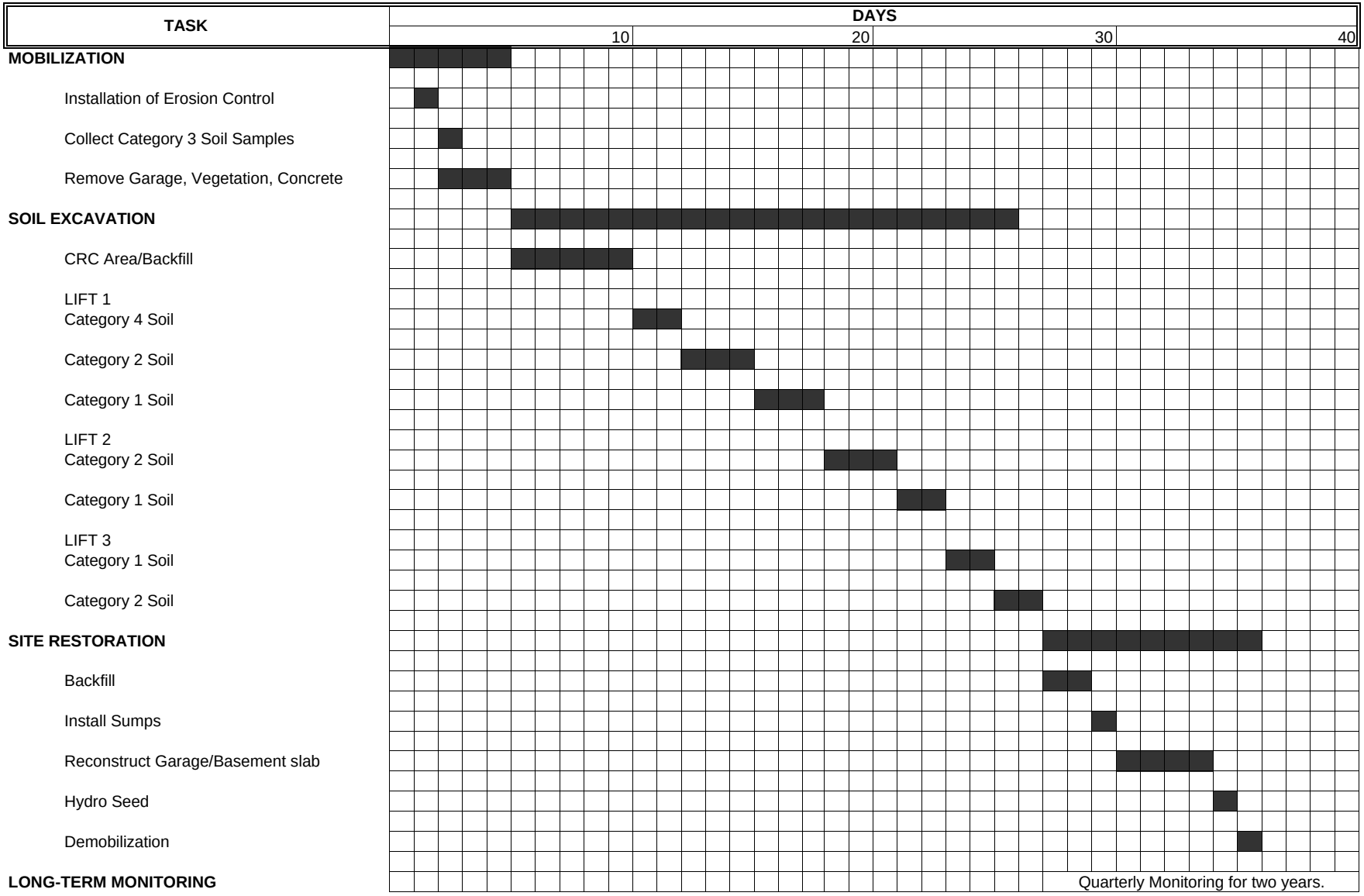
7- Blank cells = non-detect above laboratory PQL.

TABLE 6
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
CLEANUP LEVELS
FARALLON PN: 602-002

Soil Cleanup Levels:	
Compound	**Method B Residential Soil Cleanup Levels**
Aldrin	58.8 ug/kg
Chlordane	2, 860 ug/kg
BHC (Alpha)	159 ug/kg
BHC-Gamma (Lindane)	769 ug/kg
DDT	2, 940 ug/kg
DDD	4,170 ug/kg
Dieldrin	62.5 ug/kg
Endrin/Endrin Ketone	24, 000 ug/kg
Heptachlor	222 ug/kg
Heptachlor epoxide	110 ug/kg

Perched Groundwater In The Vadose Zone Cleanup Levels:	
Compound	**Method B Groundwater Cleanup Levels**
Aldrin	0.00515 micrograms per liter (ug/l)
Chlordane	0.0673 ug/l
BHC (Alpha)	0.0139 ug/l
BHC-Gamma (Lindane)	0.0673 ug/l
DDT	0.257 ug/l
DDD	0.365 ug/l
Dieldrin	0.0055 ug/l
Endrin	NA
Endrin Ketone	NA
Heptachlor	0.0194 ug/l
Heptachlor epoxide	0.00962 ug/l

TABLE 7
CLEANUP ACTION PLAN
CLEANUP ACTION SCHEDULE
ABLE PEST CONTROL SITE
KENMORE, WASHINGTON
FARALLON PN: 602-002



April 6, 2000

Mr. Byung Maeng
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue Southeast
Bellevue, Washington 98008

RE: ENVIRONMENTAL MEDIA MANAGEMENT PLAN (REVISED FINAL)
ABLE PEST CONTROL SITE
KENMORE, WASHINGTON
EMERGENCY AGREED ORDER No. DE 98TC-N170
FARALLON PN: 602-002

Dear Mr. Maeng:

Farallon Consulting LLC (Farallon) has prepared this Environmental Media Management Plan (EMMP) in accordance with the Washington State Department of Ecology (Ecology) Dangerous Waste Regulations Chapter173-303 WAC on behalf of the Potentially Liable Persons (PLPs) for the Able Pest Control Site located in Kenmore, Washington. The EMMP has been prepared to define procedures for selection of the final disposal of soil waste generated from cleanup of the 62nd Avenue Site located at 18115 62nd Avenue Northeast in Kenmore, Washington (here in referred to as the site, Figure 1). Specifically, this EMMP will be attached to the Draft Cleanup Action Plan (CAP) and is Ecology's final determination on procedures for soil designation and disposal connected with remedial actions at the site.

BACKGROUND

Farallon has completed the *Remedial Investigation/Feasibility Study, Able Pest Control Site* dated December 6, 1999 (RI/FS Report) which as been reviewed by Ecology. Ecology has confirmed that the RI/FS and subsequent sampling adequately characterizes the site soils and provides sufficient information for selection of a cleanup alternative to be addressed in the CAP and approved with the final Agreed Order. The RI/FS Report identified the chemicals of concern (herein referred to as the target pesticides) as:

Aldrin
Chlordane
Delta and gamma BHC

DDT

DDD
Dieldrin
Endrin
Endrin Ketone
Heptachlor
Heptachlor epoxide

The media of concern identified in the RI/FS Report are soil and vadose zone water. The Selected Final Cleanup Action presented in the RI/FS Report is excavation and off-site disposal of soil with concentrations of one or more of the target pesticides above the Model Toxics Control Act (MTCA) Chapter 173-340 WAC Method B residential soil cleanup levels using the carcinogenic formula values listed in CLARC II (Ecology, February 1996) (MTCA Method B cleanup levels). The final cleanup action will be conducted in accordance with an Agreed Order with Ecology and the PLPs which is in preparation at this time. A Draft CAP is in preparation by Farallon for the selected cleanup action. This EMMP will be incorporated with the final CAP and final Agreed Order.

SOURCE OF CONTAMINATION

The site was used by the Able Pest Control Company for distribution of pesticides for commercial use. Anecdotal evidence indicates that the concentrations of the target pesticides in the soil at the site may have been the result of discarded or spilled chemicals.

ANALYTICAL DATA

The analytical results of soil samples with concentrations of one or more of the target pesticides above the MTCA Method B cleanup levels collected during the RI/FS Report and the Interim Action Monitoring, prior to and after completion of the RI/FS Report by Farallon, are summarized on the attached Table 1. Table 1 also includes the equivalent concentrations for state toxicity criteria for pesticide concentration in each soil sample. A summary of the analytical results of all soil samples collected at the site, laboratory analytical reports, and sample locations are included in the RI/FS Report.

WASTE DESIGNATION

The RI/FS Report identified concentrations of one or more of the target pesticides above the MTCA Method B cleanup levels in soil samples collected from the surface to a maximum of three feet below ground surface (bgs). The following target pesticides are listed wastes under the Discarded Chemical Products List, as defined in WAC 173-303-9903:

Chemical	**Dangerous Waste No.**
Aldrin	P004

Chlordane	U036
Dieldrin	P037
Heptachlor	P059

Based on Discarded Chemical Products, WAC 173-303-081, soil waste generated from the cleanup action would be designated a Dangerous Waste (DW). However, Ecology has confirmed that a Contained-In Determination is applicable to a portion of the soil to be excavated from the site. The Contained-In Determination is based on the following:

- Concentrations of one or more of the target pesticides in the soil do not exceed the Dangerous Waste Characteristics levels (WAC 173-303-090); and,
- Concentrations of one or more of the target pesticides in the soil do not exceed the Dangerous Waste Criteria levels (WAC 173-303-100).

Based on these criteria, Ecology, in consultation with the United States Environmental Protection Agency (EPA), has agreed to the following categories of soil which will determine the selection of a disposal facility (Ecology letter dated March 7, 2000). The determination of the soil category for the soil waste is dependent on the analytical result of in-situ soil sample.

Category 1 Soils:

- Concentrations of one or more of the target pesticides are above the cleanup levels based on the Method B residential soil cleanup levels using the carcinogenic formula values listed in CLARC II (Ecology, February 1996);
- Concentrations of dieldrin are equal to or less than 1,300 microgram/kilogram (ug/kg);
- Concentrations of chlordane are equal to or less than 2,600 ug/kg;
- Equivalent concentration for state-only toxicity is equal to or less than 0.01 percent; and,
- Total halogenated organic compounds (HOC) for state-only persistent waste is less than 0.01 percent.

The analytical results of soil samples collected for the Interim Action and RI/FS that meet the criteria of Category 1 Soils are summarized on Table 2.

Category 2 Soils:

- Concentrations of one or more of the target pesticides are above the cleanup levels based on the Method B residential soil cleanup levels using the carcinogenic formula values listed in CLARC II (Ecology, February 1996);
- Concentrations of dieldrin are greater than 1,300 ug/kg but less than 10,000 ug/kg;
- Concentrations of chlordane are greater than 2,600 ug/kg but less than 15,000 ug/kg;
- Equivalent concentration for state-only toxicity is equal to or less than 0.01 percent; and,
- Total HOC for state-only persistent waste is less than 0.01 percent.

The analytical results of soil samples collected for the Interim Action and RI/FS that meet the criteria of Category 2 Soils are summarized on Table 3.

Category 3 Soils:

- Concentrations of one or more of the target pesticides are above the cleanup levels based on the Method B residential soil cleanup levels using the carcinogenic formula values listed in CLARC II (Ecology, February 1996);
- Concentrations of dieldrin are greater than 1,300 ug/kg but less than 10,000 ug/kg;
- Concentrations of chlordane are less than the Toxicity Characteristic Leaching Potential (TCLP) criteria of 30 micrograms/liter (ug/l);
- Equivalent concentration for state-only toxicity is equal to or less than 0.01 percent; and,
- Total HOC for state-only persistent waste is less than 0.01 percent.

The analytical results of soil samples collected for the Interim Action and RI/FS that meet the criteria of Category 3 Soils are summarized on Table 4.

Category 4 Soils:

- Concentrations of dieldrin are greater than 10,000 ug/kg; or,
- Concentrations of chlordane are greater than 15,000 ug/kg and are above the TCLP level of 30 ug/l; or,
- Equivalent concentration for state-only toxicity is greater than 0.01 percent; and,
- Total HOC for state-only persistent waste is equal to or greater than 0.01 percent.

The analytical results of soil samples collected for the Interim Action and RI/FS that meet the criteria of Category 4 Soils are summarized on Table 5.

CONTAINED-IN POLICY

The EPA Contained-In Policy provides that media such as soil is not required to be managed as a hazardous waste if the agency finds that contaminant concentrations do not represent an unacceptable risk to human health and the environment. EPA Region 10 bases the Contained-In Determination on the level of potential risk to human health and the environment associated with contaminant concentrations in the media, as well as potential risks to human health associated with the planned management of the waste in some cases.

Ecology has recognized the Contained-In Policy as discussed in the *Memorandum, Re: Contained-In Policy* dated February 19, 1993 prepared by Mr. Tom Eaton of Ecology (1993 Memorandum). As stated in the 1993 Memorandum, the purpose of the Contained-In Policy is to avoid needless and costly disposal methods where the contaminated soil will be managed in a way that does not represent an unacceptable risk to human health and the environment.

Ecology has determined (Ecology letter March 7, 2000) that the Category 1 Soils do not designate under federal or state characteristics and criteria (WAC 173-303-090 and –100), and are below the LDR treatment standards for contaminated soils. Ecology has determined that the Category 1 Soils no longer contain listed hazardous constituents if the soils are disposed of at a solid waste landfill that meets the requirements under Chapter 173-351 WAC (within Washington State) or RCRA Subtitle D (outside Washington State). Ecology has consulted with EPA regarding this determination.

Ecology has determined (Ecology letter March 7, 2000) that the Category 2 Soils do not designate under federal or state characteristics and criteria (WAC 173-303-090 and –100) but exceed the LDR treatment standards for contaminated soils. Ecology has determined that the concentrations of the target pesticides in the soil are less than the MTCA Method C cleanup levels for industrial soil, have a hazard index that does not exceed 1, and cancer risk calculated with the multiple hazardous substances that does not exceed 1/100,000. Ecology has determined that the Category 2 Soils no longer contain listed hazardous constituents if the soils are disposed of at a RCRA Subtitle C hazardous waste landfill that is constructed with a leachate detection and collection system in the double liner system. Ecology has consulted with EPA regarding all of these determinations.

Ecology has determined that Category 3 Soils meet the same criteria as Category 2 Soils if the TCLP concentrations for chlordane are below 30 ug/l. Category 3 Soils with TCLP concentrations of chlordane below 30 ug/l no longer contain listed hazardous constituents if the soils are disposed of at a RCRA Subtitle C hazardous waste landfill that is constructed with a leachate detection and collection system in the double liner system. Ecology has consulted with EPA regarding all of these determinations. Category 3 Soils with concentrations of TCLP above the TCLP limit will be designated as Category 4 Soils.

CONTINGENCY MANAGEMENT PLAN

The following sections provide a detailed approach to the contingency management of the excavated soils under the Contained-In Policy. The Category 1, 2, and 3 Soils will be managed as a dangerous waste during transportation and disposal. This will eliminate the potential exposure pathways and associated risks to human health and the environment. However, the management plan assumes that the Category 1, 2, and 3 Soils will not be formally designated as a dangerous waste using the Contained-In Policy and will be disposed of at an appropriate landfill.

Category 4 Soils will be designated a Dangerous Waste and will be handled, transported and disposed of in accordance with the restrictions imposed by WAC 173-303.

MANAGEMENT OF WASTE SOIL

This section summarizes the management of the soil to be excavated from the site. Detailed procedures for erosion control, health and safety monitoring and personnel protection equipment, decontamination, sampling and analysis, and detailed construction procedures will be provided in the CAP.

Estimated Volumes of Waste Soil

The results of the RI/FS and site topographic survey have been used to estimate volumes of soil to be excavated from the site. The estimated volumes may vary depending on site conditions encountered during excavation; therefore, volume estimates listed below are approximate:

Category 1 Soils	400 tons
Category 2 Soils	725 tons
Category 3 Soils	25 tons
Category 4 Soils	250 tons
Approximate Total	1,400 tons

On-site Soil Handling and Storage

The excavated soil will be handled and stored in accordance with the specific details to be provided in the CAP. These will include:

- Category 1 Soils will be loaded directly into dump trucks for off-site disposal. The soil loads will be securely covered with tarps during transportation to prevent potential wind dispersion;
- Category 2 Soils will be loaded directly into diapered dump trucks that are lined, and securely covered to prevent potential wind dispersion, and transported off-site by a hauler licensed to transport dangerous/hazardous waste;
- Category 3 Soils will be loaded directly into diapered dump trucks that are lined, and securely covered to prevent potential wind dispersion, and transported off-site by a hauler licensed to transport dangerous/hazardous waste if the analytical results of in-situ soil samples collected prior to excavation are below the TCLP levels. If the analytical results are above the TCLP levels, the Category 3 Soils will be transported in locked drop boxes; and;
- Category 4 Soils will be loaded directly into locked drop boxes and transported off-site by a hauler licensed to transport dangerous/hazardous waste.

Transportation

The Category 1 Soils in dump truck loads will be securely covered during transportation to prevent wind dispersion. The Category 2 Soils and Category 3 Soils with analytical results of in-situ samples below the TCLP levels will be loaded into dump trucks that are lined with a disposal impermeable liner. The liner will line the dump truck bed and fold over the top of the load and will preclude water entering or leaking from each load and will avoid wind dispersion. The liner will be disposed of

with each load and a new liner will be installed in each truck. The Uniform Hazardous Waste Manifest will be used for the transport, with the description of the waste as being "contaminated soils, not regulated by Washington Dangerous Waste Regulations". Copies of signed Manifests will be provided to Ecology within 15 calendar days of disposal.

The Category 4 Soils and Category 3 Soils that fail the TCLP level based on analytical results of in-situ samples will be transported in locked drop box as a dangerous waste in accordance with the requirement of WAC 173-303. Category 4 Soils will be manifested with the RCRA Identification Number, WAH 000 005 421 that was issued by Ecology for the site on June 16, 1998. The RCRA Identification Number will be used on all annual reports, Manifests, and documents that are required by the incineration facility.

Disposal

The following disposal facilities will be used for disposal of the waste soil excavated from the site:

- Category 1 Soils will be disposed of at a landfill that meets the requirements of Chapter 173-351 WAC (within Washington State)and/or a Subtitle D landfill (outside Washington State) as non-dangerous waste;
- Category 2 Soils will be disposed of at a RCRA Subtitle C landfill as a contained-in waste soil. The landfill will be instructed that these soils are not to be used for daily landfill cover;
- Category 3 Soils with the analytical results of in-situ soil samples collected prior to excavation that are below the TCLP levels will be disposed of at a RCRA Subtitle C landfill as a contained-in waste soil. The landfill will be instructed that these soils are not to be used for daily landfill cover. Category 3 Soils with the analytical results of in-situ soil samples collected prior to excavation that are above the TCLP levels will be disposed by incineration; and,
- Category 4 Soils will be disposed of by incineration.

The RCRA Subtitle D landfill selected for disposal of the Category 1 Soils is the Regional Disposal Company Roosevelt Regional Landfill, Permit # --CU 92-14. A copy of the Permits and Certifications for the Roosevelt Regional Landfill dated December 1999 is retained on file at the Farallon office. Farallon is currently evaluating costs associated with alternative Subtitle D landfills. Ecology will be notified if an alternative Subtitle D landfill is selected for disposal of the Category 1 Soils.

The RCRA Subtitle C landfill selected for disposal of the Category 2 and 3 Soils is the Waste Management Industrial Services Subtitle C Landfill located in Arlington, Oregon. A copy of the Arlington Facility Guidebook for this facility is retained on file at the Farallon office. Farallon is currently evaluating costs associated with alternative Subtitle D landfills. Ecology will be notified if an alternative Subtitle C landfill is selected for disposal of the Category 2 and 3 Soils.

The Category 4 Soils will be transported to Onyx Environmental Services Incineration Facility in Texas. A copy of the permitting information for this facility is retained on file at the Farallon office. Farallon is currently evaluating costs associated with alternative incineration facilities. Ecology will

be notified if an alternative incineration facility is selected for disposal of the Category 4 Soils.

CLOSING

Specific construction procedures and staging, sampling and analysis, and documentation requirements will be defined in the CAP to be included with the Agreed Order. Large vegetation and construction debris will be disposed of at an appropriate facility as non-dangerous waste. Farallon trust that this provides sufficient information for your needs. Should you have any questions, feel free to contact the undersigned at (425) 427-0061 at any time. Please verify in writing, at your earliest convenience, that this EMMP is approved by Ecology for use in the final CAP.

Sincerely,

Farallon Consulting LLC

Peter Jewett
Principal Engineering Geologist

Attachments

cc: Ms. Louise Bardy – Washington State Department of Ecology
Mr. William Joyce - Ogden Murphy Wallace, PLLC
Ms. Sylvia Luppert - Reaugh, Fischnaller, Oettinger, Merker & Luppert
Mr. John Wiegenstein – Heller Wiegenstein, PLLC

PJ: jrs/gr

APPENDIX B
OF
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
KENMORE, WASHINGTON
FARALLON PN: 602-002

GRADING PERMIT AND SEPA CHECKLIST

Submitted By
Farallon Consulting LLC
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

For:
Ms. Sharon Schlittenhard
Ms. Sharon Keller
Personal Representative
Estate of Sheridan Martin

May 23, 2000

Prepared by

Riley Conkin
Associate Geologist

Reviewed by

Peter Jewett
Principal Engineering Geologist

Clyde Moore, P.E.
Landmarc Technologies, Inc.

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Figure 1 Erosion and Sediment Control Plan

ATTACHMENTS

King County Department of Natural Resources Industrial Waste Program Discharge Authorization DA Letter
King County Department of Natural Resources Industrial Waste Program – Request for Discharge Authorization Extension Letter

1.0 INTRODUCTION

This Erosion and Sediment Control Plan has been prepared in accordance with the city of Kenmore requirements for a grading permit application for the Able Pest Control Site located at 18115 62nd Avenue NE in Kenmore, Washington. The Erosion and Sediment Control Plan has been prepared to guide the site cleanup defined in the Cleanup Action Plan (CAP). The cleanup is to be conducted under an Agreed Order with the Washington State Department of Ecology. This Erosion and Sediment Control Plan is included as Appendix B of the CAP and is part of the Agreed Order.

2.0 SITE SOILS

The site soils are predominantly comprised of glacial till. The site is nearly flat and the soils are stable.

3.0 CRITICAL AREAS

There are no current critical erosion areas on the site as defined by Federal, State, and local standards. The exposed soil currently covering the site surface is subject to erosion once excavation has begun.

4.0 EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs)

Erosion and sedimentation will be controlled during the project by the following:

4.1 COVER AND CONTAIN SOIL STOCKPILES

Excavation will occur during relatively dry weather. The soil excavated for off-site disposal will be loaded directly into dump trucks or locked drop boxes. Exposed excavation areas will be temporarily covered with visqueen to prevent erosion and runoff if storm events are producing enough rain to cause runoff.

4.2 SURFACE WATER CONTROL

A temporary lined catch basin will be installed on the north side of the site in the contamination reduction corridor (CRC, Figure 1) for the duration of the project. Stormwater and equipment washwater will be collected in the catch basin to prevent uncontrolled discharge off-site. Water will periodically be pumped to the on-site above ground storage tank and discharged to the sanitary sewer under a temporary King County Industrial Waste Discharge Authorization (DA). The storage tank will be sampled periodically prior to discharge to the sanitary sewer for

Organochlorine Pesticides by USEPA Method 8081. The analytical results will be reported to King County Industrial Waste as required under the temporary DA.

4.3 PLACEMENT OF SILT FENCE ALONG SITE BOUNDARY

A silt fence will be placed along the entire perimeter of the site boundary except the driveway to restrict the off-site migration of sediments. The construction of a graveled access roadway in the CRC will restrict off-site migration of sediment from the site entrance. Installation and use of a truck inspection and wash area will further reduce the potential for off-site sedimentation.

4.4 STORMWATER HANDLING PROCEDURES

Stormwater containment and disposal procedures will be performed to prevent stormwater runoff from the site. These procedures include:

- Construction during relatively dry weather;
- staged excavations so that surface runoff, if any, is directed or pumped to the surface water containment basin utilizing a sump pump as necessary;
- full closure of water conveyance systems when not in use;
- washdown of equipment leaving the site at constructed decontamination area adjacent to the lined catch basin; and,
- controlled discharge from the containment area to the storage tank for discharge to the sanitary sewer.

Any stormwater in individual excavations will be pumped out daily to the storage tank. The roof drain lines from the current residence will be temporarily re-routed off-site to the stormwater drainage ditch downstream of site to minimize runoff across the site. In addition, the section of stormwater drainage culvert beneath the northeast corner entrance to the site, which includes an upstream inlet north of the site and a downstream outlet approximately 70 feet south, and the downstream inlet to the culvert at the southeast corner of the site will be protected with sandbags and hay bails to prevent potential runoff of sediment from the site.

4.5 CONSTRUCTION ENTRANCE/CRC STABILIZATION

A stabilized construction entrance and CRC area will be constructed on the north side of the site adjacent to the lined catch basin. The construction entrance and CRC will consist of a rock pad at least 6 inches thick of 2½ inch minus crushed rock. The pad will be at least 30 feet wide and 150 feet long.

The truck wheel wash/equipment decontamination area will have 5/8-inch rock chips placed on the rock pad. An eight-ounce geotextile fabric and 40 mil high density polyethylene liner will go on the rock chips. The polyethylene liner will be covered with another eight-ounce geotextile fabric liner and three to four inches of 5/8-inch chips, and sloped toward the lined catch basin to contain all wastewater.

4.6 DUST CONTROL

Air quality monitoring for fugitive dust will be performed using a Miniram air monitoring instrument as described in the site-specific Health and Safety Plan (HASP). If air monitoring indicates fugitive dust above allowable levels, a mist spray will be applied to exposed excavation areas. This will be performed periodically as necessary during grading.

5.0 PERMANENT STABILIZATION

The site surface will be backfilled as necessary with a non-select material compacted to a non-yielding state to within six-inches of the final grade. A six-inch lift of clean topsoil will be placed on the exterior areas of the site. Hydroseeding will be established on the site immediately after completion of the project. Regular maintenance will be required initially to ensure hydroseed does not dry-up and die because of lack of moisture.

6.0 STORMWATER MANAGEMENT

The project activities will not create new or additional impermeable surfaces. The peak rates of stormwater runoff from the site will not be increased as a result of the final Cleanup Action. The erosion and sediment control BMPs previously described will adequately restrict excessive off-site stormwater migration. The stormwater contained in the lined catch basin will be sampled for chemical characteristics prior to discharge to the sanitary sewer. Should the analytical results indicate that the concentrations are above acceptable levels for sewer discharge, the water will be trucked off-site to a suitable disposal site.

7.0 MAINTENANCE

The erosion and sediment control structures will be regularly inspected at the beginning and end of each working day and maintained during construction to insure functional integrity. Proper water handling procedures will be discussed with site workers. If a weakness or failure of a control structure is identified, repairs will occur immediately.

The excavations will be planned and constructed such that runoff will be contained and directed or pumped to the lined catch basin.

Once the analytical results of the soils indicate that the MTCA cleanup levels have been attained, the site will be closed. The lined catch basin will be removed, backfilled, and compacted with clean soil. The silt fence will remain in-place until the hydroseeding is well established.

8.0 NON-ESC BMPs

This project is a Final Cleanup Action conducted under an Agreed Order in accordance with Washington State Department of Ecology Model Toxics Control Act Chapter 173-340 WAC. All work will be done in accordance with state and federal regulations including:

- Site specific Health and Safety Plan in accordance with 40 CFR 1910.120;
- 40-hour hazardous materials training for all personnel working on site;
- Strict equipment decontamination wash procedures for all equipment leaving the site including trucks, tools, and personal clothing;
- Detention of washwater and stormwater; and,
- Sampling and analysis of retained water prior to disposal.

FIGURES

ATTACHMENTS

WAC 197-11-970 Determination of nonsignificance (DNS).

DETERMINATION OF NONSIGNIFICANCE

Description of proposal

A Cleanup Action plan had been proposed under an Agreed Order with the State of Washington Department of Ecology for the excavation and removal of 1,400 cubic yards of pesticide-contaminated soil. The soil will be disposed of in accordance with the dangerous waste regulations and/or the Contained In determination requirements. Compliance sampling and analysis will be done to confirm that soils meet the cleanup levels at the defined points of compliance. The site will be restored to the existing conditions prior to the excavation and removal. Short and long term monitoring of perched groundwater in the vadose zone will be done on a quarterly basis for at least one year to confirm that cleanup levels have been met at the defined points of compliance. Soils will be monitored on the adjacent down-gradient property as well during this period.

Proponent Farallon Consulting

Location of Proposal, including street address, if any 18115 62nd Ave, NE, Kenmore, WA 98155

Lead Agency Washington State Department of Ecology

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030 (2)©. This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

[] There is no comment period for this DNS.

[] This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

[X] This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by June 27, 2000.

Responsible Official Louise Bardy

Position/title Project Manager_____ Phone. (425) 649-7209 _____

Address 3190 160th Ave SE, Bellevue, WA 98008

Date June 25, 2000_____Signature_____

Clearing and Grading
PERMIT APPLICATION
WORKSHEET

General Instructions

Part I of this form must be completed prior to scheduling a preapplication meeting with Lane Use Services Division (LUSD). Call LUSD Site Development Services Section at (206) 296-6640 or complete and return the attached meeting request form to arrange your preapplication meeting.
Part II of this form must be completed by DDES staff prior to application.
Part III of this form will be completed by DDES staff prior to application.

PART I:

Lot: 3 Block: 8 Tract: Waverly Park
Project Name: Able Pest Control Site Location: Kenmore, WA
Street Address: 18115 62nd Avenue NE
Description of Project Final Cleanup Action under Ecology Agreed Order

Parcel # Zoning: Residential
(If multiple parcels, attach separate page)

Applicant	Farallon Consulting LLC	Owner	S. Schlittenhard / J. Wiegenstein
Address:	320 3rd Avenue NE, Suite 200	Address:	c/o Heller Wiegenstein
	Issaquah, WA 98027-3333		PO Box 2760
	Attn: Peter Jewett		Poulsbo, WA 98370
Phone No.	425-427-0061	Phone No.	360-394-3500

Note: If the applicant is other than the owner, authorization from the legal owner must be provided
Agent:
Address:
Phone No.:

Proposed Scope of Work:

Total quantity of excavation:	1400	cubic yards
Total quantity of fill:	1000	cubic yards
Total quantity of imported fill:	1000	cubic yards
Total quantity of exported excavation:	1400	cubic yards
Total size of site	0.35	acres
Total area to be cleared or graded	0.30	acres
Percentage of work to be completed during the first year	100	%

PART II:

This portion of the worksheet will be completed by the Grading Unit at the time of the preapplication meeting.

Permit Type: _____ Inspection Area: _____

Related Proj. No./Name: _____

FEES:

Plan Review Fees
Total Volume: _____ c.y. Credits (list): _____
Cleared or Graded Area _____ acres Penalties (list): _____

Operating Fees
Volume: _____ c.y. Charge Penalties to: _____
Unreclaimed Area: _____ acres (SIERRA ACTIVITY #)

Other (list) SEPA Yes: ___ No: ___ Cap $_____

Clearing and Grading
PERMIT APPLICATION
WORKSHEET

Drainage Yes:___ No:____
Sens Area Yes:___ No:____
Other: _____

PART III
Additional Information:

List any pending or issued permits or approvals that may affect processing of this application.
Agreed Order with Washington State Department of Ecology
List any known or suspected sensitive areas identified on or adjacent to this property.
None known.
Has a previous environmental determination been completed for this proposal? Yes ☐ No ☒
Is a storm drainage plan being submitted with this proposal? Yes ☒ No ☐

Submittal Requirements:

Quantity	Description
1	Application Worksheet
1	* Grading Plan
1	Environmental Checklist
1	Environmental Determination
1	Quantity Calculations
_____	Drainage Plan/Calcs
1	Soils/Geotech Report
_____	Wetland/Stream Report
_____	Certification of Sensative Areas Compliance
_____	Certification of Applicant Status and/or Transfer or Applicant Status
1	Current Assessor's Maps and List of tax parcels for public notice when required
1	Legal Description (may be included on site plan)
_____	Variance/Reasonable Use Exception
_____	Estimated Application Fees
_____	Payment Schedule
_____	Other:
_____	Other:

Minimum payment due at Application Submittal
$_____
Subsequent payments subject to approved payment schedule (review of application will not commence until all review fees are paid)

* Grading plan shall include at a minimum the following information unless specifically waived: civinity, topography, dimensions, clearing limits, open space, NGPE's, conservation easements, drainage systems, buildings, structures, landscape and restoration plans, sensitive areas and associated buffers and other information as may be required by the director.

For purposes of this application, the following items are considered waived unless specifically requested above: Fire District receipt, current Certificate of Water Availability, proof that the lot(s) are recognized as separate lots, Certificate of Sewer Availability or site percolation date with preliminary Seattle King County Health Department Approval, Certificate of Future Connection for Sewer or Water if in Urban growth area, and Certificate of Transportation Concurrency.

This completed form must be signed by a representative of the Grading Unit and must accompany the completed permit application or the application will not be accepted. This approval includes a waiver for purposes of application, those items more specifically noted above.

Approved by: _____ Date:_____
Application Accepted by:_____ Date:_____

The applicant understands that signing and submitting this application authorizes DDES staff to inspect the site at any reasonable time for the purpose of permit review.

Signed:_____ Date:_____

APPENDIX C
OF
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
KENMORE, WASHINGTON
FARALLON PN: 602-002

SAMPLING AND ANALYSIS/COMPLIANCE MONITORING PLAN

Submitted By
Farallon Consulting, L.L.C.
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

For:
Ms. Sharon Schlittenhard

Ms. Sharon Keller
Personal Representative
Estate of Sheridan Martin

May 23, 2000

Prepared by

Riley Conkin
Associate Geologist

Reviewed by

Peter Jewett
Principal

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1.0 INTRODUCTION

This final draft Sampling Analysis/Compliance Monitoring Plan (herein referred to as the Plan) combines the Sampling and Analysis Plan (SAP), prepared in accordance with WAC 173-340-820, and the Compliance Monitoring Plan (CMP), prepared in accordance with WAC 173-340-410. The Plan is incorporated within the draft Cleanup Action Plan (CAP) for the cleanup of the 62nd Avenue site located in Kenmore, Washington (the site). The objective of the Plan is to ensure that sample collection, handling, and analysis during implementation of the CAP will result in data that meet the data quality objectives for cleanup of the site.

The purpose of the Plan is to provide specific methods and procedures for Performance Monitoring, Confirmational Monitoring, and waste characterization. Protection monitoring is addressed in the Health and Safety Plan (HASP) included with the CAP. Performance Monitoring will provide analytical results:

- During the excavation to guide the areal and vertical extent of soil removal;
- For *in-situ* soil samples for waste characterization; and,
- Confirmation that off-site migration of soil and/or vadose zone groundwater is not occurring during the excavation.

Confirmational Monitoring will confirm that the final cleanup levels are met for soil and vadose zone groundwater at the defined points of compliance.

2.0 PERFORMANCE MONITORING

Performance Monitoring will consist of collecting *in-situ* soil samples from the base and sidewalls of each excavation area and wastewater samples from captured vadose zone groundwater, storm water, and decontamination washwater for laboratory analysis. The procedures for collection, handling, and analysis are discussed in this section.

2.1 SOIL PERFORMANCE MONITORING

2.1.1 Soil Sample Collection

Performance soil samples will be collected from the proposed excavation areas to guide the excavation and to serve as confirmation samples where cleanup levels are attained. As defined in the CAP, the site has been divided into three general excavation subareas: the Contamination Reduction Excavation Subarea (CRC), located on the north portion of the site; the Exterior Excavation Subarea (EXT), which includes all areas outside the residence with the exception of the CRC Subarea; and, the Interior Excavation Subarea (INT), which includes the small area beneath the southwest corner of the existing residence. The CAP segregated the depth of the excavation within each of the subareas by lift: Lift 1 extends from the surface to 1-foot below ground surface (bgs); Lift 2 extends from 1 to 2 feet bgs; and Lift 3 extends from 2 to 3 feet bgs. The areas to be excavated within each of these subareas are numbered within each lift and are based on the soil categories defined in the CAP and Environmental Media Management Plan (EMMP).

Figure 1 shows specific excavation areas based on the soil categories within the EXT, INT, and CRC Subareas in Lift 1. The expected excavation areas include: nine areas of excavation within the CRC; 15 areas of excavation within the EXT; and, two areas of excavation within the INT. Figure 2 shows the areas of excavation in the EXT, INT, and CRC Subareas for Lift 2; Figure 3 shows the areas of excavation for Lift 3. The numbered excavation areas for each subarea and lift will be used as a guide for the site excavation and Performance Monitoring.

Soil samples will be collected from each excavation area using a grid system and will include *in-situ* soil samples collected from the bottom and sidewalls of each excavation. The grid system will be based on 20 foot (ft) by 20 ft sampling cells (400 square feet [ft^2]) that will be divided into four equal quadrants (10 ft by 10 ft [100 ft^2]) as shown on Figure 4. The sampling cell will overlay the excavation area completed for each soil category defined by the *in-situ* soil samples collected for the RI/FS and shown on Figures 1, 2 and 3. Each cell will be identified by the excavation area number (1), alphabetically (A) and the quadrants within each cell (NW, NE, SW or SE) corresponding with the respective position in the quadrant. Figure 4 provides a schematic layout of the sampling points within a sampling cell. A total of 5 soil samples will be analyzed from each cell; 1

discrete soil sample from the bottom of each quadrant in the cell will be composited to a single sample for analysis, and a discrete sample from each the 4 sidewalls collected at the midpoint of each sidewall.

The four discrete sidewall samples and the composited bottom sample will be submitted for laboratory analysis from each cell with the exception of soil samples collected from Category 4 Soils excavations. The discrete bottom samples will be retained for future analysis if necessary. The individual Performance Monitoring soil samples collected from the bottom of each quadrant within the sampling cell from the Category 4 Soils excavation areas will not be composited but will be run separately. These additional data will be used to more accurately define the areas of Category 4 Soils that will require excavation.

2.1.2 Soil Sampling Frequency

The soil sampling frequency will be determined by the size of the area of excavation. The following table presents the frequency of soil samples to be analyzed from an excavated area:

AREA OF EXCAVATION (ft^2)	NUMBER OF SIDEWALL SAMPLES	NUMBER OF BOTTOM SAMPLES
0 TO 100	4	1
101 TO 200	4	2
201 TO 300	4	3
301 TO 400	4	4

2.1.3 Soil Sample Collection And Handling Procedures

Soil samples will be collected directly from undisturbed soil using a stainless steel spoon or similar hand-sampling tool in excavations less than four feet deep. Soil samples will be collected from the backhoe bucket with a stainless steel spoon or similar hand-sampling tool in excavations deeper than four feet, if any are necessary. Each soil sample will be transferred directly from the stainless steel spoon into a laboratory prepared glass sample jar using a clean stainless steel trowel. The sample jars will be completely filled, immediately sealed with Teflon lined screw caps, and placed in a field cooler on ice pending delivery to the analytical laboratory. The sample containers will be clearly labeled using a unique sample number and chain-of-custody procedures will be followed for all sampling events.

2.1.4 Soil Sample Location Survey

Prior to excavation, Farallon will set-up several survey benchmarks at the site to monitor excavation and sampling elevations as the cleanup progresses. The benchmarks will be

established on the foundation of the residence and tied into the existing topographic survey of the site, which was completed during the Remedial Investigation/Feasibility Study (RI/FS). Checks of the excavation progress will be performed periodically during the cleanup as each proposed excavation lift is completed at the site.

2.1.5 Analytical Testing

Performance Monitoring soil samples will be analyzed for organochlorine pesticides using USEPA Method 8081. A detailed description of analytical methods is presented in Section 5.0 of this Plan.

2.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Quality Assurance/Quality Control (QA/QC) soil and water samples will be collected during the course of the cleanup action to provide for data validation. The following types of QA/QC samples will be collected and shipped to the laboratory with the other samples. The type and frequency of these field QA/QC samples are summarized below. The exact number of QA/QC samples will be dependent on the number of soil and groundwater samples collected during the site cleanup. However, the frequency given below will be followed.

- Blind decontamination rinsate blank: 1 water sample per 20 *in-situ* soil samples;
- Split field duplicates: 1 soil sample per 10 *in-situ* soil samples;
- Decontamination Rinsate Sample: 1 rinsate sample after collection of 20 *in-situ* soil samples.

2.3 AIR PROTECTION MONITORING

Air quality protection monitoring will be performed on a daily basis to monitor potential fugitive dust generated from excavation activities. A Miniram air quality monitoring instrument will be used to monitor air quality in the breathing zone during excavation activities. The air protection monitoring criteria are outlined in the Health and Safety Plan (HASP) incorporated as Appendix D within the CAP.

3.0 CONFIRMATIONAL MONITORING

This section presents the specific requirements for collection of confirmational samples required by the compliance monitoring plan (WAC 173-340-410). Confirmational Monitoring will consist of collecting *in-situ* soil samples from the base of completed excavation areas and vadose zone groundwater samples after completion of the removal of contaminated soil. The procedures for collecting, handling and analysis of Confirmational Monitoring samples are discussed in this section.

3.1 CONFIRMATIONAL SOIL SAMPLING

Confirmational soil sampling will be performed to confirm the long-term effectiveness of the final cleanup action once cleanup standards have been attained as described in the CAP. Performance soil sampling locations will be used as confirmational sampling points if the analytical results of Performance Monitoring soil samples indicate that cleanup levels have been attained. However, in areas where the analytical results of Performance Monitoring sampling indicates that cleanup levels have not been attained, additional excavation will be required and confirmational samples will then be collected from the final excavation limits to confirm that the cleanup levels have been attained. Confirmational soil samples will also be collected on the north side of the Preschool property.

Confirmational soil samples will be collected from individual excavations and the Preschool property using the same sampling methodology as described in Section 2.1.1 Soil Sample Collection for Performance Monitoring.

3.1.1 Sampling Frequency

Confirmational soil sampling frequency of final excavation areas will be the same as those described in Section 2.1.2 Soil Sample Frequency for Performance Monitoring

.

3.1.2 Sample Collection and Handling Procedures

Soil samples will be collected directly from undisturbed soil using a stainless steel spoon in excavations less than four feet deep. Soil samples will be collected from the backhoe bucket with a stainless steel spoon at the surface for excavations deeper than four feet. Each soil sample will be transferred directly from the stainless steel spoon into a laboratory prepared glass sample jar using a clean stainless steel trowel. The sample jars will be completely filled, immediately sealed with Teflon lined screw caps, and placed in a field cooler on ice pending delivery to the analytical laboratory. The sample containers will be clearly labeled using a unique sample number and chain-of-custody procedures will be followed for all sampling events.

3.1.3 Quality Assurance/Quality Control

Quality Assurance/Quality Control samples for Confirmational Monitoring sampling is addressed in Section 2.2 of this Plan.

3.1.4 Analytical Testing

Confirmational soil samples will be analyzed for organochlorine pesticides using USEPA Method 8081. A detailed description of analytical methods is presented in Section 5.0 of this Plan.

3.2 PRELIMINARY CONFIRMATIONAL PERCHED GROUNDWATER SAMPLING IN THE VADOSE ZONE

The Preliminary Confirmational Sampling Plan for the perched groundwater in the vadose zone is presented in this section. This plan will be finalized upon completion of the site excavation.

3.2.1 Points of Compliance

As defined in the CAP, the points of compliance for the perched groundwater in the vadose zone will be the six sampling points located on the west, south and east sides of the 62nd Avenue property (Figure 5). The points of compliance have been established at the sampling locations shown on Figure 5. Representative samples of the perched groundwater in the vadose zone, which occurs from the near surface to five feet bgs, will be collected from the established points of compliance.

3.2.2 Sample Locations

Perched groundwater in the vadose zone sample locations will be located on the west, south, and east property boundary of the 62nd Ave NE property, as shown on Figure 5. The sample locations will consist of shallow sumps constructed in accordance with the requirements as described in WAC 173-160-010 Subsection (3) (h), which excludes sumps from the provisions of Part Three -Resource Protection Wells WAC 173-160-510 Design and Construction - Surface Protective Measures. Sumps will be used in order to collect perched groundwater in the vadose zone which occurs above 5-feet bgs. A schematic detail of the sump construction is shown on Figure 6.

The sumps will be installed on the western, southern, and eastern property boundary as shown on Figure 5. Each sump will be constructed using 2-inch diameter, schedule 40 PVC screen equipped with 0.010-inch slotted screen from 6-inches bgs to the bottom of the sump. Each sump will be completed to a total depth of 5 feet bgs with a sand filter pack. A temporary bentonite seal will be placed from surface grade to six-inches below grade to prevent excess runoff of surface material from clogging the screened intervals.

The top of the sump will be secured and locked with an impermeable surface extending at least 1-foot from the sump head.

3.2.3 Monitoring and Sampling Frequency

The perched groundwater in the vadose zone samples will be collected from the sumps on a quarterly basis for the first 12 months after the completion of the cleanup and site restoration activities. However, based on the Interim Action monitoring results of the vadose zone interceptor trench, it is unlikely that sufficient perched groundwater in the vadose zone will be present for sample collection purposes during the dry season. Therefore, perched groundwater in the vadose zone samples will only be collected when sufficient perched groundwater is present in the sumps, which will most likely be restricted to the wet season.

Confirmational soil samples will be collected in the Preschool on a quarterly basis for the first 12 months after completion of the excavation. The analytical results will be reviewed by Ecology and the PLPs after four quarters to determine if additional soil monitoring at the Preschool is necessary.

Following the first 12 months of perched groundwater in the vadose zone monitoring, Ecology will evaluate the results of the analytical data. If the analytical results confirm that the site is in compliance with the cleanup criteria, PLPs will submit a request to Ecology for site closure. If the analytical results are above the cleanup levels, additional monitoring will be conducted.

3.2.4 Sampling and Handling Procedures

Perched groundwater in the vadose zone samples will be collected using a disposable bailer and decanted directly from the disposable bailer into a laboratory prepared glass sample jar. The sample jars will be completely filled, immediately sealed with Teflon lined screw caps, and placed in a field cooler on ice pending delivery to the analytical laboratory. The sample containers will be clearly labeled using a unique sample number and chain-of-custody procedures will be followed for all sampling events.

3.2.5 Analytical Testing

Perched groundwater in the vadose zone samples collected from each sump during the first 12 months will be analyzed for organochlorine pesticides using USEPA Method 8081. The method reporting limits (Practical Quantification Limit [PQL]) for all analytes will meet the data quality objectives established in the QAPP included with the CAP. Laboratory analysis will be conducted by Onsite Environmental in Redmond, Washington, which is accredited with Ecology.

4.0 WASTE CHARACTERIZATION SAMPLING

Waste characterization for soil will be based on analytical results from *in-situ* soil samples. Waste characterization will be based on the soil categories defined in the EMMP and CAP. Waste characterization for wastewater will be based on batch sampling from the aboveground storage tank and defined by the King County Industrial Waste Discharge Authorization (DA).

4.1 CATEGORY 3 SOILS

4.1.1 Toxicity Characteristic Leaching Procedure (TCLP) Sampling Protocols

Prior to the initiation of excavation activities *in-situ* soil samples will be collected from three locations where the analytical result of soil samples collected for the RI/FS meet the criteria of Category 3 Soils defined in the EMMP and CAP. The soil samples will be collected at the same location as the RI/FS soil samples for TCLP analysis. The results of the TCLP analysis will be used to determine whether the soil will be handled as a contained-in soil similar to Category 2 Soils or will be designated as a dangerous waste for incineration similar to Category 4 Soils as described in the CAP.

4.1.2 Sampling Frequency

Soil samples will be collected in close proximity to the following previous sampling locations: RI/FS Subarea 1-B2 and B3; Subarea 2-B18 and S10; and, Subarea 5-B3 at a depth of 3-inches bgs (Figure 1). One split field duplicate for TCLP analysis will be collected for QA/QC.

4.1.3 Analytical Testing

All three soil samples will be analyzed for TCLP Pesticides by USEPA Method 1311/8081 by OnSite Environmental in Redmond, Washington.

4.2 WASTEWATER

Wastewater generated during the site cleanup will consist of decontamination washwater, recovered vadose zone groundwater, and captured surface water. Decontamination washwater will be contained within a lined and bermed area, as discussed in the CAP, and transferred to a temporary 500-gallon above ground storage tank. Vadose zone groundwater and/or surface water captured and contained as discussed in the Erosion Control Plan, will be transferred to the same above ground storage tank for sampling prior to discharge to the sanitary sewer under the existing DA.

4.2.1 Waste Water Sample Location

Waste water samples will be collected directly from the above ground storage tank.

4.2.2 Wastewater Sample Collection and Handling Procedures

The wastewater sample will be decanted directly from a disposable bailer into a laboratory prepared glass sample jar. The sample jars will be completely filled, immediately sealed with Teflon lined screw caps, and placed in a field cooler on ice pending delivery to the analytical laboratory. The sample containers will be clearly labeled using a unique sample number and chain-of-custody procedures will be followed for all batch sampling events.

4.2.3 Sampling Frequency

During the final cleanup action, a surface water sample will be collected from the above ground storage tank on a batch basis as part of the discharge requirements of the DA. Batch samples will be collected when the tank has been nearly filled with wastewater collected from stormwater runoff and equipment decontamination. No QA/QC samples will be collected of the wastewater.

4.2.4 Analytical Testing

Surface water samples collected from the above ground storage tank will be analyzed for Organochlorine Pesticides by USEPA Method 8081 by OnSite Environmental in Redmond, Washington. A standard 5-day turnaround time will be used for surface water samples collected from the above ground storage tank.

5.0 ANALYTICAL METHODS AND TURNAROUND TIMES

All samples for Performance Monitoring, Confirmational Monitoring, and waste characterization will be analyzed for organochlorine pesticides using USEPA Method 8081. The method reporting limits (Practical Quantification Limit [PQL]) for all analytes will meet the data quality objectives established in the QAPP included with the CAP. Laboratory analysis will be conducted by Onsite Environmental in Redmond, Washington, which is accredited with Ecology.

During excavation activities, confirmation soil samples will be analyzed on a 24-hour turnaround time in order to expedite the overall cleanup action. Confirmational soil samples will be collected by a Farallon geologist from each individual excavation area immediately upon completion of the final excavation depth. These soil samples will be transported by courier to Onsite Environmental on a daily basis. Verbal results will be provided by the laboratory as soon as they are available in order to expedite the backfill and restoration of the site, and to prevent potential runoff and erosion from exposed excavation areas.

Farallon will obtain analytical results from the laboratory in electronic and hard copy format. The analytical results will be compiled into a database for data management. Paper copies of the analytical data will also be maintained in the project files. The necessary tables will be generated from the database and may be imported into the word-processing programs for reports. All data will undergo a QA/QC review at the time of receipt in accordance with the CAP.

6.0 SAMPLING DOCUMENTATION

Documentation of field activities will include field log documentation, sampling event data forms, Chain-of-Custody forms, and sample and waste labels. Documentation generated during the field program will be included in the Final Summary Report and retained in the project file.

Field Report Form

Field personnel will be required to keep a daily field log. Field notes will be as descriptive and as inclusive as possible, allowing independent parties to reconstruct the sampling situation from the recorded information. Language will be objective, factual, and free of inappropriate terminology. A summary of each day's events will be completed on a three-part Field Report form. At a minimum, field documentation will include the date, job number, project identification and location, weather conditions, sample collection data, field equipment used, and any activities performed in a manner other than specified in the CAP. In addition, if other forms are completed or used (e.g., Chain-of-Custody form, maps, etc.) they will be referred to, and attached to, the Field Report form. Field personnel will sign the Field Report form.

Chain-of-Custody

The written procedures that are followed whenever samples are collected, transferred, stored, analyzed, or destroyed are designed to create an accurate written record which can be used to trace the possession and handling of the sample from the moment of its collection through analysis and reporting of analytical values. This written record, the Chain-of-Custody form, will be filled out by the field sampling team at the time the sample is obtained.

All samples submitted to the laboratory are accompanied by the Chain-of-Custody record. This form is checked for accuracy and completeness, and then signed and dated by the laboratory sample custodian accepting the sample. At the laboratory, each sample is assigned a unique, sequential laboratory identification number which is stamped or written on the Chain-of-Custody form.

All samples are held under internal Chain-of-Custody in the Sample Control room using the appropriate storage technique (ambient, refrigeration, frozen). The laboratory Project Manager assigned to a particular client is responsible for tracking the status of the samples throughout the laboratory. Samples are signed out of the Sample Control room in a sample control logbook by the analyst who will prepare the samples for analysis.

The Chain-of-Custody form includes the following information: site name, sample identification number (assigned by the sampler in the field), sample date, sample location, and type of analysis required (if any). Whenever the sample is transferred from one party to another, both parties sign the Chain-of-Custody form and record the date and time of the transfer. In this manner, the sample integrity is insured from collection through analysis.

Sample Label and Numbering

Sample labels are filled out and affixed to appropriate containers immediately prior to sample collection. The label is filled out in indelible ink and includes the following information: job number and name, sample identification number, date, analytes, preservative(s), if any, and the sampler's initials.

The collected samples will be labeled based on the general excavation area, the specific excavation area, cell, and quadrant or sidewall within the cell from where the soil sample was collected. For example, samples collected from the Exterior Excavation Area 1 from the west sidewall in Cell A of Lift 1 will be labeled with the format EXT1A-WW1', and samples collected from Interior Excavation Area 2 (inside the residence), from the north sidewall will be labeled with the format INT2-NW1'. A soil sample collected from the bottom of Exterior Excavation Area 1, from the northwest quadrant of Cell A will be labeled with the format EXT1A-BTMNW1'. Split samples collected by, or provided to, Ecology will be labeled the same as the Farallon samples with the exception of an "EC-" prefix to the sample number.

Waste Material Label

The waste material labels are filled out and affixed to the appropriate waste container immediately upon filling. The label is filled out in indelible ink and includes the following information: job number and name, address where waste was generated, contents of the container, operation, date, consultant's name and phone number, and sampler's initials.

FIGURES

APPENDIX D
OF
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
KENMORE, WASHINGTON
FARALLON PN: 602-002

HEALTH AND SAFETY PLAN

Submitted By
Farallon Consulting LLC
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

For:
Ms. Sharon Schlittenhard
Ms. Sharon Keller
Personal Representative
Estate of Sheridan Martin

May 23, 2000

Prepared by

Riley Conkin
Associate Geologist

Reviewed by

Peter Jewett
Principal

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FIGURES

FIGURE 1 Site Location Map
FIGURE 2 Site Layout Map
FIGURE 3 Hospital Location Map

1.0 ADMINISTRATIVE INFORMATION

1.1 PROJECT DESCRIPTION

Project Name: Former Able Pest Control Site

Project No.: Farallon Consulting LLC No. 602-002

Site Location: 18115 62nd Avenue NE, Kenmore, Washington

Work Summary: Excavation and Soil Sampling

Comments:

Prepared by: Farallon Consulting, L.L.C.
Date: April 10, 1999

Proposed Date(s) of Operation: 05-01-00 through 10-31-00

Approvals (Project Manager and one of the other two)

Farallon Consulting LLC Project Manager: Date: 4/10/00

Field Supervisor: Date: 4/10/00

Industrial Hygienist: Date: _____

1.2 SCOPE OF SAFETY PLAN

A site location map is presented as Figure 1. A site layout map is presented as Figure 2, and includes anticipated work zones. Figures 1 and 2 are incorporated at the end of the health and safety plan.

This site-specific safety plan is intended to meet the requirement of 29 CFR Part 1910.120, 8 CCR 5192 and the USEPA Standard Operating Safety Guides for Hazardous Waste Operations (1986). All employees involved in field work at this site have completed the required 40 hours initial training, maintain qualification through annual refresher training, are under a program of medical monitoring, and are certified to wear respiratory protection, as specified in 29 CFR part 1910.134 and 8 CCR 5144. In addition, an effective Illness and Injury Prevention program has been implemented in accordance with 8 CCR, sections 1509 and 3203.

This plan was prepared from the best available information concerning site conditions. It is recognized that conditions on a site may change or that more information may become available during the operation. Unless specified in this site-specific safety plan, the field team does not have the option to modify the levels of personal protection in any way. If during the operation, it is determined that the protection specified in the site-specific safety plan requires modifications, work will cease, and the Field Supervisor will contact the Project Manager and/or Company Safety Representative. Work will not resume until authorized.

A project orientation meeting will be held prior to commencement of the project outlining ALL work activities, safety concerns and communication measures. The project scope of work, potential known site hazards and contents of this health and safety plan will be reviewed during the project orientation meeting. In addition, daily tailgate meetings will be held prior to starting work each morning. Chain-of-communication and communication responsibilities are addressed in Section 2.2.

1.3 FIELD TEAM ASSIGNMENTS

DUTY	NAME
Team Leader/Project Manager	Peter Jewett
Site Safety/Field Supervisor	Riley Conkin
Alternate Site Safety/Field Supervisor	Matt Essig

A form documenting onsite workers that have reviewed this document and attended the project orientation meeting is included is Section 1.5 of this health and safety plan. Documentation of attendance at the daily project meeting(s) is also included in Section 1.5 of this plan.

1.4 SUBCONTRACTORS AND COMMUNICATION

The following subcontractors will perform work during this operation. All employees of subcontractors performing work with the potential for exposure to hazardous waste shall meet the requirements of 29 CFR 1910.120 and 8 CCR 5192. Each company/contractor working on this project maintains the responsibility for the safety of its employee(s). In addition, each field team member and the separate companies/contractors working on this project maintain a general

responsibility to identify and correct any health and safety hazards and cooperate toward working as safely as possible.

1. Name: Premium Construction Group, Inc.
   Telephone No.:425-334-6918
   Address:12014 20th Street SE, Everett, WA 98205
   Authorized Representative: Jim Fagerlie
   Services Provided: Excavation, backfill, and demolition.
   Contract No.: Date:

2. Name:
   Telephone No.:
   Address:
   Authorized Representative:
   Services Provided:
   Contract No.: Date:

3. Name:
   Telephone No.:
   Address:
   Authorized Representative:
   Services Provided:
   Contract No.: Date:

A copy of this site health and safety plan will be available for review prior to commencing work and during work at the site. Subcontractors are encouraged to follow this plan or develop their own project-specific health and safety plan. If a subcontractor prepares a project-specific safety plan, it must meet the applicable requirements in 29 CFR 1910.120, 8 CCR 5192 and the USEPA Standard Operating Safety Guides for Hazardous Waste Operation (1986).

1.5 SAFETY COMPLIANCE AGREEMENT FORM

Site: Former Able Pest Control Site
Kenmore, Washington

Project No.: 602-002

I, the undersigned, acknowledge that I have attended the safety meeting, and received a copy of this site-specific safety plan. I have read and understood the safety plan, and do agree to adhere to the requirements specified by it. I understand that I may be prohibited from continuing work on the project for failing to comply with this safety plan.

Signature	Print name	Company	Date

2.0 DESCRIPTION OF WORK TO BE PERFORMED

Section 2.1 contains a list of planned field activities. Section 2.2 describes communication procedures during fieldwork

2.1 SAMPLING ACTIVITIES

Excavate soil and collect shallow soil samples.

2.2 COMMUNICATION DURING SITE ACTIVITIES

Most site activities will consist of at least two onsite personnel, working in relatively close proximity. The chain-of-communication (i.e., laborer, technician, supervisor, manager) will be outlined during the project orientation meeting and reiterated during daily tailgate meetings. Each field team member (contractor or subcontractor) must maintain a responsibility to identify and correct health and safety hazards. A field activity manager/supervisor will be designated prior to each onsite work project.

Identified health and safety hazards shall be communicated as soon as possible to the site supervisor or field activity manager. Appropriate corrective actions shall be implemented as specified in subsequent sections of this plan. Common hand signals shall be reviewed during this project during the project orientation meeting and daily meetings. Responsibilities for initiating emergency responses, notification of appropriate officials, buddy watch system (if appropriate) and implementation of corrective measures shall also be established during these meetings.

3.0 SITE BACKGROUND

3.1 SITE PHYSICAL DESCRIPTION

The site is located at 18115 62nd Avenue Northeast, Kenmore, Washington. The facility is a residential building.

3.2 SITE HISTORY (ACTIVITIES, INCIDENTS, ETC)

Former Able Pest Control Property.

3.3 TYPES OF MATERIALS KNOWN TO HAVE BEEN STORED ON THE SITE

Pesticides.

3.4 MATERIALS KNOWN OR SUSPECTED TO REMAIN ONSITE

Pesticide contaminated soil.

3.5 SITE STATUS (ACTIVE/INACTIVE, AGENCY ACTIONS

1. Site Status: Inactive X Active _____

2. Has the site been characterized to the best of your knowledge?

   Yes X No ____

3. Comments:

4.0 HAZARDS EVALUATION

Summary of anticipated hazards:

( ) Physical hazards inherent to the site (overhead electrical lines)
(X) Physical hazards related to excavator operations
(X) Chemical hazards
( ) Community hazards
(X) Electrical hazards
(X) Mechanical hazards
( ) Biohazards
( ) Heat stress
( ) Confined space entry
(X) Noise hazards
(X) Other - trip and fall hazards

4.1 CHEMICAL HAZARDS (ATTACH REFERENCES)

	Chemical	Range of conc. In stored material (not removed from site) or soil	Mode of Intake 1,2,3,4	Limits (PEL/TLV)	IDLH Level of Concern (H/M/L)
1.	Chlordane	Non Detect to 1,120,000 ug/kg	1,2,3,4	0.5 mg/m3	L
2.	Dieldrin	Non Detect to 65,000 ug/kg	1,2,3,4	0.25 mg/m3	L
3.					
4.					

Notes: 1 = Inhalation, 2 = Ingestion, 3 = Absorption, 4 = Contact
H = High, M = Medium, L = Low

Identify locations where the contaminants are of greatest concern on the site: Exposure to potentially impacted soils and/or groundwater during soil and groundwater sampling activities.

Comments: Appropriate personal protective equipment (gloves, safety glasses, ext.) shall be worn during sampling to minimize potential contact with impacted soils and groundwater.

Based upon available site data and prior experience, it is not expected that site operations will result in significant airborne concentrations of vapors and/or dust. "Significant" refers to concentrations which would exceed the site's referenced exposure action levels, or which are thought to pose any potential health threat to the site workers and/or surrounding community. Perimeter air monitoring will be performed a minimum of once per hour during excavating activities.

4.2 PHYSICAL HAZARDS

4.2.1 Physical Hazards Inherent to the Site

____	Fire	____	Explosion	____	Anoxia
____	Heat Stress	____	Cold Stress	__X__	Noise
____	Radiation	____	Biohazards	__X__	Mechanical Equipment

4.2.1.1 Excavation and Soil Sampling: Not Applicable

5.0 HAZARDOUS WASTE FIELD SAFETY DIRECTIVES

- No eating or smoking onsite.
- No contact lenses (if applicable to planned activities).
- Hard hats and steel-toed boots will be worn at all times (if applicable to planned activities).
- Site access will be restricted to authorized personnel only.
- All operations will have first aid kits, and fire extinguishers available.
- No facial hair is allowed that will interfere with the respirator face seal.
- Emergency information will be posted (Section 7.0).
- Safety plan will be available onsite at all times.

5.1 MECHANICAL HAZARDS

- Do not stand near rotating or hydraulic equipment while in operation.
- Verify that all equipment is in good condition.
- Do not stand or walk under elevated loads or ladders.
- Appropriate guards must be used if equipment has potentially hazardous moving parts.

5.2 ELECTRICAL HAZARDS

- Maintain a least 10-foot clearance from overhead power lines. A greater equipment distance will be maintained if required by local regulation
- Properly ground and/or bond all electrical equipment.
- Avoid standing in water when operating electrical equipment.
- If equipment must be connected by splicing wires, make sure all connections are properly taped.
- Be familiar with specific operating instructions for each piece of equipment.
- Assure appropriate bonding of containers when pumping flammable liquids.

5.3 CHEMICAL HAZARDS

Absorption, inhalation potential.

5.4 HEAT STRESS

When workers exhibit symptoms of heat stress (i.e. redness of skin, profuse sweating etc.), the individual(s) will take frequent rest breaks in a shaded area. Unzip or remove coveralls during breaks. Have cool water or electrolyte replenishment solution available. Drink small amounts frequently to avoid dehydration. Count the pulse rate for 30 seconds as early as possible in the rest period. If the pulse rate exceeds 110 beats per minute at the beginning of the rest period, shorten the work cycle by one third.

5.5 NOISE HAZARDS

Use earplugs or earmuffs when noise level prevents conversation in normal voice at distance of three feet; this corresponds to an action level of 85 dB for mandatory hearing protection use. Use hand signals, as defined in 40-hour health and safety training, to facilitate communication when hearing protection is required. If noise levels do not allow effective communication, either shut down equipment or move away from the noise source if needed.

Use hearing protection when working within 50 feet of any operating equipment.

5.6 CONFINED SPACE ENTRY

Confined spaces include excavations, tanks, trenches, pits, sumps, elevator shafts, tunnels, or any other area where circulation of fresh air is restricted or ability to readily escape from the area is restricted. Confined space entry is not anticipated to be required during cleanup activities.

5.7 RADIATION HAZARDS

There are no known sources of radiation present at the site.

5.8 BIOHAZARDS

Mosquitoes, and other insects (disease carriers or poisonous).

6.0 PLANNING/SITE SETUP

6.1 SITE SETUP

Onsite communication method: Line of sight, hand signals when using hearing protection or under conditions of excessive noise. Air horn for emergency signal.

Offsite communication method: Offsite telephones.

Site Security: Not Applicable

Identify the water and electrical locations: To be discussed at onsite safety meeting.

Emergency communication: If planned activities warrant the need to potentially notify field personnel of emergency conditions, refer to the site supervisor.

6.2 LEVELS OF PROTECTION AVAILABLE OR USED

USEPA/OSHA LEVEL: A___ B___ C X D X

Modifications/Additions: N/A

Comments:

6.3 AIR MONITORING GUIDELINES

Device	Action Level	Action to be Taken
*PDM-3 Miniram	38 mg/m^3	Employ dust suppression measures, don half face respirators with appropriate cartridges.
** LEL/Oxygen		
*** OVA/PID		

Comments:

6.4 MEASURES TO CONTROL OFFSITE MIGRATION AND EXPOSURE

Practical solutions are those normally available, which can be instituted in a reasonable time frame, by trained site personnel. The Field Supervisor or site health and safety officer will be allowed to modify procedures as determined by field conditions to ensure a safe working environment.

6.5 SPECIAL SITE CONSIDERATIONS

Work activities will be conducted in a manner which provides for awareness of, and immediate response to, circumstances which could result in public exposures.

7.0 FIELD ACTIVITIES

Excavation and collection of soil samples from proposed excavation areas in Lifts 1, 2, and 3 as described in Cleanup Action Plan.

7.1 SITE ENTRY AND SETUP

Initial level of protection: Level D protection, including hard hat, steel-toed boots, safety glasses.

Modifications: Based on work zone air monitoring, upgrade to Level C, using appropriate cartridges in respiratory equipment.

Special procedures, precautions, equipment: None anticipated.

7.2 SITE ACTIVITIES (GENERAL)

Initial level of protection: Level D protection, as above.

Modifications: Upgrade to Level C based on air monitoring.

7.2.1 Site Activities (Task Specific)

Collect shallow soil samples.

Modifications: Respiratory protection in accordance with section 6.3, total upgrade to Level C.

7.3 SAMPLE HANDLING AND PRECAUTIONS

Personnel will wear gloves and other protective equipment as necessary during the handling of soil samples. The analytical laboratory used for this project will be notified prior to shipment of the suspected contaminants at this site.

Sample containers will be decontaminated prior to shipping. Sample containers will be protected from breakage by wrapping in bubble wrap, etc., if required, placed in zip-lock bags, and packed in absorbent material. Shipping containers will be clearly labeled. Samples will be shipped under full Chain-Of-Custody procedures.

7.4 DECONTAMINATION PROCEDURES

Contact with hazardous organic chemicals is possible in the work zone. The following decontamination procedures will be implemented to minimize the movement of contaminants outside of the work zone, and to minimize the period of contact with these contaminants.

7.4.1 Personal Hygiene

Field team personnel should conduct the following to ensure that contaminants will not remain in contact with their bodies:

1. Field personnel involved in the excavation/sampling activities are instructed to wash their hands, face, neck and forearms at the end of the workday. Soap, water and towels will be provided at the site for this purpose;

2. Field personnel are instructed to take a full-body shower at home or motel at the end of the workday; particular attention should be paid to areas of the body that are typically overlooked, such as behind the ears or between the toes;

3. Disposable personal protective equipment (i.e. Tyvek suits, disposable ear plugs, gloves, booties and respirator cartridges, etc.) will be discarded in garbage bags and then placed in trash bins after each day of use; and

4. Other non-disposable protective equipment (see Section 8.0) will be washed in warm or hot soapy water after each day of use.

7.4.2 Equipment Decontamination

Equipment, samplers and parts of the excavator that have come into contact with contaminants will be cleaned before reuse at another location, at the end of each day, and prior to leaving the site. Decontamination will be with warm soapy water, steam/pressure washer, and organic solvents, if necessary. Decontamination wash and rinse water will be containerized and managed in accordance with applicable regulations.

8.0 EQUIPMENT LISTS

Personal Protective Equipment
Place an "X" at the level chosen, and a * (X) at the alternative.

Level C		Level D	
Air Purifying Respirator			
Full Face			
Half Mask Cartridge Type: Dust	X		
Escape Air Pack		Escape Pack	
Surgical Gloves		Surgical Gloves	
Outer Work Gloves		Outer Work Gloves	
Type: NITRILE	X	Type: NITRILE	X
Protective Clothing Type: Flame Retardant		Protective Clothing Type: Long Sleeves	X
Polycoated Tyvek for wet conditions	X		
Rain Suit			
Butyl Apron		Butyl Apron	
Safety Glasses	X	Safety Goggles	X
Hard Hat	X	Hard Hat	X
Neoprene Safety Boots		Neoprene Safety Boots	
Steel-Toed Boots	X	Steel-Toed Boots	X
Boot Covers		Boot Covers	
Hearing Protection	X	Hearing Protection	X
Rain Pants (wet conditions)	*X	Rain Pants (wet conditions)	*X
Instrumentation		First Aid Equipment/Supplies	

OVA/PID		First Aid Kit	X
HNU		Oxygen	
OVM		Eye Wash	
Miniram Dust Monitor	X	Stretcher	
Oxygen/explosimeter		Tool Kit	X
Drager Kit:		Thermometer(s)	
Tubes used:		Tables Chairs	
Low Flow Air Pumps		Sampler Rack	
High Flow Air Pumps		Fire Extinguishers	X
Radiation Monitor - 4			
Radiation Dosimeters			
Noise Meter			
WBGT			
pH meter			
Magnetometer			
GPR			
EM			
AIR HORN*			
Conductivity/Temperature Meter			

Decontamination Equipment	X	Other Equipment.	
Plastic Sheeting	X	Blood Pressure Monitor	
Large Washtubs		Drinking Water	X
Small Washtubs	X	Camera	X
Scrub Brushes	X	Film	X

Pressurized Sprayers	X	Drum Dolly	
Solvent Sprayer(s)		Trowels	
Plastic Trash Cans		Pick	
Trash Bags	X	Site Security	
Water Bottles		Shovels	X
Paper Towels	X	Binoculars	
Duct Tape		Traffic Cones	X
Masking Tape		Megaphone	
Ziploc Bags		Banner Tape	
Detergent		Radio/Mobil Telephone	X
TSP	X	Flagging Tape	
Sodium Hypochlorite		Fencing	
Sodium Bicarbonate		Warning Signs	
Bleach		Thieving Rods	
Hand Soap		Waste Drum Levels	
Solvent Rinse		Bung Wrench (Brass)	
Acetone		Security Guard	
Hexane		Step Ladder	
Methanol		Bailers	
Other		Rope	
Acetone		Security Ladder	

9.0 EMERGENCY INFORMATION

(Post Onsite)

Acute Symptoms	First Aid
Dizziness, nausea, headache	Rest, shade, fresh air
Unconsciousness	Get medical help

Hospital Name: Evergreen Hospital

Directions to hospital: Reference Figure 1.

Emergency Conditions: IF AN EMERGENCY CONDITION, SUCH AS FIRE, CHEMICAL RELEASE, EXPLOSION, OR OTHER PHYSICAL THREAT TO LIFE OR IMMEDIATE HEALTH OCCURS, ALL PERSONNEL ARE TO IMMEDIATELY EVACUATE THE WORK AREA. OPERATING EQUIPMENT WILL BE TURNED OFF PRIOR TO EVACUATION. PERSONNEL WILL EVACUATE TO AN ASSEMBLY AREA LOCATED AT THE NORTHEASTERN CORNER OF THE SITE, FURTHER IDENTIFIED AS THE LOCATION OF THE DRIVEWAY ENTRANCE BARRICADE LOCATED AT 62ND AVE NE AND THE DRIVEWAY ENTRANCE. EMERGENCY CONTACT WILL BE MADE IMMEDIATELY TO THE APPROPRIATE REPORTING AGENCY, OR 911, AS DETERMINED BY THE SITE SUPERVISOR OR ACTING SUPERVISOR. NEIGHBORING RESIDENTS AND BUILDING OCCUPANTS WILL BE NOTIFIED IMMEDIATELY AS DIRECTED IN THE FACT SHEET TO BE PREPARED PRIOR TO SITE MOBILIZATION.

Local Resources: 911

Ambulance: 911

Hospital Emergency Room: Evergreen Hospital
425/899-1000

Law Enforcement: 911

Fire Department: 911

Explosives Unit: 911

Poison Control Center: 911

Agency Contact:

Client Contact:

Laboratory: On-Site Environmental

Principal Contractor: Farallon Consulting LLC

Project Manager: Peter Jewett (Farallon Consulting, L.L.C. 425/427-0061

Industrial Hygienist: Cliff Schmitt (Farallon Consulting, L.L.C. 425/427-0061)

10.0 COMMUNITY RELATIONS

Emergency notification procedures and guidance on sampling procedures will be provided. An on-site contact person will be identified and introduced to the notified parties. In addition, contact phone numbers will be provided for the purpose of continued communication with all of the affected parties.

Ongoing effort is being made to minimize any disturbance of the normal activities which occur on a day-to-day basis in the areas adjacent to the construction operations.

11.0 TRAINING AND MEDICAL SURVEILLANCE

All on-site personnel will have completed 40-hour, Refresher, and Supervisor training, as appropriate, and as required by 8 CCR 5192. Additional training includes but is not limited to Hazard Communication (8 CCR 5194), Respiratory Protection (8 CCR 5144), Illness and Injury Prevention (8 CCR Sections 1509 and 3203), emergency procedures and first aid/CPR. Site-specific training will include a review of this plan and any additional information which becomes available to the site personnel throughout the duration of the project.

Medical monitoring for Farallon Consulting, L.L.C. personnel includes pre-employment and annual medical examinations in compliance with 8 CCR 5144 and 8 CCR 5192. Any person injured onsite or who suffers symptoms consistent with overexposure to site materials and/or heat stress will be provided immediate medical attention.

FIGURE 1

SITE LOCATION MAP

FIGURE 2

SITE LAYOUT MAP

FIGURE 3

HOSPITAL LOCATION MAP

APPENDIX E
OF
CLEANUP ACTION PLAN
ABLE PEST CONTROL SITE
KENMORE, WASHINGTON
FARALLON PN: 602-002

QUALITY ASSURANCE PROJECT PLAN

Submitted By
Farallon Consulting LLC
320 3rd Avenue NE, Suite 200
Issaquah, WA 98027

For:
Ms. Sharon Schlittenhard
Ms. Sharon Keller
Personal Representative
Estate of Sheridan Martin

May 23, 2000

Prepared by

Riley Conkin
Associate Geologist

Reviewed by

Peter Jewett
Principal

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1.0 INTRODUCTION

This Draft Quality Assurance Project Plan (herein referred to as the Plan) identifies data quality objectives and standard operating procedures to be implemented in accordance with the Cleanup Action Plan (CAP) for the Able Pest Control Site as defined below located in Kenmore, Washington. This Plan is incorporated within the draft CAP as Appendix E.

Work to be performed during the CAP will be conducted in accordance with the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Washington Administrative Code (WAC) 173-340-810, 29 USC Sec. 651 et esq. The purpose of this Plan as stated in Ecology's *Guidance and Specifications for Preparing Quality Assurance Project Plans* is to:

- Help the project manager and project team focus on the factors affecting data quality during the planning stage of the project;
- Facilitate communication among field, laboratory, and management staff as the project progresses; and,
- Provide a record of the project to facilitate final report preparation.

To insure that the data quality objectives (DQOs) are achieved, this Plan details aspects of sample collection and analysis including: sample collection procedures, analytical methods, quality assurance/quality control (QA/QC) procedures, and data quality reviews. This Plan describes both quantitative and qualitative measures of data quality to assure that data quality objectives are achieved.

1.1 DEFINITION OF THE SITE

The entire site consists of a residential lot located at 18115 62nd Avenue Northeast, the northwest portion of the Preschool Property located at 6124 NE 181st Street and a small portion of the property adjacent and north of the 62nd Avenue Property in Kenmore, Washington. The portion of the site addressed by the CAP is the area where soil contains concentrations of one or more of the target pesticides above the applicable cleanup levels. This includes the 62nd Avenue Property and a small potion of the north-adjacent property (referred to as the site in the CAP and this Plan). As discussed in the CAP, interim actions conducted at the Preschool Property have cleaned up the soils in this portion of the entire site.

The site is located approximately 1,200 feet from the northern end of Lake Washington and is currently zoned for residential use by the city of Kenmore. Land use surrounding the site includes single-family residences to the northwest and east; a vacant, vegetated lot to the north; a multi-unit condominium building to the west-southwest; and a preschool to the south. Residences in the vicinity of the site are connected to the municipal water supply and the sewer discharges to King County Department of Natural Resources, Industrial Waste Program. The future land use of the immediate site area is projected to remain single family or multi-unit residential.

The legal description for the 62nd Avenue Property is:

The portion of Government Lot 3, Section 11, Township 26 North, Range 4 East W.M., in King County, Washington, described as follows:

Beginning at the north quarter corner of said Section,
Thence south 2^0 41' 16" W along the centerline of said Section, a distance of 1000.151 feet;
Thence west 30.03 feet to the true point of beginning;
Thence west 152.705 feet;
Thence south 99.33 feet;
Thence north 87^0 14' 47" E to a point from which the true point of beginning bears north $2^0$41'16"E;
Thence north 2^0 41' 16" E to the true point of beginning;
(Being known as Lot 2, Block 8, Waverly Park, according to the unrecorded plat thereof, except the southerly 85.00 feet, as measured along the west line thereof, and Lot 3 in said block, except the northerly 65.00 feet as measured along the west line thereof).

The 62nd Avenue Property is currently developed with a residential home with ground level and second-floor living units and a separate two-car, dirt-floor garage. The floor of the ground-level apartment is a concrete slab approximately two to three feet below the outside grade. A gravel driveway is located along the northern portion of the 62nd Avenue Property. Lawn, shrubs, or other vegetation covers the remaining areas of the site.

1.2 BACKGROUND INFORMATION

Mr. Sheridan Martin owned the 62nd Avenue Property between 1969 and 1986 and operated a pest control company called Able Pest Control, Inc. from the residence. In late 1985, Mr. Martin sold Able Pest Control, Inc. to Mr. Tom E. Reed and Mr. James W. Nation. Mr. Reed and Mr. Nation formed a corporation named Able Pest Control, Inc. This corporation operated at the 62nd Avenue Property between November 1985 and January 1986. Operations at the 62nd Avenue Property conducted by both corporations involved storing and dispensing pesticides for off-site use. The pesticides were stored and dispensed in an area underneath the back porch located at the southwestern corner of the building.

The 62nd Avenue Property was sold to Ms. Schlittenhard on November 14, 1986. Ms. Schlittenhard converted the residence into two apartments, one on the ground-floor level and the other on the upper level of the residence. In 1994, during expansion of the ground-floor apartment, soil was excavated from the former pesticide storage and dispensing area located at the southwest corner of the residence to construct a concrete floor slab. The excavated soil was reportedly placed in the southwestern corner of the 62nd Avenue Property adjacent to the fenced property line with the Preschool Property. Prior to the interim remedial action program (SECOR, January 15, 1999), the ground surface in this area was either exposed soil or covered by grass, blackberries, and other vegetation, and it sloped towards the south-southwest with a small (<1 foot) drop at the property line.

A detailed description of the site history and remedial actions are provided in the CAP.

1.3 PROJECT OBJECTIVES

The key objective of this work is to efficiently and effectively perform soil excavation and disposal to remediate target pesticides in the shallow soils at the 62nd Avenue Property.

The CAP has defined three main excavation areas at the 62nd Avenue Property and adjacent off-site areas based on the features at the 62nd Avenue Property and previous investigations at the site. The sampling protocols for each excavation area take into account the historical property use and potential for the release of pesticides. The three main excavation areas defined in the Sampling and Analysis Plan (SAP, Appendix C) include:

- Contamination Reduction Corridor (CRC) Excavation Area;
- ExteriorExcavation Area (EXT), which includes all outside areas with the exception of the CRC area; and,
- Interior Excavation Area (INT), which includes the small area beneath the southwest corner of the existing residence.

2.0 PROJECT ORGANIZATION

Ecology has identified Sheridan A. Martin (deceased, December 1998) and Sharon Schlittenhard as potentially liable persons (PLPs) under RCW 70.105D.040. The primary contacts for the PLPs are:

For Sheridan A. Martin:

Ms. Sharon Keller
Personal Representative for the
Estate of Sheridan Martin
c/o Mr. William Joyce
Ogden Murphy Wallace, PLLC
1601 5th Ave, Suite 2100
Seattle, Washington 98101
(206) 447-7000
Fax (206) 447-0215

For Sharon Schlittenhard

Mr. John Wiegenstein
Heller Wiegenstein, PLLC
P.O. Box 2760
Poulsbo, Washington 98370
(360) 394-3500
Fax (360) 394-3503

The PLPs have contracted with Farallon Consulting, L.L.C. (Farallon) to conduct the CAP. The Project Manager and primary contact for Farallon is:

Peter Jewett
Principal Engineering Geologist
Farallon Consulting, L.L.C.
320 3rd Avenue NE, Suite 200
Issaquah, Washington 98027
(425) 427-0061
Fax (425) 427-0067

and the QA/QC Officer is:

Mr. Clifford T. Schmitt
Principal Hydrogeologist
Farallon Consulting, L.L.C.

Ecology is acting as the lead public agency for the project. The primary contact for Ecology is:

Ms. Louise Bardy
Project Coordinator-Toxics Cleanup Program
Washington State Department of Ecology-Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008
(425) 649-7209
Fax (425) 649-7098

3.0 DATA QUALITY OBJECTIVES

The DQOs for this project will be used to develop and implement procedures to ensure that data is of sufficient quality to remediate the pesticide contamination throughout the three excavation areas defined in the CAP. All observations and measurements will be made and recorded in such a manner as to yield results representative of the media and conditions observed and/or measured. Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, natural variation at a sampling point, or an environmental condition. Representativeness will be achieved through strict adherence to the SAP (Appendix C). Goals for representativeness will be met by ensuring that sampling locations are selected properly and that a sufficient number of samples are collected.

The quality of the laboratory data will be assessed by precision, accuracy, representativeness, comparability, and completeness (the "PARCC" parameters). Definitions of these parameters and the applicable quality control procedures are described in Subsections 3.1 through 3.5 of the Plan. Quantitative DQOs for applicable parameters (e.g., precision, accuracy, completeness) are provided

following each definition. Laboratory DQOs have been established by the analytical laboratory and are specified in the analytical laboratory Quality Assurance Program which is kept on file at Farallon's offices.

3.1 PRECISION

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of two or more measurements compared to their average values. Precision is calculated from results of duplicate sample analyses. Precision is quantitatively expressed as the relative percent difference (RPD), and is calculated as follows:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} \, x \, 100$$

Where:

RPD = relative percent difference

C_1 = larger of the two duplicate results (i.e., the highest detected concentration)

C_2 = smaller of the two duplicate results (i.e., the lowest detected concentration)

Quantitative RPD criteria for laboratory duplicate results have been developed by the U.S. Environmental Protection Agency (USEPA) for inorganic analysis. The criteria are $\pm$ 20 percent for water samples and $\pm$ 35 percent for soil. There are no specific RPD criteria for organic analyses.

3.2 ACCURACY

Accuracy is a measure of the closeness (bias) of the measured value to the true value. The accuracy of chemical analyses results is assessed by "spiking" samples in the laboratory with known standards (surrogates or matrix spikes of known concentration) and determining the percent recovery. The accuracy is measured as the percent recovery (%R) and is calculated as follows:

$$\%R = \frac{(M_{sa} - M_{ua})}{C_{sa}} \, x \, 100$$

Where:

%R = percent recovery

M_{sa} = measured concentration in spiked aliquot

M_{ua} = measured concentration in unspiked aliquot

C_{sa} = actual concentration of spike added

Laboratory matrix spikes and surrogates will be carried out at the analytical laboratory in accordance with USEPA SW-846 requirements for organic and inorganic analyses. Quantitative percent recovery criteria have been developed by the USEPA for laboratory matrix spikes for inorganic analysis. The criteria are 75 to 125 percent, when the sample concentration exceeds the spike concentration by a factor of four or more. There are no specific accuracy criteria for organic analyses. Where the USEPA and Ecology have not provided data validation guidelines, laboratory derived control limits will be used to assess surrogate recovery and matrix spike results.

The accuracy of sample results can also be affected by sample contamination. Sample contamination can occur because of improperly cleaned sampling equipment, exposing samples to chemical concentrations in the field or during transport to the laboratory, or because of chemical concentrations in the laboratory. To ascertain that the samples collected are not contaminated, several types of blank samples will be analyzed.

3.2.1 Equipment Rinsate Blanks

Equipment rinsate blanks, consisting of analyte-free water which has been used as a final rinse of sampling equipment (following equipment decontamination), will be used to determine if sample contamination occurred as a result of improperly cleaned sampling equipment. Where decontamination is required (e.g., soil sampling equipment, excavators), the number of equipment rinsate blanks will be at least five percent of the total number of samples collected.

3.2.2 Laboratory Method Blanks

The laboratory will run method blanks at a minimum frequency of five percent or one per batch to assess sample contamination within the laboratory.

3.3 REPRESENTATIVENESS

Representativeness is a qualitative measure of how closely the measured results reflect the actual concentration or distribution of the constituent concentrations in the matrix sampled. The sampling plan design, sampling collection techniques, sample handling protocols, sample analysis methods, and data review procedures have been developed to assure the results obtained are representative of site conditions. These issues are addressed in detail in the SAP (Appendix C) and the Plan.

3.4 COMPLETENESS

Completeness is defined as the percentage of measurements judged to be valid. Results will be considered valid if they are not rejected during data validation (see Section 6.0 Data Management, Reduction, Review and Reporting). Completeness is calculated as follows:

$$C = \frac{(Number\ of\ Valid\ Measurements)}{(Total\ Number\ of\ Measurements)}\ x\ 100$$

The target completeness goal for this work will be 90 percent for a given analysis.

3.5 COMPARABILITY

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. The use of standard USEPA and Ecology methods and procedures for both sample collection and laboratory analysis will make data collected comparable to both internal and other data generated.

4.0 SAMPLING PROCEDURES

Procedures that will be used to collect, preserve, transport, and store samples are described in the SAP provided in Appendix C of the CAP.

5.0 ANALYTICAL PROCEDURES

Chemical and physical analyses to be conducted during this project are discussed in the SAP provided in Appendix C of the CAP.

6.0 DATA MANAGEMENT, REDUCTION, REVIEW, AND REPORTING

This section outlines procedures to be followed for the inventory, control, storage, and retrieval of data collected during performance of the CAP. The procedures contained in this plan are designed to ensure that integrity of the collected data is maintained for subsequent use. Moreover, project tracking data (e.g., schedules and progress reports) will be maintained to monitor, manage, and document the progress of this cleanup action.

Farallon will maintain the project files according to the procedures outlined in this document and the Agreed Order (pending). Data generated during field activities and by laboratory analyses will be submitted directly to Farallon. Laboratory documentation from the analytical laboratories will be maintained in Farallon's project file for purposes of validating analytical data collected during the cleanup action.

6.1 DATA TYPES

A variety of data will be generated by this cleanup action, including sampling and analytical data, review of published reports, and calculation results based on mathematical expressions. The laboratory analytical data will be transmitted to Farallon as an electronic file, in addition to a hard copy. This will facilitate the subsequent validation and analysis of these data while avoiding transcription errors that may occur with computer data entry.

6.2 DATA TRANSFER

Procedures controlling the receipt and distribution of incoming data packages to Farallon and outgoing data reports from Farallon are outlined below.

6.2.1 Receipt of Data and Reports

The incoming documents will be date stamped and filed as follows. Correspondence and transmittal letters for all reports, maps, and data will be filed chronologically. Data packages, such as those from field personnel, laboratories, and surveyors (such as soil analytical data, survey data, and geologic observations), will be filed by project task, subject heading and date. If distribution is required, the appropriate number of copies will be made and distributed to appropriate persons or agencies. The original document will not be distributed to project personnel.

6.2.2 Outgoing Data and Reports

A transmittal sheet will be attached to all project data and reports sent out. A copy of each transmittal sheet will be kept in the project file. All outgoing reports and maps will be reviewed by the Project Manager and QA/QC Officer.

6.3 DATA INVENTORY

Procedures for filing, storage, and retrieval of project data and reports are discussed below.

6.3.1 Document Filing and Storage

As previously discussed, project files and raw data files will be maintained at Farallon. Files will be organized by project tasks or subject heading, and maintained by the document control clerk.

6.3.2 Access to Project Files

Access to project files will be controlled and limited to the PLPs, and Farallon personnel. Project documents will be listed according to task. Project documents will be assigned a document control number and a log will be maintained for all documents contained in the file. When a file is removed for use, a sign-out procedure will be used to track custody.

If a document is to be used for a long period, a copy will be used, and the original will be returned to the project file.

6.4 DATA REDUCTION AND ANALYSIS

The Project Manager and Project QA/QC Officer are responsible for data review and validation. Data validation parameters are outlined in Section 3.0. The particular type of analyses and presentation method selected for any given data set will depend on the type, quantity, quality, and prospective use of the data in question. The analysis of the project data is likely to require data reduction for the preparation of tables, charts, and maps, etc. To ensure that data are accurately transferred during the reduction process, all reduced data will be checked by someone other than the person that prepared the map, table, or chart. All items checked will be initialed and dated. Any incorrect transfers of data will be highlighted and changed.

6.4.1 Data Reporting Formats

The physical and chemical characterization information developed for soil and wastewater at the site in connection with the CAP will be presented in the final report in the following format.

6.4.1.1 Summary Tables

The laboratory reports will be sorted according to various parameters to summarize the information for easier assimilation and presentation. Soil sampling and analysis data will be sorted several ways, including by sample point number, constituent, and date of sample collection. The parameters chosen for sorting will depend on the determination of the most appropriate format, and the utility of that format in demonstrating the physical and chemical characteristics of interest.

6.4.1.2 Maps

Plan maps needed to illustrate results of the CAP will be assembled or prepared. They may include, but are not limited to plan maps of the site showing chemical concentration for individual chemicals and groups of chemicals.

6.4.1.3 Cross-Section

Vertical profiles, or cross-sections, may be generated from field data to display site stratigraphy, and the vertical and lateral extent of the final excavations.

6.5 TELEPHONE LOGS AND MEETING NOTES

All notes from project meetings and telephone conversations will be maintained in the project file by the Project Manager. Field notes will be retained by project field personnel until the conclusion of the field program when they will be filed with the other project documents.

7.0 QUALITY CONTROL PROCEDURES

7.1 FIELD QUALITY CONTROL

Field Quality Control samples (e.g., duplicate samples and equipment rinsate blanks) to be collected during this project are described in Section 2.2 of the SAP (Appendix C). The purpose of these samples was also discussed in Section 3.0 of the Plan.

7.2 LABORATORY QUALITY CONTROL

Analytical laboratory QA/QC procedures are provided in the laboratory Quality Assurance Plan which is on file at Farallon's offices.

7.3 DATA QUALITY CONTROL

All data will undergo two levels of QA/QC evaluation: one by the laboratory and one by Farallon. Initial data reduction, evaluation, and reporting will be performed by the laboratory as specified in the laboratory Quality Assurance Plan. The analytical data will then be validated at Farallon under supervision of the QA/QC Officer. The following types of quality control information will be reviewed, as appropriate:

- Method deviations;
- Sample extraction and holding times;
- Method reporting limits;
- Blank samples (equipment rinsate and laboratory method);
- Duplicate samples;
- Matrix spike/matrix spike duplicate samples (accuracy);
- Surrogate recoveries;
- Percent completeness; and,
- RPD (precision).

Farallon will review field records and results of field observations and measurements to insure procedures were properly performed and documented. The review of field procedures will include:

- Completeness and legibility of field logs;
- Preparation and frequency of field quality control samples;
- Equipment calibration and maintenance; and,
- Chain-of-Custody forms.

8.0 PERFORMANCE AND SYSTEM AUDITS

Performance audits will be completed for both sampling and analysis work. Field performance will be monitored through regular review of Chain-Of-Custody forms, field notebooks, and field measurements. Periodic on-site review of work in progress will also be performed by the Project Manager and/or the Project QA/QC Officer.

Accreditations received from Ecology for each analysis by the analytical laboratory demonstrates the laboratory's ability to properly perform the requested methods. Therefore, a system audit of the analytical laboratory during the course of this project will not be conducted.

The Project Manager and/or Project QA/QC Officer will oversee communication with the analytical laboratory on a frequent basis while samples are being processed and analyzed at the laboratory. This will allow Farallon to assess progress toward obtaining the DQOs, and to take corrective measures as problems arise.

Corrective measures will be the joint responsibility of the Project Manager and the Project QA/QC Officer.

The analytical laboratory will be responsible for identifying, and correcting (as appropriate) any deviations from performance standards as discussed in the laboratory QA/QC Plan. The laboratory will communicate to the Project Manager or the Project QA/QC Officer, all deviations to the performance standards and the appropriate corrective measures during sample analysis. Corrective actions are discussed in Section 11.0.

9.0 PREVENTIVE MAINTENANCE

Operation and Maintenance manuals will accompany all field sampling and measurement equipment. Included in these manuals will be procedures for start-up, calibration and system checks. All maintenance activities will be documented in field logs and/or equipment log books. A schedule of preventive maintenance activities will be maintained. In addition, spare parts and tools will be included in each equipment storage case to minimize equipment downtime.

10.0 DATA ASSESSMENT PROCEDURES

The Project Manager and Project QA/QC Officer are responsible for data review and validation. Upon receipt of each data package from the laboratory, calculations using the equations presented for precision, accuracy and completeness will performed. Results will be compared to qualitative DQOs. Data validation parameters are outlined in Section 3.0 of the Plan.

11.0 CORRECTIVE ACTION

Corrective actions will be the joint responsibility of the Project Manager and the Project QA/QC Officer. Corrective procedures can include:

- Identifying the source of the violation;
- Re-analyzing samples if holding time criteria permit;
- Re-sampling and analyzing;
- Evaluating and amending sampling and analytical procedures; and/or,
- Qualifying data to indicate the level of uncertainty.

During field operations and sampling procedures, the Project Manager and field team members will be responsible for identifying and correcting equipment malfunctions. All equipment malfunctions and corrective actions taken will be documented in the field notes. Corrective actions will be the joint responsibility of the Project Manager and the Project QA/QC Officer.

12.0 QUALITY ASSURANCE REPORTS

The final CAP report will include a quality assurance section which summarizes data quality information. This summary will include:

- Assessment of data accuracy and completeness;
- Results of performance and/or system audits; and,
- Significant quality assurance problems and their impacts on the DQOs.