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U.S. Army Corps of Engineers Alaska District

PRELIMINARY SOURCE EVALUATION 2 OPERABLE UNIT D

Fort Richardson, Alaska

FINAL October 1996



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1.0 INTRODUCTION

This document presents the field investigation results for the Preliminary Source Evaluation 2 (PSE2) conducted at nine Operable Unit D (OUD) sites at Fort Richardson, Alaska (Figure 1-1). OUD is being investigated for potential hazardous waste contamination under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA), commonly referred to as Superfund. (This document will henceforth refer to CERCLA/SARA simply as CERCLA.)

A Federal Facility Agreement (FFA) between the Army, U.S. Environmental Protection Agency (EPA) Region 10, and Alaska Department of Environmental Conservation (ADEC) was implemented in 1994 to ensure that the Fort Richardson facility and other areas potentially contaminated from sources at Fort Richardson are thoroughly investigated and remediated as necessary to protect the public health, welfare, and the environment. The FFA facilitates cooperation, information exchange, and participation among the parties by specifying the roles of the agencies in the investigation and cleanup process and by specifying that all work will be performed in accordance with CERCLA and applicable state laws.

The nine sites being investigated at OUD are listed below and identified in Figure 1-2:

- Building 35-752
- Stormwater Outfall to Ship Creek
- Building 700/718
- Building 704
- Building 796
- Building 955
- Dust Palliative
- Fire Training Area
- Grease Pits

1.1 **Preliminary Source Evaluation Objectives**

A PSE is a process used to describe an individual site, its current and past uses, and potential contamination sources. Information for the PSE is gathered from several sources, including site inspections, existing reports, review of facility plans, and employee interviews.

A site and document review process was used to identify potential contaminants for each site and to develop a conceptual site model (CSM) indicating where contamination was likely to be present. A limited sampling program was designed to sample potentially contaminated areas at each site.

At the conclusion of this PSE2 process, each of the nine sites will be designated for one of four possible outcomes:

- No further action (NFA). This action may be selected when investigation results indicate that a particular site presents no apparent risk to human health or the environment and displays no environmental contamination requiring cleanup.
- Interim remedial measure (IRM). This action may be selected when there is an identifiable and ongoing threat to public health, welfare, or the environment from identifiable sources. Generally the pollutant threat must be acute and continuing, and must be able to be mitigated by direct physical or mechanical means. The threat must be sufficient that the time frame to perform a characterization (a full remedial investigation/feasibility study) prior to implementing a remedial action is unacceptable in its protection of human health or the environment.
- Remedial investigation/feasibility study (RI/FS). This action will be selected if results
 of the PSE2 confirm that a chemical release has occurred and if environmental
 contamination exceeds threshold concentrations, presents a risk to human health or
 the environment, and is not solely petroleum, oil, and lubricant (POL) contamination,
 which may fall into another regulatory program as described below. The purpose of
 an RI/FS is to collect information necessary to assess the risks to human health and
 environment presented from contamination at a site, and to develop and analyze
 remedial action alternatives. At the conclusion of the RI/FS process, either a specific
 remedial action or no further action will be recommended.
- Other program. This action will be selected if the source area is from an underground storage tank (UST), an aboveground storage tank (AST), or if only POL contamination is present above threshold concentrations. Investigation and remediation activities may be referred to another program such as the State-Fort Richardson Environmental Restoration Agreement.

1.2 Project Scope

The specific objectives of this PSE2 include the following:

- Identify the presence or absence of contaminated media (i.e., soil, sediment, and/or groundwater).
- Determine and document no further action decisions where supported by analytical data.
- Evaluate whether contaminant concentrations are sufficient to require further action, and if so, what type of action would be appropriate.

The PSE2 report summarizes and interprets the data collected from the field activities as well as previous investigations to provide an evaluation of the observed and potential extent of environmental contamination at the nine sites in Operable Unit D.

The statement of work (SOW) for the PSE2 investigation included the following activities, presented by site.

Building 35-752

- Drum Accumulation Area. Collect soil samples from 6 inches and 2 feet below ground surface (bgs) from eight hand-auger borings. Upon receipt of sample results, advance and sample two borings to 20 feet bgs or until groundwater is encountered.
- Cooling Ponds. Collect eight sediment samples, four from the bottom of each pond. At the east side of the pond, complete one boring angled west under the pond and sample at depth of approximately 5 to 10 feet below the bottom of the pond. Advance three borings, west, north, and northeast of the pond, and complete as monitoring wells. Collect groundwater samples from the three new monitoring wells and two existing monitoring wells.
- Concrete Floor. Collect polychlorinated biphenyl (PCB) wipe samples from 28 locations inside Building 35-752.
- Former UST Location. Advance and sample four borings to 20 feet bgs or to groundwater within the footprint of the former UST excavation. Collect groundwater samples from two existing wells.

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Stormwater Outfall to Ship Creek

- Ship Creek. Collect one sidewall and one sediment sample from a location upstream and a location downstream of the stormwater outfall.
- Stormwater Drainage System. Collect one sidewall and one sediment sample from the drainage ditch within 25 feet of the confluence with Ship Creek.

Building 700/718

• Drum Accumulation Area. Collect soil samples from 6 inches and 2 feet bgs from eight hand-auger borings. Upon receipt of sample results, advance and sample two borings to 20 feet bgs or until groundwater is encountered.

Building 704

• Drum Storage Area. Collect soil samples from 6 inches and 2 feet bgs from eight hand-auger borings. Upon receipt of sample results, advance and sample two borings to 20 feet bgs or until groundwater is encountered.

Building 796

• Battery Acid Shop. Advance and sample four borings to 20 feet bgs, two inside and two outside the Battery Acid Shop. Upon receipt of soil sampling results, locate and sample a monitoring well.

Building 955

• Former Sludge Bin Area. Advance and sample four borings to a depth of 20 feet bgs.

Dust Palliative

- Collect three composite samples from each of the following locations (each composite sample will consist of four grab samples from a depth of 18 inches bgs):
 - 1. UC 5497 (Loop Road) between Roosevelt Road to the north and the turnoff to the water reservoir to the south. (This section is also referred to as the road to Otter Lake.)
 - 2. Roosevelt Road east of the Alaska Railroad right-of-way.

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- 3. UC 5997 (Davis Highway) between Sixth Street and Roosevelt Road.
- 4. Building 796 east side parking lot.

Fire Training Area

Collect 10 samples from a depth of 6 inches to 1 foot below the Fire Training Area.
 Upon receipt of the sample results, advance and sample three 20-foot borings, two inside and one outside the Fire Training Area.

Grease Pits

• Collect samples from three soil borings advanced to groundwater. Convert to monitoring wells and sample.

Background

• At each of four selected background locations, collect soil samples from 6 inches and 2 feet bgs from one hand auger boring. Advance and sample one boring to 20 feet bgs or until groundwater is encountered.

OUD PRELIMINARY SOURCE EVALUATION 2

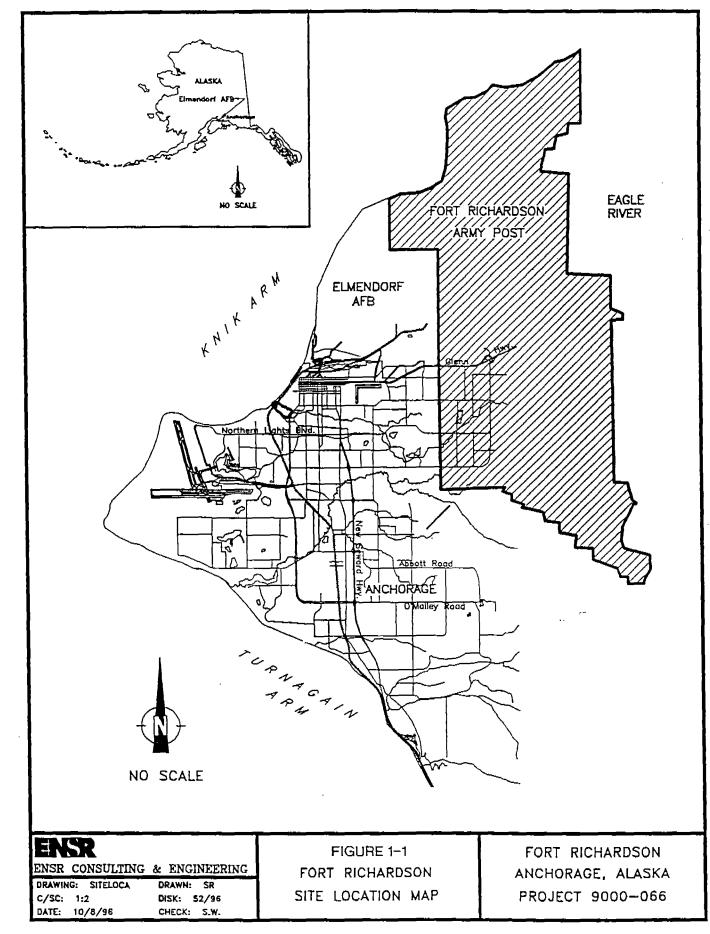
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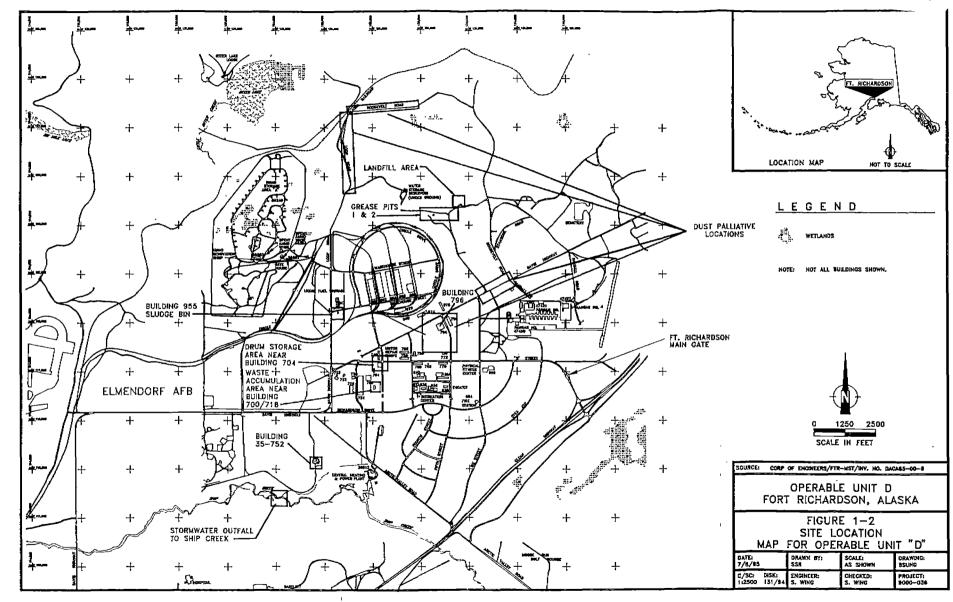
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2.0 FORT RICHARDSON BACKGROUND

2.1 Post Description

Fort Richardson was established in 1940 under the command of the Alaskan Defense Force (ADF) to protect Alaska against foreign attack. The base included an airfield, which was called Elmendorf Field. In 1941, the ADF was renamed the Alaskan Defense Command (ADC). At that time, Fort Richardson had approximately 7,800 personnel. During World War II, Fort Richardson was used as a staging and supply area for operations occurring on the Aleutian Islands. The troop complement varied in size from 7,800 to over 15,000. In 1943, the ADC was renamed the Alaskan Department and in 1947, it was again reorganized as the U.S. Army Alaska (USARAK).

In 1950, Fort Richardson was divided between the Army and Air Force. On the northern part of the installation, the Army established a new cantonment area. The original base was released to the Air Force and renamed Elmendorf Air Force Base (AFB). Fort Richardson has undergone a number of reorganizations, and command and control changes since that time, including expansion of the cantonment area. Fort Richardson is currently the home of USARAK and has approximately 2,175 military and 3,820 dependent personnel stationed at the base. In addition, approximately 1,500 civilian employees work on the base. The overall mission of Fort Richardson has not changed over time; it is still tasked with protecting Alaska from foreign invasion.

2.2 Environmental Setting

2.2.1 Geographic Setting and Topography

Fort Richardson is located on 62,000 acres of land northeast of the Municipality of Anchorage and Elmendorf AFB. Geographically, the base is bordered by Eagle Bay and the Knik Arm of Cook Inlet to the north, and the Chugach Mountain Range and State Park to the south and east. The elevation of most of Fort Richardson lies between 45 and 225 feet above mean sea level (MSL).

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2.2.2 Regional Geology

The following descriptions of regional geology are extracted from Schmoll and Dobrovolny (1972), Kirschner and Lyon (1973), and Freethey (1976).

The vicinity in which Fort Richardson is located has three general geologic terrains: glacial deposits, alluvial deposits, and metamorphic rock. Glacial sediments deposited in the Cook Inlet basin during a series of five glacial periods in recent geologic history constitute the north and central portions of Fort Richardson. In particular, terminal moraine deposits (the Elmendorf moraine) are present directly northwest of the main cantonment area. The soils of the Elmendorf moraine are composed of fine-grained, poorly sorted glacial materials (clays, silts, very fine sands), with interbedded heterogeneous layers of boulders, cobbles, gravel, sand, silt, and clays.

In this region, the marine Bootlegger Cove Formation was deposited concurrently with glacial outwash deposits. The Bootlegger Cove Formation consists primarily of thinly bedded gray to light gray silt clay to clayey silt. Where it occurs, the Bootlegger Cove Formation acts as an aquitard to groundwater movement.

Alluvial sediments of the Anchorage Plain extend from northeast of the Fort Richardson main cantonment area, southwest to the city of Anchorage. Metamorphic bedrock outcrops and mountains predominate in the south-central and southern portions of Fort Richardson. In the cantonment area, the alluvial deposits are bounded to the northwest by the Elmendorf Moraine and to the southeast by the metamorphic terrain, as described above. The alluvial sediments comprise both glacial outwash, alluvial fan, and fluvial deposits, grading from gravel in the eastern portion of the plain to sand in the southwestern portion. In the cantonment area, deposits are composed chiefly of well-bedded and well-sorted gravel (Schmoll and Dobrovolny 1972).

The OUD sites are on a sequence of alluvium and buried till to depths on the order of 200 feet. This sequence of alluvium and till probably overlies the Bootlegger Cove Formation, a dense marine clay that acts as a local aquitard.

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2.2.3 Hydrogeology

The primary surface drainage features in the area are Eagle River, to the north of the main cantonment, and Ship Creek, located south of the main cantonment. Both originate in the Chugach Mountains and flow westerly across the installation into Knik Arm. Eagle River is fed by turbid glacial meltwaters, and Ship Creek is sustained by snowmelt and rainwater runoff. Surface drainage across the main cantonment is southerly, towards Ship Creek.

Surface water from Ship Creek is the main source of drinking water for Fort Richardson. A diversion dam, where water is taken from the creek, is located approximately 10.5 miles upstream from the mouth. The Municipality of Anchorage, Elmendorf AFB, and Fort Richardson pump water from a deep aquifer for drinking water when there is low stream flow (Freethey 1976).

Two major groundwater systems have been identified in the area of Fort Richardson: a shallow system and deep system (Freethey 1976). The groundwater of the shallow system occurs under unconfined conditions in the Anchorage Plain deposits and in unconfined to semiconfined conditions in the till of the Elmendorf Moraine. Shallow perched groundwater of limited volume and extent exists in localized areas within the Elmendorf Moraine till deposits. The deep system occurs under artesian (confined) conditions beneath areas where the Bootlegger Cove Formation is present.

Groundwater in the Anchorage Plain deposits occurs between 10 and 20 feet bgs. Flow in this system is generally southerly towards Ship Creek, with a gradient between 0.05 and 0.01 ft/ft (USACE 1991). Groundwater in the deep system has been encountered at a minimum depth of 130 feet bgs in the northern area of Fort Richardson. The flow in the deep system is generally westerly to northwesterly towards Knik Arm, with a gradient between 0.02 and 0.0025 ft/ft (USACE 1991).

2.2.4 Climatology

Fort Richardson lies in a climatic transition zone between the maritime climate of the coast and continental climate of interior Alaska. Meteorological data from Anchorage from 1952 to 1987 indicate a yearly average temperature of 35.7°F, with summer temperatures ranging over 70°F and winter temperatures to -30°F. The yearly average precipitation is approximately 15 inches (UAA 1989).

Infiltration and runoff from precipitation are both predominant during breakup when the winter snowpack melts.

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3.0 FIELD OPERATIONS

This section is a summary of field operations conducted at each site. Results and findings for each site are presented in Section 5.0. The field investigation at Fort Richardson OUD was conducted from September 1994 to April 1995. The field activities included advancing and sampling soil borings, collecting surface samples, pond/stream sediment samples, PCB wipe samples, and installing and sampling monitoring wells as previously mentioned in Section 1.2. Six suction lysimeters were installed at the Grease Pits.

3.1 Field Activities

3.1.1 Surface Soil Samples

Surface soil samples were collected from seven of the nine OUD sites—Building 35-752, Building 700/718, Building 704, Building 796, Building 955, Dust Palliative, and Fire Training Area—and the Background site. Surface samples were not collected from the Stormwater Outfall to Ship Creek and the Grease Pits.

At the Fire Training Area, approximately 3 to 6 feet of fill was deposited on the pit. Surface samples were collected by drilling through the fill to the former surface of the Fire Training Area (see Section 3.1.4).

Sampling Technique

Surface samples at Building 35-752 were collected using a 2-person power auger. Large cobbles encountered at Building 35-752 resulted in frequent refusal and difficult drilling conditions. For the remaining sites, an auger extension attached to a bobcat was used to collect surface samples. Samples were collected at depths varying from 6 inches bgs to 2.5 feet bgs using a decontaminated trowel, shovel, or with a latex- or nitrile-gloved hand. New, clean gloves were worn at each sampling location.

For each sampling location, samples were not composited and containers were filled for gasoline range organic (GRO), volatile organic compound (VOC), and ethylene glycol samples first to minimize aeration. Remaining, less volatile samples were subsequently collected.

In addition, samples were collected from each sampling interval and placed in resealable plastic bags to measure ambient temperature headspace (ATH) using an organic vapor meter (OVM).

Composite Surface Soil Samples

Composite samples were collected from the Dust Palliative site. Each composite sample consisted of four grab samples. Equal volumes of soil from each of the four grab samples were mixed in a stainless steel bowl to make one composite sample prior to packing the soil into individual sample containers. Grab samples were collected at 18 inches bgs.

Additional samples were also collected for OVM ATH readings.

3.1.2 Sediment Samples

Sediment samples were collected from the Cooling Ponds at Building 35-752 and the Storm Water Outfall at Ship Creek.

Cooling Ponds at Building 35-752

Sediment samples from the cooling ponds at Building 35-752 were collected from approximately 6 inches below the pond bottom using a backhoe. The backhoe bucket was used to scrape the top layer of sediment from sample areas before collecting the sediment sample from approximately 6 inches to 1 foot below the pond bottom surface. Pond water was decanted from the backhoe bucket, and a decontaminated trowel was used to remove the top 6 inches of sediment from the bucket before collecting the samples. Volatile samples were immediately placed into containers, followed by the remaining parameters.

Stormwater Outfall at Ship Creek

Sediment samples from the Stormwater Outfall to Ship Creek were collected upstream and downstream of the outfall in Ship Creek and from sediment in the outfall itself. Two samples were collected from each of the three locations; one from sidewall sediments to assess potential contaminants from surface waters and one from the creek bottom to assess contaminants that may have been deposited by the transport waters.

As a result of extreme weather conditions (deep snow and temperatures ranging from 0 to 5°F) samples were collected by scraping sediment (the fine soil fraction along the sidewall or bottom) into a new, clean 2-liter plastic jar using a gloved hand. No head space was left in the plastic jar. Sediments were then transferred to appropriate sampling containers. GRO and VOC sample containers were filled first from the plastic jar, followed by the remaining parameters.

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3.1.3 PCB Wipe Sampling

Polychlorinated biphenyl (PCB) wipe samples were collected from the concrete floor at Building 35-752.

Concrete Floor at Building 35-752

A standard PCB wipe test was conducted using a 10-by-10-cm cardboard template placed on the concrete floor as a guide for the area to be wiped. A gauze pad constructed of 100 percent cotton was saturated with hexane and wiped 10 times in a forward and backward motion within the template area. The pad was then turned over and wiped side to side 10 times within the template area, folded, and placed into a sample jar.

At the time of sampling, equipment was stored inside the building and areas of the floor were covered in ice. Samples were collected in a modified grid pattern based on available floor space.

3.1.4 Subsurface Soil Samples

Subsurface soil samples were collected from eight of the nine OUD sites (Building 35-752, Building 700/718, Building 704, Building 796, Building 955, Dust Palliative, Fire Training Area, and Grease Pits) and the Background site. Subsurface samples were not collected from the Stormwater Outfall at Ship Creek.

Shallow Borings (0 to 20+ feet)

Hollow-stem auger methods were used to complete shallow soil borings and install shallow groundwater monitoring wells. The hollow-stem auger drilling was conducted using a CME-75 drilling rig. For subsurface soil sampling and monitoring well installation, 4.25-inch inside-diameter and 8-inch outside-diameter auger flights were used. Drill cuttings were placed into 55-gallon drums for handling and disposal as investigation-derived waste (IDW).

Upon completion, the soil borings were backfilled with bentonite grout in accordance with ADEC and the U.S. Army Corps of Engineers (USACE) regulations per the OUD PSE2 work plan.

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Subsurface Sample Collection

Subsurface samples were collected from soil borings using a clean 2.5-inch inner-diameter, 24inch long, split-spoon sampler. The sampler was driven approximately 26 inches to obtain sufficient soil volume to fill sample containers. Generally, borings were sampled at 5-foot intervals:

- 0 to 2 feet,
- 4 to 6 feet,
- 9 to 11 feet,
- 14 to 16 feet, and
- 19 to 21 feet below grade.

In some instances, there was insufficient recovery of soil from the split-spoon sampler to collect a full suite of samples for analyses due to large grain sizes and soil conditions. In these cases, additional split spoons were collected, the sampling interval increased, and a full suite of analyses was collected.

Samples to be analyzed for VOC, GRO, and ethylene glycol were collected from the split barrel sampler first to minimize aeration. The remaining soil was then geologically logged and classified using the Unified Soil Classification System. Soil samples were then placed in resealable plastic bags for an OVM reading. Remaining soil was homogenized in a clean, stainless steel bowl, and all other sample parameters were collected from the homogenized soils.

Deep Borings (>30 feet)

Air rotary drilling methods were used to advance one soil boring at Building 796 and four soil borings at the Grease Pits site. The soil boring at Building 796 was completed as a monitoring well, and two of the four soil borings at the Grease Pit site were completed with a grouping of three tensiometers. The two other soil borings at the Grease Pits were backfilled with bentonite grout in accordance with ADEC and USACE regulations per the OUD PSE2 work plan.

Due to subsurface conditions exceeding the safe usage of a hollow-stem auger drilling rig (a significant amount of cobbles and small boulders are present under the main cantonment area of Fort Richardson), a Driltek DJ-25, direct circulation, air-rotary drilling rig with a Torr Tierra casing hammer was used (operated by Alpine Drilling). A 6-inch outer-diameter tricone bit was used to cut a hole while a 7-inch outer diameter steel casing was simultaneously pounded. Boreholes were advanced in 10-foot intervals. Casing refusal frequently occurred and

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obstructions (cobbles and boulders) were crushed with the bit in order to continue casing penetration. Cuttings were ejected from the casing annulus using compressed air, discharged to an area lined with plastic tarps, and transferred to 55-gallon drums for handling and disposal as IDW.

Surface samples at the Grease Pit site were collected at approximately 10 feet bgs from trenches. The trenches were excavated prior to drilling because of reported drums and the unknown contents of the landfill.

Subsurface Sample Collection

Subsurface samples were collected from soil borings using a clean 2.5-inch inner-diameter, 24inch-long, split-spoon sampler. Sampler refusal generally resulted in soil samples less than 2 feet in length being retrieved. Soil samples were collected at the end of each 10-foot penetration using a hammer driven, 2.5-inch inner-diameter, 2-foot split-spoon sampler, with typical 3000 foot-pound blows. Between 50 and 200 blows were required for each 0.5 feet of cut core.

In the instances where there was insufficient recovery to run a complete set of analyses, soil was collected for as many of the analyses as volume permitted before advancing the soil boring to the next sampling interval.

Samples to be analyzed for VOC, GRO, and ethylene glycol were collected from the split-spoon sampler first to minimize aeration. Remaining soil was homogenized in a clean stainless steel bowl, and all other sample parameters were collected from the homogenized soils. Samples were screened using an OVM.

Soil samples were geologically logged in terms of texture, composition, and sedimentary structures when observed. Samples were also logged for moisture and classified using the Unified Soil Classification System.

3.1.5 Ambient Temperature Headspace

Representative soil samples were collected in resealable plastic bags leaving approximately 2 inches of headspace. Bags were placed in a heated vehicle for a minimum of 2 hours, allowing the soil to reach an ambient temperature of 50° to 70°F. After reaching ambient temperature, an OVM probe was inserted into the headspace of the bag to detect the presence of photoionizable VOCs. The OVM was calibrated to 100 parts per million (ppm) isobutylene standard utilized for analysis.

3.1.6 Groundwater Samples

Groundwater samples were collected from two sites: from ENSR-installed and previously existing shallow monitoring wells at Building 35-752, and from an ENSR-installed deep monitoring well at Building 796.

Well Installation and Development

Monitoring wells were designed with expected aquifer materials of 1 to 2 mm of mean grain size and a seasonal water table fluctuation of less than 2 feet. Shallow monitoring wells were constructed of 2-inch inner-diameter Schedule 40 polyvinyl chloride (PVC) riser pipe with a 10-foot prepacked 8-slotted screen filled with 40-60 sand. Deep monitoring wells used a 20-foot prepacked screen. After the prepacked screen was attached to the riser pipe, the screen was lowered to allow approximately 7 feet of screen below the water table and 3 feet above the water table. The deep well was placed with approximately 14 feet of screen below the water table and 6 feet above the water table.

The annulus was packed with sand, and a minimum 2-foot-thick bentonite pellet seal was placed on top of the sand pack. The bentonite was poured into the annual space. After the bentonite was in place, water was poured into the annulus on top of the bentonite. The bentonite was allowed to hydrate for at least 5 minutes to create an adequate seal. The annulus above the bentonite seal was filled with Volclay grout.

Wells were completed with either a flush-mounted, watertight cover, or an above-grade stickup with a locking, protective casing.

Each monitoring well was developed by surging and bailing at least 24 hours after the final completion of the well to allow the grout to set. The purpose of well development was to remove any fine sand or silt particles that may have settled around the well screen during installation and to enhance the hydrologic connection between the well and the aquifer. During development, the purged water was measured for pH, specific conductivity, and temperature. Measurements were taken after each well volume was removed. These measurements, as well as water clarity, were recorded on the well development record in the field logbooks. The well was considered developed when:

- the pH, specific conductivity, and temperature readings for three consecutive well volumes were within 10 percent and the discharge was reasonably clean of free silt.
- The well was bailed dry three times in succession.

Well development records are in the appendix designated for each site.

Groundwater Samples

The wells were sampled at least 24 hours after well development to allow for aquifer stabilization. Groundwater sampling procedures are discussed below:

- The static water level of the well and the total depth of the well were measured.
- At least three well volumes were purged from the well. If the well was bailed dry before three well volumes had been removed, samples were collected when sufficient water reentered the well.
- The pH, specific conductivity, and temperature measurements were taken after each well volume was removed. When three consecutive pH, specific conductivity, and temperature measurements were within 10 percent, the well was considered adequately purged and it was assumed that representative groundwater was being collected.
- Samples were collected from each well using a dedicated, disposable bailer constructed of high density polyethylene (HDPE).

Samples to be analyzed for VOC or GRO were taken from the bailer first to minimize aeration. The 40-ml vials were checked for air bubbles at the time of sample collection. All sample containers were labeled at the time of collection with the date, time collected, sample identification number, analysis required, type of preservation, and sampler's initials.

Groundwater sample collection records are in the appendix designated for each site.

3.1.7 Tensiometer Installation

At the Grease Pits Site, nested sets of soil tensiometers were installed in two locations at nominal depths of 65 feet, 45 feet, and 25 feet. In order to qualitatively evaluate capillary pressures at the levels of the soil tensiometers, gypsum blocks were installed within 2 inches above the soil tensiometers. Silica flour was used to suspend the soil tensiometers and gypsum blocks.

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A Driltek DJ-25, direct circulation, air-rotary drilling rig was used to reenter the pilot borings, which had previously been stabilized with 4-inch outer-diameter schedule 40 PVC casing. The casing was pulled out, and the boreholes were reamed with a 5-inch tricone bit and simultaneously installed with 6-inch inner-diameter, 7-inch outer-diameter steel casing. Boreholes were redrilled to their original terminal depths (approximately 58 feet bgs).

Soil tensiometers and gypsum blocks were obtained from SoilMoisture Corporation, Santa Barbara, California. The tubing, valving, and an ohm-meter to read the moisture content in the gypsum blocks were also purchased from SoilMoisture Corp. Each setup was calibrated and tested prior to installation.

At each interval, the installation was completed as follows:

- 1. Preassemble soil tensiometer assembly, attaching premeasured lengths of green sample tubing and black pressure/vacuum tubing to the soil tensiometers, and flexible rubber tubing (pinch valves) at the uphole ends of the tubing. Install gypsum blocks above ceramic cups of soil tensiometers with nylon fasteners. Pressure test each soil tensiometer assembly, at approximately 150 psi, while immersed in distilled water.
- 2. Presoak soil tensiometers and gypsum blocks a minimum of 6 hours in distilled water.
- 3. Ream borehole to nominal 60-foot depth.
- 4. Lift steel casing progressively, leaving a minimum of 2 feet of open hole above intended backfill below the casing shoe.
- 5. Dry tremie approximately 1 foot of granulated bentonite. Wet tremie approximately 0.5 feet of silica flour slurry, at 2 parts flour to 1 part distilled water.
- 6. Apply a 70-centibar vacuum to the soil tensiometer with a hand pump, and gently lower the assembly downhole via a 1.9-inch outer-diameter PVC riser. Thread pressure/vacuum and sampling tubing inside of the riser, along with the lead extension from the gypsum block. (The lead to the gypsum block is threaded into a drilled hole at the downhole end of the riser, and the drilled hole is plugged with 100 percent silica glue).

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- 7. Wet tremie approximately 1 foot of silica flour, burying the ceramic cup of the soil tensiometer and gypsum block. Dry tremie approximately 1 foot of granulated bentonite. Dry tremie approximately 1 foot of pelletized bentonite and hydrate with municipal water. Wet tremie bentonite-based grout to next higher interval.
- 8. Install locking wellhead, with 3-foot stick-up above grade, with appropriate depthlabelling on ends of risers.

3.1.8 Sample Handling and Shipping

Sample handling activities followed applicable requirements in the USACE *Chemical Data Quality Management for Hazardous Waste Remedial Activities* document ER 1110-1-263 (USACE 1990) per the OUD PSE2 work plan.

Samples collected during the field investigation were assigned a unique field-sample tracking number in accordance with USACE procedures.

All sample containers were labeled at the time of collection with the date, time collected, sample identification number, depth, analysis required, and sampler's initials.

Packaging and shipping requirements were carried out in accordance with the United States Department of Transportation (USDOT) regulations as promulgated in Title 49 of the Code of Federal Regulations (CFR), parts 171 through 177.

After collection, sample containers were securely closed, labeled, and placed in separate resealable plastic bags. The samples were placed in a cooler with bubble wrap around each container. Sufficient ice was placed in the cooler to maintain a temperature of 4°C plus or minus 2°C. The chain-of-custody form was placed in a resealable plastic bag and taped to the inside of the cooler lid.

All samples were shipped via overnight delivery to the designated laboratories.

3.1.9 Decontamination

A decontamination pad was set up in an area designated by the Fort Richardson Department of Public Works (DPW) (near Building 955) and relocated as necessary to facilitate ongoing operations. The decontamination pad consisted of one heavy-duty layer of HDPE liner contained on all sides by 4-by-4 timbers. The entire decontamination area was set up over a second layer of HDPE. The decontamination pad was inclined to one corner from which accumulated water was transferred to 55-gallon drums.

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Equipment used during the field program was decontaminated prior to and after each use as follows:

- Drill augers and drill rods were steam cleaned prior to use and between borings, except when a boring was relocated or redrilled a short distance from the original location because of auger refusal.
- Sampling equipment, which includes but is not limited to split-spoon samplers, trowels, hand augers, bowls, and shovels, were decontaminated prior to each boring. Prior to individual sample collection, equipment was decontaminated using EPA-accepted protocol; washed in a warm, nonphosphate detergent solution; rinsed in municipal water; sprayed with hexane; and then rinsed with distilled water. All downhole equipment was steam cleaned between holes.

3.1.10 Surveying

Sampling locations and newly installed monitoring wells were surveyed by the USACE. Surveys were conducted for both horizontal and vertical data, and referenced to existing control benchmarks.

3.1.11 Waste Management

Soil cuttings generated during the course of the investigation were containerized in 55-gallon open-top drums at the time of drilling. The decontamination waste water and well development purge water were handled in the same manner but containerized in 55-gallon bung-top drums.

All drums were labeled "non-hazardous waste pending laboratory analysis" with the date, site, borehole or monitoring well number, and point of contact phone number. Filled drums were removed from the individual sites by the Fort Richardson Hazardous Waste Facility staff and stored at Building 45-125.

Drums were characterized from the samples represented in each of the soil drums and the well development purge water drums. Drums containing decontamination water were individually sampled and characterized. A full set of analytical data and recommended disposal characterization for each drum of waste generated was provided to the Fort Richardson Hazardous Waste Facility staff.

Disposable bailers, protective clothing, and other similar supplies were presumed to be nonhazardous and were bagged for disposal at the Municipality of Anchorage regional landfill.

3.2 Field Quality Assurance/Quality Control

Quality Assurance/Quality Control (QA/QC) samples were collected to evaluate matrix handling, transportation, and analytical procedures. QA/QC samples consisted of split samples, also referred to as QA samples, and replicate samples, which were collected at a frequency of 1 every 10 samples. The primary sample and QA sample were given the same identification number. The primary sample was sent to Columbia Analytical Services (CAS), and the QA sample was sent to the USACE North Pacific Division (NPD) Laboratory. The replicate sample was given a sequential number and was submitted to CAS as a blind duplicate.

As part of the groundwater sampling program, additional volumes of water were collected at a frequency of 1 every 20 samples for the matrix spike/matrix spike duplicate (MS/MSD) and were submitted to each laboratory. Trip blanks were transported to the water sampling sites and submitted to the laboratories to verify that water samples were not contaminated in transit. One set of trip blanks, consisting of three volatile organic analysis (VOA) vials for GRO and three for VOCs, were submitted per shipped cooler of water samples for analysis. Each cooler represents one shipment.

Individual field logbooks were developed for each of the nine sites being investigated, as well as the Background site. Each field logbook contained the following:

- Labeling, packaging, and shipping protocol checklist;
- Site map;
- Field investigation summary;
- Sampling summary showing the analysis and number of samples;
- Sampling summary showing sample containers, preservation, holding times, and QA/QC requirements;
- Photograph log sheets;
- Boring logs;
- Daily chronology sheets; and
- Field safety meeting documentation sheets.

Monitoring well development records were added to the field logbooks for Buildings 35-752 and Building 796.

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4.0 DATA EVALUATION

This section presents a summary of data quality evaluations, a description of the semiquantitative risk assessment process, and an evaluation of background concentrations.

4.1 Data Quality Evaluation

According to *Risk Assessment Guidance for Superfund* (EPA 1989), analytical laboratory data should be evaluated prior to comparison with risk-based concentrations (RBCs). The USACE's Chemical Quality Assurance Report (CQAR) evaluates and qualifies laboratory data based on results from the field and laboratory QA/QC process. In addition to the data evaluation performed by USACE, an evaluation of laboratory contamination is presented below. The CQARs indicated the laboratory data from the PSE2 investigation to be useable and valid, except as qualified in the data tables in Section 5.0. (Details of the data evaluation are presented in the site-specific CQAR in the Analytical Data for Preliminary Source Evaluation 2, Operable Unit D, Volumes I, II, and III [ENSR 1995]. These documents were submitted separate to this report.)

4.1.1 Laboratory Contamination

The EPA considers acetone, 2-butanone, methylene chloride, toluene, and the phthalate esters as common laboratory contaminants. If an associated laboratory blank contains detectable levels of a common laboratory contaminant, the sample results should be considered positive only if sample concentrations exceed 10 times the maximum amount detected in the blank. If an associated laboratory blank contains detectable levels of one or more chemicals not considered by the EPA to be common laboratory contaminants, then the sample results should be considered positive only if the sample concentration exceeds 5 times the maximum amount detected in the blank (EPA 1989).

The only reported case of method blank contamination occurred with samples from the Background site. Up to 1.6 parts per billion (ppb) of methylene chloride was detected in the VOC method blanks of CAS reports K946430A and K946594A. The methylene chloride data of the associated samples 94BKGD01SL through -10SL should be considered laboratory contaminants.

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4.2 Semi-Quantitative Risk Assessment Process

With the exception of the Ship Creek Outfall, semi-quantitative risk assessments were performed for each of the nine sites in OUD. The risk assessments are considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated quantitatively, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only two exposure pathways were considered (soil ingestion and tapwater ingestion); although these pathways yield the most conservative results, other pathways may also be important.

Human health risk calculations are presented in Appendix A. The parameters and equations used are identical to those employed by EPA Region 3 for development of the *Risk Based Concentration Tables* (EPA 1995a), with two modifications:

- <u>Frozen Ground:</u> Exposure frequencies for surface and subsurface soil were reduced to 7/12 of the default exposure frequency (350 days/year for residential; 250 days per year for commercial/industrial), since the ground is frozen for approximately 5 months of the year.
- <u>Subsurface Soil</u> For subsurface soil, the product of exposure frequency and duration was assumed to be one-fifth of that for surface soil, reflecting the decreased likelihood of exposure for subsurface soil.

Carcinogenic risks and noncarcinogenic hazard indices were evaluated for two exposure pathways: soil ingestion and tapwater ingestion. The tapwater ingestion pathway was evaluated only where groundwater analytical data were obtained. The inhalation and dermal contact pathways were not evaluated; however, a comparison of risks from soil ingestion versus inhalation is presented in Appendix A (Section A.5).

Two exposure scenarios were considered: residential and commercial/industrial. The receptors evaluated under these scenarios are identical to those used to develop the EPA Region 3 RBCs (e.g., combined childhood and adult exposures for soil, adult exposures for tap water, etc.). In this manner, results are presented simply as "residential" or "commercial/industrial", without regard to the individual receptors.

Risk calculations were performed for compounds whose maximum concentrations were:

• greater than the risk-based concentration (RBC) for tap water; or

• greater than 1/10 of the RBC for soil.

RBCs from EPA Region 3 (EPA 1995a) were used to select compounds for inclusion in the semi-quantitative risk assessment. This list reflects more current toxicity information than Region 10 RBCs (EPA 1992) and contains a larger list of compounds. In addition, the Region 3 RBCs are based on age-adjusted exposure factors, which more accurately represent one's cumulative exposure to carcinogens.

Background measurements were performed for all of the target analytes (Section 4.2). Although various organic compounds were detected at levels exceeding RBCs, comparison with naturally occurring levels is generally applicable only for inorganic chemicals (EPA 1989). As a result, a statistical comparison between background and site-related sample populations was performed for metal analytes (Appendix A). Sample populations that could not be distinguished from the background population were eliminated from the risk calculations. However, no organic chemicals were eliminated based on background concentrations.

Although EPA has classified lead as a Class B carcinogen, with an interim soil cleanup level of 400 mg/Kg (EPA 1994), an approved dose-response factor is not available. As a result, lead has been removed from RBC tables published by EPA Region III (EPA 1995a), and quantitative evaluation of human health risks is not possible. Accordingly, lead was eliminated from the semi-quantitative risk assessment. Although the maximum lead concentration in soil is below the interim soil cleanup level at each site, groundwater concentrations at Building 35-752 exceeded the drinking water action level of 0.015 mg/L included in EPA's *Drinking Water Regulations and Health Advisories* (EPA 1995b). These results should be considered for any risk management decisions involving Building 35-752.

As shown on Table 4-1, current RBCs are not available for some target analytes. These analytes were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. For other compounds, either method reporting limits or elevated reporting limits (resulting from analytical interference) are above RBCs. A list of compounds not detected at reporting limits exceeding RBCs is provided for each site in Chapter 5. Most of these compounds were identified in the Work Plan (ENSR 1994), but require special analytical services to achieve reporting limits below RBCs. For this situation, the *Risk Assessment Guidance for Superfund* provides the following guidance (EPA 1989, p. 5-9):

Table 4-1. Analytes Lacking Current Risk-Based Concentrationsfrom EPA Region III (1995).

Method	Analyte
Petroleum Hydrocarbons	Gasoline Range Organics (GRO) Diesel Range Organics (DRO) Total Petroleum Hydrocarbons (TPH)
Volatile Organic Compounds (VOCs)	1,1-Dichloropropene 1,2,3-Trichlorobenzene 1,3-Dichloropropane 2,2-Dichloropropane 2-Hexanone 4-Isopropyltoluene Bromobenzene Bromochloromethane Dibromomethane n-Butylbenzene n-Propylbenzene
Semivolatile Organic Compounds (SVOCs)	2-Methyl-4,6-dinitrophenol 2-Methylnaphthalene 2-Nitrophenol 4-Chloro-3-methylphenol 4-Chlorophenyl Phenyl Ether Acenaphthylene Benzo(g,h,i)perylene Bis(2-chloroethoxy)methane Phenanthrene
Pesticides	Delta-BHC Endosulfan II Endosulfan Sulfate Endrin Aldehyde
Metals	Calcium Lead Magnesium Potassium Sodium
Herbicides	Dichloroprop
Polychlorinated Biphenyls (PCBs)	Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1260

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... available modeling data, as well as professional judgement, should be used to evaluate whether the chemical may be present above reference concentrations [RBC]. If the available information indicates the chemical is not present, [continue using only positively detected chemicals]. If there is some indication that the chemical is present, then either re-analyze selected samples using SAS [special analytical services], if time allows, or address the chemical qualitatively.

Except for samples from the Ship Creek Outfall, compounds not detected at reporting limits exceeding RBCs include several chlorinated volatile organics, semivolatile organics (including polycyclic aromatic hydrocarbons [PAH]), and insecticides. Previous detection limits that exceed RBCs may be reached with better sample preparation, better control of extraction dilutions, or through the use of alternate established methods. These items will be examined during the RI/FS.

Calculated risks via soil ingestion and tapwater ingestion are summarized for each site in Chapter 5. These data can be used to evaluate the need for additional action, and to focus subsequent efforts on the most significant human exposures. These data do not, however, constitute a baseline risk assessment, nor do they adequately address potential ecological risks. At sites determined to require further action, these issues should be evaluated further during the RI/FS.

4.3 Background Evaluation

There are two types of background chemicals: 1) naturally occurring chemicals that have not been influenced by humans, and 2) chemicals that are present due to anthropogenic sources. Soils in the alluvial outwash plain on which the main cantonment are of Fort Richardson resides frequently contain coal. Background chemicals are usually eliminated from the RI/FS process, since risks associated with background chemicals are often small when compared to site-related compounds. However, if background risk is significant, this information may be important for risk-management decisions. As a result, where background chemicals are significant, background risks should be calculated separately from site-related risks (EPA 1989a).

In human health risk assessment, inorganic chemicals that are present at naturally occurring levels may be eliminated from further consideration. Comparison with naturally occurring levels is generally applicable only for inorganic chemicals, because most organic chemicals found at contaminated sites are not naturally occurring (EPA 1989a). With the exception of metals, all other analytes are organic chemicals. As a result, background statistical comparisons were performed only for metal analytes. All other analytes were included in the semi-quantitative risk assessment process.

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The results of the background metals evaluation are presented in Appendix A and include statistical comparisons based on background sampling performed by ENSR specific for this project using data in *Background Data Analysis Report, Fort Richardson, Alaska* (E&E 1996) for the entire base.

The following sections present a summary of background sampling locations, followed by an analysis of background risks.

4.3.1 Background Sampling

As part of the OUD investigation, Background samples were collected from four areas at Fort Richardson. Four background locations were considered sufficient for the purpose of this investigation, as indicated by ENSR's scope-of-work. The locations were identified as D Street, North, Loop Road, and Ship Creek (Figure 4-1). The objectives of the Background field sampling program were to assess the concentrations of targeted compounds at the nine OUD sites in undisturbed and non-contaminated soils, and to establish the naturally occurring concentrations of target compounds for comparative purposes.

Approximately two surface soil samples and five subsurface soil samples were collected at each background location. The surface samples were collected at 6 inches and 2 feet bgs, and the subsurface samples were collected from one soil boring advanced to a nominal depth of 20 feet bgs. Boring logs are presented in Appendix K.

The soils encountered at the four sites were generally described as sandy gravel and silty sand with some gravel. OVM readings at the Background sites did not exceed 9 ppm. Soil samples were submitted for laboratory analysis of petroleum hydrocarbons, volatile organic compounds, semivolatile organic compounds, pesticides, herbicides, polychlorinated biphenyls, metals, dioxins and furans, ethylene glycol, and inorganics (ammonia nitrogen, nitrate + nitrite, and sulfate). A complete listing of analytical results for samples collected from the background sites is presented in Appendix K.

4.3.2 Background Risk Evaluation

A semi-quantitative risk assessment was performed for background chemicals using the methods described in Section 4.2. The risk assessment is considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only one exposure pathway was considered (soil ingestion); although this pathway usually yields the most conservative results, other pathways may also be important.

4.3.2.1 Compounds of Potential Concern

A summary of the compounds of potential concern is presented in Table 4-2. These compounds include monoaromatics (4-isopropyltoluene), polychlorinated diphenyl alkanes (4,4'-DDT), metals (As, Cr, Ni), and dioxins and furans (several). As shown on Table 4.2, some of these compounds are carcinogens.

All of the other target analytes were either 1) not detected or 2) below 1/10th of the RBC for residential soil EPA Region 10 (1992) suggests 1/10th of the soil RBC as a criterion for compounds to be included in a baseline risk assessment. As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semiquantitative risk assessment *only* when they were detected in a site-related sample.

As described below (Section 4.3.2.4), the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, diesel range organics [DRO], and total petroleum hydrocarbons [TPH]). As a result, these data were not included in the semiquantitative risk assessment.

4.3.2.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Sources, transport mechanisms, exposure pathways, and receptors, elements of the Conceptual Site Model, are shown on Figure 4-2. The source of background contaminants is not known, but is presumably related to previous military activities at Fort Richardson. Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile compounds of potential concern (COPC) may disperse in the atmosphere or accumulate in enclosed spaces. However, only one volatile COPC was detected at levels exceeding 1/10th of the RBC for residential soil (4-isopropyltoluene). Concentrations of 4-isopropyltoluene, as well as concentrations of nonvolatile COPCs in airborne dust, are not expected to be of concern in the atmosphere (see Appendix A, Section A.5 for a comparison of exposures via inhalation versus soil ingestion).

Surface water transport may be significant for contaminants present in surface soil. With the exception of 4-isopropyltoluene, leaching is not expected to be significant because most of the COPCs are relatively insoluble in water.

Depending on future land use, potential receptors may include residents, occupational workers, and construction workers. Ecological receptors include terrestrial and aquatic plants, mammals, invertebrates, and avian species.

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Table 4-2. Compounds of Potential ConcernBackground Samples

Туре	Source	Carcinogens	Noncarcinogens
Monoaromatics	Fuels	None	4-lsopropyltoluene
Polychlorinated diphenyl alkanes	Insecticides	4,4'-DDT	
Dioxins and Furans	Herbicides	Dibenzo-p-dioxins and dibenzofurans with chlorine substituted in the 2,3,7,8 positions (several)	None
Metals	Background soil; fuels and oils	Arsenic	Chromium Nickel

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4.3.2.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion pathway. Soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, this pathway was selected to determine if soil exposures represent a significant human health risk. If human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of a baseline risk assessment.

Soil exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for carcinogens. For example, exposures to noncarcinogens are calculated assuming childhood exposure only, whereas exposures to carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations in soil were calculated as the 95 percent upper confidence limit (UCL) of the average concentration of all samples analyzed from a particular medium (surface or subsurface soil). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991, 1992).

4.3.2.4 Toxicity Assessment

Dose-response factors were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

Compounds not included in EPA (1995a) were assigned proxy dose-response factors based on those for related compounds. These compounds are listed in Table 4-3, along with related compounds and toxic equivalency factors (TEFs; where available). A provisional reference dose for 1,3,5-trimethylbenzene (EPA 1995a) was used as a proxy reference dose 4isopropyltoluene. This value was selected because it is the lowest reference dose of all nonhalogenated alkylbenzenes provided in EPA (1995a), thereby providing a conservative estimate of the noncarcinogenic effects of volatile fuel hydrocarbons.

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Table 4-3. Proxy Dose-Response Factors for Compounds Lacking Toxicity DataBackground Samples

Surrogate	Compounds		Tar	get Compo	ound	
Name	Approved RfDo ¹	Approved CSFo ¹	Name	TEF ²	Proxy RfDo	Proxy CSFo
1,3,5-Trimethylbenzene	0.0004		4-Isopropyttoluene	None ³	0.0004	
2,3,7,8-TCDD (dioxin)		1.56E+5	2,3,7,8-PeCDDs (dioxins)	0.5		7.80E+4
2,3,7,8-TCDD		1.56E+5	2,3,7,8-HxCDDs	0.1		1.56E+4
2,3,7,8-TCDD		1.56E+5	2,3,7,8-HpCDDs	0.01		1.56E+3
2,3,7,8-TCDD		1.56E+5	OCDD	0.001		1.56E+2
2,3,7,8-TCDD		1.56E+5	2,3,7,8-TCDFs (furans)	0.1		1.56E+4
2,3,7,8-TCDD		1.56E+5	1,2,3,7,8-PeCDFs	0.05		7.80E+3
2,3,7,8-TCDD		1.56E+5	2,3,4,7,8-PeCDFs	0.5		7.80E+4
2,3,7,8-TCDD		1.56E+5	2,3,7,8-HxCDFs	0.1		1.56E+4
2,3,7,8-TCDD		1.56E+5	2,3,7,8-HpCDFs	0.01		1.56E+3
2,3,7,8-TCDD		1.56E+5	OCDF	0.001		1.56E+2

Notes:

¹ "Approved" oral reference doses (RfDs) from EPA (1995a).

² Toxicity Equivalency Factors (TEF) for PAH from Magee et al. (1993); dioxins and furans from EPA (1989).

³ No TEFs have been developed for these compounds. RfDs for surrogate compounds were substituted as those for the target compounds.

Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semi-quantitative risk assessment.

4.3.2.5 Human Health Risk Characterization

The following sections summarize potential human health risks via soil ingestion. As described above, soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, if human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of a baseline risk assessment.

Human Health Risks - Carcinogenic

Carcinogenic risks for the soil ingestion pathway are summarized on Table 4-4. A breakdown of risk calculations for each pathway and receptor are presented in Appendix A.

	Carcinogenic Risk					
Pathway	Residential	Occupational				
Surface Soil	1.0 x 10 ⁻⁵	1.2 x 10 ⁻⁵				
Subsurface Soil	4.0 x 10 ⁻⁵	4.7 x 10 ⁻⁶				
Total Risk	5.0 x 10 ⁻⁵	5.9 x 10⁵				

Table 4-4. Carcinogenic Risks for Soil Ingestion Background Samples

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Using both residential and occupational exposure factors, the excess lifetime carcinogenic risk for soil ingestion exceeds the lower benchmark of 1×10^{-6} listed in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). As a result, exposures via inhalation and dermal contact should also be evaluated. About 92 percent of the carcinogenic risk is associated with arsenic.

Human Health Risks - Noncarcinogenic

Noncarcinogenic hazard indices for the soil ingestion pathway are summarized on Table 4-5. A breakdown of risk calculations for each pathway and receptor are presented in Appendix A.

	Hazard Index					
Pathway	Residential	Occupational				
Surface Soil	0.20	0.0081				
Subsurface Soil	0.19	0.0075				
Total Hazard Index	0.39	0.0156				

Table 4-5. Hazard Indices for Soil Ingestion Background Samples

Using residential exposure factors, the total hazard index for soil ingestion is 0.39. This level is close to the estimated threshold for adverse effects (1.0). As a result, additional exposures via dermal contact and inhalation should also be considered. About 94 percent of the noncarcinogenic hazard is associated with 4-isopropyltoluene, and the remainder is associated with chromium and nickel.

Using occupational exposure factors, the total hazard index for soil ingestion and drinking water ingestion is approximately 0.016. This level is well below the estimated threshold for adverse effects (1.0). Additional exposures due to inhalation and dermal contact are not likely to exceed the adverse effects threshold.

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4.3.2.6 Summary

The foregoing analysis shows that ingestion of background soil exceeds the NCP's lower carcinogenic risk threshold for both residential and occupational scenarios. In addition, noncarcinogenic risks for residential soil ingestion are sufficiently close to the adverse effects threshold that other exposure pathways should also be evaluated. Carcinogenic risks are associated with both naturally occurring (arsenic) and anthropogenic chemicals (dioxins). Noncarcinogenic risks are primarily the result of anthropogenic chemicals (4-isopropyltoluene).

Although risks due to both naturally occurring and anthropogenic background chemicals can be eliminated during risk assessment, these results should be considered if the risk to individual receptors is important for risk-management decisions (EPA 1989).

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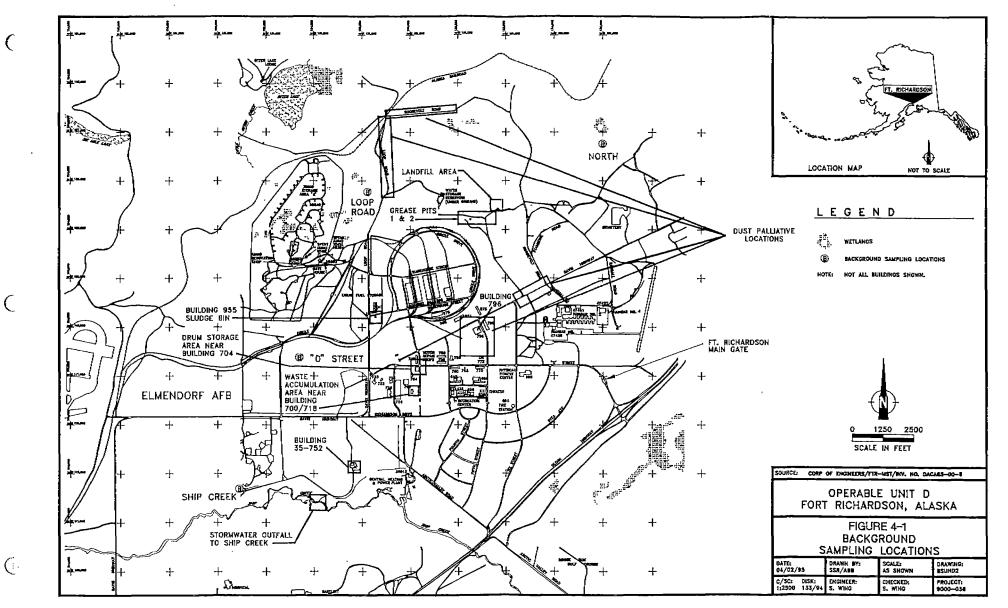


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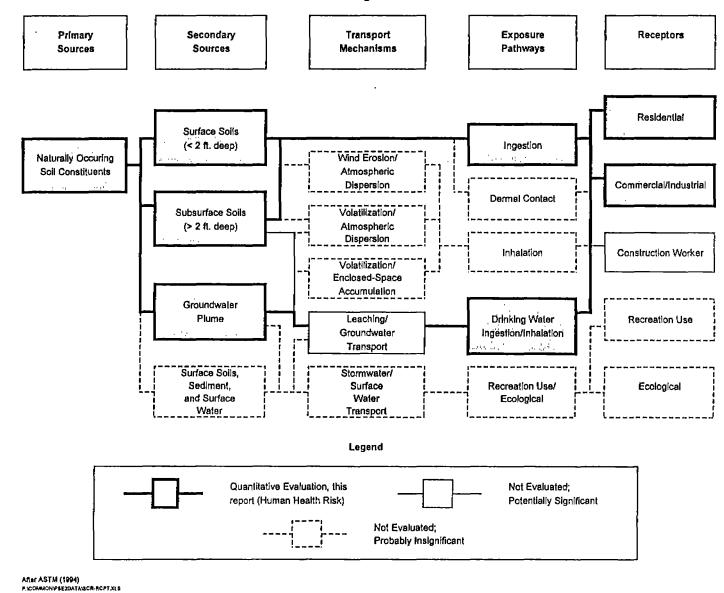


Figure 4-2: Sources, Transport Mechanisms, Exposure Pathways, and Receptors Background

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5.0 PRESENTATION OF INVESTIGATION RESULTS

This section summarizes the field investigation and presents the findings at each site. Each site is discussed in its entirety before progressing to the next site. Topics discussed for each site include:

- Site History
- Field Investigation
- Analytical Results
- Semi-Quantitative Risk Assessment
- Findings and Conclusions

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5.1 Building 35-752

5.1.1 Site History

Building 35-752 is the former generator building for the adjacent antenna field transmitter building. The building once housed four generators situated in a 4-inch-deep concrete pit located in the middle of the floor. When the generators were removed in 1987, the pit was filled with concrete to bring this area to grade. In 1989, the building was used as a temporary storage location for 125 bags of polychlorinated biphenyl (PCB)-contaminated soil. Each bag reportedly weighed approximately 2,000 pounds. The bags of soil have since been removed, but dust from the bags may remain on the floor. In 1991, samples of the dust and dirt remaining on the floor were collected and composited. Aroclor 1254, a PCB, was the only compound detected above method reporting limits (MRLs). The Aroclor 1254 concentration in the composited sample was 411 parts per million (ppm).

Seven underground storage tanks (USTs) were excavated from the south side of Building 35-752 in 1990. The tanks were operational from 1953 to 1987 and presumably contained diesel fuel for the generators. During closure activities, petroleum hydrocarbon contamination was found in the excavation. The excavated soil was stockpiled off site; during routine characterization analyses of the piles, Aroclor 1260 was detected at concentrations ranging from 5,500 to 322,000 micrograms per kilogram (μ g/Kg). The excavation was filled with clean soil from another location on base.

The south end of the east side of the building was the site of a drum storage area in the 1960s and 1970s. The drums reportedly came from vehicle maintenance shops. The unlined area was approximately 20 feet by 30 feet. In addition, herbicides and pesticides may have been applied to the area.

Insulating oils associated with the generators housed inside Building 35-752 likely contained PCBs. Cooling water from the generators was discharged into cooling ponds located southwest of the building via a culvert pipe extending from the building. There is a remote possibility that discharged water may have carried insulating oils into the ponds. The cooling ponds currently receive discharge water from Building 35-750. A well adjacent to Building 35-750 pumps water to the building cooling system, used to maintain cool temperatures for the electronic gear inside. Water is discharged from the cooling system to the cooling ponds.

The cooling ponds appear to be man-made. The Groundwater Gradient Map shown in Figure 5.1-4 supports this.

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5.1.2 Field Investigation

Sampling at Building 35-752 consisted of collecting soil, pond sediment, groundwater, and PCB wipe samples at four potential source locations to assess the presence of contamination, possible downward migration of contaminants, and to evaluate potential source areas for groundwater contamination.

The four areas investigated at Building 35-752 were:

- Concrete floor,
- Former USTs,
- Drum accumulation area, and
- Cooling ponds.

5.1.2.1 Concrete Floor

Building 35-752 is currently used for the storage of fire extinguishers. Entry is restricted; however, fire department personnel regularly enter the building. Access to Building 35-752 was obtained from the Fort Richardson Fire Department in order to assess the presence of PCBs in residual dust and oil on the concrete floor. Level C respiratory protection equipped with high efficiency particulate air (HEPA) filters were put on before entering the building, and the door to the building was left open during sampling. The breaker box was located in the building per the Fire Department's instructions, and power was turned on for sampling purposes. The building was not heated.

Sampling locations were selected to obtain representative coverage of the entire floor area and included areas obviously impacted by dust and oil (Figure 5.1-1). Samples were collected from 28 different locations. A 10-by-10-cm cardboard template was placed on the concrete floor. Gauze pads saturated with hexane were wiped 10 times in a forward and backward motion within the template area, and then turned over and wiped 10 times side to side within the template. The pads were folded and placed in a labeled sample jar. A total of 32 samples were collected and analyzed for PCBs. Each sampling location was measured from the template's southwest corner to the southwest corner of the building and marked with a paint pen for ease of relocation. Samples could not be obtained from the northwest corner of the building due to ice on the floor.

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5.1.2.2 Former UST Locations

Four borings were advanced and sampled within the footprint of the former UST excavation to assess the possible downward migration of contaminants from below the backfilled soils (Figure 5.1-2). Soil borings AP-3497 and AP-3499 (Appendix B) were advanced to assess contaminant concentrations at depth. The borings were located adjacent to existing monitoring wells AP-2982 and AP-2987, where hydrocarbon contamination has been detected. Soil borings AP-3498 and AP-3500 were located to evaluate the extent of contamination in the area of the backfilled soils.

Soil boring AP-3497 was advanced and sampled to a depth of 20 feet bgs. Subsurface materials included sandy gravel and sand. A strong hydrocarbon odor was detected from 14 to 18 feet bgs, and a slight hydrocarbon odor was detected from 18 to 20 feet bgs. OVM readings were at 166.6 ppm at 2 feet bgs, 233.3 ppm at 4 feet bgs, 233.4 ppm at 14 to 16 feet bgs, and 2.7 ppm at 18 feet bgs.

Soil boring AP-3498 was advanced and sampled to 16 feet bgs, where groundwater was encountered. Subsurface materials generally consisted of sandy gravel and sand. Strong hydrocarbon odors were detected at 10 to 16 feet bgs. At 14 to 16 feet bgs, a hydrocarbon sheen was observed on the sampler. OVM readings ranged from 1.8 ppm to 1,242 ppm. The highest readings were recorded at 10 to 12 feet bgs.

Soil boring AP-3499 was advanced and sampled to 16 feet bgs. Subsurface materials generally consisted of sandy gravel and sandy silt with pockets of light gray clay and some wood pieces. Strong hydrocarbon odors were noted at 14 to 16 feet bgs. OVM readings ranged from 5.5 ppm to 22.5 ppm.

Soil boring AP-3500 was advanced and sampled to 18 feet bgs. Subsurface materials consisted of sandy gravel and sandy silt/silty sand. Soils were generally very moist. A moderate hydrocarbon odor was detected at 4 to 6 feet bgs, and a very strong hydrocarbon odor was detected at 15 to 18 feet bgs. Groundwater was encountered at 17.5 feet bgs. The highest recorded OVM reading was >2,000 ppm at 14 to 18 feet bgs.

Groundwater samples were collected from existing wells AP-2983 and AP-2986 to evaluate the former tank area as a potential source of groundwater contamination.

Based on the soil boring logs from Building 35-752, a cross section of the investigation area is presented in Figure 5.1-3.

5.1.2.3 Drum Accumulation Area

The former drum accumulation area was sampled in eight locations within the 20-by-30-foot area (Figure 5.1-2). Samples were collected at 6 inches and 2 feet bgs at each location. The sample locations were based on a grid pattern to assess if a release has occurred and to assess potentially impacted soils. Eighteen samples were submitted for analysis. OVM readings from samples collected at 6 inches bgs ranged from 1.9 to 3.5 ppm. OVM readings from samples collected at 2 feet bgs were recorded as 0 ppm. (Background OVM readings ranged from 10 to 14 ppm.)

Two soil borings were located based on the preliminary analytical results from the surface samples. The borings were advanced in two of the more contaminated areas to evaluate the migration of the contamination through the vadose zone.

Soil borings AP-3505 and AP-3506 were drilled and sampled to 16 feet bgs, where groundwater was encountered. Subsurface materials included sandy silt to silty sand and sandy gravel. No odors were detected. OVM readings of soil samples from the two borings ranged from 2.0 ppm to 6.9 ppm. A cross section of the investigation area is presented in Figure 5.1-3.

5.1.2.4 Cooling Ponds

Eight sediment samples were collected from the Cooling Ponds (Figure 5.1-2). Four representative locations from each pond were chosen for sampling. A backhoe was used to collect the samples from the bottom of the cooling ponds.

Four borings were advanced and sampled as part of the investigation. Borehole AP-3501, a slant boring, was located on the east side of the pond and drilled at a 45-degree angle underneath the pond. The boring was sampled at a depth of approximately 7.5 feet below the bottom of the pond to assess the potential migration of contaminants from the pond sediment. The boring was angled to prevent the transport of pond sediment contaminants during drilling.

Monitoring well AP-3502, to the northeast of the pond, was located to assess local groundwater elevations and to determine whether contaminants from either the pond or monitoring well AP-2982 were present in groundwater at this location. A groundwater gradient map is presented in Figure 5.1-4. The soil boring was advanced to 22.5 feet bgs and completed as monitoring well AP-3502. Soil samples were collected to 13 feet bgs. Subsurface materials consisted of silty sand and sand. Saturated soil was encountered at 15 feet bgs. The well was screened

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from 12 to 22 feet, packed with sand to 10 feet, and capped with a 2-foot bentonite seal. The annulus was then grouted to the surface. Monitoring well AP-3502 was completed as a flush-mount well. OVM readings from field soil samples ranged from 0.4 ppm to 9.8 ppm.

Monitoring well AP-3503, west of the cooling ponds, was located to determine if contaminants from the pond sludges have impacted adjacent soils or groundwater. The boring was advanced to 19 feet bgs and completed as monitoring well AP-3503. Soil samples were collected to 12 feet bgs where saturated soil was encountered. Subsurface materials ranged from sandy silt to silty sand. The monitoring well was screened from 8.5 feet to 18.5 feet. The annular space was packed with sand to 6 feet bgs with a 2-foot-thick bentonite seal on top of the sand pack. The annulus above the bentonite seal was grouted to the surface. Monitoring well AP-3503 was completed as a stick-up well. OVM readings from field soil samples ranged from 1.1 to 2.4 ppm.

Monitoring well AP-3504 to the north of the ponds was placed to aid in the delineation of the local groundwater flow direction. The soil boring was advanced to 24 feet bgs and completed as monitoring well AP-3504. Soil samples were collected to 16 feet bgs, where saturated soil was encountered. Subsurface materials consisted of silty sand and sandy gravel. A cross section of the investigation area is presented in Figure 5.1-3. The well was screened from 13.5 feet to 23.5 feet bgs, packed with sand to 11 feet, and capped with a 2-foot-thick bentonite seal. The annulus was grouted to the surface. Monitoring well AP-3504 was completed as a flush-mount well. OVM readings from field soil samples ranged from 0.2 to 2.4 ppm.

The three new monitoring wells and existing wells AP-2982 and AP-2987 were sampled in late December 1994 to evaluate the Cooling Ponds as a potential source of groundwater contamination. Monitoring well AP-3502 had slow recovery, and was purged and sampled over a 3-day span.

5.1.3 Analytical Results

The total number of samples collected at Building 35-752 include:

- 63 soil samples, including 8 blind duplicates and 8 QA samples;
- 10 sediment samples, including 1 blind duplicate and 1 QA sample;
- 9 water samples, including 1 blind duplicate and 1 QA sample; and
- 32 PCB wipe samples, including 4 blind duplicates and 4 QA samples.

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Soil, sediment, and water samples were analyzed for total recoverable petroleum hydrocarbons (TRPH), GRO, DRO, VOCs, PCBs/organochlorine pesticides, chlorinated herbicides, semivolatile organic compounds (SVOCs), and metals. Analytes above the MRL are shown in Tables 5.1-1 through 5.1-6. A complete summary of all analytical data from Building 35-752 is shown in Appendix B.

In addition, 17 samples, generally two from each borehole, were sent to USACE North Pacific Division (NPD) Laboratory for geotechnical testing, including Atterburg limits, grain size distribution, and percent moisture content. Results from the soil geotechnical analyses are recorded in Appendix B.

All data are accepted with the following general qualifications:

- Low levels of organochlorine pesticides and PCBs may not have been detected in sample 9457524AGW based on low surrogate recoveries.
- DRO data in samples 9457525AGW and -27AGW are considered low estimates based on low surrogate recoveries.
- The selenium data in reports K947974A, K946882A, K946243A, and K946921A (samples 94575273SL through -76SL, -78SL through -84SL, -06SL through -10SL, -19SL through -26SL, -86SL through -90SL, and -4AGW through -7AGW) and the arsenic data in K947974A (samples -4AGW through -7AGW) are considered low estimates based on low matrix spike recovery.
- The lead data in report K947108A (sample 94575240SL), the barium data in report K946243A (samples -06SL through -10SL), and the arsenic data in reports K946240A and K947072A (samples -01SL through -05SL and -35SL through -39SL) are accepted as estimates based on high relative percent differences (RPDs).

More detailed qualifications and exceptions are noted in the USACE NPD Laboratory's CQAR and ENSR Quality Assurance Summary Report (QASR) located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

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				Polychlorinated I	Biphenyls (PCBs)
Sample Location No.	Sample ID:	Lab Code:	Date Collected:	Aroclor 1254 (µg/wipe)	Aroclor 1260 (µg/wipe)
1	94575249MI	K947753-001	12/9/94	750	ND
2	94575250MI	K947753-002	12/9/94	18	ND
3	94575251MI *	K947753-003	12/9/94	37	ND
4	94575252MI	K947753-004	12/9/94	41	6
5	94575253MI	K947753-005	12/9/94	41	24
6	94575254MI	K947753-006	12/9/94	82	14
7	94575255MI	K947753-007	12/9/94	76	ND
6	94575256MI	K947753-008	12/9/94	6	ND
9	94575257MI	K947753-009	12/9/94	88	ND
10	94575258MI	K947753-010	12/9/94	64	ND
11	94575259MI	K947753-011	12/9/94	130	ND
12	94575260MI	K947753-012	12/9/94	40	ND
13	94575261MI *	K947753-013	12/9/94	19	ND
14	94575262MI	K947753-014	12/9/94	38	3
15	94575263MI	K947753-015	12/9/94	33	ND
16	94575264MI	K947753-016	12/9/94	34	4
17	94575265MI *	K947753-017	12/9/94	19	2
18	94575266MI	K947753-018	12/9/94	71	12
19	94575267MI	K947753-019	12/9/94	140	13
20	94575268MI	K947753-020	12/9/94	71	17
21	94575269MI	K947753-021	12/9/94	580	29
22	94575270MI	K947753-022	12/9/94	120	24
23	94575271MI	K947753-023	12/9/94	63	35
24	94575291MI	K947753-024	12/9/94	22	32
25	94575292MI	K947753-025	12/9/94	140	27
26	94575293MI	K947753-026	12/9/94	610	39
27	94575294MI	K947753-027	12/9/94	160	ND
28	94575295MI	K947753-028	12/9/94	62	8
29	94575296MI	K947753-029	12/9/94	9	ND
30	94575297MI	K947753-030	12/9/94	27	10
31	94575298MI	K947753-031	12/9/94	58	31
32	94575299MI	K947753-032	12/9/94	73	24

TABLE 5.1-1 Summary of Analytes Detected Building 35-752 Concrete Floor Wipe Sample Analytical Results

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TABLE 5.1-2 Summary of Analytes Detected Building 35-752 Soll Sample Analytical Results Former UST Location

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	Location:			SB AP 3497				SB AP 3498	
	Sample Depth:	0-4'	4'-10'	4'-10'	14'-16'	18'-20'	0-4'	4'-8'	10'-12'
	Sample ID:	94575273SL	94575274SL	94575275SL	94575276SL	94575278SL	94575279SL	94575280SL	94575281S
	Lab Code:	K946882-006	K946882-007	K946882-008	K946882-009	K946882-010	K946682-011	K946882-001	K946882-00
	Date Collected:	11/2/94	11/2/94	11/2/94	11/2/94	t 1/2/94	11/2/94	11/2/94	11/2/94
Compound	Residential RBC								
Petroleum Hydrocarbons	(mg/Kg)								
GRO	none	ND	ND	ND	ND	ND	ND	ND	920
DRO	none	487	ND	ND	ND	ND	15	ND	8,150
ГРН	none	610	ND	ND	ND	NÖ	ND	ND	6,900
Organochiorine Pesticides	(mg/Kg)								
4-DDT	1.9	<0.07	ND	ND	ND	ND	<0.02	ND	ND
Polychlorinated Biphenyls	(mg/Kg)								
Aroclor 1260	none	4,1	ND	ND	ND	ND	0.7	ND	ND
Volatite Organic Compoun	de (ug/Kg)						· · · · ·		
Acetone	7,800,000	ND	ND	ND	ND	ND	ND	76	<12,000
richloroathane (TCE)	58,000	34	23	22	ND	ND	ND	ND	<1,200
Ethylaenzene	7,800,000	ND	ND	ND	ND	ND	ND	ND	2,300
Folal Xylenes	160,000,000	6	8	ND	ND	ND	ND	ND	14,000
1,3,5-Trimethylbenzene	31,000	ND	ND	ND	ND	ND	ND	ND	7,800
1,2,4-Trimelhylbenzene	39,000	ND	ND	ND	ND	ND	NÔ	ND	18,000
Vaphihalene	3,100,000	ND	ND	ND	ND	ND	ND	ND	<5,000
Semivolatile Organic Com	pounds (mg/Kg)								
laphthalen a	3,100	ND	ND	ND	ND	ND	ND	ND	<8
2-Methylnephthalene	none	ND	ND	ND	ND	ND	ND	ND	10
Di-n-octyl Phihalate	1,600	0.7	ND	ND	ND	ND	0.36	ND	-6
rotal Metals (mg/Kg)					·				
vsenic	0.37	0	4	4	5	5	4.	5	5
Barlum	5,500	66	50	46	42	37	59	72	44
Chromium	390	27	36	35	30	31	28	42	28
ead	none	20	6	7	7	5	5	0	0
lickel	1,600	31	32	37	34	35	29	37	30
ielenium	390	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	101	1 ŪJ
FOOTNOTES:	ND = Non-detected at U UJ = The enalyte was n < = Less than. Analy	ot detected at the MR tical reporting limit ha	L, however, the MRL is s been elevated due to	s considerad an estima matrix interferences o	te.	lion.			

A shaded value indicates result exceeds the residential risk based concentration (RBC).

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				Former UST L	ocation				
									Part 2
	Location:		SB AP 3499				SB AP 3500		
	Sample Depth:	0-2'	4'-8'	B'-12'	0-4'	0-4'	4'-8'	B'-12'	14'-16'
	Sample ID:	94575282SL	94575283SL	94575284SL	94575286SL	94575287SL	9457528BSL	94575289SL	945752905
	Lab Code;	K946882-003	K946862-004	K946882-005	K948921-005	K946921-006	K946921-007	K948921-008	K946921-0
	Date Collected:	11/2/94	11/2/94	11/2/94	1 1/3/94	11/3/94	11/3/94	11/3/94	11/3/94
Compound	Residential RBC		_						
Petroleum Hydrocarbons	(ma/Ka)								
GRO	none	ND	ND	ND	ND	ND	ND	ND	910
DRO	none	352	74	50	10	15	40	ND	1,310
ТРН	none	430	91	27	35	24	40	ND	1,800
Organochlorine Pesticide	(ma/Ka)								
4,4-DDT	1,9	<0.04	0.01	ND	ND	ND	ND	ND	ND
Polychtorinated Biphenyls	(ma/Ka)								
Arodor 1260	none	0.9	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compour	nde (µg/Kg)								
Acetone	7,800,000	ND	ND	ND	ND	ND	ND	ND	<13,000
Trichloroethene (TCE)	58,000	ND	ND	ND	ND	ND	ND	ND	<1,300
Ethylbenzene	7,800,000	ND	ND	ND	ND	ND	ND	ND	2,700
Total Xylanes	180,000,000	ŇD	ND	ND	ND	5	ND	ND	15,000
1,3,5-Trimethylbenzene	31,000	ND	ND	ND	ND	ND	ND	ND	5,600
1,2,4-Trimelhylbenzene	39,000	ND	ND	ND	ND	ND	ND	ND	14,000
Nephihalane	3,100,000	ND	ND	ND	ND	ND	ND	ND	5,300
Semivolatile Organic Com	pounds (mg/Kg)								
Naphthelene	3,100	ND	ND	ND	ND	ND	ND	ND	1,66
2-Methylnaphthalene	none	ND	ND	ND	ND	ND	ND	ND	4,48
Di-n-octyl Phthalale	t,600	ND	ND	ND	ND	NO	ND	ND	<1.5
Total Metals (mg/Kg)									
Arsenic	0.37	8	5	- 5	6	5	6	5	5
Barlum	\$,500	58	94	50	75	61	90	56	67
Chromium	390	20	31	30	28	32	32	28	31
.ead	none	84	8	6	6	5	5	5	5
Vickei	1,600	24	30	30	35	33 .	38	29	35
Selenium	390	1 UJ	1 UJ	1 UJ	1 UJ	t UJ	1 UJ	1 UJ	1 UJ
OOTNOTES:	ND = Non-detected at t	he method reporting li	mit (MRL). (See the B	uliding 35-752 Append	ix for MRL values.)				
	UJ = The enalyte was n	of detected at the MR	L, however, the MRL is	considered an estima	ta,				
	< = Less than. Analy	tical reporting limit ha	s been elevated due lo	matrix interferences o	r sample requiring dilut	ion.			
	A shaded value indicate	s result exceeds the r	esidentiel risk based c	oncentration (RBC).					

TABLE 5.1-2 Summary of Analytes Detected (cont.)

Building 35-752 Soil Sample Analytical Results

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OUD PRELIMINARY SOURCE EVALUATION 2

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TABLE 5.1-3 Summary of Analytes Detected Building 35-752 Soil Sample Analytical Results **Drum Accumulation Area**

	Location:	Location: SB AP 3505					SB AP 3506				
	Sample Depth:	0-4'	4'-5'	9-11	12-15	0-2	4'-8'	8-12	14'-16'		
	Sample ID:	94575219SL	94575220SL	94575221SL	94575222SL	94575223SL	94575224SL	94575225SL	94575226SI		
	Lab Code;	K946921-001	K946921-002	K946921-003	K946921-004	K946921-010	K946921-011	K946921-012	K946921-01		
	Date Collected:	11/3/94	11/3/94	11/3/94	11/3/94	11/3/94	11/3/94	11/3/94	11/3/94		
Compound	Residential RBC				1		i				
Petroleum Hydrocarbons						<u> </u>			<u> </u>		
	none	81	61	ND	ND	83	ND	ND	ND		
грн	none	146	56	ND	ND	350		ND	ND		
Organochiorine Pesticide:	s (mg/Kg)										
4.4'-DDD	2.7	<0.1	<0.06	ND	ND	ND	ND	ND	ND		
.4'-DDT	1,9	<0.1	<0.1	ND	ND	<0.02	ND	ND	ND		
Polychiorinated Biphenyl											
Aroclor 1260	none	3.4	1.1	ND		0.3		ND			
/olatile Organic Compour	nds (µg/Kg)										
Inchloroethene (TCE)	58,000	10	6	DM	ND	ND	ND	ND	ND		
[oluene	16,000,000	5	ND	ND	ND	ND	ND	ND	ND		
Ethylbenzene	7,800,000	ND	ND	ND	ND	ND	ND	ND	ND		
Total Xylenes	160,000,000	9	6	7	ND	ND	ND	ND	ND		
1.2.4-Trimethylbenzene	39,000	ND	ND	ND	NĎ	ND	ND	ND	ND		
Semivolatile Organic Com											
Fluoranthene	3,100	<0.6	0.73	ND	ND	<0.6	ND	ND	ND		
Pyrene	2,300	<0.6	0.69	ND	ND	<0.6					
	46	<0.6	ND	ND	ND	0.80		ND ND	ND		
Bis(2-ethylhexyl) Phthalate Chrysene		<0.6	0.85	ND ND	ND	<0.6		ND ND	ND ND		
Di-n-octyl Phthalate	1,600	<0.6	0.85	ND -	ND	1.32	0.36	ND 0.41	0,3		
	0.88	<0.8 0.7	0.97	ND	ND	<0.6	ND	ł			
Benzo(b)fluoranthene	8.8	0.7	0.65	ND ND	ND	<	ND ND	ND	ND		
Benzo(k)iluoranthene	0.088	0.7	-0.31			<0.5	ND ND	ND	ND NO		
Benzo(a)pyrene	0.88	<0.6	ND	ND ND		<0.6	ND	ND	NO		
Indeno(1,2,3-cd)pyrene	0.86							ND	ND		
Total Metals (mg/Kg)					-		1				
Arsenic	0,37	6	7	4	6	5	4	6	-6		
Barium	5,500	69	76	44	37	70	63	44	44		
Chromium	390	26	28		27		40	31	32		
Lead	none	18	8	4	5	24	6	5	6		
Nickel	1,600	31	30	25	32	33	33	30	39		
Selenium	390	1 UJ	1 UJ	100	1 UJ	101	1 UJ	1 UJ	103		
Aluminum	78,000	NA	NA	NA	NA	NA	NA	NA	NA		
Calcium	лопе	NA	NA	NA	NA	NA	NA	NA	NA		
Cobalt	4,700	NA	NA	NA	NA	NA	NA	NA	NA		
Copper	2,900	NA	NA	<u>NA</u>	NA	<u>NA</u>	<u>NA</u>	NA	NA		
lron	none	NA	NA	NA	NA	NA	NA	NA	NA		
Magnesium	none	NA	NA	NA	NA	NA	NA	NA	NA		
Manganese	390	NA	NA	NA	NA	NA	NA	NA	NA		
Potassium	none	NA	NA	NA	NA	NA	NA	NA	NA		
Sodium	none	NA	NA	NA	NA	NA	NA	NA	NA		
Vanadium	550	NA	NA	NA	NA	NA	NA	NA	NA		
Zinc	23,000	NA	NA	NĄ	NA	NA	NA	NA	NA		
FOOTNOTES:	ND = Non-detected	at the method re	porting limit (Mf	RL). (See the Bu	ilding 35-752 Ap	pendix for MRL	values.)				
	NA = Sample not ar	alyzed for this c	ompound,								
	UJ = The analyte w	as not detected a	it the MRL, how	ever, the MRL is	considered an e	stimate.					
	< = Less than. A	nalytical reportin	g limit has been	nievated due to	metrix interferen	ces or sample r	equiring dilution,				
	A shaded value indi	Cates result exci	necis the residen	tiai risk based or	incentration (RB	IC).					

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TABLE 5.1-3 Summary of Analytes Detected (cont.) Building 35-752 Soil Sample Analytical Results Drum Accumulation Area

	Location:			\$\$1			SS 3		
	Sample Depth:	6"	6*		6"	2	6*	2.	
	Sample ID:	94575201SL	94575202SL	94575218SL	94575203SL	94575217SL	94575204SL	94575216SL	
	Lab Code:	K945240-001	K945240-002	K946306-008	K945240-003	K946306-007	K945240-004	K946306-00	
	Date Collected:	10/6/94	10/6/94	10/10/94	10/6/94	10/10/94	10/6/94	10/10/94	
Compound	Residential RBC								
Petroleum Hydrocarbons ((mg/Kg)						1	1	
DRO	none	55	50	ND	18	15	70	ND	
РН	none	182	27	13 J	28	27 J	43	16 J	
Organochlorine Pesticides	(mg/Kg)							·	
4.4-DDD	2.7	ND	ND	ND	ND	ND	ND	ND	
4'-DDT	1.9		0.04	ND	ND	ND	0.02	ND	
	1.3						0.02		
olychlorinated Biphenyls	: (mg/Kg)			<u>i </u>					
vocior 1260	none	ND	ND	ND	ND	ND	ND	ND	
/olatile Organic Compour	nds (µg/Kg)								
richloroethene (TCE)	58,000	ND	ND	ND	ND	ND	ND	ND	
oluene	16,000,000	ND	ND	ND	ND	8	6	ND	
Ethylbenzene	7,800,000	ND	ND	ND	ND	6	ND	ND	
Total Xylenes	160,000,000	ND	ND	ND	ND	38	6	ND	
2.4-Trimethylbenzene	39,000	ND	ND	ND	ND	23	ND	ND	
Combrolatile Occasie Com			-					1	
Semivolatile Organic Com	3,100	ND	ND ND	ND	ND	ND	ND		
		ND		ND	ND	ND			
Pyrene	2,300	ND	ND	ND	ND	ND	ND ND		
Bis(2-ethylhexyl) Phthalate	88		ND	ND ND	NO NO		ND	ND	
Chrysene		ND ND	<u> </u>				ND	ND	
Di-n-octyl Phthalate	1,600	ND	ND ND	ND	ND	ND	ND	ND	
Benzo(b)fluoranthene	0.88	ND	ND	ND ND	ND	ND	ND ND	ND	
Benzo(k)fluoranthene	8.8	ND	ND ND	ND ND	ND	ND	ND ND	ND	
Benzo(a)pyrene	0.088	ND	ND	ND ND		ND	ND	ND	
ndeno(1,2,3-cd)pyrene	0.88	ND	ND	ND	ND		ND	ND	
Total Metals (mg/Kg)			<u> </u>	<u> </u>			<u></u>		
Arsenic	0.37	6J.	10 J	·5	7	77	8J	5	
Barium	5,500	77	97	58	64	57	99	49	
Chromium	390	29	35	30	29	38	36	24	
ead	none	5	8	6	8	8	12	5	
Nickel	1,600	33	42	37	33	44	49	27	
Selenium	390	<u>1</u> , UJ	1 UJ	ND	1100	ND	1 UJ	ND	
Aluminum	78,000	15,100	19,200	NA	13,300	NA NA	18,700	NA	
Calcium	none	4,360	5,230	NA	3,940	NA	5,670	NA	
Cobalt	4,700	11	13	NA	10	NA	13	NA	
Copper	2,900	28	39	NA	28	NA	31	NA	
iron	none	25,100	30,900	NA	22,000	NA	30,900	NA	
Magnesium	none	7,420	9,240	NA	7,300	NA	10,300	NA	
Manganese	390	564	720	NA	477	NA	669	NA	
Potassium	none	440	590	NA	440	NA	590	NA	
Sodium	none	122	158	NA	108	NA	171	NA	
Vanadium	550	45	57	NA	41	NA	60	NA	
	23,000	57	72	NA	52	NA	72 '	NA	

J = Value is considered an estimate.

A shaded value indicates result exceeds the residential risk based concentration (RBC).

VAAQCICOMMONRICHFINALSIREPTABLESIB35752 F XLSB35-752 Drum

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OUD PRELIMINARY SOURCE EVALUATION 2

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TABLE 5.1-3 Summary of Analytes Detected (cont.) **Building 35-752 Soil Sample Analytical Results** Drum Accumulation Area

	Location:	S	54		SS 5	· ·	SS 6		
	Sample Depth:	6"		6*		z	<u> </u>	2"	
	Sample ID:	94575205SL	- 94575215SL	94575206SL	94575213SL	94575214SL	94575207SL	94575212S	
	Lab Code:	K945240-005	K946306-005	K946242-001	K946306-003	K946306-004	K946242-002	K946306-00	
	Date Collected:	10/6/94	10/10/94	10/6/94	10/10/94	10/10/94	10/6/94	10/10/94	
		10/0/94	10/10/34	10/03-1	10/10/34	10/10/94	10/0/94	10/10/84	
Compound	Residential RBC								
etroleum Hydrocarbons	(mg/Kg)								
DRO	none	92	61	192	778	669	97	52	
ГРН	none	270	35 J	740	1,300 J	1,700 J	41	87 J	
Organochlorine Pesticide	. (ma/Ka)								
.4'-DDD	2.7	ND	ND	ND -	ND	ND	ND	ND	
I,4'-DDT	1.9	0.12	ND	ND	ND	ND		<0.04	
	1.9	0.12						-0.04	
Polychiorinated Biphenyls	s (mg/Kg)								
Vrocior 1260	none	0.5	ND	1.1	ND	ND	1.1	0,6	
/eletile Oie Oee		· ·							
/olatile Organic Compour		ND	ND		ND	ND		ND	
Trichloroethene (TCE)	58,000	6	<u> </u>	ND	ND ND		ND		
foluene	16,000,000		ND	÷	<u> </u>		ND	ND	
Ethylbenzene	7,800,000	ND			ND	ND	ND ND	ND	
Total Xylenes	160,000,000	6		ND	ND	ND	ND	ND	
1,2,4-Trimethylbenzene	39,000	ND	ND		ND	ND	ND	ND	
Semivolatile Organic Com	ipounds (mg/Kg)			-	}		1		
luoranthene	3,100	ND	ND	ND	ND	<0.7	ND	ND	
Pyrene	2,300	ND	ND	ND	ND	<0.7	ND	ND	
Bis(2-ethylhexyl) Phthalate	46	ND	ND	ND	ND	<0.7	ND	ND	
Chrysene	88	0.3	ND	ND	ND	<0,7	ND	ND	
Di-n-octyl Phthalate	1,600	ND	ND	ND	ND	<0.7	ND	ND	
Benzo(b)fluoranthene	-0.88	ND	ND	ND	ND	<0.7	ND	ND	
Benzo(k)fluoranthene	8.8			ND	ND	<0.7	ND		
Benzo(a)pyrene	0.088		ND	ND	ND	<0.7	ND		
Indeno(1,2,3-cd)pyrene	0.88		ND	ND	ND	<0.7	ND		
inderio(1,2,5-54)pyrene	0.00								
Total Metals (mg/Kg)		[· · · · · · · · · · · · · · · · · · ·			ļ		
Arsenic	0.37	7J	5	5	6	8	7	.6	
Barium	5,500	110	81	220 J	81	93	73 J	93	
Chromium	390		36	23	31	38	25	34	
Lead	попе	10	10	36	11	18	8	10	
Nickel	1,600	30	36	23	32	38	27	34	
Selenium	390	1 UJ	ND	ាយ	ND	ND	1 UJ	ND	
Aluminum	78,000	17,300	NA	8,620	NA	NA	13,300	• NA	
Calcium	лопе	3,150	NA	7,220	NA	NA	3,310	NA	
Cobait	4,700	11	NA	7	NA	NA	10	NA	
Copper	2,900	· 20	NA	22	NA	NA	24	NA	
Iron	none	22,700	NA	18,500	NA	NA	22,400	NA	
Magnesium	none	5,930	NA	6,820	NA	NA	6,250	NA	
Manganese	390	472	NA	383	NA	NA	455	NA	
Potassium	none	ND	NA	ND	NA	NA	450	NA	
Sodium	none	116	NA	65	NA	NA	111	NA	
Vanadium	550	46	NA	28	NA	NA	41	NA	
Zinc	23,000	47	NA	86	NA	NA	53	NA	
FOOTNOTES:	ND = Non-detacted NA = Sample not an UJ = The analyte wa < = Less than, Au	alyzed for this cor as not detected at nalytical reporting	npound, the MRL, however limit has been ele	, the MRL is consi	dered an estimate	-	ilution,		
CADE COMMON RICHTEINALS	J ≠ Value is consid A shaded value indi EPTABLE\$\8J\$752-F.XI	cates résult excee		risk based concen	tration (RBC)_			101	

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TABLE 5.1-3 Summary of Analytes Detected (cont.) Building 35-752 Soil Sample Analytical Results Drum Accumulation Area

Part 4 of 4

							Part 4 of
	Location:	SS 7		SS 8			
	Sample Depth:	6*	2"	6	z		
	Sample ID:	94575208SL	94575211SL	94575209\$L	94575210SL		
	Lab Code:	K946242-003	K946306-001	K946242-004	K946242-005		
	Date Collected:	10/6/94	10/10/94	10/6/94	10/6/94		
Compound	Residential RBC						
Petroleum Hydrocarbons	(mg/Kg)						
DRO	none	ND	17	100	ND		
ГРН	none	ND	14 J	48	13		
······································	- (
Organochiorine Pesticide		ND	ND	<0.06	0.01		·
4,4'-DDD	2.7	<0.04	<0.02	<0.08	<0.01		<u> </u>
4,4'-DDT	1.9	<0.04	~0.02	~0.50	-0.04		·
Polychlorinated Biphenyl	s (mg/Kg)						
Aroctor 1260	none	1.9	0.5	15.6	1.9		1
	nde (welke)						
Volatile Organic Compour	58,000	ND	ND	ND	ND		
Trichloroethene (TCE)	16,000,000	ND		ND ND	5		
Ethylbenzene	7,800,000			ND ND	ND	<u> </u>	
Total Xvienes	160.000.000	ND	ND	ND		_	+
1,2,4-Trimethylbenzene	39,000	ND	ND	ND	ND		·
							·
Semivolatile Organic Con	pounds (mg/Kg)	·			<u> </u>		
Fluoranthene	3,100	ND	ND	0.8	ND		
Pyrene	2,300		ND	0.7	ND		<u> </u>
Bis(2-ethylhexyl) Phthalate	46		ND	ND	ND		
Chrysene	88	ND	ND	0.8	ND		
Di-n-octyl Phthalate	1,600		ND		DND		<u> </u>
Benzo(b)fluoranthene	0.88	ND		0.8	ND		
Benzo(k)fluoranthene	8.8	ND	ND	0.7	ND	 .	\
Benzo(a)pyrane	0.088	ND	ND	0.3	ND		<u> </u>
indeno(1,2,3-cd)pyrene	0.88	ND		0.3			<u> </u>
Total Metals (mg/Kg)			1	}			1
Arsenic	0.37	7 :	. 6	• 7	7		
Barium	5,500	67 J	90	83.1	92 J		1
Chromium	390	30	34	33	32		
Lead	none	6	16	13	7		
Nickel	1,600	30	40	34	29		1
Selenium	390	1 UJ	ND	1 UJ	100		
Aluminum	78,000	14,800	NA	16,200	17,000		
Calcium	none	4,110	NA	4,240	5,620		
Cobalt	4,700	10	NA	12	12		
Copper	2,900	28	NA	34	29		
	none	26,600	NA	28,800	28,800		
Magnesium	none	7,430	NA	8,170	7,640		
Manganese	390	502	NA	544	628		
Potassium	none	610	NA	530	570		1
Sodium	none	116	NA	112	134	ļ.,	
Vanadium	550	47	NA	50	50	ļ	<u> </u>
Zinc	23,000	61	NA	68	63		
FOOTNOTES:	ND = Non-detected			(See the Building	35-752 Appendix	or MRL values.)	
	J = Value is consid						
	NA = Sample not an UJ = The analyte wa		-	the MOI is count	lead an anti-		
	UJ = The analyte wat < = Less than. Ar						tik dian
	A shaded value indi					- ina radimulia (

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TABLE 5.1-4 Summary of Analytes Detected Building 35-752 Soil Sample Analytical Results Cooling Ponds

	Location:	MW AP 3502				MW AP 3503				
	Sample Depth:	0-4'	0-4'	4'-6'	9'-13'	0-6'	6'-8'	8'-12'	8'-12'	
	Sample ID:	94575227SL	94575228SL	94575229SL	94575230SL	94575231SL	94575232SL	94575233SL	94575234S	
	Lab Code:	K946995-001	K946995-002	K946995-003	K946995-004	K947040-001	K947040-002	K947040-003	K947040-00	
	Date Collected:	11/7/94	11/7/94	11/7/94	11/7/94	11/8/94	11/8/94	11/8/94	11/8/94	
Compound	Residential RBC									
Petroleum Hydrocarbons (m)	g/Kg)									
GRO	none	8	ND	ND	ND	ND	ND	ND	ND	
080	none	107 J	151 J	24 J	ND	55	34	ND	ND	
ГРН	none	7t	183	26	ND	64	18	ND	ND	
Organochiorine Pesticides (n	ng/Kg)									
4-DDO	2.7	< 0.1	< 0.1	ND	ND	ND	ND	ND	ND	
I,4'-DDT	1.0	< 0.1	< 0.2	< 0.02	ND	0.12	<0,04	ND	ND	
Polychiorinated Biphenyls (n	ng/Kg)									
voctor 1260	none	2.3	B.7	0.7	ND	0.5	0,2	ND	ND	
/olatile Organic Compounds								··		
calona	7.800.000	420	710	NÐ	ND	ND	ND	ND	ND	
dethylene Chloride	85,000	ND	ND							
-Bulanone (MEK)	47,000,000	90	120	ND	ND	ND	ND	ND	ND	
s-1.2-Dichloroethene	780,000	8	ND	DND	ND	ND	ND	ND	ND	
Inchloroethene (TCE)	58,000	ND	ND	6	ND	ND	ND	ND	ND	
Iolal Xylenes	160,000,000	18	11	ND	ND	ND	ND	ND	ND	
,2,4-Trimethylbenzene	39,000	21	46	ND	ND	ND	ND	ND	ND	
Isopropylloluene	none	ND	21	ND	ND	ND	ND	ND	ND	
,4-Dichlorobenzene	27,000	ND	ND							
laphthalene	3,100,000	ND	36	ND	ND	ND	ND	ND	ND	
iotal Matala (mg/Kg)										
vraenic	0.37	5	5	5	5	5	4	4	4	
larlum	5,500	99	91	89	46	47	54	69	56	
thromlum	390	33	34	37	25	27	21	30	29	
	hone	9	11	7	6	θ	5	7	6	
ead	1,600	30	34	37	30	36	44	30	31	

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TABLE 5.1-4 Summary of Analytes Detected (cont.) Building 35-752 Soil Sample Analytical Results

Cooling Ponds

	Location:			MW AP 3504			S8 AP 3501
	Sample Depth:	0-2'	4'-10'	4'-10'	10'-14'	14'-16'	5'-7'
	Sample ID:	94575235SL	94575236SL	94575237SL	94575238SL	94575239SL	94575240S
	Lab Code:	K947072-001	K947072-002	K947072-003	K947072-004	K947072-005	K7108-001
	Date Collected;	- 11/9/94	11/9/94	11/9/94	11/9/94	11/9/94	11/11/94
Compound	Residential RBC						
Petroleum Hydrocarbons (mg/K)	a)						
GRO	rione	ND	ND	ND	ND	ND	ND
DRO	none	51	ND	ND	ND	20	100
ТРН	none	89	12	20	13	13	137
Organochiorine Pesticides (mg/i	(a)						
4,4'-DDD	2.7	<0.08	ND	0.03	ND	ND	<0.15
4,4-DDT	1.9	0.1	ND	0.03	ND	ND	<0.30
Polychlorinated Biphenyls (mg/l	(g)						
Aroclor 1260	nóne	0,6	ND	ND	ND	ND	18.6
Volatile Organic Compounds (µg	I/Kg)						
Acetone	7,800,000	ND	ND	ND	ND	ND	59
Methylene Chloride	85,000	20	ND	ND	ND	ND	ND
2-Butanona (MEK)	47,000,000	ND	ND	ND	ND	ND	ND
ds-1,2-Dichloroethene	780,000	ND	ND	ND	ND	ND	ND
Trichloroethene (TCE)	59,000	ND	12	19	ND	ND	ND
Totat Xylenes	160,000,000	8	ND	ND	ND	ND	ND
1,2,4-Trimelhylbenzene	39,000	ND	ND	ND	ND	ND	ND
f-laopropylloluene	none	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	27,000	ND	ND	ND	ND	ND	7
Naphthalane	3,100,000	ND	ND	ND	ND	ND	ND
fotal Metals (mg/Kg)							
Arsenic	0.37	5J	5 4 J	5 J	4 J	6 J	5
muhaE	5,500	79	60	44	64	63	57
Chromlum	390	32	38	31	38	36	38
eed	none	12	5	6	5	ð	13 J
lickel	1,600	29	36	30	45	38	33
ل >	 Non-detected al life n Value is considered a Less than, Analytica Indeed value indicates ro 	n estimate. I reporting limit has be	en elevated due lo ma	trix interferences or se	·		

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TABLE 5.1-5 Summary of Analytes Detected Building 35-752 Sediment Sample Analytical Results Cooling Ponds

	Location:	Location: A		BB	C	D	E	F G		<u>н</u>
	Sample Depth:	0-6"	0-6"	0-6"	0-6*	0-6"	0-6"	0-6"	0-6"	0-6"
	Sample ID:	94575240SD	94575241SD	94575242SD	94575243SD	94575244SD	94575245SD	94575246SD	94575247SD	94575248S
	Lab Code:	K947714-001	K947714-002	K947714-003	K947714-004	K947714-005	K947714-008	K947714-007	K947714-008	K947714-00
	Date Collected:	12/8/94	12/8/94	12/8/94	12/8/94	12/8/94	12/8/94	12/8/94	12/8/94	12/8/94
Compound	Residential RBC		1							
Total Petroleum Hydrocarb	one (malKa)									
IPH	none	230	240	240	420	290	83	186	440	260
	· · · · ·									
Organochlorine Pesticides	<u></u>						<0.04	<0.1	<0.08	<0.05
4,4'-DDD	2.7	0.03	0.1	0.03	0.02	0.07				
4,4'-DDT	1.0	<0.2	<0.3	<0.02	<0.04	0,04	<0,04	<0,1	<0.08	<0.07
Polychlorinated Biphenyls (mg/Kg)								l	
Aroclor 1260	enon	0.3	0.5	0.4	0.8	0.1	0.5	2.2	4.5	3.4
Volatile Organic Compound	s (ua/Ka)									
Acelone	7,800,000	160	170	190	420	210	240	110	180	230
2-Butanone (MEK)	47,000,000	47	43	ND	58	33	20	ND	40	ND
1,1,1-Trichloroethane (TCA)	7,000,000	18	ND	ND	<10	ND	14	10	<10	ND
1,4-Dichlorobenzene	27,000	ND	ND	ND	<10	ND	ND	ND	15	6
Semivolatile Organic Comp	ounds (mg/Kg)									
Phenanthrene	none	ND	ND	ND	્ય	0,4	2.2	1.5	1.5	0.7
luoranthene	3,100	ND	0,3	ND	4	0.5	3.9	2,1	2.3	4.4
Pyrene	2,300	ND	ND	ND	4	0.4	0.7	1.9	<0,8	5.4
Benz(a)anthracene	88.0	ND	ND	ND	·· <4	ND	0.8	ND	<0.8	1.5
Bla(2-ethylhexyl) Phthalale	46	ND	NO	ND		ND	ND	ND	<0.8	0.4
Chrysene	88	ND	ND	ND	્ય	ND	1.1	0.8	<0.8	1.6
Benzo(b)fluoranthene	0.88	ND	ND	ND	<4 .	ND	0,7	0.4	<0.8	2
Benzo(k)fluoranthene	8,8	ND	ND	ND	<4	ND	0,4	0,5	<0.B	1.3
Benzo(a)pyrene	0.088	ND	ND	ND	ંચ	ND	ND	ND	<0.8	1.2
ndeno(1,2,3-cd)pyrene	0.88	ND	ND	ND	-4	ND	ND	ND	<0.8	0.5
Benzo(g,h,l)perylene	enon	ND	ND	ND	<4	ND	ND	ND	<0.8	0,5
fotal Metals (mg/Kg)	1									
krsenic	0.37	. 4	4	4 .	3	5 :	3	3	5	5
Jadum	5,500	103	114	.113	85	96	44	49	83	61
Chromlum	390	34	35	43	33	48	33	28	45	43
ead	none	22	28	48	23	21	14	31	61	36
lickel	1,600	29	30	37	31	42	35	40	44	40
FOOTNOTES:	ND = Non-delected at	the method reporti	ng limit (MRL). (See	the Building 35-752	Appendix for MRL	values.}				
	< = Less than. And				•	quiring dilution.				
	A shaded value indica	ites result exceeds	the residential risk b	ased concentration ((RBC).					

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TABLE 5.1-6 Summary of Analytes Detected Building 35-752 Groundwater Sample Analytical Results Cooling Ponds

	Location:	MW AP 3502	MW AP 3503	MW A	P 3504	MW AP 2982	MW AP 2983	MW AP 2986	MW AP 2987
	Sample ID:	9457528AGW	9457525AGW	9457521AGW	9457522AGW	9457523AGW	9457526AGW	9457527AGW	9457524AGW
	Lab Code:	K948015-003	K947974-005	K947938-001	K947938-002	K948015-001	K947974-001	K947974-007	K947974-003
	Date Collected:	12/21/94	12/20/94	12/10/94	12/10/94	12/20/94	12/20/94	12/20/94	12/20/94
Compound	Residential RBC								
Petroleum Hydrocarbone (µ	o/L)					_			
GRO	none	ND	ND	ND	ŇA	292	ND	ND	ND
DRO	none	105	69 J	ND	ND	226	ND	566 J	1310
ТРН	none	ND	ND	ND	ND	ND	ND	500	ND
Polychiorinated Biphenyls (PCBs) (µg/L)								
Aroclor 1260	none	ND	ND	ND	ND	ND	ND	0.7	0.2 UJ
Volatile Organic Compound	s (µg/L)								
1,1-Dichloroethane	810	ND	ND	ND	NA	0.6	ND	ND	ND
1,1,1-Trichloroelhane (TCA)	1,300	ND	ND	3,4	NA	9.7	ND	ND	ND
Benzene	0,36	ND	ND	ND	NA	46	ND	ND	1.6
Trichloroethene (TCE)	1.0	ND	ND	0.6	NA	0.6	0.5	ND	0.6
Toluene	750	ND	ND	ND	NA	2.8	ND	ND	ND
Ethylbenzene	1,300	ND	ND	ND	NA	22	ND	ND	ND
Total Xylenes	12,000	ND	ND	ND	NA	56	ND	ND	ND
1,3,5-Trimelhylbenzene	2.4	ND	ND	ND	NA	2	ND	ND	ND
1,2,4-Trimelhylbenzene	3	ND	ND	ND	NA	11	ND	ND	ND
Naphthalene	1,500	ND	ND	ND	NA	9	ND	ND	ND
Semivolatile Organic Compo	ounds (µg/L)								
Bis(2-ethylhexyl) Phthalate	48	ND	ND	ND	ND	ND	ND	11	ND
Total Metals (µg/L)									
Arsenic	0.038	5	52 J	29	34 :	27	28 J .	48 J	27 J
Barlum	2,600	129	1,480	683	722	424	761	245	604
Cadmlum	18	ND	6	ND	ND	ND	ND	ND	ND
Chromium	180	17	402	208	229	97	182	72	154
Lead	none	5	112	48	53	26	64	44	52
Mercury	11	ND	1.8	1.2	1.2	0.7	1.5	0,7	1.1
Nickel	730	25	548	318	345	153	290	102	229
	ND = Non-delected at (J = Value is considen UJ = The analyte was (NA = not analyzed, A shaded value indicate	ed an estimate. not detected at the M	IRL, however, the Mi	RL is considered an e	sümate,	31.}			

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5.1.4 Semi-Quantitative Risk Assessment

As described in Section 4.2, a semi-quantitative risk assessment was conducted encompassing the four areas investigated at Building 35-752. The risk assessment is considered semiquantitative because: 1) potential risks to ecological receptors were not evaluated quantitatively, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only two exposure pathways were considered (soil ingestion and tapwater ingestion); although these pathways yield the most conservative results, other pathways may also be important.

Building 35-752 is located approximately 1,250 feet north of Ship Creek. The site is surrounded by mixed spruce and birch forest, with grassy clearings. Surface soils are exposed in the gravel parking area around the building. The interior of Building 35-752 is used as storage space for fire extinguishers; access is restricted.

The cooling ponds discharge to an unlined ditch that transports moving water for several hundred feet to the south. The flow rate was estimated at 5 to 10 gallons per minute (gpm) during the site visit but probably increases during rainfall or snowmelt events.

5.1.4.1 Compounds of Potential Concern

A summary of the compounds of potential concern (COPC) is presented in Table 5.1-7. These compounds include monoaromatics (benzene, toluene, ethylbenzene, xylenes, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, and 4-isopropyltoluene), polycyclic aromatic hydrocarbons (PAHs) [naphthalene, 2-methylnaphpthalene, phenanthrene, benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene], chlorinated aliphatics (trichlorethene, 1,1,1-trichloroethane, and 1,1-dichloroethane), PCBs, polychlorinated diphenyl alkanes (4,4'-DDT), phthalates (bis[2-ethylhexyl]phthalate), and metals (arsenic, barium, cadmium, chromium, mercury, nickel, and vanadium). As shown on Table 5.1-7, some of these compounds are carcinogens.

All of the other target analytes were either 1) not detected, 2) below 1/10th of the RBC for residential soil, 3) below the RBC for residential tap water, or 4) not statistically different from the background sample population (metals only). As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. In addition, a list of

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Туре	Source	Carcinogens	Noncarcinogens
Monoaromatics	Fuels	Benzene	Toluene Ethylbenzene Xylenes 1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene 4-Isopropyltoluene
Polyaromatics (PAH)	Fuels, oils	Benz(a)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	Naphthalene 2-Methylnaphthalene Phenanthrene Benzo(g,h,i)perylene
Chlorinated aliphatics	Solvents	Trichloroethene (TCE)	1,1,1-Trichloroethane (TCA) 1,1-Dichloroethane
Polychlorinated biphenyls (PCB)	Transformer oil	Total PCBs	(Aroclor 1016 or 1254 only)
Polychlorinated diphenyl alkanes	Insecticides	4,4'-DDT	None
Phthalates	Plastics	Bis(2-ethylhexyl) phthalate	None
Metals ¹	Background soil; fuels & oils	Arsenic	Barium Cadmium ² Chromium Mercury Nickel Vanadium

Table 5.1-7. Compounds of Potential ConcernBuilding 35-752

¹ Based on the background metals statistics evaluation in Appendix A, some metals were not included in the semi-quantative risk assessment because they were not statistically significant from background concentrations.

² Cadmium is considered a carcinogen via the inhalation pathway; however, inhalation of nonvolatile compounds is considered insignificant relative to oral ingestion (see Appendix A, Section A.5).

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compounds that were not detected at detection limits exceeding current risk-based concentrations is provided in Table 5.1-8. Most of these compounds were identified in the Work Plan (ENSR 1994) but require special analytical services to achieve reporting limits below RBCs. During the RI/FS, Table 5.1-8 should be reviewed to determine if the likelihood that the compound is present warrants the use of special analytical services.

As described in Section 5.1.4.4, the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, DRO, and TPH). As a result, these data were not included in the semi-quantitative risk assessment.

5.1.4.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Sources, transport mechanisms, exposure pathways, and receptors (elements of the Conceptual Site Model) are shown on Figure 5.1-5. As discussed previously, four primary sources are present at the site: surface dust on oiled concrete inside Building 35-752; the former drum accumulation area; seven former USTs; and the Cooling Ponds. With the exception of the concrete floor, all of these sources appear to have impacted surface soils, subsurface soils, and groundwater. The Cooling Ponds also appear to have impacted pond sediments and possibly surface water.

Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile COPCs may disperse in the atmosphere or accumulate in enclosed spaces. In accordance with EPA (1995a), several COPCs are considered "volatile" (benzene, toluene, ethylbenzene, xylenes, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, trichloroethene, 1,1,1-trichloroethane, and 1,1-dichloroethane), having Henry's Law constants greater than 10⁻⁵. Concentrations of these compounds are not expected to be significant in atmospheric air, but may be of concern within Building 35-752. Similarly, concentrations of nonvolatile COPCs in airborne dust are not expected to be of concern in the atmosphere, but may be significant within Building 35-752 (particularly PCBs).

Surface water transport may be significant for contaminated sediments present in the Cooling Ponds, particularly during rainfall or snowmelt events. Leaching and groundwater transport has resulted in migration of monoaromatics, PAH, chlorinated aliphatics, PCBs, phthalates, and metals. The dynamic state of the dissolved plume (expanding, degrading, or steady state) is not known, but is expected to be degrading. Long-term monitoring, or leaching and dissolved phase transport modeling, is required to verify this conclusion.

Compound	Matrix	Maximum Detection	Risk-Based
	matrix	Limit	Concentration
/inyl Chloride	Soil	1300 µg/Kg	340 µg/Kg
1,1-Dichloroethene	Soil	1300 µg/Kg	1,100 µg/Kg
1,2-Dibromoethane (EDB)	Soil	5300 µg/Kg	8 µg/Kg
1,2,3-Trichloropropane	Soil	1300 µg/Kg	91 µg/Kg
1,2-Dibromo-3-chloropropane (DBCP)	Soil	5300 µg/Kg	460 µg/Kg
N-Nitrosodimethylamine	Soil	40 mg/Kg	0.013 mg/Kg
Bis(2-chloroethyl) Ether	Soil	6 mg/Kg	0.58 mg/Kg
N-Nitrosodi-n-propylamine	Soil	6 mg/Kg	0.091 mg/Kg
2-Nitroaniline	Soil	40 mg/Kg	4.7 mg/Kg
Hexachlorobenzene	Soil	6 mg/Kg	0.4 mg/Kg
3,3'-Dichlorobenzidine	Soil	40 mg/Kg	1.4 mg/Kg
Benz(a)anthracene	Soil	6 mg/Kg	0.88 mg/Kg
Benzo(b)fluoranthene	Soil	6 mg/Kg	0.88 mg/Kg
Benzo(a)pyrene	Soil	6 mg/Kg	0.088 mg/Kg
Indeno(1,2,3-cd)pyrene	Soil	6 mg/Kg	0.88 mg/Kg
Dibenz(a,h)anthracene	Soil	6 mg/Kg	0.088 mg/Kg
Pentachlorophenol	Soil	40 mg/Kg	5.3 mg/Kg
Beryllium	Soil	1 mg/Kg	0.15 mg/Kg
Heptachlor Epoxide	Soil	0.1 mg/Kg	0.07 mg/Kg
Dieldrin	Soil	0.1 mg/Kg	0.04 mg/Kg
Toxaphene	Soil	6 mg/Kg	0.58 mg/Kg
Aroclor 1254	Soil	6 mg/Kg	1.6 mg/Kg
1,2-Dibromoethane (EDB)	Sediment	40 µg/Kg	8 µg/Kg
N-Nitrosodimethylamine	Sediment	24 mg/Kg	0.013 mg/Kg
Bis(2-chloroethyl) Ether	Sediment	4 mg/Kg	0.58 mg/Kg
N-Nitrosodi-n-propylamine	Sediment	4 mg/Kg	0.091 mg/Kg
2-Nitroaniline	Sediment	24 mg/Kg	4.7 mg/Kg
Hexachlorobenzene	Sediment	4 mg/Kg	0.4 mg/Kg
3,3'-Dichlorobenzidine	Sediment	24 mg/Kg	1.4 mg/Kg
Dibenz(a,h)anthracene	Sediment	4 mg/Kg	0.088 mg/Kg
Pentachlorophenol	Sediment	24 mg/Kg	5.3 mg/Kg
Dieldrin	Sediment	0.1 mg/Kg	0.04 mg/Kg
Тохарһепе	Sediment	5 mg/Kg	0.58 mg/Kg
Chlordane	Sediment	0.8 mg/Kg	0.49 mg/Kg
1,1-Dichloroethene	Water	0.5 μg/L	0.044 µg/L
Chloroform	Water	0.5 µg/L	0.15 µg/L
Bromodichloromethane	Water	0.5 µg/L	0.17 µg/L
Carbon Tetrachloride	Water	0.5 µg/L	0.16 µg/L

Table 5.1-8 Compounds Not Detected at Reporting LimitsExceeding Current Risk-Based Concentrations, Building 35-752

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Table 5.1-8, cont'd.Compounds Not Detected at Reporting LimitsExceeding Current Risk-Based Concentrations, Building 35-752

Compound	Matrix	Maximum Detection	Risk-Based
Compound	matrix	Limit	Concentration
1,2-Dichloroethane	Water	0.5 µg/L	0.12 µg/L
1,2-Dichloropropane	Water	0.5 µg/L	0.16 µg/L
cis-1,3-Dichloropropene	Water	0.5 µg/L	0.077 µg/L
1,1,2-Trichloroethane	Water	0.5 µg/L	0.19 µg/L
1,2-Dibromoethane (EDB)	Water	2 µg/L	0.00075 µg/L
1,1,1,2-Tetrachloroethane	Water	0.5 µg/L	0.41 μg/L
1,1,2,2-Tetrachloroethane	Water	0.5 µg/L	0.052 µg/L
Vinyl Chloride	Water	0.5 µg/L	0.019 µg/L
1,4-Dichlorobenzene	Water	0.5 µg/L	0.44 µg/L
1,2-Dibromo-3-chloropropane (DBCP)	Water	2 µg/L	0.048 µg/L
Hexachlorobutadiene	Water	2 µg/L	0.14 µg/L
trans-1,3-Dichloropropene	Water	0.5 µg/L	0.077 µg/L
N-Nitrosodimethylamine	Water	25 µg/L	0.0013 µg/L
Aniline	Water	25 µg/L	10 µg/L
Bis(2-chloroethyl) Ether	Water	10 µg/L	0.0092 µg/L
1,4-Dichlorobenzene	Water	10 µg/L	0.44 µg/L
Bis(2-chloroisopropyl) Ether	Water	10 µg/L	0.26 µg/L
N-Nitrosodi-n-propylamine	Water	10 µg/L	0.0096 µg/L
Hexachloroethane	Water	10 µg/L	0.75 µg/L
Nitrobenzene	Water	10 µg/L	3.4 µg/L
Hexachlorobutadiene	Water	10 µg/L	0.14 µg/L
Hexachlorocyclopentadiene	Water	10 µg/L	0.15 µg/L
2-Nitroaniline	Water	25 µg/L	2.2 μg/L
Hexachlorobenzene	Water	10 µg/L	0.0066 µg/L
3,3'-Dichlorobenzidine	Water	25 µg/L	0.15 µg/L
Benz(a)anthracene	Water	10 µg/L	0.092 µg/L
Bis(2-ethylhexyl) Phthalate	Water	10 µg/L	4.8 µg/L
Chrysene	Water	10 µg/L	9.2 µg/L
Benzo(b)fluoranthene	Water	10 µg/L	0.092 µg/L
Benzo(k)fluoranthene	Water	10 µg/L	0.92 µg/L
Benzo(a)pyrene	Water	10 µg/L	0.0092 µg/L
Indeno(1,2,3-cd)pyrene	Water	10 µg/L	0.092 µg/L
Dibenz(a,h)anthracene	Water	10 µg/L	0.0092 µg/L
2,4,6-Trichlorophenol	Water	10 µg/L	6.1 µg/L
Pentachlorophenol	Water	25 µg/L	0.56 µg/L
Arsenic	Water	5 µg/L	0.038 µg/L
Heptachlor	Water	0.04 µg/L	0.0023 µg/L
Aldrin	Water	0.04 µg/L	0.004 µg/L
Note: Some detection limits are elevated due to ana	alytical interference		
list of detection limits	-		, ,

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Table 5.1-8, cont'd.Compounds Not Detected at Reporting LimitsExceeding Current Risk-Based Concentrations, Building 35-752

Compound	Matrix	Maximum Detection Limit	Risk-Based Concentration
Heptachlor Epoxide	Water	0.04 µg/L	0.0012 µg/L
4,4'-DDT	Water	0.5 µg/L	0:2 µg/L
Dieldrin	Water	0.04 µg/L	0.0042 µg/L
Toxaphene	Water	1 µg/L	0.061 µg/L
Chlordane	Water	0.5 µg/L	0.052 µg/L
Note: Some detection limits are elevated d	ue to analytical interfer	ence. See the Building 35-752	2 Appendix for a complete
list of detection limits			

Depending on the future land use, potential receptors may include residents, occupational workers, and construction workers. Although it is unlikely that contaminants would reach Ship Creek, additional receptors could include recreational users. Ecological receptors include terrestrial plants, mammals, waterfowl, and aquatic species.

5.1.4.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion and drinking water ingestion pathways. Exposures via these pathways generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, these pathways were selected to determine if soil exposures represent a significant human health risk. If human health risks via soil ingestion and drinking water ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion and drinking water ingestion are significant and drinking water ingestion are sold ingestion and drinking water ingestion are sold ingestion and drinking water ingestion are sold as part of a baseline risk assessment.

Exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for carcinogens. For example, soil exposures for noncarcinogens are calculated assuming childhood exposure only, whereas soil exposures for carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations were calculated as the 95 percent upper confidence limit (UCL) of the average concentration of all samples analyzed from a particular medium (surface soil, subsurface soil, or groundwater). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991, 1992).

5.1.4.4 Toxicity Assessment

Dose-response factors for most compounds were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),

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- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

Compounds not included in EPA (1995a) were assigned proxy dose-response factors based on those for related compounds. These compounds are listed in Table 5.1-9. A provisional reference dose for 1,3,5-trimethylbenzene (EPA 1995a) was used as a proxy reference dose for other alkylbenzenes lacking approved dose-response factors. This value was selected because it is the lowest reference dose of all nonhalogenated alkylbenzenes provided by EPA (1995a), thereby providing a conservative estimate of the noncarcinogenic effects of volatile fuel hydrocarbons. Similarly, toxic equivalence factors developed by Magee et al. (1993) were used to estimate proxy reference doses for noncarcinogenic PAH lacking approved dose-response factors. These factors were used to evaluate potential noncarcinogenic effects associated with semivolatile fuel hydrocarbons (i.e., PAH).

Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992b), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semi-quantitative risk assessment.

5.1.4.5 Human Health Risk Characterization

The following sections summarize potential human health risks via soil ingestion and tapwater ingestion. As previously described, exposures via these pathways generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, if human health risks via soil ingestion and drinking water ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion and drinking water ingestion and drinking water ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of the baseline risk assessment.

Human Health Risks - Carcinogenic

Carcinogenic risks for the soil ingestion and drinking water ingestion pathways are summarized on Table 5.1-10. Detailed risk calculations for each pathway and receptor are presented in Appendix A.

Table 5.1-9. Proxy Dose-Response Factors for Compounds Lacking Toxicity Data Building 35-752

Surrogate Comp	ounds	Target Compound						
Name	Approved RfDo ¹	Name	TEF ²	Proxy RfDo	Proxy CSFo			
1,3,5-Trimethylbenzene	nethylbenzene 0.0004 4-		None ³	0.0004				
Naphthalene	0.04	2-Methylnaphthalene	1	0.04				
Naphthalene	0.04	Phenanthrene	0.13	0.308				
Naphthalene	0.04	Benzo(g,h,i)perylene	1.3	0.0308				

Notes: ¹ "Approved" oral reference doses (RfDs) from EPA (1995). ² Toxicity Equivalency Factors (TEF) for PAH from Magee et al. (1993). ³ No TEFs have been developed for these compounds. RfDs for surrogate compounds were substituted as ¹ Toxicity Equivalency Factors (TEF) for these compounds. RfDs for surrogate compounds were substituted as

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Table 5.1-10.	Carcinogenic Risks for Soil Ingestion								
and Drinking Water Ingestion									
Building 35-752									

	Carcinogenic Risk				
Pathway	Residential	Occupational			
Surface Soil	2.2 x 10 ⁻⁵	2.6 x 10 ⁻⁶			
Subsurface Soil	7.1 x 10 ⁻⁷	8.4 x 10 ⁻⁸			
Groundwater (as tap water)	1.2 x 10 ⁻³	5.7 x 10 ⁻⁴			
Total Risk	1.2 x 10 ⁻³	5.7 x 10 ⁻⁴			

Using both residential and occupational exposure factors, the excess lifetime carcinogenic risk for soil ingestion and drinking water ingestion exceeds the lower benchmark of 1×10^{-6} listed in the NCP. As a result, exposures via inhalation and dermal contact may also be evaluated. The majority of the carcinogenic risk is associated with arsenic in groundwater. The remainder of the carcinogenic risk is associated with PCBs, benzene, trichloroethene, and bis(2-ethylhexyl)phthalate.

Human Health Risks - Noncarcinogenic

Noncarcinogenic hazard indices for the soil ingestion and drinking water ingestion pathways are summarized on Table 5.1-11. A breakdown of risk calculations for each pathway and receptor are presented in Appendix A.

	Hazard Index				
Pathway	Residential	Occupational			
Surface Soil	0.055	0.0022			
Subsurface Soil	0.010	0.00040			
Groundwater (as tap water)	3.5	2.1			
Total Hazard Index	3.5	2.1			

Table 5.1-11. Hazard Indices for Soil Ingestionand Drinking Water IngestionBuilding 35-752

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Using both residential and occupational exposure factors, the total hazard index for soil/drinking water ingestion is above the estimated threshold for adverse effects.

5.1.4.6 Ecological Risk Characterization

Quantitative assessment of ecological risks can be performed at the organism, population, or ecosystem level. Although ecosystem-level effects may be the most important, effects testing and modeling are rarely performed due to a number of practical considerations (Suter 1993). Quantification of population-level effects, such as reproductive potential, is important to maintain species populations, whereas assessment of organism-level effects evaluates the risk to individual organisms.

Chemicals can be evaluated as single compounds or as mixtures. Methods for evaluating the toxicity of mixtures requires knowledge regarding the sites and modes of action of individual compounds. Unlike for human health risk assessment, these methods have not been standardized, and there is some debate regarding the most appropriate approach.

If potential exposure pathways and receptors are present, ecological assessment begins with identification of the compounds of potential concern. This can be done in a similar fashion as for human health risk assessment, using ecological RBCs. Ecological RBCs may include toxicity benchmarks, sediment quality criteria, or other regulatory criteria. One set of criteria in common use provides benchmark concentrations for eight representative mammalian species and nine avian species (Opresko et al. 1994). Although benchmark concentrations are provided for 76 chemicals, toxicity benchmarks are not available for many target analytes. Also, the benchmarks are provided as concentrations in food, requiring evaluation of plant uptake and other routes of dietary exposure.

Likewise, standardized criteria for aquatic species reflect various exposure routes and test methods, and are not available for all target compounds. As a result, compilation of ecological RBCs can involve significant effort. Due to the large number of analytes measured at Building 35-752, ecological RBCs were not compiled as part of this project.

Potential receptors at Building 35-752 include terrestrial, avian, and aquatic species at a variety of trophic levels. The most highly exposed species include those with a small home range and small body weight to food consumption ratio (e.g., mice, benthic invertebrates, resident songbirds). However, other less exposed species may warrant evaluation based on their susceptibility to particular chemicals (e.g., reproductive effects of 4,4'-DDT in raptors).

A comparison of cooling pond sediment concentrations with available sediment quality criteria is shown on Table 5.1-12. The compounds shown, however, were selected using human health RBCs as described in Section 5.1.4.1. These criteria may not be appropriate for selection of ecological compounds of potential concern.

The results shown on Table 5.1-12 indicate that concentrations of several chemicals exceeded the lowest sediment benchmark value. As a result, more detailed quantitative analyses may be warranted. First, ecological RBCs may be identified for representative terrestrial, avian, and aquatic species. Compounds of potential concern may then be selected based on a comparison of ecological RBCs with measured concentrations. At this point, the appropriate risk quantitation methods and measurement endpoints may be selected.

5.1.5 Findings and Conclusions

Risks to human health associated with noncarcinogenic compounds are above the estimated threshold for adverse effects. The excess lifetime carcinogenic risk for soil ingestion and drinking water ingestion exceeds the lower benchmark of 1×10^{-6} listed in the NCP. The greatest carcinogenic risk is associated with arsenic. The remainder of the carcinogenic risk is associated with PCBs, benzene, trichloroethene, and bis(2-ethylhexyl)phthalate.

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Table 5.1-12. Cooling Pond Sediment Concentrations and Ecological Sediment Quality Benchmarks Building 35-752

Compound	MRL,	Samples/	Conce	entration,	mg/Kg	Sediment Quality Benchmarks					
-	mg/Kg	Detects	Min.	Max.	Mean	Ont. MOE	ORNL-SQB	WDNR-SQC	EPA-SQC	NOAA ER-L	
Acetone	0.05	9/9	0.11	0.42	0.21		0.064				
2-Butanone (MEK)	0.02	9/6	0.01	0.058	0.030						
1,1,1-Trichloroethane (TCA)	0.005	9/3	0.003	0.018	0.007		0.179				
1,4-Dichlorobenzene	0.005	9/2	0.003	0.015	0.005						
Phenanthrene	0.3	9/5	0.15	2.2	0.97				1.8 (b)	0.225	
Fluoranthene	0.3	9/6	0.15	4.4	1.8			12.2 (b)	6.2 (b)	0.6	
Pyrene	0.3	9/4	0.15	5.4	1.3					0.35	
Benz(a)anthracene	0.3	9/2	0.15	2	0.58		0.108			0.23	
Chrysene	0.3	9/3	0.15	2	0.74					0.4	
Benzo(b)fluoranthene	0.3	9/3	0.15	2	0.68						
Benzo(k)/luoranthene	0,3	9/3	0.15	2	0.58						
Benzo(a)pyrene	0.3	9/1	0.15	2	0.50		0.14	0.89 (b)		0.4	
Indeno(1,2,3-cd)pyrene	0.3	9/1	0.15	2	0.42						
Benzo(g,h,l)perylene	0.3	9/1	0.15	2	0.42						
Bis(2-ethylhexyl) Phthalate	0.3	9/1	0.15	2	0.41		8.9E+5				
Aroclor 1260	0.1	9/9	0.1	4.5	1.4	0.005	1099				
Total PCBs	0.7	9/9	0.4	4.8	1.7		20.52			0.05	
4,4'-DDD	0.01	9/5	0.02	0.1	0.043	0.008				0.002	
4,4'-DDT	0.01	9/1	0.01	0,15	0.052	0.007				0.001	
Arsenic	1	9/9	3	5	4.0	6		10		8.2	
8arlum -	1	9/9	44	114	61			500			
Chromlum	2	9/9	26	46	38	26		100		81	
Lead	1	9/9	14	61	31	31		50		46.7	
Nickel	10	9/9	29	44	36	16		100		21	
Total Petroleum Hydrocarbons (TPH)	10	9/9	83	440	265						

(b) = assumed 1% organic carbon content

Ont-MOE = Ontario Ministry of the Environment, Lowest Effect Level (Persoud 1990)

ORNL-SQB × Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biola (Hull & Suter 1994)

WDNR-SQB = Wisconsin Department of Natural Resources Sediment Quality Criteria

EPA SQC = EPA Sediment Quality Criteria derived for five contaminants (1993)

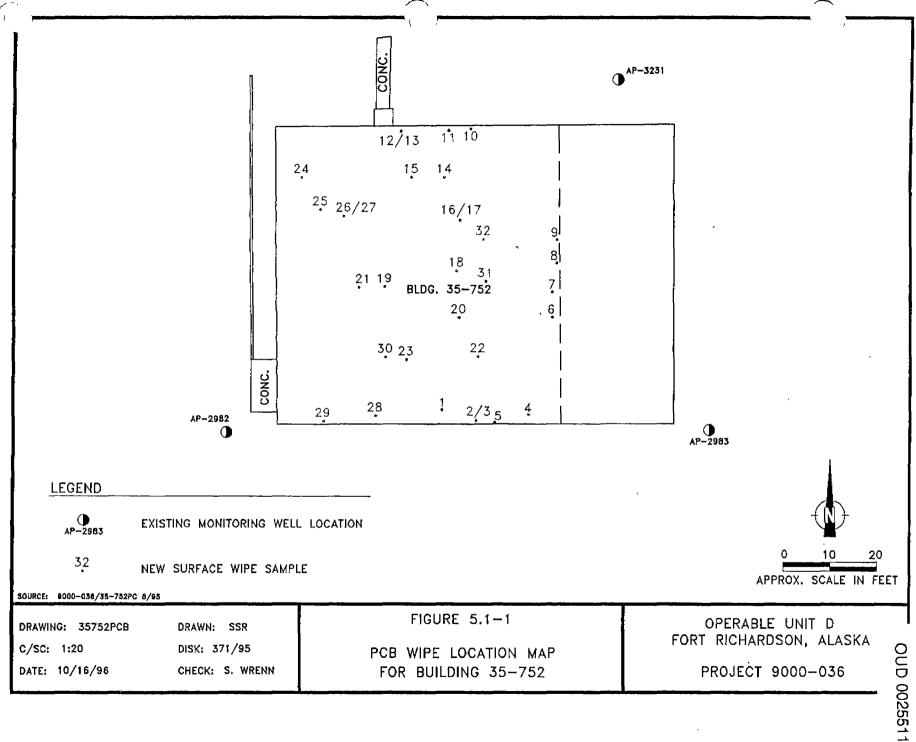
NOAA ER-L = National Oceanic and Atmospheric Adminstration Effects Range - Low, values for screening contaminants in sediment (Long & Morgan, revised 1993)

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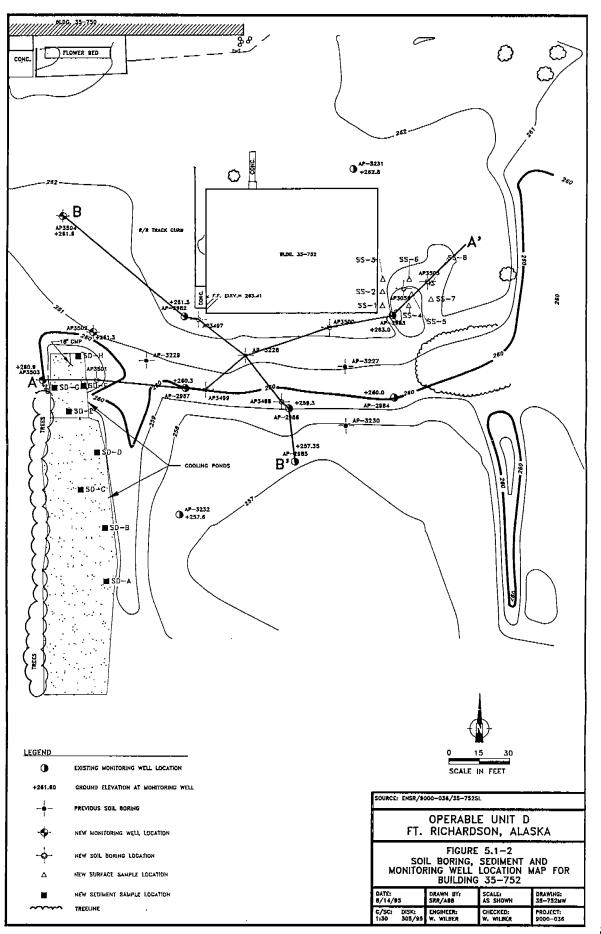
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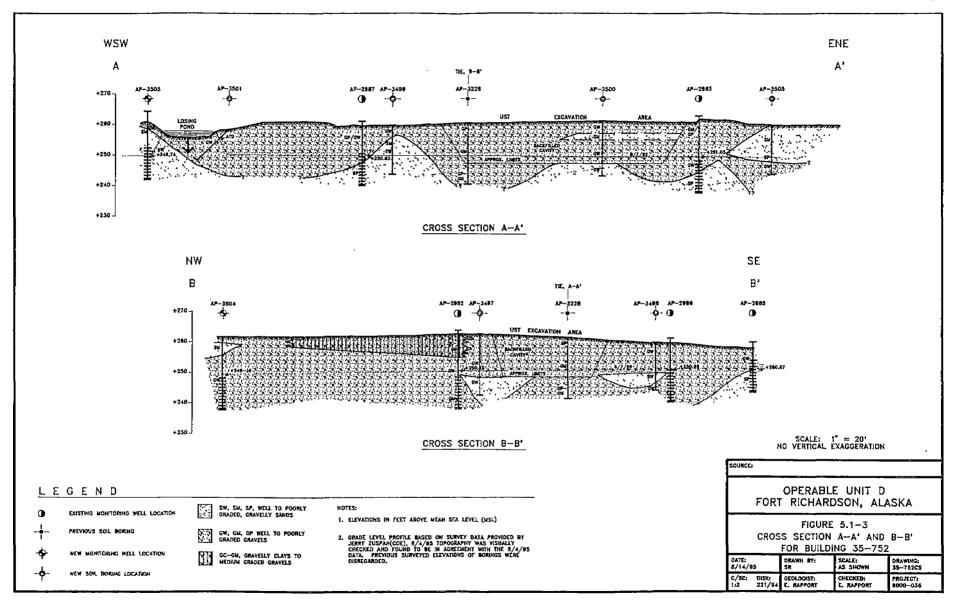
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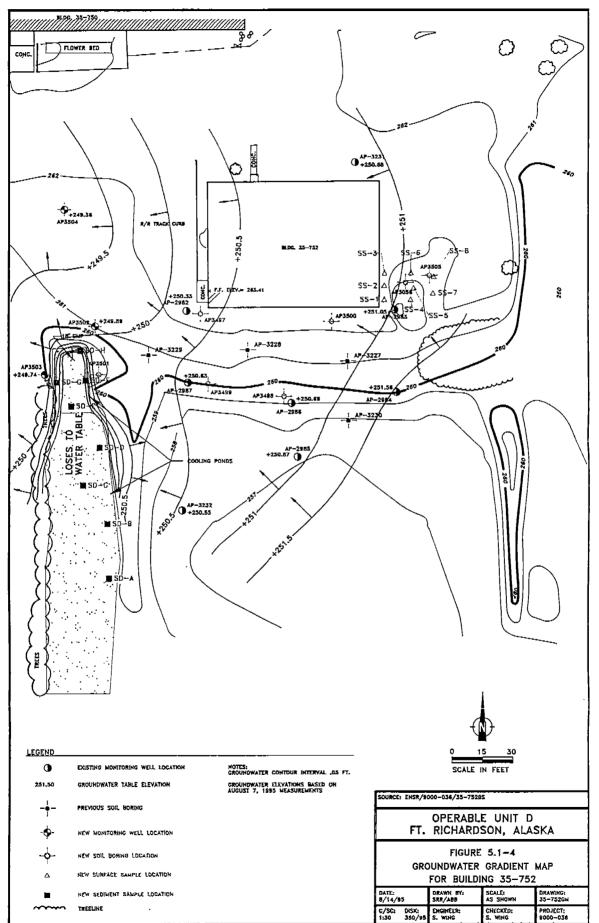




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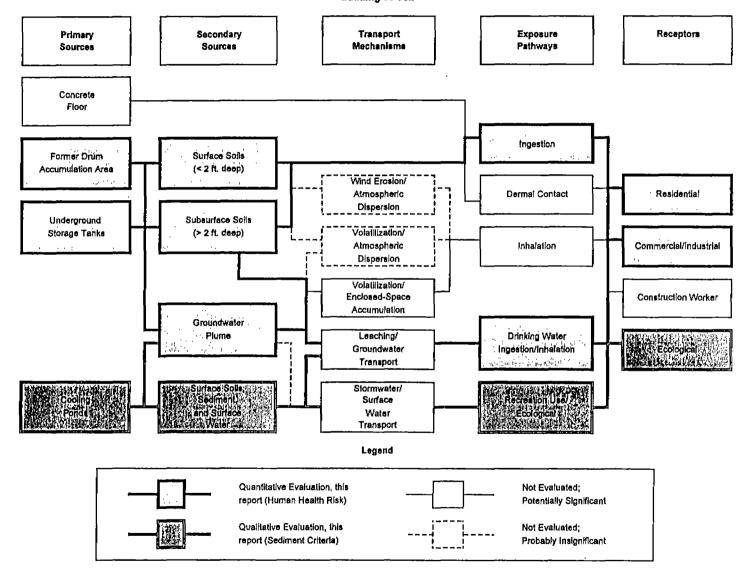


Figure 5.1-5: Sources, Transport Mechanisms, Exposure Pathways, and Receptors Building 35-752

After ASTM (1994) P.COMMON/PSE2DATA/ACR-RCPT/XLB

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Stormwater Outfail to Ship Creek

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5.2 Stormwater Outfall to Ship Creek

5.2.1 Site History

The Stormwater Outfall to Ship Creek serves as the discharge point for the stormwater drainage system of Fort Richardson's main cantonment (Figure 5.2-1). The stormwater drainage system consists of a network of aluminum, corrugated metal, and asbestos cement pipes that discharge to unlined culverts directed south towards Ship Creek. The operational dates of the stormwater drainage system are uncertain; however, it is likely the stormwater system has drained through the stormwater outfall to Ship Creek since the construction of the main cantonment in 1955. Fort Richardson does not currently have a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharge. Oils, fuels, and solvents—and to a lesser degree herbicides and pesticides, metals, and PCBs—may have been carried from the main cantonment area by surface runoff and deposited in soil and bottom sediments in the stormwater outfall ditch.

Approximately 420 yards upstream from the outfall are the Cooling Ponds at Building 35-752. Sediments in the Cooling Ponds are known to have elevated levels of PCBs and DRO. The Cooling Ponds are drained by an unlined culvert that feeds into the stormwater outfall system.

5.2.2 Field Investigation

The objective of the investigation at the stormwater outfall was to evaluate the drainage system as a source of contaminants to Ship Creek (Figure 5.2-2).

Surface sediment samples were collected from the stormwater outfall drainage ditch and Ship Creek in late November. A sample from each location was collected by scraping sediment (the fine depositional soil fraction along the sidewall or bottom) into a clean 2-liter plastic jar and then transferred to the appropriate glass sampling container. The plastic jars were used as an intermediate measure to minimize the length of time spent in the water at sub-zero temperatures and because of the dangerous conditions associated with sampling in Ship Creek.

One sidewall sample and one sediment sample were collected upstream of the stormwater outfall to assess background constituents and the potential for upstream contaminant sources. The sidewall sample was collected from the south bank of Ship Creek, 20 feet upstream from the stormwater outfall. The sediment sample was collected from the creek bottom, 15 feet from the south bank and 12 feet from the north bank.

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One sidewall sample and one sediment sample were also collected downstream of the stormwater outfall to assess the potential discharge of the contaminants from the stormwater drainage system. The sidewall sample was collected from the south bank 15 feet downstream from the outfall. The sediment sample was collected downstream of the outfall in the middle of the creek, 6 feet from the south bank and 15 feet from the north bank.

Two samples were collected from the stormwater drainage ditch to assess the potential presence of residual hydrocarbons and other contaminants that may have absorbed into soils from the surface water. The first soil sample was collected from the sidewall of the drainage ditch, 6 feet from the outlet to Ship Creek. A sediment sample was also collected from the bottom of the stormwater outfall ditch, 15 feet from the outlet to Ship Creek.

5.2.3 Analytical Results

A total of 10 samples were collected, including two blind duplicates and two QA samples. All samples were analyzed for TRPH, GRO, DRO, VOCs, PCBs/organochlorine pesticides, and metals. Analytes detected above the MRL are shown in Table 5.2-1. A complete summary of the analytical data is presented in Appendix C.

The laboratory quality control checks indicate that the analytical data are within acceptable criteria ranges, with the exceptions noted in the USACE NPD laboratory's CQAR (ENSR 1995).

- Up to 1.6 ppb of methylene chloride was detected in the VOC method blanks of CAS reports K946430A and K946594A. The methylene chloride data of the associated samples 94BKGD01SL through -10SL should be considered a result of laboratory contamination.
- The VOC data of samples 94BKGD03SL, -05SL, and -22SL should be considered low estimates, if detected, based on low recovery of one out of three surrogates.
- Low levels of selenium may not have been detected in the samples of CAS reports K946430A, K94659A, and K946865A (samples 94BKGD01SL through -10SL and 94BKGD20SL through -26SL) due to low matrix spike recoveries. The lead data in CAS report K946850A (samples 94BKGD11SL through -19SL) should be considered estimates due to high laboratory duplicate RPD results.

A complete discussion of the QA checks can be found in the USACE NPD Laboratory CQAR and ENSR QASR located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

TABLE 5.2-1 Summary of Detected Analytes Ship Creek Stormwater Outfall Soil Sample Analytical Results

		SS1	\$\$2	SS 3	SS3D	S S4	S\$5	SS5D	556
	Sample Depth:	Suface	Sulace	Suface	Suface	Suface	Sulace	Suface	Suface
	Sample ID:	94SWOF01SD	94SWOF02SD	94SWOF03SD	94SWOF04SD	94SWOF05SD	B4SWOF06SL	94SWOF07SL	94SWOF08SL
	Lab Code:	K947378-001	K947379-002	K947379-003	K947379-004	K947370-005	K947370-008	K947370-007	K947370-008
	Date Collected:	\$1/22/94	11/22/94	11/22/94	11/22/94	11/22/94	11/22/94	11/22/94	11/22/94
Compound	Residential RBC								
Petroleum Hydrocari	bons (mg/Kg)								
DRO	none	16 J	ND	ND	ND	ND	ND	ND	ND
ГРН	none	29	13	ND	ND	ND	ND	ND	ND
Total Metals (mg/Kg)									
Amenic	0.37	5	4	4	3	3	4	4	5
Badum	5,500	52	32	42	34	31	41	43	39
Chromlum	390	36	31	33	28	29	29	31	37
ead	none	7	5	5	4	4	5	4	5
lickel	1,600	29	24	25	21	23	24	28	30
OOTNOTES:	ND × Non-detected at t	he method reporting it	mit (MRL). (See Storn	nwater Outfall Appendi	(for MRL values.)				
	J = H Value le consider								
	A shaded value indicate	s result exceeds the	residential risk based o	concentration (RBC)					

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5.2.4 Semi-Quantitative Risk Assessment

Semi-quantitative risk assessment was not performed for the Stormwater Outfall site because the concentrations of all organic compounds (with the exception of DRO and TPH) were below the MRLs. A comparison of MRLs versus human health RBCs indicates that the MRL for only one organic compound (1,2-dibromoethane) exceeded the residential RBC for soil. However, comparison with human health RBCs is inappropriate for this site, because ecological effects are probably more significant. As described in Section 5.1.4.6, a compilation of ecological RBCs is beyond the scope of this effort; however, a comparison between detected concentrations and ecological benchmark values is presented in Table 5.2-2.

Results shown on Table 5.2-2 indicate that the concentrations of some chemicals exceeded the lowest sediment benchmark value. As a result, more detailed quantitative analyses may be warranted. As part of this effort, background concentrations should be measured for stream sediment, which may be different than for soil.

5.2.5 Findings and Conclusions

Metals data may not be compared to background data collected as part of this PSE2. The background samples collected were for soil, not for stream or outfall sediment. Additional background sampling of outfall and stream sediments may indicate that arsenic concentrations are representative of background conditions.

A semi-quantitative risk assessment was not performed for this site. Exposure assumptions, detected compounds, future land use, and contaminant fate and transport may be evaluated for inclusion in a baseline risk assessment. In addition, ecological receptors, RBCs, risk quantitation methods, and measurement endpoints may be identified for inclusion in a baseline ecological risk assessment. Results of the baseline risk assessment may be used to evaluate the need for continued monitoring or corrective action. The extent of contamination and the dynamic state of sediment, and soil (expanding, degrading, or steady-state) have not been evaluated.

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Table 5.2-2. Soil/Sediment Concentrations and Ecological Sediment Quality Benchmarks Ship Creek Outfall

Compound	MRL,	Samples/	Conce	entration,	mg/Kg	Sediment Quality Benchmarks			
	mg/Kg	Detects	Min.	Max.	Mean	Ont. MOE	WDNR-SQC	NOAA ER-L	
Arsenic	1	8/8	3	5	4.0	6	10	8.2	
Barium	1	8/8	31	52	39		500		
Chromium	2	8/8	28	37	32	26	100	81	
Lead	1	8/8	4	7	5	31	50	46.7	
Nickel	10	8/8	21	30	25	16	100	21	
Diesel Range Organics (DRO)	10	8/1	5	16	6		ĺ		
Total Petroleum Hydrocarbons (TPH)	10	8/2	5	29	9				

Ont-MOE = Ontario Ministry of the Environment, Lowest Effect Level (Persaud 1990)

ORNL-SQB = Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biola (Hull & Suler 1994)

WDNR-SQB = Wisconsin Department of Natural Resources Sediment Quality Criteria

EPA SQC = EPA Sediment Quality Criteria derived for five contaminants (1993)

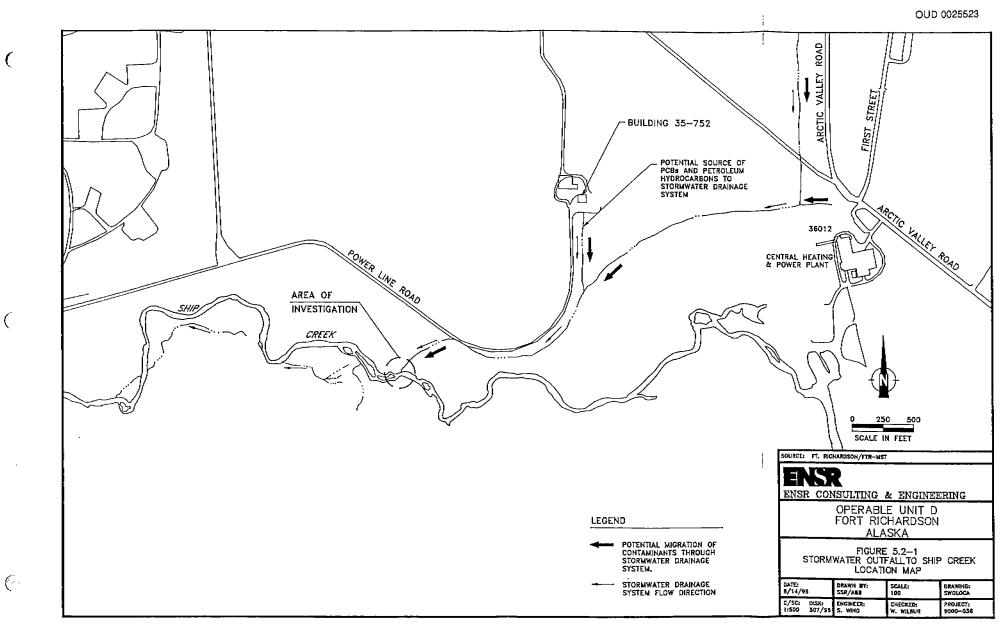
NOAA ER-L = National Oceanic and Atmospheric Adminstration Effects Range - Low, values for screening contaminants in sediment (Long & Morgan, revised 1993)

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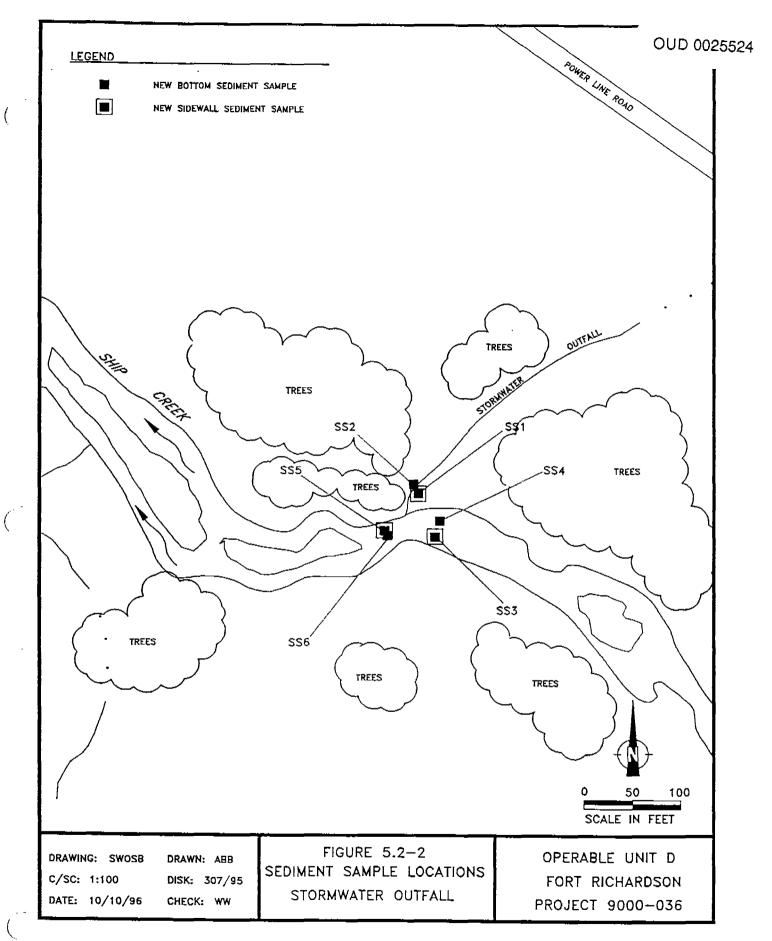
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5.3 Building 700/718

5.3.1 Site History

Wastes generated from Building 700, the Recurring Maintenance Building and Paint Shop, are temporarily stored in an unpaved 30-by-30-foot drum accumulation area on the east side of Building 718 (Figure 5.3-1). Building 718 is a general storage shed within a secured, fenced area associated with Building 700. Based on site history, drums may have contained acids, denatured alcohol, mineral spirits, methyl ethyl ketone, waste oil, grease, solvents, enamel paints, and PCBs. The site is currently active and has been in operation at least 10 years.

In 1990, the U.S. Army Environmental Hygiene Agency (AEHA) performed a characterization of the wastes stored in twenty-seven 55-gallon drums. The drums had been transported to this location from a warehouse facility in Haines, Alaska, in the late 1980s. Results from the waste characterizations indicated drums contained mineral spirits, Stoddard solvent, gasoline, JP-4, kerosene, fuel oil, lubrication oil, ethylene glycol, and PCBs.

No previous investigations of soils or groundwater have been conducted at this site.

5.3.2 Field Investigation

The objectives of the PSE2 investigation at Building 700/718 were to assess the potential release of contaminants from the drum accumulation area, to evaluate the locations of potentially contaminated soils, and to evaluate possible downward migration of contamination from surface spills. Groundwater was not investigated because the purpose of this investigation was to identify specific contaminants present in the soil. A groundwater investigation, if necessary, could be included as part of an RI.

Surface samples were collected at eight locations within the 30-by-30-foot investigation area (Figure 5.3-2). Samples were collected at 6 inches and 2 feet bgs to determine if a release has occurred at the site. At surface sample 1, soils were stained down to 2 feet bgs. A strong hydrocarbon odor was detected at 2 feet bgs, and the OVM reading was 229 ppm. At surface sample 2, 6 inches bgs, the OVM reading was 79 ppm. Samples were submitted for laboratory analysis, and preliminary analytical results were obtained within 2 weeks. Upon receipt of the preliminary analytical data, the results were evaluated to position two 20-foot soil borings.

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The two 20-foot borings were located adjacent to surface samples 1 and 3 based on preliminary analytical results (Figure 5.3-2). Subsurface material at AP-3507 (Appendix D) consisted of sandy gravel. A moderate solvent odor was detected at 2 to 4 feet bgs. OVM readings ranged from 1.8 ppm to 141.1 ppm. The highest reading was at 2 feet bgs.

Subsurface material at AP-3508 consisted of sandy gravel. No odors were noted and OVM readings ranged from 0.2 to 2.0 ppm.

Based on the soil boring logs from Building 700/718, a cross section of the investigation area is presented in Figure 5.3-3.

5.3.3 Analytical Results

A total of 31 samples, including three blind duplicates and two QA samples, were submitted for laboratory analysis. All samples at Building 700/718 were analyzed for TRPH, GRO, DRO, VOCs, PCBs/organochlorine pesticides, ethylene glycol, and metals. Analytes detected above the MRL are shown in Table 5.3-1. A complete summary of all analytical data from Building 700/718 is provided in Appendix D.

In addition, four samples, two from each 20-foot boring, were sent to the USACE NPD laboratory for geotechnical testing, including Atterburg limits, grain size distribution, and percent moisture content. Results from the soil geotechnical analyses are presented in Appendix D.

The laboratory quality control checks indicate that the analytical data are within acceptable criteria ranges, with the following exceptions noted in the USACE NPD laboratory's CQAR (ENSR 1995).

• The project laboratory's ethylene glycol data and selenium data were considered low estimates due to out-of-control QC data.

More detailed qualifications and exceptions are noted in the USACE NPD Laboratory's CQAR and ENSR QASR located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

5.3.4 Semi-Quantitative Risk Assessment

As described in Section 4.2, a semi-quantitative risk assessment was conducted for this site. The risk assessment is considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated, 2) the exposures evaluated reflect the available analytical data

TABLE 5.3-1 Summary of Analytes Detected Building 700/718 Soil Sample Analytical Results

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	Location:			SB A	P 3507	SB AP 3508						
	Depth (feel):	0-4	0-4	4-6	8-12	14-16	18-20	0-4	4-6	9-11	12-16	18-20
	Sample ID:	04071019SL	04071820SL	94B71821SL	94B71822SL	94B71823SL	94671824SL	94871825SL	94971026SL	94B71827SL	94871826SL	948718295
	Lab Code:	K946935-001	K946935-002	K946935-003	K946935-004	K946935-005	K946937-001	K946937-002	K946937-003	K946937-004	K946937-005	K946937-0
	Date Collected:	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94	t 1/4/94	11/4/94	11/4/94	11/4/94	11/4/94
Compound	Residential RBC											
Petroleum Hydrocarbon	• (mg/Kg)											
GRO	none	120	63	ND	ND	ND	ND	ND	ND	ND	ND	ND
DRO	none	4,840	4,430	73	NÖ	ND	ND	16	ND	ND	ND	ND
IPH	hone	8,800	10,000	200	ND	ND	ND	31	ND	ND	ND	ND
Organochiorine Pesticid	•• (ma/Ka)											
4-DDD	2.7	ND	ND	ND	ND	ND	ND	ND	DND	ND	ND	ND
I.4 DOT	1.9	ND	ND	ND	ND	ND	ND	0,03	ND	ND	ND	ND
I,4'-DDE	1.9	ND	ND	ND	ND	ND D	ND	ND	ND	ND	ND	ND
Polychiorineted Bipheny	(a (PCBs) (mg/Kg)											
Aroclor 1200	none	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
volatile Organic Compo	unds (µg/Kg) _							_			1	1
Acetone	7,800,000	ND	ND	ND	64	88	ND	ЙD	ND	ND	ND	52
í oluene	15,000,000	ND	8	ND	ND	ND	ND	ND	ND	ND	ND	ND
fetrachloroethene (PCE)	12,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	180,000,000	ND	ND	ND	ND	ND	ND	5	ND	ND	ND	ND
rotal Metals (mg/Kg)									-			
Visenic	0,37	Ø	7	5	7	ð	9	6	6	7	8	5
3arium	5,500	52	32	33	30	44	52	62	35	41	59	51
Chromium	390	42	24	30	28	29	50	30	29	31	30	38
ead	none	10	5	5	5	5	8	8	5	6	6	5
lickel	1,600	63	35	40	32	39	83	32	37	30	28	38
	ND = Non-detected a											
	< × Less than. And						ring dilution.					
	UJ = The analyte wai A shaded value indici											

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TABLE 5.3-1 Summary of Analytes Detected (cont.) Building 700/718 Soil Sample Analytical Results

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	Location:	Surf	ace 1	Surf	ace 2	Suri	ace 3	Suri	aca 4		Surface 5	
	Depth (feet):	0.5	2	0.5	2	0.5	2	0.5	2	0.5	2	2
	Semple ID:	94871818SL	94B71817SL	94871816SL	94B71815SL	94871814SL	94871813SL	94871804SL	94B71805SL	94871801SL	94871802SL	94871803SI
	Lab Code:	K946431-009	K946431-008	K946431-007	K946431-006	K946431-005	K946431-004	K946386-004	K946386-005	K946386-001	K946386-002	K946366-00
	Date Collected:	10/13/94	10/13/94	10/13/94	10/13/94	10/13/94	10/13/94	10/12/94	10/12/94	10/12/94	10/12/94	10/12/94
Compound	Residential RBC											
Petroleum Hydrocarbon	s (mg/Kg)											
GRO	none	151	177	DND	ND	ND						
ORO	none	24,000	10,300	559	167	58	589	12	13	104	28	20
TPH	none	34,000	31,000	360	330	78	1500	30	34	45	33	36
Organochtorine Pesticid	ee (mg/Kg)											
4,4'-DDD	2.7	<0,02	<0,02	ND	NÐ	ND	ND	ND	ND	0.01	ND	ND
4,4'-DDT	1.0	<0.02	<0.02	0.12	0.1	0.03	0.01	0.01	ND	0.05	0,02	0.01
4,4'-DOE	1,9	<0.02	<0.02	ND	ND							
Polychlorinated Bipheny	la (PCBa) (mg/Kg)											
Aroclor 1260	none	ND	ND	ND	0.2	ND	ND	ND	ND	ND	ND	ND
Volatile Organic Compo	unds (µg/Kg)											
Acetone	7,600,000	<5,000	<5,000	ND	ND							
Toluene	16,000,000	<500	<500	ND	ND	7	ND	ND	ND	ND	ND	ND
Tatrachloroathana (PCE)	12,000	<500	<500	100	ND	ND						
Total Xylenes	160,000,000	<500	<500	ND	ND	10	ND	ND	7	ND	NO	ND
Total Metals (mg/Kg)		1										
Araonic	0.37	7	6	Ð	6	7	8	6	8	7	8	6
3arium (5,500	56	39	44	54	61	69	45	52	51	50	41
Chromium	390	33	30	26	32	34	27	30	29	31	29	27
ead	none	267	67	12	10	Ð	9	8	8	12	10	9
Vickel	1,600	49	38	29	37	44	34	42	39	47	47	38

UJ = The analyte was not detected at the MRL, however, the MRL is considered an estimate.

A sheded value indicates result exceeds the residential risk based concentration (RBC).

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	Location:	Surfa	ace 6		Surface 7	Surface 8		
	Depth (feet):	0.5	2	0.5	2	2	0.5	2
	Sample ID:	94871806SL	94B71807SL	94871812SL	94871810SL	94871811SL	94871808SL	94871809SL
	Lab Code:	K946386-006	K946386-007	K946431-003	K946431-001	K946431-002	K945386-008	K946386-009
	Date Collected:	10/12/94	10/12/94	10/13/94	10/13/94	10/13/94	10/12/94	10/12/94
Compound	Residential RBC							
Petroleum Hydrocarbon	s (mg/Kg)							
GRO	none	ND	ND	ND	ND	ND	ND	ND
DRO	none	108	24	92	198	345	37	32
ГРН	none	70	45	750	500	1,400	98	62
Organochlorine Pesticid	es (mg/Kg)							
4.4-DDD	2.7	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	1.9	0.25	ND	0.03	0.01	0.02	ND	ND
4.4-DDE	1,9	0.01	ND	ND	ND	ND	ND	ND
Polychiorinated Bipheny	ris (PCBs) (mg/Kg)							
Arodor 1260	none	ND	ND	0.2	ND	ND	ND	ND
Volatile Organic Compo	unds (µg/Kg)							
Acetone	7,800,000	ND	ND	ND	ND	ND	ND	ND
Toluene	16.000,000	ND	6	5	ND	ND	ND	7
Tetrachioroethene (PCE)	12,000	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	160,000,000	8	6	ND	ND	ND	ND	7
Total Metals (mg/Kg)								
Arsenic	0.37	7	6	7	7	7	5	6
Barium	5,500	53	61	53	52	53	50	61
Chromium	390	26	22	35	27	27	30	23
ead	none	15	3	8	7	7	8	8
Nickel	1,600	33	29	35	33	37	41	27
FOOTNOTES:	1,600 ND = Non-detected a < = Less then, Ana UJ = The analyte wa A shaded value indic	t the method report lybcal reporting it is not detected at t	he MRL, however,	(See the Building) The MRL is consid	700/718 Appendoc dered an estimate.	for MRL values.)	41	27

TABLE 5.3-1 Summary of Analytes Detected (cont.) Building 700/718 Soil Sample Analytical Results

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and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only one exposure pathway was considered (soil ingestion); although this pathway usually yields the most conservative results, other pathways may also be important.

The drum storage area at Building 700/718 is in a developed area consisting of a metal storage building on a gravel pad. Access is restricted to the area by a fence and locked gate. Surrounding land uses are generally industrial in nature, with railroad tracks west of the site. There is a second-growth forest approximately 500 feet south of the building. There are no surface water bodies within 0.5 mile.

5.3.4.1 Compounds of Potential Concern

A summary of the COPCs is presented in Table 5.3-2. These compounds include PCBs, insecticides (4,4'-DDT), and arsenic. All of these compounds are carcinogens.

Туре	Source	Carcinogens
Polychlorinated biphenyls (PCB)	Transformer oil	Total PCBs
Polychlorinated diphenyl alkanes	Insecticides	4-4'-DDT
Metals ¹	Background soil	Arsenic

Table 5.3-2. Compounds of Potential ConcernBuilding 700/718

¹ Based on the background metals statistics evaluation in Appendix A, some metals were not included in the semiquantitative risk assessment because they were not statistically significant from background concentrations.

All other target analytes were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only). As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. In addition, a list of compounds that were not detected at detection limits exceeding current risk-based concentrations is provided in Table 5.3-3. Most of these compounds were identified in the Work Plan (ENSR 1994) but require special analytical services to achieve reporting limits below RBCs. During the RI/FS, Table 5.3-3 should be reviewed to determine if the likelihood that the compound is present warrants the use of special analytical services.

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Table 5.3-3 Compounds Not Detected at Reporting LimitsExceeding Current Risk-Based Concentrations, Building 718

	Risk-Based Concentration	
0.04 mg/Kg	0.038 mg/Kg	
0.7 mg/Kg	0.58 mg/Kg	
500 µg/Kg	340 µg/Кg	
2000 µg/Kg	7.5 μg/Kg	
500 µg/Kg	91 µg/Kg	
2000 µg/Kg	460 µg/Kg	
	0.7 mg/Kg 500 µg/Kg 2000 µg/Kg 500 µg/Kg	

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As described in Section 5.3.4.4, the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, DRO, and TPH). As a result, these data were not included in the semi-quantitative risk assessment.

5.3.4.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Sources, transport mechanisms, exposure pathways, and receptors (elements of a Conceptual Site Model) are shown on Figure 5.3-4. As discussed previously, the primary source is the drum accumulation area. Secondary sources include contaminated surface and subsurface soil. It is not known whether groundwater or surface waters have been impacted.

Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile COPCs may disperse in the atmosphere or accumulate in enclosed spaces. However, no volatile COPCs were detected at concentrations exceeding 1/10th of the RBC for residential soil. Concentrations of nonvolatile COPCs in airborne dust are not expected to be of concern in the atmosphere (see Appendix A, Section A.5).

Surface water transport is not expected to be significant, since the surrounding topography is relatively flat and no surface water bodies are present within 0.5 mile of the site. Leaching is not expected to be significant since all of the COPCs are relatively insoluble in water.

Depending on the future land use, potential receptors may include residents, occupational workers, and construction workers. Ecological receptors include terrestrial plants, mammals, and avian species.

5.3.4.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion pathway. Soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, this pathway was selected to determine if soil exposures represent a significant human health risk. If human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of a baseline risk assessment.

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Soil exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for carcinogens. For example, exposures to noncarcinogens are calculated assuming childhood exposure only, whereas exposures to carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations in soil were calculated as the 95 percent UCL of the average concentration of all samples analyzed from a particular medium (surface or subsurface soil). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991, 1992).

5.3.4.4 Toxicity Assessment

Dose-response factors were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992b), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semi-quantitative risk assessment.

5.3.4.5 Human Health Risk Characterization

The following sections summarize potential human health risks via soil ingestion. As described above, soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, if human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are soil ingestion are close to the acceptable risk threshold, then other exposure pathways may need to be evaluated as part of a baseline risk assessment.

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Human Health Risks

Carcinogenic risks for the soil ingestion pathway are summarized on Table 5.3-4. A breakdown of risk calculations for each pathway and receptor are presented in Appendix A. Noncarcinogenic risks were not evaluated, since all noncarcinogenic compounds were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only).

	Carcinogenic Risk				
Pathway	Residential	Occupational			
Surface Soil	2.9 x 10 ⁻⁶	3.4 x 10 ⁻⁷			
Subsurface Soil	6.1 x 10 ⁻⁶	7.1 x 10 ⁻¹¹			
Total Risk	9.0 x 10 ^{.6}	3.4 x 10 ⁻⁷			

Table 5.3-4. Carcinogenic Risks for Soil IngestionBuilding 700/718

Using residential exposure factors, the excess lifetime carcinogenic risk for soil ingestion exceeds the lower benchmark of 1×10^{-5} listed in the NCP. As a result, exposures via inhalation and dermal contact may also be evaluated. Nearly all of the carcinogenic risk is associated with PCBs. A very small fraction of the total risk is associated with 4,4'-DDT,

Using the occupational exposure factors, the excess lifetime carcinogenic risk for soil ingestion does not exceed the lower benchmark of 1×10^{-6} listed in the NCP.

As described in Section 5.3.4.4, risks associated with bulk hydrocarbon measurements (GRO, DRO, and TPH) could not be evaluated. During the RI/FS, an effort may be made to evaluate the transport, fate, and toxicity of petroleum hydrocarbons in surface and subsurface soil.

5.3.4.6 Ecological Risk Characterization

Quantitative assessment of ecological risks can be performed at the organism, population, or ecosystem level. Although ecosystem-level effects may be the most important, effects testing and modeling are rarely performed due to a number of practical considerations (Suter 1993).

Quantification of population-level effects, such as reproductive potential, is important to maintain species populations, whereas assessment of organism-level effects evaluates the risk to individual organisms.

Chemicals can be evaluated as single compounds or as mixtures. Methods for evaluating the toxicity of mixtures requires knowledge regarding the sites and modes of action of individual compounds. Unlike for human health risk assessment, these methods have not been standardized, and there is some debate regarding the most appropriate approach.

If potential exposure pathways and receptors are present, ecological assessment begins with identification of the compounds of potential concern. This can be done in a similar fashion as for human health risk assessment, using ecological RBCs. Ecological RBCs may include toxicity benchmarks, sediment quality criteria, or other regulatory criteria. One set of criteria in common use provides benchmark concentrations for eight representative mammalian species and nine avian species (Opresko et al. 1994). Although benchmark concentrations are provided for 76 chemicals, toxicity benchmarks are not available for many target analytes. Also, the benchmarks are provided as concentrations in food, requiring evaluation of plant uptake and other routes of dietary exposure. Due to the large number of analytes measured at Building 700/718, ecological RBCs were not compiled as part of this project.

Potential receptors at Building 700/718 include terrestrial and avian species at a variety of trophic levels. The most highly exposed species include those with a small home range and small body weight to food consumption ratio (e.g., mice and resident songbirds). However, other less exposed species may warrant evaluation based on their susceptibility to particular chemicals (e.g., reproductive effects of 4,4'-DDT in raptors).

As part of the RI/FS, ecological RBCs may be identified for representative terrestrial and avian species. Compounds of potential concern may be selected based on a comparison of ecological RBCs with measured concentrations. At this point, the appropriate risk quantitation methods and measurement endpoints may be selected.

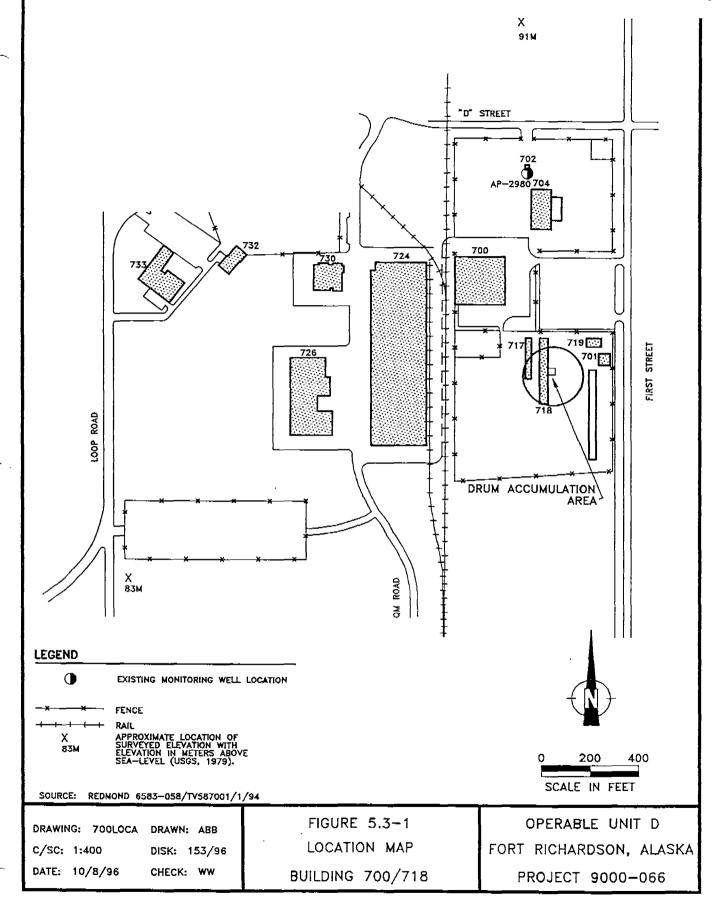
5.3.5 Findings and Conclusions

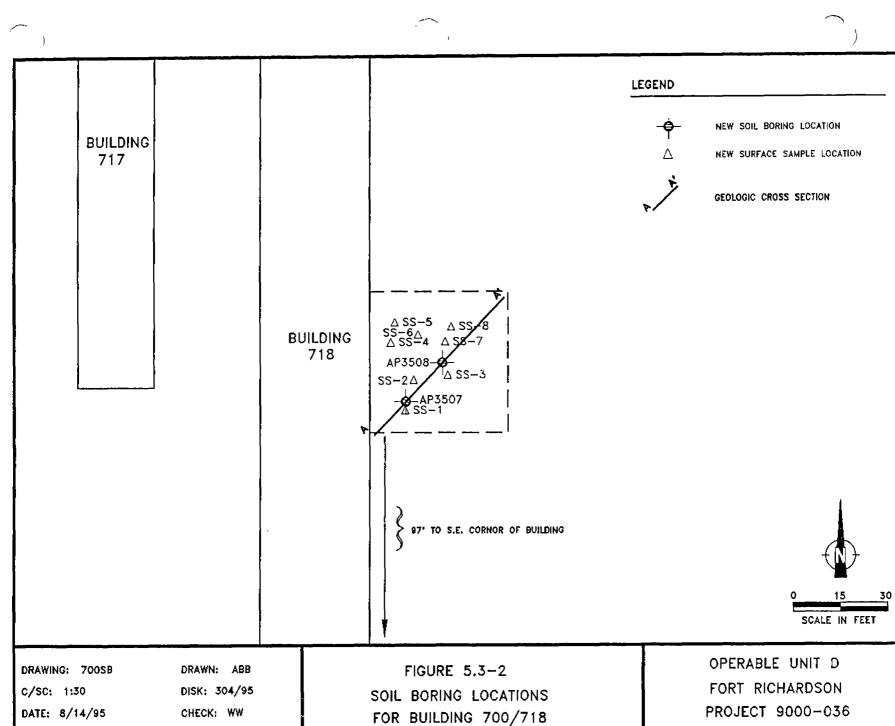
Although risks associated with noncarcinogenic compounds are below the estimated threshold for adverse effects, the excess lifetime carcinogenic risk for soil ingestion using residential exposures exceeds the lower benchmark of 1 x 10⁻⁶ listed in the NCP. Nearly all of the risk is associated with PCBs. A very small fraction of the total excess lifetime cancer risk is associated with 4,4'-DDT.

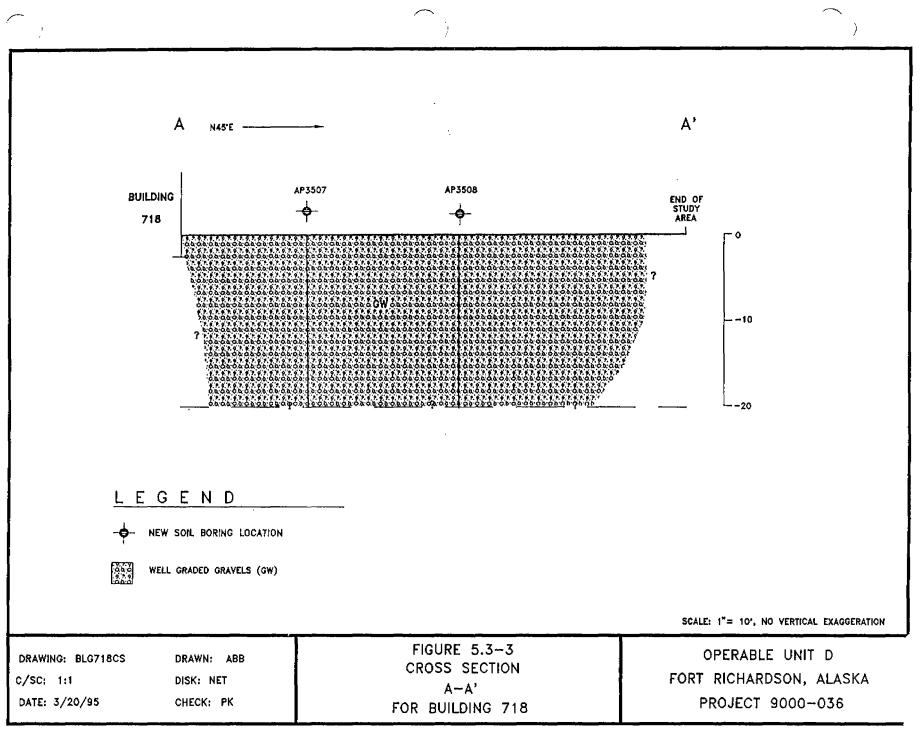
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The semi-quantitative risk assessment was performed using exposure assumptions that may not be appropriate for the site (e.g., residential use). In addition, the extent of contamination and the dynamic state of soil contamination plumes (expanding, degrading, or steady-state) have not been evaluated. The exposure assumptions, compounds of potential concern, future land use, and contaminant fate and transport may be re-evaluated for inclusion in a baseline risk assessment, if required. In addition, ecological receptors, RBCs, risk quantitation methods, and measurement endpoints may be identified for inclusion in a baseline ecological risk assessment.







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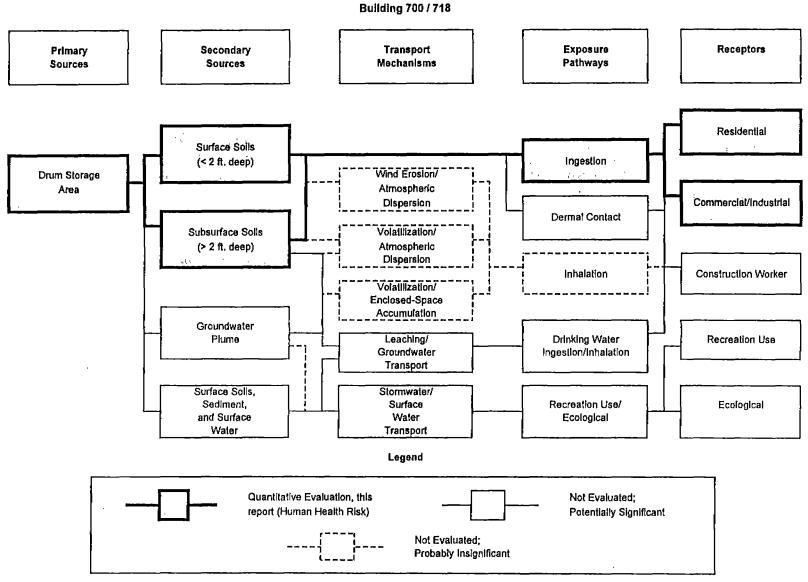


Figure 5.3-4: Sources, Transport Mechanisms, Exposure Pathways, and Receptors

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After ASTM (1994) P./common/Psezdata/scr-rcpt xta OUD 0025541

Building 704

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5.4 Building 704

5.4.1 Site History

Building 704 and the surrounding parking area are used for storage and maintenance of U.S. Army Directorate of Public Works (PW) vehicles and heavy equipment (Figure 5.4-1). At the time of an Army inspection conducted in 1990, containers holding various wastes and unused petroleum products were stored in an approximately 85-by-85-foot area in the northeast corner of the Building 704 parking area. The AEHA performed a characterization of the drum contents, and the results indicated that waste paint, brake fluid, lubricating oil, gasoline, diesel, kerosene, mineral spirits, fuel oil, JP-4, ballast water, alcohols, chlorinated solvents, and other flammable liquids were stored in this location. All containers were removed from the site in 1991.

5.4.2 Field Investigation

The objectives of the PSE2 investigation at Building 704 were to assess the potential release of contaminants from the drum storage area; to evaluate the locations of potentially impacted soils; and to evaluate possible downward migration of contaminants from surface spills.

Surface samples were collected at eight locations within the 85-by-85-foot investigation area (Figure 5.4-2). Samples were collected at 6 inches and 2 feet bgs in areas with visible staining and at 12 inches and 2.5 feet in areas not visibly stained. At surface sample 1, a band of asphalt was observed at 6 inches bgs, and at 2 feet bgs a strong hydrocarbon odor was noted. Samples were shipped to the laboratory for analysis, and analytical results were obtained within 2 weeks. Upon receipt of the preliminary analytical data, the results were evaluated to assess the potentially impacted areas for further investigation.

Two 20-foot borings were located based on preliminary data adjacent to surface samples 1 and 8. Subsurface material at boring AP-3509 (Appendix E) included sandy gravel and gravel. At boring AP-3510, subsurface material consisted of sandy gravel until a clayey silt was encountered at approximately 19 feet bgs.

All OVM readings from field samples were below 6 ppm.

Based on the soil boring logs, a cross section of the investigation area is presented in Figure 5.4-3.

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5.4.3 Analytical Results

A total of 34 samples, including four blind duplicate samples and three QA samples, were shipped to the laboratory for analysis. All samples at Building 704 were analyzed for TRPH, GRO, DRO, VOCs, PCBs/organochlorine pesticides, ethylene glycol, and metals. Analytes above the MRLs are shown in Table 5.4-1. A complete summary of analytical data for Building 704 is presented in Appendix E.

In addition, two samples from each 20-foot boring were sent to the USACE NPD laboratory for geotechnical testing, including Atterburg limits, grain size distribution, and percent moisture content. Results from the soil geotechnical analyses are presented in Appendix E.

The laboratory quality control checks indicate that the analytical data are within acceptable criteria ranges, with the exceptions noted in the USACE NPD laboratory's CQAR (ENSR 1995). More detailed qualifications and exceptions are noted in the USACE NPD Laboratory's CQAR and ENSR QASR located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

In general the following qualifications apply to the data:

- The pesticide/PCB data for samples 94B70401SL through -18SL should be considered high estimates due to high laboratory control (LC) recoveries.
- Low levels of selenium may not have been detected if present in the associated samples due to a low matrix spike recovery.

5.4.4 Semi-Quantitative Risk Assessment

As described in Section 4.2, a semi-quantitative risk assessment was performed for this site. The risk assessment is considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only one exposure pathway was considered (soil ingestion); although this pathway usually yields the most conservative results, other pathways may also be important.

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	Location:			SB AF	3509		
	Depth (feet);	0-4	0-4	4-6	9-11	12-16	18-20
	Sample ID:	94870419SL	94B70420SL	94870421SL	94870422SL	94870423SL	94870424SL
	Lab Code:	K946936-001	K946935-002	K946936-003	K946935-004	K946936-005	K946936-006
	Date Collected:	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94
Compound	Residential RBC				 -		
Petroleum Hydrocarbons (mg/Kg)				<u> </u>		
GRO	none	ND	ND	ND	ND	ND	ND
DRO	none	ND	ND	ND	ND	ND	ND
грн	none	ND	16	ND	ND	ND	ND
Organochlorine Pesticides	(mg/Kg)				[
4.4'-DDD	2.7	ND	ND	ND	ND	ND	ND
4'-DDT	1.9	0.04	0.02	0.05	DND	ND	NĎ
4,4'-DDE	1.9	ND	ND	ND	ND	ND	ND
Chlordane	0.49	ND	ND	<0.3	ND	ND	ND
Volatile Organic Compoun	ds (µg/Kg)						
Acetone	7,800,000	ND	ND	69	60	61	ND
Toluene	16,000,000	ND	ND	ND	ND	ND	8
Tetrachloroethene (PCE)	12,000	ND	ND	ND	ND	ND	ND
Total Xylenes	160,000.000	ND	ND	ND	ND	ND	9
Total Metals (mg/Kg)							
Arsenic	0.37	10	5	4	18	8	6
Barium	5,500	38	28	30	28	33	40
Chromium	390	28	30	23	17	19	19
Lead	none	10	6	5	6	4	6
Nickel	1,600	48	47	50	25	28	28
FOOTNOTES:	ND = Non-detected at < = Less than, Analy A shaded value indicat	ical reporting limit (as been elevaled du	s io matrix interferenc	es or sample requiri		

TABLE 5.4-1 Summary of Analytes Detected **Building 704 Soil Sample Analytical Results**

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TABLE 5.4-1 Summary of Analytes Detected (cont.) Building 704 Soil Sample Analytical Results

	Location:			SB AF	3510		
	Depth (feet):	0.4	4-8	4-8	9-11	14-16	18-20
	Sample ID:	94870425SL	94B70426SL	94870427SL	94870428SL	94B70429SL	94870430SL
	Lab Code:	K947000-001	K947000-002	K947000-003	K947000-004	K947000-005	K947000-006
	Date Collected:	11/7/94	11/7/94	11/7/94	11/7/94	11/7/94	11/7/94
Compound	Residential RBC						
etroleum Hydrocarbons (r	ng/Kg)						
GRO	none	5	ND	ND	ND	ND	ND
DRO	none	270	33	27	14	ND	ND
РН	none	190	16	20	ND	ND	ND
Organochiorine Pesticides	(mg/Kg)						
4'-DDD	2,7	0.01	ND	ND	ND	ND	ND
4,4'+DDT	1.9	0.02	ND	ND	ND	ND	ND
4'-DDE	1.9	ND	ND	ND	ND	ND	ND
Chlordane	0.49	ND	ND	ND	ND	ND	ND
Volatile Organic Compound	is (µg/Kg)						
Acetone	7,800,000	88	ND	NĎ	ND	ND	ND
Toluene	16.000,000	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	12,000	ND	ND	DND	ND	ND	ND
Total Xylenes	160,000,000	ND	ND	6	DN	ND	8
Total Metals (mg/Kg)							
Arsenic	0.37	5	5	8	5	6	7
Barium	5,500	77	47	53	55	54	96
Chromium	390	37	28	31	36	38	
Lead	none	13	7	7	7	7	7
	1,600	48	35	38	35	38	48

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Part 3 of 5 Location; Surface 2 Surface 1 Surface 3 Depth (feet): 05 2 25 1 05 2 Sample ID: 94870404SL 9487040551 94870406SL 94870409SL 94870413SL 94870414SL Lab Code: K946366-004 K946366-005 K946366-008 K946366-009 K946366-013 K946366-014 Date Collected: 10/11/94 10/11/94 10/11/94 10/11/94 10/11/94 10/11/94 Residential RBC Compound Petroleum Hydrocarbons (mg/Kg) GRO 11 ND ND ND ND ND none DRO 1,454 Z93 ΝĐ 133 372 291 none ТРН 1,600 650 500 400 680 360 none Organochiorine Pesticides (mg/Kg) 0.02 J ND U £0.0 4.4'-DOD 27 L 90.0 0.05 J 0.02 J 0.58 J 4.4'-DDT 0.19 J 0.03 J ND 1.9 0.67 J 0.28 J ⊲.05 ND ND 0.05 J 4,4'-DDE 1.9 0.01 J ND Chlordane 0.49 <0.5 ND ND ND ND ND Volatile Organic Compounds (µg/Kg) ND ND ND 7,800,000 ND ND ND Acetone 16,000,000 12 ND ND ND ND ND Toluene Tetrachloroethene (PCE) 12,000 ND ND ND ND ND ND ND ND ND Total Xylenes 160,000,000 12 ND ND Total Metals (mg/Kg) 6 8 9 0.37 6 7 6 Arsenic 55 5,500 109 60 47 Barium 80 44 24 40 28 41 Chromium 390 31 30 none 85 17 23 18 18 13 ead 42 36 46 Nicke 1 600 40 38 28 ND = Non-detected at the method reporting limit (MRL). (See the Building 704 Appendix for MRL values.) FOOTNOTES: J = Value is considered an estimate. < = Less than. Analytical reporting limit has been elevated due to matrix interferences or sample requiring dilution.</p>

TABLE 5.4-1 Summary of Analytes Detected (cont.) Building 704 Soil Sample Analytical Results

A shaded value indicates result exceeds the residential risk based concentration (RBC),

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	Location:		Surface 4		Surfa	ace 5
	Depth (feet):	0.5	2	2	0.5	2
	Sample (D:	94870410SL	94870411SL	94B70412SL	94B70406SL	94870407SL
	Lab Code:	K946366-010	K946366-011	K948366-012	K946366-006	K946366-007
	Date Collected:	10/11/94	10/11/94	10/11/94	10/11/94	10/11/94
Compound	Residential RBC					
Petroleum Hydrocarbons (mg/Kg)					
GRO	none	ND		ND	ND	ND
DRO	none	50	22	41	ន	63
ГРН	none	430	160	132	310	290
Organochiorine Pesticides	(ing/Kg)					
4.4-000	2.7	0.04 J	0.01 J	0.01 J	L 80.0	0.04 J
4,4'-DDT	1.9	0.52 J	0.17 J	0,16 J	1.54 J	0.61 J
4,4'-DDE	1.9	ND	ND	ND	L 60,0	0.03 J
Chlordane	0.49	ND	ND	ND	ND	ND
Volatile Organic Compoun	ds (µg/Kg)					
Acetone	7,800,000	ND	ND	ND	ND	ND
Toluene	15,000,000	5	ND	ND	8	ND
Tetrachloroethene (PCE)	12,000	ND	ND	ND	ND	ND
Total Xylenes	160,000,000	ND	6	ND	9	ND
Total Metals (mg/Kg)				[
Arsenic	0,37	6	12	12	7	а
Barium	5,500	92	45	42	72	47
Chromium	390	38	34	28	36	28
Lead	none	28	12	8	29	16
Nickel	1,600	40	48	44	44	31
FOOTNOTES:	ND = Non-detected at J = Value is consider < = Less than. Analy A shaded value indicat	ed an estimate. tical reporting limit h	as been elevated due	to matrix interference	es or sample requirin	

TABLE 5.4-1 Summary of Analytes Detected (cont.) **Building 704 Soil Sample Analytical Results**

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	Location:			Surface 7		Surface 8		
	Depth (feet):	1	1	2.5	1	2.5	0.5	2
	Sample ID:	94B70401SL	94870402SL	94870403SL	94B70415SL	94870416SL	94870417SL	94870418S
	Lab Code;	K946366-001	K946366-002	K946366-003	K946366-015	K946366-016	K946366-017	K946366-01
	Date Collected:	10/11/94	10/11/94	10/11/94	10/11/94	10/11/94	10/11/94	10/11/94
Compound	Residential RBC							
Petroleum Hydrocarbons (i	ng/Kg)							
GRO	none	ND	ND	ND	DND	ND	ND	ND
DRO	none	442	473	20	501	103	89	28
ГРН	none	850	730	22	370	310	200	71
Organochlorine Pesticides	(mg/Kg)							}
4,4'-DDD	2.7	0.04 J	0.02 J	ND	0.05 J	0.02 J	0.05 J	<0.05
4,4'-DDT	1.9	0_46 J	0.27 J	0.02 J	0,44 J	0.31 J	1.12 J	0.67 J
4,4'-DDE	1.9	ND	ND	ND	0.02 J	ND	0.07 J	<0.05
Chlordane	0.49	ND	ND	ND	0.2 J	0.4 J	2.3 J	2.5 J
Volatile Organic Compound	ds (µg/Kg)							
Acetone	7,800,000	ND	ND	ND	ND	ND	ND	ND
Toluene	16,000,000	ND	ND	ND	ND	ND	ND	ND
Tetrachioroethene (PCE)	12,000	ND	ND	ND	ND	6	ND	ND
Total Xylenes	160,000,000	ND	ND	ND	ND	ND	ND	ND
Total Metals (mg/Kg)								
Arsenic	0.37	6	6	6	7	8	8	6
Barium	5,500	79	76	39	80	68	89	53
Chromium	390	33	32	28	31	29	36	32
Lead	попе	48	60	9	26	28	36	15
Nickel	1,600	38	34	33	34	36	26	38
FOOTNOTES:	ND = Non-detected at	the method repo	rting limit (MRL).	(See the Building	704 Appendix for	MRL values.)		<u> </u>
	J = Value is conside	red an estimate.						
	< = Less than. Analy	tical reporting lim	rit has been eleva	ted due to matrix i	nterferences or \$2	mpla requiring di	lution.	

TABLE 5.4-1 Summary of Analytes Detected (cont.) **Building 704 Soil Sample Analytical Results**

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Building 704 is located in a developed area, consisting of a maintenance building on a cleared gravel staging area. Surrounding land uses are generally industrial in nature, with railroad tracks on the west side of the site. A second-growth forest is located approximately 1,000 feet south of the site. There are no surface water bodies within 0.5 mile.

5.4.4.1 Compounds of Potential Concern

A summary of the COPCs is presented in Table 5.4-2. These compounds include insecticides (4,4'-DDT and chlordane) and metals (arsenic). All of these compounds are carcinogens.

Туре	Source	Carcinogens
Polychlorinated diphenyl alkanes	Insecticides	4-4'-DDT
Chlorinated cyclodienes	Insecticides	Chlordane
Metals ¹	Background soil	Arsenic

Table 5.4-2. Compounds of Potential ConcernBuilding 704

Based on the background metals statistics evaluation in Appendix A, some metals were not included in the semiquantitative risk assessment because they were not statistically significant from background concentrations.

All other target analytes were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only). As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. In addition, a list of compounds that were not detected at detection limits exceeding current risk-based concentrations is provided in Table 5.4-3. Most of these compounds were identified in the Work Plan (ENSR 1994) but require special analytical services to achieve reporting limits below RBCs. During the RI/FS, Table 5.4-3 should be reviewed to determine if the likelihood that the compound is present warrants the use of special analytical services.

As described in Section 5.4.4.4, the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, DRO, and TPH). As a result, these data were not included in the semi-quantitative risk assessment.

Compound	Matrix	Maximum Detection Limit	Risk-Based Concentration
Aldrin	Soil	0.05 mg/Kg	0.038 mg/Kg
Dieldrin	Soil	0.05 mg/Kg	0.04 mg/Kg
Toxaphene	Soil	2 mg/Kg	0.58 mg/Kg
Chlordane	Soil	0.5 mg/Kg	0.49 mg/Kg
1,2-Dibromoethane (EDB)	Soil	20 µg/Kg	7.5 µg/Kg

Table 5.4-3Compounds Not Detected at Detection LimitsExceeding Current Risk-Based Concentrations, Building 704

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5.4.4.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Sources, transport mechanisms, exposure pathways, and receptors (elements of a Conceptual Site Model) are shown on Figure 5.4-4. As discussed previously, the primary source is the drum storage area. Secondary sources include contaminated surface and subsurface soil. It is not known whether groundwater or surface waters have been impacted.

Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile COPCs may disperse in the atmosphere or accumulate in enclosed spaces. However, no volatile COPCs were detected at concentrations exceeding 1/10th of the RBC for residential soil. Concentrations of nonvolatile COPCs in airborne dust are not expected to be of concern in the atmosphere (see Appendix A, Section A.5).

Surface water transport is not expected to be significant since the surrounding topography is relatively flat and no surface water bodies are present within 0.5 mile of the site. Leaching is not expected to be significant since all of the COPCs are relatively insoluble in water.

Depending on the future land use, potential receptors may include residents, occupational workers, and construction workers. Ecological receptors include terrestrial plants, mammals, and avian species.

5.4.4.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion pathway. Soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, this pathway was selected to determine if soil exposures represent a significant human health risk. If human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of the baseline risk assessment.

Soil exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for

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OUD PRELIMINARY SOURCE EVALUATION 2

carcinogens. For example, exposures to noncarcinogens are calculated assuming childhood exposure only, whereas exposures to carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations in soil were calculated as the 95 percent UCL of the average concentration of all samples analyzed from a particular medium (surface or subsurface soil). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991, 1992).

5.4.4.4 Toxicity Assessment

Dose-response factors were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992b), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semi-quantitative risk assessment.

5.4.4.5 Human Health Risk Characterization

The following sections summarize potential human health risks via soil ingestion. As described above, soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, if human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are soil ingestion are close to the acceptable risk threshold, then other exposure pathways may need to be evaluated as part of the baseline risk assessment.

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Human Health Risks

Carcinogenic risks for the soil ingestion pathway are summarized on Table 5.4-4. A breakdown of risk calculations for each pathway and receptor are presented in Appendix A. Noncarcinogenic risks were not evaluated, since all noncarcinogenic compounds were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only).

	Carcinogenic Risk			
Pathway	Residential	Occupational		
Surface Soil	9.2 x 10 ⁻⁷	1.0 x 10 ⁻⁷		
Subsurface Soil	4.3 x 10 ⁻⁸	5.1 x 10 ⁻⁹		
Total Risk	9.6 x 10 ⁻⁷	1.1 x 10 ⁻⁷		

Table 5.4-4. Carcinogenic Risks for Soil IngestionBuilding 704

Using both residential and occupational exposure factors, the excess lifetime carcinogenic risk for soil ingestion does not exceed the lower benchmark of 1×10^{-6} listed in the NCP. As described in Section 5.4.4.4, risks associated with bulk hydrocarbon measurements (GRO, DRO, and TPH) could not be evaluated. During the RI/FS, an effort may be made to evaluate the transport, fate, and toxicity of petroleum hydrocarbons in surface and subsurface soil.

5.4.4.6 Ecological Risk Characterization

Quantitative assessment of ecological risks can be performed at the organism, population, or ecosystem level. Although ecosystem-level effects may be the most important, effects testing and modeling are rarely performed due to a number of practical considerations (Suter 1993). Quantification of population-level effects, such as reproductive potential, is important to maintain species populations, whereas assessment of organism-level effects evaluates the risk to individual organisms.

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Chemicals can be evaluated as single compounds or as mixtures. Methods for evaluating the toxicity of mixtures requires knowledge regarding the sites and modes of action of individual compounds. Unlike for human health risk assessment, these methods have not been standardized, and there is some debate regarding the most appropriate approach.

If potential exposure pathways and receptors are present, ecological assessment begins with identification of the compounds of potential concern. This can be done in a similar fashion as for human health risk assessment, using ecological RBCs. Ecological RBCs may include toxicity benchmarks, sediment quality criteria, or other regulatory criteria. One set of criteria in common use provides benchmark concentrations for eight representative mammalian species and nine avian species (Opresko et al. 1994). Although benchmark concentrations are provided for 76 chemicals, toxicity benchmarks are not available for many target analytes. Also, the benchmarks are provided as concentrations in food, requiring evaluation of plant uptake and other routes of dietary exposure. Due to the large number of analytes measured at Building 704, ecological RBCs were not compiled as part of this project.

Potential receptors at Building 704 include terrestrial and avian species at a variety of trophic levels. The most highly exposed species include those with a small home range and small body weight to food consumption ratio (e.g., mice and resident songbirds). However, other less exposed species may warrant evaluation based on their susceptibility to particular chemicals (e.g., reproductive effects of 4,4'-DDT in raptors).

As part of the RI/FS, ecological RBCs may be identified for representative terrestrial and avian species. Compounds of potential concern may be selected based on a comparison of ecological RBCs with measured concentrations. At this point, the appropriate risk quantitation methods and measurement endpoints may be selected.

5.4.5 Findings and Conclusions

The risks associated with and noncarcinogenic compounds are below the estimated threshold for adverse effects, and the excess lifetime carcinogenic risk for soil ingestion does not exceed the lower benchmark of 1×10^{-6} listed in the NCP.

The semi-quantitative risk assessment was performed using exposure assumptions that may not be appropriate for the site (e.g., residential use). In addition, the extent of contamination and the dynamic state of soil contamination (expanding, degrading, or steady-state) have not been evaluated. The exposure assumptions, compounds of potential concern, future land use, and contaminant fate and transport may be re-evaluated for inclusion in a baseline risk assessment, if required. In addition, ecological receptors, RBCs, risk quantitation methods, and measurement endpoints may be identified for inclusion in a baseline ecological risk assessment.

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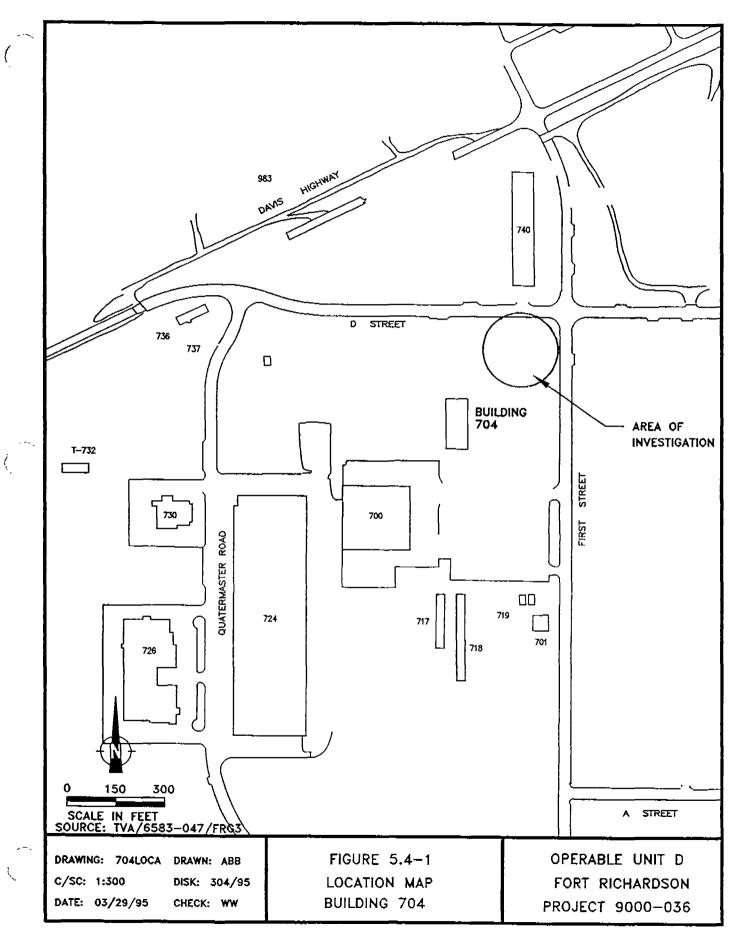
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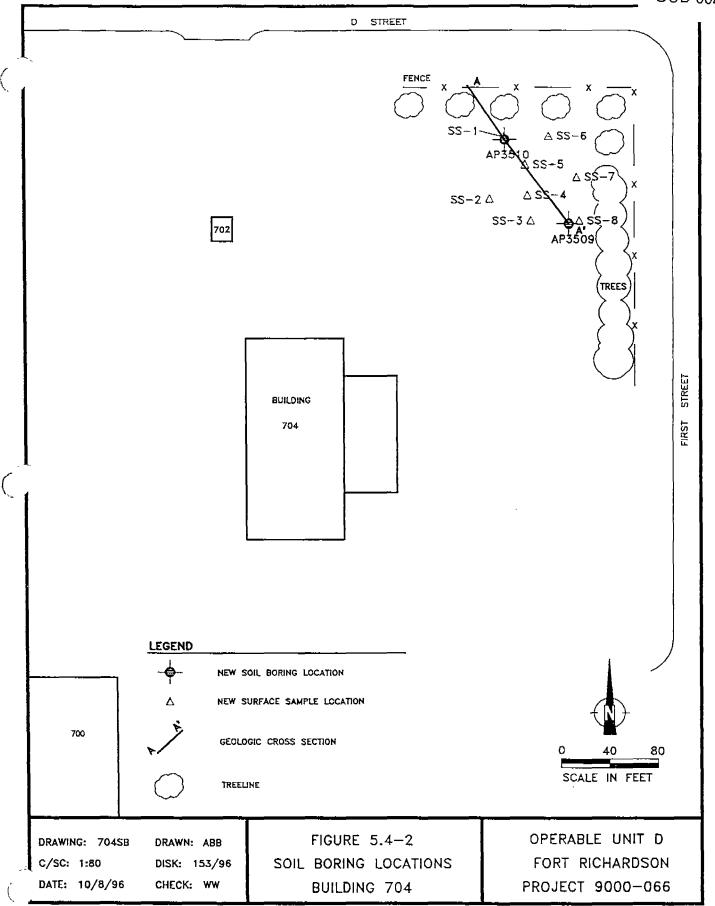
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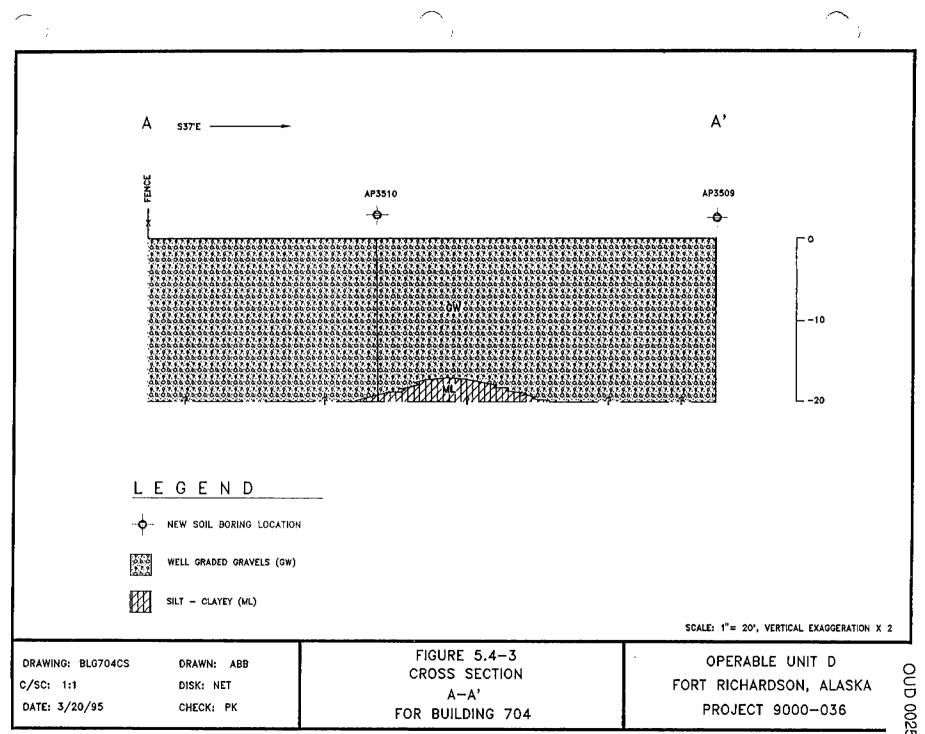
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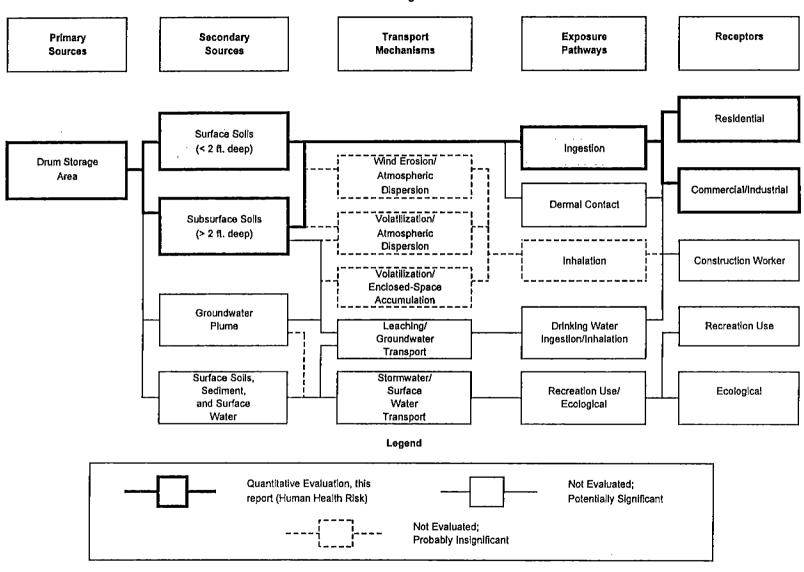


Figure 5.4-4: Sources, Transport Mechanisms, Exposure Pathways, and Receptors Building 704

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Building 796

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5.5 Building 796

5.5.1 Site History

Building 796, the DOL Maintenance/Vehicle and Weapons Repair Section, is used for vehicle and equipment maintenance (Figure 5.5-1). A Battery Shop is located within the building. At the Battery Shop, batteries were reportedly drained onto a stainless steel table and into a small aboveground tank. The acids were neutralized with sodium bicarbonate, and resulting fluids were tested for pH with litmus paper. When the fluids were adequately neutralized, they were discharged via a floor drain to a UST (SAIC 1990). The UST location has not yet been defined but is reportedly located approximately 100 feet from the Battery Shop. Site drawings show a floor drain connected to the sanitary sewer. If there was a UST connected to the acid neutralization system, it would probably have been located along the former storm sewer line. The UST system was in operation until 1980 when the acids were reportedly discharged to a log crib located outside the shop. The crib was removed in approximately 1985, and the floor drain was reconnected to the storm drain. In 1993, the floor drain was connected to an oil/water separator.

The old acid disposal lines and surrounding soils were reportedly removed after 1981 (they were likely removed in 1985 after the system was shut down). When removed, the pipe was reportedly no longer structurally sound. The depth of the excavation immediately adjacent to the building was 8 feet.

An oil/water separator is located on the east side of the facility, approximately 20 feet from the Battery Shop. The oil/water separator visually appears to be in good condition and has apparently been added to the facility within the last several years. The oil/water separator reportedly backs up on occasion, overflowing various parts of the system. Past leaks could possibly have impacted the area investigated.

No previous investigations have been conducted at the Battery Shop site. Potential contaminants of concern include metals, VOCs, GRO, DRO, SVOCs, ethylene glycol, and PCBs.

5.5.2 Field Investigation

The objectives of the PSE2 investigation at Building 796 are to evaluate the potential presence of contaminants in subsurface soils near the former storm sewer line, to evaluate the potential presence of contaminants below the former floor drain and sewer line in the Battery Shop, and to assess the potential release of contaminants to groundwater.

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OUD PRELIMINARY SOURCE EVALUATION 2

The investigation was to include four soil borings and one monitoring well. The soil boring sites were selected based on the previously reported locations for the storm sewer line and the former log crib. The first two borings were to have been located inside the Battery Shop. The next two borings were located immediately outside the Battery Shop; one in the location of the former log crib, and the other over the former storm sewer line.

The two borings inside the shop were finished as shallow subsurface samples because the interior dimensions of the Battery Shop precluded the use of the drilling rig. These former borings were advanced via a bobcat-mounted auger and hand excavation to a maximum practical depth of 48 inches bgs. An electric jackhammer was used to break through the 12-inch deep concrete floor. The remaining depth was achieved by a combination of hand-held shovels and an auger attachment on a bobcat. Large cobbles, rebar, and cast iron piping were encountered during the sampling of these two borings.

Sample location 1, inside the Battery Shop, was 15 feet from the center of the bay door. One sample was collected from a depth of 32 to 40 inches bgs. The field team encountered a large boulder at 12 to 34 inches bgs and a 4-inch diameter cast iron pipe at 34 inches bgs, which precluded the advancement of this boring beyond 40 inches bgs. The sample collected had an observed OVM reading of 0.0 ppm.

Sample location 2, inside the Battery Shop, was 30 feet from the center of the bay door. Two samples were collected at depths of 32 to 36 inches bgs and 48 inches bgs. Rebar was encountered, which precluded the advancement of this boring beyond 48 inches bgs. The OVM readings for these two samples were 1.7 ppm and 0.0 ppm, respectively. Boreholes 1 and 2 were backfilled to grade with excavated materials, and concrete patches were placed over the disturbed floor areas. The concrete patches were merged with surrounding concrete by extending rebar from the existing concrete into the area to be patched.

The soils encountered at the borings inside the building were generally described as sandy gravel including large cobbles.

All samples from the first two borings were analyzed for the entire list of parameters selected for this site: TRPH, GRO, DRO, VOCs, SVOCs, PCBs/organochlorine pesticides, ethylene glycol, sulfate, metals, oxygen reduction potential (Redox), and soil pH.

Boring AP-3511 (Appendix F) was advanced to 18 feet bgs outside the Battery Shop, over the former log crib site, and 15 feet northeast of the center of the bay door. Recovery of soil in the split-spoon sampler was consistently low; therefore, a field decision was made to prioritize the parameters to be analyzed. Continuous sampling was conducted from 0 to 9 feet bgs to collect

the first sample for GRO, VOC, and ethylene glycol analyses. The next sample was collected at 10 to 12 feet bgs for GRO, VOCs, ethylene glycol, metals, and sulfate analyses. The third sample was collected at 12 to 14 feet bgs for TRPH, DRO, SVOCs, PCBs/organochlorine pesticides, sulfate, metals, and Redox analyses. The next two samples for this boring were collected at 14 to 16 feet bgs and 16 to 18 feet bgs for analyses of the entire list of parameters. The last sample was also tested for Atterburg limits, percent moisture content, and grain size distribution.

Soils were generally described as silty sand to 14 feet bgs and sandy gravel to 17 feet bgs. Throughout this boring, there were no odors detected. The samples collected at 12 to 14 feet bgs, 14 to 16 feet bgs, and 16 to 18 feet bgs contained light-yellow colored silt mixed throughout the core. The last sample collected also contained a light-gray silt mixed throughout the core.

Boring AP-3512 was advanced to 19 feet bgs outside the building and 150 feet east from the center of the bay door. The boring was located over the former storm sewer line. A steam line was encountered at 6 feet bgs, and the location was moved west 5 feet and redrilled. The samples from this boring were analyzed for the entire list of parameters. Geotechnical testing for Atterburg limits, percent moisture content, and grain size distribution was performed on the samples collected at 5 to 7 bgs and 15 to 17 feet bgs.

Soils were described as silty sand to 9 feet bgs and sandy gravel to 16.5 feet bgs. There were no odors observed throughout the boring, and only slight orange staining was encountered at 17 feet, which was attributed to iron oxide.

Monitoring well AP-3513 was located adjacent to Boring AP-3511 (Figure 5.5-2). The borehole was advanced to 18 feet bgs before the first sample was collected. Bentonite slurry from the completion of boring AP-3511 was observed on the outside of the split-spoon sampler at 19.4 feet bgs. The first sample was analyzed for the entire list of parameters. The second sampling location, at a depth of 28 to 29.8 feet bgs, yielded low recovery of soil in the first sampler, therefore a second sampler was advanced. The samples collected at 28 to 29.8 feet bgs and 38 to 39.8 feet bgs were analyzed for all parameters. The subsequent sample yielded extremely low recovery of soils; therefore soils were analyzed for fewer parameters (GRO, VOCs, and ethylene glycol). Sufficient recovery of soil was obtained in the sampler at 58 to 59.9 feet bgs to analyze for the full list of parameters. The following sample, at a depth of 68 to 68.7 feet bgs, again provided low recovery; soils for this sample were analyzed for GRO, DRO, VOCs, SVOCs, PCBs/organochlorine pesticides, ethylene glycol, sulfate, metals, Redox, and soil pH. Groundwater was encountered at a depth of 87.9 feet bgs, and the well was

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advanced to a total depth of 91.5 feet bgs. The borehole was completed as a monitoring well in accordance with the work plan. The well was screened at an interval of 3.6 feet below water level and 6.4 feet above water level. Sand was added to a depth of 78.4 feet bgs and capped with an 8.4-foot-thick bentonite seal. The well was then grouted to the surface.

The soils encountered at the borings outside the building were generally described as silty, sandy gravel to a depth of 89 feet bgs where saturated silty mud was encountered.

Monitoring well AP-3513 was developed according to the work plan. The well was sampled and the water was analyzed for the entire list of parameters. There were no unusual odors or coloration noticed while sampling.

Based on the soil boring logs from Building 796, a cross section of the investigation area is shown in Figure 5.5-3.

5.5.3 Analytical Results

A total of 33 soil samples, including six blind duplicates and five QA samples, were collected. One groundwater sample, including a blind duplicate and QA sample, was also collected. Trip blanks were shipped with the water samples. Analytes above the MRLs are shown in Tables 5.5-1 and 5.5-2. A complete summary of all analytical data from Building 796 is shown in Appendix F.

In addition, samples from the soil borings were sent to USACE NPD Laboratory for geotechnical testing, including Atterburg limits, grain size distribution, and percent moisture content. Results from the soil geotechnical analysis are presented in Appendix F.

The laboratory quality control checks indicate that the analytical data are within acceptable criteria ranges, with the exceptions noted in the USACE NPD laboratory's CQAR and ENSR QASR located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

The following deficiencies were noted in the data:

• Based on a low out-of-control VOC surrogate recovery, the soil VOC data of sample 94B79627SL should be considered low estimates.

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TABLE 5.5-1 Summary of Analytes Detected Building 796 Soil Sample Analytical Results

Part 1 of 3 SB AP 3511 Location 10-12 12-14 14'-16' Sample Depth 0-9 16'-18' 94B79612SL 94979606SL 94B79608SL 94879609SL 04870611SL Sample 10 94B70607SL 94B79810SL 94879613SL K946893-008 K946693-009 K948693-010 K946693-011 K946693-012 K946693-013 K946693-014 K946693-001 Lab Code 10/25/94 10/25/94 10/25/94 10/25/94 10/25/94 10/25/94 10/25/94 10/25/94 **Date Collected Residendial RBC** Compound Petroteum Hydrocarbons (mg/Kg) NA NA ND ND ND NA 12 NA 0R0 none TPH NA NA NA 14 21 16 NA 11 none Organochiorina Pesticides (mg/Kg) 1.4-DDT 1.0 ŇĀ NA NA ND ND ND ŇĀ ND Volatile Organic Compounds (µg/Kg) Acelone 7,600,000 ND ND ND NA NA ND NA ND Chloroform 100,000 ND ND ND NA NA ND NA ND Carbon Tetrachloride 4,900 ND ND NA NA ND ND ŇA ND Trichioroethene (TCE) 58,000 ND ND ND ŇÅ NA 8 ŇA ND ND ND 16,000,000 ND ND NA NA NA Toluene ND Total Xylenes 160,000,000 ND ND ND NA NA ND NÁ ND 1,2,4-Trichlorobenzene 780.000 ND ND ND ÑĀ NA ND NĂ ND Total Metals (mg/Kg) NA 0.37 NA Arsenic 7 NA 7 Ā 6 5 NA 50 64 54 43 Barlum 5,500 NA NA 47 Chromlum 390 ŇA NA 120 48 48 35 NA 34 37 Lead попа NA NA 357 44 35 NĀ 18 NA Nickel 1,600 NA 13 25 23 20 NA 22 Other Analyses pH (units) none NA ŇĂ NA 0.80 6.91 7.37 7,30 6.81 Redox Polential (mV) ŇΑ NĂ NĂ NA NA NA 1800 NA none ŇĂ NA NA 580 Sulfate (mo/Kg) 200 540 none NA 930 FOOTNOTES: ND = Non-detected at the method reporting limit (MRL), (See the Building 795 Appendix for MRL values.) NA = not analyzed. A shaded value indicates result exceeds the residential risk based concentration (RBC).

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TABLE 5.5-1 Summary of Analytes Detected (cont.) Building 796 Soli Sample Analytical Results

	Location:			58 AP 3512			S	51		SS 2	
	Sample Depth:	0-2'	7'-9'	9-11	15'-17'	17'-19'	32*	-40"	32"-36"	4	0°
	Sample ID:	94B79614SL	94B79616SL	94879617SL	94879818SL	94979619SL	94879601SL	94879602SL	94879603SL	94B79604S1	94B79605SL
	Lab Code:	K046693-002	K946893-004	K946893-005	K946693-008	K946693-007	K948524-001	K946524-002	K846524-003	K040565-001	K946565-002
	Date Collected:	10/25/94	10/25/94	10/25/94	10/25/94	10/25/94	10/18/94	10/18/94	10/18/94	10/10/04	10/19/94
Compound	Residendial RBC										
Petroleum Hydrocarbon	u (ma/Ka)								4		
DRO	попа	ND	NÅ	ND	ND	NO	364	302	ND	ND	ND
TPH	none	950	ND	ND	ND	ND	240	730	14	ND	ND
Organochiorine Pesticio											
(,4'-DDT	\$, 0	0.01	NA	ND	ND	ND	NA	NA	NA	ND	NĎ
Volatile Organic Compo	ands (ua/Ka)										
Acetone	7.800,000	ND	ND	ND	65	83	ND	55	ND	ND	ND
Chloroform	100,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachlorida	4,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Inchloroethene (TCE)	58,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
l'oluene	18,000,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
folal Xylenes	160,000,000	ND	ND	ND	ND	ND	5	ND	ND	ND	ND
2,4-Trichlorobanzena	780,000	ND	ND	ND	ND	ND	20	25	- DND	ND	ND
rotal Metals (mg/Kg) Arsenic	0.37	10			<u> </u>	12	8				
Barlum	5,500	55	33	40	40		52	56	32	0 27	<u>6</u> 28
Chromlum	390		25		26	<u>44</u> 29	37	37	31	27	20
ead	none	10		5	20	5	45	184		7	
Nickel	1,600		32	48		42		56		51	38
	1,000		U_								
Other Analysee											
H (unite)	none	7.47	7.11	7.40	7.05	7.19	4.73	5,2	6.1	6.09	8.29
(mV)	noné	NA	NA	NA	NA	NA	290	270	240	310	270
· · · · · · · · · · · · · · · · · ·	none	5.2	37	10	9.0	8,3	2100	3500	55	40	18

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MW AP 3513 948/98.5' 94879824SL K947797-001 12/13/94 38'-39.8' 940796235L K947757-004 12/12/94 28'-29.6' 94879622SL K947757-003 12/12/94 ND 11 18 52

TABLE 5.5-1 Summary of Analytes Detected (cont.) **Building 796 Soll Sample Analytical Results**

Petroleum Hydrocarbon DRO	none	ND	18	18	ND I	NA	33	- NA	19 -
ГРН	none	28	48	52	11	NA	63	NA	NA
Organochiorine Pesticid									
4-DDT	1.0	ND	ND	ND	ND	NA	ND	NA	ND
/olatile Organic Compo	unds (µg/Kg)								
Celone	7,800,000	ND	ND	ND	ND	ND	ND	NA	71 J
Chloroform	100,000	ND	ND	ND	ND	ND	ND	NA NA	5 J
Carbon Tetrachlorida	4,900	ND	NÖ	ND	ND	ND	ND	NA	30 J
richioroethene (TCE)	58,000	ND	ND	ND	ND	ND	ND	NA	5 UJ
oluene	16,000,000	ND	ND	ND	ND	ND	Ð	NA	10 J
olal Xylenes	160,000,000	ND	ND	ND	NÓ	ND	14	NA	111
2.4-Trichlorobenzene	780,000	ND	ND	ND	ND	ND	ND	NA	20 UJ
iotal Metals (mg/Kg)									
visionic	0,37	6	4	4	4	NA	0	NA	4
arlum 🛛 🚽	5,500	56	64	72	51	NA	50	ŇĂ	44
Chromlum	390	34	34	38	22	NA	36	NA	24
ead	enon	5	8	6	5	NA	5	NA	5
lickel	1,600	33	85	84	33	NA	48	NA	23
Sther Analyses	ļ						1		ļ
H (unita)	none	7,16	7.31	7.23	7.16	NA	7.77	ŇA	7.73
ledox Potential (mV)	none	220	230	200	220	NĂ	210	NA	200
utfale (mg/Kg)	none	210	150	170	110	NA	- 53	NA	60
COTNOTES: N	ID = Non-delected at I	he method reportin	ig limit (MRL). (See	the Building 798 Apr	pendix for MRL value	es.)			

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Compound

Location:

Sample ID:

Leb Code:

18'-19

94879620SL K947757-002 12/12/94

94879621SL K947757-001 12/12/94

Sample Depth:

Date Collected: Residendial RBC 12/13/94

10/15/96

68'-68.6' 948796265L K947797-003 \$2/13/94

58'-59.9' 94970025SL

K047707-002

12/13/94

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	Location:	MW AP 3513				
	Sample ID: Lab Code: Date Collected:	94879628GW K948014-001 12/21/94	94879628GW K948049-001 12/21/94	94879629GW K948049-003 12/21/94		
Compound	Residential RBC					
Petroleum Hydrocarbons (µg/L)						
DRÖ	none	199	132	238		
ТРН	none	ND	0.5	0.8		
Voiatile Organic Compounds (µg/L)						
Chioroform	0.15	4	3.4	3.6		
Carbon Tetrachloride	0.16	0.7	0.6	0.7		
Toluene	750	1	0.6	0.8		
Semivolatile Organic Compounds (Bis(2-ethylhexyl) Phthalate	μg/L) <u>4.8</u>		15	ND		
Total Metals (µg/L)						
Arsenic	0.038	13	14	17		
Banum	2,600	323	342	426		
Chromium	160	81	99	129		
Lead	none	14	21	26		
Nickel	730	100	114	151		
Other Analyses						
Sulfate (mg/L)	лопе	32	NA	33		
NA =	Analysis not performed	on that sample,	.). (See the Building 796 A at risk based concentration			

TABLE 5.5-2 Summary of Analytes Detected Building 796 Groundwater Sample Analytical Results

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- The precision of the bis (2-ethylhexyl) phthalate data for water sample 94B79628GW should be considered as an estimate due to the lack of submitted precision data.
- As a result of elevated detection limits, low levels of organochlorine pesticides and PCBs may not have been detected in soil samples 94B79601SL and -02SL.

5.5.4 Semi-Quantitative Risk Assessment

As described in Section 4.2, a semi-quantitative risk assessment was conducted for this site. The risk assessment is considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only one exposure pathway was considered (soil ingestion); although this pathway usually yields the most conservative results, other pathways may also be important.

Building 796 is located in a developed area, consisting of a building and a paved parking lot. The building is adjacent to a road, with surface runoff into a ditch graded toward the south. There are no surface water bodies within 0.5 mile.

5.5.4.1 Compounds of Potential Concern

A summary of COPCs is presented in Table 5.5-3. These compounds include monoaromatics (toluene), chlorinated alkanes (carbon tetrachloride, chloroform), and metals (arsenic, chromium, and nickel). As shown in Table 5.5-3, some of these compounds are carcinogens.

Туре	Source	Carcinogens	Noncarcinogen s
Monoaromatics	Fuels	None	Toluene
Chlorinated alkanes	Solvents	Carbon tetrachloride Chloroform	None
Metals ¹	Background soil; fuels and oils; batteries	Arsenic	Nickel Chromium

Table 5.5-3. Compounds of Potential ConcernBuilding 796

Based on the background metals statistics evaluation in Appendix A, some metals were not included in the semiquantitative risk assessment because they were not statistically significant from background concentrations.

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All other target analytes were either 1) not detected, 2) below the RBC for tap water, 3) below 1/10th of the RBC for residential soil, or 4) not statistically different from the background sample population (metals only). As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. In addition, a list of compounds that were not detected at detection limits exceeding current risk-based concentrations is provided in Table 5.5-4. Most of these compounds were identified in the Work Plan (ENSR 1994) but require special analytical services to achieve reporting limits below RBCs. During the RI/FS, Table 5.5-4 should be reviewed to determine if the likelihood that the compound is present warrants the use of special analytical services.

As described in Section 5.5.4.4, the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, DRO, and TPH). As a result, these data were not included in the semi-quantitative risk assessment.

5.5.4.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Sources, transport mechanisms, exposure pathways, and receptors (elements of a Conceptual Site Model) are shown on Figure 5.5-4. As discussed previously, primary sources include an oil/water separator and a former acid discharge line. Secondary sources include contaminated surface soil, subsurface soil, and groundwater. It is not known whether surface waters have been impacted.

Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile COPCs may disperse in the atmosphere or accumulate in enclosed spaces. Three volatile compounds were detected (toluene, carbon tetrachloride, and chloroform). Concentrations of these compounds are not expected to be significant in atmospheric air, but may be of concern within Building 796. Similarly, concentrations of nonvolatile COPCs in airborne dust are not expected to be of concern in the atmosphere (see Appendix A, Section A.5).

Surface water transport is not expected to be significant, since the surrounding topography is relatively flat, and no surface water bodies are present within 0.5 mile of the site. Leaching and groundwater transport has resulted in migration of toluene, chloroform, and carbon tetrachloride. The dynamic state of the dissolved plume (expanding, degrading, or steady state) is not known, but is expected to be degrading. Long-term monitoring, or leaching and dissolved phase transport modeling, is required to verify this conclusion.

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CompositionMatrixLimitConcentrationHeptachlorWater $0.04 \mu g/L$ $0.0023 \mu g/L$ AldrinWater $0.04 \mu g/L$ $0.0012 \mu g/L$ Heptachlor EpoxideWater $0.04 \mu g/L$ $0.0012 \mu g/L$ DieldrinWater $0.04 \mu g/L$ $0.0012 \mu g/L$ DieldrinWater $0.04 \mu g/L$ $0.0012 \mu g/L$ ChlordaneWater $0.5 \mu g/L$ $0.052 \mu g/L$ Vinyl ChlordeWater $0.5 \mu g/L$ $0.052 \mu g/L$ 1.1-DichloroetheneWater $0.5 \mu g/L$ $0.019 \mu g/L$ Carbon TetrachlorideWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1.2-DichloroethaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1.2-DichloroptopaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1.2-DichloroptopaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1.2-DichloroptopaneWater $0.5 \mu g/L$ $0.077 \mu g/L$ InstrustrianeWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1.1.2-TichloroptopaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2-TichloroptopeneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.1.2-TichloropthaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.1.2-TichloropthaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.0013 \mu g/L$ 1.1.2.2-Tetrachloroetha	Сотроила	Matrix	Maximum Detection	Risk-Based
AldrinWater $0.04 \ \mu g/L$ $0.004 \ \mu g/L$ Heptachlor EpoxideWater $0.04 \ \mu g/L$ $0.0012 \ \mu g/L$ DieldrinWater $0.04 \ \mu g/L$ $0.0042 \ \mu g/L$ ToxapheneWater $1 \ \mu g/L$ $0.061 \ \mu g/L$ ChlordaneWater $1 \ \mu g/L$ $0.061 \ \mu g/L$ Vinyl ChlorideWater $0.5 \ \mu g/L$ $0.052 \ \mu g/L$ I,1-DichloroetheneWater $0.5 \ \mu g/L$ $0.044 \ \mu g/L$ ChlordaneWater $0.5 \ \mu g/L$ $0.044 \ \mu g/L$ ChlordorformWater $0.5 \ \mu g/L$ $0.044 \ \mu g/L$ Carbon TetrachlorideWater $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ L_2-DichloroethaneWater $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ BenzeneWater $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ BromodichloropropaneWater $0.5 \ \mu g/L$ $0.17 \ \mu g/L$ Is-1.3-DichloropropeneWater $0.5 \ \mu g/L$ $0.077 \ \mu g/L$ I,1.2-TrichloroethaneWater $0.5 \ \mu g/L$ $0.0075 \ \mu g/L$ 1,1.2-TetrachloroethaneWater $0.5 \ \mu g/L$ $0.0075 \ \mu g/L$ 1,1.2-TetrachloroethaneWater $0.5 \ \mu g/L$ $0.013 \ \mu g/L$ 1,1.2-DichloropropaneWater $0.5 \ \mu g/L$ $0.013 \ \mu g/L$ 1,1.2-DichlorophropaneWater $10 \ \mu g/L$ $0.0092 \ \mu g/L$ 1,1.2-TetrachloroethaneWater $10 \ \mu g/L$ $0.0013 \ \mu g/L$ 1,2-DichlorophropaneWater $10 \ \mu g/L$ $0.0092 \ \mu g/L$ 1,4-DichlorobenzeneWater $10 \ \mu$		matrix	Limit	Concentration
Heptachlor EpoxideWater $0.04 \ \mu g/L$ $0.0012 \ \mu g/L$ DieldrinWater $0.04 \ \mu g/L$ $0.0012 \ \mu g/L$ ToxapheneWater $1 \ \mu g/L$ $0.0042 \ \mu g/L$ ChlordaneWater $0.5 \ \mu g/L$ $0.052 \ \mu g/L$ Vinyl ChlorideWater $0.5 \ \mu g/L$ $0.019 \ \mu g/L$ (1-DichloroetheneWater $0.5 \ \mu g/L$ $0.019 \ \mu g/L$ ChloroformWater $0.5 \ \mu g/L$ $0.014 \ \mu g/L$ ChloroformWater $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ Carbon TetrachlorideWater $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ 1.2-DichloroethaneWater $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ BenzeneWater $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ 1.2-DichloropropaneWater $0.5 \ \mu g/L$ $0.17 \ \mu g/L$ I.2-DichloropropaneWater $0.5 \ \mu g/L$ $0.077 \ \mu g/L$ I.2-DichloropropaneWater $0.5 \ \mu g/L$ $0.077 \ \mu g/L$ I.1.2-TrichloropropaneWater $0.5 \ \mu g/L$ $0.0077 \ \mu g/L$ I.1.2-TrichloropropaneWater $0.5 \ \mu g/L$ $0.0077 \ \mu g/L$ 1.1.2-TrichloropthaneWater $0.5 \ \mu g/L$ $0.0077 \ \mu g/L$ 1.1.2-TichloropthaneWater $0.5 \ \mu g/L$ $0.00075 \ \mu g/L$ 1.1.2-TichloropthaneWater $0.5 \ \mu g/L$ $0.00075 \ \mu g/L$ 1.1.2-TichloropthaneWater $0.5 \ \mu g/L$ $0.00075 \ \mu g/L$ 1.1.2-TichloropthaneWater $0.5 \ \mu g/L$ $0.00075 \ \mu g/L$ 1.1.2-DichloropthaneWater<	Heptachlor	Water	0.04 μg/L	0.0023 µg/L
DieldrinWater $0.04 \mu g/L$ $0.0042 \mu g/L$ ToxapheneWater $1 \mu g/L$ $0.061 \mu g/L$ ChlordaneWater $0.5 \mu g/L$ $0.052 \mu g/L$ Vinyl ChlorideWater $0.5 \mu g/L$ $0.019 \mu g/L$ 1.1-DichloroetheneWater $0.5 \mu g/L$ $0.044 \mu g/L$ ChloroformWater $0.5 \mu g/L$ $0.044 \mu g/L$ ChloroformWater $0.5 \mu g/L$ $0.015 \mu g/L$ Carbon TetrachlorideWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1.2-DichloroethaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BenzeneWater $0.5 \mu g/L$ $0.16 \mu g/L$ I.2-DichloropropaneWater $0.5 \mu g/L$ $0.17 \mu g/L$ BromodichloromethaneWater $0.5 \mu g/L$ $0.077 \mu g/L$ I.2-DichloropropaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ I.1.2-TrichloropropeneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2-TrichloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2-TrichloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2-TrichloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1.1.2-Tichloropopane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1.1.2-TichlorobenzeneWater $0.5 \mu g/L$ $0.0013 \mu g/L$ 1.1.2-TichlorobenzeneWater $0.5 \mu g/L$ $0.0048 \mu g/L$ 1.2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ 1.3.2-Di	Aldrin	Water	0.04 μg/L	0.004 µg/L
ToxapheneWater1 $\mu g/L$ 0.061 $\mu g/L$ ChlordaneWater0.5 $\mu g/L$ 0.052 $\mu g/L$ Vinyl ChlorideWater0.5 $\mu g/L$ 0.019 $\mu g/L$ 1,1-DichloroetheneWater0.5 $\mu g/L$ 0.014 $\mu g/L$ ChloroformWater0.5 $\mu g/L$ 0.15 $\mu g/L$ Carbon TetrachlorideWater0.5 $\mu g/L$ 0.15 $\mu g/L$ 1,2-DichloroethaneWater0.5 $\mu g/L$ 0.16 $\mu g/L$ 1,2-DichloropropaneWater0.5 $\mu g/L$ 0.36 $\mu g/L$ 1,2-DichloropropaneWater0.5 $\mu g/L$ 0.16 $\mu g/L$ BromodichloromethaneWater0.5 $\mu g/L$ 0.17 $\mu g/L$ BromodichloropropaneWater0.5 $\mu g/L$ 0.077 $\mu g/L$ BromodichloropropeneWater0.5 $\mu g/L$ 0.077 $\mu g/L$ 1,1,2-TrichloroethaneWater0.5 $\mu g/L$ 0.00075 $\mu g/L$ 1,1,2-TetrachloroethaneWater0.5 $\mu g/L$ 0.00075 $\mu g/L$ 1,1,2-TetrachloroethaneWater0.5 $\mu g/L$ 0.44 $\mu g/L$ 1,2-Dibromo-sthane (EDB)Water0.5 $\mu g/L$ 0.44 $\mu g/L$ 1,2-DichloroptopaneWater0.5 $\mu g/L$ 0.44 $\mu g/L$ 1,2-DichloroptopaneWater0.5 $\mu g/L$ 0.00075 $\mu g/L$ 1,1,2-TetrachloroethaneWater0.5 $\mu g/L$ 0.44 $\mu g/L$ 1,2-DichloroptopaneWater0.5 $\mu g/L$ 0.41 $\mu g/L$ 1,2-DichloroptopaneWater0.5 $\mu g/L$ 0.41 $\mu g/L$ 1,2-DichloroptopaneWater0.5 $\mu g/L$ 0.0013 $\mu g/L$ 1,2	Heptachlor Epoxide	Water	0.04 μg/L	0.0012 µg/L
ChlordaneWater $0.5 \mu g/L$ $0.052 \mu g/L$ Vinyl ChlorideWater $0.5 \mu g/L$ $0.019 \mu g/L$ 1,1-DichloroetheneWater $0.5 \mu g/L$ $0.044 \mu g/L$ ChlordormWater $0.5 \mu g/L$ $0.044 \mu g/L$ Carbon TetrachlorideWater $0.5 \mu g/L$ $0.15 \mu g/L$ 1,2-DichloroethaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BenzeneWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1,2-DichloropropaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BromodichloromethaneWater $0.5 \mu g/L$ $0.17 \mu g/L$ cis-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.0077 \mu g/L$ 1,1,2-TichloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.0013 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ 1,2-Dibromo-3-chloropropaneWater $10 \mu g/L$ $0.0032 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$	Dieldrin	Water	0.04 μg/L	
Vinyl ChlorideWater $0.5 \ \mu g/L$ $0.019 \ \mu g/L$ 1,1-DichloroetheneWater $0.5 \ \mu g/L$ $0.044 \ \mu g/L$ ChloroformWater $0.5 \ \mu g/L$ $0.15 \ \mu g/L$ Carbon TetrachlorideWater $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ 1,2-DichloroethaneWater $0.5 \ \mu g/L$ $0.12 \ \mu g/L$ BenzeneWater $0.5 \ \mu g/L$ $0.36 \ \mu g/L$ 1,2-DichloropropaneWater $0.5 \ \mu g/L$ $0.36 \ \mu g/L$ BromodichloromethaneWater $0.5 \ \mu g/L$ $0.077 \ \mu g/L$ BromodichloropropaneWater $0.5 \ \mu g/L$ $0.077 \ \mu g/L$ I,1,2-DichloropropeneWater $0.5 \ \mu g/L$ $0.077 \ \mu g/L$ I,1,2-TirchloroethaneWater $0.5 \ \mu g/L$ $0.0075 \ \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \ \mu g/L$ $0.0075 \ \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \ \mu g/L$ $0.0075 \ \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \ \mu g/L$ $0.0075 \ \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \ \mu g/L$ $0.0013 \ \mu g/L$ 1,1,2-TetrachloroethaneWater $2 \ \mu g/L$ $0.044 \ \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \ \mu g/L$ $0.044 \ \mu g/L$ 1,4-DichlorobenzeneWater $2 \ \mu g/L$ $0.044 \ \mu g/L$ 1,4-DichlorobetaleneWater $2 \ \mu g/L$ $0.044 \ \mu g/L$ AnilineWater $2 \ \mu g/L$ $0.044 \ \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \ \mu g/L$ $0.0032 \ \mu g/L$ <t< td=""><td>Toxaphene</td><td>Water</td><td>1 μg/L</td><td>0.061 µg/L</td></t<>	Toxaphene	Water	1 μg/L	0.061 µg/L
1,1-DichloroetheneWater0.5 $\mu g/L$ 0.044 $\mu g/L$ ChloroformWater0.5 $\mu g/L$ 0.044 $\mu g/L$ Carbon TetrachlorideWater0.5 $\mu g/L$ 0.15 $\mu g/L$ 1,2-DichloroethaneWater0.5 $\mu g/L$ 0.12 $\mu g/L$ BenzeneWater0.5 $\mu g/L$ 0.36 $\mu g/L$ 1,2-DichloropropaneWater0.5 $\mu g/L$ 0.16 $\mu g/L$ BromodichloromethaneWater0.5 $\mu g/L$ 0.17 $\mu g/L$ signodichloropropaneWater0.5 $\mu g/L$ 0.077 $\mu g/L$ BromodichloropropeneWater0.5 $\mu g/L$ 0.077 $\mu g/L$ 1,1,2-TrichloroethaneWater0.5 $\mu g/L$ 0.0075 $\mu g/L$ 1,1,2-TetrachloroethaneWater0.5 $\mu g/L$ 0.00075 $\mu g/L$ 1,1,2,2-TetrachloroethaneWater0.5 $\mu g/L$ 0.00075 $\mu g/L$ 1,4-DichlorobenzeneWater0.5 $\mu g/L$ 0.0017 $\mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water0.5 $\mu g/L$ 0.044 $\mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water2.5 $\mu g/L$ 0.0013 $\mu g/L$ 1,4-DichlorobenzeneWater2.5 $\mu g/L$ 0.0013 $\mu g/L$ AnilineWater10 $\mu g/L$ 0.026 $\mu g/L$ Bis(2-chloroethyll) EtherWater10 $\mu g/L$ 0.0092 $\mu g/L$ 1,4-DichlorobenzeneWater10 $\mu g/L$ 0.26 $\mu g/L$ Nitrosodi-n-propylamineWater10 $\mu g/L$ 0.0096 $\mu g/L$ Nitrosodi-n-propylamineWater10 $\mu g/L$ 0.0096 $\mu g/L$ NitrobenzeneWater10 $\mu g/L$ <	Chlordane	Water	0.5 μg/L	0.052 µg/L
1,1-DichloroetheneWater $0.5 \mu g/L$ $0.044 \mu g/L$ ChloroformWater $0.5 \mu g/L$ $0.15 \mu g/L$ Carbon TetrachlorideWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1,2-DichloroethaneWater $0.5 \mu g/L$ $0.12 \mu g/L$ BenzeneWater $0.5 \mu g/L$ $0.36 \mu g/L$ 1,2-DichloropropaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BromodichloropropaneWater $0.5 \mu g/L$ $0.17 \mu g/L$ cis-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ trans-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00175 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.0013 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.044 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $10 \mu g/L$ $0.0029 \mu g/L$ AnilineWater $10 \mu g/L$ $0.0029 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ N-Nitrosodi-n-prop/amineWater $10 \mu g/L$ 0.0	Vinyl Chloride	Water	0.5 μg/L	0.019 µg/L
ChloroformWater $0.5 \mu g/L$ $0.15 \mu g/L$ Carbon TetrachlorideWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1,2-DichloroethaneWater $0.5 \mu g/L$ $0.12 \mu g/L$ BenzeneWater $0.5 \mu g/L$ $0.12 \mu g/L$ BenzeneWater $0.5 \mu g/L$ $0.12 \mu g/L$ BromodichloropropaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BromodichloropropeneWater $0.5 \mu g/L$ $0.17 \mu g/L$ BromodichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ trans-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1,2-Dibromoethane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1,1,2,-TetrachloroethaneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,2,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.048 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $2 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $10 \mu g/L$ $0.0032 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ <td< td=""><td>1,1-Dichloroethene</td><td>Water</td><td>0.5 μg/L</td><td>• =</td></td<>	1,1-Dichloroethene	Water	0.5 μg/L	• =
Carbon TetrachlorideWater $0.5 \mu g/L$ $0.16 \mu g/L$ 1,2-DichloroethaneWater $0.5 \mu g/L$ $0.12 \mu g/L$ BenzeneWater $0.5 \mu g/L$ $0.36 \mu g/L$ 1,2-DichloropropaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BromodichloromethaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BromodichloropropaneWater $0.5 \mu g/L$ $0.17 \mu g/L$ BromodichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ trans-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.0075 \mu g/L$ 1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.0013 \mu g/L$ 1,4-DichlorobenzeneWater $2 \mu g/L$ $0.044 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.0096 \mu g/L$ N-Nitrosodi-n-propylamine	Chloroform	Water	0.5 μg/L	
1.2-DichloroethaneWater $0.5 \mu g/L$ $0.12 \mu g/L$ BenzeneWater $0.5 \mu g/L$ $0.36 \mu g/L$ 1.2-DichloropropaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BromodichloromethaneWater $0.5 \mu g/L$ $0.17 \mu g/L$ cis-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ trans-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1.2-TrichloroethaneWater $0.5 \mu g/L$ $0.0077 \mu g/L$ 1,2-Dibromoethane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1,1.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,1.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1.2-TetrachloroethaneWater $0.5 \mu g/L$ $0.0013 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0096 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ Hexach	Carbon Tetrachloride	Water	1	
BenzeneWater $0.5 \mu g/L$ $0.36 \mu g/L$ 1,2-DichloropropaneWater $0.5 \mu g/L$ $0.16 \mu g/L$ BromodichloromethaneWater $0.5 \mu g/L$ $0.17 \mu g/L$ cis-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ trans-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.0077 \mu g/L$ 1,2-Dibromoethane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.00075 \mu g/L$ 1,2-Dibromo-3-chloroptopane (DBCP)Water $0.5 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $0.0013 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ I,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.26 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.26 \mu g/L$ Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.14 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.15 \mu g/L$ LabeloroethaneWater $10 \mu g/L$ $0.14 \mu g/L$ <t< td=""><td>1,2-Dichloroethane</td><td>Water</td><td>0.5 μg/L</td><td></td></t<>	1,2-Dichloroethane	Water	0.5 μg/L	
1.2-Dichloropropane Water $0.5 \ \mu g/L$ $0.16 \ \mu g/L$ Bromodichloromethane Water $0.5 \ \mu g/L$ $0.17 \ \mu g/L$ cis-1,3-Dichloropropene Water $0.5 \ \mu g/L$ $0.077 \ \mu g/L$ trans-1,3-Dichloropropene Water $0.5 \ \mu g/L$ $0.077 \ \mu g/L$ 1,1,2-Trichloropthane Water $0.5 \ \mu g/L$ $0.0075 \ \mu g/L$ 1,2-Dibromoethane (EDB) Water $2 \ \mu g/L$ $0.00075 \ \mu g/L$ 1,1,2-Tetrachloroethane Water $0.5 \ \mu g/L$ $0.41 \ \mu g/L$ 1,1,2-Tetrachloroethane Water $0.5 \ \mu g/L$ $0.41 \ \mu g/L$ 1,1,2-Tetrachloroethane Water $0.5 \ \mu g/L$ $0.41 \ \mu g/L$ 1,1,2-Tetrachloroethane Water $0.5 \ \mu g/L$ $0.41 \ \mu g/L$ 1,4-Dichlorobenzene Water $0.5 \ \mu g/L$ $0.44 \ \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP) Water $2 \ \mu g/L$ $0.048 \ \mu g/L$ N-Nitrosodimethylamine Water $2 \ \mu g/L$ $0.014 \ \mu g/L$ Aniline Water $10 \ \mu g/L$ $0.0092 \ \mu g/L$ Bis(2-chloroisopropyl) Ether Water $10 \ \mu g/L$ 0	Benzene	Water		
BromodichloromethaneWater $0.5 \mu g/L$ $0.17 \mu g/L$ cis-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ trans-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.19 \mu g/L$ 1,2-Dibromoethane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.044 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $2 \mu g/L$ $0.0013 \mu g/L$ N-NitrosodimethylamineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $10 \mu g/L$ $0.0092 \mu g/L$ I,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ AnilineWater $10 \mu g/L$ $0.0096 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.0096 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ <	1,2-Dichloropropane	Water	0.5 μg/L	
cis-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ trans-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.19 \mu g/L$ 1,2-Dibromoethane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.044 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $10 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ AnilineWater $10 \mu g/L$ $0.0096 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0096 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ Dis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.0096 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ <	Bromodichloromethane	Water		
trans-1,3-DichloropropeneWater $0.5 \mu g/L$ $0.077 \mu g/L$ 1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.19 \mu g/L$ 1,2-Dibromoethane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1,1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,1,2,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $2 \mu g/L$ $0.013 \mu g/L$ N-NitrosodimethylamineWater $25 \mu g/L$ $10 \mu g/L$ AnilineWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ AnilineWater $10 \mu g/L$ $0.0096 \mu g/L$ Bis(2-chloroebnzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.14 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.26 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.14 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.26 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.14 \mu g/L$ Hexachloroetha	cis-1,3-Dichloropropene	Water	0.5 μg/L	
1,1,2-TrichloroethaneWater $0.5 \mu g/L$ $0.19 \mu g/L$ 1,2-Dibromoethane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1,1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,1,2,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.052 \mu g/L$ 1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.044 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ 1,2-Dibromo-3-chloroptaneWater $2 \mu g/L$ $0.044 \mu g/L$ 1,2-Dibromo-3-chloroptaneWater $2 \mu g/L$ $0.013 \mu g/L$ 1,2-Dibromo-3-chloroptaneWater $25 \mu g/L$ $0.0013 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ 1,4-DichlorobenzeneW	trans-1,3-Dichloropropene	Water	0.5 μg/L	
1,2-Dibromoethane (EDB)Water $2 \mu g/L$ $0.00075 \mu g/L$ 1,1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,1,2,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.052 \mu g/L$ 1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $2 \mu g/L$ $0.014 \mu g/L$ N-NitrosodimethylamineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $0.0092 \mu g/L$ Bis(2-chlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0096 \mu g/L$ Bis(2-chlorosopropyl) EtherWater $10 \mu g/L$ $0.0096 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.14 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.15 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.15 \mu g/L$ 2-NitroanilineWater $10 \mu g/L$ $0.15 \mu g/L$ HexachlorobenzeneWater $10 \mu g/L$ $0.0066 \mu g/L$	1,1,2-Trichloroethane	Water		
1,1,1,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.41 \mu g/L$ 1,1,2,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.052 \mu g/L$ 1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $2 \mu g/L$ $0.014 \mu g/L$ N-NitrosodimethylamineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $10 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.266 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.266 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ Sis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.14 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.15 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.15 \mu g/L$ 2-NitroanilineWater $10 \mu g/L$ $0.0066 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.0066 \mu g/L$	1,2-Dibromoethane (EDB)	Water	-	
1,1,2,2-TetrachloroethaneWater $0.5 \mu g/L$ $0.052 \mu g/L$ 1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $2 \mu g/L$ $0.14 \mu g/L$ N-NitrosodimethylarnineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $10 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.26 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ PercenterWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.15 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.15 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.26 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.15 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.0066 \mu g/L$ HexachlorobenzeneWater $10 \mu g/L$ $0.0066 \mu g/L$ <td>1,1,1,2-Tetrachloroethane</td> <td>Water</td> <td>0.5 μg/L</td> <td></td>	1,1,1,2-Tetrachloroethane	Water	0.5 μg/L	
1,4-DichlorobenzeneWater $0.5 \mu g/L$ $0.44 \mu g/L$ 1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $2 \mu g/L$ $0.14 \mu g/L$ N-NitrosodimethylamineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $0.0013 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.0092 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.26 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.15 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.15 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.15 \mu g/L$ 2-NitroanilineWater $10 \mu g/L$ $0.26 \mu g/L$	1,1,2,2-Tetrachloroethane	Water		
1,2-Dibromo-3-chloropropane (DBCP)Water $2 \mu g/L$ $0.048 \mu g/L$ HexachlorobutadieneWater $2 \mu g/L$ $0.14 \mu g/L$ N-NitrosodimethylamineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $0.0013 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.026 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.26 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.15 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.15 \mu g/L$ 2-NitroanilineWater $10 \mu g/L$ $0.0066 \mu g/L$	1,4-Dichlorobenzene	Water	0.5 <i>μ</i> g/L	
HexachlorobutadieneWater $2 \mu g/L$ $0.14 \mu g/L$ N-NitrosodimethylamineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $10 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.44 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.26 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.15 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.15 \mu g/L$ 2-NitroanilineWater $10 \mu g/L$ $0.26 \mu g/L$ HexachlorobenzeneWater $10 \mu g/L$ $0.75 \mu g/L$	1,2-Dibromo-3-chloropropane (DBCP)	Water		
N-NitrosodimethylamineWater $25 \mu g/L$ $0.0013 \mu g/L$ AnilineWater $25 \mu g/L$ $10 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.44 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.26 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.15 \mu g/L$ 2-NitroanilineWater $10 \mu g/L$ $0.22 \mu g/L$ HexachlorobenzeneWater $10 \mu g/L$ $0.15 \mu g/L$	Hexachlorobutadiene	Water		
AnilineWater $25 \mu g/L$ $10 \mu g/L$ Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.44 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.26 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.0096 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.15 \mu g/L$ 2-NitroanilineWater $10 \mu g/L$ $0.2066 \mu g/L$	N-Nitrosodimethylamine	Water	25 μg/L	
Bis(2-chloroethyl) EtherWater $10 \mu g/L$ $0.0092 \mu g/L$ 1,4-DichlorobenzeneWater $10 \mu g/L$ $0.44 \mu g/L$ Bis(2-chloroisopropyl) EtherWater $10 \mu g/L$ $0.26 \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \mu g/L$ $0.0096 \mu g/L$ HexachloroethaneWater $10 \mu g/L$ $0.75 \mu g/L$ NitrobenzeneWater $10 \mu g/L$ $0.75 \mu g/L$ HexachlorobutadieneWater $10 \mu g/L$ $0.14 \mu g/L$ HexachlorocyclopentadieneWater $10 \mu g/L$ $0.15 \mu g/L$ 2-NitroanilineWater $10 \mu g/L$ $0.15 \mu g/L$ HexachlorobenzeneWater $10 \mu g/L$ $0.26 \mu g/L$	Aniline	Water	25 μg/L	
1,4-DichlorobenzeneWater10 $\mu g/L$ 0.44 $\mu g/L$ Bis(2-chloroisopropyl) EtherWater10 $\mu g/L$ 0.26 $\mu g/L$ N-Nitrosodi-n-propylamineWater10 $\mu g/L$ 0.0096 $\mu g/L$ HexachloroethaneWater10 $\mu g/L$ 0.75 $\mu g/L$ NitrobenzeneWater10 $\mu g/L$ 0.44 $\mu g/L$ HexachlorobutadieneWater10 $\mu g/L$ 0.14 $\mu g/L$ HexachlorocyclopentadieneWater10 $\mu g/L$ 0.14 $\mu g/L$ 2-NitroanilineWater10 $\mu g/L$ 0.15 $\mu g/L$ HexachlorobenzeneWater10 $\mu g/L$ 0.0066 $\mu g/L$	Bis(2-chloroethyl) Ether	Water	10 <i>µ</i> g/L	
Bis(2-chloroisopropyl) EtherWater $10 \ \mu g/L$ $0.26 \ \mu g/L$ N-Nitrosodi-n-propylamineWater $10 \ \mu g/L$ $0.0096 \ \mu g/L$ HexachloroethaneWater $10 \ \mu g/L$ $0.75 \ \mu g/L$ NitrobenzeneWater $10 \ \mu g/L$ $0.15 \ \mu g/L$ HexachlorobutadieneWater $10 \ \mu g/L$ $0.14 \ \mu g/L$ HexachlorocyclopentadieneWater $10 \ \mu g/L$ $0.15 \ \mu g/L$ 2-NitroanilineWater $25 \ \mu g/L$ $2.2 \ \mu g/L$ HexachlorobenzeneWater $10 \ \mu g/L$ $0.0066 \ \mu g/L$	1,4-Dichlorobenzene	Water	10 <i>µ</i> g/L	_
N-Nitrosodi-n-propylamineWater10 μ g/L0.0096 μ g/LHexachloroethaneWater10 μ g/L0.75 μ g/LNitrobenzeneWater10 μ g/L3.4 μ g/LHexachlorobutadieneWater10 μ g/L0.14 μ g/LHexachlorocyclopentadieneWater10 μ g/L0.15 μ g/L2-NitroanilineWater25 μ g/L2.2 μ g/LHexachlorobenzeneWater10 μ g/L0.0066 μ g/L	Bis(2-chloroisopropyl) Ether	Water	10 <i>µ</i> g/L	
HexachloroethaneWater10 μ g/L0.75 μ g/LNitrobenzeneWater10 μ g/L3.4 μ g/LHexachlorobutadieneWater10 μ g/L0.14 μ g/LHexachlorocyclopentadieneWater10 μ g/L0.15 μ g/L2-NitroanilineWater25 μ g/L2.2 μ g/LHexachlorobenzeneWater10 μ g/L0.0066 μ g/L	N-Nitrosodi-n-propylamine	Water	10 <i>μ</i> g/L	
NitrobenzeneWater10 μ g/L3.4 μ g/LHexachlorobutadieneWater10 μ g/L0.14 μ g/LHexachlorocyclopentadieneWater10 μ g/L0.15 μ g/L2-NitroanilineWater25 μ g/L2.2 μ g/LHexachlorobenzeneWater10 μ g/L0.0066 μ g/L	Hexachloroethane	Water	10 μg/L	
HexachlorobutadieneWater10 μ g/L0.14 μ g/LHexachlorocyclopentadieneWater10 μ g/L0.15 μ g/L2-NitroanilineWater25 μ g/L2.2 μ g/LHexachlorobenzeneWater10 μ g/L0.0066 μ g/L	Nitrobenzene	Water		
2-NitroanilineWater $25 \mu g/L$ $2.2 \mu g/L$ HexachlorobenzeneWater $10 \mu g/L$ $0.0066 \mu g/L$	Hexachlorobutadiene	Water	10 µg/L	
2-NitroanilineWater $25 \mu g/L$ $2.2 \mu g/L$ HexachlorobenzeneWater $10 \mu g/L$ $0.0066 \mu g/L$	Hexachlorocyclopentadiene	Water		
Hexachlorobenzene Water 10 µg/L 0.0066 µg/L		Water	25 μg/L	
	Hexachlorobenzene	Water		
	3,3'-Dichlorobenzidine	Water	25 μg/L	
Benz(a)anthracene Water 10 μg/L 0.092 μg/L	Benz(a)anthracene	Water		
Bis(2-ethylhexyl) Phthalate Water 10 µg/L 4.8 µg/L	Bis(2-ethylhexyl) Phthalate	Water	_	
Chrysene Water 10 µg/L 9.2 µg/L	Chrysene	Water		

Table 5.5-4 Compounds Not Detected at Detection LimitsExceeding Current Risk-Based Concentrations, Building 796

lote: Some detection limits are elevated due to analytical interference. See the Building 796 Appendix for a complete list of detection limits

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Table 5.5-4, cont'd. Compounds Not Detected at Detection LimitsExceeding Current Risk-Based Concentrations, Building 796

Compound	Matrix	Maximum Detection	Risk-Based
compound	Maura	Limit	Concentration
Benzo(b)fluoranthene	Water	10 µg/L	0.092 µg/L
Benzo(k)fluoranthene	Water	10 <i>µ</i> g/L	0.92 µg/L
Benzo(a)pyrene	Water	10 µg/L	0.0092 µg/L
Indeno(1,2,3-cd)pyrene	Water	10 <i>µ</i> g/L	0.092 µg/L
Dibenz(a,h)anthracene	Water	10 µg/L	0.0092 µg/L
2,4,6-Trichlorophenol	Water	10 µg/L	6.1 µg/L
Pentachlorophenol	Water	25 <i>µ</i> g/L	0.56 µg/L
Arsenic	Water	5 μg/L	0.038 µg/L
1,2-Dibromoethane (EDB)	Soil	20 µg/Kg	7.5 μ g /Kg
N-Nitrosodimethylamine	Soil	2 mg/Kg	0.013 mg/Kg
N-Nitrosodi-n-propylamine	Soil	0.3 mg/Kg	0.091 mg/Kg
3,3'-Dichlorobenzidine	Soil	2 mg/Kg	1.4 mg/Kg
Benzo(a)pyrene	Soil	0.3 mg/Kg	0.088 mg/Kg
Dibenz(a,h)anthracene	Soil	0.3 mg/Kg	0.088 mg/Kg
Note: Some detection limits are elevated due	to analytical interfer	ence. See the Building 796 A	ppendix for a complete list
of detection limits			

9000-035-430 Recycled Paper Depending on the future land use, potential receptors may include residents, occupational workers, and construction workers. Ecological receptors include terrestrial plants, mammals, and avian species.

5.5.4.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion and drinking water ingestion pathways. Exposures via these pathways generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, these pathways were selected to determine if chemical exposures represent a significant human health risk. If human health risks via soil ingestion and drinking water ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion and drinking water ingestion are significant and drinking water ingestion are significant as part of the baseline risk assessment.

Exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for carcinogens. For example, exposures to noncarcinogens are calculated assuming childhood exposure only, whereas exposures to carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations in soil were calculated as the 95 percent UCL of the average concentration of all samples analyzed from a particular medium (surface soil, subsurface soil, or groundwater). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991, 1992).

5.5.4.4 Toxicity Assessment

Dose-response factors were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992b), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semi-quantitative risk assessment.

5.5.4.5 Human Health Risk Characterization

The following sections summarize potential human health risks via soil ingestion and drinking water ingestion. As described previously, exposures via these pathways generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, if human health risks via soil ingestion and drinking water ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion and drinking water ingestion are close to the acceptable risk threshold, then other exposure pathways may be evaluated as part of the baseline risk assessment.

Human Health Risks - Carcinogenic

Carcinogenic risks for the soil ingestion and drinking water ingestion pathways are summarized on Table 5.5-5. Detailed risk calculations for each pathway and receptor are presented in Appendix A.

	Carcinogenic Risk			
Pathway	Residential	Occupational		
Surface Soil	2.9 x 10 ⁻¹⁰	3.4 x 10 ⁻¹¹		
Subsurface Soil	1.5 x 10 ⁻¹⁰	1.8 x 10 ⁻¹¹		
Groundwater (as tap water)	4.7 x 10 ⁻⁴	2.2 x 10 ⁻⁴		
Total Risk	4.7 x 10 ⁻⁴	2.2 x 10 ⁻⁴		

Table 5.5-5. Carcinogenic Risks for Soil Ingestion and Drinking Water Ingestion Building 796

9000-036-430 Recycled Paper Using residential and occupational exposure factors, the excess lifetime carcinogenic risk for soil/drinking water ingestion exceeds the lower benchmark of 1×10^{-6} listed in the NCP. As a result, exposures via inhalation and dermal contact may also be evaluated. The majority of the carcinogenic risk is associated with ingestion of arsenic in groundwater. It is important to note that it was not possible to determine whether the arsenic levels in groundwater are within normal background ranges. If groundwater arsenic concentrations are within normal background ranges, total carcinogenic risks would fall below the 1×10^{-6} benchmark for both residential and occupational exposure. The soil exposures do not exceed the lower benchmark of 1×10^{-6} listed in the NCP.

Human Health Risks - Noncarcinogenic

Noncarcinogenic hazard indices for the soil ingestion and drinking water ingestion pathways are summarized on Table 5.5-6. Detailed risk calculations for each pathway and receptor are presented in Appendix A.

Table 5.5-6. Hazard Indices for Soil Ingestion and Drinking Water Ingestion Building 796

	Hazard Index			
Pathway	Residential	Occupational		
Surface Soil	Not calculated; concentrations below relevant thresholds			
Subsurface Soil	Not calculated; concentrations below relevant threshold			
Groundwater (as tap water)	0.0013	0.00096		
Total Hazard Index	0.0013	0.00096		

Using both residential and occupational exposure factors, the total hazard index for soil/drinking water ingestion is well below the estimated threshold for adverse effects (1.0).

5.5.4.6 Ecological Risk Characterization

Quantitative assessment of ecological risks can be performed at the organism, population, or ecosystem level. Although ecosystem-level effects may be the most important, effects testing and modeling are rarely performed due to a number of practical considerations (Suter 1993).

Quantification of population-level effects, such as reproductive potential, is important to maintain species populations, whereas assessment of organism-level effects evaluates the risk to individual organisms.

Chemicals can be evaluated as single compounds or as mixtures. Methods for evaluating the toxicity of mixtures requires knowledge regarding the sites and modes of action of individual compounds. Unlike for human health risk assessment, these methods have not been standardized, and there is some debate regarding the most appropriate approach.

If potential exposure pathways and receptors are present, ecological assessment begins with identification of the compounds of potential concern. This can be done in a similar fashion as for human health risk assessment, using ecological RBCs. Ecological RBCs may include toxicity benchmarks, sediment quality criteria, or other regulatory criteria. One set of criteria in common use provides benchmark concentrations for eight representative mammalian species and nine avian species (Opresko et al. 1994). Although benchmark concentrations are provided for 76 chemicals, toxicity benchmarks are not available for many target analytes. Also, the benchmarks are provided as concentrations in food, requiring evaluation of plant uptake and other routes of dietary exposure. Due to the large number of analytes measured at Building 796, ecological RBCs were not compiled as part of this project.

Potential receptors at Building 796 include terrestrial and avian species at a variety of trophic levels. The most highly exposed species include those with a small home range and small body weight to food consumption ratio (e.g., mice and resident songbirds). However, other less exposed species may warrant evaluation based on their susceptibility to particular chemicals (e.g., reproductive effects of 4,4'-DDT in raptors).

As part of the RI/FS, ecological RBCs may be identified for representative terrestrial and avian species. Compounds of potential concern may be selected based on a comparison of ecological RBCs with measured concentrations. At this point, the appropriate risk quantitation methods and measurement endpoints may be selected.

5.5.5 Findings and Conclusions

The risks associated with noncarcinogenic compounds are below the estimated threshold for adverse effects, the excess lifetime carcinogenic risk for drinking water ingestion exceeds the lower benchmark of 1×10^{-6} listed in the NCP. The majority of the excess lifetime cancer risk is associated with arsenic in groundwater. Arsenic is assumed to be completely in its carcinogenic form and above natural background levels. The remainder of the risk is

associated with carbon tetrachloride and chloroform. However, if arsenic were eliminated as a compound of potential concern by comparison with background levels in groundwater, carcinogenic risks would also fall below the threshold for adverse effects.

The semi-quantitative risk assessment was performed using exposure assumptions that may not be appropriate for the site (e.g., residential use). In addition, the extent of contamination and the dynamic state of soil and groundwater contamination plumes (expanding, degrading, or steady-state) have not been evaluated. The exposure assumptions, compounds of concern, future land use, and contaminant fate and transport may be re-evaluated for inclusion in a baseline risk assessment, if required. In addition, ecological receptors, RBCs, risk quantitation methods, and measurement endpoints may be identified for inclusion in a baseline ecological risk assessment.

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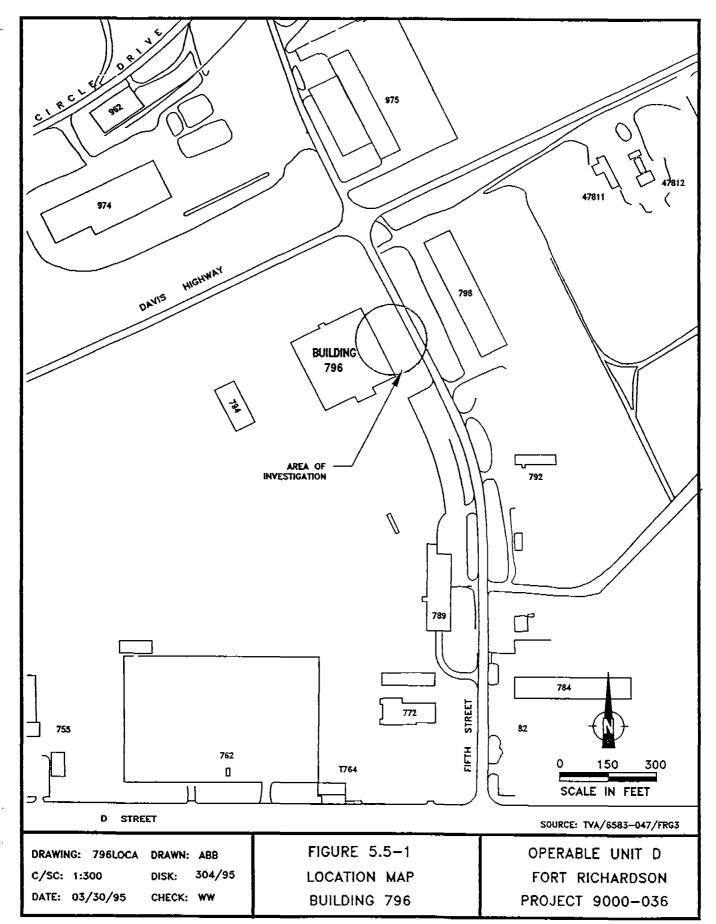
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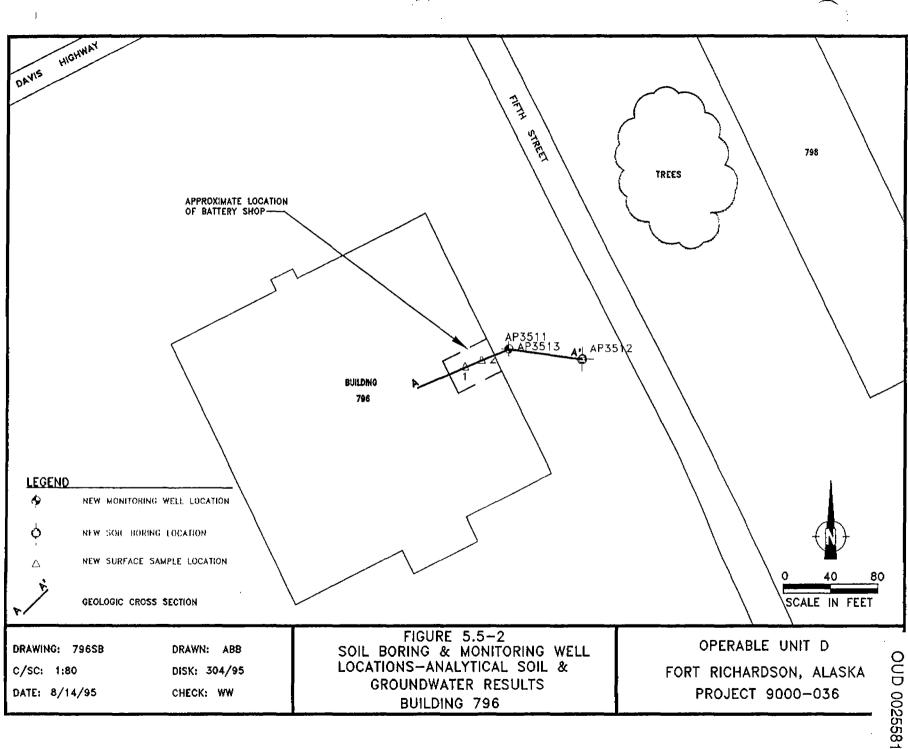
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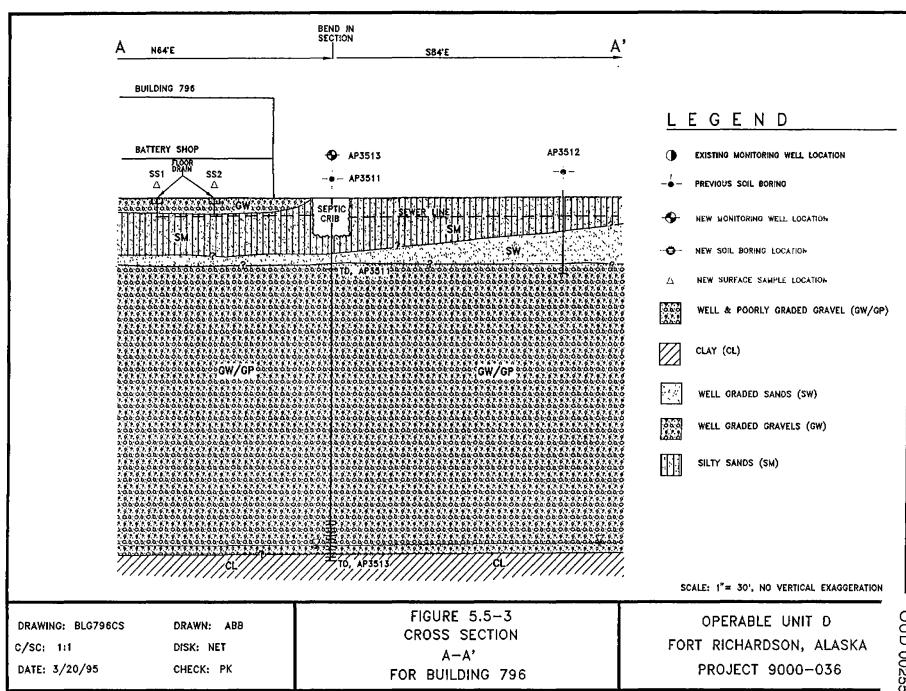


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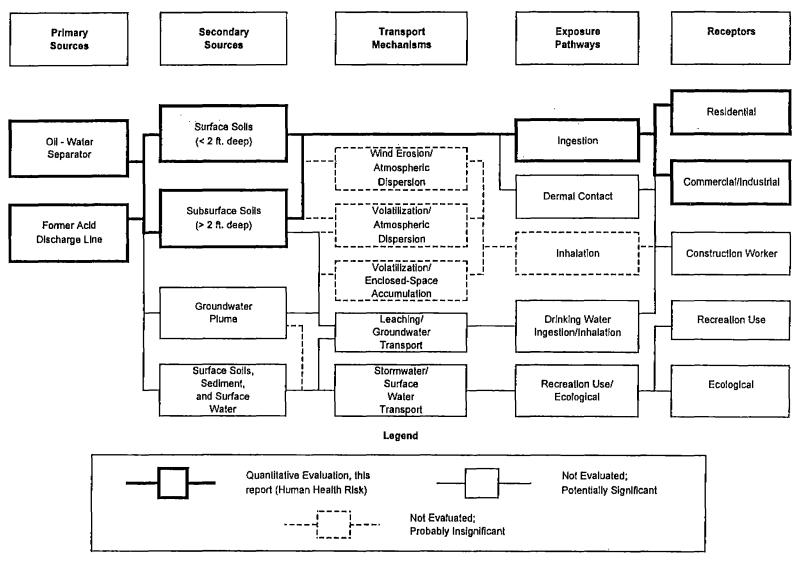
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Figure 5.5-4: Sources, Transport Mechanisms, Exposure Pathways, and Receptors Building 796

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Building 955

5.6 Building 955

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5.6.1 Site History

This site was the location of a former sludge bin that was used as a transfer area for petroleum wastes (Figure 5.6-1). The bin reportedly consisted of a storage tank that had been split lengthwise. Waste liquids containing water and some solids were transported to this area from various base sources and allowed to separate by gravity. When wastes settled, they were segregated into water, liquid petroleum compounds, and sludge. Water was pumped from the bin and disposed. Liquid petroleum was pumped to railroad tanker cars and transported to Fort Wainwright for energy recovery. Sludges were shoveled into drums and disposed off site.

Potential COPCs associated with the sludge bin include petroleum hydrocarbons, fuels, kerosene, VOCs, SVOCs, PCBs, ethylene glycol, metals, herbicides, and pesticides.

In March 1993, the USACE conducted a geotechnical investigation of soils near the former sludge bin. Subsurface soil samples indicated the presence of petroleum hydrocarbons, VOCs, herbicides, and pesticides.

The focus of this investigation is the original sludge bin described above; however, at least two other sludge bins and possibly three have been in use or are scheduled to be used at the site. Building 955 was reportedly built over one of the additional sludge bins. It has been described as a storage tank split lengthwise. In addition, a new sludge bin and building were constructed in 1990 and became operational in 1994.

5.6.2 Field Investigation

The objective of the PSE2 investigation at Building 955 was to evaluate the potential presence of contaminants in subsurface soils at the suspected location of the former sludge bin. Groundwater was not investigated at this site because the location of the former grease pit was poorly documented and the intent of the PSE2 was to identify specific contaminants in the soil. A groundwater investigation, if necessary, could be included as part of an RI.

The investigation involved collecting subsurface soil samples from four 20-foot soil borings (Figure 5.6-2). The locations for the borings were selected based on review of aerial photographs (dated May 1974). The first boring was centered in a dark stained area identified on the photographs, and subsequent boring locations were based on the expected spread of potential contamination within an area of approximately 20 square feet. Aerial photography was used because the entire site had been regraded and a fresh layer of gravel had been applied.

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Boring AP-3514 (Appendix G) was advanced to 20 feet bgs. The soils encountered in the first 6 inches bgs were consistent with gravelly fill. A black staining was observed in the first sample taken at 0 to 2 feet bgs. Soil encountered to a depth of 10 feet bgs was described as sandy gravel with a slight amount of silt. Gravel with some sand was observed at 10 to 12 feet bgs. Silty sand with some gravel was observed at 12 to 18 feet bgs. The last sample was taken at 18 to 20 feet bgs, and the soils were described as gravel with some sand. A slight hydrocarbon odor was observed near the top of boring. The odor became stronger as the depth increased. OVM readings ranged from 32.5 ppm near the surface to 260 ppm at 14 feet bgs.

Boring AP-3515 was advanced to 20 feet bgs. Sand with some gravel was observed to 20 feet bgs. A slight orange staining was observed in the sample taken at 6 to 8 feet bgs and determined to be iron oxidation. No odors were observed in this boring.

Boring AP-3516 was advanced to 20 feet bgs. Sand with some gravel was observed to a depth of 12 feet bgs. Sandy gravel was observed at 12 to 16 feet bgs. A 12-inch layer of black peat was observed at 16 feet bgs. The soils were described as sand with some gravel from 16.5 to 20 feet bgs. A slight orange staining was again observed at a depth of 13 feet bgs and attributed to iron oxidation. There were no odors observed throughout this boring. OVM readings ranged from 0.2 ppm to 2.3 ppm.

Boring AP-3517 was advanced to 20 feet bgs. Sandy gravel fill was described from the samples at 0 to 2, 2 to 4, and 8 to 10 feet bgs. The soil from 10 to 20 feet bgs was described as sand with some gravel. A slight orange staining was observed at a depth of 14 feet bgs. There were no odors observed at this boring. OVM readings ranged from 0.2 ppm to 2.3 ppm.

Based on soil boring logs, a cross section of the investigation area is presented in Figure 5.6-3.

5.6.3 Analytical Results

A total of 20 samples, including two blind duplicates and two QA samples, were collected. Samples were analyzed for TRPH, GRO, DRO, VOCs, PCBs/organochlorine pesticides, chlorinated herbicides, SVOCs, ethylene glycol, and metals. Analytes above the MRLs are shown in Table 5.6-1. A complete summary of analytical data for Building 955 is presented in Appendix G.

In addition, eight samples, generally two from each boring, were sent to the USACE NPD laboratory for geotechnical testing, including Atterburg limits, grain size distribution, and percent moisture content. Results from the soil geotechnical analyses are provided in Appendix G.

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Part 1 of 2 SB AP 3514 SB AP 3515 Location: Sample Depth: 0-4' 8'-12' 12'-16' 18'-20' 0-6 0-6' B'-12' 12'-16' 16'-20' Sample ID: 94895501SL 94895502SL 94B95503SL 94895504SL 04805505SL 94B95506SL 94895507SL 94895508SL 94B95509SL Lab Code: K946767-001 K946787-002 K046767-003 K946767-004 K948767-005 K946767-008 K946767-007 K946767-008 K946767-009 **Date Collected:** 10/28/94 10/28/94 10/28/94 10/28/94 10/28/94 10/28/94 10/28/94 10/28/94 10/28/94 **Residential RBC** Compound Petroleum Hydrocarbons (mg/Kg) ND 20 ND ND ND GRO ND ND 60 ND none 353 1,720 486 ND ND ND ND DRO none 648 18 TPH 260 300 740 190 ND ND ND ND none ND Organochiorine Pesticides (mg/Kg) 4,4-ODT 1.9 0.08 0.04 ND ND 0.25 0.33 ND ND ND 14-DDE 1,9 ND ND ND ND 0.02 0.02 ND ND ND Volatile Organic Compounds (µg/Kg) <7,000 <700 ND <14,000 70 Acelone 7,800,000 ND 87 ND 59 ND 8 Toluana 16,000,000 ND ND <1.400 ND ND ND 13 <700 160,000,000 <1,400 ND 5 ND ND 13 Total Xylenes 6 6 Semivolatile Organic Compounds (mg/Kg ND ND <1.5 ND ŇD ND ŃĎ ND Bis(2-ethylhexyl) Phthal 48 ŇD Total Metale (mg/Kg) Arsenic 0.37 6 7 6 7 8 5 7 7 7 5,500 52 50 70 51 59 58 52 81 60 Barlum Chromlum 390 34 31 38 31 41 34 33 37 36 Lead nona 6 6 8 5 8 0 8 7 7 43 39 50 46 39 1,600 34 49 40 41 Nickel FOOTNOTES: ND = Non-detected at the method reporting limit (MRL). (See the Building 955 Appendix for MRL values.) < ... = Less than. Analytical reporting limit has been elevated due to matrix interferences or sample requiring dilution. A shaded value indicates result exceeds the residential risk based concentration (RBC) 10/15/96 VOAOCYCOMMOMRICH/FINALS/REPTABLES/TABLES/XLS/955

TABLE 5.6-1 Summary of Analytes Detected Building 955 Soil Sample Analytical Results

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TABLE 5.6-1 Summary of Analytes Detected (cont.) Building 955 Soll Sample Analytical Results

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	Location:			SB AP 3516				SB A	P 3517	
	Sample Depth:	0-8'	0-8'	8'-12'	12'-16'	16'-18'	0-6	8'-12'	12'-16	16'-20'
	Sample ID;	94B95510SL	94B95511St	94895512SL	94895513SL	94B95514SL	94B95515SL	94B95516SL	94B95517SL	94B95518SI
	Lab Code:	K946789-005	K946799-008	K946789-007	K946799-008	K946789-009	K946799-001	K946799-002	K946799-003	K946799-00-
	Date Collected;	10/29/94	10/29/94	10/29/94	10/29/94	10/29/94	10/29/94	10/29/94	10/29/94	10/29/94
Compound	Residential RBC									
Petroleum Hyd	drocarbons (mg/Kg)									
GRO	none	ND								
DRO	none	18	22	ND	ND	27	62	ND	NO	ND
TPH	none	31	37	ND	ND	10	31	ND	ND	ND
Organochlorin	ie Pesticides (mg/Kg)	•								
4,4'-DDT	1.9	0.01	0.01	ND	ND	ND	95	0.4	0.11	ND
4.4-DDE	1,9	ND ND	NO	ND	ND	ND	1.27	ND	ND	ND
Volatile Organ	lic Compounds (µg/K 7,600,000	9)	ND	ND	ND ND	ND	ND ND	ND	ND ND	ND
Toluene	16,000,000	ND	ND	ND	7	6		ND ND	ND ND	5
		ND	ND	8		ND	7	5	ND	
Tolal Xylene	160,000,000		NU		<u>G</u>				NU	8
Semivolatile O	rganic Compounds (mg/Kg)						_		
Bis(2-elhythe	48	ND	2	ŇÐ	ND	ND	ND	ND	ND	ND
rotal Metals (n	ng/Kg)									
Arsenic	0,37	5	8	5	4	4	5	5	6	5
3arlum	5,500	157 J	146 J	46 J	54 J	64 J	141 J	51 J	59 J	58 J
Chromium	390	31	37	38	33	47	34	24	21	33
ead	none	5 J	6 J	4 J	4 J	4 J	9 J	5 J	BJ	5.,
Vickel	1,600	38	39	38	41	50	45	58	31	37

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The laboratory quality control checks indicate that the analytical data are within acceptable criteria ranges, with the exceptions noted in the USACE NPD laboratory's CQAR and ENSR QASR located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

• The data results for barium and lead for samples 94B95510SL to -18SL should be considered estimates due to out-of-control sample duplicate RPD results.

5.6.4 Semi-Quantitative Risk Assessment

As described in Section 4.2, a semi-quantitative risk assessment was performed for this site. The risk assessment is considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only one exposure pathway was considered (soil ingestion); although this pathway usually yields the most conservative results, other pathways may also be important.

Building 955 is located in a developed area of the main cantonment. The area of investigation is in a gravel pad staging area. Surrounding land uses are industrial in nature with railroad tracks on the east side of the site. A second-growth forest lies approximately 100 feet south of the site. There is no surface water bodies within 0.5 mile.

5.6.4.1 Compounds of Potential Concern

A summary of the COPCs is presented in Table 5.6-2. These compounds include insecticides (4,4'-DDT, 4,4'-DDE) and arsenic. All of these compounds are carcinogens.

Туре	Source	Carcinogens
Polychlorinated diphenyl alkanes	Insecticides	4-4'-DDT 4,4'-DDE
Metals ¹	Background soil	Arsenic

Table 5.6-2. Compounds of Potential ConcernBuilding 955

Based on the background metals statistics evaluation in Appendix A, some metals were not included in the semiquantitative risk assessment because they were not statistically significant from background concentrations.

9000-036-430 Recycled Paper All other target analytes were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only). As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. In addition, a list of compounds that were not detected at detection limits exceeding current risk-based concentrations is provided in Table 5.6-3. Most of these compounds were identified in the Work Plan (ENSR 1994) but require special analytical services to achieve reporting limits below RBCs. During the RI/FS, Table 5.6-3 should be reviewed to determine if the likelihood that the compound is present warrants the use of special analytical services.

As described in Section 5.6.4.4, the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, DRO, and TPH). As a result, these data were not included in the semi-quantitative risk assessment.

5.6.4.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Sources, transport mechanisms, exposure pathways, and receptors (elements of a Conceptual Site Model) are shown on Figure 5.6-4. As discussed previously, the primary source is the sludge bin/UST area. Secondary sources include contaminated surface and subsurface soil. It is not known whether groundwater or surface waters have been impacted.

Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile COPCs may disperse in the atmosphere or accumulate in enclosed spaces. However, no volatile COPCs were detected at concentrations exceeding 1/10th of the RBC for residential soil. Concentrations of nonvolatile COPCs in airborne dust are not expected to be of concern in the atmosphere (see Appendix A, Section A.5).

Surface water transport is not expected to be significant, since the surrounding topography is relatively flat, and no surface water bodies are present within 0.5 mile of the site. Leaching is not expected to be significant, since all of the COPCs are relatively insoluble in water.

Depending on the future land use, potential receptors may include residents, occupational workers, and construction workers. Ecological receptors include terrestrial plants, mammals, and avian species.

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Compound	Matrix	Maximum Detection Limit	Risk-Based Concentration
Toxaphene	Soil	14 mg/Kg	0.58 mg/Kg
Chlordane	Soil	5 mg/Kg	0.49 mg/Kg
Aroclor 1254	Soil	3 mg/Kg	1.6 mg/Kg
Vinyl Chloride	Soil	1400 µg/Kg	340 µg/Kg
1,1-Dichloroethene	Soil	1400 µg/Kg	1100 µg/Kg
1,2-Dibromoethane (EDB)	Soil	5400 µg/Kg	7.5 µg/Kg
1,2,3-Trichloropropane	Soil	1400 µg/Kg	91 µg/Kg
1,2-Dibromo-3-chloropropane (DBCP)	Soil	5400 µg/Kg	460 µg/Kg
N-Nitrosodimethylamine	Soil	10 mg/Kg	0.013 mg/Kg
Bis(2-chloroethyl) Ether	Soil	1.5 mg/Kg	0.58 mg/Kg
N-Nitrosodi-n-propylamine	Soil	1.5 mg/Kg	0.091 mg/Kg
2-Nitroaniline	Soil	10 mg/Kg	4.7 mg/Kg
Hexachlorobenzene	Soil	1.5 mg/Kg	0.4 mg/Kg
3,3'-Dichlorobenzidine	Soil	10 mg/Kg	1.4 mg/Kg
Benz(a)anthracene	Soil	1.5 mg/Kg	0.88 mg/Kg
Benzo(b)fluoranthene	Soil	1.5 mg/Kg	0.88 mg/Kg
Benzo(a)pyrene	Soil	1.5 mg/Kg	0.088 mg/Kg
Indeno(1,2,3-cd)pyrene	Soil	1.5 mg/Kg	0.88 mg/Kg
Dibenz(a,h)anthracene	Soil	1.5 mg/Kg	0.088 mg/Kg
Pentachlorophenol	Soil	10 mg/Kg	5.3 mg/Kg

Table 5.6-3 Compounds Not Detected at Detection LimitsExceeding Current Risk-Based Concentrations, Building 955

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5.6.4.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion pathway. Soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, this pathway was selected to determine if soil exposures represent a significant human health risk. If human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of the baseline risk assessment.

Soil exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for carcinogens. For example, exposures to noncarcinogens are calculated assuming childhood exposure only, whereas exposures to carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations in soil were calculated as the 95 percent UCL of the average concentration of all samples analyzed from a particular medium (surface or subsurface soil). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991, 1992).

5.6.4.4 Toxicity Assessment

Dose-response factors were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992b), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semi-quantitative risk assessment.

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5.6.4.5 Human Health Risk Characterization

The following sections summarize potential human health risks via soil ingestion. As described above, soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, if human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are soil ingestion are close to the acceptable risk threshold, then other exposure pathways may need to be evaluated as part of the baseline risk assessment.

Human Health Risks

Carcinogenic risks for the soil ingestion pathway are summarized on Table 5.6-4. A breakdown of risk calculations for each pathway and receptor are presented in Appendix A. Noncarcinogenic risks were not evaluated, since all noncarcinogenic compounds were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only).

	Carcinogenic Risk				
Pathway	Residential	Occupational			
Surface Soil	1.5 x 10 ⁻⁵	1.7 x 10 ⁻⁶			
Subsurface Soil	7.0 x 10 ⁻⁹	8.1 x 10 ⁻¹⁰			
Total Risk	1.5 x 10 ⁻⁵	1.7 x 10 ⁻⁶			

Table 5.6-4. Carcinogenic Risks for Soil IngestionBuilding 955

Using both residential and occupational exposure factors, the excess lifetime cancer risk for soil ingestion exceeds the lower benchmark of 1×10^{-6} listed in the NCP. As a result, exposures via inhalation and dermal contact may also be evaluated. The risk is associated with 4,4'-DDT and 4,4'-DDE.

5.6.4.6 Ecological Risk Characterization

Quantitative assessment of ecological risks can be performed at the organism, population, or ecosystem level. Although ecosystem-level effects may be the most important, effects testing and modeling are rarely performed due to a number of practical considerations (Suter 1993). Quantification of population-level effects, such as reproductive potential, is important to maintain species populations, whereas assessment of organism-level effects evaluates the risk to individual organisms.

Chemicals can be evaluated as single compounds or as mixtures. Methods for evaluating the toxicity of mixtures requires knowledge regarding the sites and modes of action of individual compounds. Unlike for human health risk assessment, these methods have not been standardized, and there is some debate regarding the most appropriate approach.

If potential exposure pathways and receptors are present, ecological assessment begins with identification of the compounds of potential concern. This can be done in a similar fashion as for human health risk assessment, using ecological RBCs. Ecological RBCs may include toxicity benchmarks, sediment quality criteria, or other regulatory criteria. One set of criteria in common use provides benchmark concentrations for eight representative mammalian species and nine avian species (Opresko et al. 1994). Although benchmark concentrations are provided for 76 chemicals, toxicity benchmarks are not available for many target analytes. Also, the benchmarks are provided as concentrations in food, requiring evaluation of plant uptake and other routes of dietary exposure. Due to the large number of analytes measured at Building 955, ecological RBCs were not compiled as part of this project.

Potential receptors at Building 955 include terrestrial and avian species at a variety of trophic levels. The most highly exposed species include those with a small home range and small body weight to food consumption ratio (e.g., mice and resident songbirds). However, other less exposed species may warrant evaluation based on their susceptibility to particular chemicals (e.g., reproductive effects of 4,4'-DDT in raptors).

As part of the RI/FS, ecological RBCs may be identified for representative terrestrial and avian species. Compounds of potential concern may be selected based on a comparison of ecological RBCs with measured concentrations. At this point, the appropriate risk quantitation methods and measurement endpoints may be selected.

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5.6.5 Findings and Conclusions

Although risks associated with noncarcinogenic compounds are below the estimated threshold for adverse effects, the excess lifetime carcinogenic risk for soil ingestion exceeds the lower benchmark of 1×10^{-6} listed in the NCP. The carcinogenic risk is associated with 4,4'-DDT and 4,4'-DDE.

The semi-quantitative risk assessment was performed using exposure assumptions that may not be appropriate for the site (e.g., residential use). In addition, the extent of contamination and the dynamic state of soil contamination plumes (expanding, degrading, or steady-state) have not been evaluated. The exposure assumptions, compounds of potential concern, future land use, and contaminant fate and transport may be re-evaluated for inclusion in a baseline risk assessment, if required. In addition, ecological receptors, RBCs, risk quantitation methods, and measurement endpoints may be identified for inclusion in a baseline ecological risk assessment. ,

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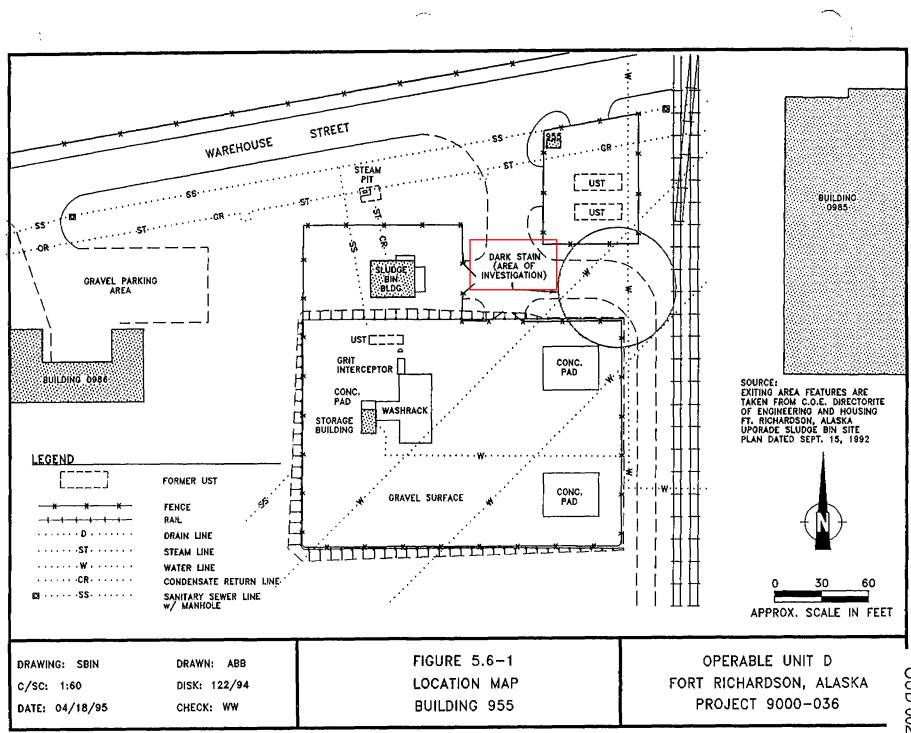
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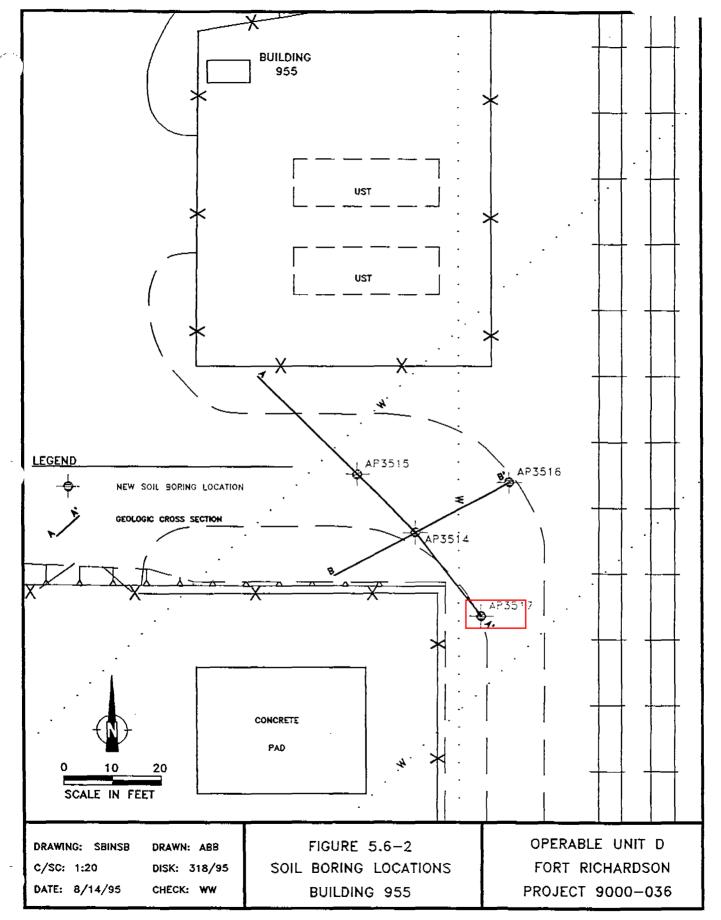
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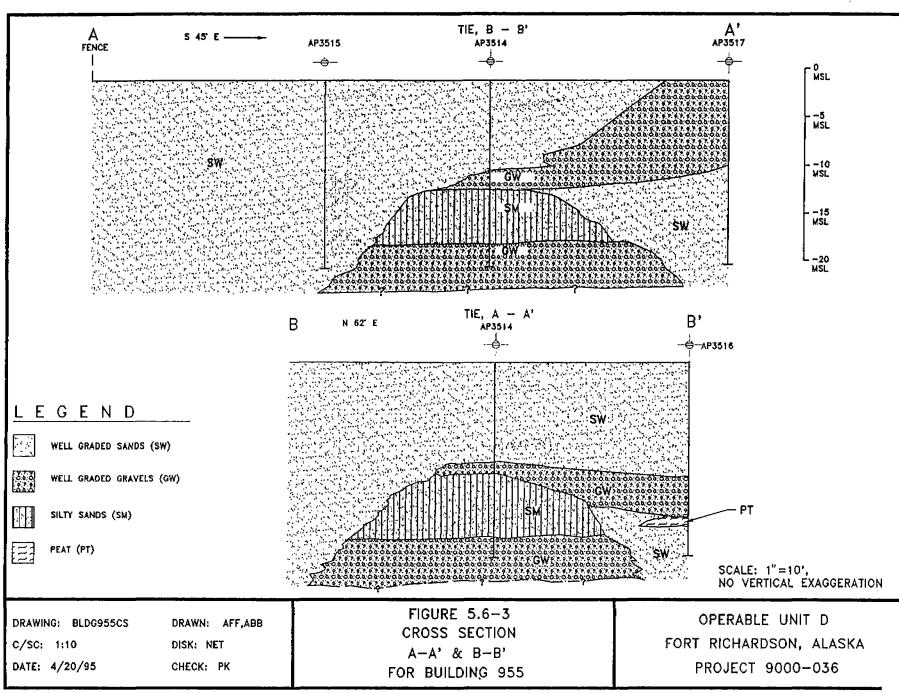
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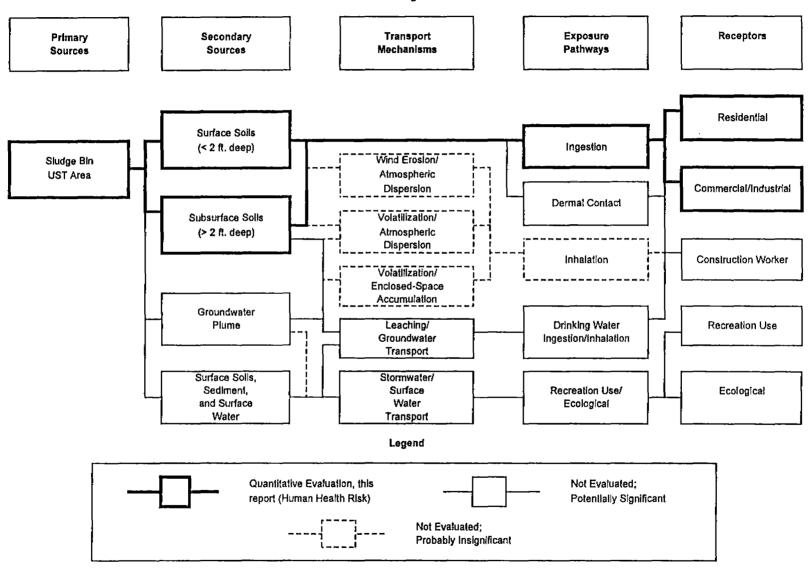


Figure 5.6-4: Sources, Transport Mechanisms, Exposure Pathways, and Receptors Building 955

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5.7 Dust Palliative

5.7.1 Site History

Road oiling using waste oils has historically been conducted to maintain gravel roads and parking areas at Fort Richardson. No previous investigations of gravel roads or parking lots have been conducted at the base.

Petroleum hydrocarbons, PCBs, and metals are potential contaminants of concern. In addition, herbicides and pesticides were routinely used in the past for vegetation and insect control along roadways.

The study area consists of three roadways and one gravel parking lot (Figure 5.7-1):

- A 1-mile unpaved section of UC 5497 between Roosevelt Road to the north and the turn off to the water reservoir to the south. This section is also known as the road to Otter Lake.
- Roosevelt Road east of the Alaska Railroad right of way.
- UC 5997 (Davis Highway) between Sixth Street and Roosevelt Road.
- The east side parking lot at Building 796.

5.7.2 Field Investigation

The objectives of the investigation at the Dust Palliative sites were to qualitatively evaluate the impact of road oiling over a large area. Groundwater was not investigated because the intent of the PSE2 was to identify specific contaminants impacting soils in the Dust Palliative site. A groundwater investigation, if necessary, could be included as part of an RI.

Three composite samples were collected from each of the four locations (Figures 5.7.2a and 5.7-2b). Each composite sample consisted of four grab samples. Grab samples were collected from a depth of 18 inches bgs. Equal volumes of each set of four grab samples were mixed in a stainless steel bowl to make one composite sample. The samples were then placed in appropriate sample containers.

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The samples from Roosevelt Road east of the Alaska Railroad right of way and the 1 mile unpaved section of Roosevelt Road to Otter Lake were collected using a power auger to drill 18 inches bgs. Along the roadways, samples were collected from the shoulders and drainage ditches to minimize conflicts with traffic. In the parking lot at Building 796, sample locations were selected to obtain a representative sample of the area. At UC 5997 and the parking lot of Building 796, the power auger was unable to penetrate the frozen ground, and a drill rig was necessary to advance the shallow borings (samples were collected in late October).

OVM readings from field composite samples from Roosevelt Road east of the Alaska Railroad right of way ranged from 7.0 ppm to 18.0 ppm. At UC 5497, OVM readings were 44 ppm and 55 ppm. At Building 796 and UC 5997, OVM readings ranged from 0.8 ppm to 2.5 ppm.

5.7.3 Analytical Results

A total of 16 composite samples, including two blind duplicates and two QA samples, were collected and analyzed from the Dust Palliative areas. Each sample was tested for TRPH, PCBs/organochlorine pesticides, chlorinated herbicides, SVOCs, and metals. Analytes detected above the MRLs are shown in Table 5.7-1. A complete summary of analytical data is presented in Appendix H.

The laboratory quality control checks indicate that the analytical data are within acceptable criteria ranges, with the exceptions noted in the USACE NPD laboratory's CQAR and ENSR QASR located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

- Low levels of SVOC analytes may not have been detected if present in sample 94DUST13SL.
- The data of lead and chromium in samples 94DUST09SL through -15SL should be considered low estimates.

5.7.4 Semi-Quantitative Risk Assessment

As described in Section 4.2, a semi-quantitative risk assessment was performed for this site. The risk assessment is considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only one exposure pathway was considered (soil ingestion); although this pathway usually yields the most conservative results, other pathways may also be important.

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TABLE 5.7-1 Summary of Analytes Detected Dust Pallative Roadway Soil Sample Analytical Results

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	Location:		Buildi	ng 796			Roosev	elt Road	
Sampte:		Surf	ace 1	Surface 2	Surface 3	Surf	ace 1	Surface 2	Surface 3
	Sample (D:	94DUST09SL	94DUST10SL	94DUST11SL	94DUST12SL	94DUST01SL	94DUST02SL	94DUST04SL	94DUST05S
	Lab Code;	K946743-001	K946743-002	K946743-003	K946743-004	K946450-001	K946450-002	K945450-003	K946450-00
	Date Collected;	10/26/94	10/26/94	10/26/94	10/26/94	10/15/94	10/15/94	10/15/94	10/15/94
Compound	Residential RBC								
Petroleum Hydrocarbons ()	mg/Kg}	_							
трн	none	52	66	130	71	76	94	140	87
One and a block of the other block	e]					
	(ma/ka) (
Organochiorine Posticidos 4,4'-DDT	(mg/Kg) 1.9	ND	ND	0.01	0.02	0,07	0.13	0.18	0.1
	1.9								0,1
4,4 ⁻ -DDT	1.9	ND NO	ND ND	0.01 ND	0.02 ND	0,07	0.13	0.18	0,1
4,4'-DDT Semivoletile Organic Comp Bls(2-ethylhexyl) Phthalate	1.9 20unds (mg/Kg)								
4,4'-DDT Semivolatile Organic Comp	1.9 20unds (mg/Kg)								
4,4°-DDT Semivolatile Organic Comp Bis(2-sihyihexyi) Phthalate Total Metals (mg/Kg)	1.9 nounds (mg/Kg)] 46			ND	ND	ND		0.9	ND
4,4-DDT Semivoletile Organic Comp Bis(2-ethylhexyl) Phthalate Total Metals (mg/Xg) Arsanic	1.9 1.9 100unds (mg/Kg) 146 0.37	NÓ 7	ND 7	ND \$	ND 6	ND 8	0.6	0.9	ND 6
4,4°-DDT Semivolatile Organic Comp Bis(2-athylhaxyi) Phthalate Total Metals (mg/Kg) Arsanic Barkim	1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9	NO 7 51	ND 7 41	ND 5 41	ND 6 54	ND 6 81	0.6 	0.9 6 48	ND 6 50

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TABLE 5.7-1 Summary of Analytes Detected (cont.) **Dust Patiative Roadway Soll Sample Analytical Results**

Part 2 of 2 UC 5497 Surface 2 UC 6997 Location: Sample: Surface 1 Surface 3 Surface 1 Surface 2 Surface 3 94DUST06SL 94DUST07SL 94DUSTOBSL 94DUST13SL 94DUST14SL 94DUST155L Sample ID; Lab Code: K946450-005 K946450-006 K946450-007 K946743-005 K946743-006 10/26/94 K946743-007 10/25/94 10/15/94 10/15/94 10/15/94 10/26/94 Date Collected: **Residential RBC** Compound Petrolaum Hydrocarbons (mg/Kg) TPH_____ 59 136 39 98 114 260 0000 Organochlorine Pesticides (mg/Kg) 4,4'-DDT ND ND 1.9 ND 0.09 0.04 0.05 Semivolatile Organic Compounds (mg/Kg) Bis(2-ethylhexyl) Phihalate 46 ND ND ND <0.6 ND ND Total Metals (mg/Kg) Arsonic 0 37 8 6 6 6 Ř -7 Barium 5.600 60 65 70 43 58 46 Chromlum 390 31 20 J 36 30 -17 J 16 J Lead Nickel none 1,600 3 7 7 13 J 16 J 27 J 36 40 33 42 28 22 FOOTNOTES: ND = Non-detected at the method reporting NmH (MRL). (See the Dust Patiative Roedway Appendix for MRL values.) J = Value is considered an estimate. A shaded value indicates result exceeds the residential risk based concentration (RBC), VOAQCICOMMONNICHVINALSWEPTABLESTABLES XLEIDINI T 10/15/68

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The Dust Palliative sites are adjacent to residential properties, commercial/industrial properties, and undeveloped areas (including forests, wetlands, etc.). The roadways are travelled by workers, residents, and visitors. Ditches along the roadways transport runoff and snowmelt to nearby surface water bodies.

5.7.4.1 Compounds of Potential Concern

A summary of the COPCs is presented in Table 5.7-2, consisting of arsenic, a carcinogen.

Туре	Source	Carcinogens
Metals ¹	Background soil	Arsenic

Table 5.7-2. Compounds of Potential Concern Dust Palliative

Based on the background metals statistics evaluation in Appendix A, some metals were not included in the semi-quantitative risk assessment because they were not statistically significant from background concentrations.

All other target analytes were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only). As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. In addition, a list of compounds that were not detected at detection limits exceeding current risk-based concentrations is provided in Table 5.7-3. Most of these compounds were identified in the Work Plan (ENSR 1994) but require special analytical services to achieve reporting limits below RBCs. During the RI/FS, Table 5.7-3 should be reviewed to determine if the likelihood that the compound is present warrants the use of special analytical services.

As described in Section 5.7.4.4, the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, DRO, and TPH). As a result, these data were not included in the semi-quantitative risk assessment.

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Table 5.7-3 Compounds Not Detected at Detection Limits Exceeding Current Risk-Based Concentrations, Dust Pallative

Compound	Matrix	Maximum Detection Limit	Risk-Based Concentration
N-Nitrosodimethylamine	Soil	4 mg/Kg	0.013 mg/Kg
Bis(2-chloroethyl) Ether	Soil	0.6 mg/Kg	0.58 mg/Kg
N-Nitrosodi-n-propylamine	Soil	0.6 mg/Kg	0.091 mg/Kg
Hexachlorobenzene	Soîl	0.6 mg/Kg	0.4 mg/Kg
3,3'-Dichlorobenzidine	Soil	4 mg/Kg	1.4 mg/Kg
Benzo(a)pyrene	Soil	0.6 mg/Kg	0.088 mg/Kg
Dibenz(a,h)anthracene	Soil	0.6 mg/Kg	0.088 mg/Kg

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5.7.4.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Sources, transport mechanisms, exposure pathways, and receptors (elements of a Conceptual Site Model) are shown on Figure 5.7-3. As discussed previously, the primary sources are road oiling and vehicle exhaust. Secondary sources include contaminated surface soil. It is not known whether subsurface soil, groundwater, or surface waters have been impacted.

Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile COPCs may disperse in the atmosphere or accumulate in enclosed spaces. However, no volatile COPCs were detected at concentrations exceeding 1/10th of the RBC for residential soil. Concentrations of nonvolatile COPCs in airborne dust are not expected to be of concern in the atmosphere (see Appendix A, Section A.5).

Surface water transport may be significant, particularly during rainfall or snowmelt events. Contaminants would most likely be transported as entrained sediments, since the COPCs are relatively insoluble in water. Similarly, leaching is not expected to be significant, since the COPCs are relatively insoluble.

Depending on the future land use, potential receptors may include residents, occupational workers, and construction workers. Ecological receptors include terrestrial plants, mammals, avian species, and aquatic species.

5.7.4.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion pathway. Soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, this pathway was selected to determine if soil exposures represent a significant human health risk. If human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of the baseline risk assessment.

Soil exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for

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carcinogens. For example, exposures to noncarcinogens are calculated assuming childhood exposure only, whereas exposures to carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations in soil were calculated as the 95 percent UCL of the average concentration of all samples analyzed from a particular medium (surface or subsurface soil). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991, 1992).

5.7.4.4 Toxicity Assessment

Dose-response factors were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

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Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992b), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semi-quantitative risk assessment.

5.7.4.5 Human Health Risk Characterization

Human Health Risks

Carcinogenic and noncarcinogenic risks were not evaluated, since all carcinogenic and noncarcinogenic compounds were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only).

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5.7.4.6 Ecological Risk Characterization

Quantitative assessment of ecological risks can be performed at the organism, population, or ecosystem level. Although ecosystem-level effects may be the most important, effects testing and modeling are rarely performed due to a number of practical considerations (Suter 1993). Quantification of population-level effects, such as reproductive potential, is important to maintain species populations, whereas assessment of organism-level effects evaluates the risk to individual organisms.

Chemicals can be evaluated as single compounds or as mixtures. Methods for evaluating the toxicity of mixtures requires knowledge regarding the sites and modes of action of individual compounds. Unlike for human health risk assessment, these methods have not been standardized, and there is some debate regarding the most appropriate approach.

If potential exposure pathways and receptors are present, ecological assessment begins with identification of the compounds of potential concern. This can be done in a similar fashion as for human health risk assessment, using ecological RBCs. Ecological RBCs may include toxicity benchmarks, sediment quality criteria, or other regulatory criteria. One set of criteria in common use provides benchmark concentrations for eight representative mammalian species and nine avian species (Opresko et al. 1994). Although benchmark concentrations are provided for 76 chemicals, toxicity benchmarks are not available for many target analytes. Also, the benchmarks are provided as concentrations in food, requiring evaluation of plant uptake and other routes of dietary exposure.

Likewise, standardized criteria for aquatic species reflect various exposure routes and test methods, and are not available for all target compounds. As a result, compilation of ecological RBCs can involve significant effort. Due to the large number of analytes measured at the Dust Palliative sites, ecological RBCs were not compiled as part of this project.

Potential receptors at Dust Palliative sites include terrestrial, avian, and aquatic species at a variety of trophic levels. The most highly exposed species include those with a small home range and small body weight to food consumption ratio (e.g., mice, benthic invertebrates, resident songbirds). However, other less exposed species may warrant evaluation based on their susceptibility to particular chemicals (e.g., reproductive effects of 4,4'-DDT in raptors).

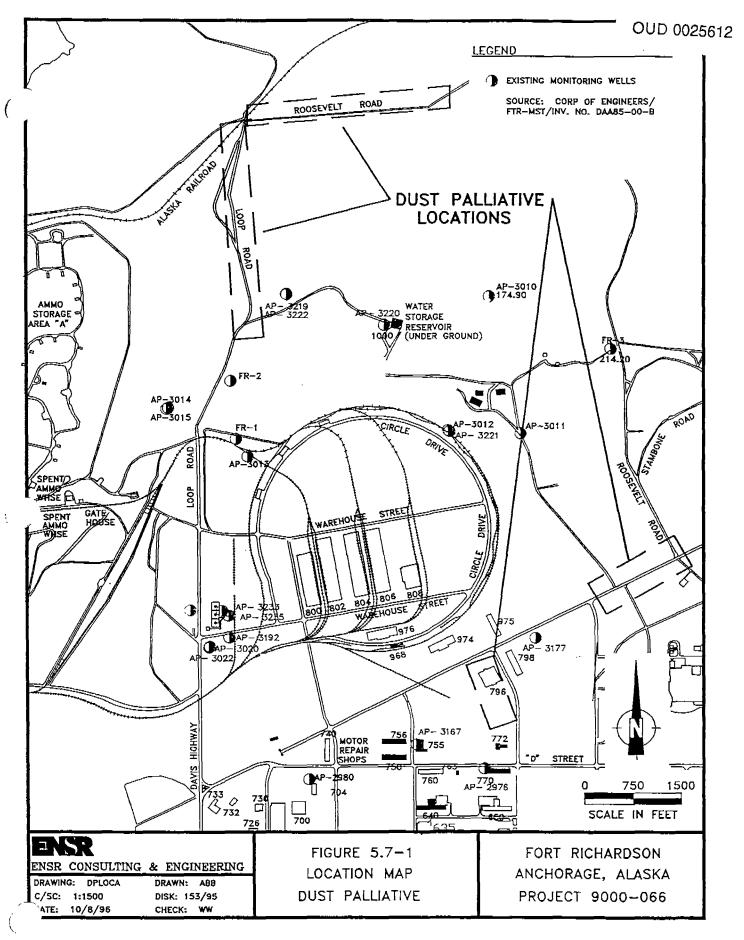
As part of the RI/FS, ecological RBCs may be identified for representative terrestrial, avian, and aquatic species. Compounds of potential concern may be selected based on a comparison of ecological RBCs with measured concentrations. At this point, the appropriate risk quantitation methods and measurement endpoints may be selected.

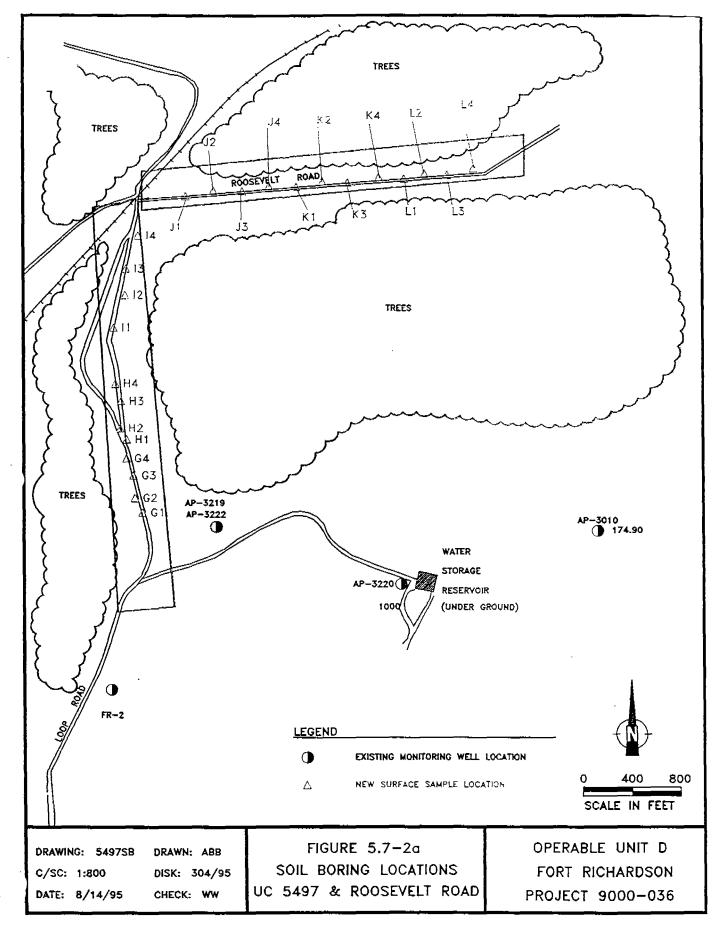
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5.7.5 Findings and Conclusions

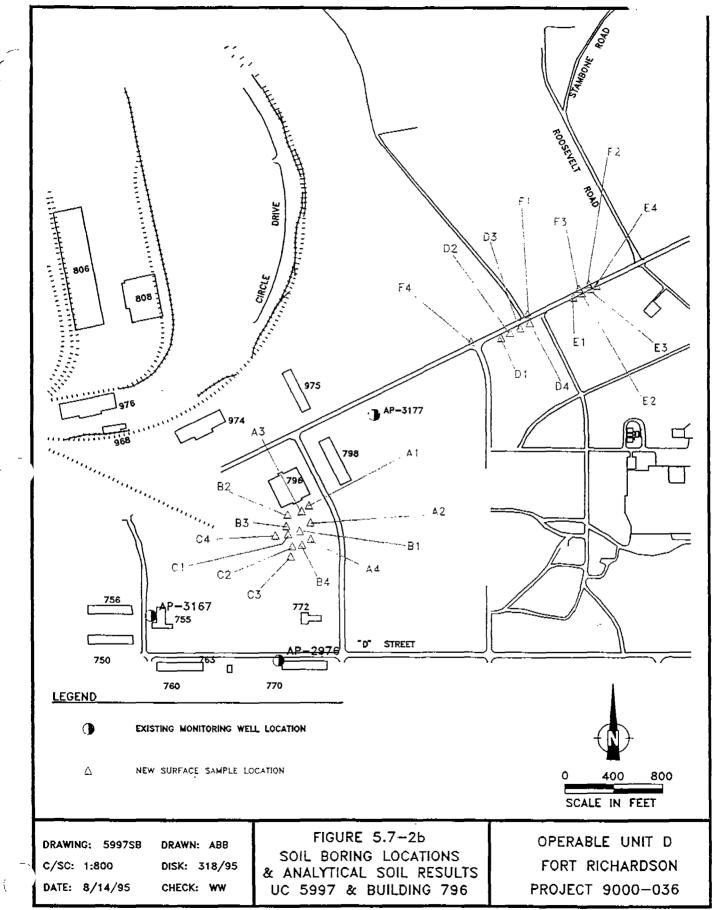
Due to the absence of compounds of potential concern, a semi-quantitative evaluation of carcinogenic and noncarcinogenic risks was not performed.

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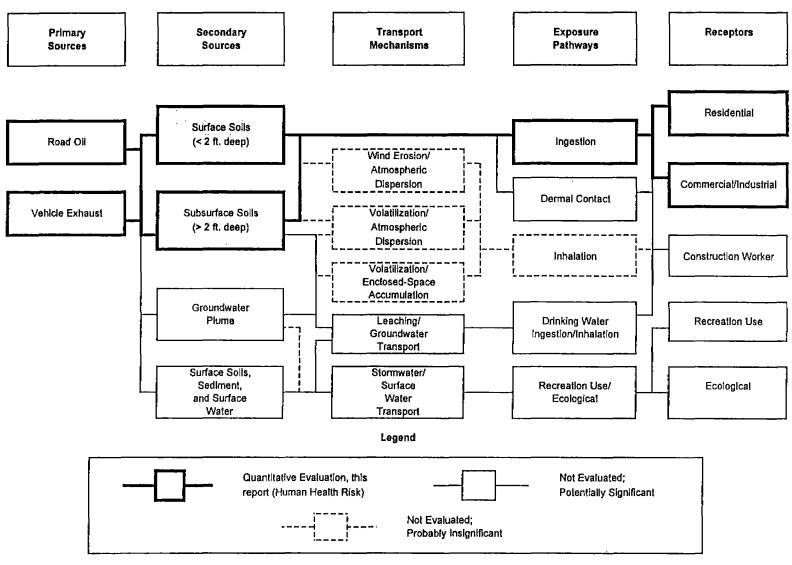


Figure 5.7-3: Sources, Transport Mechanisms, Exposure Pathways, and Receptors Dust Pallative Roadway

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Fire Training Area

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5.8 Fire Training Area

5.8.1 Site History

The former Fire Training Area is located between Loop Road and Roosevelt Road, and north of Circle Drive (Figure 5.8-1). The fire training pit, situated over a former landfill, was approximately 50 feet in diameter, surrounded by a 1-foot berm. The site was used for fire training between 1985 and 1988. Liquid petroleum hydrocarbons, including diesel, JP-4, waste oil, transmission fluid, brake fluid, hydraulic fluid, fuels mixed with solvents, and soils contaminated with petroleum products, were poured into the unlined pit and ignited. Fluids were stored at the site until they were burned. An estimated 1,500 to 2,300 gallons of waste were burned per year at each fire training pit (E&E 1991; WCC 1987). Subsequent to 1988, the fire training pit has been covered with an estimated 3 to 6 feet of stockpiled POL-contaminated soil originating from other sites.

Previous investigations at the fire training area have focused on fuel identification, metals, VOCs, SVOCs, herbicides, and pesticides. In 1986, the AEHA reported unlabelled drums at the site. Analyses of soils in and near the fire training pit detected toluene and ethylbenzene to 6 feet bgs. Landfill debris was encountered at 6 to 8 feet bgs.

In 1989, a soil gas survey probed the area to a depth of 12.5 feet (WCC 1990). High concentrations of benzene (830 parts per million by volume [ppmv]), toluene (910 ppmv), and xylenes (480 ppmv) were detected. At 12.5 feet bgs, the sample probe was in the landfill itself, and results may not be indicative of the fire training pit.

Another shallow soil gas survey detected maximum concentrations of 11,900 ppm of benzene, toluene, and xylenes (E&E 1991).

5.8.2 Field Investigation

The location of the fire training pit was determined by the USACE survey crew based on an aerial photograph. Ten surface sampling locations were evenly spaced within a 35-foot radius from the center point of the fire training pit (Figure 5.8-2).

Based on soils encountered at the first sampling location, the fill depth was estimated to be 2 feet and not the previously estimated 3 to 6 feet.

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A CME-75 drill rig was used to obtain shallow subsurface samples varying in depth from 2 to 9.5 feet bgs. The drill rig was used to bore through the observed fill depth of 2 feet before each sample was collected. The depth of the samples varied according to the amount of soil recovered in the split-spoon sampler. The sample depth was increased if initial recovery was insufficient to fill all sample jars.

The field team was able to verify the approximate location of the pit by the observation of strong solvent and fuel odors in 7 of the 10 samples collected and a dark staining due to burned soils observed in 4 of the 10 samples collected. Two of the samples contained scraps of a cotton material similar to absorbent pads. Samples were submitted for laboratory analysis, and preliminary results were received with 2 weeks.

The results of the preliminary laboratory data were reviewed to select the most impacted locations as sites for three of the four 20-foot soil borings (Figure 5.8-2). Groundwater was not investigated because the intent of the PSE2 was to identify specific contaminants impacting soils in the Fire Training area. A groundwater investigation, if necessary, could be included as part of an RI.

Soil boring AP-3518 (Appendix I) was located outside the Fire Training Area, 85 feet from the center point. The boring was advanced to a depth of 22 feet bgs. Soils encountered were described as sandy gravel to 14 feet bgs, silty sand to 20 feet bgs, and gravel to 22 feet bgs. The presence of a very strong fuel/solvent odor was first observed at 6 feet bgs and continued throughout the boring. Wood and paper scraps were encountered at a depth of 8 feet bgs, and an oily substance was observed at 12 feet bgs.

Soil boring AP-3519 was advanced to 22 feet bgs adjacent to surface sampling location 7. Strong hydrocarbon and solvent odors were encountered at a depth of 4 feet bgs and continued throughout the boring. Paper debris was observed at a depth of 6 feet. The amount and variety of debris encountered increased from 6 to 16 feet bgs. This debris was consistent with general landfill materials and ceased at the 18 foot bgs depth. Gravelly sand fill was encountered to 16 feet bgs with some gravel to 22 feet bgs.

Soil boring AP-3520 was advanced to 23 feet bgs between surface sampling locations 9 and 10. Strong hydrocarbon odors were observed starting at 2 feet bgs and continuing to 23 feet bgs. Debris was not encountered at this boring location.

Soil boring AP-3521 was advanced to 24 feet bgs adjacent to surface sampling location 5. Burnt soil materials and a very strong hydrocarbon odor were observed at a depth of 4 feet bgs. The same odor decreased at the 6-foot-bgs depth and continued to 12 feet bgs. Wood pieces and a strong hydrocarbon odor were observed at a depth of 14 feet bgs with the odor continuing to 18 feet bgs. A slight hydrocarbon odor was observed at a depth of 20 feet bgs to 24 feet bgs.

Based on the soil boring logs, a cross section of the investigation area is presented in Figure 5.8-3.

5.8.3 Analytical Results

A total of 30 samples, including three blind duplicate samples and three QA samples, were collected and sent to the laboratory for analysis. All samples were analyzed for TRPH, GRO, DRO, VOCs, PCBs, SVOCs, ethylene glycol, metals, and dioxins/furans. Analytes above the MRL are shown in Table 5.8-1. A complete summary of the analytical data for the Fire Training Area is show in Appendix I.

Geotechnical testing, including Atterburg limits, grain size distribution, and percent moisture content, was performed on 15 samples. The results from this testing are presented in Appendix I.

The project data are accepted with the following exception noted in the USACE NPD laboratory's CQAR and ENSR QASR located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

 Project data of total recoverable petroleum hydrocarbons in CAS reports K946749A, K947227A, and K947276A (sample numbers 94FTP101SL through -27SL) were considered estimates due to high RPD.

5.8.4 Semi-Quantitative Risk Assessment

As described in Section 4.2, a semi-quantitative risk assessment was performed for this site. The risk assessment is considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only one exposure pathway was considered (soil ingestion); although this pathway usually yields the most conservative results, other pathways may also be important.

TABLE 5.8-1 Summary of Analytes Detected Fire Training Area Soil Sample Analytical Results

	Location:		SB AF	P 3518		1		SB AP 3519		
	Sample Depth:	2'-6'	6'-10'	10'-18'	18'-22'	2'-	8'	B'-14'	14'-18'	20'-22'
	Sample ID:	94FTP112SL	94FTP113SL	94FTP114SL	94FTP115SL	04FTP116SL	84FTP117SL	94FTP118SL	94FTP119SL	94FTP120SI
	Lab Code:	K7227-001	K7227-002	K7227-003	K7227-004	K7227-005	K7276-009	K7276-010	K7276-011	7276-012
	Date Collected:	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15,16/94	11/15,16/94	11/15,16/94	11/15,16/94
Compound	Residential RBC									
Petroleum Hydrocarbons (mg/	Ka)		i i			l i				
GRO	none	ND	ND	B1	ND	1,800	1,900	1,200	ND	ND
DRO	none	461	1,630	1,250	315	1,120	1,100	360	ND	ND
ГРН	none	490 J	2,900 J	17,000 J	2,700 J	2,100 J	1,700 J	470 J	10 J	10 UJ
Organochlorine Pesticides (m	n/Kg)		[
4,4'-DDD	2.7	ND	0,04	<0.03	<0.02	ND	ND	<0.02	ND	ND
4.4'-DDE	1.9	ND	<0.03	<0.02	<0.02	ND	ND	0.07	ND	ND
Polychiorinated Biphenyis (PC	Ba) (mo/Ka)									
Aroclor 1232	none	ND	<3.5	<0.7	<1.2	ND	ND	3.0	ND	ND
Aroclor 1248	nona	ND	<1.5	0.2	<0.6	ND	ND	<0.3	ND	ND
Aroclar 1254	1.6	ND	<0.7	<0.7	<0.6	ND	ND	0,4	ND	ND
Aroclor 1260	none	ND	<0.7	0.5	<0.3	ND ND	ND	ND	ND	ND
Volatile Organic Compounds (ua/Ka)									
Acelone	7,800,000	ND	110	<13,000	81	240	<6,500	200	97	6,800
Methylene Chloride	85,000	ND	ND	<2,600	ND	ND	<1,300	ND	ND	ND
2-Butanone (MEK)	47,000,000	ND	ND	<5,200	ND	75	<2,600	57	73	3200
Banzana	22,000	ND	ND	<1,300	ND	θ	<850	ND	ND	ND
2-Hexenone	nona	ND	ND	<5,200	ND	ND	<2,600	ND	ND	ND
Foluene	16,000,000	8	11	<1,300	ND	310	1,500	50	17	12
-Methyl-2-penlanone (MIBK)	none	ND	ND	<5,200	ND	ND	<2,600	72	ND	ND
Ethylbenzene	7,800,000	ND	ND	1,700	ND	120	640	45	5	ND
Total Xylenes	160,000,000	7	ND	10,000	17	810	6,400	340	35	11
sopropylbenzene	3,100,000	ND	ND	<5,200	ND	48	<2,600	ΝD	ND	ND
Propylbenzene	none	ND	ND	<5,200	ND	150	<2,800	84	ND	ND
,3,5-Trimelhylbenzene	31,000	ND	ND	6,500	ND	270	<2,600	150	ND	ND
2,4-Trimelhylbenzene	39,000	ND	ND	18,000	ND	810	6,700	400	41	ND
sc-Bulylbenzene	780,000	ND	ND	<5,200	ND	60	<2,600	ND	ND	ND
Isopropylloluene	none	ND	ND	5,600	ND	55	<2,600	60	ND	ND
4-Dichlorobenzene	27,000	ND	ND	2,900	73	ND	<650	ND	ND	ND
laphthalene	3,100,000	ND	ND	<5.200	37	730	3,100	ND	ND ND	

ND = Non-detected at the method reporting limit (MRL). (See the Fire Training Area Appendix for MRL values.)
 < Less than. Analytical reporting limit has been elevated due to matrix interferences or sample regulding difution.
 J = Value is considered an estimate.
 UJ = The analyte was not detected at the MRL, however, the MRL is considered en estimate.

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OUD PRELIMINARY SOURCE EVALUATION 2

TABLE 5.8-1 Summary of Analytes Detected (cont.) Fire Training Area Soil Sample Analytical Results

	Location:			P 3520			SB AP 3521		Surface 1	Surface 2
	Sample Depth:	2'-10'	13'-17'	17	-23	2'-6'	12'-16'	16'-20'	2,5'-4,5'	2'-6'
	Sample ID:	94FTP121SL	94FTP122SL	94FTP123SL	94FTP124SL	94FTP125SL	94FTP126SL	94FTP127SL	94FTP101SL	94FTP102S
	Leb Code:	K7278-005	K7276-006	K7276-007	K7276-008	K7278-001	K7276-002	K7276-003	K946749-007	K946749-00
	Date Collected:	11/15,16/94	11/15,16/94	11/15,18/94	11/15,18/94	11/15,16/94	11/15,10/94	11/15,16/94	10/27/94	10/27/94
Compound	Residential RBC									
Petroleum Hydrocarbons (mg	/Kg)									
GRO	none	920	NO	ND	ND	634	ND	ND	1,000	9
DRO	none	985	ND	ND	ND	764	208	24	3,610	64
грн	none	1,300 J	16 J	10 UJ	10 J	1,100	430	35	5,800	69
Organochlorine Pesticides (m	g/Kg)					\		l		
4,4'-DDD	2.7	ND	NO	ND	ND	ND	ND	0.01	ND	ND
4,4'-DDE	1.0	ND	ND	ND	ND	DN	ND	ND	ND	ND
Polychlorinated Biphenyls (P	CBs) (mg/Kg)]		ł				
Aroclor 1232	none	ND	ND							
Aroclar 1248	none	ND	NÖ	ND	ND	DND	ND	ND	ND	ND
Arocior 1254	1,6	ND	ND	ND		ND	ND	ND	ND	ND
Aroclor 1260	none	ND	ND							
/olatile Organic Compounds	(vg/Xg)									
Acetone	7,800,000	<6,500	120	330	310	<13,000	52	460	<13,000	ND
Vethylene Chloride	85,000	<1,300	ND	ND	ND	<2,600	19	ND	<2,600	31
2-Bulanone (MEK)	47,000,000	<2,600	210	330	1700	<5,200	ND	300	<5,200	ND
Banzana	22,000	<650	ND	ND	ND	<1,300	ND	ND	<1,300	NĎ
2-Hexanone	6001	<2,800	ND	ND	ND	<5,200	ND	84	<5,200	ND
Toluene	16,000,000	2,900	8	10	25	<1,300	8	13	1,900	7
I-Melhyl-2-pentanone (MIBK)	nona	<2,600	ND	25	30	<5,200	ND	ND	<5,200	ND
Ethylbenzene	7,800,000	1,000	ND	ND	6	2,100	ND	Ð	<1,300	ND
Total Xylenes	160,000,000	13,000	10	7	41	10,000	13	71	000,88	18
sopropylbanzana	3,100,000	<2,600	ND	ND	ND	<5,200	ND	ND	<5,200	ND
Propylbenzene	none	<2,000	ND	ND	DN	<5,200	ND	ND	<5,200	ND
3.5-Trimelhylbenzene	31,000	<2,600	ND	ND	ND	24,000	ND	ND	30,000	ND
,2,4-Trimethylbenzene	39,000	5,400	ND	ND	ND	47,000	ND	40	39,000	ND
ac-Bulylbenzene	780,000	<2,600	ND	ND	NO	<5,200	ND	ND	<5,200	ND
Isopropyltoluene	none	<2,600	ND	ND	ND	<5,200	ND	39	<5,200	ND
.4-Dichlorobenzene	27,000	<850	ND	NO	NO	<1,300	ND	ND	<1,300	ND
laphihalena	3,100,000	3,100	ND	NO	ND	15,000	ND	ND	<5.200	ND

UJ = The analysis was not detected at the MRL, however, the MRL is considered an estimate. UJ = The analysis was not detected at the MRL, however, the MRL is considered an estimate. A shaded value indicates result exceeds the residential risk based concentration (RBC). VOADCCCOMMONNICHFINALSWEPTABLESTABLES.XLS(FTP

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TABLE 5.8-1 Summary of Analytes Detected (cont.) Fire Training Area Soll Sample Analytical Results +

	Location:	Surface 3	Surf	ace 4	Surface 5	Surface 6	Surface 7	Surface 8	Surface B	Surface 10
	Sample Depth:	2'-6'	3.5'9.5'	3.5'9.5'	2'-6'	4'-6'	2'-6'	2.5'-6.5'	0-2'	0-4'
	Sample ID:	94FTP103SL	BIFTP104SL	94FTP105SL	84FTP108SL	94FTP107SL	94FTP108SL	94FTP109SL	04FTP110SL	04FTP111S
	Lab Code:	K946749-009	K946749-010	K948749-011	K848748-001	K946749-002	K946749-003	K946749-004	K946749-005	K946749-00
	Date Collected:	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94	10/27/04	10/27/94	10/27/94
Compound	Residential RBC									
Petroleum Hydrocarbons (mg	/Kg)									
GRO	none	ND	28	9	2,000	453	12,000	622	4,200	4,200
DRO	none	247	47	40	472	755	2,250	2,650	5,370	3,870
ТРН	none	430	77	93	1,100	1,500	3,700	3,000	8,100	0,100
Organochiorine Pesticides (m	g/Kg)									
4,4'-DDD	2.7	ND	ND							
4,4'-DDE	1,9	ND	ND	ND	ND	NÐ	ND	ND	ND	ND
Polychiorinated Biphenyls (PC	Be) (mg/Kg)									
Aroclor 1232	rione	ND	ND							
Arodor 1248	none	ND	ND							
Aroclor 1254	1.0	ND	ND	ND	ND	ND	NO	ND		ND
Aroclor 1260	none	ND	ND	ND	ND	ND	ND	NO	ND	ND
Volatile Organic Compounds (µa/Ka)									
Acelone	7,600,000	ND	380	98	<6,500	<14,000	<14,000	<7,000	<14,000	<8,500
Mathylene Chloride	85,000	39	31	ND	<1,300	<2,700	<2,700	<1,400	<2,700	<1,300
2-Butanone (MEK)	47,000,000	ND	58	ND	<2,600	<5,400	<5,400	<2,800	<5,400	<2,600
Benzena	22,000	ND	7	ND	<850	<1,400	3,800	1,000	<1,400	5,200
2-Hexanone	none	ND	ND	ND	<2,600	<5,400	<5,400	<2,800	<5,400	41,000
foluene	16,000,000	12	Ð	5	<850	<1,400	160,000	850	25,000	240,000
4-Methyl-2-penlanone (MIBK)	none	ND	ND	ND	<2,600	<5,400	<5,400	<2,800	<5,400	<2,600
Ethylbenzene	7,800,000	ND	11	38	3,000	<1,400	39,000	7,500	2,600	16,000
Tolal Xylenes	160,000,000	7	240	85	17,000	9,000	360,000	43,000	200,000	180,000
sopropylbenzene	3,100,000	ND	43	ND	3,500	<5,400	9,200	<2,800	<5,400	4,800
n-Propylbenzene	none	NC	43	ND	7,100	<5,400	17,000	5,700	<5,400	7,300
1,3,6-Trimelhylbenzene	31,000	ND	190	59	23,000	25,000	22,000	15,000	36,000	15,000
2,4-Trimethylbenzene	39,000	ND	290	34	74,000	32,000	57,000	28,000	93,000	48,000
ec-Butylbenzene	780,000	ND	ND	ND	4,600	<5,400	5,800	<2,800	<5,400	3,400
Isopropylloluane	none	ND	ND	ND	4,400	<5,400	<5,400	<2,800	<5,400	3,000
,4-Dichlorobenzene	27,000	DN	ND	ND	<850	<1,400	<1,400	<700	<1,400	<850
laphthalene	3,100,000	ND	ND	ND	28,000	8,000	24,000	12.000	31,000	12,000

ND = Non-detected at the method reporting limit (MRL). (See the Fire Training Area Appendix for MRL values.)
< = Less than, Analytical reporting limit has been elevated due to matrix interferences or sample requiring dilution.
A shaded value indicates result exceeds the residential risk based concentration (RBC). OOTNOTES: ND

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TABLE 5.8-1 Summary of Analytes Detected (cont.) Fire Training Area Soil Sample Analytical Results

	Location;		SB A	P 3518		SB AP 3519					
	Sample Depth:	2'-0'	6'-10'	10'-16'	18'-22'	2	-8'	8'-14'	14'-18'	20'-22'	
	Sample ID:	B4FTP112SL	04FTP113SL	94FTPt14SL	94FTP115SL	84FTP116SL	84FTP117SL	94FTP118SL	94FTP119SL	94FTP120S	
	Lab Code;	K7227-001	K7227-002	K7227-003	K7227-004	K7227-005	K7276-009	K7276-010	K7276-011	7276-012	
	Date Collected:	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15,16/94	11/15,16/94	11/15,16/94		
Compound	Residential RBC										
Semivolatile Organic Compo	ounds (mg/Kg)			i	l						
Naphthalene	3,100	ND	2.2	<1.5	0,4	5	8	0.7	ND	NÐ	
2-Methylnaphtheiene	none	ND	<1.5	<1,5	ND	8	10	1	ND	ND	
Diethyl Phthalale	63,000	ND	<1.5	<1.5	0.3	<3	<3	ND	ND	ND	
Di-n-butyl Phthalate	none	ND	<1.5	<1.5	0.4	<3	<3	ND	ND	ND	
Butylbenzyl Phihalate	18,000	ND	<1.5	4.9	0.5	<3	<3	ND	ND	ND	
Bis(2-ethylhexyl) Phthalale	46	ND	<1.5	1.7	0.7	<3	<3	ND	ND	ND	
3- and 4-Methylphenol	390	ND	<1.5	2.7	0.7	<3	<3	ND	ND	ND	
Total Metals (mg/Kg)						1					
Amenic	0,37	5	6	6	5	4	7	10	7	θ	
arlum	5,500	65	76	76	51	46	50	49	58	41	
Cadmium	30	ND	4	ND	ND	ND	ND	ND	ND	ND	
Chromium	390	35	34	41	41	30	46	30	24	22	
.eed	none	15	111	87	18	10	15	8	7	6	
Mercury	23	ND	0.3	0.3	ND	ND	ND	ND	ND	ND	
Vickel	1,600	37	37	37	34	37	40	33	30	28	
Silver	390	ND	2	ND	ND	ND	ND	ND	ND	ND	

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TABLE 5.8-1 Summary of Analytes Detected (cont.) Fire Training Area Soil Sample Analytical Results

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-	Location:		SB A	P 3520		SB AP 3521			Surface 1	Surface 2
	Sample Depth:	2'-10'	13'-17'	17%	-23'	2'-6'	12'-16'	16'-20'	2.5'-4.5'	2'-6'
	Sample (D:	04FTP121SL	94FTP122SL	94FTP123SL	94FTP124SL	94FTP125SL	94FTP126SL	94FTP127SL	94FTP101SL	94FTP102St
	Lab Code:	K7276-005	K7276-006	K7278-007	K7276-008	K7276-001	K7276-002	K7276-003	K946749-007	K946749-00
	Date Collected:	11/15,16/94	11/15,16/94	11/15,16/94	11/15,\$6/94	11/15,16/94	11/15,16/94	11/15,16/94	10/27/94	10/27/94
Compound	Residential RBC									
Semivolatile Organic Compo	unds (mg/Kg)									
Naphihalene	3,100	3	ND	ND	ND	<3	ND	ND	9	ND
2-Methylnaphthalene	non a	5	ND	ND	ND	5	ND	ND	θ	ND
Diethyl Phthalale	63,000	<3	ND	ND	ND	<3	NÖ	ND	<2	ND
)i-n-butyl Phthalate	none	<3	ND	ND	ND	<3	ND	ND	<2	ND
Butylbenzyl Phthalale	16,000	<3	ND	ND	ND	<3	ND	ND	<2	ND
Bis(2-ethylhexyl) Phthalate	46	<3	ND	ND	ND	<3	ND	ND	<2	ND
3- and 4-Methylphenol	390	<3	ND	ND	ND	<3	ND	ND	<2	ND
Total Metals (mg/Kg)					_					
Arsanio	0.37	9	7	8	7	7	6	8	0	7
3arium	5,500	47	39	62	73	64	38	44	80	64
Cadmium.	39	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromlum	390	33	28	41	30	41	32	31	35	31
ead	B-IDON	9	7	9	8	9	7	8	15	10
lercury	23	ND	ND	ND	ND	ND	ND	ND	ND	ND
lickel	1,600	40	35	44	34	78	40	46	47	39
Silver	390	ND	ND	ND	ND	ND	ND	ND	ND	ND

A shaded value indicates result exceeds the residential risk based concentration (RBC). VGAOCICOMMONNRICHFINALSWEPTABLESIVABLES XLSJFIP

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	Location:	Surface 3	Surf	ace 4	Surface 5	Surface 6	Surface 7	Surface 8	Surface 9	Surface 10
	Sample Depth:	2'-6'	3.5'9.5'	3.5'9.5'	2'-6'	4'-6'	2'-6'	2.5'-8.5'	0-2'	0-4'
	Sample ID:	94FTP103SL	94FTP104SL	94FTP105SL	B4FTP100SL	04FTP107SL	94FTP108SL	94FTP109SL	94FTP110SL	94FTP111S
	Lab Code:	K946749-009	K946749-010	K946749-011	K946749-001	K946749-002	K946749-003	K946749-004	K946749-005	K946749-00
	Date Collected:	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94	10/27/94
Compound	Residential RBC									
Semivolatile Organic Compo	unde (mg/Kg)									
Naphthalene	3,100	ND	ND	ND	0.9	0,31	9	4	17	12
2-Methylnaphthalene	nona	ND	ND	ND	2.0	0.91	9	4	13	11
Diethyl Phthalate	63,000	ND	ND	ND	ND	ND	<2	<2	<2	<2
Di-n-butyl Phihalale	none	ND	ND	ND	ND	ND	<2	≺2	<2	<2
Butylbenzyl Phihalate	18,000	ND	ND	ND	ND	ND	<2	<2	<2	<2
Bis(2-elhylhexyl) Phthalate	48	ND	ND	ND	ND	ND	<2	<2	<2	<2
3- and 4-Methylphenol	390	ND	ND	ND	ND	ND	<2	<2	<2	<2
Total Metals (mg/Kg)										
Arsenic	0.37	7	7	7	6	7	6	θ	6	9
Badum	5,500	86	100	86	89	90	64	78	72	66
Cadmlum	39	ND	ND							
Chromlum	390	48	42	34	30	39	43	40	34	39
and	none	12	8	6	11	8	11	15	17	29
Aarcury	23	ND	ND							
Nickel	1,600	43	40	41	37	47	46	56	37	48
Silver	390	ND	ND							

TABLE 5.8-1 Summary of Analytes Detected (cont.) Fire Training Area Soli Sample Analytical Results

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	Location:		SB AF	P 3518				SB AP 3519		
	Sample Depth:	2'-6'	6'-10'	10'-18'	18'-22'	2	-8'	0'-14'	14'-18'	20'-22'
	Sample ID:	94FTP112SL	94FTP113SL	94FTP114SL	94FTP115SL	94FTP116SL	94FTP117SL	94FTP118SL	94FTP119SL	94FTP1205
	Lab Code:	K7227-001	K7227-002	K7227-003	K7227-004	K7227-005	K7276-009	K7276-010	K7276-011	7276-012
	Date Collected:	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15,16/94	11/15,16/94	11/15,16/94	11/15,16/9
Compound	Residential RBC									
Dioxins & Furans (pg/g)										
2,3,7,8-TCDD	4,000	ND	1.6	ND	ND	ND	ND	ND	ND .	ND
Tolal TCDD	none	ND	21	ND	ND	ND	ND	ND	ND	ND
2,3,7,8-PeCDD	none	ND	5.5	ND	ND	ND	ND	ND	ND	ND
Total PeCDD	none	ND	42	ND	ND	ND	ND	ND	ND	ND
2,3,4,7,8-HxCDD	none	ND	7.4	ND	ND	ND	ND	ND	ND	ND
2,3,8,7,8-HxCDD	none	ND	100	20	2.7	ND	ND	ND	ND	ND
,2,3,7,8,9-HxCDD	none	ND	25	5.6	ND	ND	ND	ND	ND	ND
Folal HxCDD	none	ND	480	99	13	ND	ND	1.4	ND	ND
1,2,3,4,8,7,8-HpCDD	none	5.1	1,200	340	70	4.3	4	7.2	ND	ND
fotal HpCOD	none	6,8	2,000	580	150	7.9	7.5	12	ND	ND
DCDD	none	35	10,000	3,200	1,300	32	40	84	1	0.99
3,7,8-TCOF	поле	ND	4,4	NO	ND	ND	ND	ND	ND	ND
Iolal TCDF	none	1.9	61	ND	ND	ND	ND	ND	ND	ND
,2,3,7,8-PeCDF	none	ND	2.5	ND	ND	ND	ND	ND	ND	ND
2,3,4,7,8-PeCDF	hona	ND	4.3	ND	ND	ND	ND	DN	ND	ND
otal PeCDF	none	3.8	81	6.4	ND	0.7	ND	ND	ND	ND
,2,3,4,7,8-HxCDF	none	ND	10	4,8	ND	ND	ND	ND	ND	ND
,2,3,6,7,8-HxCDF	nona	ND	14	ND	ND	ND	ND	ND	ND	ND
3,4,8,7,8-HxCDF	none	ND	11	3.4	ND	ND	ND	ND	ND	ND
,2,3,7,8,9-HxCDF	none	ND	2.2	ND	ND	ND	ND	ND	ND	ND
olal HxCDF	none	2.1	680	150	11	ND	ND	1.5	ND	ND
2,3,4,8,7,8-HpCDF	none	2.1	560	110	14	1.4	1,1	1.2	ND	ND
,2,3,4,7,8,9-HpCDF	aone	ND	17	6.1	ND	ND	ND	ND	ND	ND
olal HpCDF	none	5	2,200	450	85	2.2	3.6	3.7	ND	ND
CDF	none	5	2,200	530 rea Appendix for M	62	ND	2.0	2,3	ND	ND

TABLE 5.8-1 Summary of Analytes Detected (cont.) Fire Training Area Soll Sample Analytical Results

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TABLE 5.8-1 Summary of Analytes Detected (cont.) Fire Training Area Soli Sample Analytical Results

	Location:		SB A	P 3520			SB AP 3521		Surface 1	Surface 2
	Sample Depth:	2'-10'	13'-17'	17	-23'	2'-6'	12'-16'	16'-20'	2,5'-4,5'	2'-6'
	Sample ID:	94FTP121SL	94FTP122SL	94FTP123SL	94FTP124SL	94FTP125SL	94FTP126SL	94FTP127SL	94FTP101SL	94FTP102S
	Lab Code:	K7278-005	K7276-006	K7276-007	K7278-008	K7278-001	K7276-002	K7278-003	K946749-007	K946749-00
	Date Collected:	11/15,16/94	11/15,18/94	11/15,16/94	11/15,18/94	11/15,16/94	11/15,16/94	11/15,16/94	10/27/94	10/27/94
ompound	Residential RBC									
loxins & Furans (pg/g)						1				
3,7,8-TCDD	4,000	ND	ND							
otal TCDD	none	ND	ND							
2,3,7,8-PeCDD	nona	ND	ND							
olal PeCDD	none	ND	ND							
2,3,4,7,8-HxCDD	none	ND	ND							
2,3,8,7,8-HxCDD	none	ND	ND	ND	ND	ND	1,5	ND	ND	ND
2,3,7,8,9-HxCDD	none	ND	ND							
olal HxCOD	none	ND	ND	ND	ND	ND	5.7	ND	ND	ND
2,3,4,8,7,8-HpCDD	none	3,3	ND	ND	ND	3.6	36	4.5	2.2	3.8
olal HpCDD	none	6.3	ND	ND	ND	0,0	69	7.9	3.9	6.6
CDD	none	24	1.3	1.2	1.1	26	490	38	17	29
3,7,B-TCOF	hone	ND	ND							
olal TCDF	none	ND	ND	ND	ND	1.8	ND	ND	ND	0.57
2,3,7,8-PeCDF	nóne	ND	ND							
3,4,7,8-PeCDF	none	ND	NO	ND						
olal PeCDF	none	ND	ND	ND	ND	1.8	ND	ND	0.34	2.5
2,3,4,7,8-HxCDF	nona	ND	ND							
2,3,8,7,8-HxCDF	none	ND	ND							
3,4,8,7,8-HxCDF	none	ND	ND							
2,3,7,8,9-HxCOF	none	ND	ND							
otal HxCDF	none	ND	ND	ND	ND	1.9	5.9	ND	0.95	2.3
2,3,4,8,7,8-HpCDF	none	ND	ND	ND	ND	1.4	4.9	ND	0.76	1.3
2,3,4,7,8,9-HpCDF	none	ND	ND							
lal HpCDF	none	1.5	ND	ND	ND	3.0	22	ND	2.1	3.8
CDF COTNOTES: ND = Non-delecte	none	3.2	ND	NÐ	ND	3.4	15	2.0	2	3,7

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TABLE 5.8-1 Summary of Analytes Detected (cont.) Fire Training Area Soll Sample Analytical Results

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Surface 3 Surface 4 Surface 5 Surface 6 Surface 7 Surface 8 Surface 9 Surface 10 Location 2'-6' 3.5'0.5' 2'-6' 4'-6' 2'-6' 2,5'-6,5' 0-2' 0-4' Sample Depth: 3,5'9,5' 94FTP103SL 94FTP104SL 94FTP105SL 94FTP106SL 94FTP107SL 94FTP108SL 94FTP109SL 94FTP110SL 94FTP111SL Sample ID: Lab Code: K946749-009 K948749-010 K946749-011 K946749-001 K946749-002 K946749-003 K946749-004 K946749-005 K946749-006 10/27/94 10/27/94 10/27/94 10/27/94 10/27/94 10/27/94 10/27/94 10/27/94 **Date Collected** 10/27/94 **Residential RBC** Compound Dioxins & Furans (pg/g) ND ND ND ND 2,3,7,8-TCDD 4,000 ND ND NĎ ND ND NO ND ND ND Tolal TCDD none ND ND ND ND ND 1,2,3,7,8-PeCDD ND ND ND ND ND ND ND ND ND none Total PeCDD ND ND ND ND ND ND ND ND ND none 1,2,3,4,7,8-HxCDD ND ND ND ND ND ND ND ND ND none 1,2,3,8,7,8-HxCDD ND ND ND ND ND 0.54 0.88 none ND ND 1,2,3,7,8,9-HxCDD ND NO ND ND ND ND ND ND ND none Total HxCDD none ND ND ND 1.1 ND 2.3 3.1 ND 2.2 1,2,3,4,6,7,8 HpCDD 5.2 2.9 3,7 4.4 2.5 11 14 5,3 8,8 none 13 5.8 7.B Total HpCDD none 11 4.3 21 25 12 18 OCDD 41 21 29 36 19 110 none 100 48 80 2,3,7,8-TCDF ND ND NÐ ND ND ND ND ND none ND Total TCDF none 2.7 ND ND 1.2 ND ND 5.8 ND ND 1,2,3,7,8-PeCDF none ND ND ND ND ND ND ND ND ND 2,3,4,7,8-PeCDF 0.43 ND ND 0,34 ND ND 0.56 ND ND none 0.94 2.2 4.4 0.54 Total PeCDF none 5.7 1.3 10 0,73 0.84 ND 1,2,3,4,7,8-HxCDF ND ND NO ND ND ND ND ND nona 1,2,3,6,7,8-HxCDF ND ND ND ND ND ND ND ND none ND 2,3,4,8,7,8-HxCDF 0.55 0.37 0.41 0.48 ND none 0,4 0.84 ND ND 1,2,3,7,8,9-HxCDF ND ND ND ND ND ND ND ND ND none Total HxCDF 3,0 1.2 2.1 2 none 1.2 1.5 7.5 1.2 2 1.2,3,4,8,7,8-HpCOF 1.8 0.0 1.2 14 0.86 2.4 4.7 1.9 none 1.3 1,2,3,4,7,8,9-HpCDF ND ND ND ND ND ND none ND ND ND Total HpCDF 4.7 2.4 3.6 3,9 2.6 none 8 15 3.8 8.7 OCDF 4.1 2 3.2 3.2 2.2 5.2 none 13 2.8 5 OOTNOTES: ND = Non-datacled at the method reporting limit (MRL). (See the Fire Training Area Appendix for MRL values.) TCDD = Tetrachlorodibenzo-p-dloxin TCDF = Tetrachlorodibenzofuran PeCDD = Pentachlorodibenzo-p-dioxin PeCDF = 1,2,3,7,8-Pentachlorodibenzofuran HxCDD = Hexachlorodibenzo-p-dioxin HxCDF = Hexachlorodibenzofuran HpCDD = Heplachlorodibenzo-p-dioxin VDAGCVCOMMONVRICHVINALSVREPTABLESITABLESIXLSIFTP HpCDF = Heptachlorodibenzofuren

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The Fire Training Area is located within a fenced and locked area north of the main cantonment. Mixed brush and grassland, and spruce and birch forests surround the area. Immediately south of the landfill access road to the Fire Training Area is an active borrow pit. Prevailing drainage runs through the Fire Training Area to the borrow pit. There are no surface water bodies within 0.5 mile.

5.8.4.1 Compounds of Potential Concern

A summary of the COPCs is presented in Table 5.8-2. These compounds include monoaromatics (benzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, 4-isopropyltoluene, isopropylbenzene, n-propylbenzene, and 4-isopropyltoluene), PAH (2-methylnaphpthalene), chlorinated monoaromatics (1,4-dichlorobenzene), ketones (2-hexanone and 4-methyl-2-pentanone), PCBs, dioxins and furans (several), phthalates (di-n-butyl phthalate), and metals (arsenic and cadmium). As shown on Table 5.8-2, compounds are identified as carcinogens and noncarcinogens.

Туре	Source	Carcinogens	Noncarcinogens
Monoaromatics	Fuels	Benzene	1,3,5-Trimethylbenzene 1,2,4-Trimethylbenzene Isopropylbenzene n-Propylbenzene 4-Isopropyltoluene
Polyaromatics (PAH)	Fuels, oils	None	2-Methylnaphthalene
Chlorinated monoaromatics	Solvents	1,4-Dichlorobenzene	None
Ketones	Solvents	None	2-Hexanone 4-Methyl-2-pentanone
Polychlorinated biphenyls (PCB)	Transformer oil	Total PCBs	(Arocior 1016 or 1254 only)
Dioxins and furans	Herbicides, Burning Chlorinated Organics	Dibenzo-p-dioxins and dibenzofurans with chlorine substituted in the 2,3,7,8 positions (several)	None
Phthalates	Plastics	None	Di-n-butyl Phthalate
Metals ¹	Background soil; fuels and oils	Arsenic	Cadmium

Table 5.8-2. Compounds of Potential ConcernFire Training Area

¹ Based on the background metals statistics evaluation in Appendix A, some metals were not included in the semiquantitative risk assessment because they were not statistically significant from background concentrations.

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All other target analytes were either 1) not detected, 2) below 1/10th of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only). As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. In addition, a list of compounds that were not detected at detection limits exceeding current risk-based concentrations is provided in Table 5.8-3. Most of these compounds were identified in the Work Plan (ENSR 1994) but require special analytical services to achieve reporting limits below RBCs. During the RI/FS, Table 5.8-3 should be reviewed to determine if the likelihood that the compound is present warrants the use of special analytical services.

As described in Section 5.8.4.4, the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, DRO, and TPH). As a result, these data were not included in the semi-quantitative risk assessment.

5.8.4.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Sources, transport mechanisms, exposure pathways, and receptors (elements of a Conceptual Site Model) are shown on Figure 5.8-4. As discussed previously, primary sources include the former fire training pit, a former landfill, contaminated soil stockpiles, and drums containing flammable liquids. Secondary sources include contaminated surface and subsurface soil. It is not known whether groundwater or surface waters have been impacted.

Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile COPCs may disperse in the atmosphere or accumulate in enclosed spaces. However, no enclosed spaces are present in the vicinity of the Fire Training Area. In accordance with EPA (1995a), only four COPCs are considered "volatile" (benzene, 1,4-dichlorobenzene, 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene), having Henry's Law constants greater than 10⁻⁵. Concentrations of these compounds are not expected to be significant in atmospheric air. Similarly, concentrations of nonvolatile COPCs in airborne dust are not expected to be of concern in the atmosphere (see Appendix A, Section A.5).

Surface water transport is not expected to be significant, since the surrounding topography is relatively flat, and no surface water bodies are present within 0.5 mile of the site. Leaching may be significant for the more soluble compounds, including monoaromatics, ketones, and chlorinated monoaromatics. However, the depth to groundwater (approximately 180 feet) may be sufficient for natural attenuation of these compounds concurrent with downward migration.

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Compound	Matrix	Maximum Detection	Risk-Based Concentration
Toxaphene	Soil	0.7 mg/Kg	0.58 mg/Kg
1,2-Dibromoethane (EDB)	Soil	5400 µg/Kg	7.5 µg/Kg
1,2,3-Trichloropropane	Soil	1400 µg/Kg	91 µg/Kg
1,2-Dibromo-3-chloropropane (DBCP)	Soil	5400 µg/Kg	460 µg/Kg
N-Nitrosodimethylamine	Soil	20 mg/Kg	0.013 mg/Kg
Bis(2-chloroethyl) Ether	Soil	3 mg/Kg	0.58 mg/Kg
N-Nitrosodi-n-propylamine	Soil	3 mg/Kg	0.091 mg/Kg
2-Nitroaniline	Soil	20 mg/Kg	4.7 mg/Kg
Hexachlorobenzene	Soil	3 mg/Kg	0.4 mg/Kg
3,3'-Dichlorobenzidine	Soil	20 mg/Kg	1.4 mg/Kg
Benz(a)anthracene	Soil	3 mg/Kg	0.88 mg/Kg
Benzo(b)fluoranthene	Soil	3 mg/Kg	0.88 mg/Kg
Benzo(a)pyrene	Soil	3 mg/Kg	0.088 mg/Kg
Indeno(1,2,3-cd)pyrene	Soil	3 mg/Kg	0.88 mg/Kg
Dibenz(a,h)anthracene	Soil	- 3 mg/Kg	0.088 mg/Kg
Pentachlorophenol	Soil	20 mg/Kg	5.3 mg/Kg

Table 5.8-3 Compounds Not Detected at Detection Limits Exceeding Current Risk-Based Concentrations, Fire Training Pits

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Depending on the future land use, potential receptors may include residents, occupational workers, and construction workers. Ecological receptors include terrestrial plants, mammals, and avian species.

5.8.4.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion pathway. Soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, this pathway was selected to determine if soil exposures represent a significant human health risk. If human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of a baseline risk assessment.

Soil exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for carcinogens. For example, exposures to noncarcinogens are calculated assuming childhood exposure only, whereas exposures to carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations in soil were calculated as the 95 percent UCL of the average concentration of all samples analyzed from a particular medium (surface or subsurface soil). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991b, 1992).

5.8.4.4 Toxicity Assessment

Dose-response factors for most compounds were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

Compounds not included in EPA (1995a) were assigned proxy dose-response factors based on those for related compounds. These compounds are listed in Table 5.8-4, along with related compounds and toxicity equivalency factors (where available). A provisional reference dose for 1,3,5-trimethylbenzene (EPA 1995a) was used as a proxy reference dose for other alkylbenzenes lacking approved dose-response factors. This value was selected because it is the lowest reference dose of all nonhalogenated alkylbenzenes provided in EPA (1995a), thereby providing a conservative estimate of the noncarcinogenic effects of volatile fuel hydrocarbons. Similarly, toxic equivalence factors developed by Magee et al. (1993) were used to estimate proxy reference doses for noncarcinogenic PAH lacking approved dose-response factors. These factors were used to evaluate potential noncarcinogenic effects associated with semivolatile fuel hydrocarbons (i.e., PAH).

Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992b), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semi-quantitative risk assessment.

5.8.4.5 Human Health Risk Characterization

The following sections summarize potential human health risks via soil ingestion. As described previously, soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, if human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are soil ingestion are close to the acceptable risk threshold, then other exposure pathways may be evaluated as part of a baseline risk assessment.

Human Health Risks - Carcinogenic

Carcinogenic risks for the soil ingestion pathway are summarized on Table 5.8-5. Detailed risk calculations for each pathway and receptor are presented in Appendix A.

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Table 5.8-4. Proxy Dose-Response Factors for Compounds Lacking Toxicity DataFire Training Area

Surrogate Compounds		Target Compound				
Name	Approved RfDo ¹	Approved CSFo ¹	Name	TEF ²	Proxy RfDo	Proxy CSFo
1,3,5-Trimethylbenzene	0.0004		4-Isopropyitoluene	None ³	0.0004	
Isopropylbenzene	0.04		n-Propylbenzene	None ³	0.04	
Methyl ethyl ketone	0.6		4-Methyl-2-pentanone	None ³	0.6	
Methyl ethyl ketone	0.6		2-Hexanone	None ³	0.6	
Dibutyl phthalate	0.1		Di-n-butyl phthalate	None ³	0.1	
Naphthalene	0.04		2-Methylnaphthalene	1	0.04	
2,3,7,8-TCDD (dioxin)		1.56E+5	2,3,7,8-PeCDDs (dioxins)	0.5		7.80E+4
2,3,7,8-TCDD		1.56E+5	2,3,7,8-HxCDDs	0.1		1.56E+4
2,3,7,8-TCDD		1.56E+5	2,3,7,8-HpCDDs	0.01		1.56E+3
2,3,7,8-TCDD		1.56E+5	OCDD	0.001		1.56E+2
2,3,7,8-TCDD		1.56E+5	2,3,7,8-TCDFs (furans)	0.1		1.56E+4
2,3,7,8-TCDD		1.56E+5	1,2,3,7,8-PeCDFs	0.05		7.80E+3
2,3,7,8-TCDD		1.56E+5	2,3,4,7,8-PeCDFs	0.5		7.80E+4
2,3,7,8-TCDD		1.56E+5	2,3,7,8-HxCDFs	0.1		1.56E+4
2,3,7,8-TCDD		1.56E+5	2,3,7,8-HpCDFs	0.01		1.56E+3
2,3,7,8-TCDD		1.56E+5	OCDF	0.001		1.56E+2

Notes:

¹ "Approved" oral reference doses (RfDs) from EPA (1995a).

² Toxicity Equivalency Factors (TEF) for PAH from Magee et al. (1993); dioxins and furans from EPA (1989).

³ No TEFs have been developed for these compounds. RfDs for surrogate compounds were substituted as those for the target compounds.

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	Carcinogenic Risk			
Pathway	Residential	Occupational		
Surface Soil	3.0 x 10 ⁻⁶	3.5 x 10 ⁻⁷		
Subsurface Soil	3.1 x 10 ⁻⁶	3.7 x 10 ⁻⁷		
Total Risk	6.1 x 10 ⁻⁶	7.2 x 10 ⁻⁷		

Table 5.8-5. Carcinogenic Risks for Soil IngestionFire Training Area

Using both residential and occupational exposure factors, the excess lifetime carcinogenic risk for soil ingestion exceeds the lower benchmark of 1×10^{-6} listed in the NCP. As a result, exposures via inhalation and dermal contact may need to be evaluated. The carcinogenic risk is associated with PCBs, benzene, 1,4-dichlorobenzene, dioxins, and furans.

Human Health Risks - Noncarcinogenic

Noncarcinogenic hazard indices for the soil ingestion pathway are summarized on Table 5.8-6. Detailed risk calculations for each pathway and receptor are presented in Appendix A.

Table 5.8-6. Noncarcinogenic Hazard Indices for Soil IngestionFire Training Area

Pathway	Noncarcinogenic Hazard Index			
	Residential	Occupational		
Surface Soil	1.1	0.043		
Subsurface Soil	0.081	0.0033		
Total Hazard Index	1.2	0.046		

Using residential exposure factors, the total hazard index for soil ingestion is above the estimated threshold for adverse effects (1.0). As a result, exposures via inhalation and dermal contact may need to be evaluated. The majority of noncarcinogenic hazard is associated with

trimethylbenzenes. The remainder of the noncarcinogenic hazard is associated with other monoaromatics (isopropylbenzene, n-propylbenzene, and 4-isopropyltoluene), ketones (2-hexanone and 4-methyl-2-pentanone), 2-methylnaphthalene, di-n-butyl phthalate, and cadmium.

Using occupational exposure factors, the total hazard index for soil ingestion is well below the estimated threshold for adverse effects (1.0). However, if groundwater impacts are present, the additional noncarcinogenic hazard associated with potential groundwater use may need to be evaluated.

5.8.4.6 Ecological Risk Characterization

Quantitative assessment of ecological risks can be performed at the organism, population, or ecosystem level. Although ecosystem-level effects may be the most important, effects testing and modeling are rarely performed due to a number of practical considerations (Suter 1993). Quantification of population-level effects, such as reproductive potential, is important to maintain species populations, whereas assessment of organism-level effects evaluates the risk to individual organisms.

Chemicals can be evaluated as single compounds or as mixtures. Methods for evaluating the toxicity of mixtures requires knowledge regarding the sites and modes of action of individual compounds. Unlike for human health risk assessment, these methods have not been standardized, and there is some debate regarding the most appropriate approach.

If potential exposure pathways and receptors are present, ecological assessment begins with identification of the compounds of potential concern. This can be done in a similar fashion as for human health risk assessment, using ecological RBCs. Ecological RBCs may include toxicity benchmarks, sediment quality criteria, or other regulatory criteria. One set of criteria in common use provides benchmark concentrations for eight representative mammalian species and nine avian species (Opresko et al. 1994). Although benchmark concentrations are provided for 76 chemicals, toxicity benchmarks are not available for many target analytes. Also, the benchmarks are provided as concentrations in food, requiring evaluation of plant uptake and other routes of dietary exposure. Due to the large number of analytes measured at the Fire Training Pits, ecological RBCs were not compiled as part of this project.

Potential receptors at the Fire Training Pits include terrestrial and avian species at a variety of trophic levels. The most highly exposed species include those with a small home range and small body weight to food consumption ratio (e.g., mice and resident songbirds). However, other less exposed species may warrant evaluation based on their susceptibility to particular chemicals (e.g., reproductive effects of 4,4'-DDT in raptors).

As part of the RI/FS, ecological RBCs may need to be identified for representative terrestrial and avian species. Compounds of potential concern may be selected based on a comparison of ecological RBCs with measured concentrations. At this point, the appropriate risk quantitation methods and measurement endpoints may be selected.

5.8.5 Findings and Conclusions

The concentrations of carcinogenic and noncarcinogenic compounds are above the estimated threshold levels for adverse effects, the excess lifetime carcinogenic risk for soil ingestion exceeds the lower benchmark of 1×10^{-6} listed in the NCP. The carcinogenic risk is associated with benzene, 1,4-dichlorobenzene, PCBs, and various dioxin and furan congeners.

The semi-quantitative risk assessment was performed using exposure assumptions that may not be appropriate for the site (e.g., residential use). In addition, the extent of contamination and the dynamic state of soil contamination plumes (expanding, degrading, or steady-state) have not been evaluated. The exposure assumptions, compounds of potential concern, future land use, and contaminant fate and transport may be re-evaluated for inclusion in a baseline risk assessment, if required. In addition, ecological receptors, RBCs, risk quantitation methods, and measurement endpoints may need to be identified for inclusion in a baseline ecological risk assessment.

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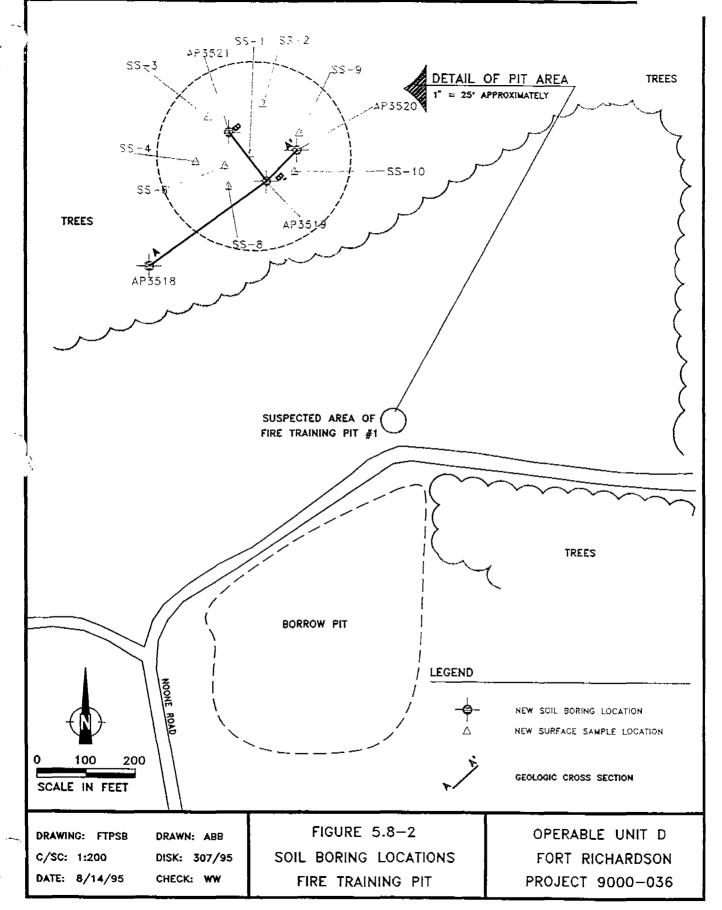
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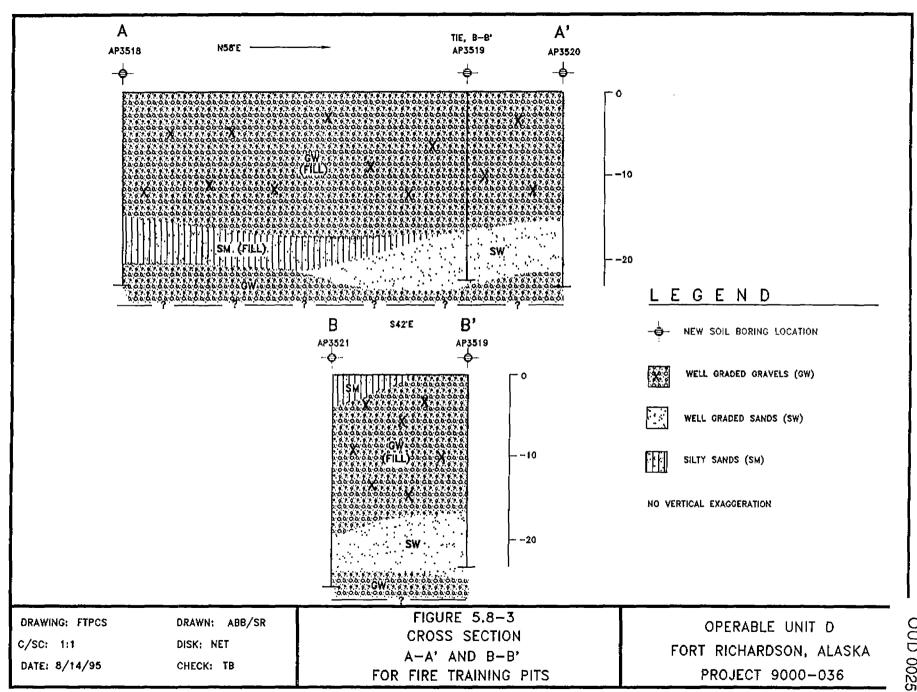
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OUD 0025639 ROAD ROOSEVELT LEGEND EXISTING MONITORING WELLS SOURCE: CORP OF ENGINEERS/ FTR-MST/INV. NO, DAA85-OO-B ٥٥ P LANDFILL AREA ▲P-3010 174.90 0 AP-3219 \_AP-3222 AREA OF FIRE TRAINING PIT #1 WATER STORAGE RESERVOIR (UNDER GROUND) AP-- 3220 FR-X 14.20 o GREASE PIT AREA Ì AP-3012 CIRCLE AP-3011 AP-3221 DRIVE STAMBONE ROOSENELT C4 OF STREET WAREHOUSE DRIVE 500 1000 BO4 BO6 808 UG TANKS FREET SCALE IN FEET 802 800 975 52 Г FIGURE 5.8-1 OPERABLE UNIT D ENSR CONSULTING & ENGINEERING FIRE TRAINING PIT FORT RICHARDSON DRAWING: GPSP DRAWN: SR/ABB SITE PLAN PROJECT 9000-066 C/SC: 1:1000 DISK: 153/96 ATE: 10/8/95 CHECK: T.B.

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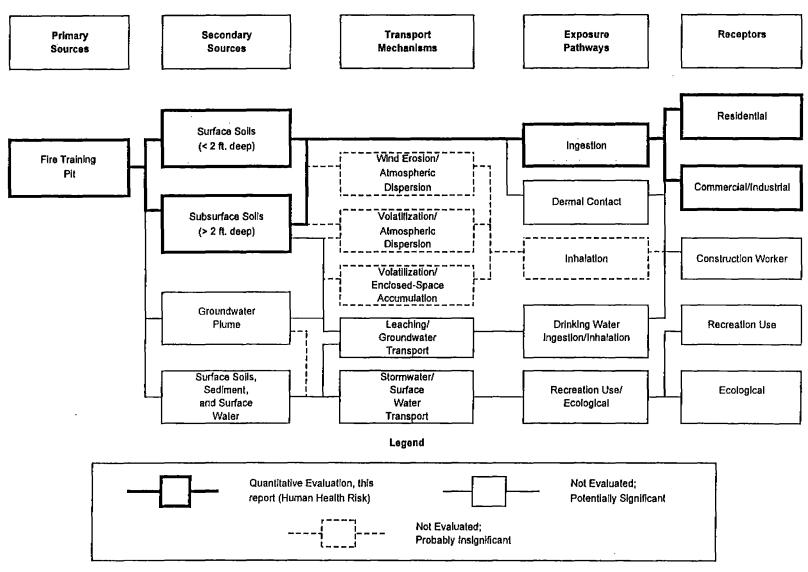


Figure 5.8-4: Sources, Transport Mechanisms, Exposure Pathways, and Receptors Fire Training Pit

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Grease Pits

#### 5.9 Grease Pits

#### 5.9.1 Site History

The Grease Pits Site is located\_north of the main cantonment and southwest of the previously discussed Fire Training Pit in the area of Fort Richardson's former landfill (Figure 5.9-1). The original Work Plan was prepared to investigate two grease pits and one human waste pit at the site. During the course of the investigation, it was determined that at least 10 pits and possibly more have been excavated, used, and backfilled at the site. The ultimate scope of work performed and described herein was correspondingly modified after discussions between ENSR, the USACE, EPA, and ADEC.

Historical information on the Grease Pits Site is not well documented; however, some information relevant to this study is indicated as follows:

- According to Travis Barber, USACE (pers. comm.), many pits have existed on site (exact locations are unknown), and at least two pits existed east of the main pit area. Five pit locations were tentatively identified in the main pit area (see Figure 5.9-2).
- The pits may have been used to dump cooking greases and other oils from field training exercises, miscellaneous trash and debris, and human waste.
- Although the grease pits were not intended for general landfill use, the grease pit site is included as a portion of "old landfill" disposal areas that were in operation as recently as 1977 (E&E 1993a).
- During a May 1988, AEHA inspection, two trenches were open, with 55-gallon drums and liquid waste floating on the surface of the water in the base of the trench; the exact location of these trenches has not been determined.
- At the time of a later visual site inspection (SAIC 1990), one grease pit (location unknown) contained four drums labelled ethylene glycol; these drums had spilled and their contents were pooling in a brown puddle on the trench bottom. Another grease pit contained eight unidentified drums at the time of the 1990 site inspection.
- One identified human waste pit is approximately 50 feet east of the pit with the ethylene glycol.

- It is also possible that some individual pits have been used for disposal of petroleumtype grease and oil, oil/water/sediment separator bottoms, fuel tank water, and other chemicals.
- It has been reported that active uses of the trenches at the Grease Pits Site stopped sometime after 1988. All open trenches have been backfilled, regraded, and the surface has been hydroseeded.

As the number, location, and exact use of each pit is uncertain, the environmental investigation of this site focuses on the identification of contaminants in representative pits rather than attempting to locate each individual grease pit. Contaminants of concern that were examined at the Grease Pits Site include petroleum hydrocarbons, VOCs, SVOCs, halogenated compounds, solvents, metals, ethylene glycol, and fecal coliform.

#### 5.9.2 Field Investigation

Field investigation, as modified, included:

- Excavating seven trenches ranging in depth from 5 to 10 feet bgs and 12 to 50 feet in length, to locate some representative pits, prior to drilling soil borings; screening headspace vapors with an OVM.
- Four soil borings (Appendix J) to depths of 30 to 60 feet bgs.

The location of the trenches, soil borings, and samples locations are shown in Figure 5.9-2. A cross section of this area is provided in Figure 5.9-3.

Trenches were excavated with a backhoe as described below. Trench depths are provided in Appendix J.

| <u>Trench</u> | <u>Depth</u> | <u>Length</u> | Comments                                                    |
|---------------|--------------|---------------|-------------------------------------------------------------|
| 1             | 10           | 40            | Oil automotive debris and headspace vapors up to 200 ppm.   |
| 2             | 10           | 15            | Weathered trash from 0.5 to 2 feet. 0 ppm headspace vapors. |
| 3             | 10           | 35            | Native soil.                                                |

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| Trench | <u>Depth</u> | <u>Length</u> | Comments                                                                                                                                                                                                                                                                 |
|--------|--------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4      | 10           | 20            | Mess hall waste from 3 to 5 feet. Metallic debris<br>(e.g., bulldozer parts, wire rope, spent artillery<br>casing) from 5 to 8 feet. Probable date of burial<br>early 1970s based on some items found. No fuel<br>solvent odors or headspace vapors above<br>background. |
| 5      | 5            | 12            | Native soil.                                                                                                                                                                                                                                                             |
| 6      | 7            | 50            | Southern ¼ of trench - mess hall waste and<br>spent artillery casing container. Fuel/solvent<br>odor.                                                                                                                                                                    |
| 7      | 7            | 35            | Native soil.                                                                                                                                                                                                                                                             |

Borings were drilled using an air-rotary drilling rig described in Section 3.1.4.

The Grease Pit Area investigation was modified to investigate the area the pits are located in by collecting samples at 10-foot intervals from three soil borings and completing the soil borings as monitoring wells.

While advancing the soil borings, high fluid saturations were encountered in the vadose interval at a variety of depths ranging from 30 to 50 feet below grade level. Relatively highest water saturations (specific retentions) are generally associated with finer-grained materials (recovered gravelly muds). A fourth soil boring was advanced to bracket the area where the grease pits are known to be located.

In order to assess the groundwater quality in the vadose zone and to assess the degree of capillary rise, two nested sets of suction lysimeters with gypsum blocks were installed in the borings; AP-3522 and AP-3525. Details regarding the installation and data collection from the suction lysimeters is presented in Section 5.9.4. The other two borings were backfilled with bentonite-based grout. Comments regarding installation of the borings are described below:

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| <u>Boring</u>                 | <u>Depth</u> | <u>Comments</u>                                                                                                                                                                                                                |
|-------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AP-3522<br>(site of Trench 1) | 58.8         | In location of obvious backfilled pit. High headspace<br>screening (up to 200 ppm) to 25 feet. Muddy<br>gravels. Background levels in headspace deeper<br>than 25 feet bgs. Very moist soils at 48 feet bgs; no<br>free water. |
| AP-3523<br>(site of Trench 2) | 28.3         | Very moist soils at 28.1 feet. Muddy gravels.<br>Background levels in headspace vapors.                                                                                                                                        |
| AP-3524<br>(site of Trench 3) | 48.5         | Moist to wet soils from 27 to 45 feet. Muddy gravel. Background levels in headspace vapors.                                                                                                                                    |
| AP-3525<br>(site of Trench 4) | 57.9         | In location of obvious backfilled pit. Moist to wet from 27 to 28 feet. Muddy gravel.                                                                                                                                          |

Based on these field investigations, the following observations and conclusions were made:

- The metallic debris uncovered in trench 4 does not appear to include spent petroleum hydrocarbon.
- The debris found in trenches 1 and 6 are likely to include petroleum wastes.
- Based on readings of headspace vapors, vertical migration of contaminants through subsurface soil is likely to be limited to 25 feet bgs or less.

There is still a concern that the location of other backfilled trenches/pits have not been identified.

#### 5.9.3 Analytical Results

A total of 29 soil samples, including three blind duplicate samples and three QA samples, were collected and sent to the laboratory for analysis. Analytes detected above the MRLs are shown in Table 5.9-1. A complete summary of analytical data is presented in Appendix J.

Four samples were submitted to the USACE NPD Laboratory for geotechnical analysis, which included Atterburg limits, percent moisture content, and grain size testing.

The project data was determined to be acceptable with the following qualification:

• Precision and accuracy of soil SVOC data could not be completely assessed due to matrix interference in matrix spike/matrix spike duplicate recoveries.

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### TABLE 5.9-1 Summary of Analytes Detected Grease Pits Soil Sample Analytical Results

| 10'<br>SL 95GP1202SL<br>D1 K950397-002 | 17.8'-18.6'                                                     | 27.3'-29.2'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                      |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01 K950397-002                         | brobiooaci                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 37,8'-38,9'                                                                                                                                                          | 48.6'-49.6'                                                                                                                                                                                                                                                                  | 57.8-58.8                                                                                                                                                                                                                                                                                                                                          |
|                                        | 95GP1203SL                                                      | 95GP1204SL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 95GP1205SL                                                                                                                                                           | 95GP1206SL                                                                                                                                                                                                                                                                   | 95GP1207S                                                                                                                                                                                                                                                                                                                                          |
|                                        | K950447-001                                                     | K950447-002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | K950447-003                                                                                                                                                          | K950476-002                                                                                                                                                                                                                                                                  | K950476-00                                                                                                                                                                                                                                                                                                                                         |
| 1/20/95                                | 1/23/95                                                         | 1/23/95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1/23/95                                                                                                                                                              | 1/24/95                                                                                                                                                                                                                                                                      | 1/24/95                                                                                                                                                                                                                                                                                                                                            |
|                                        |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
|                                        | j                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
| NA                                     | NA                                                              | NĀ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NA                                                                                                                                                                   | NA                                                                                                                                                                                                                                                                           | NA                                                                                                                                                                                                                                                                                                                                                 |
| NA                                     | NA                                                              | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ŇA                                                                                                                                                                   | NA                                                                                                                                                                                                                                                                           | ŇA                                                                                                                                                                                                                                                                                                                                                 |
| NA                                     | NA                                                              | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NA                                                                                                                                                                   | NA                                                                                                                                                                                                                                                                           | NA                                                                                                                                                                                                                                                                                                                                                 |
|                                        |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
| <8,000                                 | <12,000                                                         | 110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 57                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <2,400                                 | <5,000                                                          | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <600                                   | <1,200                                                          | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <600                                   | 39,000                                                          | 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <600                                   | 2,200                                                           | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <600                                   | 25,000                                                          | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <600                                   | <mark>84,000</mark>                                             | 23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <2,400                                 | 5,500                                                           | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <2,400                                 | 11,000                                                          | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <2,400                                 | 14,000                                                          | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <2,400                                 | 39,000                                                          | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <2,400                                 | 8,500                                                           | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
|                                        |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
| <3                                     | 0.6                                                             | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | NĎ                                                                                                                                                                                                                                                                                                                                                 |
| <3                                     | 1.4                                                             | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <3                                     | ND                                                              | ŇĎ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
| <3                                     | ND                                                              | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
|                                        |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
| 4                                      | NA                                                              | 6 J                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 7 J                                                                                                                                                                  | NA                                                                                                                                                                                                                                                                           | ŇĂ                                                                                                                                                                                                                                                                                                                                                 |
| 31                                     | NA                                                              | 79                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 68                                                                                                                                                                   | NA                                                                                                                                                                                                                                                                           | NA                                                                                                                                                                                                                                                                                                                                                 |
| 25                                     | NA                                                              | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | NA                                                                                                                                                                                                                                                                           | NĂ                                                                                                                                                                                                                                                                                                                                                 |
| 15                                     | NA                                                              | 42                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 34                                                                                                                                                                   | NA                                                                                                                                                                                                                                                                           | NA                                                                                                                                                                                                                                                                                                                                                 |
| ND                                     | NA                                                              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 6                                                                                                                                                                    | NA                                                                                                                                                                                                                                                                           | NA                                                                                                                                                                                                                                                                                                                                                 |
| 28                                     | NÁ                                                              | ND .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ND                                                                                                                                                                   | NA                                                                                                                                                                                                                                                                           | NA                                                                                                                                                                                                                                                                                                                                                 |
| ND                                     | NA                                                              | 31                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 55                                                                                                                                                                   | NA                                                                                                                                                                                                                                                                           | NA                                                                                                                                                                                                                                                                                                                                                 |
|                                        |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                      |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                    |
| 0.5                                    | NĂ                                                              | 0.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0,4                                                                                                                                                                  | 0.7                                                                                                                                                                                                                                                                          | 0.3                                                                                                                                                                                                                                                                                                                                                |
| ND                                     | NA                                                              | ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ND                                                                                                                                                                   | ND                                                                                                                                                                                                                                                                           | ND                                                                                                                                                                                                                                                                                                                                                 |
|                                        | 28<br>ND<br>0.5<br>ND<br>orting limit (MRL). (See the<br>ample. | 28 NA     ND NA     O.5 NA | 28     NA     ND       ND     NA     31       0.5     NA     0.4       ND     NA     ND       Initi (MRL).     (See the Gresse Pits Appendix for MRL values.) ample. | 28         NA         ND         ND           ND         NA         31         55           0.5         NA         0.4         0.4           ND         NA         ND         ND           orting limit (MRL).         (See the Grease Pits Appendix for MRL values.) ample. | 28         NA         ND         ND         NA           ND         NA         31         55         NA           0.5         NA         0.4         0.4         0.7           ND         NA         ND         ND         ND           ording limit (MRL). (See the Grease Pits Appendix for MRL velues.) ample.         ND         ND         ND |

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#### TABLE 5.9-1 Summary of Analytes Detected (cont.) Grease Pits Soil Sample Analytical Results

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|                               | Location:                                                                                                                |                                                                 | SB A                      | P 3523                |                      |             |             | S8 AP 3524  |             | Pert 2     |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------|-----------------------|----------------------|-------------|-------------|-------------|-------------|------------|
|                               | Sample Depth:                                                                                                            | <u> </u>                                                        |                           | 17.3'-18.3'           | 27.3'-28.3'          | 10          | 17.3 18.2   | 27.3'       | 37.3'-38.2' | 47.3-46.1  |
|                               | Sample ID:                                                                                                               | 95GP1208SL                                                      | 95GP1209SL                | 95GP1210SL            | 95GP1211SL           | 95GP1212SL  | 85GP1215SL  | 95GP1216SL  | 95GP1217SL  | 95GP12185  |
|                               | Lab Code:                                                                                                                | K950502-001                                                     | K950502-002               | K950601-001           | K950601-002          | K950638-001 | K950667-004 | K950687-003 | K950687-002 | K950667-00 |
|                               | Data Collected:                                                                                                          | 1/25/95                                                         | 1/25/95                   | 1/30/95               | 1/30/95              | 1/31/95     | 2/1/95      | 2/1/95      | 2/1/95      | 2/1/95     |
| Compound                      | Residential RBC                                                                                                          |                                                                 |                           |                       |                      |             |             |             |             |            |
| Petroleum Hydrocarbone (      | mg/Kg)                                                                                                                   |                                                                 |                           |                       |                      |             |             |             |             | 1          |
| GRO                           | none                                                                                                                     | NA                                                              | NA                        | NA                    | NA                   | NA          | NA          | NA          | NA          | NA         |
| DRO                           | enon                                                                                                                     | NA                                                              | NA                        | NA                    | NA                   | NA          | NA          | NA          | NA          | NA         |
| IPH                           | enon                                                                                                                     | NA                                                              | NA                        | NA                    | NA                   | NA          | NA          | NA          | NA          | NA         |
| /olatile Organic Compound     | ds (ug/Kg)                                                                                                               |                                                                 |                           |                       |                      |             |             |             |             |            |
| cetone                        | 7,800,000                                                                                                                | ND                                                              | ND                        | ND                    | ND                   | 83          | ND          | ND          | 70          | ND         |
| -Butenone (MEK)               | 47,000,000                                                                                                               | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| Benzene                       | 22,000                                                                                                                   | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| Toluene                       | 16,000,000                                                                                                               | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| Tetrachloroethene (PCE)       | \$2,000                                                                                                                  | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| Ethylbenzene                  | 7,800,000                                                                                                                | ND                                                              | NO                        | ND                    | ND                   | NÐ          | ND          | ND          | ND          | ND         |
| Total Xylenes                 | 160,000,000                                                                                                              | ND                                                              | ND                        | ND                    | ND                   | 6           | ND          | ND          | ND          | ND         |
| sopropylbanzena               | 3,100,000                                                                                                                | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| Propylbenzene                 | none                                                                                                                     | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| 3,5-Trimethylbenzane          | 31,000                                                                                                                   | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| 2,4-Trimethylbenzene          | 39,000                                                                                                                   | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| Naphthelone                   | 3,100,000                                                                                                                | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | ND          | ND          | ND         |
| Semivolatile Organic Comp     | ounde (mg/Kg)                                                                                                            |                                                                 |                           |                       |                      |             |             |             |             |            |
| Vephihalone                   | 3,100                                                                                                                    | ŇD                                                              | ND                        | ND                    | ND                   | ND          | ND          | NA          | ND          | ND         |
| -Methylnaphthalene            | none                                                                                                                     | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | NA          | ND          | ND         |
| Bis(2-ethylhexyl) Phthalate   | 40                                                                                                                       | ND                                                              | ND                        | ND                    | 0.4                  | ND          | ND          | NA          | ND          | 0,3        |
| Di-n-octyl Phihalate          | 1,600                                                                                                                    | ND                                                              | ND                        | ND                    | ND                   | ND          | 0,3         | NA          | ND          | 0.4        |
| otal Metals (mg/Kg)           |                                                                                                                          |                                                                 |                           |                       |                      |             |             |             |             |            |
| Vrienic                       | 0.37                                                                                                                     | 6                                                               | 5                         | 5                     | 4                    | 8           | NA          | NA          | 0           | NA         |
| muha                          | 5,500                                                                                                                    | 28                                                              | 29                        | 51                    | 82                   | 30          | NA          | NA          | 82          | NA         |
| Chromium                      | 390                                                                                                                      | 21                                                              | 25                        | 30                    | 35                   | 25          | NA          | NA          | 35          | NA         |
| ead                           | none                                                                                                                     | 5                                                               | 7                         | 5                     | 8                    | 4           | NA          | NA          | 5           | NA         |
| fercury                       | 23                                                                                                                       | ND                                                              | ND                        | ND                    | ND                   | ND          | NA          | NA          | ND          | NA         |
| lickel                        | 1,600                                                                                                                    | 29                                                              | 32                        | 43                    | 44                   | 34          | NA          | NA          | 40          | NA         |
| elenium                       | 390                                                                                                                      | ND                                                              | ND                        | ND                    | DND                  | ND          | NA          | NA          | 1 UJ        | NA         |
| ther Analyses (mg/Kg)         |                                                                                                                          |                                                                 |                           |                       |                      |             |             |             |             |            |
| mmonia as Nitrogen            | none                                                                                                                     | 0.5                                                             | 0.3                       | 0.2                   | 0.5                  | 0.2         | NA          | NA          | ND          | NA         |
| litrale + Nitrile as Nitrogen | none                                                                                                                     | ND                                                              | ND                        | ND                    | ND                   | ND          | ND          | NA          | ND          | NA         |
| OOTNOTES:                     | ND = Non-detected at<br>NA = Analysis not perfi<br>J = Value is conside<br>< = Less then, Anal<br>A sheded value indicat | ormed on this samp<br>red an estimate.<br>yticst reporting fimi | le.<br>Lhas been elevaled | due lo matrix interfe | rences or sample re- |             |             |             |             |            |

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#### TABLE 5.9-1 Summary of Analytes Detected (cont.) Grease Pits Soli Sample Analytical Results

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|                               |                                                                                                                                |                                                                                       |                                                  |                                           |                                    |             |             |             |             |             | Part 3 of 3 |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                               | Location:                                                                                                                      |                                                                                       |                                                  |                                           | SB AP 3525                         |             |             |             | Trench 5    | Trench 6    | Trench 7    |
|                               | Sample Depth:                                                                                                                  |                                                                                       | 0'                                               | 17.3'-18.3'                               | 27.3'-27.9'                        | 37.3'       | 47.3'-47.9' | 57.3'-57.7' | 4'          | 4'          | 6'          |
|                               | Semple ID;                                                                                                                     | 95GP1213SL                                                                            | 95GP1214SL                                       | 95GP1219SL                                | 95GP1220SL                         | 95GP1221SL  | 95GP1222SL  | 95GP1223SL  | 95GP1223SLb | 95GP1224SL  | 95GP1225SL  |
|                               | Lab Code:                                                                                                                      | K950638-003                                                                           | K950638-002                                      | K050694-003                               | K950894-002                        | K850694-001 | K950717-002 | X950717-001 | K950778-001 | K850778-002 | K950778-003 |
|                               | Date Collected:                                                                                                                | 1/31/95                                                                               | 1/31/95                                          | 2/2/95                                    | 2/2/95                             | 2/2/05      | 2/9/95      | 2/3/95      | 2/7/95      | 2/7/05      | 2/7/95      |
| Compound                      | Residential RBC                                                                                                                |                                                                                       |                                                  |                                           |                                    |             |             |             |             |             |             |
| Petroleum Hydrocarbons (      | mg/Kg)                                                                                                                         |                                                                                       |                                                  |                                           |                                    |             |             |             |             |             |             |
| GRO                           | none                                                                                                                           | NA                                                                                    | NA                                               | <u>NA</u>                                 | NA NA                              | NA          | NA          | NA          | ND          | NA          | 800         |
| DR0                           | none                                                                                                                           | NA                                                                                    | NA                                               | NA                                        | NA                                 | NA          | NA          | NA          | ND          | NA          | 3,600       |
| ТРН                           | none                                                                                                                           | NA                                                                                    | NA                                               | NA                                        | NA                                 | NA          | NA          | NA          | ND          | ND          | 5,600       |
| Volatile Organic Compound     | de (ug/Kg)                                                                                                                     |                                                                                       |                                                  |                                           |                                    |             |             |             |             |             |             |
| Acetone                       | 7,800,000                                                                                                                      | 50                                                                                    | ND                                               | 68                                        | 73                                 | 65 J        | ND          | 51          | ND          | ND          | <12,000     |
| 2-Bulanone (MEK)              | 47,000,000                                                                                                                     | ND                                                                                    | ND                                               | ND                                        | ND                                 | ND          | ND          | ND          | ND          | ND          | <5,000      |
| Benzene                       | 22,000                                                                                                                         | ND                                                                                    | ND                                               | ND                                        | 6                                  | 110 J       | ND          | ND          | ND          | ND          | <1,200      |
| Toluene                       | 16,000,000                                                                                                                     | ND                                                                                    | ND                                               | ND                                        | ND                                 | 11 J        | ND          | NO          | ND          | ND          | <1,200      |
| Tetrachloroelhene (PCE)       | 12,000                                                                                                                         | ND                                                                                    | ND                                               | ND                                        | NO                                 | ND          | ND          | ND          | ND          | ND          | <1,200      |
| Elhylbenzene                  | 7,600,000                                                                                                                      | ND                                                                                    | NO                                               | ND                                        | ND                                 | ND          | ND          | ND          | ND          | ND          | <1,200      |
| Total Xylenes                 | 160,000,000                                                                                                                    | ND                                                                                    | ND                                               | 6                                         | ND                                 | 14 J        | ND          | ND          | ND          | NO          | 19,000      |
| Isopropylbenzene              | 3,100,000                                                                                                                      | ND                                                                                    | ND                                               | ND                                        | ND                                 | ND          | ND          | ND          | ND          | ND          | <5,000      |
| n-Propylbenzene               | none                                                                                                                           | ND                                                                                    | ND                                               | ND                                        | ND                                 | ND          | ND          | ND          | ND          | ND          | <5,000      |
| 1,3,5-Trimethylbenzene        | 31,000                                                                                                                         | ND                                                                                    | ND                                               | ND                                        | ND                                 | ND          | ND          | ND          | ND          | ND          | 5,900       |
| 1,2,4-Trimethylbenzene        | 39,000                                                                                                                         | DND                                                                                   | ND                                               | NÐ                                        | ND                                 | ND          | ND          | ND          | ND          | ND          | 17,000      |
| Naphthalene                   | 3,100,000                                                                                                                      | ND                                                                                    | ND                                               | ND                                        | ND                                 | ND          | ND          | ND          | ND          | DN D        | <5,000      |
| Semivolatile Organic Comp     | ounde (mg/Kg)                                                                                                                  |                                                                                       | •                                                |                                           |                                    |             |             |             |             |             |             |
| Nephthalene                   | 3,100                                                                                                                          | ND                                                                                    | ND                                               | ND                                        | ND                                 | ND          | NA          | NA          | ND          | ND          | 4           |
| 2-Methylnaphthalene           | none                                                                                                                           | ND                                                                                    | ND                                               | ND                                        | ND                                 | ND          | NA          | NĂ          | ND          | ND          | 7           |
| Bis(2-othylhexyl) Phthalala   | 46                                                                                                                             | ND                                                                                    | ND                                               | 0,3                                       | ND                                 | ND          | NA          | NA          | ND          | ND          | <3          |
| Di-n-octyl Philhalala         | 1,600                                                                                                                          | ND                                                                                    | ND                                               | 0,3                                       | 0.6                                | 0,7         | ŇA          | NA          | ND          | ND          | <3          |
| Total Metale (mg/Kg)          |                                                                                                                                |                                                                                       |                                                  |                                           |                                    |             |             |             |             |             |             |
| Arsenic                       | 0.37                                                                                                                           | 3                                                                                     | 4                                                | 7                                         | NA                                 | NA          | NA          | NA          | 4           | NĂ          | 7           |
| Barlum                        | 5,500                                                                                                                          | 32                                                                                    | 20                                               | 69                                        | NA                                 | NA          | NĂ          | NA          | 32          | NA          | 38          |
| Chromlum                      | 390                                                                                                                            | 23                                                                                    | 20                                               | 53                                        | NA                                 | NA          | NA          | NA          | 37 J        | NA          | 28 J        |
| Lead                          | none                                                                                                                           | 4                                                                                     | 6 .                                              | 7                                         | NA                                 | NA          | NA          | NA          | 9           | NA          | 22          |
| Mercury                       | 23                                                                                                                             | DN                                                                                    | ND                                               | ND                                        | NA                                 | NA          | NA          | NA          | ND          | NA          | ND          |
| Nickel                        | 1,600                                                                                                                          | 60                                                                                    | 37                                               | 48                                        | NA                                 | NA          | NA          | NA          | 41          | NA          | 43          |
| Selenium                      | 390                                                                                                                            | ND                                                                                    | ND                                               | ND                                        | NA                                 | ŇĂ          | NA          | NA          | ND          | NA          | ND          |
| Other Analyses (mg/Kg)        |                                                                                                                                |                                                                                       |                                                  |                                           |                                    |             |             |             |             |             |             |
| Ammonia as Nitrogen           | none                                                                                                                           | ND                                                                                    | ND                                               | NA                                        | NA                                 | NA          | NA          | NÁ          | ND          | ND          | <0.8        |
| Nitrate + Nitrite as Nitrogen | none                                                                                                                           | ND                                                                                    | ND                                               | ND                                        | NA                                 | 12          | NA          | NA          | ND          | 2.2         | ND          |
| FOOTNOTES:                    | ND = Non-delected at<br>NA = Analysis not per<br>J = Value is conside<br>= Less than. Analyse was not<br>A shaded value indica | formed on this san<br>and an estimate,<br>dytical reporting fir<br>detected at the MF | nple.<br>Ni has been aleva<br>N., however, the M | ited due to matrix i<br>IRL is considered | nierforances or sa<br>an astimate. | •           | tion.       |             |             |             |             |

OUD PRELIMINARY SOURCE EVALUATION 2

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| ug/L Location:<br>Sample ID:<br>Depth:<br>Lab Code:<br>Date Collected: | 95GP<br>27 1<br>K950 | r. 80   | JGW<br>35<br>-001 |     | AP 352<br>95GP1291<br>43 ft. BA<br>K9506659<br>10/18/5 | 1GW<br>3S<br>1002 |           | AP 3522<br>95GP129GW (<br>43 ft. BGS<br>K9505659-00<br>10/1895 |       | AP 3525<br>95GP12930<br>22 4, BG3<br>X3506659 4<br>10/18/95 | 204   | AP 352<br>95GP1294<br>32 ft. BG<br>K9505659<br>10/18/9 | GW<br>IS<br>-005 | K951       | od Blank<br>101-MB1<br>101-MB1 | K951       | Pier<br>od Blani<br>102-MB<br>102-MB |
|------------------------------------------------------------------------|----------------------|---------|-------------------|-----|--------------------------------------------------------|-------------------|-----------|----------------------------------------------------------------|-------|-------------------------------------------------------------|-------|--------------------------------------------------------|------------------|------------|--------------------------------|------------|--------------------------------------|
| /olstile Organic Compounds<br>EPA Method 2260)                         |                      |         |                   | MRL |                                                        | ļ                 | MRL       |                                                                | MRL   |                                                             | MRL   |                                                        | MRI              |            | MRL                            |            | MRL                                  |
| .1.1.2-Tetrachioroethane                                               | ND                   |         |                   | 0.5 | <u>O</u> N                                             |                   | 0.5       | ND I                                                           | 1 0.5 | NO                                                          | 0.5   | ND                                                     | 0.5              | ND         |                                | ND         | 0.                                   |
| 1,1-Trichlorgenane                                                     |                      | 0.3     | J                 | 0.5 | 2.2                                                    |                   | 0.5       | - <u>1.6</u>                                                   | 1 0.5 | 0.1 J                                                       |       |                                                        |                  | ND         |                                | ND         | 0.                                   |
| 1.2.2-Tetrachioroethane                                                | ND                   | _       | _                 | 0.5 |                                                        |                   | 0.5       |                                                                | 0.5   |                                                             | 0.5   |                                                        |                  | ND         |                                | ND         |                                      |
| 1-Dichloroetharte                                                      |                      | 6.3     | $\vdash$          | 0.5 | 12                                                     | 1                 | 0.5       | 9.9                                                            | 0.5   | 1.0                                                         | 10.5  | - ND -                                                 | - 63             | IND        |                                | ND         | - <u>†-</u> ā                        |
| 1-Dichioroethene                                                       | NO                   |         |                   | 0.5 | NO                                                     |                   | 0.5       | ND                                                             | 0.5   | ND                                                          | 0.5   | ND D                                                   |                  | IND        |                                | ND         | 0                                    |
| .3-Dichloroproperve                                                    | ND                   |         |                   | 0.5 | ND<br>ND                                               |                   | 0.5       |                                                                | 20    |                                                             | 2.0   |                                                        |                  | DI         |                                | ND         | 0                                    |
| 2.3-Trichlorobenzene<br>2.3-Trichloropropane                           |                      |         | <u> </u>          | 2.0 |                                                        |                   | 0.5       |                                                                | + 65  |                                                             |       |                                                        |                  | ND         |                                | ND<br>ND   | $+\frac{2}{6}$                       |
| 2.4-Trichlorobinzene                                                   | ND                   |         | -                 | 2.0 | ND                                                     |                   | 20        | ND                                                             | 20    | ND                                                          | 2.0   | - ND-                                                  |                  | TND        |                                | ND         |                                      |
| 2,4-Trimettyibenzene                                                   |                      | 3.0     |                   | 2.0 | 0.3                                                    | J                 | 2.0       | 0.213                                                          | 2.0   | ND                                                          | 2.0   | ND                                                     | - 20             | ומאלי      | 20                             | ND         | 1 2                                  |
| 2-Dibramo-3-chioropropane                                              | ND                   |         |                   | 2.0 | ND                                                     |                   | 20        |                                                                | 2.0   |                                                             | 2.0   | ND                                                     |                  | DI         |                                | ND         | 2                                    |
| 2-Dipromoethane                                                        | ND                   |         |                   | 2.0 |                                                        | $\vdash$          | 2.0       |                                                                | 2.0   |                                                             | - 0.5 |                                                        |                  |            |                                | ND<br>ND   | 2                                    |
| 2-Dichloroethane                                                       | ND                   |         | -                 | 0.5 | NO                                                     | ┝╌┲┢              | 0.5       | ND                                                             | 0.5   |                                                             | 0.5   |                                                        |                  | ND         |                                | NO         | - 0                                  |
| 2-Dichioroproperve                                                     |                      | 0.2     | J                 | 0.5 | ND                                                     |                   | 0.5       | NO                                                             | 0.5   | ND                                                          | 0.5   | _ND _                                                  | 0.3              | ND         | 0.5                            | ND         | 0                                    |
| 1,3,5-Tranethylbenzene                                                 |                      | 1.0     |                   | 2.0 | 0.3                                                    |                   | 2.0       | 0.3]J                                                          | 2.0   |                                                             | 2.0   | - ND                                                   |                  | ND         |                                | ND         | 2                                    |
| 1,3-Dichlorobenzene                                                    | ND<br>ND             |         |                   | 0.5 |                                                        | +                 | 0.5       | ND                                                             | 0.5   |                                                             | 0.5   |                                                        |                  |            |                                | ND         | 0                                    |
| 4-Dichlorobenzene                                                      |                      | _       |                   | 0.5 | 0.3                                                    | ┢᠇┥               | 0.5       | 0.3 J                                                          | 1 85  | ND                                                          | 0.5   | ND ND                                                  |                  | ND         |                                | ND         | 1 0.                                 |
| 2-Dichioroproparte                                                     | NO                   |         |                   | 0.5 | ND                                                     | <u> </u>          | 0.5       | NO                                                             | 105   | ND                                                          | 0.5   | ND                                                     | 0.5              | NO         | 0.5                            | ND         | 1 0                                  |
| -Butanone                                                              | ND                   |         |                   | 20  | ND                                                     |                   | 20<br>2.0 | 51,                                                            | 20    |                                                             | 20    | 10                                                     |                  | ND         |                                | ND         | - 7                                  |
| Chlorosoluene                                                          |                      |         | _                 | 2.0 | ND<br>ND                                               | $\vdash$          | 뷠         |                                                                | 20    |                                                             | 2.0   | ND                                                     |                  |            |                                | ND         | 2                                    |
| -Hexanone<br>Chlorotoluene                                             |                      | _       |                   | 2.0 |                                                        | ┝╌┾               | 201       | ND                                                             | 20    |                                                             | 20    |                                                        |                  | ND         |                                | ND         | 2                                    |
| Methyl-2-pentenone                                                     |                      | 0.4     | μ.                | 20  | NO                                                     |                   | 20        | ND                                                             | 20    | ND                                                          | 20    | 1.0                                                    | J 1 2            | ND         |                                | NO         | 1 2                                  |
|                                                                        |                      |         | 18                |     |                                                        | 19.6              | 20        | 6.0                                                            |       | 1013                                                        |       | 20                                                     |                  | 201        |                                | 2.0 J      | 2                                    |
| BenZ#Ne                                                                |                      | 760     | D                 | 10  | - 18<br>ND                                             |                   | 0.5       | 15<br>ND                                                       | 0.5   |                                                             | 0.5   | 0.2                                                    |                  | ND         |                                | ND         | 0.                                   |
| Sromobenzene<br>Sromochloromethane                                     | ND<br>ND             |         | _                 | 0.5 |                                                        | ┝╍┥               | 0.3       |                                                                | 0.5   |                                                             | 0.5   |                                                        |                  |            |                                | IDN<br>IDN | 0.                                   |
| Stomodichioromethane                                                   | NO                   | _       | -                 | 0.5 | ND                                                     | +                 | 0.5       | ND                                                             | 0.5   | - ND                                                        | 0.5   |                                                        |                  | IND        |                                | ND         | -1                                   |
| Bromoform                                                              | ND                   |         |                   | 0.5 | ND                                                     |                   | 0.5       | D                                                              | 0.3   | ND                                                          | 0.5   | ND                                                     | 0.5              | IND        | 0.5                            | וסא        | 1 0                                  |
| Bromomethane                                                           | DM                   | _       |                   | 0.5 |                                                        |                   | 0.5       | ND                                                             | 0.5   |                                                             | 0.5   | NÖ                                                     |                  | ND         |                                | ND         | 0                                    |
| Carbon disulfida                                                       | ND                   | 2.2     | ⊢                 | 0.5 | 0.8<br>ND                                              | ┝╌╷┝              | 0.5       | ND O.6                                                         | 0.5   | - 6.1<br>ND                                                 | 0.5   | 3.8<br>ND                                              |                  | NO         |                                | ND         |                                      |
| Chiorobenzene                                                          | - NO                 |         | Ļ                 | 0.5 | ND                                                     | ┝╌┿               | 0.5       |                                                                | + 05  | - ND -                                                      | - 0.3 |                                                        |                  |            |                                | ND:        |                                      |
| Chioroethane                                                           |                      | 0.4     | 5                 | 0.5 | 0.2                                                    |                   | 0.5       | ND                                                             | 0.3   | 0213                                                        | 0.5   | ND                                                     |                  |            | 0.5                            | ND         | - <del>1</del> ă                     |
| Chloroform                                                             | - ND                 |         |                   | 0.5 | ND                                                     |                   | 0.5       | ND                                                             | 0.5   | 0.1 J                                                       |       | ND                                                     |                  | ND         | 0.5                            | ND         | 10                                   |
| Chloromethane                                                          |                      | 0.2     |                   | 0.3 | ND                                                     |                   | 0.5       | 0.10                                                           | 0.5   | 021                                                         |       | 0.4<br>ND                                              |                  | ND         |                                | ND         |                                      |
| cis-1.2-Dichicroethene                                                 | NO                   | 190     | μ_                | 10  | ND 13                                                  | +                 | 0.5       | ND 11                                                          | 0.5   | 1.0<br>ND                                                   | 0.5   | -NO                                                    |                  | ND<br>ND   |                                | ND         | - 0                                  |
| Dibromochloromethane                                                   | - ND                 |         | ⊢                 | 0.5 | ND                                                     | ++                | 0.5       |                                                                | 0.5   |                                                             | 0.5   |                                                        |                  | IND        |                                | ND         |                                      |
| Dibromomethane                                                         | ND                   |         | t –               | 0.5 | NO_                                                    |                   | 0.5       |                                                                | 0.5   | ND                                                          | 0,5   | ND                                                     | - 0.             | IND        | 0.5                            | DA         | ō                                    |
| Dichlorodifuoromethane                                                 | NO                   |         | L                 | 0.5 | 1.9                                                    |                   | 0.5       |                                                                | 0.5   | 0.91                                                        | 0.5   | 0.1                                                    |                  | ND         | 0.5                            | ND         | 0                                    |
| Citylbenzane<br>HazaChlorobytaciene                                    | - ND                 | 16      | _                 | 0.5 | 0.2<br>ND                                              | ᡛ᠇ᡰ               | 2.0       |                                                                | 0.5   |                                                             | 2.0   |                                                        |                  |            |                                | ND<br>ND   |                                      |
| sopropyibenzene                                                        | 140                  | 0.4     | 5                 | 2.0 |                                                        | ┼╍┼               | 2.0       | ND -                                                           | - 20  | - <del></del>                                               | 20    | ND                                                     |                  | IND        |                                | ND:        | 2                                    |
| Vethylene chloride                                                     |                      | 1.7     | 5                 | 1.0 | 0,8                                                    | J,B               | 1.0       | 0.7 3.                                                         |       | 0.9 1                                                       | B 1.0 |                                                        | J.B 1.0          | 10.6       | 1.0                            | 0.5 J      | 1                                    |
| Butyloenzene                                                           | ND                   |         |                   | 2.0 | ND                                                     |                   | 2.0       | ND                                                             | 2.0   | ND                                                          | 2.0   | ND I                                                   |                  | DI ND      |                                | ND         | 2                                    |
| -Propyibenzene                                                         | ND                   | 4.0     | ⊢                 | 2.0 | ND 40                                                  | ┟╍┢               | 2.0       |                                                                | 2.0   |                                                             | 2.0   |                                                        |                  |            |                                | ND         | 2                                    |
| -isopropyticiuene                                                      |                      | 0.4     | 5                 | 2.0 |                                                        |                   | 20        | Lia.0                                                          | 20    | ND                                                          | 20    |                                                        | +2.0             | <b>Not</b> | - 2.0                          | ND         | 2                                    |
| ec-Butylbenzene                                                        | DA                   | -       |                   | 2.0 | ND                                                     | 1                 | 20        | ND 1                                                           | 2.0   | ND                                                          | 20    | ND                                                     |                  | ND         |                                | ND         | - 2                                  |
| Styrene                                                                | ND                   |         |                   | 0.5 | ND                                                     |                   | 0.5       | ND 1                                                           | 0.5   |                                                             | 0.5   | ND                                                     |                  | ND         | 0.5                            | ND         | 0                                    |
| erl-Butylbenzene                                                       | <u>D</u>             | <u></u> | Į                 | 2.0 | ND 30                                                  | ++                | 20        | ND 2.7                                                         | 2.0   |                                                             | 2.0   |                                                        |                  | DN         |                                | ND         | 2                                    |
| erachioroethene                                                        |                      | 0.5     | +                 | 0.5 |                                                        |                   | 0.5       | 20                                                             | - 63  | 1.0                                                         | - 0.5 |                                                        |                  |            |                                | ND         |                                      |
| rans-1.2-Dichlorowthene                                                |                      | 1.0     | t-                | 0.5 | 0.4                                                    |                   | 0.5       |                                                                | 0.5   | 0.11.                                                       |       |                                                        |                  | ND         |                                | ND         |                                      |
| rans-1,3-Dichloropropene                                               | ND                   |         |                   | 0.5 | ND                                                     |                   | 0.5       | ND I                                                           | 1 0.5 | ND                                                          | 03    | ND                                                     | 0.3              | DI         | 0.5                            | ND         | 0                                    |
| Inchloroethene                                                         |                      | 0.5     |                   | 0.5 | 0.5                                                    | 11                | 0.5       | 0.41                                                           | 03    | ND                                                          | 0.5   | ND D                                                   |                  | DN         |                                | ND         | 0                                    |
| Techiorofacoromithane                                                  | ND                   | 92      | th.               | 0.5 | ND 37                                                  | ⊢∔                | 0.5       | ND 27                                                          | 0.5   | NO 9.2                                                      | 0.5   | ND ND                                                  |                  |            | - 0.5                          | ND         |                                      |
| Kylenies                                                               |                      | Ť       |                   | 0.5 |                                                        | ┼╌╀               | 0.5       | 13                                                             | 03    |                                                             | 0.5   |                                                        |                  |            |                                | ND         | +-8                                  |
| · · · · · · · · · · · · · · · · · · ·                                  |                      | _       | •                 |     | •·                                                     | ÷÷                |           |                                                                | 1     |                                                             |       |                                                        |                  |            |                                |            | `                                    |

J = Value is considered estimated, B = Compound was also found present in the associated method blank, D = analysis performed at a dilution,

1. BGS = Feet below ground surface, contractional according to the state of the surface of the s

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More detailed qualifications and exceptions are noted in the USACE NPD Laboratory's CQAR and ENSR QASR located in Volumes I through III of Analytical Data for PSE2 OUD (ENSR 1995).

Subsequent to the original PSE2 data collection activities, water samples were collected from the suction lysimeters at AP-3522 and AP-3525 in October 1995. Results are presented in Section 5.9.4.

#### 5.9.4 Suction Lysimeter Results

Suction lysimeter arrays were installed in borings AP-3522 and AP-3525 at approximately 25, 45, and 60 feet bgs. A suction lysimeter and gypsum block were installed at each depth (See Figure 5.9-3 and as-built drawings in Appendix J).

Based on available drilling data, the vadose zone in the site area is composed of stratified, cobbly gravels with silt and clay occurring as a pore filling. Suction lysimeters collect water from surrounding soil pore spaces. Water table elevations appear to be deeper than 150 feet bgs based on data from the monitoring wells in the vicinity of the site.

Suction lysimeters AP-3522 and AP-3525 were installed using an air rotary drilling rig in April 1995. The lysimeters were installed with porous ceramic cup assemblies at depths of 25 ft, 45 ft, and 60 ft bgs. Gypsum blocks were set immediately above the levels of the ceramic cups to assess moisture content. The gypsum blocks have wire leads that measure the resistance across the gypsum block in ohms. The resistance changes with the moisture content present. The moisture content is then approximated from moisture content curves available for some typical farm soils. Moisture content readings from AP-3522 ranged from 6 to 8 percent. Moisture content readings from AP-3525 ranged from 3.1 to 7.25 percent.

Distilled water was used with silica flour to make a slurry, and for hydration of bentonite chips. The lysimeters were purged 3 times in April, 4 times in September, and 3 times in October 1995 to equilibrate pore water with surrounding soils, and to assess recovery rates. The ceramic cups were held at 70 centibar vacuums for approximately one week for each event, and the resultant pore water was subsequently extracted using a hand pump. Volumes recovered from the cups fluctuated widely between 0 and 500 mL. The fluctuation in recovered pore water volumes may be attributed to variances in infiltration rates, but is more likely a factor of recovery rates; and field capacity (specific retention).

#### OUD PRELIMINARY SOURCE EVALUATION 2

During October 1995 the cups underwent final purging, and sampling. The cups were purged 3 times during which pH, conductivity, and temperature were measured. The pH readings ranged between 6.7 and 7.99. Conductivity readings ranged from 550 to 3,480  $\mu$ mhos/cm. Temperature readings ranged between 4.5 and 9 degrees centigrade.

Water samples were collected from the lysimeters on October 18, 1995 and analyzed for EPA Test Method 8260. Pore water was sampled from suction lysimeters AP-3522 and AP-3525 at approximately 25 and 45 ft bgs. Insufficient water was obtained from the 60-foot cups for analysis of samples. A duplicate sample was collected from the 45-foot cup in lysimeter AP-3522.

Following sampling, the lysimeters were flushed with pressurized air, and the cups were then left at ambient pressure to mitigate the potential for ice damage over the winter.

#### Analytical Results

A total of five water samples, including one duplicate sample, was collected from the lysimeters and sent to the laboratory for analysis. Analytes detected above the MRLs are shown in Table 5.9-1. A complete summary of analytical data is presented in Appendix J.

Benzene was the key constituent of concern; detected in water from lysimeter AP-3522 at 760  $\mu$ g/L at 27 ft bgs, and 18  $\mu$ g/L at 43 ft bgs. Varying concentrations of other VOCS were detected up to 190  $\mu$ g/L in samples from AP-3522. The analytical results for these samples indicated that VOCS generally attenuate at least 1 order of magnitude between 27 and 43 ft bgs. The majority of VOCS were reported below the method reporting limits for samples from AP-3525.

In general, the potentially most mobile VOCs appear to attenuate at the sites of AP-3522 and AP-3525 with increased depth to 45 ft bgs. VOCS in vadose pore fluid attenuate 100 feet above the water table.

#### 5.9.5 Semi-Quantitative Risk Assessment

As described in Section 4.2, a semi-quantitative risk assessment was conducted on this site. The risk assessment is considered semi-quantitative because: 1) potential risks to ecological receptors were not evaluated, 2) the exposures evaluated reflect the available analytical data and do not necessarily represent the maximum extent of contamination or future changes in contaminant concentrations, and 3) only one exposure pathway was considered (soil ingestion); although this pathway usually yields the most conservative results, other pathways may also be important.

The Grease Pit Site is located north of the main cantonment in a fenced and locked area. Surrounding land uses include former landfill areas. The area of investigation is surrounded by mixed spruce and birch forest, with interspersed grasslands. There are no surface water bodies within 0.5 mile.

#### 5.9.5.1 Compounds of Potential Concern

The COPCs are summarized in Table 5.9-2. These compounds include monoaromatics (benzene, toluene, ethylbenzene, xylenes, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, isopropylbenzene, n-propylbenzene, and 4-isopropyltoluene), PAH (naphthalene and 2-methylnaphthalene), chlorinated alkenes (tetrachloroethene), ketones (methyl ethyl ketone), phthalates (bis[2-ethylhexyl]phthalate and di-n-butyl phthalate), and metals (arsenic and cadmium). As shown on Table 5.9-2, some of these compounds are carcinogens.

All other target analytes were either 1) not detected, 2) below 1/10<sup>th</sup> of the RBC for residential soil, or 3) not statistically different from the background sample population (metals only). As shown by Table 4-1, however, RBCs are not available for some compounds. These compounds were included in the semi-quantitative risk assessment *only* when they were detected in a site-related sample. In addition, a list of compounds that were not detected at detection limits exceeding current risk-based concentrations is provided in Table 5.9-3. Most of these compounds were identified in the Work Plan (ENSR 1994) but require special analytical services to achieve reporting limits below RBCs. During the RI/FS, Table 5.9-3 should be reviewed to determine if the likelihood that the compound is present warrants the use of special analytical services.

As described in Section 5.9.4.4, the toxicity of petroleum hydrocarbons cannot be evaluated using bulk hydrocarbon measurements (GRO, DRO, and TPH). As a result, these data were not included in the semi-quantitative risk assessment.

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| Туре                   | Source                             | Carcinogens         | Noncarcinogens                                                                                                                                      |
|------------------------|------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Monoaromatics          | Fuels                              | Benzene             | Toluene<br>Ethylbenzene<br>Xylenes<br>1,3,5-trimethylbenzene<br>1,2,4-trimethylbenzene<br>Isopropylbenzene<br>n-Propylbenzene<br>4-Isopropyltoluene |
| Polyaromatics<br>(PAH) | Fuels, oils                        | None                | Naphthalene<br>2-Methylnaphthalene                                                                                                                  |
| Chlorinated<br>alkenes | Solvents                           | Tetrachloroethene   | None                                                                                                                                                |
| Ketones                | Solvents                           | Methyl ethyl ketone | Acetone                                                                                                                                             |
| Phthalates             | Plastics                           | None                | Bis(2-ethylhexyl)phthalate<br>Di-n-butyl phthalate                                                                                                  |
| Metais <sup>1</sup>    | Background soil;<br>fuels and oils | Arsenic             | Barium<br>Chromium<br>Mercury<br>Selenium                                                                                                           |

# Table 5.9-2. Compounds of Potential ConcernGrease Pits

Based on the background metals statistics evaluation in Appendix A, some metals were not included in the semi-quantitative risk assessment because they were not statistically significant from background concentrations.

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| Compound                           | Matrix  | Maximum Det | ection | Risk-Based    |
|------------------------------------|---------|-------------|--------|---------------|
|                                    | Midulia | Limit       |        | Concentration |
| Benzene                            | Water   | 2.5         | µg/L   | 0.36 µg/L     |
| Chloromethane                      | Water   | 2.5         | µg/L   | 1.4 µg/L      |
| Vinyl Chloride                     | Water   | 2.5         | µg/L   | 0.019 µg/L    |
| 1,1-Dichloroethene                 | Water   | 2.5         | µg/L   | 0.044 µg/L    |
| Methylene Chloride                 | Water   | 5           | µg/L   | 4.1 µg/L      |
| Chloroform                         | Water   | 2.5         | µg/L   | 0.15 µg/L     |
| Carbon Tetrachloride               | Water   | 2.5         | µg/L   | 0.16 µg/L     |
| 1,2-Dichloroethane                 | Water   | 2.5         | µg/L   | 0.12 µg/L     |
| Benzene                            | Water   | 2.5         | µg/L   | 0.36 µg/L     |
| Trichloroethene (TCE)              | Water   | 2.5         | µg/L   | 1.6 µg/L      |
| 1,2-Dichloropropane                | Water   | 2.5         | µg/L   | 0.16 µg/L     |
| Bromodichloromethane               | Water   | 2.5         | µg/L   | 0.17 µg/L     |
| cis-1,3-Dichloropropene            | Water   | 2.5         | µg/L   | 0.077 µg/L    |
| trans-1,3-Dichloropropene          | Water   | 2.5         | µg/L   | 0.077 µg/L    |
| 1,1,2-Trichloroethane              | Water   | 2.5         | µg/L   | 0.19 µg/L     |
| Tetrachloroethene (PCE)            | Water   | 2.5         | µg/L   | 1.1 µg/L      |
| 1,2-Dibromoethane (EDB)            | Water   | 10          | µg/L   | 0.00075 µg/L  |
| 1,1,1,2-Tetrachioroethane          | Water   | 2.5         | µg/L   | 0.41 µg/L     |
| Bromoform                          | Water   | 2.5         | µg/L   | 2.4 µg/L      |
| 1,1,2,2-Tetrachloroethane          | Water   | 2.5         | µg/L   | 0.052 µg/L    |
| 1,3,5-Trimethylbenzene             | Water   | 10          | μg/L   | 2.4 µg/L      |
| 1,2,4-Trimethylbenzene             | Water   | 10          | μg/L   | 3 µg/L        |
| 1,4-Dichlorobenzene                | Water   | 2.5         | µg/L   | 0.44 µg/L     |
| 1,2-Dibromo-3-chloropropane (DBCP) | Water   | 10          | µg/L   | 0.048 µg/L    |
| Hexachlorobutadiene                | Water   | 10          | µg/L   | 0.14 µg/L     |
| N-Nitrosodimethylamine             | Water   | 250         | µg/L   | 0.0013 µg/L   |
| Aniline                            | Water   | 250         | µg/L   | 10 µg/L       |
| Bis(2-chloroethyl) Ether           | Water   | 100         | μg/L   | 0.0092 µg/L   |
| 1,4-Dichlorobenzene                | Water   | 100         | µg/L   | 0.44 µg/L     |
| Bis(2-chloroisopropyl) Ether       | Water   | 100         | µg/L   | 0.26 µg/L     |
| N-Nitrosodi-n-propylamine          | Water   | 100         | µg/L   | 0.0096 µg/L   |
| Hexachloroethane                   | Water   | 100         | µg/L   | 0.75 µg/L     |
| Nitrobenzene                       | Water   | 100         | µg/L   | 3.4 µg/L      |
| Isophorone                         | Water   | 100         | µg/L   | 71 µg/L       |
| Hexachlorobutadiene                | Water   | 100         | µg/L   | 0.14 µg/L     |
| Hexachlorocyclopentadiene          | Water   | 100         | µg/L   | 0.15 µg/L     |
| 2-Nitroaniline                     | Water   | 250         | µg/L   | 2.2 µg/L      |
| 3-Nitroaniline                     | Water   | 250         | µg/L   | 110 µg/L      |
| 2,4-Dinitrotoluene                 | Water   | 100         | µg/L   | 73 µg/L       |

# Table 5.9-3 Compounds Not Detected at Detection LimitsExceeding Current Risk-Based Concentrations, Grease Pit

Note: Some detection limits are elevated due to analytical interference. See the Grease Pit Appendix for a complete list of detection limits

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| Compound                           | Matrix | Maximum Detection | <b>Risk-Based</b> |
|------------------------------------|--------|-------------------|-------------------|
| Compound                           | matrix | Limit             | Concentration     |
| 2,6-Dinitrotoluene                 | Water  | 100 µg/L          | 37 µg/L           |
| 4-Nitroaniline                     | Water  | 250 μg/L .        | 110 µg/L          |
| N-Nitrosodiphenylamine             | Water  | 100 µg/L          | 14 µg/L           |
| Hexachlorobenzene                  | Water  | 100 µg/L          | 0.0066 µg/L       |
| 3,3'-Dichlorobenzidine             | Water  | 250 µg/L          | 0.15 µg/L         |
| Benz(a)anthracene                  | Water  | 100 µg/L          | 0.092 µg/L        |
| Bis(2-ethylhexyl) Phthalate        | Water  | 100 µg/L          | 4.8 µg/L          |
| Chrysene                           | Water  | 100 µg/L          | 9.2 µg/L          |
| Benzo(b)fluoranthene               | Water  | 100 µg/L          | 0.092 µg/L        |
| Benzo(k)fluoranthene               | Water  | 100 µg/L          | 0.92 µg/L         |
| Benzo(a)pyrene                     | Water  | 100 µg/L          | 0.0092 µg/L       |
| Indeno(1,2,3-cd)pyrene             | Water  | 100 µg/L          | 0.092 µg/L        |
| Dibenz(a,h)anthracene              | Water  | 100 µg/L          | 0.0092 µg/L       |
| 2,4,6-Trichlorophenol              | Water  | 100 µg/L          | 6.1 µg/L          |
| 2,4-Dinitrophenol                  | Water  | 250 µg/L          | 73 µg/L           |
| Pentachlorophenol                  | Water  | 250 µg/L          | 0.56 µg/L         |
| Arsenic                            | Water  | 5 µg/L            | 0.038 µg/L        |
| Vinyl Chloride                     | Soil   | 1200 µg/Kg        | 340 µg/Kg         |
| 1,1-Dichloroethene                 | Soil   | 1200 µg/Kg        | 1100 µg/Kg        |
| 1,2-Dibromoethane (EDB)            | Soil   | 5000 µg/Kg        | 7.5 µg/Kg         |
| 1,2,3-Trichloropropane             | Soil   | 1200 µg/Kg        | 91 µg/Kg          |
| 1,2-Dibromo-3-chloropropane (DBCP) | Soil   | 5000 µg/Kg        | 460 <b>µg/K</b> g |
| N-Nitrosodimethylamine             | Soil   | 20 mg/Kg          | 0.013 mg/Kg       |
| Bis(2-chloroethyl) Ether           | Soil   | 3 mg/Kg           | 0.58 mg/Kg        |
| N-Nitrosodi-n-propylamine          | Soil   | 3 mg/Kg           | 0.091 mg/Kg       |
| 2-Nitroaniline                     | Soil   | 20 mg/Kg          | 4.7 mg/Kg         |
| Hexachiorobenzene                  | Soil   | 3 mg/Kg           | 0.4 mg/Kg         |
| 3,3'-Dichlorobenzidine             | Soil   | 20 mg/Kg          | 1.4 mg/Kg         |
| Benz(a)anthracene                  | Soil   | 3 mg/Kg           | 0.88 mg/Kg        |
| Benzo(b)fluoranthene               | Soil   | 3 mg/Kg           | 0.88 mg/Kg        |
| Benzo(a)pyrene                     | Soil   | 3 mg/Kg           | 0.088 mg/Kg       |
| Indeno(1,2,3-cd)pyrene             | Soil   | 3 mg/Kg           | 0.88 mg/Kg        |
| Dibenz(a,h)anthracene              | Soil   | 3 mg/Kg           | 0.088 mg/Kg       |
| Pentachlorophenol                  | Soil   | 20 mg/Kg          | 5.3 mg/Kg         |

### Table 5.9-3, cont'd. Compounds Not Detected at Detection Limits Exceeding Current Risk-Based Concentrations, Grease Pit

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### 5.9.5.2 Sources, Transport Mechanisms, Exposure Pathways, and Receptors

Known primary sources, transport mechanisms, exposure pathways, and receptors, elements of a Conceptual Site Model, are shown on Figure 5.9-4. As discussed previously, primary sources include grease pits and the human waste disposal pit. Secondary sources include contaminated surface and subsurface soil.

Potential transport mechanisms include surface water transport, leaching and groundwater transport, and volatilization. Within the air phase, volatile COPCs may disperse in the atmosphere or accumulate in enclosed spaces; however, no enclosed spaces are present in the vicinity of the fire training area. In accordance with EPA (1995a), several COPCs are considered "volatile" (benzene, toluene, ethylbenzene, xylenes, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, isopropylbenzene, n-propylbenzene, 4-isopropyltoluene, tetrachloroethylene, methyl ethyl ketone, and acetone), having Henry's Law constants greater than 10<sup>-5</sup>. Concentrations of these compounds are not expected to be significant in atmospheric air. Similarly, concentrations of nonvolatile COPCs in airborne dust are not expected to be of concern in the atmosphere (see Appendix A, Section A.5).

Surface water transport is not expected to be significant, since the surrounding topography is relatively flat, and no surface water bodies are present within 0.5 mile of the site. Leaching may be significant for the more soluble compounds, including monoaromatics, chlorinated alkenes, and ketones. However, the depth to groundwater (estimated at 150 feet bgs) may be sufficient for natural attenuation of these compounds concurrent with downward migration.

Depending on the future land use, potential receptors may include residents, occupational workers, and construction workers. Ecological receptors include terrestrial plants, mammals, and avian species.

#### 5.9.5.3 Exposure Assessment

A preliminary exposure assessment was performed for the soil ingestion pathway. Soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, this pathway was selected to determine if soil exposures represent a significant human health risk. If human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of the baseline risk assessment.

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Soil exposures were calculated using default exposure factors for residential and commercial/industrial receptors (EPA 1995a). These exposure factors reflect individuals with the highest chronic exposure for noncarcinogens and the highest cumulative exposure for carcinogens. For example, exposures to noncarcinogens are calculated assuming childhood exposure only, whereas exposures to carcinogens are calculated assuming combined childhood and adult exposure. A list of the exposure factors and equations is provided in Appendix A.

Exposure concentrations in soil were calculated as the 95 percent UCL of the average concentration of all samples analyzed from a particular medium (surface or subsurface soil). If the compound was not detected, one-half of the reporting limit was used to calculate the 95 percent UCL. This approach is consistent with EPA guidance (EPA 1991b, 1992).

#### 5.9.5.4 Toxicity Assessment

Dose-response factors for most compounds were obtained from EPA (1995a). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995),
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994),
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources.

Compounds not included in EPA (1995a) were assigned proxy dose-response factors based on those for related compounds. These compounds are listed in Table 5.9-4, along with related compounds and toxicity equivalency factors (where available). A provisional reference dose for 1,3,5-trimethylbenzene (EPA 1995a) was used as a proxy reference dose for npropylbenzene. This value was selected because it is the lowest reference dose of all nonhalogenated alkylbenzenes provided in EPA (1995a), thereby providing a conservative estimate of the noncarcinogenic effects of volatile fuel hydrocarbons. Similarly, toxic equivalence factors developed by Magee et al. (1993) were used to estimate a proxy reference dose for 2-methylnaphthalene. This factor was used to evaluate potential noncarcinogenic effects associated with semivolatile fuel hydrocarbons (i.e., PAH).

Although provisional dose response factors have been developed for JP-4, JP-5, gasoline, and diesel fuel (EPA 1992b), these values are not appropriate for this evaluation. These values are based on fresh petroleum products and do not accurately represent the composition, and therefore the toxicity, of weathered petroleum products. They have not been subjected to

rigorous peer review and are not routinely used, even by EPA, in risk assessment. As a result, bulk hydrocarbon measurements (GRO, DRO, and TPH) were not included in the semiquantitative risk assessment.

## Table 5.9-4. Proxy Dose-Response Factors for Compounds Lacking Toxicity Data Grease Pits

| Surrogate Cor    | npounds                                   | Target Compound     |                   |               |               |  |  |  |  |  |
|------------------|-------------------------------------------|---------------------|-------------------|---------------|---------------|--|--|--|--|--|
| Name             | Approved<br>RfD <sub>2</sub> <sup>1</sup> | Name                | TEF <sup>2</sup>  | Proxy<br>RfD。 | Proxy<br>CSF。 |  |  |  |  |  |
| Isopropylbenzene | 0.04                                      | n-Propylbenzene     | None <sup>3</sup> | 0.04          |               |  |  |  |  |  |
| Naphthalene      | 0.04                                      | 2-Methylnaphthalene | 1                 | 0.04          |               |  |  |  |  |  |

Notes:

"Approved" RfDs from EPA (1995a)

<sup>2</sup> Toxicity Equivalency Factors (TEFs) from Magee et al. (1993)

<sup>3</sup> No TEFs have been developed for these compounds. RfDs for surrogate compounds were substituted as those for the target compounds.

#### 5.9.5.5 Human Health Risk Characterization

The following sections summarize potential human health risks via soil ingestion. As described above, soil exposures via ingestion generally result in greater chemical uptake than dermal contact, inhalation, or recreation use. Accordingly, if human health risks via soil ingestion are significantly below the acceptable risk threshold, then combined health risks from other exposure pathways are probably within acceptable limits. However, if human health risks via soil ingestion are close to the acceptable risk threshold, then other exposure pathways should be evaluated as part of the baseline risk assessment.

#### Human Health Risks - Carcinogenic

Carcinogenic risks for the soil ingestion pathway are summarized on Table 5.9-5. Detailed risk calculations for each pathway and receptor are presented in Appendix A.

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# Table 5.9-5. Carcinogenic Risks for Soil IngestionGrease Pits

| -               | Carcino                                              | ogenic Risk            |  |  |  |
|-----------------|------------------------------------------------------|------------------------|--|--|--|
| Pathway         | Residential                                          | Occupational           |  |  |  |
| Surface Soil    | Not evaluated; concentrations below threshold levels |                        |  |  |  |
| Subsurface Soil | 5.1 x 10⁵                                            | 5.9 x 10 <sup>-9</sup> |  |  |  |
| Total Risk      | 5.1 x 10 <sup>-8</sup>                               | 5.9 x 10 <sup>-9</sup> |  |  |  |

Using residential and occupational exposure factors, the excess lifetime carcinogenic risk for soil ingestion does not exceed the lower benchmark of  $1 \times 10^{-6}$  listed in the NCP. If groundwater impacts are present, exposures via tapwater ingestion may also be considered.

#### Human Health Risks - Noncarcinogenic

Noncarcinogenic hazard indices for the soil ingestion pathway are summarized on Table 5.9-6. Detailed risk calculations for each pathway and receptor are presented in Appendix A.

## Table 5.9-6. Noncarcinogenic Hazard Indices for Soil IngestionGrease Pits

| Pathway            | Noncarcinogenic Hazard Index                         |              |
|--------------------|------------------------------------------------------|--------------|
|                    | Residential                                          | Occupational |
| Surface Soil       | Not evaluated; concentrations below threshold levels |              |
| Subsurface Soil    | 0.11                                                 | 0.0045       |
| Total Hazard Index | 0.11                                                 | 0.0045       |

Using residential exposure factors, the total hazard index for soil ingestion is below the estimated threshold for adverse effects (1.0). However, if groundwater impacts are present, exposures via tapwater ingestion may also need to be considered.

9000-035-430 Recycled Paper Using occupational exposure factors, the total hazard index for soil ingestion is well below the estimated threshold for adverse effects (1.0). Additional noncarcinogenic hazards due to dermal contact and inhalation are not likely to exceed the acceptable limit. However, if groundwater impacts are present, the additional noncarcinogenic hazard associated with potential groundwater use may also need to be evaluated.

#### 5.9.5.6 Ecological Risk Characterization

Quantitative assessment of ecological risks can be performed at the organism, population, or ecosystem level. Although ecosystem-level effects may be the most important, effects testing and modeling are rarely performed due to a number of practical considerations (Suter 1993). Quantification of population-level effects, such as reproductive potential, is important to maintain species populations, whereas assessment of organism-level effects evaluates the risk to individual organisms.

Chemicals can be evaluated as single compounds or as mixtures. Methods for evaluating the toxicity of mixtures requires knowledge regarding the sites and modes of action of individual compounds. Unlike for human health risk assessment, these methods have not been standardized, and there is some debate regarding the most appropriate approach.

If potential exposure pathways and receptors are present, ecological assessment begins with identification of the compounds of potential concern. This can be done in a similar fashion as for human health risk assessment, using ecological RBCs. Ecological RBCs may include toxicity benchmarks, sediment quality criteria, or other regulatory criteria. One set of criteria in common use provides benchmark concentrations for eight representative mammalian species and nine avian species (Opresko et al. 1994). Although benchmark concentrations are provided for 76 chemicals, toxicity benchmarks are not available for many target analytes. Also, the benchmarks are provided as concentrations in food, requiring evaluation of plant uptake and other routes of dietary exposure. Due to the large number of analytes measured at the Grease Pits, ecological RBCs were not compiled as part of this project.

Potential receptors at the Grease Pits include terrestrial and avian species at a variety of trophic levels. The most highly exposed species include those with a small home range and small body weight to food consumption ratio (e.g., mice and resident songbirds). However, other less exposed species may warrant evaluation based on their susceptibility to particular chemicals (e.g., reproductive effects of 4,4'-DDT in raptors).

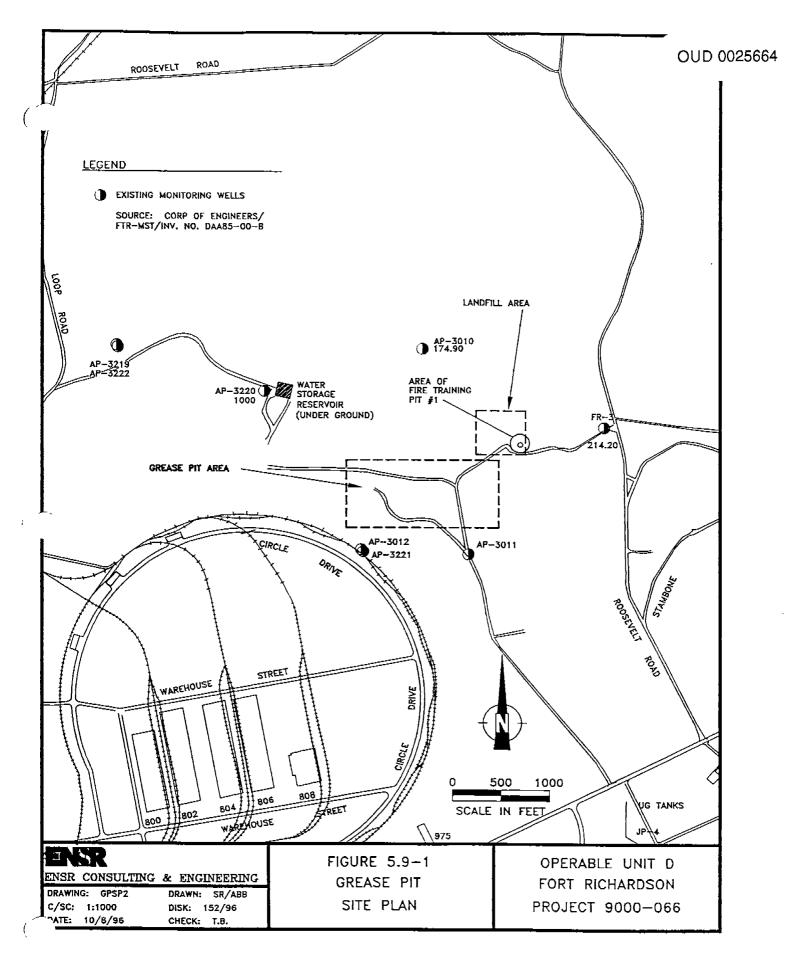
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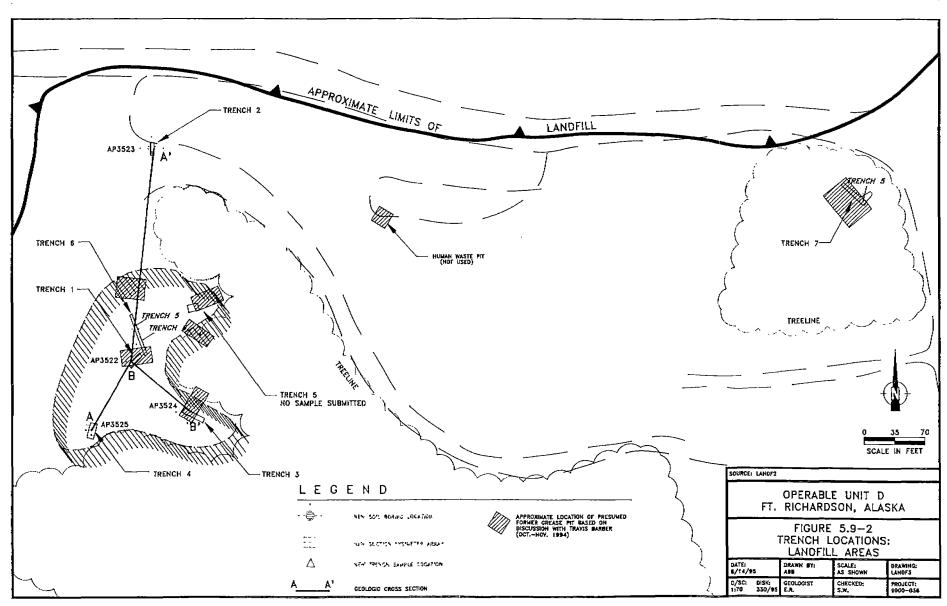
As part of the RI/FS, ecological RBCs may need to be identified for representative terrestrial and avian species. Compounds of potential concern may be selected based on a comparison of ecological RBCs with measured concentrations. At this point, the appropriate risk quantitation methods and measurement endpoints may be selected.

#### 5.9.6 Findings and Conclusions

The human health risks, using residential exposure parameters for soil ingestion, do not exceed the target noncarcinogenic hazard index of 1.0 or the excess lifetime cancer risk of 1 x  $10^{-6}$  as listed in the NCP.

The semi-quantitative risk assessment was performed using exposure assumptions that may not be appropriate for the site (e.g., residential use). In addition, the extent of contamination and the dynamic state of soil and groundwater contamination plumes (expanding, degrading, or steady-state) have not been evaluated. The exposure assumptions, compounds of potential concern, future land use, and contaminant fate and transport may need to be re-evaluated for inclusion in a baseline risk assessment, if required. In addition, ecological receptors, RBCs, risk quantitation methods, and measurement endpoints may be identified for inclusion in a baseline ecological risk assessment.



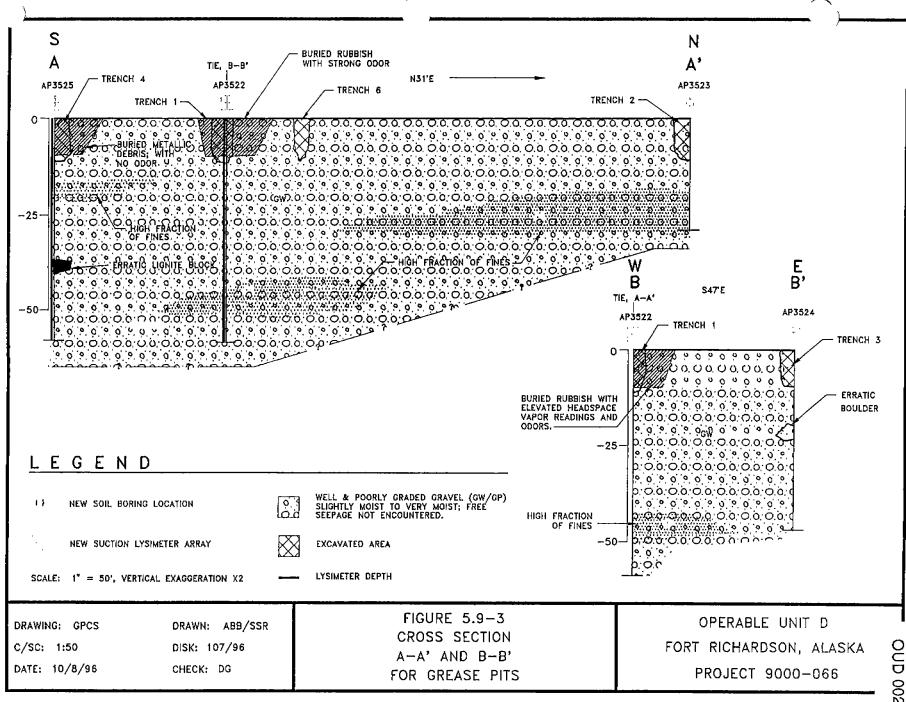


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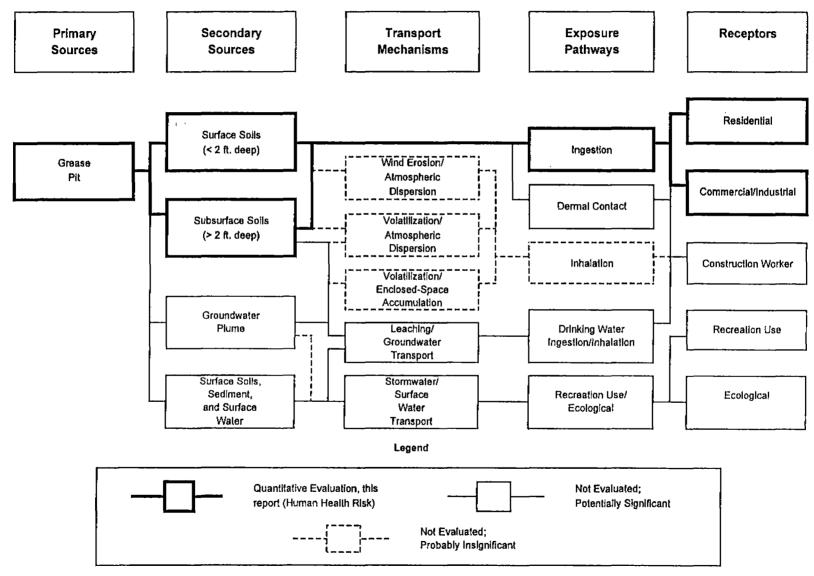


Figure 5.9-4 Sources, Transport Mechanisms, Exposure Pathways, and Receptors Grease Pit Area



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#### APPENDIX A

### **RISK CALCULATIONS**

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- Risk Calculations
- Background Metals Statistics
- Summary Risk Tables for Each Site
- Summary Statistics for Each Site

# **RISK CALCULATIONS**

In accordance with EPA Region X guidance (EPA 1992) risk calculations were performed for compounds whose *maximum* concentrations were:

- greater than the risk-based concentration (RBC) for tap water, or
- greater than 1/10 of the RBC for soil.

For metals data, a significance test was performed to determine whether metals data for each site can be distinguished from the background sample population. Metals data which could *not* be distinguished from background were not included in the risk calculations. Details of the statistical analysis are provided in a subsequent section of this Appendix.

RBCs from EPA Region III (EPA 1995) were used for screening criteria. This list reflects more current toxicity information than the Region X RBCs (EPA 1992), and contains a larger list of compounds (nearly 600 compounds for the Region III RBCs, vs. about 140 compounds for the Region X RBCs). In addition, the Region III RBCs are based on age-adjusted exposure factors, which more accurately represent one's cumulative exposure to carcinogens.

The following sections present the equations used to calculate carcinogenic risk and the noncarcinogenic hazard index. The assumptions are identical to those used to develop the EPA Region III RBCs, with two modifications:

- <u>Frozen Ground</u>: Exposure frequencies for surface and subsurface soil were reduced to 7/12 of the default exposure frequency (350 days/year for residential; 250 days per year for commercial/industrial), since the ground is frozen for approximately 5 months of the year.
- <u>Subsurface Soil</u>: For subsurface soil, the product of exposure frequency and duration was assumed to be one-fifth of that for surface soil, reflecting the decreased likelihood of exposure for subsurface soil.

Carcinogenic risks and noncarcinogenic hazard indices were evaluated for two exposure pathways: soil ingestion and tapwater ingestion/inhalation. A justification for eliminating soil exposures via the inhalation pathway is provided in Section A.5 of this Appendix.

Two exposure scenarios were considered: residential and commercial/industrial. The receptors evaluated under these scenarios are identical to those used to develop the EPA Region III RBCs (e.g., combined childhood and adult exposures for soil, adult exposures for tap water, etc.). In this manner, results are presented simply as "residential" or "commercial/industrial", without regard to the individual receptors.

Dose-response factors for most compounds were obtained from EPA (1995). These factors were obtained from:

- 1) EPA's Integrated Risk Information System (current as of January 1, 1995)
- 2) EPA's Health Effects Assessment Summary Tables (current through March 1994)
- 3) The Superfund Health Risk Technical Support Center, and
- 4) Other EPA sources

In accordance with EPA (1995) oral dose-response factors were substituted for unavailable inhaled dose-response factors. Compounds not included in EPA (1995) were assigned proxy dose-response factors based on those for related compounds. Target compounds, surrogates, and proxy dose response factors are listed for each site in the main body of this report.

# A.1 Residential Soil Ingestion

Carcinogenic risks were calculated based on combined childhood and adult exposure (EPA 1995), using a reduced exposure frequency for seasonally frozen soil:

$$ELCR = \frac{EFr_{s} \cdot IFSadj}{ATc \cdot 10^{6} \frac{mg}{kg}} \sum_{i=1}^{n} EC_{i} \cdot CSFo_{i} (1)$$

where *ELCR* = excess lifetime carcinogenic risk *EFr*<sub>s</sub> = residential exposure frequency, soil (200 d/y) *IFSadj* = age-adjusted soil ingestion factor (114.29 mg-y/kg-d) *ATc* = averaging time for carcinogens (25550 d) *EC*<sub>i</sub> = exposure concentration for the  $i^{\text{th}}$  compound (mg/kg) *CSFo*<sub>i</sub> = oral cancer slope factor for the  $i^{\text{th}}$  compound (risk per mg/kg/d) Using the parameters identified above, equation (1) can be simplified as:

$$ELCR = 8.95 \times 10^{-7} \cdot \sum_{i=1}^{n} EC_i \cdot CSFo_i$$
 (2)

Equation (2) was used to calculate carcinogenic risks associated with ingestion of surface soil. For subsurface soil, the combined exposure frequency and duration was assumed to be onefifth of that for surface soil, resulting in the following equation for carcinogenic risk:

$$ELCR = 1.79 \ x \ 10^{-7} \cdot \sum_{i=1}^{n} EC_i \cdot CSFo_i$$
 (3)

Noncarcinogenic hazard indices were calculated based on childhood exposure only (EPA 1995):

$$HI = \frac{EFr_s \cdot EDc \cdot IRSc}{BWc \cdot ATn_c \cdot 10^6 \frac{mg}{kg}} \sum_{i=1}^n \frac{EC_i}{RfDo_i} \quad (4)$$

| where | HI                | = | cumulative hazard index                                               |
|-------|-------------------|---|-----------------------------------------------------------------------|
|       | EDc               | = | exposure duration, age 1-6 (6 y)                                      |
|       | IRSc              | = | soil ingestion rate, age 1-6 (200 mg/d)                               |
|       | BWc               | = | body weight, age 1-6 (15 kg)                                          |
| 2     | ATn <sub>c</sub>  | = | averaging time for noncarcinogens, child (2190 d)                     |
|       | EC,               | = | exposure concentration for the i <sup>th</sup> compound (mg/kg)       |
|       | RfDo <sub>i</sub> | = | oral reference dose for the <i>i</i> <sup>th</sup> compound (mg/kg/d) |

Using the parameters identified above, equation (4) reduces to:

$$HI = 7.31 \ x \ 10^{-6} \cdot \sum_{l=1}^{n} \frac{EC_{l}}{RfDo_{l}}$$
(5)

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Equation (5) was used to calculate the hazard index resulting from ingestion of surface soil. For subsurface soil, the product of exposure frequency and duration was assumed to be onefifth of that for surface soil, resulting in the following equation for the hazard index:

$$HI = 1.46 \ x \ 10^{-6} \cdot \sum_{i=1}^{n} \frac{EC_{i}}{RfDo_{i}}$$
(6)

# A.2 Commercial/Industrial Soil Ingestion

Carcinogenic risks were calculated based on adult occupational exposure, assuming that only 50 percent of total soil ingestion is work-related (EPA 1995):

$$ELCR = \frac{EFo_s \cdot EDo \cdot IRSa \cdot FC}{BWa \cdot ATc \cdot 10^6 \frac{mg}{kg}} \sum_{i=1}^n EC_i \cdot CSFo_i \quad (7)$$

occupational exposure frequency, soil (150 d/y) where EFo. = occupational exposure duration (25 y) EDo = IRSa soil ingestion rate, adult (100 mg/d) **=** FC fraction of contaminated soil ingested (0.5) = body weight, adult (70 kg) BWa =

Using the parameters identified above, equation (7) reduces to:

$$ELCR = 1.05 \times 10^{-7} \cdot \sum_{i=1}^{n} EC_i \cdot CSFo_i$$
 (8)

Equation (8) was used to calculate carcinogenic risks associated with ingestion of surface soil. For subsurface soil, the product of exposure frequency and duration was assumed to be onefifth of that for surface soil, resulting in the following equation for carcinogenic risk:

$$ELCR = 2.10 \times 10^{-8} \cdot \sum_{i=1}^{n} EC_i \cdot CSFo_i$$
 (9)

Noncarcinogenic hazard indices were also calculated assuming that 50 percent of total soil ingestion is work-related:

$$HI = \frac{EFo_s \cdot EDo \cdot IRSa \cdot FC}{BWa \cdot ATn_o \cdot 10^6 \frac{mg}{kg}} \sum_{i=1}^n \frac{EC_i}{RfDo_i}$$
(10)

where  $ATn_{o}$  = averaging time for noncarcinogens, occupational (9125 d)

Using the parameters identified above, equation (10) reduces to:

$$HI = 2.94 \times 10^{-7} \cdot \sum_{i=1}^{n} \frac{EC_i}{RfDo_i}$$
(11)

Equation (11) was used to calculate the hazard index resulting from ingestion of surface soil. For subsurface soil, the combined exposure frequency and duration was assumed to be one-fifth of that for surface soil, resulting in the following equation for the hazard index:

$$HI = 5.87 \times 10^{-8} \cdot \sum_{i=1}^{n} \frac{EC_i}{RfDo_i}$$
 (12)

# A.3 Residential Drinking Water Ingestion/Inhalation

Volatilization terms were calculated for compounds identified by EPA (1995) as having a Henry's Law constant greater than 10<sup>-5</sup>. A volatilization factor of 0.5 was used, obtained from RAGS Information Branch (EPA 1991c). Carcinogenic risks were calculated based on combined childhood and adult exposure:

$$ELCR = \frac{EFr_{w}}{ATc \cdot 1000 \frac{\mu g}{ma}} \{K \cdot IFAadj \cdot \sum_{i=1}^{n} EC_{i} \cdot CSFi_{i} + IFWadj \cdot \sum_{i=1}^{n} EC_{i} \cdot CSFo_{i}\}$$
(13)

| where | EFr <sub>w</sub> =  | residential exposure frequency, tap water (350 d/y)              |
|-------|---------------------|------------------------------------------------------------------|
|       | IFAadj =            | age-adjusted inhalation factor (11.66 m <sup>3</sup> -y/kg-d)    |
|       | K =                 | volatilization factor (0.5 L/m³)                                 |
|       | IFWadj =            | age-adjusted tap water ingestion factor (1.09 L-y/kg-d)          |
|       | CSFi <sub>i</sub> = | inhalation cancer slope factor for the it the compound (risk per |
|       |                     | mg/kg/d)                                                         |

Using the parameters identified above, equation (13) reduces to:

$$ELCR = 7.98 \ x \ 10^{-5} \cdot \left\{ \sum_{i=1}^{n} EC_{i} \cdot CSFi_{i} + 0.187 \cdot \sum_{i=1}^{n} EC_{i} \cdot CSFo_{i} \right\}_{4}^{(1)}$$

Noncarcinogenic hazard indices were calculated based on combined childhood and adult exposure:

$$HI = \frac{EFr_{w} \cdot EDtot}{BWa \cdot ATn_{r} \cdot 1000 \frac{\mu g}{ma}} \{K \cdot IRAa \cdot \sum_{i=1}^{n} \frac{EC_{i}}{RiDi_{i}} + IRWa \cdot \sum_{i=1}^{n} \frac{EC_{i}}{RiDo_{i}}\}$$
(15)

where EDtot = exposure duration, total (30 y)  $ATn_r =$  averaging time for noncarcinogens, residential (10950 d) IRAa = inhalation rate, adult (20 m<sup>3</sup>/d) IRWa = tap water ingestion rate, adult (2 L/d)  $RfDi_i =$  inhalation reference dose for the *i*<sup>th</sup> compound (mg/kg/d)

Using the parameters identified above, equation (15) reduces to:

$$HI = 1.37 \times 10^{-4} \cdot \{\sum_{i=1}^{n} \frac{EC_i}{RfDi_i} + 0.20 \cdot \sum_{i=1}^{n} \frac{EC_i}{RfDo_i}\}$$
(16)

# A.4 Commercial/Industrial Drinking Water Ingestion/Inhalation

Carcinogenic risks were calculated for an adult, using the default occupational exposure frequency and duration:

$$ELCR = \frac{EFo_{w} \cdot EDo}{BWa \cdot ATc \cdot 1000 \frac{\mu g}{mg}} \{K \cdot IRAa \cdot \sum_{i=1}^{n} EC_{i} \cdot CSFi_{i} + IRWa \cdot \sum_{i=1}^{n} EC_{i} \cdot CSFo_{i}\} (17)$$

where  $EFo_w$  = occupational exposure frequency, tap water (250 d/y)

Using the parameters identified above, equation (17) reduces to:

$$ELCR = 3.49 \times 10^{-5} \cdot \{\sum_{i=1}^{n} EC_{i} \cdot CSF_{i} + 0.20 \cdot \sum_{i=1}^{n} EC_{i} \cdot CSF_{0}\}$$
(18)

Similarly, noncarcinogenic hazard indices were calculated for an adult:

$$HI = \frac{EFo_{w} \cdot EDo}{BWa \cdot ATn_{o} \cdot 1000 \frac{\psi g}{mg}} \{K \cdot IRAa \cdot \sum_{i=1}^{n} \frac{EC_{i}}{RfDi_{i}} + IRWa \cdot \sum_{i=1}^{n} \frac{EC_{i}}{RfDo_{i}}\}$$
(19)

Using the parameters identified above, equation (19) reduces to:

$$HI = 9.78 \times 10^{-5} \cdot \{\sum_{i=1}^{n} \frac{EC_i}{RfDi_i} + 0.20 \cdot \sum_{i=1}^{n} \frac{EC_i}{RfDo_i}\}$$
(20)

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# A.5 Soil Exposures via the Inhalation Route

The following paragraphs present a comparison of exposures via the inhalation versus ingestion pathways for soil. This analysis is provided as a justification for eliminating the inhalation pathway from semi-quantitative risk calculations.

Carcinogenic risks for residential soil ingestion are provided by equation (1):

$$ELCR = \frac{EFr_{s} \cdot IFSadj}{ATc \cdot 10^{6} \frac{mq}{kq}} \sum_{i=1}^{n} EC_{i} \cdot CSFo_{i}^{(21)}$$

Which can be simplified as shown by equation (2):

$$ELCR = 8.95 \times 10^{-7} \cdot \sum_{i=1}^{n} EC_i \cdot CSFo_i$$
 (22)

Evaluation of exposures via the inhalation pathway requires consideration of both volatilization and particulate emissions. Neglecting the effects of soil adsorption, reductions in molecular mixing, and diffusion through tortuous pore channels, a soil volatilization factor can be obtained by multiplying the tapwater volatilization factor K by a representative soil unit weight (say, 125 lbs/ft<sup>3</sup>):

$$V = 0.5 \frac{L}{m^3} \cdot \frac{ft^3}{28.32L} \cdot \frac{125 \, lbs}{ft^3} \cdot \frac{kg}{2.203 \, lbs} = 1.002 \frac{kg}{m^3}$$
(23)

where: V = soil volatilization factor

Employing the particulate emission factor provided in EPA's proposed *Soil Screening Guidance* (EPA 1994), the resulting expression for carcinogenic risk is:

$$ELCR = \frac{EFr_s \cdot IFAadj}{ATc \cdot 10^6 \frac{mg}{kg}} \{ V \cdot \sum_{i=1}^n EC_i \cdot CSFi_i + \frac{1}{PEF} \cdot \sum_{i=1}^n EC_i \cdot CSFi_i \}$$
(24)

where: PEF = particulate emission factor (6.79 x 10<sup>8</sup> m<sup>3</sup>/kg)

Due to the large size of EPA's particulate emission factor *PEF*, the second summation in (24) can be neglected, yielding:

$$ELCR = \frac{EFr_{s} \cdot IFAadj \cdot V}{ATc \cdot 10^{6} \frac{mg}{kg}} \sum_{i=1}^{n} EC_{i} \cdot CSFi_{i} \quad (25)$$

This implies that risks associated with inhalation of soil particulates is probably insignificant relative to risks via soil ingestion. Using the parameters identified previously, equation (25) reduces to:

$$ELCR = 9.13 \times 10^{-8} \cdot \sum_{i=1}^{n} EC_i \cdot CSFi_i$$
 (26)

Noting that oral cancer slope factors are commonly substituted for unavailable inhaled cancer slope factors (EPA 1995), comparison of equations (22) and (26) indicates that risks via the inhalation pathway for volatile compounds are approximately 1/10 of the risks via the ingestion pathway. In reality, however, risks via the inhalation pathway are probably much lower, since volatile compounds are often strongly adsorbed to soil organic matter. In addition, the enthalpy of liquid solutions is greater than solid matrices, resulting in increased molecular mixing and volatilization. Not only is there less molecular mixing in solid matrices (resulting in reduced migration of contaminants to the air-solid interface), diffusion of gaseous contaminants is inhibited by the tortuosity of soil pores. As a result, the soil volatilization factor V probably grossly overestimates volatilization from contaminated soil.

The foregoing analysis indicates that 1) inhalation exposures for particulate emissions are insignificant relative to exposures via soil ingestion, 2) as a result, inhalation exposures for nonvolatile compounds can probably be neglected, and 3) the incremental carcinogenic risks and noncarcinogenic hazard indices for inhalation of volatile compounds probably range from 1/10 to 1/100 of the carcinogenic risks and noncarcinogenic hazard indices for most compounds.

# BACKGROUND METALS STATISTICS

The following paragraphs describe the methods and results of a statistical comparison among site and background soil metal concentrations. The objective was to determine whether soil metal concentrations at the sites were significantly greater than background concentrations and ultimately to determine which metals to include in the risk calculations for exposure to surface and subsurface soil.

Five metals (arsenic, barium, chromium, lead, and nickel) were included in the comparisons. Site soil concentrations for these five metals were compared to the following background soil populations:

- OUD (site-specific) background surface and subsurface soil populations.
- Basewide soil background populations.

The site-specific background soil data were collected in this study and included the background data discussed in Section 4.3. The basewide background data were compiled and summarized in *Background Data Analysis Report, Fort Richardson, Alaska* ("background report"; E&E 1996) and included all background soil metal concentration data collected to date at Fort Richardson.

Background soil metal concentrations were compared to each OUD site sample population using Cochran's approximation to the Behren's Fisher t-test as described in 40 CFR 264, Appendix IV. This test method compares estimated mean metal concentrations determined from site and background sample data and is recommended by EPA due to the test's robustness and power for testing with small sample populations. Test results are provided in Table 1, which summarizes each comparison among the site and background sample populations. In Table 1, the result of each comparison is tabulated as a yes or no response to the following question:

"Is the mean metal concentration in the site soil population significantly (at the 95 percent confidence level) greater than in the background soil population?"

Results of the comparisons among the sites and basewide background populations were difficult to interpret due to the fact that the site samples were grouped into one of two categories (surface soil and subsurface soil), whereas the basewide background populations were divided into several other categories, including the root zone, and geologic units (Qay2 and Qey), which were not defined for each site in this study. Due to the differences in how each soil metal concentration population was defined in this study and in the background report, the null hypothesis for the statistical tests is that the site soil population for a given metal is equivalent to at least one of the background soil populations. In other words, to reject the null hypothesis, all the statistical comparisons for a given site and metal must show significant differences between the site and background populations.

Given the null hypothesis, only lead in surface soil at the Fire Training Pit site, the Building 704 site, and in subsurface soil at the Building 796 site was definitely (i.e., in comparison to all background populations) greater than in background soil populations. Consequently, arsenic, barium, chromium, and nickel were not included in the screening for compounds of potential concern in soil. Similarly, lead in soil at the remaining sites and soil depth categories were not included in the screening for compounds of potential concern. The following paragraphs describe the statistical comparison methods in more detail.

# OUD Background Metal Concentrations (Site-Specific Background)

The first step in the evaluation consisted of calculating the statistical parameters required in the t-test for the OUD background sample population. For each metal and soil depth range within the OUD background population, the following parameters were obtained:

- N<sub>bs</sub> = The number of background samples obtained from surface soil.
- $X_{bs}$  = The estimated mean metal concentration for background surface soil or  $\Sigma X_i / N_{bs}$  where  $X_i$  is i<sup>th</sup> metal concentration.

- $S_{bs}^{2}$  = The estimated variance of the metal concentration in the background surface soil or  $\Sigma(X_i X_{hs})^2/(N_{hs} 1)$ .
- $W_{bs}$  = The special weighting as defined in Cochran's approximation to the Behren's-Fisher t-test or  $S_{bs}^2/N_{bs}$ .
- $t_{bs}$  = The t-statistic for the background surface soil estimated mean metal concentration with (N<sub>bs</sub> 1) degrees of freedom and at the 95% level of significance. This level of significance is equivalent to the 90% level of significance for a two-tailed t-test.

The same parameters were calculated for subsurface soil using the subscript (bd). Results of these calculations for each metal and soil depth range are summarized in Table 1.

Based on the OUD background soil metal concentration results, it appeared that surface soil (bs) and subsurface (bd) concentrations were very similar and from the same population. To test this hypothesis, the surface soil and subsurface soil metal concentrations were compared using Cochran's approximation to the Behren's-Fisher t-test.

To compare the OUD background surface and subsurface soil metal concentrations, the following t-statistics were calculated for each metal as described in 40 CFR 264, Appendix IV:

The t-test statistic:

$$T* = (X_{bd} - X_{bs})/(W_{bd} + W_{bs})^{1/2}$$

The critical t-statistic at the 90% significance level for a two-tailed test:

$$T^{c} = \frac{W_{bd} t_{bd} + W_{bs} t_{bs}}{W_{bd} + W_{bs}}$$

These test statistics were used to determine whether there were significant (at the 90% confidence level) differences among metal concentrations between OUD background surface and subsurface soil. For each metal, if the absolute value of T\* is less than T°, then it is unlikely that surface and subsurface soil metal concentrations are different. Conversely, if the absolute value of T\* is more than or equal to T°, then it is likely that surface and subsurface soil metal concentrations are different. Table 2 summarizes the results of these tests. For each metal, the absolute value of T\* was less than T°, indicating that surface and subsurface soil contain similar metal concentrations in the OUD background sample population.

Based on the results, the OUD background surface and subsurface metal concentration data were "pooled" into a single OUD background metal soil sample population. The pooled OUD background statistics are summarized in Table 4.

Similarly, test statistics were calculated for each of the basewide soil background metal populations defined by the background report. The pooled OUD background soil populations and the basewide background soil populations were then compared to each site soil population. The following paragraphs describe the methods for these comparisons.

# Site Versus Background Metal Concentrations

For each site and soil depth range, metal concentrations in the site sample population were tested against the OUD and basewide background sample population using Cochran's approximation to the Behren's-Fisher t-test. To conduct the tests, the following parameters were obtained for each metal, site, and soil depth range:

- $N_m$  = The number of samples obtained from the site for a given metal analyses.
- $X_m$  = The estimated mean metal concentration from the site sample population or  $\Sigma X/N_m$  where  $X_i$  is the i<sup>th</sup> metal concentration.
- $S_m^2$  = The estimated variance of the metal concentration sample population or  $\Sigma(X_i X_m)^2/(N_m 1)$ .
- $W_m$  = The special weighting as defined in Cochran's approximation to the Behren's-Fisher t-test or  $S_m^2/N_m$ .
- $t_m$  = The t-statistic for the site estimated mean metal concentration with (N<sub>m</sub> 1) degrees of freedom and at the 95% level of significance for a one-tailed t-test.

Tables 5 through 9 summarize the results of these calculations for each site, metal, and soil depth range. To test whether site soil estimated mean metal concentrations were significantly (95%) greater than background sample population concentrations, the following test statistics were calculated for each site, metal, and soil depth range:

$$T* = \frac{(X_m - X_b)}{(W_m + W_b)^{1/2}}$$

The t-test statistic where X<sub>b</sub> and W<sub>b</sub> are the estimated mean metal concentration and special weighting for the pooled background sample population, respectively.

$$T^{c} = \frac{W_m t_m + W_b t_b}{W_m + W_b}$$

The critical t-statistic at the 95% level of significance for a one-tailed test where t<sub>p</sub> is the t-statistic for the pooled background sample population.

For each metal and soil depth range, if  $T^* < T^c$ , then it is unlikely that the site metal concentrations are higher than in background soil. Conversely, if  $T^* \ge T^c$ , it is likely that site metal concentrations are greater than in background soil.

Tables 5 through 9 summarize the results of these tests for each site and soil depth range. If  $T^*$  was greater than or equal to  $T^c$ , then a result of "yes", indicating that site soil contained greater metal concentrations as compared to background, was noted in the far right column. If  $T^*$  was less than  $T^c$ , then a result of "no", indicating that the site soil did not contain significantly higher metal concentrations than in background soil, was noted in the far right column.

The overall results of the comparisons are summarized in Table 1.

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|                       |                  |     |         |              |                 |      |     |                  |      |              |              | -               | Statistic<br>ound Sc |       | •                   |     |                  |     |         |              |                 |                  |     |            |              |                |
|-----------------------|------------------|-----|---------|--------------|-----------------|------|-----|------------------|------|--------------|--------------|-----------------|----------------------|-------|---------------------|-----|------------------|-----|---------|--------------|-----------------|------------------|-----|------------|--------------|----------------|
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|                       | ουρ              |     | Bat     | e Wide       | Backgro         | und  |     | oup              | 81   | nse Wide I   | Backgr       | bruc            | OUD                  |       | Base Wid<br>ackgrou |     | ουσ              | Ba  | se Wide | Backgro      | ound            | GUD              | B   | ase Wide E | Jackgro      | und            |
| Medium/<br>Site       | Site<br>Specific | All | Surface | Rool<br>Zone | Sub-<br>surface | Qay2 | Qey | Site<br>Specific | _AII | Surface      | Root<br>Zone | Sub-<br>surface | Site<br>Specific     | AIL   | Qay2                | Qey | Site<br>Specific | Ati | Surface | Root<br>Zone | Sub-<br>surface | Site<br>Specific | Ali | Surface    | Root<br>Zone | Sub-<br>surfac |
| Surface Boil          |                  |     |         |              |                 |      |     |                  |      | <del>.</del> |              |                 |                      |       | ·····               |     |                  | ·   | ··      |              | ·               |                  |     |            |              |                |
| Fire Training Pil     | Yes              | No  | No      | No           | Yes             | No   | Yes | N¤               | No   | No           | No           | No              | No                   | No    | No                  | Yes | Yes              | Yes | Yes     | Yes          | Yes             | No               | No  | Na         | No           | No             |
| Grease Pits           | N/A              | N/A | N/A     | N/A          | N/A             | N/A  | N/A | N/A              | N/A  | N/A          | N/A          | N/A             | N/A                  | N/A   | N/A                 | N/A | N/A              | N/A | N/A     | N/A          | N/A             | N/A              | N/A | N/A        | N/A          | N/A            |
| Dust Pallative Rdwy   | Yee              | Yes | Na      | No           | Yes             | Na   | Yes | No               | Na   | No           | No           | No              | No                   | No    | No                  | No  | Yes              | Yes | No      | Yes          | Yes             | No               | No  | No         | No           | No             |
| Building 35-752       | Yes              | No  | No      | No           | No              | No - | Yes | Yes              | Yes  | No           | No           | Yes             | No                   | No    | No                  | Yes | No               | No  | No      | No           | No              | No               | No  | No         | No           | No             |
| Ship Cr SW Outfall    | No               | Na  | No      | No           | No              | No   | No  | No               | No   | No           | No           | No              | No                   | No    | No                  | Yes | No               | No  | No      | No           | No              | No               | No  | [ No       | No .         | No             |
| Building 955          | Yee              | No  | No      | No           | No              | No   | Yes | Yos              | You  | No           | No           | Yes             | No                   | Yes   | Yes                 | Yes | No               | No  | No      | No           | No              | No               | Yes | Yes        | Yes          | Yes            |
| Building 718          | Yes              | Yes | No      | No           | Yes             | Yes  | Yea | No               | No   | Nº           | No           | No              | No                   | No    | No                  | No  | No               | Na  | No      | No           | No              | No               | No  | Yes        | No           | No             |
| Buildling 704         | Yes              | Yes | Na      | No           | Yes             | Yes  | Yes | No               | No   | Nº I         | No           | Yos             | No                   | No    | N₀                  | Yes | Yes              | Yes | Yes     | Yee          | Yes             | No               | Yes | Yes        | No           | Yes            |
| Building 796          | N/A              | No  | No      | <u>No</u>    | No              | No_  | No  | N/A              | _Na  | No           | _No          | No              | <u>N/A</u>           | No    | No                  | Na  | N/A              | No  | No      | Na           | Na              | N/A              | _No | No         | No           | No             |
| Subsurface Soll       | · · · · · ·      |     |         |              |                 |      |     | <u> </u>         |      | <u> </u>     |              |                 |                      |       | <u> </u>            |     |                  |     |         | <u> </u>     |                 |                  |     |            |              | <del></del>    |
| Fire Treining Pil     | Yes              | Yes | No      | No           | Yea             | Yes  | Yes | Yés              | Yos  | No           | No           | Yes             | No                   | Yes   | Yee                 | Yes | Yes              | Yes | No      | No           | Yes             | No               | Yes | Yes        | Yes          | Yes            |
| Gress# Pits           | No               | No  | No      | No           | No              | Na   | No  | No               | No   | No           | No           | No              | No                   | No    | No                  | No  | No               | No  | No      | No           | No              | No               | No  | No         | No           | No             |
| Dust Palletive Rdwy   | N/A              | No  | No      | No           | No              | No   | No  | N/A              | No   | No           | No           | No              | N/A                  | No    | No                  | No  | N/A              | No  | No      | Na           | No              | N/A              | No  | No         | No .         | No             |
| Building 35-752       | No               | No  | No      | No           | No              | No   | No  | Yes              | Yes  | No           | No           | Yea             | No                   | No    | No                  | Yes | Yes              | Yes | No      | No           | Yes             | No               | No  | No         | No           | No             |
| Ship Cr 8W Outfall    | N/A              | No  | No      | No           | No              | No   | No  | N/A              | No   | No           | No           | No              | N/A                  | No    | No                  | Na  | N/A              | No  | No      | No           | No              | N/A              | No  | No         | No           | No             |
| Building 955          | No               | No  | Na      | No           | No              | No   | Yee | No               | No   | No           | No           | Na              | No                   | Yes   | No                  | Yes | Na               | No  | No      | Na           | No              | No               | Yes | Yes        | No           | Yes            |
| Building 718          | No               | No  | No      | No           | No              | No   | Yes | No               | No   | No           | No           | No              | No                   | No    | No                  | Yes | No               | No  | No      | No           | No              | No               | No  | No         | No           | No             |
| Suliding 704          | No               | No  | No      | No           | Yes             | No   | Yes | Na               | No   | No           | No           | No              | No                   | No    | No                  | No  | No               | No  | No      | No           | No              | No               | No  | No         | No           | No             |
| Building 796          | Yes              | No  | No      | No           | Yes             | No   | Yes | No               | No   | No           | No           | Na              | No                   | No    | No                  | Yes | Yea              | Yes | Yes     | Yee          | Yes             | No               | Yas | Yes        | Yes          | Yes            |
| Site Specific Bitgrnd | No               | No  | No      | No           | No              | No   | No  | _ No             | No   | No           | No           | No              | No                   | No    | No                  | No  | No               | Yes | Yes     | Yes          | Yes             | No               | Yes | Yes        | Yes          | Yes            |

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N/A = not applicable.

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| Metal | N <sub>be</sub> | X <sub>bs</sub> | S <sub>bs</sub> <sup>2</sup> | W <sub>bs</sub> | t <sub>os</sub> | N <sub>bd</sub> | X <sub>bd</sub> | S <sub>bd</sub> <sup>2</sup> | W <sub>bd</sub> | t <sub>bd</sub> |
|-------|-----------------|-----------------|------------------------------|-----------------|-----------------|-----------------|-----------------|------------------------------|-----------------|-----------------|
| As    | 29              | 5.2000          | 1.9560                       | 0.1956          | 1.8331          | 19              | 5.0526          | 1.1640                       | . 0.0613        | 1.7341          |
| Ba    | 10              | 55.0000         | 151,6000                     | 15,1600         | 1.8331          | 19              | 60.4211         | 840.3000                     | 44.2200         | 1.7341          |
| Cr    | 10              | 32.6000         | 40.2700                      | 4.0270          | 1.8331          | 19              | 28.7895         | 60.9500                      | 3.2080          | 1.7341          |
| РЬ    | 10              | 6.1000          | 1,6560                       | 0.1656          | 1.8331          | 19              | 6.3684          | 7.8010                       | 0.4106          | 1.7341          |
| Ni    | 10              | 44.6000         | 208.5000                     | 20.8500         | 1.8331          | 19              | 41.7368         | 2297.0000                    | 120.9000        | 1.7341          |

| Table 2. | OUD | Background | Metal | Concentrations | in | Soil: | Summarv | Statistics. |
|----------|-----|------------|-------|----------------|----|-------|---------|-------------|
|          |     |            |       |                |    |       |         |             |

Where: N<sub>be</sub>

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= number of background surface soil samples and  $N_{bd}$  = number of background deep soil samples. = average background surface soil samples and  $X_{bd}$  = average background deep soll samples. = estimated background surface soil sample variance and  $S_{bd}^2$  = estimated background deep soll sample variance. = special weighting (= $S_{ba}^2/N_{ba}$ ), surface soll samples and  $W_{bd}$  = special weighting (= $S_{bd}^2/N_{bd}$ ) deep soil samples. = t-statistic at 95% significance level with ( $N_{ba}$  - 1) degrees of freedom. = t-statistic at 95% significance level with ( $N_{bd}$  - 1) degrees of freedom. Хы Sы Wы

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|    |        |         | Metal  |         |        |
|----|--------|---------|--------|---------|--------|
|    | As     | Ba      | Cr     | Pb      | Ni     |
| T* | 0.2908 | -0.7035 | 1.4167 | -0.3536 | 0.2405 |
| ۲¢ | 1.8095 | 1.7594  | 1.7892 | 1.7626  | 1.7487 |

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Table 3. Calculated T-Values (at 90% confidence level, two-tailed) for OUD Background Surface and Subsurface Soil.

| Metal (  |                 |                 | d Backgrou<br>Soil: Summ     |                 | ics.            |
|----------|-----------------|-----------------|------------------------------|-----------------|-----------------|
| Analyte  | N <sub>bp</sub> | X <sub>bp</sub> | S <sub>bp</sub> <sup>2</sup> | W <sub>bp</sub> | t <sub>bp</sub> |
| Arsenic  | 29              | 5.10            | 1.45                         | 0.05            | 1.701           |
| Barium   | 29              | 58.60           | 595.37                       | 20.53           | 1.701           |
| Chromium | 29              | 30,11           | 548.94                       | 18.93           | 1.701           |
| Lead     | 29              | 40.71           | 4.56                         | 0.16            | 1.701           |
| Nickel   | 29 ·            | 42.73           | 1546.30                      | 53.32           | 1.701           |

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Footnotes:

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N<sub>bp</sub> = number of pooled background soil samples.

= average of pooled background soll samples.

X<sub>bp</sub> S<sub>bp</sub><sup>2</sup> W<sub>bp</sub>

= estimated pooled background soil sample variance. = special weighting  $(S_{bp}^2/N_{bp})$ , soil samples. = t-statistic at 95% significance level with  $(N_{bp} - 1)$  degrees of freedom. t<sub>bp</sub>

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|                                  |     |       |                             |      |                |       |        |        |       |       | Table  | ÷ 5. 7 | Arse  | nic    |       |         |        |       |       |        |       |      |        |            |      |        |
|----------------------------------|-----|-------|-----------------------------|------|----------------|-------|--------|--------|-------|-------|--------|--------|-------|--------|-------|---------|--------|-------|-------|--------|-------|------|--------|------------|------|--------|
|                                  |     |       |                             |      |                |       |        |        | Stat  | istic | al Ba  | ckgr   | ound  | d Eval | uatio | on      |        |       |       |        |       |      |        |            |      |        |
| Medlum/                          | ·   |       |                             |      |                | S     | te Spe | cific  |       | All   |        |        | Surfa | C0     | F     | loot Ze | one    | S     | ubsur | face   |       | Qay  | 2      |            | Qay  |        |
| Site                             | Nm  | Xm    | S <sub>m</sub> <sup>2</sup> | Wm   | t <sub>m</sub> | T*    | ۳°     | Yes/No | T*    | ۲°    | Yes/No | T*     | ۲°    | Yes/No | T*    | ۳°      | Yes/No | T*    | r     | Yes/No | T*    | ٣    | Yes/No | T٩         | ۳    | Yes/No |
| Surface Soll                     |     |       |                             |      |                |       |        |        |       |       |        |        |       |        |       | -       |        |       |       |        | ·     |      | _      | • <u> </u> |      |        |
| Fire Training Pit                | 11  | 6,73  | 3.22                        | 0.29 | 1.81           | 2.78  | 1.80   | Yes    | 1.80  | 1.81  | No     | 0.12   | 1,79  | No     | 0.30  | 1.79    | No     | 2.36  | 1.81  | Yes    | 1.32  | 1.81 | No     | 3.23       | 1.79 | Yes    |
| Grease Pits                      | N/A | N/A   | N/A                         | N/A  | N/A            | N/A   | N/A    | N/A    | N/A   | N/A   | N/A    | N/A    | N/A   | N/A    | N/A   | N/A     | N/A    | N/A   | N/A   | N/A    | N/A   | N/A  | N/A    | N/A        | N/A  | N/A    |
| Dust Pallative Rdwy              | 14  | 6.29  | 0.68                        | 0.05 | 1.77           | 3.81  | 1.74   | Yes    | 2.30  | 1.75  | Yes    | -1.17  | 1,72  | No     | -0,83 | 1.71    | No     | 3.54  | 1.75  | Yes    | 1.17  | 1.75 | No     | 4,79       | 1.72 | Yes    |
| Building 35-752                  | 36  | 5.72  | 2.38                        | 0.07 | 1.69           | 1.83  | 1.69   | Yes    | -0.07 | 1.69  | No     | -2.72  | 1.68  | No     | -2.41 | 1,67    | No     | 1.06  | 1.69  | No     | -1.03 | 1.68 | No     | 2.63       | 1.68 | Yes    |
| Ship Cr SW Outfall               | 8   | 4.00  | 0.57                        | 0.07 | 1.89           | -3,20 | 1.82   | No     | -6.17 | 1.87  | No     | -7.54  | 1.80  | No     | -7.24 | 1.79    | No     | -5.01 | 1.87  | No     | -7.05 | 1.87 | No     | -2.62      | 1.81 | No     |
| Building 955                     | 6   | 6.17  | 1,37                        | 0.23 | 2.02           | 2.03  | 1.98   | Yes    | 0.88  | 2.00  | No     | -0,93  | 1.95  | No     | -0,72 | 1.95    | No     | 1.51  | 2.00  | No     | 0.33  | 2.00 | No     | 2.51       | 1.96 | Yes    |
| Building 718                     | 21  | 6.67  | 0.83                        | 0.04 | 1.72           | 5,29  | 1.71   | Yes    | 4.25  | 1.71  | Yes    | 0.03   | 1.69  | No     | 0.39  | 1.68    | No     | 5,55  | 1.71  | Yes    | 2.99  | 1.71 | Yes    | 6.42       | 1.69 | Yes    |
| Buidling 704                     | 18  | 7.06  | 4.53                        | 0.25 | 1.74           | 3,57  | 1.73   | Yes    | 2,59  | 1.74  | Yes    | 0,72   | 1.73  | No     | 0.92  | 1.72    | No     | 3,18  | 1.74  | Yes    | 2.06  | 1.74 | Yes    | 4.06       | 1.73 | Yes    |
| Building 798                     | 1   | 10.00 | N/A                         | N/A  | N/A            | N/A   | N/A    | N/A    | N/A   | N/A   | No     | N/A    | N/A   | No     | N/A   | N/A     | No     | _N/A  | N/A   | No     | N/A   | N/A  | No     | N/A        | N/A  | No     |
| Subsurface Soll                  |     |       |                             |      |                |       |        |        |       |       |        |        |       |        |       |         |        |       |       |        |       |      |        |            |      |        |
| Fire Treining Pit                | 18  | 6,75  | 0.73                        | 0.05 | 1.75           | 5,39  | 1.73   | Yes    | 4.37  | 1.74  | Yes    | 0.29   | 1.71  | No     | 0.64  | 1.70    | No     | 5.59  | 1.74  | Yes    | 3.17  | 1.74 | Yes    | 6.47       | 1.71 | Yes    |
| Grease Pits                      | 15  | 5.14  | 2.21                        | 0,15 | 1.76           | 0,08  | 15,81  | No     | -1.52 | 1.78  | No     | -3.40  | 1.74  | No     | -3.15 | 1.73    | No     | -0,73 | 1.76  | No     | -2,18 | 1.75 | No     | 0.63       | 1.74 | No     |
| Dust Pailative Rdwy              | N/A | N/A   | N/A                         | N/A  | N/A            | N/A   | N/A    | N/A    | N/A   | N/A   | No     | N/A    | N/A   | No     | N/A   | N/A     | No     | N/A   | N/A   | No     | N/A   | N/A  | No     | N/A        | N/A  | No     |
| Building 35-752                  | 29  | 5.08  | 1.10                        | 0.04 | 1.70           | -0,10 | 1.70   | No     | -3.10 | 1.69  | No     | -5.26  | 1.68  | No     | -4.90 | 1.67    | No     | -1.62 | 1.69  | No     | -4.27 | 1.69 | No     | 0.74       | 1.68 | No     |
| Ship Cr SW Outfall               | N/A | N/A   | N/A                         | N/A  | N/A            | N/A   | N/A    | N/A    | N/A   | N/A   | No     | N/A    | N/A   | No     | N/A   | N/A     | No     | N/A   | N/A   | No     | N/A   | N/A  | No     | N/A        | N/A  | No     |
| Building 955                     | 12  | 5.67  | 1.33                        | 0.11 | 1.80           | 1.41  | 1.77   | No     | -0.21 | 1.79  | No     | -2.45  | 1.76  | No     | -2.18 | 1.75    | No     | 0.68  | 1.79  | No     | -0.97 | 1.78 | No     | 2,06       | 1.76 | Yes    |
| Building 718                     | 8   | 6.25  | 1.98                        | 0.25 | 1.89           | 2.11  | 1.86   | No     | 1.01  | 1.89  | No     | -0.75  | 1.86  | No     | -0.55 | 1,85    | No     | 1.62  | 1.89  | No     | 0,49  | 1.89 | No     | 2.58       | 1.86 | Yes    |
| Building 704                     | 12  | 7.33  | 13,33                       | 1,11 | 1.80           | 2.07  | 1.79   | No     | 1.51  | 1.79  | No     | 0.62   | 1.79  | No     | 0,73  | 1.79    | No     | 1.80  | 1,79  | Yes    | 1.28  | 1.79 | No     | 2.30       | 1.79 | Yes    |
| Building 796                     | 20  | 6.35  | 3,50                        | 0.18 | 1.73           | 2.64  | 1.72   | Yes    | 1.43  | 1,73  | No     | -0.65  | 1.72  | No     | -0.42 | 1.71    | No     | 2.14  | 1.73  | Yes    | 0,81  | 1.73 | No     | 3.20       | 1.72 | Yes    |
| Footnoies:<br>N/A = not applicat | hla |       |                             |      |                |       |        |        |       |       |        |        |       |        |       |         |        |       |       |        |       |      |        |            |      |        |
| N = number of a                  |     |       |                             |      |                |       |        |        |       |       |        |        |       |        |       |         |        |       |       |        |       |      |        |            |      |        |

N<sub>m</sub> = number of samples.

 $X_m =$  average or mean of sample population.

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 $S_m^2$  = variance.  $W_m$  = special weighting  $(S_m^2/N_m)$ .

t, = t-stalistic at the 95% confidence level with Nm-1 degrees of freedom.

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t\* = t-test statistic.

f\* = critical t-test statistic.

Yes/No = If the absolute value of T\* is less than T\*, then it is unlikely that the concentrations are different (ie, result is 'No').

|                                         |                 |        |                  |       |                | _     |        |          | le 6. |      |        |       |       |        |       |        |        |       |       |        |
|-----------------------------------------|-----------------|--------|------------------|-------|----------------|-------|--------|----------|-------|------|--------|-------|-------|--------|-------|--------|--------|-------|-------|--------|
|                                         |                 |        |                  |       |                | S     | tatis  | tical Ba | ckgr  | ound | Evalua | tion  |       |        |       |        |        |       | _     |        |
| Medium/                                 |                 |        |                  |       |                | Si    | te Spe | clfic    |       | All  |        |       | Surfa | C0     | F     | Root Z | one    | S     | ubsur | face   |
| Area                                    | Nm              | Xm     | S <sub>m</sub> ² | Wm    | t <sub>m</sub> | T*    | ۲¢     | Yes/No   | T*    | ۲°   | Yes/No | T*    | ۲°    | Yes/No | T*    | ۲°     | Yes/No | T*    | Т°    | Yes/No |
| Surface Soll                            |                 |        |                  |       |                | _     |        |          |       |      |        |       |       |        |       |        |        |       |       |        |
| Fire Training Pit                       | 11              | 54,4   | 166              | 15.1  | 1.81           | -0.70 | 1.75   | No       | -0.87 | 1.80 | No     | -2.77 | 1.76  | No     | -1.97 | 1.76   | No     | 0.10  | 1.79  | No     |
| Grease Pits                             | N/A             | N/A    | N/A              | N/A   | N/A            | N/A   | N/A    | N/A      | N/A   | N/A  | N/A    | N/A   | N/A   | N/A    | N/A   | N/A    | N/A    | N/A   | N/A   | N/A    |
| Dust Pallative Roadway                  | 14              | 56,4   | 184              | 13.1  | 1.77           | -0.38 | 1.73   | No       | -0,41 | 1.76 | No     | -2.48 | 1.73  | No     | -1.64 | 1.73   | No     | 0.62  | 1.75  | No     |
| Building 35-752                         | 36              | 72.0   | 131 <b>1</b>     | 36.4  | 1.69           | 1.78  | 1.69   | Yes      | 2.28  | 1.69 | Yes    | 0.51  | 1.69  | No     | 1.11  | 1.69   | No     | 2.91  | 1.69  | Yes    |
| Ship Creek SW Outfall                   | 8               | 39,3   | 48               | 6.0   | 1.89           | -3.75 | 1.74   | No       | -6.75 | 1.84 | No     | -7.13 | 1.76  | No     | -6.11 | 1.76   | No     | -5.15 | 1.83  | No     |
| Building 955                            | 6               | 102.2  | 2553             | 425.6 | 2.02           | 2.07  | 2.00   | Yes      | 2.14  | 2.01 | Yes    | 1.61  | 2.01  | No     | 1.81  | 2.01   | No     | 2.33  | 2.01  | Yes    |
| Building 718                            | 21              | 52.0   | 73               | 3.5   | 1.72           | -1.35 | 1.70   | No       | -2.63 | 1.70 | No     | -4.37 | 1.69  | No     | -3.28 | 1.69   | No     | -0.84 | 1.70  | No     |
| Buidling 704                            | 18              | 64.0   | 503              | 27.9  | 1.74           | 0.78  | 1.72   | No       | 1.12  | 1.73 | No     | -0.72 | 1.72  | No     | -0.06 | 1.72   | No     | 1.83  | 1.73  | Yes    |
| Building 796                            | 1               | 55.0   | N/A              | N/A   | N/A            | N/A   | N/A    | N/A      | N/A   | N/A  | No     | N/A   | N/A   | No     | N/A   | N/A    | No     | N/A   | N/A   | No     |
| Subsurface Soil                         |                 |        |                  |       |                |       |        |          |       |      |        |       |       |        |       |        | -      |       |       |        |
| Fire Training Pit                       | 16              | 72.4   | 258              | 16.1  | 1.75           | 2.28  | 1.72   | Yes      | 3.43  | 1.74 | Yes    | 0.75  | 1,72  | No     | 1.54  | 1.72   | No     | 4.31  | 1.74  | Yes    |
| Grease Pits                             | 15              | 47.1   | 402              | 26,8  | 1.76           | -1.67 | 0.80   | No       | -2.03 | 1.75 | No     | -3.49 | 1.74  | No     | -2.82 | 1.74   | No     | -1.28 | 1.75  | No     |
| Dust Pallative Roadway                  | N/A             | N/A    | N/A              | N/A   | N/A            | N/A   | N/A    | N/A      | N/A   | N/A  | No     | N/A   | N/A   | No     | N/A   | N/A    | No     | N/A   | N/A   | No     |
| Building 35-752                         | 29              | 70.9   | 446              | 15.4  | 1.70           | 2.05  | 1.70   | Yes      | 3.13  | 1.70 | Yes    | 0.46  | 1.69  | No     | 1.26  | 1.69   | No     | 4.04  | 1.69  | Yes    |
| Ship Creek SW Outfall                   | N/A             | N/A    | N/A              | N/A   | N/A            | N/A   | N/A    | N/A      | N/A   | N/A  | No     | N/A   | N/A   | No     | N/A   | N/A    | No     | N/A   | N/A   | No     |
| Building 955                            | 12              | 56.2   | 47               | 3.9   | 1.80           | -0.48 | 1.72   | No       | -0.74 | 1.75 | No     | -3.21 | 1.71  | No     | -2.14 | 1.71   | No     | 0.90  | 1.74  | No     |
| Building 718                            | 8               | 43,1   | 106              | 13.2  | 1.89           | -2.66 | 1.78   | No       | -3.84 | 1.87 | No     | -5.17 | 1.80  | No     | -4.33 | 1.80   | No     | -2.76 | 1.86  | No     |
| Building 704                            | 12              | 50.3   | 363              | 30.2  | 1.60           | -1.16 | 1.76   | No       | -1.36 | 1.79 | No     | -2.85 | 1.77  | No     | -2.20 | 1.77   | No     | -0.65 | 1.79  | No     |
| Building 796                            | 20              | 47.8   | 159              | 8,0   | 1.73           | -2.01 | 1.71   | No       | -3.26 | 1.72 | No     | -4.77 | 1.70  | No     | -3.82 | 1.70   | No     | -1.93 | 1.71  | No     |
| Footnotes:                              |                 |        |                  |       |                |       |        |          |       |      |        |       | _     |        |       |        |        |       |       |        |
| N/A = not applicable.                   |                 |        |                  |       |                |       |        |          |       |      |        |       |       |        |       |        |        |       |       |        |
| N <sub>m</sub> = number of sam          | nple <b>s</b> . |        |                  |       |                |       |        |          |       |      |        |       |       |        |       |        |        |       |       |        |
| X <sub>m</sub> = average or me          | an of s         | sample | populati         | on.   |                |       |        |          |       |      |        |       |       |        |       |        |        |       |       |        |
| S <sub>m</sub> <sup>2</sup> = variance. |                 |        |                  |       |                |       |        |          |       |      |        |       |       |        |       |        |        |       |       |        |
|                                         |                 |        |                  |       |                |       |        |          |       |      |        |       |       |        |       |        |        |       |       |        |

$$\begin{split} & W_m = \text{special weighting } (S_m^{2}/N_m). \\ & t_m = t\text{-statistic at the 95% confidence level with } N_m\text{-1 degrees of freedom.} \end{split}$$

t<sup>\*</sup> = t-test statistic. t<sup>°</sup> = critical t-test statistic. Yes/No = if the absolute value of T<sup>\*</sup> is less than T<sup>°</sup>, then it is unlikely that the concentrations are different (ie, result is 'No').

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|-----------------------------------|---------|---------------------|------------------|---------|----------------|----------|---------|---------|-------|------|--------|------------|------|--------|-------|------|--------|
|                                   |         |                     |                  |         | Sta            |          |         | ckgrou  | nd Ev |      | ion    | r <u> </u> |      |        |       |      |        |
| Medlum/                           |         |                     |                  |         |                | <u> </u> | te Spe  | CIFIC   |       | All  |        |            | Qay  | 2      |       | Qe)  | !      |
| Site                              | Nm      | Xm                  | S <sub>m</sub> ² | Wm      | t <sub>m</sub> | T*       | ۲°      | Yes/No  | T*    | T°   | Yes/No | T*         | Lc   | Yes/No | T*    | T٩   | Yes/No |
| Surface Soll                      |         |                     |                  |         |                |          |         |         |       |      |        |            |      |        |       |      |        |
| Fire Training Pit                 | 11      | 33.1                | 54.7             | 1.65    | 1.81           | 0.66     | 1.71    | No      | 1.44  | 1.80 | No     | 0.84       | 1.80 | No     | 2.86  | 1.75 | Yes    |
| Grease Pits                       | N/A     | N/A                 | N/A              | N/A     | N/A            | N/A      | N/A     | N/A     | N/A   | N/A  | N/A    | N/A        | N/A  | N/A    | N/A   | N/A  | N/A    |
| Dust Pallative Roadway            | 14      | 27.6                | 80.4             | 2.91    | 1.77           | -0.52    | 1.71    | No      | -2.03 | 1.77 | No     | -2.48      | 1.77 | No     | -0.28 | 1.74 | No     |
| Building 35-752                   | 36      | 31.2                | 24.5             | 0.79    | 1.69           | 0.24     | 1.70    | No      | -0.02 | 1.68 | No     | -0.84      | 1.68 | No     | 2.06  | 1.67 | Yes    |
| Ship Creek SW Outfall             | 8       | 31.6                | 10.0             | 0.32    | 1.89           | 0.35     | 1.70    | No      | 0.68  | 1.82 | No     | -0.51      | 1.82 | No     | 2.72  | 1.71 | Yes    |
| Building 955                      | 6       | 35.2                | 11.8             | 0.33    | 2.02           | 1.15     | 1.71    | No      | 5.88  | 1.91 | Yes    | 4.65       | 1.91 | Yes    | 5.52  | 1.73 | Yes    |
| Building 718                      | 21      | 29,2                | 20,3             | 0,69    | 1.72           | -0,19    | 1.70    | No      | -2.14 | 1.71 | No     | -3,00      | 1.71 | No     | 0.73  | 1.68 | No     |
| Buidling 704                      | 18      | 32.0                | 17.6             | 0.55    | 1.74           | 0.43     | 1.70    | No      | 1.00  | 1.72 | No     | 0.03       | 1.72 | No     | 2.82  | 1.68 | Yes    |
| Building 796                      | 1       | 37.0                | N/A              | N/A     | N/A            | N/A      | N/A     | N/A     | N/A   | N/A  | No     | N/A        | N/A  | No     | N/A   | N/A  | No     |
| Subsurface Soil                   |         |                     |                  |         |                |          |         |         |       |      |        |            |      |        |       |      |        |
| Fire Training Pil                 | 16      | 37.3                | 23.9             | 0.64    | 1.75           | 1.61     | 1.70    | No      | 6.93  | 1.74 | Yes    | 5.97       | 1.73 | Yes    | 6.56  | 1.69 | Yes    |
| Grease Pils                       | 15      | 28.3                | 136.6            | 9,11    | 1.76           | -0,34    | 1,26    | No      | -0.95 | 1.76 | No     | -1.21      | 1.76 | No     | 0.02  | 1.75 | No     |
| Dust Pallative Roadway            | N/A     | N/A                 | N/A              | N/A     | N/A            | N/A      | N/A     | N/A     | N/A   | N/A  | No     | N/A        | N/A  | No     | N/A   | N/A  | No     |
| Bullding 35-752                   | 29      | 32.6                | 32.5             | 1.00    | 1.70           | 0,56     | 1,70    | No      | 1.34  | 1.70 | No     | 0.59       | 1.69 | No     | 2.92  | 1.68 | Yes    |
| Ship Creek SW Outfall             | N/A     | N/A                 | N/A              | N/A     | N/A            | N/A      | N/A     | N/A     | N/A   | N/A  | No     | N/A        | N/A  | No     | N/A   | N/A  | No     |
| Building 955                      | 12      | 33.3                | 44.2             | 1.33    | 1.80           | 0.71     | 1.71    | No      | 1.79  | 1.78 | Yes    | 1.13       | 1.78 | No     | 3.19  | 1.73 | Yes    |
| Building 718                      | 8       | 32.9                | 59.6             | 1.81    | 1.89           | 0.61     | 1.72    | No      | 1.22  | 1.88 | No     | 0.65       | 1.88 | No     | 2.66  | 1.80 | Yes    |
| Building 704                      | 12      | 29.4                | 80.3             | 2.73    | 1.80           | -0.15    | 1.71    | No      | -1.04 | 1.79 | No     | -1.51      | 1.79 | No     | 0.60  | 1.75 | No     |
| Building 796                      | 20      | 37.3                | 521.9            | 14.01   | 1.73           | 1.24     | 1.71    | No      | 1.62  | 1.73 | No     | 1.40       | 1.73 | No     | 2.31  | 1.72 | Yes    |
| Footnotes:                        |         |                     |                  |         |                |          |         |         |       |      |        |            | -    |        |       |      |        |
| N/A = not applicable.             |         |                     |                  |         |                |          |         |         |       |      |        |            |      |        |       |      |        |
| N <sub>m</sub> ⇒ number of sam    | ples.   |                     |                  |         |                |          |         |         |       |      |        |            |      |        |       |      |        |
| X <sub>m</sub> ≍ average or mea   | an of s | ample p             | oopulatio        | n,      |                |          |         |         |       |      |        |            |      |        |       |      |        |
| S <sub>m</sub> ² ≖ variance.      |         |                     |                  |         |                |          |         |         |       |      |        |            |      |        |       |      |        |
|                                   | hting - | (S <sub>m</sub> ²/N | <sub>m</sub> ).  |         |                |          |         |         |       |      |        |            |      |        |       |      |        |
| t <sub>m</sub> ⊨ t-statistic at t |         |                     |                  | level w | ith N          | 1 decre  | es of f | reedom. |       |      |        |            |      |        |       |      |        |

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t<sup>\*</sup> = t-test statistic. t<sup>e</sup> = critical t-test statistic. Yes/No = if the absolute value of T<sup>\*</sup> is less than T<sup>c</sup>, then it is unlikely that the concentrations are different (ie, result is 'No').

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------|-----------------------------|-------|----------------------|----------|----------------|----------|-------------------|------|---------|-------|-------|--------|-------|--------|--------|-------|-------|-------|
| Medlum/                                                                                                                                                                                                                       | <u> </u>                     |                                  |                             |       |                      |          | te Spe         |          |                   | All  |         |       | Surfa | ce     | F     | Root Z | one    | S     | ubsur | face  |
| Site                                                                                                                                                                                                                          | Nm                           | Xm                               | S <sub>m</sub> <sup>2</sup> | Wm    | t <sub>m</sub>       | T*       | Τ <sup>c</sup> | Yes/No   | T*                | ٦°   | Yes/No  | T۴    | ۳°    | Yes/No | T*    | T°     | Yes/No | T*    | T°    | Yes/N |
| Surface Soil                                                                                                                                                                                                                  |                              |                                  |                             |       |                      | •        |                |          |                   |      |         |       |       | _      |       |        |        |       |       |       |
| Fire Training Pit                                                                                                                                                                                                             | 11                           | 267.6                            | 1324                        | 49.70 | 1.81                 | 2.88     | 1.81           | Yes      | 36.88             | 1.81 | Yes     | 36.10 | 1.81  | Yes    | 36.40 | 1.81   | Yes    | 37.01 | 1.81  | Yes   |
| Grease Pits                                                                                                                                                                                                                   | N/A                          | N/A                              | N/A                         | N/A   | N/A                  | N/A      | N/A            | N/A      | N/A               | N/A  | N/A     | N/A   | N/A   | N/A    | N/A   | N/A    | N/A    | N/A   | N/A   | N/A   |
| Dust Pallative Roadway                                                                                                                                                                                                        | 14                           | 14.00                            | 41.4                        | 2.96  | 1.77                 | 4.35     | 1.77           | Yes      | 3.73              | 1.77 | Yes     | 1.16  | 1.76  | No     | 2.20  | 1.76   | Yes    | 4.23  | 1.77  | Yes   |
| Building 35-752                                                                                                                                                                                                               | 36                           | 8.24                             | 39.7                        | 4.82  | 1.69                 | 0.88     | 1.69           | No       | 0.31              | 1.69 | No      | -1.56 | 1.69  | No     | -0.76 | 1.69   | No     | 0.70  | 1.69  | No    |
| Ship Creek SW Outfail                                                                                                                                                                                                         | 8                            | 4.68                             | 1.0                         | 0.20  | 1.89                 | -2.23    | 1.80           | No       | -5.63             | 1.87 | No      | -8.29 | 1.73  | No     | -6.51 | 1.74   | No     | -3.91 | 1.88  | No    |
| Building 955                                                                                                                                                                                                                  | 6                            | 6.83                             | 2.2                         | 0.32  | 2.02                 | 0.78     | 1.90           | No       | -1.24             | 1.99 | No      | -5.52 | 1.80  | No     | -3,68 | 1.82   | No     | 0.23  | 2.00  | No    |
| Building 718                                                                                                                                                                                                                  | 21                           | 24.10                            | 3261                        | 135.4 | 1.72                 | 1.53     | 1.72           | No       | 1.42              | 1.72 | No      | 1.05  | 1.72  | No     | 1.21  | 1.72   | No     | 1.49  | 1.72  | No    |
| Buidling 704                                                                                                                                                                                                                  | 18                           | 25.72                            | 418.9                       | 16.29 | 1.74                 | 4.79     | 1.74           | Yes      | 4.50              | 1.74 | Yes     | 3.39  | 1.74  | Yes    | 3.85  | 1.74   | Yes    | 4.71  | 1.74  | Yes   |
| Building 796                                                                                                                                                                                                                  | 1                            | 10.00                            | N/A                         | N/A   | N/A                  | N/A      | N/A            | N/A      | N/A               | N/A  | N/A     | N/A   | N/A   | N/A    | N/A   | N/A    | N/A    | N/A   | N/A   | N/A   |
| Subsurface Soll                                                                                                                                                                                                               |                              |                                  |                             |       |                      |          |                |          |                   |      |         |       |       |        | •     |        | -      |       |       |       |
| Fire Training Pit                                                                                                                                                                                                             | 16                           | 11.44                            | 31.7                        | 2.77  | 1.75                 | 3.00     | 1.75           | Yes      | 2.32              | 1.75 | Yes     | -0.22 | 1.74  | No     | 0.82  | 1.74   | No     | 2.83  | 1.75  | Yes   |
| Grease Pits                                                                                                                                                                                                                   | 15                           | 9.00                             | 69.1                        | 4.61  | 1.76                 | -14.53   | 0.68           | No       | 0.67              | 1.76 | No      | -1.25 | 1.75  | No     | -0.43 | 1.75   | No     | 1.07  | 1.76  | No    |
| Dust Pallative Roadway                                                                                                                                                                                                        | N/A                          | N/A                              | N/A                         | N/A   | N/A                  | N/A      | N/A            | N/A      | N/A               | N/A  | No      | N/A   | N/A   | No     | N/A   | N/A    | No     | N/A   | N/A   | No    |
| Building 35-752                                                                                                                                                                                                               | 29                           | 16.30                            | 310.5                       | 19.05 | 1.70                 | 2.29     | 1.70           | Yes      | 2.00              | 1,70 | Yes     | 1.01  | 1.70  | No     | 1.43  | 1.70   | No     | 2.20  | 1.70  | Yes   |
| Ship Creek SW Outfall                                                                                                                                                                                                         | N/A                          | N/A                              | N/A                         | N/A   | N/A                  | N/A      | N/A            | N/A      | N/A               | N/A  | No      | N/A   | N/A   | No     | N/A   | N/A    | No     | N/A   | N/A   | No    |
| Building 955                                                                                                                                                                                                                  | 12                           | 5.50                             | 1.5                         | 0.28  | 1.80                 | -1.13    | 1.76           | No       | -3.72             | 1.78 | No      | -7.15 | 1.72  | No     | -5.37 | 1.72   | No     | -2.20 | 1.79  | No    |
| Building 718                                                                                                                                                                                                                  | 8                            | 5.38                             | 0.3                         | 0.05  | 1.89                 | -1.83    | 1.74           | No       | -7.97             | 1.81 | No      | -8.68 | 1.69  | No     | -6.77 | 1.69   | No     | -5.12 | 1.83  | No    |
| Building 704                                                                                                                                                                                                                  | 12                           | 9.25                             | 47.3                        | 5.11  | 1.80                 | 1.29     | 1.79           | No       | 0.75              | 1.80 | No      | -1.09 | 1.78  | No     | -0.31 | 1.79   | No     | 1.12  | 1.80  | No    |
| Building 796                                                                                                                                                                                                                  | 20                           | 38.60                            | 6938                        | 179.8 | 1.73                 | 2.41     | 1.73           | Yes      | 2.32              | 1.73 | Yes     | 1.99  | 1.73  | Yes    | 2.13  | 1.73   | Yes    | 2.38  | 1.73  | Yes   |
| footnotes:<br>N/A = not applicable,<br>N <sub>m</sub> = number of sam<br>X <sub>m</sub> = average or mean<br>S <sub>m</sub> <sup>2</sup> = variance,<br>W <sub>m</sub> = special weiging<br>t <sub>m</sub> = t-statistic at t | an of a<br>hting :<br>the 95 | (S <sub>m</sub> ²/N <sub>m</sub> | ).                          |       | ith N <sub>m</sub> - | 1 degree | es of fr       | eedom.   |                   |      |         |       |       |        |       |        |        |       |       |       |
| t° = t-test statistic<br>t° = critical t-test                                                                                                                                                                                 | C.                           |                                  |                             |       |                      | n uogrot |                |          |                   |      |         |       |       |        |       |        |        |       |       |       |

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Yes/No = If the absolute value of T\* is less than T<sup>o</sup>, then it is unlikely that the concentrations are different (ie, result is 'No').

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|                                           |         |          |                             |                |                |         |        |         | e 9.  |       |         | _     |       |        |       |         |        |       |        |       |
|-------------------------------------------|---------|----------|-----------------------------|----------------|----------------|---------|--------|---------|-------|-------|---------|-------|-------|--------|-------|---------|--------|-------|--------|-------|
|                                           |         |          |                             |                |                | St      | atisti | ical Ba | ckgro | und l | Evaluat |       |       |        |       |         |        |       | _      |       |
| Medium/                                   |         |          |                             |                |                | SI      | te Spe | cific   |       | All   |         |       | Surfa | e      | F     | loot Ze | one    | S     | ubsurl | ace   |
| Site                                      | Nm      | Xm       | S <sub>m</sub> <sup>2</sup> | W <sub>m</sub> | t <sub>m</sub> | T*      | Τ°     | Yes/No  | Тŧ    | Т⁰    | Yes/No  | T*    | ۲°    | Yes/No | T*    | Τ¢      | Yes/No | Т⁺    | T٩     | Yes/N |
| Surface Soll                              |         |          |                             |                |                |         |        |         |       |       |         |       |       |        |       |         |        |       |        |       |
| Fire Training Pil                         | 11      | 35.64    | 26.86                       | 2.44           | 1.81           | -0.95   | 1.71   | No      | 0.12  | 1.79  | No      | 1.19  | 1.76  | No     | -1.32 | 1.77    | No     | 0.08  | 1.77   | No    |
| Grease Pils                               | N/A     | N/A      | N/A                         | N/A            | N/A            | N/A     | N/A    | N/A     | N/A   | N/A   | N/A     | N/A   | N/A   | N/A    | N/A   | N/A     | N/A    | N/A   | N/A    | N/A   |
| Dust Pallative Roadway                    | 14      | 34.07    | 43.30                       | 3.09           | 1.77           | -1.15   | 1.70   | No      | -0.72 | 1.76  | No      | 0.39  | 1.74  | No     | -1.96 | 1.74    | No     | -0.70 | 1.74   | No    |
| Building 35-752                           | 36      | 34.00    | 38.83                       | 1.08           | 1.69           | -1.18   | 1.70   | No      | -1.16 | 1.68  | No      | 0.47  | 1.68  | No     | -2.66 | 1.69    | No     | -1.05 | 1.68   | No    |
| Ship Creek SW Outfall                     | 8       | 25.25    | 9.07                        | 1.13           | 1.89           | -2.37   | 1.71   | No      | -8.07 | 1.82  | No      | -4.72 | 1.77  | No     | -8.07 | 1.78    | No     | -7.10 | 1.79   | No    |
| Building 955                              | 6       | 43.33    | 17.87                       | 2.98           | 2.02           | 80.0    | 1.72   | No      | 4.26  | 1.97  | Yes     | 4.67  | 1.89  | Yes    | 2.42  | 1.91    | Yes    | 3.96  | 1.93   | Yes   |
| Bullding 718                              | 21      | 38.43    | 68.76                       | 3.27           | 1.72           | -0.57   | 1.70   | No      | 1.55  | 1.72  | No      | 2.33  | 1.71  | Yes    | 0.09  | 1.71    | No     | 1.43  | 1.71   | No    |
| Buldling 704                              | 18      | 39.00    | 46.59                       | 2.59           | 1.74           | -0.50   | 1.70   | No      | 2.04  | 1.73  | Yes     | 2.79  | 1.72  | Yes    | 0.38  | 1.72    | No     | 1.87  | 1.72   | Yes   |
| Building 796                              | 1       | 51,00    | N/A                         | N/A            | N/A            | N/A     | N/A    | N/A     | N/A   | N/A   | No      | N/A   | N/A   | No     | N/A   | N/A     | No     | N/A   | N/A    | No    |
| Subsurface Soll                           |         |          |                             |                |                |         |        |         |       |       |         | _     |       |        |       |         |        |       | _      |       |
| Fire Training Pit                         | 16      | 45,75    | 104.5                       | 6.53           | 1.75           | 0.39    | 1.71   | No      | 3.90  | 1.75  | Yes     | 4.37  | 1.74  | Yes    | 2.66  | 1.74    | Yes    | 3.75  | 1.74   | Yes   |
| Grease Pils                               | 15      | 36.07    | 157.4                       | 10.49          | 1.76           | -0.83   | 1.47   | No      | 0.19  | 1.76  | No      | 0.82  | 1.75  | No     | -0.63 | 1.75    | No     | 0.17  | 1.75   | No    |
| Dust Pallative Roadway                    | N/A     | N/A      | N/A                         | N/A            | N/A            | N/A     | N/A    | N/A     | N/A   | N/A   | No      | N/A   | N/A   | No     | N/A   | N/A     | No     | N/A   | N/A    | No    |
| Building 35-752                           | 29      | 33.93    | 21.61                       | 0.75           | 1.70           | -1.20   | 1,70   | No      | -1.38 | 1,68  | No      | 0.45  | 1.69  | No     | -2.91 | 1.69    | No     | -1.20 | 1.68   | No    |
| Ship Creek SW Outfall                     | N/A     | N/A      | N/A                         | N/A            | N/A            | N/A     | N/A    | N/A     | N/A   | N/A   | No      | N/A   | N/A   | No     | N/A   | N/A     | No     | N/A   | N/A    | No    |
| Building 955                              | 12      | 42.25    | 7 <b>8</b> .02              | 6.50           | 1.80           | -0.06   | 1.71   | No      | 2.58  | 1.79  | Yes     | 3.15  | 1.77  | Yes    | 1.42  | 1.78    | No     | 2.48  | 1.78   | Yes   |
| Building 718                              | 8       | 38.38    | 118.6                       | 14.82          | 1.89           | -0.53   | 1.74   | No      | 0.75  | 1.89  | No      | 1.27  | 1.87  | No     | 0.03  | 1.88    | No     | 0.73  | 1.88   | No    |
| Building 704                              | 12      | 36.67    | 63,88                       | 5,32           | 1.80           | -0.79   | 1.71   | No      | 0.51  | 1.78  | No      | 1.30  | 1.77  | No     | -0.61 | 1.77    | No     | 0.47  | 1.78   | No    |
| Building 796                              | 20      | 40.80    | 444.2                       | 22.21          | 1.73           | -0,22   | 1.24   | No      | 1.13  | 1.73  | No      | 1.55  | 1.73  | No     | 0.53  | 1.73    | No     | 1.10  | 1.73   | No    |
| Foolnotes:                                |         |          |                             |                |                |         | -      |         |       |       |         | -     | _     |        |       |         |        |       |        |       |
| N/A = not applicable.                     |         |          |                             |                |                |         |        |         |       |       |         |       |       |        |       |         |        |       |        |       |
| N <sub>m</sub> ⊨ number of sam            | iples.  |          |                             |                |                |         |        |         |       |       |         |       |       |        |       |         |        |       |        |       |
| X <sub>m</sub> = average or me            | an of s | sample p | opulatio                    | an.            |                |         |        |         |       |       |         |       |       |        |       |         |        |       |        |       |
| S <sub>m</sub> <sup>2</sup> = variance.   |         |          |                             |                |                |         |        |         |       |       |         |       |       |        |       |         |        |       |        |       |
| W <sub>m</sub> = special weig             | htina   | (S_2/N   | ).                          |                |                |         |        |         |       |       |         |       |       |        |       |         |        |       |        |       |
| t الم | -       |          |                             | a level v      | vith N         | -1 deor | ees of | freedom |       |       |         |       |       |        |       |         |        |       |        |       |
| t* = t-test statistic                     |         |          |                             |                |                | , aug   | 000 01 |         |       |       |         |       |       |        |       |         |        |       |        |       |
|                                           | υ,      |          |                             |                |                |         |        |         |       |       |         |       |       |        |       |         |        |       |        |       |

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t<sup>e</sup> = critical t-test statistic. Yes/No = if the absolute value of T\* is less than T<sup>e</sup>, then it is unlikely that the concentrations are different (ie, result is 'No').

#### SURFACE SOIL (< 2 ft deep); RESIDENTIAL

| Carcinogenic Compounds |       |                  |                                     |                                     |
|------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| Compound               | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
| 4,4'-DDT               | N     | 3.40E-01         | 4.30E-02                            | 1.31E-08                            |
| Benz(a)anthracene      | N     | 7.30E-01         | 1.50E-01                            | 9.80E-08                            |
| Benzo(b)fluoranthene   | N     | 7.30E-01         | 2.50E-01                            | 1.63E-07                            |
| Benzo(k)fluoranthene   | N     | 7.30E-02         | 2.50E-01                            | 1,63E-08                            |
| Benzo(a)pyrene         | N     | 7.30E+00         | 2.00E-01                            | 1.31E-06                            |
| Indeno(1,2,3-cd)pyrene | N     | 7.30E-01         | 2.00E-01                            | 1.31E-07                            |
| Total PCB              | N     | 7.70E+00         | 3.00E+00                            | 2.07E-05                            |

#### Total Carcinogenic Risk

#### Noncarcinogenic Compounds

| Compound               | VOC ? | RīDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |
|------------------------|-------|------------------|-------------------------------------|--------------------------------|
| 1,3,5-Trimethylbenzene | Y     | 4.00E-04         | 1.00E-02                            | 1.83E-04                       |
| 1,2,4-Trimethylbenzene | Y     | 5.00E-04         | 1.60E-02                            | 2.34E-04                       |
| Vanadium               | N     | 7.00E-03         | 5.19E+01                            | 5.42E-02                       |
| 4-isopropyttoluene     | N     | 4.00E-04         | 1.20E-02                            | 2.19E-04                       |
| 2-Methylnaphthalene    | N     | 4.00E-02         | 2.00E-04                            | 3.66E-08                       |
| Phenanthrene           | N     | 3.08E-01         | 1.50E-01                            | 3.56E-06                       |
| Benzo(g,h,i)perylene   | N     | 3.08E-02         | 2.00E-01                            | 4.75E-05                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

#### Total Hazard Index 5.49E-02

2.24E-05

# SUBSURFACE SOIL (> 2 ft deep); RESIDENTIAL

#### Carcinogenic Compounds

| Compound               | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT               | N     | 3.40E-01         | 3.70E-01                            | 2.25E-08                            |
| Benz(a)anthracene      | N     | 7.30E-01         | 5.25E-01                            | 6.86E-08                            |
| Benzo(b)fluoranthene   | N     | 7.30E-01         | 4.30E-01                            | 5.62E-08                            |
| Benzo(k)fluoranthene   | N     | 7.30E-02         | 4.10E-01                            | 5.36E-09                            |
| Benzo(a)pyrene         | N     | 7.30E+00         | 3.90E-01                            | 5.10E-07                            |
| Indeno(1,2,3-cd)pyrene | N     | 7.30E-01         | 3.90E-01                            | 5.10E-08                            |

#### Total Carcinogenic Risk

#### Noncarcinogenic Compounds

| Compound               | VOC 7 | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | In <del>crementa</del> l<br>Hazard<br>Index |
|------------------------|-------|------------------|-------------------------------------|---------------------------------------------|
| 1,3,5-Trimethylbenzene | Y     | 4.00Ë-04         | 8.26E-01                            | 3.01E-03                                    |
| 1,2,4-Trimethylbenzene | Y     | 5.00E-04         | 1.95E+00                            | 5.70E-03                                    |
| 4-Isopropyttoluene     | N     | 4.00E-04         | 3.20E-01                            | 1.17E-03                                    |
| 2-Methyinaphthalene    | N     | 4.00E-02         | 1.04E+00                            | 3.80E-05                                    |
| Phenanthrene           | N     | 3.08E-01         | 6.42E-01                            | 3.04E-06                                    |
| Benzo(g,h,i)perylene   | N     | 3.08E-02         | 3.90E-01                            | 1.85E-05                                    |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations

Total Hazard index

9.95E-03

7.13E-07

# SURFACE SOIL (< 2 ft deep); OCCUPATIONAL

#### Carcinogenic Compounds

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| Compound               | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT               | N     | 3.40E-01         | 4.30E-02                            | 1.54E-09                            |
| Benz(a)anthracene      | N     | 7.30E-01         | 1.50E-01                            | 1.15E-08                            |
| Benzo(b)fluoranthene   | N     | 7.30E-01         | 2.50E-01                            | 1,92E-08                            |
| Benzo(k)fluoranthene   | N     | 7.30E-02         | 2.50E-01                            | 1.92E-09                            |
| Benzo(a)pyrene         | N     | 7.30E+00         | 2.00E-01                            | 1.53E-07                            |
| Indeno(1,2,3-cd)pyrene | N     | 7.30E-01         | 2.00E-01                            | 1.53E-08                            |
| Total PCB              | N     | 7.70E+00         | 3.00E+00                            | 2.43E-06                            |

#### Total Carcinogenic Risk

# Noncarcinogenic Compounds

| Compound               | VOC 7 | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incrementai<br>Hazard<br>index |
|------------------------|-------|------------------|-------------------------------------|--------------------------------|
| 1,3,5-Trimethylbenzene | Y     | 4.00E-04         | 1.00E-02                            | 7.35E-06                       |
| 1,2,4-Trimethylbenzene | Y     | 5.00E-04         | 1.60E-02                            | 9.41E-06                       |
| Vanadium               | N     | 7.00E-03         | 5.19E+01                            | 2.18E-03                       |
| 4-isopropyttotuene     | N     | 4.00E-04         | 1.20E-02                            | 8.82E-06                       |
| 2-Methylnaphthalene    | N     | 4.00E-02         | 2.00E-04                            | 1,47E-09                       |
| Phenanthrene           | N     | 3.08E-01         | 1.50E-01                            | 1.43E-07                       |
| Benzo(g,h,i)perviene   | N     | 3.08E-02         | 2.00E-01                            | 1.91E-06                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard Index

SUBSURFACE SOIL (> 2 ft deep); OCCUPATIONAL

#### **Carcinogenic Compounds**

| Compound               | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT               | N     | 3.40E-01         | 3.70E-01                            | 2.64E-09                            |
| Benz(a)anthracene      | N     | 7.30E-01         | 5.25E-01                            | 8.05E-09                            |
| Benzo(b)fluoranthene   | N     | 7.30E-01         | 4.30E-01                            | 6.59E-09                            |
| Benzo(k)fluoranthene   | N     | 7.30E-02         | 4.10E-01                            | 6.29E-10                            |
| Benzo(a)pyrene         | N     | 7.30E+00         | 3.90E-01                            | 5.98E-08                            |
| Indeno(1,2,3-cd)pyrene | N     | 7.30E-01         | 3.90E-01                            | 5.98E-09                            |

Total Carcinogenic Risk 8.37E-08

#### Noncarcinogenic Compounds

| Compound               | VOC ? | RīDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |
|------------------------|-------|------------------|-------------------------------------|--------------------------------|
| 1,3,5-Trimethylbenzene | Y     | 4.00E-04         | 8.26E-01                            | 1.21E-04                       |
| 1,2,4-Trimethylbenzene | Y     | 5.00E-04         | 1.95E+00                            | 2.29E-04                       |
| 4-isopropyttoiuene     | Ν.    | 4.00E-04         | 3.20E-01                            | 4.70E-05                       |
| 2-Methylnaphthalene    | N     | 4.00E-02         | 1.04E+00                            | 1.53E-06                       |
| Phenanthrene           | N     | 3.08E-01         | 6.42E-01                            | 1.22E-07                       |
| Benzo(g,h,i)perylene   | N     | 3.08E-02         | 3.90E-01                            | 7_43E-07                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard Index

4.00E-04

2.63E-06

2.21E-03

#### BUILDING 35-752 GROUNDWATER

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# GROUNDWATER; RESIDENTIAL

| Carcinogenic Co | ompounds |
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| Compound                    | VOC 7 | CSFo,<br>Kg-d/mg | CSFi,<br>Kg-d/mg | Exposure<br>Concentration,<br>ug/L | Exposure<br>Concentration,<br>mg/L | incrementai<br>Carcinogenic<br>Risk |
|-----------------------------|-------|------------------|------------------|------------------------------------|------------------------------------|-------------------------------------|
| Benzene                     | Y     | 2.90E-02         | 2.90E-02         | 1,96E+01                           | 1.96E-02                           | 5.39E-05                            |
| Trichloroethene (TCE)       | Y     | 1,10E-02         | 6.00E-03         | 5.70E-01                           | 5.70E-04                           | 3.66E-07                            |
| Arsenic                     | N     | 1.75E+00         | 1.51E+00         | 4.09E+01                           | 4.09E-02                           | 1.07E-03                            |
| Bis(2-ethylhexyl) Phthalate | N     | 1.40E-02         | 1.40E-02         | 7.17E+00                           | 7.17E-03                           | 1.50E-06                            |
| Total PCB                   | N     | 7.70E+00         | 7.70E+00         | 9.00E-01                           | 9.00E-04                           | 1.03E-04                            |
|                             |       | Total Carcin     | ogenic Risk      |                                    |                                    | 1.23E-03                            |

#### Non-Carcinogenic Compounds

| Compound                    | VOC ? | RfDo,<br>mg/Kg-d | RīDi,<br>mg/Kg-d | Exposure<br>Concentration,<br>ug/l | Exposure<br>Concentration,<br>mg/L | incrementai<br>Hazard<br>Index |
|-----------------------------|-------|------------------|------------------|------------------------------------|------------------------------------|--------------------------------|
| 1,1,1-Trichloroethane (TCA) | Y     | 9.00E-02         | 2.86E-01         | 4.67E+00                           | -4.67E-03                          | 3.66E-03                       |
| 1,1-Dichloroethane          | Y     | 1.00E-01         | 1.43E-01         | 4.00E-01                           | 4.00E-04                           | 4.93E-04                       |
| 1,2,4-Trimethylbenzene      | Ŷ     | 5.00E-04         | 5.00E-04         | 5.20E+00                           | 5.20E-03                           | 1.71E+00                       |
| 1,3,5-Trimethylbenzene      | Y     | 4.00E-04         | 4.00E-04         | 1.42E+00                           | 1.42E-03                           | 5.84E-01                       |
| Ethylbenzene                | Y     | 1.00E-01         | 2.86E-01         | 9.39E+00                           | 9.39E-03                           | 7.07E-03                       |
| Toluene                     | Y     | 2.00E-01         | 1.14E-01         | 1.32E+00                           | 1.32E-03                           | 1.77E-03                       |
| Total Xylenes               | Ŷ     | 2.00E+00         | 2.00E+00         | 2_40E+01                           | 2.40E-02                           | 1.97E-03                       |
| Barium                      | N     | 7.00E-02         | 1.43E-04         | 9.08E+02                           | 9.08E-01                           | 3.55E-01                       |
| Cadmium                     | N     | 5.00E-04         | 5.00E-04         | 3,13E+00                           | 3.13E-03                           | 1.72E-01                       |
| Chromium                    | N     | 1.00E+00         | 5.71E-07         | 2.49E+02                           | 2.49E-01                           | 6.82E-03                       |
| Mercury                     | N     | 3.00E-04         | 8.57E-05         | 1.39E+00                           | 1.39E-03                           | 1.27E-01                       |
| Napthalene                  | N     | 4.00E-02         | 4.00E-02         | 4.36E+00                           | 4.36E-03                           | 2.99E-03                       |
| Nickel                      | N     | 2.00E-02         | 2.00E-02         | 3.60E+02                           | 3.60E-01                           | 4.93E-01                       |
|                             |       | Total Hazard     | Index            |                                    |                                    | 3.46E+00                       |

#### **Total Hazard Index**

#### GROUNDWATER; OCCUPATIONAL

#### Carcinogenic Compounds

| Compound                    | VOC ? | CSFo,<br>Kg-d/mg | CSFi,<br>Kg-d/mg | Exposure<br>Concentration,<br>ug/l | Exposure<br>Concentration,<br>mg/L | incremental<br>Carcinogenic<br>Risk |  |
|-----------------------------|-------|------------------|------------------|------------------------------------|------------------------------------|-------------------------------------|--|
| Benzene                     | Y     | 2.90E-02         | 2.90E-02         | 1.96E+01                           | 1.96E-02                           | 2.38E-05                            |  |
| Trichloroethene (TCE)       | Y     | 1.10E-02         | 6.00E-03         | 5,70E-01                           | 5.70E-04                           | 1.63E-07                            |  |
| Arsenic                     | N     | 1.75E+00         | 1.51E+00         | 4.09E+01                           | 4.09E-02                           | 5.00E-04                            |  |
| Bis(2-ethylhexyl) Phthalate | N     | 1.40E-02         | 1.40E-02         | 7.17E+00                           | 7.17E-03                           | 7.01E-07                            |  |
| Total PCB                   | Ν     | 7.70E+00         | 7.70E+00         | 9.00E-01                           | 9.00E-04                           | 4.84E-05                            |  |
| Total Carcinogenic Risk     |       |                  |                  |                                    |                                    |                                     |  |

### **Total Carcinogenic Risk**

#### Non-Carcinogenic Compounds

| Compound                    | VOC ? | RfDo,<br>mg/Kg-d | RfDi,<br>mg/Kg-d | Exposure<br>Concentration,<br>ug/i | Exposure<br>Concentration,<br>mg/L | incremental<br>Hazard<br>Index |
|-----------------------------|-------|------------------|------------------|------------------------------------|------------------------------------|--------------------------------|
| 1,1,1-Trichloroethane (TCA) | Y     | 9.00E-02         | 2.86E-01         | 4.57E+00                           | 4.67E-03                           | 2.61E-03                       |
| 1,1-Dichloroethane          | Y     | 1.00E-01         | 1.43E-01         | 4.00E-01                           | 4.00E-04                           | 3.52E-04                       |
| 1,2,4-Trimethylbenzene      | Y     | 5.00E-04         | 5.00E-04         | 5.20E+00                           | 5.20E-03                           | 1.22E+00                       |
| 1,3,5-Trimethylbenzene      | Y     | 4.00E-04         | 4.00E-04         | 1.42E+00                           | 1.42E-03                           | 4.17E-01                       |
| Ethylbenzene                | Y     | 1.00E-01         | 2.86E-01         | 9.39E+00                           | 9.39E-03                           | 5.05E-03                       |
| Toluene                     | Y     | 2.00E-01         | 1.14E-01         | 1.32E+00                           | 1.32E-03                           | 1.26E-03                       |
| Total Xylenes               | Y     | 2.00E+00         | 2.00E+00         | 2.40E+01                           | 2.40E-02                           | 1.41E-03                       |
| Barium                      | N     | 7.00E-02         | 1.43E-04         | 9.08E+02                           | 9.08E-01                           | 2.54E-01                       |
| Cadmium                     | N     | 5.00E-04         | 5.00E-04         | 3.13E+00                           | 3.13E-03                           | 1.22E-01                       |
| Chromium                    | N     | 1.00E+00         | 5.71E-07         | 2.49E+02                           | 2.49E-01                           | 4.87E-03                       |
| Mercury                     | N     | 3.00E-04         | 8.57E-05         | 1.39E+00                           | 1.39E-03                           | 9.06E-02                       |
| Napthalene                  | N     | 4.00E-02         | 4.00E-02         | 4.36E+00                           | 4.36E-03                           | 2.13E-03                       |
| Nickel                      | Ν     | 2.00E-02         | 2.00E-02         | 3.60E+02                           | 3.60E-01                           | 3.52E-01                       |

Total Hazard Index

2.12E+00

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#### BUILDING 718

#### SURFACE SOIL (< 2 ft deep); RESIDENTIAL

#### Carcinogenic Compounds

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|           | Compound | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogenic<br>Risk |
|-----------|----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT  |          | N     | 3.40E-01         | 6.00E-02                            | 1,83E-08                            |
| Total PCB |          | N     | 7.70E+00         | 4.13E-01                            | 2.85E-06                            |
|           |          |       | Total Carcino    | genic Risk                          | 2.86E-06                            |

# SUBSURFACE SOIL (>2 ft deep); RESIDENTIAL

#### Carcinogenic Compounds

|           | Compound | VOC ? | CSFo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-----------|----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4-DDT   |          | N     | 3.40E-01         | 1.00E-02                            | 6.09E-10                            |
| Total PCB |          | N     | 7.70E+00         | 0.00E+00                            | 0.00E+00                            |
|           |          |       | Total Carcino    | genic Risk                          | 6.09E-10                            |

#### SURFACE SOIL (< 2 ft deep); OCCUPATIONAL

#### **Carcinogenic Compounds**

|           | Compound | V0C ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogenic<br>Risk |
|-----------|----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT  |          | N     | 3.40E-01         | 6.00E-02                            | 2.14E-09                            |
| Total PCB |          | N     | 7.70E+00         | 4.13E-01                            | 3.34E-07                            |
|           |          |       | Total Carcino    | genic Risk                          | 3.36E-07                            |

#### SUBSURFACE SOIL (>2 ft deep); OCCUPATIONAL

# Carcinogenic Compounds

| Compound  | VOC ? | CSFo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogenic<br>Risk |
|-----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT  | N     | 3.40E-01         | 1.00E-02                            | 7,14E-11                            |
| Total PCB | N     | 7.70E+00         | 0.00E+00                            | 0.00E+00                            |

Total Carcinogenic Risk 7.14E-11

# SURFACE SOIL (< 2 ft deep); RESIDENTIAL

#### Carcinogenic Compounds

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| Compound  | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT  | N     | 3.40E-01         | 5.71E-01                            | 1.74E-07                            |
| Chlordane | Ν     | 1.30E+00         | 6.40E-01                            | 7.45E-07                            |
|           | Total | 9.19E-07         |                                     |                                     |

# SUBSURFACE SOIL (> 2 ft deep); RESIDENTIAL

#### Carcinogenic Compounds

| Compound  | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT  | N     | 3.40E-01         | 1.76E-01                            | 1.07E-08                            |
| Chlordane | N     | 1.30E+00         | 1.41E-01                            | 3.27E-08                            |
|           | Total | Carcinogenie     | c Risk                              | 4.34E-08                            |

#### SURFACE SOIL (< 2 ft deep); OCCUPATIONAL

#### Carcinogenic Compounds

| Compound  | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incr <del>emental</del><br>Carcin <del>ogenic</del><br>Risk |
|-----------|-------|------------------|-------------------------------------|-------------------------------------------------------------|
| 4,4-DOT   | N     | 3.40E-01         | 5.71E-01                            | 2.04E-08                                                    |
| Chlordane | N     | 1.30E+00         | 6.40E-01                            | 8.74E-08                                                    |
|           | Total | 1.08E-07         |                                     |                                                             |

#### SUBSURFACE SOIL (> 2 ft deep); OCCUPATIONAL

#### Carcinogenic Compounds

| Compound  | V0C 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4-DDT   | N     | 3.40E-01         | 1.76E-01                            | 1.26E-09                            |
| Chlordane | N     | 1.30E+00         | 1.41E-01                            | 3.84E-09                            |
|           | Total | 5.10E-09         |                                     |                                     |

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# SURFACE SOIL (< 2 ft deep); RESIDENTIAL

| Carcinogenic Compounds    |            |                  | _                                   |                                     |
|---------------------------|------------|------------------|-------------------------------------|-------------------------------------|
| Compound                  | VOC ?      | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
| Carbon Tetrachioride      | N          | 1,30E-01         | 2.50E-03                            | 2.91E-10                            |
|                           | Total      | Carcinogenic     | Risk                                | 2.91E-10                            |
| Noncarcinogenic Compound  | is         |                  |                                     |                                     |
| No Compounds of Concern   | VOC ?      | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Hazard<br>Index      |
|                           | Tot        | tai Hazard Inc   | Jex .                               | 0.00E+00                            |
| SUBSURFACE SOIL (> 2 ft d | eep); RESI | DENTIAL          |                                     |                                     |
| Carcinogenic Compounds    |            |                  |                                     |                                     |
| Compound                  | VOC ?      | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogenic<br>Risk |
| Carbon Tetrachloride      | N          | 1.30E-01         | 6.50E-03                            | 1.51E-10                            |
|                           | Total Carc | inogenic Risk    |                                     | 1.51E-10                            |
| Noncarcinogenic Compound  | is         |                  |                                     |                                     |
| No Compounds of Concern   | VOC ?      | RīDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index      |

Total Hazard Index

0.00E+00

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#### BUILDING 796

# SURFACE SOIL (< 2 ft deep); OCCUPATIONAL

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| Carcinogenic Compounds                      |          |                  | _                                   |                                |  |
|---------------------------------------------|----------|------------------|-------------------------------------|--------------------------------|--|
| Compound                                    | VOC ?    | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,          | incremental<br>Carcinogenic    |  |
| Carbon Tetrachloride                        | N        | 1.30E-01         | mg/Kg<br>2.50E-03                   | Risk<br>3 41E-11               |  |
|                                             | Total    | Carcinogenic     | : Risk                              | 3.41E-11                       |  |
| Noncarcinogenic Compounds                   |          |                  |                                     |                                |  |
| Compound                                    | VOC 7    | RīDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |  |
|                                             | 0.002+00 |                  |                                     |                                |  |
| SUBSURFACE SOIL (> 2 ft deep); OCCUPATIONAL |          |                  |                                     |                                |  |
| Carcinogenic Compounds                      |          |                  |                                     |                                |  |

CSFo, Exposure Incremental Compound VOC ? Kg-d/mg Concentration, Carcinogenic mg/Kg Risk Carbon Tetrachloride N 1.30E-01 6.50E-03 1.77E-11

Total Carcinogenic Risk 1.77E-11

Noncarcinogenic Compounds

|          |       | RfDo,   | Exposure       | Incremental |
|----------|-------|---------|----------------|-------------|
| Compound | VOC 7 | mg/Kg/d | Concentration, | Hazard      |
|          |       |         | mg/Kg          | Index       |

Total Hazard Index 0.00E+00

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9.56E-04

# GROUNDWATER; RESIDENTIAL

| Carcinogenic Compounds                        |             | <b>6</b> -7.                     | 005                              | <b>-</b>                           | <b>F</b>                           |                                     |
|-----------------------------------------------|-------------|----------------------------------|----------------------------------|------------------------------------|------------------------------------|-------------------------------------|
| Compound                                      | VOC 7       | CSFo,<br>Kg-d/mg                 | CSFi,<br>Kg-d/mg                 | Exposure<br>Concentration,<br>µg/l | Exposure<br>Concentration,<br>mg/L | incremental<br>Carcinogenic<br>Risk |
| Chloroform<br>Carbon Tetrachloride<br>Arsenic | Y<br>Y<br>N | 6.10E-03<br>1.30E-01<br>1.75E+00 | 8.05E-02<br>5.25E-02<br>1.51E+01 | 4.00E+00<br>7.00E-01<br>1.70E+01   | 4.00E-03<br>7.00E-04<br>1.70E-02   | 2.61E-05<br>4.29E-06<br>4.44E-04    |
|                                               |             |                                  | Total Carcin                     | ogenic Risk                        |                                    | 4.74E-04                            |
| Non-Carcinogenic Compound                     | ls          |                                  |                                  |                                    |                                    |                                     |
| Compound                                      | VOC ?       | RFDo<br>mg/Kg-d                  | RFDi<br>mg/Kg-d                  | Exposure<br>Concentration,<br>ug/l | Exposure<br>Concentration,<br>mg/L | incremental<br>Hazard<br>Index      |
| Toluene                                       | Y           | 2.00E-01                         | 1.14E-01                         | 1.00E+00                           | 1.00E-03                           | 1.34E-03                            |
|                                               |             |                                  | Total Hazard                     | Index                              |                                    | 1.34E-03                            |
| GROUNDWATER; OCCUPAT                          | IONAL       |                                  |                                  |                                    |                                    |                                     |
| Carcinogenic Compounds                        |             |                                  |                                  |                                    |                                    |                                     |
| Compound                                      | VOC 7       | CSFo,<br>Kg-d/mg                 | CSFi,<br>Kg-d/mg                 | Exposure<br>Concentration,<br>ug/l | Exposure<br>Concentration,<br>mg/L | incremental<br>Carcinogenic<br>Risk |
| Chloroform<br>Carbon Tetrachloride<br>Arsenic | Y<br>Y<br>N | 6.10E-03<br>1.30E-01<br>1.75E+00 | 8.05E-02<br>5.25E-02<br>1.51E+01 | 4.00E+00<br>7.00E-01<br>1.70E+01   | 4.00E-03<br>7.00E-04<br>1.70E-02   | 1.14E-05<br>1.92E-06<br>2.08E-04    |
|                                               |             |                                  | Total Carcin                     | ogenic Risk                        |                                    | 2.21E-04                            |
| Non-Carcinogenic Compound                     | is          |                                  |                                  |                                    |                                    |                                     |
| Compound                                      | VOC 7       | RFDo<br>mg/Kg-d                  | RFDI<br>mg/Kg-d                  | Exposure<br>Concentration,<br>ug/l | Exposure<br>Concentration,<br>mg/L | incremental<br>Hazard<br>Risk       |
| Toluene                                       | Y           | 2.00E-01                         | 1.14E-01                         | 1_00E+00                           | 1.00E-03                           | 9.56E-04                            |

Total Hazard Index

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# SURFACE SOIL (< 2 ft deep); RESIDENTIAL

Carcinogenic Compounds

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| Compound | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogenic<br>Risk |
|----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT | N     | 3.40E-01         | 4.78E+01                            | 1 45 <b>E-0</b> 5                   |
| 4,4'-DDE | N     | 3.40E-01         | 6.44E-01                            | 1.96E-07                            |

Total Carcinogenic Risk 1.47E-05

#### SUBSURFACE SOIL (> 2 ft deep); RESIDENTIAL

Carcinogenic Compounds

| Compound | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogenic<br>Risk |
|----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT | Ν     | 3.40E-01         | 1.09E-01                            | 6.63E-09                            |
| 4,4'-DDE | Ν     | 3.40E-01         | 5.00E-03                            | 3.04E-10                            |

| Total Carcinogenic Risk | 6.94E-09 |
|-------------------------|----------|
|                         |          |

1.73E-06

SURFACE SOIL (< 2 ft deep); OCCUPATIONAL

Carcinogenic Compounds

| Cor      | npound | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|----------|--------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT |        | N     | 3.40E-01         | 4.78E+01                            | 1.71E-06                            |
| 4,4'-DDE |        | N     | 3.40E-01         | 6.44E-01                            | 2.30E-08                            |

Total Carcinogenic Risk

SUBSURFACE SOIL (> 2 ft deep); OCCUPATIONAL

Carcinogenic Compounds

|          | Compound | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogenic<br>Risk |
|----------|----------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT |          | N     | 3.40E-01         | 1.09E-01                            | 7.78E-10                            |
| 4,4'-DDE |          | N     | 3.40E-01         | 5.00E-03                            | 3.57E-11                            |

Total Carcinogenic Risk 8.14E-10

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# SURFACE SOIL (< 2 ft deep); RESIDENTIAL

Carcinogenic Compounds

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| No Compounds of Concern     | VOC 7   | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-----------------------------|---------|------------------|-------------------------------------|-------------------------------------|
|                             | Total   | Carcinogenie     | : Risk                              | 0.00E+00                            |
| SURFACE SOIL (< 2 ft deep); | OCCUPAT | IONAL            |                                     |                                     |
| Carcinogenic Compounds      |         |                  |                                     |                                     |
| No Compounds of Concern     | VOC 7   | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|                             | Total   | 0.00E+00         |                                     |                                     |

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Italicized dose-response factors are proxies

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# SURFACE SOIL (< 2 ft deep); RESIDENTIAL

# OUD 0025707

#### **Carcinogenic Compounds**

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| Compound                                  | VOC 7 | CSFo,<br>Kg-d/mg  | Exposure<br>Conce <del>ntrat</del> ion,<br>mg/Kg | Incrementai<br>Carcinogenic<br>Risk |
|-------------------------------------------|-------|-------------------|--------------------------------------------------|-------------------------------------|
| Benzene                                   | Y     | 2.90E-02          | 1.93E+00                                         | 5.02E-08                            |
| 1,4-Dichlorobenzene                       | Y     | 2.40E-02          | 4.60E-01                                         | 9.88E-09                            |
| Total PCB                                 | N     | 7.70E+00          | 4.00E-01                                         | 2.76E-06                            |
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin       | N     | 1.56E+05          | 3.90E-07                                         | 5.45E-08                            |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin     | N     | 7.80E+04          | 2.70E-07                                         | 1.88E-08                            |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin    | N     | 1.56E+04          | 3.20E-07                                         | 4.47E-09                            |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin    | N     | 1.56E+04          | 3.80E-07                                         | 5.31E-09                            |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin    | N     | 1.56E+04          | 3.10E-07                                         | 4.33E-09                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | N     | 1.56E+03          | 6.70E-06                                         | 9.35E-09                            |
| OCDD                                      | N     | 1.55E+02          | 6.00E-05                                         | 8.38E-09                            |
| 2,3,7,8-Tetrachlorodibenzofuran           | N     | 1,56E+04          | 1.10E-07                                         | 1.54E-09                            |
| 1,2,3,7,8-Pentachlorodibenzofuran         | N     | 7.80E+03          | 1.90E-07                                         | 1.33E-09                            |
| 2,3,4,7,8-Pentachlorodibenzofuran         | N     | 7.80E+04          | 3.00E-07                                         | 2.09E-08                            |
| 1,2,3,4,7,8-Hexachiorodibenzofuran        | N     | 1.56E+04          | 1.30E-07                                         | 1.82E-09                            |
| 1,2,3,6,7,8-Hexachlorodibenzofuran        | N     | 1.56E+04          | 1.30E-07                                         | 1.82E-09                            |
| 2,3,4,6,7,8-Hexachlorodibenzoturan        | N     | 1,56E+04          | 3.14E-07                                         | 4.38E-09                            |
| 1,2,3,7,8,9-Hexachlorodibenzofuran        | N     | 1.56E+04          | 1.35E-07                                         | 1.88E-09                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran     | N     | 1.56E+03          | 1.79E-06                                         | 2.50E-09                            |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran     | N     | 1.56E+03          | 1.88E-07                                         | 2.62E-10                            |
| OCDF                                      | N     | 1. <b>56E+0</b> 2 | 4.25E-06                                         | 5.93E-10                            |
|                                           | Total | Carcinogenk       | : Risk                                           | 2.96E-06                            |

# Noncarcinogenic Compounds

| Compound                    | VOC 7 | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |
|-----------------------------|-------|------------------|-------------------------------------|--------------------------------|
| 1,3,5-Trimethylbenzene      | Y     | 4.00E-04         | 1.84E+01                            | 3.36E-01                       |
| 1,2,4-Trimethylbenzene      | Y     | 5.00E-04         | 4.88E+01                            | 7.14E-01                       |
| Cadmium                     | N     | 5.00E-04         | 5.00E-01                            | 7.31E-03                       |
| Isopropylbenzene            | N     | 4.00E-02         | 3.85E+00                            | 7.03E-04                       |
| 2-Hexanone                  | N     | 6.00E-01         | 1.14E+01                            | 1.39E-04                       |
| 4-Methyl-2-pentanone (MIBK) | N     | 6.00E-01         | 1.81E+00                            | 2.20E-05                       |
| n-Propylbenzene             | N     | 4.00E-02         | 6.42E+00                            | 1.17E-03                       |
| 4-Isopropyltoluene          | N     | 4.00E-04         | 2.48E+00                            | 4.53E-02                       |
| 2-Methyinaphthalene         | N     | 4 00E-02         | 8.35E+00                            | 1.53E-03                       |
| Di-n-butyl Phthalate        | N     | 1.00E-01         | 1.21E+00                            | 8.85E-05                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard Index

1.11E+00

# SURFACE SOIL (< 2 ft deep) OCCUPATIONAL

# OUD 0025708

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#### Carcinogenic Compounds

| Compound                                  | VOC 7 | CSFo,<br>Kg-d∕mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-------------------------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| Benzene                                   | Y     | 2.90E-02         | 1.93E+00                            | 5.89E-09                            |
| 1,4-Dichlorobenzene                       | Y     | 2.40E-02         | 4.60E-01                            | 1.16E-09                            |
| Total PCB                                 | N     | 7.70E+00         | 4.00E-01                            | 3.23E-07                            |
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin       | N     | 1.56E+05         | 3.90E-07                            | 6.39E-09                            |
| 1,2,3,7,8-Pentachlorodibenzo-p-dioxin     | N     | 7.80E+04         | 2.70E-07                            | 2.21E-09                            |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin    | N     | 1.56E+04         | 3.20E-07                            | 5.24E-10                            |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin    | N     | 1.56E+04         | 3.80E-07                            | 6.22E-10                            |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin    | N     | 1.56E+04         | 3.10E-07                            | 5.08E-10                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | N     | 1.56E+03         | 6.70E-06                            | 1.10E-09                            |
| OCDD                                      | N     | 1.56E+02         | 6.00E-05                            | 9.83E-10                            |
| 2,3,7,8-Tetrachlorodibenzofuran           | N     | 1.56E+04         | 1.10E-07                            | 1.80E-10                            |
| 1,2,3,7,8-Pentachlorodibenzofuran         | N     | 7.80E+03         | 1.90E-07                            | 1.56E-10                            |
| 2,3,4,7,8-Pentachlorodibenzofuran         | N     | 7.80E+04         | 3.00E-07                            | 2.46E-09                            |
| 1,2,3,4,7,8-Hexachlorodibenzofuran        | N     | 1.56E+04         | 1.30E-07                            | 2.13E-10                            |
| 1,2,3,6,7,8-Hexachlorodibenzofuran        | N     | 1.56E+04         | 1.30E-07                            | 2.13E-10                            |
| 2,3,4,6,7,8-Hexachlorodibenzofuran        | N     | 1.56E+04         | 3.14E-07                            | 5.14E-10                            |
| 1,2,3,7,8,9-Hexachlorodibenzofuran        | N     | 1.56E+04         | 1.35E-07                            | 2.21E-10                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran     | N     | 1.56E+03         | 1.79E-06                            | 2.93E-10                            |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran     | N     | 1.56E+03         | 1.88E-07                            | 3.08E-11                            |
| OCDF                                      | N     | 1.56E+02         | 4.25E-06                            | 6.96E-11                            |
|                                           | Totai | Carcinogenik     | - Risk                              | 3.47E-07                            |

#### Noncarcinogenic Compounds

| Compound                    | VOC 7 | RIDo,<br>mg/Kg/d | Exposure<br>Con <del>centra</del> tion,<br>mg/Kg | incremental<br>Hazard<br>Index |
|-----------------------------|-------|------------------|--------------------------------------------------|--------------------------------|
| 1,3,5-Trimethylbenzene      | Y     | 4.00E-04         | 1.84E+01                                         | 1.35E-02                       |
| 1,2,4-Trimethylbenzene      | Y     | 5.00E-04         | 4.88E+01                                         | 2.87E-02                       |
| Cadmium                     | N     | 5.00E-04         | 5.00E-01                                         | 2.94E-04                       |
| isopropyibenzene            | N     | 4.00E-02         | 3.85E+00                                         | 2.83E-05                       |
| 2-Hexanone                  | N     | 6.00E-01         | 1.14E+01                                         | 5.59E-06                       |
| 4-Methyl-2-pentanone (MIBK) | N     | 6.00E-01         | 1,81E+00                                         | 8.85E-07                       |
| n-Propylbenzene             | N     | 4.00E-02         | 6.42E+00                                         | 4.72E-05                       |
| 4-Isopropyttoluene          | N     | 4.00E-04         | 2.48E+00                                         | 1.82E-03                       |
| 2-Methylnaphthalene         | N     | 4.00E-02         | 8.35E+00                                         | 6.14E-05                       |
| Di-n-butyl Phthalate        | N     | 1.00É-01         | 1.21E+00                                         | 3.56E-06                       |

Note: major metal cations (AI, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard Index

4.25E-02

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# SUBSURFACE SOIL (> 2 ft deep); RESIDENTIAL

Carcinogenic Compounds

| Compound                                  | VOC 7 | CSFo,<br>Kg-d/mg        | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-------------------------------------------|-------|-------------------------|-------------------------------------|-------------------------------------|
| Benzene                                   | Y     | 2.90E-02                | 3.39E-01                            | 1.76E-09                            |
| 1,4-Dichlorobenzene                       | Y     | 2.40E-02                | 6.15E-01                            | 2.64E-09                            |
| Total PCB                                 | N     | 7.70E+00                | 2.04E+00                            | 2.81E-06                            |
| 2,3,7,8-Tetrachlorodibenzo-p-diction      | N     | 1.56E+05                | 3.90E-07                            | 1.09E-08                            |
| 1,2,3,7,8-Pentachlorodibenzo-p-dicxin     | N     | 7.80E+04                | 1.15E-06                            | 1.61E-08                            |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dicxin    | N     | 1.56E+04                | 1.52E-06                            | 4.25E-09                            |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-diction   | N     | 1.56E+04                | 1.89E-05                            | 5.29E-08                            |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin    | N     | 1.56E+04                | 4.48E-06                            | 1.25E-08                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | N     | 1.56E+03                | 2.38E-04                            | 6.66E-08                            |
| OCDD                                      | N     | 1.56E+02                | 2.07E-03                            | 5.79E-08                            |
| 2,3,7,8-Tetrachlorodibenzofuran           | N     | 1,56E+04                | 8.93E-07                            | 2.49E-09                            |
| 1,2,3,7,8-Pentachlorodibenzofuran         | N     | 7.80E+03                | 6.24E-07                            | 8.71E-10                            |
| 2,3,4,7,8-Pentachlorodibenzofuran         | N     | 7.80E+04                | 9.60E-07                            | 1.34E-08                            |
| 1,2,3,4,7,8-Hexachlorodibenzofuran        | N     | 1.56E+04                | 2.18E-06                            | 6.08E-09                            |
| 1,2,3,6,7,8-Hexachlorodibenzofuran        | N     | 1,56E+04                | 2.56E-06                            | 7.14E-09                            |
| 2,3,4,6,7,8-Hexachlorodibenzofuran        | N     | 1.56E+04                | 3.14E-07                            | 8.77E-10                            |
| 1,2,3,7,8,9-Hexachlorodibenzofuran        | N .   | 1.56E+04                | 5.14E-07                            | 1.44E-09                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran     | N     | 1.56E+03                | 1.05E-04                            | 2.94E-08                            |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran     | N     | 1,56E+03                | 3.47E-06                            | 9.69E-10                            |
| OCDF                                      | N     | 1.56E+02                | 4.21E-04                            | 1.17E-08                            |
|                                           |       | Total Carcinogenic Risk |                                     | 3.11E-06                            |

#### Noncarcinogenic Compounds

| Compound                    | VOC ? | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |
|-----------------------------|-------|------------------|-------------------------------------|--------------------------------|
| 1,3,5-Trimethylbenzene      | Y     | 4.00E-04         | 9.08E+00                            | 3.31E-02                       |
| 1,2,4-Trimethylbenzene      | Y     | 5.00E-04         | 1.33E+01                            | 3.89E-02                       |
| Cadmium                     | N     | 5.00E-04         | 1.10E+00                            | 3.21E-03                       |
| Isopropylbenzene            | N     | 4.00E-02         | 1.06E+00                            | 3.87E-05                       |
| 2-Hexanone                  | N     | 6.00E-01         | 1.06E+00                            | 2.58E-06                       |
| 4-Methyl-2-pentanone (MIBK) | N     | 6.00E-01         | 1.06E+00                            | 2.59E-06                       |
| n-Propylbenzene             | N     | 4.00E-02         | 1.59E+00                            | 5.81E-05                       |
| 4-Isopropyttoluene          | N     | 4.00E-04         | 1.48E+00                            | 5.38E-03                       |
| 2-Methyinaphthalene         | N     | 4.00E-02         | 1.92E+00                            | 7.01E-05                       |
| Di-n-butyl Phthalate        | N     | 1.00E-01         | 4.90E-01                            | 7.15E-06                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard Index

8.09E-02

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# SUBSURFACE SOIL (> 2 ft deep); OCCUPATIONAL

Carcinogenic Compounds

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| Compound                                   | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|--------------------------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| Benzene                                    | Y     | 2.90E-02         | 3.39E-01                            | 2.06E-10                            |
| 1,4-Dichlorobenzene                        | Y     | 2.40E-02         | 6.15E-01                            | 3.10E-10                            |
| Total PCB                                  | N     | 7.70E+00         | 2.04E+00                            | 3.30E-07                            |
| 2,3,7,8-Tetrachlorodibenzo-p-dicxin        | N     | 1.56E+05         | 3.90E-07                            | 1.28E-09                            |
| 1,2,3,7,8-Pentachiorodibenzo-p-dioxin      | N     | 7.80E+04         | 1.15E-06                            | 1.88E-09                            |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin     | N     | 1.56E+04         | 1.52E-06                            | 4.99E-10                            |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin     | N     | 1.56E+04         | 1.89E-05                            | 6.20E-09                            |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin     | N     | 1.56E+04         | 4.48E-06                            | 1.47E-09                            |
| 1,2,3,4,6,7,8-Heptachlorodibertzo-p-dioxin | N     | 1.56E+03         | 2.38E-04                            | 7.81E-09                            |
| OCDD                                       | N     | 1.56E+02         | 2.07E-03                            | 6.79E-09                            |
| 2,3,7,8-Tetrachiorodibenzofuran            | N     | 1.56E+04         | 8.93E-07                            | 2.93E-10                            |
| 1,2,3,7,8-Pentachlorodibenzofuran          | N     | 7.80E+03         | 6.24E-07                            | 1.02E-10                            |
| 2,3,4,7,8-Pentachlorodibenzofuran          | N     | 7.80E+04         | 9.60E-07                            | 1.57E-09                            |
| 1,2,3,4,7,8-Hexachlorodibenzofuran         | N     | 1.56E+04         | 2.18E-06                            | 7.13E-10                            |
| 1,2,3,6,7,8-Hexachlorodibenzofuran         | N     | 1.56E+04         | 2.56E-06                            | 8.37E-10                            |
| 2,3,4,6,7,8-Hexachlorodibenzofuran         | N     | 1.56E+04         | 3.14E-07                            | 1.03E-10                            |
| 1,2,3,7,8,9-Hexachlorodibenzofuran         | N     | 1.56E+04         | 5.14E-07                            | 1.68E-10                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran      | N     | 1.56E+03         | 1.05E-04                            | 3.45E-09                            |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran      | N     | 1.56E+03         | 3.47E-06                            | 1.14E-10                            |
| OCDF                                       | N     | 1.56E+02         | 4.21E-04                            | 1.38E-09                            |
|                                            |       | Total Carcin     | 3.65E-07                            |                                     |

#### Noncarcinogenic Compounds

| Compound                    | VOC 7 | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |
|-----------------------------|-------|------------------|-------------------------------------|--------------------------------|
| 1,3,5-Tnmethylbenzene       | Y     | 4.00E-04         | 9.08E+00                            | 1.33E-03                       |
| 1,2,4-Trimethylbenzene      | Y     | 5.00E-04         | 1.33E+01                            | 1.57E-03                       |
| Cadmium                     | N     | 5.00E-04         | 1.10E+00                            | 1.29E-04                       |
| Isopropyibenzene            | N     | 4.00E-02         | 1.06E+00                            | 1.56E-06                       |
| 2-Hexanone                  | N     | 6.00E-01         | 1.06E+00                            | 1.04E-07                       |
| 4-Methyl-2-pentanone (MIBK) | N     | 6.00E-01         | 1.06E+00                            | 1.04E-07                       |
| n-Propylbenzene             | N     | 4.00E-02         | 1.59E+00                            | 2.34E-06                       |
| 4-Isopropyttoluene          | N     | 4.00E-04         | 1.48E+00                            | 2.16E-04                       |
| 2-Methylnaphthalene         | N     | 4.00E-02         | 1.92E+00                            | 2.82E-06                       |
| Di-n-butyl Phthalate        | N     | 1.00E-01         | 4.90E-01                            | 2.88E-07                       |

Note: major metal cations (AI, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard Index

3.25E-03

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## SUBSURFACE SOIL (> 2 ft deep); RESIDENTIAL

Carcinogenic Compounds

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| Compound                | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | inc <del>remental</del><br>Carcinogenic<br>Risk |
|-------------------------|-------|------------------|-------------------------------------|-------------------------------------------------|
| Benzene                 | Y     | 2.90E-02         | 1.19E-01                            | 6.16E-10                                        |
| Tetrachloroethene (PCE) | Y     | 5.208-02         | 1.09E-01                            | 1.02E-09                                        |
|                         |       | 1.63E-09         |                                     |                                                 |

#### Noncarcinogenic Compounds

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| Compound                    | VOC ? | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |
|-----------------------------|-------|------------------|-------------------------------------|--------------------------------|
| Total Xylenes               | Y     | 2.00E+00         | 1.48E+01                            | 1.08E-05                       |
| Acetone                     | Y     | 1.00E-01         | 1.16E+00                            | 1.70E-05                       |
| 2-Butanone (MEK)            | Y     | 6.00E-01         | 4.55E-01                            | 4.45E-08                       |
| Toluene                     | Y     | 2.00E-01         | 1.10E-01                            | 8.03E-07                       |
| Ethylbenzene                | Y     | 1.00E-01         | 1.17E-01                            | 1.71E-06                       |
| Isopropylbenzene            | Y     | 4.00E-02         | 4.56E-01                            | 1.67E-05                       |
| 1,3,5-Trimethylbenzene      | Y     | 4.00E-04         | 1.07E+00                            | 3.90E-03                       |
| 1,2,4-Trimethylbenzene      | Y     | 5.00E-05         | 3.09E+00                            | 9.01E-02                       |
| Naphthaiene                 | Y     | 4.00E-02         | 1.01E+01                            | 3.68E-04                       |
| Mercury                     | N     | 3.00E-04         | 1.00E-01                            | 4.87E-04                       |
| Selenium                    | N     | 5.00E-03         | 5.00E-01                            | 1.46E-04                       |
| n-Propyibenzene             | Y     | 4.00E-02         | 4.56E+02                            | 1.67E-02                       |
| 2-Methyin#phthaiene         | Y     | 4.00E-02         | 2.46E+01                            | 8.97E-04                       |
| Bis(2-ethylhexyl) Phthalate | N     | 2.00E-02         | 5.94E-01                            | 4.34E-05                       |
| Di-n-octyl Phthalate        | N     | 2.00E-02         | 7.50E-01                            | 5.47E-05                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard Index

1.13E-01

#### SUBSURFACE SOIL (> 2 ft deep); OCCUPATIONAL

## Carcinogenic Compounds

| Compound                | VOC 7 | CSFo,<br>Kg-d/mg        | Exposure<br>Concentration,<br>mg/Kg | Inc <del>remental</del><br>Carcinogenic<br>Risk |  |
|-------------------------|-------|-------------------------|-------------------------------------|-------------------------------------------------|--|
| Benzene                 | Y     | 2.90E-02                | 1.19E-01                            | 7.22E-11                                        |  |
| Tetrachloroethene (PCE) | Y     | 5.20E-02                | 1.09E-01                            | 1.19E-10                                        |  |
|                         |       | Total Carcinogenic Risk |                                     |                                                 |  |

#### Noncarcinogenic Compounds

| Compound                    | VOC ? | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Hazard<br>Index |
|-----------------------------|-------|------------------|-------------------------------------|--------------------------------|
| Total Xylenes               | Y     | 2.00E+00         | 1.48E+01                            | 4.35E-07                       |
| Acetone                     | Y     | 1.00E-01         | 1.16E+00                            | 6.82E-07                       |
| 2-Butanone (MEK)            | Y     | 6.00E-01         | 4.55E-01                            | 4.45E-08                       |
| Toluene                     | Y     | 2.00E-01         | 1.10E-01                            | 3.23E-08                       |
| Ethylbenzene                | Y     | 1.00E-01         | 1.17E-01                            | 6.86E-08                       |
| isopropyibenzene            | Y     | 4.00E-02         | 4.56E-01                            | 6.70E-07                       |
| 1,3,5-Trimethylbenzene      | Y     | 4.00E-04         | 1.07E+00                            | 1.57E-04                       |
| 1,2,4-Trimethylbenzene      | Y     | 5.00E-05         | 3.09E+00                            | 3.62E-03                       |
| Naphthalene                 | Y     | 4.00E-02         | 1.01E+01                            | 1.48E-05                       |
| Mercury                     | N     | 3.00E-04         | 1.00E-01                            | 1.96E-05                       |
| Selenium                    | N     | 5,00E-03         | 5.00E-01                            | 5.87E-06                       |
| n-Propylbenzene             | Y     | 4.00E-02         | 4.56E+02                            | 6.70E-04                       |
| 2-Methylnaphthalene         | Y     | 4.00E-02         | 2.46E+01                            | 3.60E-05                       |
| Bis(2-ethylhexyl) Phthalate | N     | 2.00E-02         | 5.94E-01                            | 1.74E-06                       |
| Di-n-octyl Phthalate        | N     | 2.00E-02         | 7.50E-01                            | 2.20E-06                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard Index

4.53E-03

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## SURFACE SOIL (< 2 ft deep); RESIDENTIAL

**Carcinogenic Compounds** 

| Compound                                  | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogénic<br>Risk |
|-------------------------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT                                  | N     | 3.40E-01         | 1.10E-02                            | 3.35E-09                            |
| Arsenic                                   | N     | 1.75E+00         | 6.01E+00                            | 9 41E-06                            |
| Total DIOXINS                             | N     | 1.56E+05         | 5.37E-06                            | 7.50E-07                            |
| Total TCDD                                | N     | 1.56E+05         | 1.68E-07                            | 2.35E-08                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | N     | 1.56E+04         | 5.12E-07                            | 7.15E-09                            |
| OCDD                                      | N     | 1.56E+02         | 3.20E-06                            | 4.47E-10                            |
| 2,3,4,7,8-Pentachlorodibenzofuran         | N     | 7.80E+04         | 1.87E-07                            | 1.31E-08                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran     | N     | 1.56E+03         | 1.63E-07                            | 2.28E-10                            |
| OCDF                                      | N     | 1.56E+02         | 2.00E-07                            | 2.79E-11                            |

#### Total Carcinogenic Risk

Noncarcinogenic Compounds

| Compound           | VOC ? | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |
|--------------------|-------|------------------|-------------------------------------|--------------------------------|
| Chromium           | N     | 1.00E+00         | 3.63E+01                            | 2.65E-04                       |
| Nickel             | N     | 2.00E-02         | 5.30E+01                            | 1.94E-02                       |
| 4-Isopropyttoluene | N     | 4.00E-04         | 1.00E+01                            | 1.83E-01                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

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Total Hazard Index 2.02E-01
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## SUBSURFACE SOIL (>2 FT DEEP) RESIDENTIAL.

**Carcinogenic Compounds** 

| Compound                                  | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-------------------------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT                                  | N     | 3.40E-01         | 4.88E-02                            | 2.97E-09                            |
| Arsenic                                   | N     | 1.75E+00         | 5.48E+00                            | 1.72E-06                            |
| Total DIOXINS                             | N     | 1.56E+05         | 1.39E-05                            | 3.88E-07                            |
| Total TCDD                                | N     | 1.56E+05         | 1.35E-03                            | 3.77E-05                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | N     | 1.56E+04         | 8.72E-07                            | 2.43E-09                            |
| OCDD                                      | N     | 1.56E+02         | 4.70E-06                            | 1.31E-10                            |
| 2,3,4,7,8-Pentachlorodibenzofuran         | N     | 7.80E+04         | 3.30E-07                            | 4.61E-09                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran     | N     | 1.56E+03         | 4.80E-07                            | 1.34E-10                            |
| OCDF                                      | N     | 1.56E+02         | 3.60E-07                            | 1.01E-11                            |
|                                           | Total | c Risk           | 3.98E-05                            |                                     |

Noncarcinogenic Compounds

| Compound           | Voc 7 | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | Incrementai<br>Hazard<br>Index |
|--------------------|-------|------------------|-------------------------------------|--------------------------------|
| Chromium           | N     | 1.00E+00         | 3.19E+01                            | 4.662-05                       |
| Nickel             | N     | 2.00E-02         | 6.08E+01                            | 4.44E-03                       |
| 4-Isopropyitoluene | N     | 4.00E-04         | 4.96E+01                            | 1.81E-01                       |

Note: major metal cations (AI, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

Total Hazard index

1.86E-01

1.02E-05

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## SURFACE SOIL (< 2 ft deep); OCCUPATIONAL

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#### **Carcinogenic** Compounds

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| Compound                                  | VOC 7 | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Carcinogenic<br>Risk |
|-------------------------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT                                  | N     | 3.40E-01         | 1.10E-02                            | 3.93E-10                            |
| Arsenic                                   | N     | 1.75E+00         | 6.01E+00                            | 1.10E-06                            |
| Total DIOXINS                             | N     | 1.56E+05         | 5.37E-06                            | 8.80E-08                            |
| Total TCDD                                | N     | 1.56E+05         | 1.68E-07                            | 2,75E-09                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | N     | 1.56E+04         | 5.12E-07                            | 8.39E-10                            |
| OCDD                                      | N     | 1.56E+02         | 3.20E-06                            | 5.24E-11                            |
| 2,3,4,7,8-Pentachlorodibenzofuran         | N     | 7.80E+04         | 1.87E-07                            | 1.53E-09                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran     | N     | 1.56E+03         | 1.63E-07                            | 2.67E-11                            |
| OCDF                                      | N     | 1.56E+02         | 2.00E-07                            | 3.28E-12                            |
|                                           | Total | Carcinogenie     | c Risk                              | 1.20E-06                            |

Noncarcinogenic Compounds

| Compound           | VOC 7 | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incrementai<br>Hazard<br>Index |
|--------------------|-------|------------------|-------------------------------------|--------------------------------|
| Chromium           | N     | 1.00E+00         | 3.63E+01                            | 1.07E-05                       |
| Nickel             | N     | 2.00E-02         | 5.30E+01                            | 7.79E-04                       |
| 4-Isopropyltoluene | N     | 4.00E-04         | 1.00E+01                            | 7.35E-03                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

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Total Hazard Index 8.14E-03

#### SUBSURFACE SOIL (>2 FT DEEP) OCCUPATIONAL

**Carcinogenic Compounds** 

| Compound                                  | VOC ? | CSFo,<br>Kg-d/mg | Exposure<br>Concentration,<br>mg/Kg | Incremental<br>Carcinogenic<br>Risk |
|-------------------------------------------|-------|------------------|-------------------------------------|-------------------------------------|
| 4,4'-DDT                                  | N     | 3.40E-01         | 4.88E-02                            | 3.48E-10                            |
| Arsenic                                   | N     | 1,75E+00         | 5.48E+00                            | 2.01E-07                            |
| Total DIOXINS                             | N     | 1.56E+05         | 1,39E-05                            | 4,55E-08                            |
| Total TCDD                                | N     | 1.56E+05         | 1.35E-03                            | 4.43E-06                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | N     | 1.56E+04         | 8.72E-07                            | 2.86E-10                            |
| OCDD                                      | N     | 1.56E+02         | 4.70E-06                            | 1.54E-11                            |
| 2,3,4,7,8-Pentachlorodibenzofuran         | N     | 7.80E+04         | 3.30E-07                            | 5.41E-10                            |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran     | N     | 1.56E+03         | 4,80E-07                            | 1.57E-11                            |
| OCDF                                      | N     | 1.56E+02         | 3.60E-07                            | 1.18E-12                            |
|                                           | Total | c Risk           | 4.67E-06                            |                                     |

Noncarcinogenic Compounds

| Compound           | VOC 7 | RfDo,<br>mg/Kg/d | Exposure<br>Concentration,<br>mg/Kg | incremental<br>Hazard<br>Index |
|--------------------|-------|------------------|-------------------------------------|--------------------------------|
| Chromium           | N     | 1.00E+00         | 3,19E+01                            | 1.87E-06                       |
| Nickel             | N     | 2.00E-02         | 6.08E+01                            | 1.78E-04                       |
| 4-isopropyttoluene | Ν     | 4.00E-04         | 4.96E+01                            | 7.26E-03                       |

Note: major metal cations (Al, Ca, Fe, Mg, Mn, K, Na) eliminated from risk calculations.

#### Total Hazard Index

7.46E-03

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## BUILDING 35-752 WIPE SAMPLES SUMMARY STATISTICS FOR RISK ASSESSMENT

| METHOD | COMPOUND     | UNITS   | MRL | Ň  | Hits | MIN | MĂX   | MEAN  | 95% UCL |
|--------|--------------|---------|-----|----|------|-----|-------|-------|---------|
| PCB    | Aroclor 1254 | µg/wipe | . 1 | 32 | 32   | 6.0 | 750.0 | 122.9 | 179.1   |
| PCB    | Aroclor 1260 | µg/wipe | 1   | 32 | 19   | 0.5 | 39.0  | 10.2  | 14.0    |
| PCB    | TOTAL PCBs   | µg/wipe |     | 32 | 19   | 9.0 | 753.0 | 135.6 | 193.1   |

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## BUILDING 35-752 SUMMARY STATISTICS FOR RISK ASSESSMENT

|            |                             |       |      | <b>—</b> |                 | <b>SH</b> | ALLOW   | (0-2')         |                 |    |                    | 0     | EEP (> | 2')    |          |
|------------|-----------------------------|-------|------|----------|-----------------|-----------|---------|----------------|-----------------|----|--------------------|-------|--------|--------|----------|
| METHOD     | COMPOUND                    | UNITS | MRL  | Ň        | Hits            | MIN       | MAX     | MEAN           | 95% UCL         | Ň  | Hits               | MIN   | MAX    | MEAN   | 95% UCL  |
| PETHYDRO   | Toluene                     | µg/Kg | 5    | 20       | 3               | 2.5       | 8.0     | 3.0            | 3.6             | 36 | 2                  | 2.5   | 650    | 37.3   | 78.0     |
| PETHYDRO   | Ethylbenzene                | µg/Kg | 5    | 20       | 1               | 2.5       | 6.0     | 2.7            | 3.0             | 36 | 2                  | 2.5   | 2700   | 141.3  | 305.2    |
| PETHYDRO   | Total Xylanes               | µg/Kg | 5    | 20       | 7               | 2.5       | 38.0    | 6.3            | 9,5             | 36 | 7                  | 2.5   | 15000  | 808.4  | 1757.4   |
| PETHYDRO   | GRO                         | mg/Kg | 5    | 20       | 1               | 2.5       | 8,0     | 2.8            | 3,3             | 36 | 2                  | 2.5   | 920    | 53.2   | 112.9    |
| PETHYDRO   | DRO                         | mg/Kg | 10   | 20       | 17              | 5         | 776     | 151            | 240             |    | 18                 | 5     | 8150   | 295    | 679      |
| PETHYDRO   | ТРН                         | mg/Kg | 10   | 20       | 19              | 5         | 1700    | 261            | 438             | 36 | 21                 | 5     | 6900   | 295    | 626      |
| PESTICIDES | 4,4'-DDD                    | mg/Kg | 0.01 | 20       | 1               | 0,005     | 0.050   | 0.015          | 0.021           | 36 | 1-                 | 0.005 | 0.075  | 0,009  | 0.013    |
| PESTICIDES | 4,4'-DDT                    | mg/Kg | 0.01 | 20       | _ 2             | 0.005     | 0.120   | 0.029          | 0.043           | 36 | 5                  | 0.005 | 0.250  | 0.023  | 0.037    |
| PCBS       | Aroclor 1260                | mg/Kg | 0.1  | 20       | 12              | 0.05      | 8,70    | 1.25           | 2,06            | 36 | 9                  | 0.05  | 18.60  | 1.17   | 2,29     |
| PCBs       | TOTAL PCBs                  | mg/Kg |      | 20       | 12              | 0         | 15.6    | 2              | 3               | 36 | 9                  | 0     | 19     | 1      | **       |
| VOAs       | Acelone                     | µg/Kg | 50   | 20       | 2               | 25        | 710     | 79             | 146             | 36 | 2                  | 25    | 6500   | 373    | 781      |
| VOAs       | Methylene Chloride          | µg/Kg | 10   | 20       | 1               | 5         | 20      | 6              | 7               | 38 |                    | 輔協師   |        |        | 潮泉計159   |
| VOAs       | 2-Butanone (MEK)            | µg/Kg | 20   | 20       | 2               | 10        | 120     | 20             | 31              |    | 11 <b>0</b>        | 設設10  | 2650   | CC 153 | 4113-320 |
| VOAs       | cls-1,2-Dichloroethene      | µg/Kg | 5    | 20       | 1               | 2,5       | 6.0     | 2.7            | 3,0             | 36 | : <b>:</b> : : : 0 | 1.2.5 | 1850   | i#37,1 | 77.8     |
| VOAs       | Trichloroethene (TCE)       | µg/Kg | 5    | 20       | 2               | 2.5       | 34.0    | 4.5            | 7.2             | 38 | 6                  | 2.5   | 650    | 39.1   | 79.6     |
| VOAs       | Toluene                     | µg/Kg | 5    | 20       | 3               | 2.5       | 8.0     | 3.0            | 3.6             |    | 2                  | 2.5   | 650    | 37.3   | 78.0     |
| VOAs       | Ethylbenzene                | µg/Kg | 5    | 20       | 1               | 2.5       | 6.0     | 2.7            | 3.0             |    | 2                  | 2.5   | 2700   | 141.3  | 305.2    |
| VOAs       | Total Xylenes               | µg/Kg | 5    | 20       | 7               | 2.5       | 38.0    | 6.3            | 9.5             | 36 | 7                  | 2.5   | 15000  | 808.4  | 1757.4   |
| VOAs       | 1,3,5-Trimelhylbenzene      | µg/Kg | 20   | 20       | a 17 1 <b>D</b> | 過日10      | 。前年10   | 学校(10          | aria (2 10      | 36 | 2                  | 10    | 7800   | 362    | 826      |
| VOAs       | 1,2,4-Trimeihylbenzene      | µg/Kg | 20   | 20       | 3               | 10        | 46      | 13             | 16              | 36 | 2                  | 10    | 18000  | . 898  | 1953     |
| VOAs       | 4-Isopropylloluene          | µg/Kg | 20   | 20       | 1               | 10        | 21      | 11             | 12              | 36 | 220                | 器间10  | 2650   | 250 53 | A 320    |
| VOAs       | 1,4-Dichlorobenzene         | µg/Kg | 5    | 20       | n ta O          | 111.3     | 3 13    | 124 <b>3</b> 3 | 21pt 2573       | 36 | 1                  | 3     | 650    | 37     | 78       |
| VOAs       | Naphihalene                 | µg/Kg | 20   | 20       | 1               | 10        | 36      | 11             | 14              | 36 | 1                  | 10    | 5300   | 228    | 497      |
| SemI-VOAs  | Naphthalene                 | mg/Kg | 0.3  | 20       | 截10             | 101150    | 0.350   | 0.175          | 385 O 199       | 36 | 1                  | 0.150 | 3.000  | 0.271  | 0.421    |
| Semi-VOAs  | 2-Methyinaphthalene         | mg/Kg | 0.3  | 20       | I KEO           | 1.0.15    | 0135    | 月10,16         | HANKS0 20       | 36 | 2                  | 0,15  | 10.00  | 0,54   | 1.04     |
| Semi-VOAs  | Fluoranthene                | mg/Kg | 0,3  | 20       | 140             | MO15      | 670.35  | 11:0118        | NW 0.20         | 36 | 2                  | 0.15  | 3      | 0,28   | 0.42     |
| SemI-VOAs  | Pyrene                      | mg/Kg | 0,3  | 20       | ¥.10            | 140.15    | 0.05    | SA 0.18        | 1-118:0.20      | 36 | 2                  | 0.15  | 3      | 0,28   | 0.41     |
| SemI-VOAs  | Bis(2-ethylhexyl) Phthalate | mg/Kg | 0,3  | 20       | 1               | 0.15      | 0.80    | 0.20           | 0.26            | 36 | 100                | 磷0.15 | 13.00  | 0.25   | 0.38     |
| Semi-VOAs  | Chrysene                    | mg/Kg | 0.3  | 20       | 14.0            | 州0:15     | ¥0.35   | SED 18         | <b>承出版0:20</b>  | 38 | 3                  | 0.15  | 3.00   | 0,29   | 0.43     |
| Semi-VOAs  | Di-n-octyl Phthalate        | mg/Kg | 0.3  | 20       | 3               | 0.15      | 1.32    | 0.26           | 0.37            | 36 | 4                  | 0,15  | 3      | 0,29   | 0.43     |
| Semi-VOAs  | Benzo(b)fluoranthene        | mg/Kg | 0.3  | 20       | 1               | 0.15      | 0.70    | 0.20           | 0.25            | 36 | 2                  | 0,15  | 3      | 0,29   | 0.43     |
| Semi-VOAs  | Benzo(k)fluoranthene        | mg/Kg | 0.3  | 20       | 1               | 0.15      | 0.70    | 0.20           | 0.25            | 36 | 2                  | 0.15  | 3      | 0.28   | 0.41     |
| Semi-VOAs  | Benzo(a)pyrene              | mg/Kg | 0.3  | 20       | <u> <u></u></u> | 016       | 110,35  | 0.18           | Di 140 20       | 36 | 2                  | 0.15  | 3      | 0.25   | 0.39     |
| Semi-VOAs  | Indeno(1,2,3-cd)pyrene      | mg/Kg | 0.3  | 20       | 6¥0             | 趣0,15     | \$10.35 | PAD 18         | <b>16000.20</b> | 38 | 1                  | 0,15  | 3      | 0.25   | 0.39     |
| METALS     | Arsenic                     | mg/Kg | 1    | 20       | 20              | 4         | 8       | 6              | 6               | 36 | 36                 | 4     | 10     | 5      | ē        |
| METALS     | Barlum                      | mg/Kg | 1    | 20       | 20              | 47        | 99      | 73             | 80              | 36 | 36                 | 37    | 220    | 68     | 77       |
| METALS     | Chromlum                    | mg/Kg | 2    | 20       | 20              | 20        | 38      | 31             | 32              | 36 | 36                 | 21    | 42     | 31     | 33       |
| METALS     | Lead                        | mg/Kg | 1    | 20       | 20              | 5         | 94      | 15             | 23              | 36 | 36                 | 4     | 36     | 8      | 9        |

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#### BUILDING 35-752 SUMMARY STATISTICS FOR RISK ASSESSMENT

|        |                                                                      |       | -   |    |      | SH/   | ALLOW | (0-2') |         |    |      |       | )EEP ( > | 2')   |         |
|--------|----------------------------------------------------------------------|-------|-----|----|------|-------|-------|--------|---------|----|------|-------|----------|-------|---------|
| METHOD | COMPOUND                                                             | UNITS | MRL | N  | Hits | MIN   | MAX   | MEAN   | 95% UCL | N  | Hits | MIN   | MAX      | MEAN  | 95% UCL |
| METALS | Nickel                                                               | mg/Kg | 10  | 20 | 20   | 24    | 44    | 33     | 35      | 36 | . 36 | 23    | 49       | 34    | 35      |
| METALS | Aluminum                                                             | mg/Kg | 10  | 1  | 1    | 17000 | 17000 | 17000  | -       | 9  | 9    | 8620  | 19200    | 15169 | 17181   |
| METALS | Calcium                                                              | mg/Kg | 10  | 1  | 1    | 5620  | 5620  | 5820   |         | 9  | 9    | 3150  | 7220     | 4581  | 5372    |
| METALS | Cobalt                                                               | mg/Kg | 2   | _1 | 1    | 12    | 12    | 12     | -       | 9  | 9    | 7     | 13       | 11    | 12      |
| METALS | Copper                                                               | mg/Kg | 2   | 1  | 1    | 29    | 29    | 29     |         | 9  | 9    | 20    | 39       | 28    | 32      |
| METALS | Iron                                                                 | mg/Kg | 4   | 1  | 1    | 28800 | 28800 | 28600  | -       | 9  | 9    | 18500 | 30900    | 25311 | 27976   |
| METALS | Magneslum                                                            | mg/Kg | 2   | 1  | 1    | 7840  | 7840  | 7840   |         | 9  | 9    | 5930  | 10300    | 7651  | 8518    |
| METALS | Manganese                                                            | mg/Kg | 1   | 1  | 1    | 628   | 628   | 628    | -       | 9  | 9    | 383   | 720      | 532   | 596     |
| METALS | Potassium                                                            | mg/Kg | 400 | 1  | 1    | 570   | 570   | 570    |         | 9  | 7    | 200   | 810      | 450   | 547     |
| METALS | Sodium                                                               | mg/Kg | 20  | 1  | 1    | 134   | 134   | 134    | 4       | 9  | 9    | 65    | 171      | 120   | 139     |
| METALS | Vanadium                                                             | mg/Kg | 2   | 1  | 1    | 50    | 50    | 50     |         | 9  | 9    | 28    | 60       | 46    | 52      |
| METALS | Zinc                                                                 | mg/Kg | 2   | 1  | 1    | 63    | 63    | 63     |         | 9  | 9    | 47    | 86       | 63    | 71      |
|        | ded lines indicate compound wa<br>ndicates not calculable due to lov |       |     |    |      | -     | nge.  |        |         |    |      |       |          |       |         |

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## BUILDING 35-752- SEDIMENT SAMPLES SUMMARY STATISTICS FOR RISK ASSESSMENT

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|           |                             |       |      |   |      | SHAL   | LOW ( 0-2 | ?)     |         |
|-----------|-----------------------------|-------|------|---|------|--------|-----------|--------|---------|
| метно     | COMPOUND                    | UNITS | MRL  | N | Hits | MIN    | MAX       | MEAN   | 95% UCL |
| PetHydro  | ТРН                         | mg/Kg | 10   | 9 | 9    | 83.00  | 440.00    | 265.44 | 333.75  |
| Pesticide | 4,4'-DDD                    | mg/Kg | 0.01 | 9 | 5    | 0.02   | 0.10      | 0.04   | 0.06    |
| Pesticide | 4,4'-DDT                    | mg/Kg | 0.01 | 9 | 1    | 0.01   | 0.15      | 0.05   | 0.08    |
| PCB       | Aroclor 1260                | mg/Kg | 0.1  | 9 | 9    | 0.10   | 4.50      | 1.41   | 2.39    |
| PCBs      | TOTAL PCBs                  | mg/Kg |      | 9 | 9    | 0.40   | 4.80      | 1.71   | 2.69    |
| VOA       | Acetone                     | µg/Kg | 50   |   | 9    | 110.00 | 420.00    | 212.22 | 266.24  |
| VOA       | 2-Butanone (MEK)            | µg/Kg | 20   |   | 6    | 10.00  | 58.00     | 30.11  | 41.39   |
| VOA       | 1,1,1-Trichloroethane (TCA  | µg/Kg | 5    | 9 | 3    | 2.50   | 18.00     | 6.89   | 10.48   |
| VOA       | 1,4-Dichlorobenzene         | µg/Kg | 5    | 9 | 2    | 2.50   | 15.00     | 4.56   | 7.12    |
| SVOA      | Phenanthrene                | mg/Kg | 0.3  | 9 | 5    | 0.15   | 2.20      | 0.97   | 1.49    |
| SVOA      | Fluoranthene                | mg/Kg | 0.3  | 9 | 6    | 0.15   | 4,40      | 1.76   | 2.76    |
| SVOA      | Pyrene                      | mg/Kg | 0.3  | 9 | 4    | 0.15   | 5.40      | 1.25   | 2.31    |
| SVOA      | Benz(a)anthracene           | mg/Kg | 0.3  | 9 | 2    | 0.15   | 2.00      | 0.58   | 1.01    |
| SVOA      | Bis(2-ethylhexyl) Phthalate | mg/Kg | 0.3  | 9 | 1    | 0.15   | 2.00      | 0.41   | 0.79    |
| SVOA      | Chrysene                    | mg/Kg | 0.3  | 9 | 3    | 0.15   | 2.00      | 0.74   | 1.20    |
| SVOA      | Benzo(b)fluoranthene        | mg/Kg | 0.3  | 9 | 3    | 0.15   | 2.00      | 0.68   | 1.16    |
| SVOA      | Benzo(k)fluoranthene        | mg/Kg | 0.3  | 9 | 3    | 0.15   | 2.00      | 0.58   | 0,98    |
| SVOA      | Benzo(a)pyrene              | mg/Kg | 0.3  | 9 | 1    | 0.15   | 2.00      | 0.50   | 0.91    |
| SVOA      | Indeno(1,2,3-cd)pyrene      | mg/Kg | 0.3  | 9 | 1    | 0,15   | 2.00      | 0.42   | 0.80    |
| SVOA      | Benzo(g,h,i)perylene        | mg/Kg | 0.3  | 9 | 1    | 0.15   | 2.00      | 0.42   | 0.80    |
| Melals    | Arsenic                     | mg/Kg | 1    | 9 | 9    | 3.00   | 5.00      | 4.00   | 4.54    |
| Metals    | Barlum                      | mg/Kg | 1    | 9 | 9    | 44.00  | 114.00    | 80.89  | 97.69   |
| Metals    | Chromlum                    | mg/Kg | 2    | 9 | 9    | 26.00  | 46.00     | 37.56  | 41.83   |
| Metals    | Lead                        | mg/Kg | 1    | 9 | 9    | 14.00  | 61.00     | 31.33  | 40.56   |
| Metals    | Nickel                      | mg/Kg | 10   | 9 | 9    | 29.00  | 44.00     | 36.44  | 39.86   |

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| METHOD    |                             | UNITS | <b>MRL</b> | Ň  | HITS | MIN    | MAX     | MEAN   | 85% UCL |
|-----------|-----------------------------|-------|------------|----|------|--------|---------|--------|---------|
| PelHydro  | Benzene                     | μg/L  | 0.5        | 7  | 2    | 0.25   | 46.00   | 8.98   | 19.62   |
| PeliHydro | Tojuene                     | μg/L  | 0.5        |    | 1    | 0.25   | 2.80    | 0.61   | 1.32    |
| PelHydro  | Ethylbenzene                | ua/L  | 0.5        | 7  |      | 0.25   | 22.00   | 3.38   | 9.39    |
| PelHydro  | Total Xylanea               | µg4.  | 0.5        |    |      | 0.25   | 58.00   | 8.21   | 23.89   |
| PelHydro  | GRO                         | µg/L  | 50         | 7  |      | 25.00  | 292.00  | 63.14  | 137.28  |
| PelHydro  | ORO                         | ug/L  | 50         | 8  | 5    | 25.00  | 1310.00 | 296.38 | 598.54  |
| PelHydro  | ТРН                         |       | 200        |    | 1    | 100.00 | 500.00  | 150.00 | 244.73  |
| РСВ       | Aroclor 1260                | µ04.  | 0.2        | 8  | - 1  | 0.10   | 0.70    | 0.18   | 0.32    |
| PCB       | TOTAL PCB:                  | ug/L  |            | 10 | 3    | 0.70   | 1.30    | 0.78   | 0.90    |
| VOA       | 1.1-Dichlorosthane          | µg/L  | 0.5        | 7  | 1    | 0.25   | 0.60    | 0.30   | 0.40    |
| VOA       | 1.1.1-Trichloroethane (TCA) | µg/L  | 0.5        | 7  | 2    | 0.25   | 9.70    | 2.05   | 4.87    |
| VOA       | Benzene                     | μg/L  | 0.5        | 7  | 2    | 0.25   | 48.00   | 6.98   | 19,82   |
| VOA       | Trichloroethene (TCE)       | μα/L  | 0.5        | 7  | - 4  | 0.25   | 0.60    | 0.44   | 0.57    |
| VOA       | Toluane                     | ug/L  | 0.5        | 7  | 1    | 0.25   | 2.80    | 0.61   | 1,32    |
| VÕĂ       | Ethylbenzene                | µo/L  | 0.5        | 7  | 1    | 0.25   | 22.00   | 3.36   | 9,30    |
| VOA       | Total Xylenes               | µg/L  | 0.5        | 7  | 1    | 0.25   | 58.00   | 8.21   | 23,69   |
| VOA       | 1,3,5-Trimethylbenzene      | µo/L  | 2          | 7  | 1    | 1.00   | 2.00    | 1.14   | 1.42    |
| VOA       | 1,2,4-Trimethylbenzene      | µg/L  | 2          | 7  | 1    | 1.00   | 11.00   | 2.43   | 5.20    |
| VOA       | Naphthalene                 | µg/L  | 2          | 7  | 1    | 1.00   | 9.00    | 2.14   | 4.38    |
| SVOA      | Bis(2-ethylhexyl) Phihalate | µg/L  | 10         | ē  | 1    | 5,00   | 11.00   | 5.75   | 7.17    |
| Metal     | Arsenic                     | μg/L  | 5          | Ð  | Ð    | 5.00   | 52.00   | 31.25  | 40,92   |
| Motal     | Barium                      | lug/L | 5          | 8  | Ð    | 129.00 | 1480.00 | 831,00 | 907.58  |
| Melat     | Cedmlum                     | 40/L  | 3          | B  | 1    | 1.50   | 6.00    | 2.06   | 3.13    |
| Melal     | Chromlum                    | µg/L  | 5          | 8  | 8    | 17.00  | 402.00  | 169.88 | 248.86  |
| Metal     | Lesd                        | μαΛ.  | 2          | 8  | á    | 5.00   | 112.00  | 50.50  | 71.21   |
| Metal     | Mercury                     | μα/L  | 0.5        | 6  | ī    | 0.25   | 1.80    | 1.08   | 1.39    |
| Metal     | Nickel                      | Hg/L  | 20         | 8  | 8    | 25.00  | 546.00  | 250,75 | 359,64  |

#### BUILDING 35-762 WATER SAMPLE STATISTICAL SUMMARY FOR RISK ASSESSMENT

|          |          |       |     |   |      | SH/ | <b>LLOW</b> | (0-2') |         |
|----------|----------|-------|-----|---|------|-----|-------------|--------|---------|
| METHOD   | COMPOUND | UNITS | MRL | N | HITS | MIN | MAX         | MEAN   | 95% UCL |
| PelHydro | DRO      | mg/Kg | 10  | 8 | 1    | 5   | 16          | 6.4    | 9.0     |
| PetHydro | ТРН      | mg/Kg | 10  | 8 | 2    | 5   | 29          | 9,0    | 14.7    |
| METAL    | Arsenic  | mg/Kg | 1   | 8 | Ē    | 3   | 5           | 4.0    | 4.5     |
| METÁL    | 8arium - | mg/Kg | 1   | 8 |      | 31  | 52          | 39,3   | 43.9    |
| METAL    | Chromlum | mg/Kg | 2   | B | 8    | 28  | 37          | 31.6   | 33.7    |
| METAL    | Lead     | mg/Kg | 1   | 8 | 8    | 4   | 7           | 4.9    | 5.5     |
| METAL    | Nickel   | mg/Kg | 10  | 8 | 8    | 21  | 30          | 25.3   | 27.3    |

## SHIP CREEK SUMMARY STATISTICS FOR RISK ASSESSMENT

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## BUILDING 718 SUMMARY STATISTICS FOR RISK ASSESSMENT

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|          |                         |       |      |    |            | SHA     | LLOW  | {<2'}         |         |    | -            | D      | EEP (> | 2')           |              |
|----------|-------------------------|-------|------|----|------------|---------|-------|---------------|---------|----|--------------|--------|--------|---------------|--------------|
| METHOD   | COMPOUND                | UNITS | MRL  | Ň  | HITS       | MIN     | MAX   | MEAN          | 95% UCL | N  | HITS         | MIN    | MAX    | MEAN          | 95% UCL      |
| PETHYDRO | Toluene                 | µg/Kg | 5    | 21 | 5          | 2.5     | 250.0 | 27.0          | 54.9    | 8  |              | 2.5    | . 2.5  | sz 2,5        | <b>1</b> 2.5 |
| PETHYDRO | Total Xylenes           | µg/Kg | 5    | 21 | 6          | 2.5     | 250,0 | 27,4          | 55,3    | 8  | 0            | 1.2.5  | 2,5    | <b>第4 2 5</b> | JPE 2.5      |
| PETHYDRO | GRO                     | mg/Kg | 5    | 21 | 4          | 2.5     | 177.0 | 28.4          | 46,6    | 8  | 計約0          | 2,5    | 2.5    | <b>建设:5</b>   | 教制研 2.5      |
| PETHYDRO | DRO                     | mg/Kg | 10   | 21 | 21         | 12      | 24000 | 2189          | 4294    | 8  | 1            | 5      | 73     | 14            | 30           |
| PETHYDRO | ТРН                     | mg/Kg | 10   | 21 | 21         | 30      | 34000 | 4248          | 7936    | 8  | 1            | 5      | 200    | 29            | 76           |
| PEST     | 4,4'-DDD                | mg/Kg | 0.01 | 21 | 1          | 0.005   | 0.01  | 0.006         | 0.01    | 8  | 创成 P         | 0,005  | 0.01   | 0.005         | <133 0.01    |
| PEST     | 4,4'-DDT                | mg/Kg | 0.01 | 21 | 13         | 0.005   | 0.25  | 0.035         | 0.06    |    |              |        |        |               | 海道 0.01      |
| PEST     | 4,4'-DDE                | mg/Kg | 0.01 | 21 | 1          | 0.005   | 0.01  | 0.006         | 0.01    | :8 | 12 60        | 0.005  | £0:01  | 1×0.005       | 開以線 0.01     |
| PCB      | Aroclor 1260            | mg/Kg | 0.1  | 21 | 2          | 0.050   | 0.20  | 0.064         | 0.08    | 8  |              | 0.050  | ÷ 0.05 | 10,050        | V2 0.05      |
| PCBs     | TOTAL PCBs              | mg/Kg |      | 21 | 2          | 0.350   | 0.550 | 0.388         | 0.413   | 18 | 144\$ HO     | (調整)為0 | 0%¥40  |               | 123 200 TO 0 |
| VOA      | Acetone                 | µg/Kg | 50   | 21 | ⇒ <b>0</b> | · 16 25 | 2500  | an <b>261</b> | 制作的541  | 6  | 3            | 25     | 68     | 39            | 52           |
| VOA      | Toluene                 | µg/Kg | 5    | 21 | 5          | 2.5     | 250.0 | 27.0          | 54.9    | B  | <b>3</b> 970 | 2.5    | 前2.5   | 國際2.5         | 間離離。25       |
| VOA      | Tetrachloroethene (PCE) | µg/Kg | 5    | 21 | Ī          | 2.5     | 250.0 | 30.7          | 59.3    | B  |              | 4. 2.5 | 2.5    | 2.5           | 前前 44 2 5    |
| VOA      | Total Xylenes           | µg/Kg | 5    | 21 | 6          | 2.5     | 250.0 | 27.4          | 55.3    | 18 | <b>0</b>     | 2,5    | 1 2.5  | 25            | 1月36年。2.5    |
| METAL    | Arsenic                 | mg/Kg | 1    | 21 | 21         | 5       | 9     | 7             | 7       | 8  | 8            | 5      | Ð      | 7             | Ð            |
| METAL    | Barium                  | mg/Kg | 1    | 21 | 21         | 32      | 69    | 52            | 55      | 8  | 8            | 30     | 59     | 43            | 50           |
| METAL    | Chromlum                | mg/Kg | 2    | 21 | 21         | 22      | 42    | 29            | 31      | 8  | 8            | 26     | 50     | 33            | 38           |
| METAL    | Lead                    | mg/Kg | 1    | 21 | 21         | 5       | 267   | 24            | 46      | B  | 8            | 5      | 6      | 5             | 6            |
| METAL    | Nickel                  | mg/Kg | 10   | 21 | 21         | 27      | 63    | 38            | 42      | B  | ð            | 28     | 63     | 38            | 46           |

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| BUILDING 704                           |
|----------------------------------------|
| SUMMARY STATISTICS FOR RISK ASSESSMENT |

|          |                         |       |      |     |      | SHA   | LLOW | (<2') |            | _  |      | DI     | EEP ( > | 2' }  |         |
|----------|-------------------------|-------|------|-----|------|-------|------|-------|------------|----|------|--------|---------|-------|---------|
| METHOD   | COMPOUND                | UNITS | MRL  | N   | HITS | MIN   | MAX  | MEAN  | 95% UCL    | N  | HITS | MIN    | MAX     | MEAN  | 95% UCI |
| PETHYDRO | Toluene                 | µg/Kg | 5    | 18  | 3    | 2.5   | 12.0 | 3.5   | <b>4.5</b> | 12 | 1    | 2.5    | 8.0     | 3.0   | 3,1     |
| PETHYDRO | Total Xylenes           | µg/Kg | 5    | 18  | 3    | 2.5   | 12.0 | 3.6   | 4.7        | 12 | 3    | 2.5    | 9,0     | 3.6   | 4,      |
| PETHYDRO | GRO                     | mg/Kg | 5    | 18  | 2    | 2.5   | 11.0 | 3.1   | 4.0        | đ2 | si 0 | 1. 2.5 | 2.5     | 12.6  | 國建國2.0  |
| PETHYDRO | DRO                     | mg/Kg | 10   | 18  | 15   | 5     | 1454 | 248   | 392        | 12 | 6    | 5      | 133     | 30    | 5:      |
| PETHYDRO | ТРН                     | mg/Kg | 10   | 18  | 17   | 5     | 1600 | 419   | 578        | 12 | 5    | 5      | 400     | 67    | 13      |
| PEST     | 4,4'-DDD                | mg/Kg | 0.01 | 18  | 14   | 0.005 | 0.08 | 0.031 | 0.04       | 12 | 2    | 0.005  | 0.03    | 0.008 | 0.0     |
| PEST     | 4,4'-DDT                | mg/Kg | 0.01 | 18, | 17   | 0.005 | 1.54 | 0.401 | 0.57       | 12 | 4    | 0.005  | 0.58    | 0.083 | 0.1     |
| PEST     | 4,4'-DDE                | mg/Kg | 0.01 | 18  | 5    | 0.005 | 0.09 | 0.018 | 0.03       | 12 | 1    | 0,005  | 0.05    | 0.009 | 0.02    |
| PEST     | Chlordane               | mg/Kg | 0.1  | 18  | 3    | 0.050 | 2.50 | 0.331 | 0.64       | 12 | 1    | 0.050  | 0.40    | 0.088 | 0.14    |
| VOA      | Acetone                 | µg/Kg | 50   | 18  | 1    | 25    | 88   | 29    | 35         | 12 | 3    | 25     | 69      | 35    | 44      |
| VOA      | Toluene                 | µg/Kg | 5    | 18  | 3    | 2,5   | 12.0 | 3.5   |            | 12 | 1    | 2.5    | 8.0     | 3.0   | 3.0     |
| VOA      | Tetrachloroethene (PCE) | µg/Kg | 5    | 16  | (1)  | 12.5  | 1215 | 1215  | 14.442.5   | 12 | 1    | 2.5    | 6.0     | 2.8   | 3.:     |
| VOA      | Total Xylenes           | µg/Kg | 5    | 18  | 3    | 2.5   | 12.0 | 3,6   | 4.7        | 12 | 3    | 2.5    | 9.0     | 3.6   | 4.1     |
| METĀL    | Arsenic                 | mg/Kg | 1    | 18  | 18   | 5     | 12   | 7     | . 6        | 12 | 12   | 4      | 18      | 7     | 9       |
| METAL    | Barium                  | mg/Kg | 1    | 18  | 18   | 28    | 109  | 64    | 73         | 12 | 12   | 28     | .98     | 50    | 6       |
| METAL    | Chromium                | mg/Kg | 2    | 18  | 18   | 24    | 40   | 32    | 34         | 12 | 12   | 17     | 44      | 29    | 34      |
| METAL    | Lead                    | mg/Kg | 1    | 18  | 18   | 6     | 85   | 26    | 34         | 12 | 12   | 4      | 28      | 9     | 1       |
| METAL    | Nickel                  | mg/Kg | 10   | 10  | 18   | 26    | 48   | 39    | 42         | 12 | 12   | 25     | 50      | 37    | 4       |

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## BUILDING 796 SUMMARY STATISTICS FOR RISK ASSESSMENT

|          |                               |       |      | Γ  |          | SHA    | LLOW  | (0-2')        |                 | _  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0              | EEP ( > .      | 2')   |            |
|----------|-------------------------------|-------|------|----|----------|--------|-------|---------------|-----------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|-------|------------|
| METHOD   | COMPOUND                      | UNITS | MRL  | N  | HITS     | MIN    | MAX   | MEAN          | 95% UCL         | Ň  | HITS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | MIN            | MAX            | MEAN  | 95% UC     |
| PETHYDRO | Toluene                       | µg/Kg | 5    | 3  | -4°×60   | 溪幽2.5  | 2.5   | 2.5           | 1.2.5           | 19 | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.5            | 10.0           | 3.1   | <u>3</u> . |
| PETHYDRO | Total Xylenes                 | µg/Kg | 5    | 3  |          |        | 2,5   | 2.5           | 2,5             | 19 | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.5            | 14.0           | 3.7   | 5.         |
| PETHYDRO | DRO                           | mg/Kg | 10   | Į. | V ( V    | 14 E B | 陸3:5  | <b>3.44</b> 5 | <b>御殿</b> を     | 18 | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5              | 364            | 46    | 8          |
| PETHYDRO | TPH                           | mg/Kg | 10   | Ī  | 1        | 950    | 950   | 950           |                 | 18 | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5              | 730            | 71    | 14         |
| PEST     | 4,4'-DDT                      | mg/Kg | 0.01 | T  | 1        | 0.01   | 0.01  | 0.01          | -               | 15 | . in the second | 10 <b>,005</b> | <b>7,00.01</b> | 0.005 | inge 0.0   |
| VOA      | Acetone                       | µg/Kg | 50   | 13 | <b>1</b> | 震:25   | AX25  | 2. 4 25       | <b>讨作到於25</b>   | 19 | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 25             | 83             | 34    | 4          |
| VOA      | Chloroform                    | µg/Kg | 5    | 3  | 翻滾0      | 2.5    | 2.5   | Sec.2.5       | 120 1 2 5       | 19 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.5            | 5.0            | 2.6   | 2.         |
| VOA      | Carbon Tetrachloride          | µg/Kg | 5    | 3  | 保護0      | 合約2.5  | 2.6   | 1125          | <b>服料型</b> 第2.5 | 19 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.5            | 30.0           | 3,9   | 6.         |
| VOA      | Trichloroethene (TCE)         | µg/Kg | 5    | 3  | 0        | 2.5    | 12.5  | 2.5           | A. B. 2.5       | 19 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.5            | 8.0            | 2,8   | 3.         |
| VOA      | Toluene                       | µg/Kg | 5    |    |          |        |       |               | · 建卡尔 2.5       |    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.5            | 10.0           | 3.1   | 3.         |
| VOA      | Total Xylenes                 | µg/Kg | 5    | 3  |          | 1 2.5  | 2.5   | 运输2/5         | 新达(法2.5         | 19 | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.5            | 14.0           | 3.7   | 5.0        |
| VOA      | 1,2,4-Trichlorobenzene        | µg/Kg | 20   | 3  | 新教 0     | 据每110  | 达;为10 | 翻過約0          | 453的标志10        | 19 | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10             | 25             | 11    | 1:         |
| METAL    | Arsenic                       | mg/Kg | 1    | Ī  | 1        | 10     | 10    | 10            | 1               | 20 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4              | 12             | 6     |            |
| METAL    | Berlum                        | mg/Kg | 1    | Ī  | 1        | 55     | 55    | 55            |                 | 20 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 26             | 72             | 48    | 5          |
| METAL    | Chromlum                      | mg/Kg | 2    | T  | 1        | 37     | 37    | 37            |                 | 20 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 20             | 129            | 37    | 4          |
| METAL    | Lead                          | mg/Kg | 1    | 1  | 1        | 10     | 10    | 10            |                 | 20 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5              | 357            | 39    | 7          |
| METAL    | Nickel                        | mg/Kg | 10   | 1  | 1        | 51     | 51    | 51            |                 | 20 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 13             | 94             | 41    | 4:         |
| OTHER    | рН                            | none  | 1    | 1  | 1        | 7.47   |       | 7.47          | -               | 20 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4.73           | 7.77           | 6.84  | 7.1        |
| OTHER    | Oxidation-Reduction Potential | none  | -    | Ō  | N 110    | 0.0D0  | 0,00  | 5 開始          | 關於 前一           | 11 | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 200            | 310            | 242   | 26         |
| OTHER    | Sulfate                       | mg/Kg | 3    | 1  | 1        | 5.2    |       |               |                 | 20 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6.3            | 3500.0         | 529.4 | 883.       |

## BUILDING 955 SUMMARY STATISTICS FOR RISK ASSESSMENT

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|          |                             |        |      | 1  |         | SH    | ALLOW  | (0-2') |          |    |         | D      | EEP ( >        | 2')      |          |
|----------|-----------------------------|--------|------|----|---------|-------|--------|--------|----------|----|---------|--------|----------------|----------|----------|
| METHOD   | COMPOUND                    | UNITS  | MRL  | Ň  | HITS    | MIN   | MAX    | MEAN   | 95% ÜCL  | N  | HITS    | MIN    | MAX            | MEAN     | 95% UCI  |
| PETHYDRO | Totuene                     | µg/Kg  | 5    | 6  | 2       | 2.5   | 9.0    | 4.5    | 7.1      | 12 | 4       | 2.5    | 700.0          | 91.3     | 203.3    |
| PETHYDRO | Total Xylenes               | µg/Kg  | 5    | 6  |         | 2.5   |        | 4.3    | 5.9      |    | 6       | 2.5    | 700.0          | 92.0     | 203.0    |
| PETHYDRO | GRO                         | mg/Kg  | 5    | ß  | 14 ga 0 | 2.6   | 1, 2,5 | 2.5    | 创, 中心2.5 | 12 | 2       | 2.5    | 60.0           | 8,8      | 17.5     |
| PETHYDRO | DRO                         | mg/Kg  | 10   | 6  |         | 5     | 353    |        | 190      | 12 | 5       | 5      | 1720           | 244      | 510      |
| PETHYDRO | ТРН                         | mg/Kg  | 10   | 6  | 4       | 5     | 260    | 62     | 142      | 12 | 4       | 5      | 740            | 107      | 221      |
| PEST     | 4,4'-DDT                    | mg/Kg  | 0.01 | 6  | 6       | 0.01  | 95,00  | 15.94  | 47.80    | 12 | 3       | 0.005  | 0.400          | 0.050    | 0,109    |
| PEST     | 4,4'-DDE                    | mg/Kg  | 0.01 | 6  | 3       | 0.005 | 1.270  | 0.221  | 0.644    | 12 | 1.0     | 0.005  | 0.005          | 1.0.005  | 0,00     |
| VOA      | Acetone                     | µg/Kg  | 50   | 6  | 2       | 25    | 79     | 41     | 62       | 12 | 1       | 25     | 7000           | 899      | 2021     |
| VOA      | Toluene                     | µg/Kg  | 5    | 8  | 2       | 2.5   | 9.0    | 4.5    | 7.1      | 12 | 4       | 2.5    | 700.0          | 91.3     | 203.3    |
| VOA      | Total Xylenes               | µg/Kg  | 5    | 6  | 3       | 2.5   | 7.0    | 4.3    | 5.9      | 12 | 6       | 2.5    | 700.0          | 92.0     | 203,6    |
| SVOA     | Bis(2-ethylhexyl) Phthalate | mg/Kg  | 0.3  | e  | 1       | 0.15  | 2,00   | 0.46   | 1.08     | 12 | 1. Sec. | :60,15 | ab <b>0.76</b> | let 0,20 | fei 0.26 |
| WETAL    | Arsenic                     | mg/Kg  | 1    | 6  | 6       | 5     | 6      | 6      | 7        | 12 | 12      | 4      | 7              | 6        | 6        |
| METAL    | Barlum                      | mg/Kg  | 1    | 6  | 6       | 52    | 157    | 102    | 144      | 12 | 12      | 46     | 70             | 58       | 60       |
| METAL    | Chromium                    | mg/Kg  | 2    | 6  | 6       | 31    | 41     | 35     | 38       | 12 | 12      | 21     | 47             | 33       | 37       |
| METAL    | Lead                        | mg/Kg_ | 1    | 6  | 6       | 5     | 9      | 7      | 8        | 12 | 12      | 4      | 8              | 6        |          |
| METAL    | Nickel                      | mg/Kg  | 10   | 18 | 6       | 38    | 49     | 43     | 47       | 12 | 12      | 31     | 59             | 42       | 47       |

## DUST PALLATIVE ROADWAY SUMMARY STATISTICS FOR RISK ASSESSMENT

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| [        |                             |       | 1    |    |      | SH/    | LLÓW ( | 0-2')   |         |
|----------|-----------------------------|-------|------|----|------|--------|--------|---------|---------|
| METHOD   | COMPOUND                    | UNITS | MRL  | N  | HITS | MIN    | MAX    | MEÂN    | 95% UCL |
| PETHYDRO | ТРН                         | mg/Kg | 10   | 14 | 14   | 39.000 | 260.00 | 101.571 | 127.84  |
| PEST     | 4,4'-DDT                    | mg/Kg | 0.01 | 14 | 9    | 0.005  | 0.18   | 0.051   | 0.08    |
| SVOA     | Bis(2-ethylhexyl) Phthalate | mg/Kg | 0.3  | 14 | 2    | 0.150  | 0.90   | 0.246   | 0.35    |
| METAL    | Arsenic                     | mg/Kg | 1    | 14 | 14   | 5.000  | 8.00   | 6.286   | 6.68    |
| METAL    | Barlum                      | mg/Kg | 1    | 14 | 14   | 41.000 | 81.00  | 56,357  | 62.78   |
| METÁL    | Chromium                    | mg/Kg | 2    | 14 | 14   | 16.000 | 43.00  | 27.643  | 31.69   |
| METAL    | Lead                        | mg/Kg | 1    | 14 | 14   | 7.000  | 27.00  | 14.000  | 17.04   |
| METAL    | Nickel                      | mg/Kg | 10   | 14 | 14   | 22.000 | 42.00  | 34.071  | 37,19   |

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#### FIRE TRAINING PITS SUMMARY STATISTICS FOR RISK ASSESSMENT

|          |                             |       |      | F           |        | SH       | ALLOW (           | 0-2')   |            | <u> </u> |      | · · ·  | DEEP (>2    | P)       |           |
|----------|-----------------------------|-------|------|-------------|--------|----------|-------------------|---------|------------|----------|------|--------|-------------|----------|-----------|
| METHOD   | COMPOUND                    | UNITS | MRL  | N           | HITS   | MIN      | MAX               | MEAN    | 95% UCL    | N        | HITS | MIN    | MAX         | MEAN     | 95% UCL   |
| PETHYDRO | Benzene                     | µg/Kg | 5    | 11          |        | 2.5      | 5200.0            | 1031.0  | 1993.5     | 16       | 2    | 2.5    | 1000.0      | 189.7    | 339.6     |
| PETHYDRO | Toluene                     | µg/Kg | 5    | 11          | Ę      | 7        | 240000            | 40974   | 87398      | 16       | 13   | 2.5    | 1900        | 267      | 496       |
| PETHYDRO | Ethylbenzene                | µg/Kg | 5    | 11          | 6      | 2,5      | 39000,0           | 6006,1  | 12493.7    | 16       | 8    | 2.5    | 7500.0      | 671.6    | 1494.2    |
| PETHYDRO | Total Xylenes               | µg/Kg | 5    | 11          | 11     | 7        | 380000            | 73386   | 142112     | 16       | 15   | 2.5    | 68000       | 8180     | 16636     |
| PETHYDRO | GRO                         | mg/Kg | 5    | 11          | ę      | 2.5      | 12000.0           | 2515.3  | 4422.4     | 16       | 7    | 2.5    | 1800.0      | 257.8    | 487.1     |
| PETHYDRO | DRO                         | mg/Kg | 10   | 11          | 11     | 64       | 5370              | 1526    | 2440       | 16       | 11   | 5      | 3610        | 683      | 1158      |
| PETHYDRO | трн                         | mg/Kg | 10   | 11          | 11     | 89       | 8100              | 2383    | 3786       | 16       | 14   | 5      | 17000       | 2185     | 4078      |
| PEST     | 4,4'-DDD                    | mg/Kg | 0.01 | 41          | 北西     | 0,005    | HU-0.005          | 0.005   | ar 310.005 | 16       | 2    | 0.005  | 0.040       | 0.009    | 0.013     |
| PEST     | 4,4'-DDE                    | mg/Kg | 0.01 | -11         | 5. HI  | 0.005    | iner, 0,005       | 0,005   | 0.005      | 16       | 1    | 0,005  | 0.070       | 0.010    | 0.017     |
| PCB      | Aroclor 1232                | mg/Kg | 0.1  | 11          | 1000   | 20,05    |                   |         | 14:14 0.05 | 16       | 1    | 0.05   | 3.60        | 0.43     | 0.85      |
| PCB      | Aroclor 1248                | mg/Kg | 0.1  | <b>;1</b> ] |        | 20.05    | 1:410,05          | 1, 0,05 |            | 16       | 1    | 0.05   | 0.75        | 0.13     | 0,20      |
| PCB      | Aroclor 1254                | mg/Kg | 0.1  |             |        |          |                   |         | 0.05       | 16       | 1    | 0.05   | 0,40        | 0.13     | 0.16      |
| PCB      | Aroclor 1260                | mg/Kg | 0.1  | 11          |        |          | 科44,0,05          |         |            | 16       |      | 0,05   | 0.50        | 0.10     | 0.16      |
| PCBs     | TOTAL PCBs                  | mg/Kg |      |             | 1 Line |          |                   |         | XC-11-0,4  | 16       |      | 0,35   | 6.05        | 1.24     | 2.04      |
| VOA      | Acetone                     | µg/Kg | 50   | 11          | 1      | 25       |                   |         | 4606       | 16       | 12   | 52     | 7000        | 2032     | 3305      |
| VOA      | Methylene Chloride          | µg/Kg | 10   | 11          | 1      |          |                   |         | 905        | 16       | 2    | 5      | 1350        | 297      | 531       |
| VOA      | 2-Butanone (MEK)            | µg/Kg | 20   | 11          | 1      |          |                   |         |            | 16       | 8    | 10     | 3200        | 954      | 1480      |
| VOA      | Benzene                     | µg/Kg | 5    | 11          | 3      |          | 5200.0            |         | 1993.5     | 16       |      | 2.5    | 1000.0      | 189.7    | 339,8     |
| VOA      | 2-Hexanone                  | µg/Kg | 20   | 11          |        |          | 41000             | 1       | 11399      | 16       |      | 10     |             | 593      | 1062      |
| VOA      | Toluene                     | µg/Kg | 5    | 11          |        |          | 240000            | 40974   | 87398      | 16       | 13   | 2.5    | 1900.0      | 266.8    | 496.2     |
| VOA      | 4-Melhyl-2-pentanone (MIBK) | µg/Kg | 20   | 11          | 5月51   | 11/14/10 | an 2700           | U 1204  | 你们的 1808   | 16       | 3    | 10     | 2700        | 595      | 1063      |
| VOA      | Ethylbenzene                | µg/Kg | 5    | 11          | 8      |          | 39000.0           | 6006.1  | 12493.7    | 16       | - 8  | 2.5    | 7500,0      | 671.6    | 1494.2    |
| VOA      | Total Xylenes               | µg/Kg | 5    | 11          | 11     |          | 380000            | 73386   | 142112     | 16       | 15   | 3      | 68000       | 8180     | 16636     |
| VOA      | Isopropylbenzene            | µg/Kg | 20   | 11          | 4      |          | 9200              | 2316    |            | 16       | 1    | 10     | 2700        | 591      | 1060      |
| VOA      | n-Propylbenzene             | µg/Kg | 20   | 11          | 4      |          | 17000             | 3589    | 6421       | 16       | Э    | tō     | 5700        | 864      | 1592      |
| VOA      | 1,3,5-Trimethylbenzene      | µg/Kg | 20   | 11          | 6      |          | 36000             | 11173   | 18382      | 18       | 7    | 10     | 30000       | 4812     | 9079      |
| VOA      | 1,2,4-Trimethylbenzene      | µg/Kg | 20   | 11          | e      |          | 93000             | 29995   | 48928      | 16       | 9    | 10     | 39000       | 7367     | 13339     |
| VOA      | sec-Butylbenzene            | µg/Kg | 20   | 11          | 4      |          | 5800              | 1982    | 3083       | 18       | 110  | F/R 10 | 1 Jini 2700 | r († 689 | (h.) 1058 |
| VOA      | 4-Isopropylloluene          | µg/Kg | 20   | 11          | 3      |          | 4400              | 1644    | 2479       | 16       | 3    | 10     | 5600        | 781      | 1475      |
| VOA      | 1,4-Dichlorobenzene         | µg/Kg | 5    | 11          | ¥- 180 | 2,6      | 9// <b>700</b> ,0 | 305.5   | 459.9      | 16       | 2    | 2.5    | 2900.0      | 293.6    | 615.2     |
| VOA      | Naphthalene                 | µg/Kg | 20   | 11          | 8      | 10       | 31000             | 10633   | 17250      | 18       | 3    | 10     | 12000       | 1584     | 3108      |
| SVOA     | Naphthalene                 | mg/Kg | 0.3  | 11          | 7      | 0.15     | 17,00             | 5.17    | 8.27       | 16       | 6    | 0.15   | 9.00        | 1.17     | 2.19      |
| SVOA     | 2-Methylnaphthalene         | mg/Kg | 0.3  | 11          | ė      |          | 13.00             | 5.77    | 8.35       | 16       | - 4  | 0.15   | 8,00        | 1.06     | 1.97      |
| SVOA     | Diethyl Phthalate           | mg/Kg | 0.3  |             | 化液 0   | 5.0.5    | NG 11 50          | 510.87  | Sept. 121  | 16       | 1    | 0.15   | 1.00        | 0.34     | 0.48      |
| SVOA .   | Di-n-butyl Phthalate        | mg/Kg | 0.3  | 11          | 190    | 业0,15    | 1150              | 10.07   | (1)21      | 18       | 1    | 0.15   | 1.00        | 0.35     | 0.49      |
| SVOA     | Butylbenzyl Phthalate       | mg/Kg | 0.3  |             |        |          |                   |         | 2634-1121  | 16       | 2    | 0,15   | 4.90        | 0.61     | 1.13      |
| SVOA     | Bis(2-ethylhexyl) Phthalate | mg/Kg | 0.3  | 11          | 111.40 | \$ 0:15  | 84441.60          | A10.87  | 和此他121     | 16       | 2    | 0.15   | 1.70        | 0.43     | 0.63      |
| SVOA     | 3- and 4-Methylphenol*      | mg/Kg | 0.3  |             |        |          |                   |         | 期期41.21    | 16       | 2    | 0.15   | 2.70        | 0.49     | 0.78      |

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#### FIRE TRAINING PITS SUMMARY STATISTICS FOR RISK ASSESSMENT

|            |                                                   |           |        |          |             | SI          | ALLOW (     | 0-2')         |                | <b>I</b> |      |        | DEEP (>2 | 2')     |         |
|------------|---------------------------------------------------|-----------|--------|----------|-------------|-------------|-------------|---------------|----------------|----------|------|--------|----------|---------|---------|
| METHOD     | COMPOUND                                          | UNITS     | MRL    | N        | HITS        | MIN         | MAX         | MEAN          | 95% UCL        | N        | HITS | MiN    | MAX      | MEAN    | 95% UCL |
| MÉTAL      | Arsenic                                           | mg/Kg     | 1      | 11       | 11          |             | -           | l             |                | 16       | 16   | 5      | . 10     | 7       | 7       |
| METAL      | Barium                                            | mg/Kg     | 1      | 11       | 11          |             |             |               |                | 16       | 16   | 38     | 100      | 65      | 74      |
| METAL      | Cadmium                                           | mg/Kg     | 1      | 11       | 周刊          | 0.5         | ·****•0.5   | WE 0,5        | NZ 0,5         | 16       | 1    | 0,5    | 4.0      | 0.7     | 1.1     |
| METAL      | Chromium                                          | mg/Kg     | 2      | 11       | 11          | 30          | 46          | 38            | 41             | 16       | 18   | 22     | 42       | 34      | 37      |
| METAL      | Lead                                              | mg/Kg     | 1      | 11       | 11          |             | 29          |               |                | 16       | 16   | 6      | 111      | 21      | 34      |
| METAL      | Mercury                                           | mg/Kg     | 0.2    | 11       | 1240        |             | 影响在61       | 达前0月          | 考定理学 0,1       | 16       | 2    | 0,1    | 0.3      | 0,1     | 0.2     |
| METAL      | Nickel                                            | mg/Kg     | 10     | 11       | 11          |             | 78          |               | 51             |          | 16   | 26     | 56       | 40      | 43      |
| METAL      | Silver                                            | mg/Kg     | 2      | 11       | <b>新时(</b>  | · 建建筑       | <b>潮波得到</b> | 階級科           | 101106-041     | 16       | 1    | 1      | 2        | 1       | 1       |
| DIOXIN     | 2,3,7,8-Tetrachlorodibenzo-p-dloxin               | pg/g      | varies | 11       | 翻編          | 1-0.09      | M + 120     | AH0,21        | 17 kg 0.39     | 16       | 1    | 0.08   | 1.60     | 0.23    | 0.39    |
| DIOXIN     | Total TCDD                                        | pg/g      | varies | 11       | 26.20       | 10,10       | 准计 1:20     | 来 0,23        | 批准件 0.40       |          | 1    | 0,100, | 21,000   | 1.450   | 3.735   |
| DIOXIN     | 1,2,3,7,8-Pentachlorodibenzo-p-dioxin             | pg/g      | varies |          |             |             |             |               | 10.27          | 16       | 1    | 0.03   | 5.50     | 0.56    | 1.15    |
| DIOXIN     | Total PeCDD                                       | P9/9      | varies |          |             |             |             |               | 11月10.73       |          | 1    | 0.03   | 42,00    | 3,44    | 7,96    |
| DIOXIN     | 1,2,3,4,7,8-Hexachtorodibenzo-p-dloxin            | pg/g      | varies |          | 潮越(         | <b>0.00</b> | 14:0:47     | 州(0.25        | 444 10.32      | 16       | 1    | 0,085  | 7,400    | 0.738   | 1.523   |
| DIOXIN     | 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin            | pg/g      | varies | 11       |             | 0.14        | 0.54        |               |                | 16       | 5    | 0.08   | 100.00   | 7,97    | 18.94   |
| DIOXIN     | 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin            | pg/g      | varies | 11       | 翻拍          | ₩Õ.08       | 12 0.42     | 0.24          | AND \$0,31     | 16       | 2    | 0.08   | 25.00    | 2.14    | 4,88    |
| DIOXIN     | Totat HxCDD                                       | pg/g      | varies | 11       |             | 0.20        | 2.30        | 0,77          | 1,19           | 16       | 6    | 0.1    | 480.0    | 37.8    | 90.6    |
| DIOXIN     | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dloxin         | pg/g      | varies | 11       | 11          |             | 11.0        | 5,3           | 6.7            | 18       | 11   | 0,085  | 1200.000 | 105.242 | 238.409 |
| DIOXIN     | Total HpCDD                                       | pg/g      | varies | 11       | 11          | 6,3         | 21.0        | 10,6          | 13.5           | 18       | 11   | 0.085  | 2000.000 | 179.161 | 401.225 |
| DIOXIN     | OCDD                                              | pg/g      | varies | 11       | 11          |             | 110         |               | 60             | te       | 16   | 1.0    | 10000.0  | 956,5   | 2074.1  |
| DIOXIN     | 2,3,7,8-Tetrachlorodibenzofuran                   | pg/g      | varies | 11       | 44年6        | 4 0.04      | (see 0.15   | li¢.(0;09     | (法):24.0/11    | 16       | 1    | 0.055  | 4.400    | 0.418   | 0.893   |
| DIOXIN     | Total TCDF                                        | pg/g      | varies | 11       | 1           | 0.08        | 2.70        | 0.80          | 1.30           | 16       | 2    | 0.06   | 61.00    | 4.32    | 10.97   |
| DIOXIN     | 1,2,3,7,8-Pentachlorodibenzofuran                 | pg/g      | varies | 11       | 滞留年(        | 120.04      | 1.0.24      | 111 0.15      | N/2 0.19       | 16       | 1    | 0.037  | 2.500    | 0.342   | 0.624   |
| DIOXIN     | 2,3,4,7,8-Penlachlorodibenzofuran                 | pg/g      | varies | 11       |             | 0.07        | 0.45        | 0.23          | 0.30           | 16       | 2    | 80.0   | 4.30     | 0.51    | 0.96    |
| DIOXIN     | Total PeCDF                                       | P@/g      | varies | 11       | 6           |             | 5,70        |               |                | 16       | 7    | 0.120  | 61.000   | 5.183   | 11.019  |
| DIOXIN     | 1,2,3,4,7,8-Hexachlorodlbenzofuran                | P8/9      | varies | 11       | (計算)        | 造0.04       | 编辑 0,18     | <b>NU.071</b> | <b>新曲年0,13</b> | 18       | 2    | 0.031  | 10,000   | 1.007   | 2.177   |
| DIOXIN     | 1,2,3,8,7,8-Hexachlorodibenzofuran                | pg/g      | varies | 11       | 素の          | 10.04       | Si Mi Ori B | 0.11          | 13世界以前の13      | 18       | 1    | 0.031  | 14.000   | 1.035   | 2.556   |
| DIOXIN     | 2,3,4,8,7,8-Hexachlorodibenzofuran                | pg/g      | varies | 11       |             |             | 0.550       | 0,235         | 0.314          | 16       | 6    | 0,12   | 11.00    | 1,12    | 2,33    |
| DIOXIN     | 1,2,3,7,8,9-Hexachlorodibenzofuran                | pg/g      | varies | <b>H</b> | 旗頭          | 0.027       | Whit 0, 170 | 610.107       | E 600 135      | 16       | 1    | 0.027  | 2,200    | 0.271   | 0.514   |
| DIOXIN     | Tolal HxCDF                                       | pg/g      | varies | 11       | 8           | 0.140       | 3.600       | 1.550         | 2.138          | 18       | 10   | 0.12   | 680.00   | 53.89   | 128,83  |
| DIOXIN     | 1,2,3,4,6,7,8-Heptachlorodlbenzofuran             | pg/g      | varias | 11       | 10          | 0.295       | 2,400       | 1,490         | 1.797          | 16       | 10   | 0.06   | 560.00   | 43.70   | 105,20  |
| DIOXIN     | 1,2,3,4,7,8,9-Heptachlorodibenzofuran             | P9/9      | varies | 11       | <b>MFHC</b> | 60,035      | 10.335      | R0142         | 0.186          | 16       | 2    | 0.040  | 17,000   | 1.550   | 3.471   |
| DIOXIN     | Total HpCDF                                       | P9/9      | varies | 11       | 11          |             |             |               | 5.3            | 16       | 10   | 0.08   | 2200.00  | 172.94  | 414.82  |
| DIOXIN     | OCDF                                              | pg/g      | varies | 11       | 10          | 1.200       | 5,200       | 3.600         | 4.250          | 16       | 11   | 0.120  | 2200,000 | 177.204 | 420.503 |
| DIOXIN     | TOTAL DIOXINS                                     | pg/g      | -      | 11       | 11          | 37.0        | 149.8       | 70.1          | 88.5           | 16       | 16   | 2.96   | 17745.00 | 1591.87 | 3560.03 |
| NOTE: Shad | ded lines indicate compound was not detected in I | hat depth | range. |          |             |             |             |               |                |          |      |        |          |         |         |

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Continued from previous page

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|----------|-------------------------------|-------|--------|----|------|-------|---------|---------|---------|
| METHOD | COMPOUND | UNITS | MRL | N | HITS | MIN | MAX | MEAN | 95% UCL |
| PetHydra | Total Xylenes | µg/Kg | 5 | 3 | 1 | 2.5 | 19000.0 | 2716.4 | 14821.5 |
| PetHydro | GRO | mg/Kg | 5 | 2 | 1 | 2.5 | 800.0 | 136.0 | 1588.3 |
| PetHydro | DRO | mg/Kg | 10 | 2 | 1 | 2.5 | 3600.0 | 602.5 | 7158,5 |
| PalHydro | ТРН | mg/Kg | 10 | 3 | 1 | 5 | 5600 | 839 | 4379 |
| VOA | Acetone | µg/Kg | 50 | 28 | 9 | 5 | 6000 | 589 | 1161 |
| VOA | 2-Butanone (MEK) | µg/Kg | 20 | 26 | 1 | 0.005 | 2500.00 | 214.172 | 455.32 |
| VOA | Benzene | µg/Kg | 5 | 26 | 3 | 0.005 | 600,00 | 60.785 | 118.62 |
| VOA | Toluene | µg/Kg | 5 | 26 | 3 | 0.005 | 600.00 | 52.172 | 109,97 |
| VOA | Tetrachloroelhene (PCE) | µg/Kg | 5 | 26 | 1 | 0.05 | 600,00 | 51.50 | 109.3 |
| VOA | Ethylbenzene | µg/Kg | 5 | 26 | 2 | 3 | 600 | 60 | 117 |
| VOA | Total Xylenes | µg/Kg | 5 | 26 | 6 | 2,5 | 19000.0 | 1586.9 | 3423.9 |
| VOĀ | Isopropylbenzene | µg/Kg | 20 | 26 | 1 | 2.5 | 2500.0 | 215.3 | 458.3 |
| VOA | n-Propylbenzene | µg/Kg | 20 | 28 | 1 | 2.5 | 2500.0 | 215,3 | 458,3 |
| VOA | 1,3,5-Trimelhylbenzene | µg/Kg | 20 | 28 | 2 | 6 | 5900 | 500 | 1070 |
| VOA | 1,2,4-Trimethylbenzene | µg/Kg | 20 | 26 | 2 | 10 | 17000 | 1444 | 3085 |
| VOĀ | Naphthelene | µg/Kg | 20 | 26 | 1 | 10 | 2500 | 226 | 460 |
| SVOA | Naphthalene | mg/Kg | 0.3 | 23 | 2 | 0,15 | 28.00 | 6,69 | 10.07 |
| SVOA | 2-Methylnaphthalene | mg/Kg | 0.3 | 23 | 2 | 0,15 | 48.00 | 17.08 | 24.57 |
| SVOA | Bis(2-ethylhexyl) Phthalate | mg/Kg | 0.3 | 23 | 3 | 0.15 | 1.50 | 0.40 | 0.59 |
| SVOA | Di-n-octyl Phihalate | mg/Kg | 0.3 | 23 | 5 | 0.15 | 1.60 | 0.57 | 0.78 |
| Metals | Arsenic | mg/Kg | 1 | 15 | 15 | 4 | 7 | 6 | |
| Metels | Barium | mg/Kg | 1 | 15 | 15 | 32 | 69 | 46 | 58 |
| Metais | Chromlum | mg/Kg | 2 | 15 | 13 | 28 | 53 | 39 | 45 |
| Melalø | Lead | mg/Kg | 1 | 15 | 15 | 7 | 22 | 13 | 16 |
| Metals | Mercury | mg/Kg | 0.2 | 15 | 2 | 0.1 | 0,1 | 0.1 | 0,1 |
| Metals | Nickel | mg/Kg | 10 | 15 | 13 | 41 | 48 | 44 | 46 |
| Metels | Selenium | mg/Kg | 1 | 15 | 2 | 0,5 | 0,5 | 0.5 | 0.8 |
| Other | Ammonia as Nilrogen | mg/Kg | 0.2 | 17 | 11 | 0.1 | 0.4 | 0.2 | 0,3 |
| Other | Nitrate + Nitrite as Nitrogen | mg/Kg | varies | 20 | 2 | 0.45 | 12 | 3 | |

GREASE PITS SUMMARY STATISTICS FOR RISK ASSESSMENT

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|-----------|--|-------|------|--------------|----|------|-------|----------|-------|---------|
| METHOD | COMPOUND | UNITS | MRL | 95% UCL | Ň | HITS | MIN | MAX | MEAN | 95% UCL |
| PETHYDRO | Toluene | µg/Kg | 5 | 3.5 | | 4 | 2.5 | 81.0 | 7.1 | 14.3 |
| PETHYDRO | Ethylbenzene | µg/Kg | 5 | 2.5 | | 1 | 2.5 | 8.0 | 2.8 | 3.3 |
| PETHYDRO | Total Xylenes | µg/Kg | 5 | 6.3 | 19 | 11 | 2.5 | 13.0 | 5.8 | 7.2 |
| | DRO | mg/Kg | 10 | 41 | 19 | 8 | 5 | 195 | 37 | 59 |
| PETHYDRO | ТРН | mg/Kg | 10 | 30 | | 12 | 5 | 111 | 25 | 38 |
| PESTICIDE | 4,4'-DDD | mg/Kg | 0.01 | 0,006 | | 1 | 0.005 | 0.02 | 0.006 | 0.007 |
| PESTICIDE | 4,4'-DDT | mg/Kg | 0.01 | 0.011 | | 6 | 0.005 | 0,19 | 0.029 | 0.049 |
| PESTICIDE | 4,4'-DDE | mg/Kg | 0.01 | 0.005 | 19 | 4 | 0.005 | 0.04 | 0.009 | 0.013 |
| VOA | Acetone | µg/Kg | 50 | 43 | 19 | 7 | 25 | 1400 | 146 | 275 |
| VOA | Methylena Chloride | µg/Kg | 10 | 11 | 19 | 3 | 5 | 51 | 9 | 13 |
| VOA | 2-Butanone (MEK) | µg/Kg | 20 | 時時後(10 | 19 | 3 | 10 | 150 | 20 | 33 |
| VOA | Toluene | µg/Kg | 5 | 3,5 | 19 | 4 | 2.5 | 81.0 | 7.1 | 14.3 |
| VOA | Ethylbenzene | µg/Kg | 5 | 2.5 | 19 | Ī | 2.5 | 8.0 | 2.8 | 3.3 |
| VOA | Total Xylenes | µg/Kg | 5 | 6.3 | 19 | 11 | 2.5 | 13.0 | 5,8 | 7.2 |
| VOA | n-Propylbenzene | µg/Kg | 20 | 16.1.4.10 | 19 | 2 | 10 | 39 | 12 | 15 |
| VOA | 4-Isopropylloluene | µg/Kg | 20 | ¥44,10 | | 2 | 10 | 260 | 26 | 50 |
| SVOA | Di-n-octyl Phthelate | mg/Kg | 0.3 | 0.26 | 19 | 1 | 0.15 | 0.60 | 0.17 | 0.21 |
| SVOA | 3- and 4-Methylphenol* | mg/Kg | 0.3 | 1KH (M.O. 15 | 19 | 1 | 0,15 | 0.40 | 0.16 | 0.19 |
| METALS | Arsenic | mg/Kg | 1 | 6 | 19 | 19 | 4 | 8 | 5 | 5 |
| METALS | Barium | mg/Kg | 1 | 62 | 19 | 19 | 32 | 125 | 60 | 72 |
| METALS | Chromlum | mg/Kg | 2 | 36 | 19 | 19 | 10 | 45 | 29 | 32 |
| METALS | Lead | mg/Kg | 1 | 7 | 19 | 19 | 4 | 15 | 6 | 7 |
| METALS | Nickel | mg/Kg | 10 | 53 | 19 | 18 | 5 | 235 | 42 | 61 |
| OTHER | Ammonia as Nitrogan | mg/Kg | | 11.90 | 19 | 9 | 0.11 | 110.00 | 6.97 | 16.99 |
| OTHER | Sulfate | mg/Kg | | 14.0 | 10 | 19 | 2.8 | 31.0 | 8,7 | 11.8 |
| | Total TCDD | PPT | | 0.168 | 19 | 2 | 0.075 | 1.400 | 0.223 | 0.351 |
| DIOXIN | Tolal HxCDD | PPT | | KI + 0.15 | 19 | 1 | 0.05 | 2.30 | 0.23 | 0.43 |
| | 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin | PPT | | 0.512 | 19 | 7 | 0.065 | 3.600 | 0.543 | 0.872 |
| DIOXIN | Tolal HpCDD | PPT | | 0.825 | 19 | 7 | 0.065 | 6.800 | 0.883 | 1.516 |
| DIOXIN | OCDD | PPT | | 3.2 | 19 | 10 | 0.3 | 18.0 | 3.0 | 4.7 |
| | Total TCDF | PPT | · | 10:17 | 19 | | 0.04 | 10.00 | 0.93 | 1.94 |
| | 2,3,4,7,8-Pentachlorodibenzofuran | РРТ | | Ni 0,187 | 19 | 1 | 0.04 | 1.60 | 0.19 | 0.33 |
| | Total PeCDF | PPT | | 0,472 | 19 | 2 | 0.05 | 18.00 | 1.23 | 2.88 |
| DIOXIN | Total HxCDF | PPT | | 1132021 | 19 | 2 | 0.095 | 6,400 | 0.624 | 1.235 |
| DIOXIN | 1,2,3,4,6,7,8-Heptachiorodibenzofuran | PPT | | 0,163 | 19 | | 0.03 | 1.70 | 0.28 | 0,48 |
| | Total HpCDF | PPT | | D,193 | 19 | 3 | 0.030 | 2,800 | 0.393 | 0.689 |
| | OCDF | - PPT | · | 0.20 | 19 | | 0.08 | 1.20 | 0.26 | 0.36 |
| DIOXIN | TOTAL DIOXINS | ╾┼╴╴┤ | | 5.37 | 19 | 10 | 0.96 | 65.11 | 7.92 | 13.88 |
| | ed lines indicate compound was not detected in | | | 0,07 | | 10 | 0.00 | 00.11 | 1.02 | 10.00 |

BACKGROUND SUMMARY STATISTICS FOR RISK ASSESSMENT

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APPENDIX B

BUILDING 35-752

- Laboratory Results
- Soil Boring Summary
- Boring Logs and Monitoring Well Completion Diagrams
- Monitoring Well Development Records
 Groundwater Sample Collection Records
- Resurvey Elevation Data for all Monitoring Wells (August 4, 1995)
 Monitoring Well Measurements to Groundwater
 August 7, 1995 Monitoring Well Sounding Summary
- Soil Classifications

Ft. Richardson OU D Site Building 35-752 Sediment Sample Analytical Results Petroleum Hydrocarbons

| dry weight basis | | | E | Analysis:
PA Method: | | nzene
1260 | | luene
1260 | · · | benzene
260 | | Xylenes
260 | | SRO
0/8015 | |)RO
0/8100 | | TPH
1/418.1 |
|------------------|-----------------|--|---------------------|-------------------------|----------|---------------|----------|---------------|---------|----------------|-----|----------------|-----|---------------|-----|---------------|-----|----------------|
| | | | | Units: | ц р | g/Kg | , h | g/Kg | μ | g/Kg | μ | g/Kg | m | g/Kg | m | g/Kg | m | g/Kg |
| Location | Sample
Depth | Sample ID | Lab Code | Date
Collected | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Resul |
| COOLING POND | 3 | <u>. </u> | | · | | | | | | | | | | | | | | í ——— |
| A | 0-6* | 94575240SD | K947714-001 | 12/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | NA | 10 | ŇĂ | 10 | 230 |
| A | 0-6" | 94575241SD | K947714-002 | 12/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | NA | 10 | NA | 10 | 240 |
| 8 | 0-6" | 94575242SD | K947714-003 | 12/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | NÁ | 10 | NA | 10 | 240 |
| С | 0-6" | 94575243SD | K947714-004 | 12/8/94 | 5 | <10 | 5 | <10 | 5 | <10 | 5 | <10 | 5 | NA | 10 | NA | 10 | 420 |
| 0 | 0-6" | 94575244SD | K947714-005 | 12/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | NA | 10 | NA | 10 | 290 |
| Ε | 0-6" | 94575245SD | K947714-006 | 12/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | NA | 10 | NA | 10 | 83 |
| F | 0-8" | 94576246SD | K947714-007 | 12/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | NA | 10 | NA | 10 | 186 |
| G | 0-6" | 94575247SD | K947714-008 | 12/8/94 | 5 | <10 | 5 | <10 | 5 | <10 | 5 | <10 | 5 | NA | 10 | NA | 10 | 440 |
| Н | 0-6" | 94575248SD | K947714-009 | 12/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | NA | 10 | NA | 10 | 260 |
| FOOTNOTES | NA = Not ar | alyzed. | thod reporting limi | | ue lo ma | atrix interfe | rences o | er sample re | gnhlupe | dilution. | | | | | | | L | |

VDAQC/COMMOMRICH/FINAL8/REPTABLES/B35752-F.XLS/Pathydro-Tbil

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4/17/95

Ft. Richardson OU D Site Building 35-752 Sediment Sample Analytical Results Pesticides and PCBs

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| dry weight basis | | | | | | COOLING PONDS | | | | |
|---------------------------|-----------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|
| mg/Kg | Location: | | A | В | C | D | E | F | G | Н |
| | Sample Depth: | 0-6* | 0-8* | 0-6" | 0-6* | 0-6" | 0-6" | 0-6" | 0-6" | 0-6* |
| | Sample ID: | 94575240SD | 94575241SD | 94575242SD | 94575243SD | 94575244SD | 94575245SD | 94575246SD | 94575247SD | 94575248SD |
| | Lab Code: | K947714-001 | K947714-002 | K947714-003 | K947714-004 | KB47714-005 | K947714-006 | K947714-007 | K947714-008 | K947714-009 |
| | Date Collected: | 12/8/94 | 12/8/94 | 12/8/94 | 12/8/94 | 12/8/94 | 12/B/94 | 12/8/84 | 12/8/94 | 12/8/94 |
| Organochiorine Pesticides | MRL | _ | | | • | | | | | |
| (EPA Methods 3540/8080) | | | | | | | | | | |
| Alpha-BHC | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Bela-BHC | 0.03 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Delta-BHC | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor | 0,01 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aldrin | 0.01 | ND | ND | ND | ND | ND | ND | ND | <0.02 | ND |
| Gamma-BHC (Lindana) | 0,01 | NO | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachtor Epoxide | 0,01 | ND | ND | ND | NÖ | ND | ND | ND | ND | ND |
| Endosulfen 1 | 0.01 | ND | ND | ND | ND | ND | ND | <0.1 | ND | ND |
| Endrin | 0.01 | ND | <0,02 | ND | <0.03 | ND | <0.04 | <0.1 | <0.08 | <0.8 |
| Endosulfan II | 0.01 | ND | ND | ND | ND | ND | <0.04 | <0.1 | <0.08 | <0.05 |
| 4'-DDD | 0.01 | 0.03 | 0,1 | 0.03 | 0.02 | 0,07 | <0.04 | <0.1 | <0.08 | <0.05 |
| Endrin Aldehyde | 0.01 | ND | ND | ND | <0.02 | ND | <0.04 | <0.1 | <0.08 | <0.07 |
| Endosulfan Sulfale | 0.01 | ND | ND | ND | ND | ND | <0.04 | <0.1 | <0,08 | <0.05 |
| 4,4'-DDT | 0.01 | <0.2 | <0.3 | <0.02 | <0.04 | 0.04 | <0.04 | <0.1 | e0.08 | <0.07 |
| 4,4'-DDE | 0.01 | ND | ND | ND | ND | ND | ND | <0.1 | <0.08 | <0.05 |
| Dieldrin | 0.01 | ND | ND | ND | ND | ND | ND | <0.1 | <0,08 | <0.05 |
| Methoxychlor | 0.02 | ND | ND | ND | ND | ND | <0.15 | <0,4 | <0,3 | <0.20 |
| Toxaphena | 0.3 | ND | ND | ND | ND | ND | <0.8 | <5 | <5 | <3 |
| Chlordane | 0.1 | ND | ND | ND | ND | ND | ND | <0.8 | <0.8 | <0,4 |
| Polychlorinated Biphenyla | MRL | | | | | | | | | |
| EPA Methods 3540/8080} | | | | | | | | | | |
| voclor 1016 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Voclor 1221 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| voclor 1232 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Jocior 1242 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| vroclor 1248 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| vocior 1254 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| vocior 1260 | 0,1 | 0,3 | 0.5 | 0.4 | 0.8 | 0.1 | 0.5 | 2.2 | 4.5 | 3,4 |

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Ft. Richardson OU D Site Building 35-752 Sodiment Sample Analytical Results Volatile Organic Compounds

| | | | | | | | <u> </u> | | | Page |
|---|--------------|-------------|------------------|-------------|-------------|------------------|-------------|-------------|--------------|-------------|
| iry weight basis | | | | | | COOLING PONDS | | | | |
| g/Kg | Location: | / | | 8 | | 0 | E | F | Ģ | м |
| 34 | mple Depth; | 0-6* | 0-6 ⁻ | 9-67 | | 0-4* | 0-6" | 0-6 | 0-6 | 0-67 |
| | Sample ID: | 94575240SD | \$4575241SD | \$457524250 | 94575243SD | \$4575244SD | \$4575245SD | \$4575246SD | \$4575247SD | 94575248SD |
| | Lab Code: | K947714-001 | K947714-002 | K947714-003 | K947714-004 | K947714-005 | K947714-005 | K947714-007 | K\$47714-006 | K947714-009 |
| De | a Collected: | 12/3/94 | 12/\$/94 | 12/8/94 | 12/8/94 | 12/6/94 | 12/8/94 | 12/6/94 | 12/6/94 | 12/8/94 |
| olatila Organic Compounds | MRL | | | | | | | | | |
| PA Method \$260) | | | | | | | | | | |
| | | | | | | | | | | |
| ichlorodillyoromethane (CFG 12) | | ND | ND | ND | <10 | NÖ | ND | ND | <10 | ND |
| hioromethane | 5 | ND | ND | ND | <10 | ND | <u>NO</u> | NO | <10 | ND |
| myl Chieride | 5 | ND | ND | ND | <10 | NO | NO
NO | ND | <10 | ND |
| romonethane | \$ | ND | ND | ND | <10 | NO | | ND | <10 | ND |
| hioroethane | 5 | ND | ND | NO | <10 | ND
NO | | NO | <10 | NO |
| nchicrofluoromethane (CFC 11) | 5 | ND | ND | ND
190 | 420 | _ | 240 | ND | <10 | ND |
| celone | 50 | 160 | 170 | | <19 | 210 | | 110 | 180 | 230 |
| ,1-Dichloroethene | 5 | ND | ND | ND | | ND | ND | ND | <10 | 04 |
| arban Dieutlide | | ND | ND | ND | <10 | ND
ND | ND | NO | <10 | ND |
| lethyluna Chlorida | 10 | ND | ND | ND | <20 | | ND | ND | <20 | ND |
| ans-1,2-Dichlorosthene | 5 | ND | ND | ND ID | <10 | ND | NO | NO | <10 | ND |
| 1-Dichloroethane | 5 | ND | ND | ND ND | <10 | ND | NO | NO | <10 | ND |
| -Butanone (MEK) | 20 | 47 | 43 | ND | 58 | | 20 | NO | 40 | ND |
| 2-Dichioropropune | 5 | ND | ND | 80 | <10 | NO | <u> </u> | ND | <10 | ND |
| s-1,2-Dichioroethene | | ND | ND | 04 | -10 | - 1 0 | NÖ | NO | <10 | ND |
| hiaroform | 5 | ND | ND | NO | <10 | NO | NO | ND | <10 | ND |
| romochioromethane | 5 | NO | ND | ND | <10 | NO | ND | NO | <10 | NO |
| ,1,1-Trichlorosthane (TCA) | 5 | 18 | ND | | <10 | ND | 14 | 10 | <10 | NO |
| 1-Dichloropropone | 5 | ND | ND | ND | <10 | | ND | NO | <10 | ND |
| Carbon Twinachioride | 5 | ND | ND | ND | -10 | NÖ | ND | ND | <10 | NO |
| 2-Dichlorosthane | - 5 | ND | ND | ND | <10
<10 | ND | ND ND | ND | <10 | NO |
| enzene | 5 | ND | ND | NO | <10 | | NO NO | ND | <10 | ND |
| richioroethene (TCE) | 5 | ND | ND | ND | | ND | | NO | <10 | ND |
| 2-Dicharopropente | 5 | ND | ND | NO | <10 | | NO | NO | -10 | ND |
| romodehiaramethene | 5 | ND | ND | ND | <10 | ND | ND | ND | <10 | ND |
| Stromomethine | 5 | ND | ND | NO | <10 | ND | NO | ND | <10 | NO |
| Hezanone | 20 | NO | ND | ND | <40 | NO | | NO | -40 | ND |
| ie-1,3-Oichicsoprepene | \$ | ND | ND | ND | <10 | ND | ND | ND | <10 | ND |
| alvene | 5 | ND | ND | ND | 40 | ND | ND | ND | <10 | NO |
| rane-1,3-Dichleropropune | 5 | ND | ND | ND | <10 | ND | ND | ND | <10 | ND |
| 1,1,2-Trichloroethane | - 5 | ND | ND | ND | <10 | NÖ | NO | NO | <10 | ND |
| Methyl-2-pentanone (MBK) | 20 | ND | ND | ND | -40 | ND | NO | NO | <40 | ND |
| .3-Dichlorepreperm | 5 | ND | ND | ND | <10 | NO | ND | ND | <10 | ND |
| reschioronhene (PCE) | 5 | ND | ND | ND | <10 | NO | NO | ND | <10 | ND |
| Dibromochioromethane | 5 | ND | NÖ | ND | <10 | ND | ND | ND | <10 | ND |
| 2-Dibromonthane (EDB) | 20 | ND | NO | ND | <40 | ND | ND | NO | <40 | ND |
| Chlorobenzene | 5 | NO | ND | NO | <10 | NÖ | ND | ND | <10 | ND |
| 1,1,2-Tetrachioronthane | 5 | ND | ND | NO | -10 | ND | ND | ND | <10 | NO |
| Invibenzone | 5 | ND | ND | NO | <10 | NO | NO | ND | <10 | ND |
| otat Xylenes | 5 | NO | ND | NO | <10 | <u> NO</u> | NO | ND | <10 | ND |
| Styrone | 5 | ND | ND | NO | <10 | NO | ND | ND | <10 | ND |
| Bromotorm | 5 | ND | ND | ND | <10 | ND | ND | NO | <10 | ND |
| sopropylaanzene | 20 | ND | NO | NO | -40 | 80 | NO | ND | <40 | NO |
| 1,2,2-Tetrachiorostiuna | 5 | ND | NO | ND | <10 | NO | NO | NO | <10 | ND |
| 2,3-Trichloroprepene | 5 | ND | ND | NO IS | <10 | ND
ND | ND | ND | <10 | NO |
| Somobenzene | 5 | ND | NO | ND | <10 | | | ND | <10 | ND |
| Propylanzane | - 20 | ND | ND
S | 2 | <40 | NO | | ND | <40 | ND |
| Chierotokene | 20 | NO | <u> NO</u> | ND NO | | NO | <u> NÖ</u> | | | NO |
| -Createring | 20 | - MD | | | | ND | | ND | | ND |
| ,3,5-Trimetvytherature | 20 | ND | ND | ND | <40 | ND - | ND | ND | <40 | NO |
| ort-Butybergene | - 20 | ND | ND | ND ND | | NO | ND | ND | <40 | ND ND |
| 2,4-Trimethybertzane | 20 | <u></u> | OK 10 | ND
ND | <40 | NO NO | | NO | | |
| ec-Butybenzene | 20 | NO | ND | | <10 | NO | ND
ND | NO | | ND |
| .3-Dichlorobenzene | | <u>NO</u> | | 1 | <10 | | | NO NO | <10 | ND |
| -Isopropyliciuene | 20 | ND ND | ND | ND | | | NO | NO | | ND |
| ,4-Dictelorobenzene | | ND | | | <10 | | | ND | 15 | <u> </u> |
| Butyberzene | 20 | NO | ND
ND | ND | | <u> NO</u> | NO | NO | | NO |
| 2-Dichiorobenzene | 5 | ND | NO | ND | <10 | ND | ND | NO | <10 | ND |
| 2-Dibromo-3-chieropropane (D | | ND | ND | NO | <40 | <u>NO</u> | - NO | ND | ~40 | NO |
| 2,4-Trichlorobenzene | 20 | ND | NO | <u> NO</u> | -40 | ND | ND. | NO | | ND |
| | 20 | ND | ND | ND | <40 | NO | ND | NO | <40 | ND |
| and the second se | | | | | | ND | ND | | | ND |
| Inphilvelove | 20 | ND | NO | ND | | NO | NO | ND
NO | <40 | - NO |

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Ft, Richardson OU D Site Building 35-752 Sediment Sample Analytical Results Semivolatile Organic Compounds

| ry weight basis | | | * | | | COOLING PONDS | | | | Peg |
|--|----------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-----------------------------|------------|
| w/Kg | Location: | | A | в | C | | Ē | F | G | H H |
| - + | ample Depth: | 0-6* | 0-6* | 0-67 | 0-5" | 0.6" | 0-5 | 0-6" | 0.6 | 0-6" |
| | Sample ID: | 94575240SD | 9457524150 | 8457524250 | 457574350 | 94575244SD | 94575245SD | \$4575246SD | 04575247SD | 945752485 |
| | Lab Code: | K947714-001 | K947714-002 | K947714-003 | K947714-004 | K947714-005 | K947714-005 | K#47714-007 | K947714-008 | K347714-00 |
| đ | ata Collected: | 12/8/94 | 12/8/94 | 12/6/94 | 12/8/94 | 12/5/94 | 12/6/94 | 12/8/94 | 12/5/94 | 12/8/94 |
| envivolatile Organic Compoun | da i | | i | | | 1 | | | <u> </u> | |
| PA Methods 3669/8270 | MRL | | | | | | | | | |
| Nitrosodimethylamine | 2 | NO | ND | ND | ~~ | ND | - NO | ND | -4.5 | ND |
| | 1 | NO | ND | ND | <12
- 4 | ND | 20 | ND | | NO |
| 3/4(2-chioroethyl) Ether
,2-Dichlorobenzene | 0.3 | ND | ND
ND | ND | | ND | | ND ND | <0.8
<0.8 | ND
ND |
| .3-Dichlombenzene | 20 | ND ND | ND | NO | - 4 | NO | NO | | | NO |
| .4-Dichlorobenzane | | NO | ND | ND | 4 | NO | - 10 | ND - | -0.8 | ND |
| 3a(2-chiaraisopropyi) Ether | 20 | ND | ND | NO | - 4 | NO | ND | NO | -0,8 | ND |
| -Nitosodi-n-propylamina | 0.3 | NO | ND | ND | - 4 | ND | ND | ND | <0.8 | ND |
| iexachioroethane | 10.3 | ND | ND | NO | -4 | NO | ND | NO | -0,8 | ND |
| etrobenzone . | 0.3 | ND | ND | NO | | ND | ND | NO | <0.8 | NO |
| sophorone | 0.3 | NO | NO | ND | - 44 | NÖ | NO | ND | <0.8 | NC) |
| 3=(2-chloroethoxy)methane | 0.3 | NÚ | ND | ND | 4 | NO | ND | ND | -0.4 | ND |
| 2,4-Trichlorobenzens | 0.3 | NO | ND | ND | - 4 | NO | ND | ND | <0.8 | ND |
| inphiliplene | 50 | ND | ND | ND | - 44 | ND | NO | ND | | ND |
| Chloroeniline | 10 | ND | ND | ND | य | NO | ND | ND | -0,4 | NO |
| icrachiorobutaciene | 0.3
0.3 | ND | NO | NO | य | ND | NO | NO | 40.8 | ND |
| Methylnephthalene
texachlorocyclopentaclene | 63
60 | ND
ND | ND | ND | 4 | NO | NO NO | ND
NO | <0.5
<2.5 | NŬ
NO |
| -Chicronephthalane | 0.3 | 0x
0x | NO | | | NO | - NO | | <0.5
<0.5 | ND ND |
| -Chicronophilaiane | 2
2 | NO NO | ND | ND | ~ | ND | NO | ND | -4.5 | ND |
| Simethyl Phthalatia | - 0.3 | NO | NO | NO | | NO | NO | NO | | ND |
| cenaphtrylene | 0.3 | NO | ND | ND | | NO | ND | NO | | NO |
| Niroeniine | 2 | NO | ND | NO | <4 | ND | NO | ND | -4,5 | NO |
| Consphiltene | 20 | ND | NÖ | ND | य | NO | NO | ND | 8 | ND |
| Dibenzoluran | 0.3 | ND | NO | NO | -4 | ND | ND | NO | <0.8 | NO |
| 2,4-Dinitrotoluene | 20 | ND | ND | ND | - 4 | NÖ | NO | ND | -4.6 | NO |
| 2.6-Dinitrotokana | 0.3 | NÖ | NÔ | NO. | | NO | ND | NO | -0.8 | MD |
| Diethyl Philhelater | 0.3 | ND | NO | NO NO | 4 | NÔ | HD | ND | 8.0× | MD |
| -Chiorophenyl Phenyl Elher | 20 | ND | NÔ | NÖ | -4 | NO | ND | NÖ | -0,£ | ND |
| luorene | 5 | ND | ND | ND | -4 | ND | ND | NO | <0.8 | ND |
| L'Aireanille | 2 | ND | ND | с но | - 24 | NO
NO | NO | ND | -4.5 | ND |
| V-Nitosodiphenylemine | 0.3 | ND | ND | NO | 4 | NO | - ND | NO | 4.0× | NO |
| Bromophenyl Phenyl Ether
texechlorobenzene | 0.3 | ND | ND | NO | | NO | NO | | <0.6 | NO |
| henenärene | | NO | NO | ND | | 0.4 | - 22 | 1.5 | 1.5 | 0.7 |
| Vitracene | 0.3 | NO | NO | NO | | ND | - HD | NO | | ND |
| Di-n-butyl Phittalate | 0.3 | NO | ND | ND | | NO | NO | ND | -0.8 | NO |
| luoranthene | 20 | ND | 20 | NO | -4 | 0.5 | - 29 - | 21 | 23 | 4.4 |
| Pyrene | 0.3 | ND | NO | ND | | 0.4 | 0.7 | 1.9 | <0.8 | 5.4 |
| Butylbenzyl Phihalata | 0.3 | NO | ND | ND | 4 | NO | NEO | NO | -0.6 | NO |
| 3,3'-Dichiorobenzidine | 2 | NO | ND | ND | 24 | ND | NO | ND | વડ | NÓ |
| Senz(s)anthracene | 0.3 | ND | ND | CN C | - 4 | NO | 0.6 | NO | <0.8 | 1.5 |
| Sit(Z-ethylhexyl) Philalate | 0.3 | NO | NO | NO | | NO | ND | NO | <0.6 | 0,4 |
| Chrysene | 0.3 | ND | ND | ND | - 44 | ND | 1.1 | E.0 | <0.5 | 1.8 |
| Di-n-octyl Phihalata | 2.0 | ND | NO | NO | | NO | ND | ND | <0,8 | NO |
| Benzo(b)Auorenthese | 0.3 | NO | NO | NO | | NO 15 | 0.7 | 0.4 | -0.6 | 2 |
| Benzo(k)Buoranthene | 0.3 | NÖ | ND
ND | ND | - 4 | ND | 0.4
ND | 0.5 | <.8 | 11 |
| Benzo(a)pyrene | 0.3
0.3 | | ND
ND | NO | | | ND | NO | 4.5
40> | 1.2 |
| ndeno(1,2,3-cd)pyrana
Dibenz(a,h)enthracene | E0 | | ND ND | | | NO NO | | NO | 40.8 | NO |
| Benzo(g,h,i)perylene | 0.3 | NO | | | 4 | NU
NO | | ND | <0.8 | 0.5 |
| Phenol | 2.0 | NO | NO | NO | - 4 | NO | ND | NO | 4.0 | NO |
| 2-Chiorophenoi | 103 | ND | NO | ND . | | NO | NO | ND | -0.6 | ND |
| Benzyl Alcohol | ده | ND | ND | ND | - 44 | NO | NO | NO | -0.8 | ND |
| Z-Methylphenol | 6.3 | NO | NO | ND | 4 | ND | ND | NO | -0.8 | NO |
| 3- and 4-Methylphanol* | 0.3 | | ND | NÓ | -4 | ND | NO | ND | -0.8 | ND |
| 2-Nitrophenel | 6.3 | NO | NO | NO | | NO | ND | NO | <0.6 | ND |
| 2,4-Dimethylphenol | 6.0 | ND | ND | NÔ | -4 | ND | NO | ND | -0.5 | ND |
| Benzoic Acid | Z | NO | NO | ND | - 24 | NO | NED | NO | <4.5 | NO |
| 2,4-Dichlarophenal | 20 | ND IN | ND | NO | - 4 | NO | HO | ND | 1.0× | ND |
| 4-Chloro-3-methylphenal | C0 | ND | ND | ND | | NO | ND | ND | 8.0× | NO |
| 2.4.6-Trichlorophenol | 20 | | ND | NO - | | NO NO | - <u>NO</u> | ND | LD> | NO |
| 2,4,5-Trichkrophenal
2,4-Dinitrophenal | | ND
ND | ND ND | ND | 4 | NO | NO | ND | 40.5 | NO |
| | 2 | NO | ND | NO | < | NO NO | NO | NO | | ND |
| | 1 4 | 1 | 1. 🗝 | | | | | | <4.5 | NO |
| 4-Nitrophenol | | NO. | | NO | 624 | I NO | 1 M.D. | | 24 6 | - un |
| | 2 | ND | ND
ND | NO
RO | 4 | NO | ND | ND
ND | 45 | ND
ND |

Ft. Richardson OU D Site Building 35-752 Sediment Sample Analytical Results Total Metals

| dry weight bas | ls | | | | Analyte: | Arsenic | Barlum | Cadmium | Chromium | Lead | Mercury | Nickel | Selenium | Silver |
|----------------|-----------------|------------|----------|-------------------|----------|---------|--------|---------|----------|------|---------|--------|----------|--------|
| mg/Kg | | | | | Method: | 7060 | 6010A | 6010A | 6010A | 7421 | 7471 | 6010A | 7740 | 6010A |
| Location | Sample
Depth | Sample ID | Leb Code | Date
Collected | MRL: | 1 | 1 | 1 | 2 | 1 | 0.2 | 10 | 1 | 2 |
| COOLING PON | IDS | · · · · · | | | | | | | | | | | | |
| A | 0-8* | 94575240SD | K771401 | 12/8/04 | | 4 | 103 | ND | 34 | 22 | ND | 29 | ND | ND |
| Ā | 0-8* | 94675241SD | K771402 | 12/8/94 | | 4 | 114 | ND | 35 | 20 | ND | 30 | ND | ND |
| B | 0-8" | 94575242SD | K771403 | 12/8/94 | | 4 | 113 | ND | 43 | 48 | ND | 37 | ND | ND |
| C | 0-6" | 94575243SD | K771404 | 12/8/94 | | 3 | 65 | ND | 33 | 23 | ND | 31 | ND | ND |
| | 0-6" | 94575244SD | K771405 | 12/8/94 | | 5 | 96 | ND | 40 | 21 | ND | 42 | ND | ND |
| E | 0-6* | 94575245SD | K771400 | 12/8/94 | | 3 | - 44 | ŇD | 33 | 14 | ND | 35 | ND | ND |
| 5 | 0-6* | 94575246SD | K771407 | 12/8/94 | | 3 | 49 | ND | 26 | 31 | ND | 40 | ND | ND |
| G | 0-6* | 94575247SD | K771408 | 12/8/04 | | 5 | 83 | ND | 45 | 61 | ND | - 44 | ND | ND |
| 1 | 0-6" | 94575248SD | K771409 | 12/8/94 | | 5 | 61 | ND | 43 | 36 | ND | 40 | ND | ND |

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Ft. Richardson OU D Site Building 35-752 Soli Sample Analytical Results Petroleum Hydrocarbons

| dry weight basis | | | E | Analysis:
PA Method: | | nzene
3260 | | luene
1260 | | benzene
260 | | Xylenes
260 | | RO
0/8015 | | 0RO
0/8100 | | 1/418.1 |
|------------------|-----------------|---------------------------------------|-----------------------------------|-------------------------|------|---------------|-----|---------------|------|----------------|-----|----------------|-----|--------------|-----|---------------|----------|---------|
| | | | | Units: | Ч | g/Kg | ч _ | g/Kg | pq p | g/Kg | p | g/Kg | m | g/Kg | m | g/Kg | m | g/Kg |
| Location | Sample
Depth | Sample ID | Lab Code | Date
Collected | MRL. | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Resul |
| COOLING PONDS | l | 1 <u>.</u> | | | | | | | | | | | | | | | | |
| SB AP 3501 | 5'-7' | 94575240SL | K947108-001 | 11/11/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 100 | 10 | 137 |
| MW AP 3502 | 0-4' | 94575227SL | K946995-001 | 11/7/94 | 5 | ND | 5 | ND | 5 | ND | 5 | 16 | -5 | 8 | 10 | 107 J | 10 | 71 |
| MW AP 3502 | 0-4' | 94575228SL | K948995-002 | 11/7/94 | 5 | ND | 5 | ND | 5 | ND | 5 | 11 | 5 | ND | 10 | 151 J | 10 | 183 |
| MW AP 3502 | 4'-6' | 94575229SL | K948995-003 | 11/7/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 24 J | 10 | 26 |
| MW AP 3502 | 8'-13' | 94575230SL | K948995-004 | 11/7/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| MW AP 3503 | 0-6' | 94575231SL | K947040-001 | 31/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 55 | 10 | 64 |
| MW AP 3503 | 6'-8' | 94575232SL | K947040-002 | 11/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 34 | 10 | 18 |
| MW AP 3503 📫 | 8'-12' | 94575233SL | K947040-003 | 11/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| MW AP 3503 | 8'-12' | 94575234SL | K947040-004 | 11/8/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| MW AP 3504 | 0-2 | 94575235SL | K947072-001 | 11/9/94 | 5 | ND | 5 | ND | 5 | ND | 5 | 8 | 5 | ND | 10 | 51 | 10 | 89 |
| MW AP 3504 | 4'-10' | 94575236SL | K947072-002 | 11/9/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ŇD | 5 | ND | 10 | ND | 10 | 12 |
| MW AP 3504 | 4'-10' | 94575237SL | K947072-003 | 11/9/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | 20 |
| MW AP 3504 | 10'-14' | 94575238SL | K947072-004 | 11/9/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 6 | ND | 10 | ND | 10 | 13 |
| MW AP 3504 | 14'-16' | 94575239SL | K947072-005 | 11/9/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 29 | 10 | 13 |
| FOOTNOTES: | | elected al the me
is considered an | thod reporting limit
estimate. | (MRL). | | | | | | | | | | <u> </u> | | | <u>1</u> | |

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KOAQCICOMMONIACHFINALSIREPTABLESIB35752-F.XLBPethydro-TMI

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

| dry weight basis | _ | | | | COOLIN | G PONDS | | | |
|--|--|-----------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-------------------------------------|
| ng/Kg | Location: | | MW A | P 3502 | | | MWA | P 3503 | |
| - | Sample Depth:
Sample ID:
Lab Code: | 0-4'
94575227SL
K946995-001 | 0-4'
94575228SL
K946995-002 | 4'-6'
94575229SL
K946995-003 | 9'-13'
94575230SL
K946995-004 | 0-8'
94575231SL
K947040-001 | 6'-8'
94575232SL
K947040-002 | 8'-12'
94575233SL
K947040-003 | 8'-12'
94575234SL
K947040-004 |
| | Date Collected: | 11/7/94 | 11/7/94 | 11/7/94 | 11/7/94 | 11/8/94 | 11/8/94 | 11/8/94 | 11/8/94 |
| Organochlorine P | esticides | | | 1 | ł | | | | |
| (EPA Methods 354 | | | | | | | | | |
| | MRL | | | | | | | <u></u> | |
| Alpha-BHC | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Beta-BHC | 0.03 | ND | ND | ND | ND | ND | ND | ND | ND |
| Delta-BHC | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachior | 0.01 | ND | ND | ND | | ND | ND | ND | ND |
| Aldrin | 0.01 | ND | ND | ND | ND | ND | ND | ND_ | ND |
| Gamma-BHC (Lind | | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor Epoxide | | ND | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan I | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Endrin | 0.01 | < 0.1 | < 0.2 | < 0.02 | ND | ND | ND | ND | ND |
| Endosulfan II | 0.01 | < 0,1 | < 0.1 | ND | ND | ND | ND | ND | ND |
| 4,4'-DDD | 0.01 | < 0.1 | < 0.1 | ND | ND | ND | ND | ND | ND |
| Endrin Aldehyde | 0.01 | < 0.1 | < 0.1 | ND | ND | ND | ND | ND | ND |
| Endosulfan Sulfate | | < 0.1 | < 0.1 | ND | ND | ND | ND | ND | ND |
| 4,4'-DDT | 0,01 | < 0.1 | < 0.2 | < 0.02 | ND | 0.12 | <0.04 | ND | ND |
| 4,4-DDE | 0.01 | < 0.1 | < 0.1 | | ND | ND | ND | ND | ND |
| Dieldrin | 0.01 | < 0.1 | < 0,1 | ND | ND | ND | ND | ND | ND |
| Methoxychlor | 0.02 | ND | ND | ND | ND | ND | ND | ND | ND |
| Toxaphene | 0.3 | < 3 | <6 | <1 | ND | <0.6 | <0.6 | ND | ND |
| Chlordane | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Polychlorinated E
(EPA Methods 35 | 40/8080)
MRL | | | | | | | | |
| Aroclor 1016 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1221 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1232 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1242 | 0.1 | ND | ND | ND | ND | ND | ND . | ND | ND |
| Aroclor 1248 | 0.1 | ND | <3 | ND | ND | ND | ND | ND | ND |
| Aroclor 1254
Aroclor 1260 | 0.1 | ND
2.3 | <6 | 0.7 | | 0.5 | ND
0.2 | | |
| Alocior 1260 | 0.1 | <u> </u> | 0./ | 0.7 | | 0.5 | 0.2 | | |
| Chlorinated Herb
(EPA Method 815 | L L | | | | | | | | |
| Dalapon | 1 | ND - | ND | 2 | ND | ND | ND | ~ | 2 |
| MCPP | 20 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Dicamba | 20 | ND | ND | ND | ND | ND | ND | ND | ND |
| | | ND | ND | ND | ND | ND | ND | ND | ND |
| МСРА | 0.1 | | ND | ND | ND | ND | ND | ND | ND |
| MCPA
Dichloroprop | 0.1 | ND | ND | | | 1 | | + | + ·· |
| MCPA
Dichloroprop
2,4-D | | ND
ND | ND | ND | ND | ND | ND | ND | ND ND |
| MCPA
Dichloroprop
2,4-D | 0.2 | | | | ND
ND | ND
ND | ND
ND | ND
ND | ND
ND |
| MCPA
Dichloroprop
2,4-D
2,4,5-TP (Silvex) | 0.2 | ND | ND | ND | 1 | | | <u> </u> | · |

Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

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| iry weight basis | | | | CO | DLING PONDS (c | ent.) | | |
|---|------------|-------------|-------------|-------------|----------------|-------------|---------------|------|
| ng/Kg L | ocation: | | | MW AP 3504 | | | SBAP | 3501 |
| Sampi | Depth: | 0-2 | 4'-10' | 4-10 | 10'-14' | 14'-16' | 5-7 | |
| Sa | mpie ID: | 94575235SL | 94575236SL | 94575237SL | 94575238SL | 94575239SL | 94575240SL | |
| ե | b Code: | K947072-001 | K947072-002 | K947072-003 | K947072-004 | K947072-005 | K7108-001 | |
| Date C | pliected: | 11/9/94 | 11/9/94 | 11/9/94 | 11/9/94 | 11/9/94 | 11/11/94 | |
| Organochlorine Pesticide | s [| | | | | | | |
| EPA Methods 3540/8080) | | | | | | | | |
| _ | MRL | | | | | | | |
| Vpha-BHC | 0.01 | ND | ND | ND | ND . | ND | ND | |
| Beta-BHC | 0.03 | ND | ND | ND | ND | ND | ND | |
| Delta-BHC | 0.01 | ND | ND | ND | ND | ND | ND | |
| Heptachlor | 0.01 | ND | ND | ND | ND | ND | ND | |
| Ndrin | 0.01 | ND | ND | ND | ND | ND | ND | |
| Samma-BHC (Lindane) | 0.01 | ND | ND | ND | ND | ND | ND | |
| Heptachlor Epoxide | 0.01 | ND | ND | ND | ND | ND | ND | |
| Endosulfan I | 0.01 | ND | ND | ND | ND | ND | ≪0.03 | |
| Endrin | 0.01 | <0.02 | ND | ND | ND | ND | <0.03 | |
| Endosultan II | 0.01 | <0.04 | ND | ND | ND | ND | <0.08 | |
| 4,4'-000 | 0.01 | <0.08 | ND | 0.03 | ND | ND | <0.15 | |
| Endrin Aldehyde | 0.01 | ND | ND | ND | | ND | ⊲0.30 | |
| Endosutfan Sulfate | 0.01 | ⊲0.08 | ND | ND | ND | ND | <0.03 | |
| 4,4'-DDT | 0.01 | 0.1 | ND | 0.03 | ND | ND | < 0.30 | |
| 4,4'-DDE | 0.01 | ND | ND | ND. | ND | ND | <0.10 | |
| Dieldrin | 0.01 | ND | ND | ND | ND | NÔ | <0.03 | |
| Methoxychlar | 0.02 | ND | ND | ND | . ND | ND | <0.10 | |
| Toxaphene | 0.3 | <0.6 | ND | ND | ND | ND | <0.6 | |
| Chiordane | 0.1 | ND | ND | ND | ND | ND | ND | |
| Polychiorinated Bipheny | | | | | | | | |
| (EPA Methods 3540/8080 | | | | 1 | | | | |
| | MRL | | | | | | | |
| Aroclor 1016 | 0.1 | ND | ND | ND | ND | ND | ND | |
| Arocior 1221 | 0.1 | ND | ND ND | ND | ND | ND - | ND | |
| Aroclor 1232 | 0.1 | | ND | | ND | ND | | |
| Aroclor 1232 | 0.1 | ND | ND | ND | ND | ND | ND | |
| Aroclor 1248 | 0.1 | ND ND | ND | | ND | ND | | |
| Aroclor 1254 | 0.1 | ND | ND | ND | ND | ND | ND ND | |
| Aroclor 1260 | 0.1 | 0,6 | | | | ND | 18.6 | |
| | | | | · · · · · | | | | |
| Chlorinated Herbicides | } | | | | 1 | | | |
| (EPA Method 8150A Mod | ified) | | | | ļ | | | |
| | MRL | | | | | | | |
| Dalapon | 1 | ND | ND | ND | ND | ND | ND | |
| МСРР | 20 | ND | ND | ND | ND | ND | ND | |
| Dicamba | 0.1 | ND | ND | ND | ND | ND | ND | |
| МСРА | 20 | NO | ND | ND | ND | DND | ND | |
| Dichloroprop | 0.1 | ND | ND | NÓ | ND | ND | ND | |
| 2,4-0 | 0.2 | ND | ND | ND | ND | ND | ND | |
| | 0.05 | ND | ND | ND | ND | NĎ | ND | |
| 2,4,5-TP (Silvex) | 0.05 | ND | ND | ND | ND | ND | ND | |
| | | | | 1 10 | ND | ND | ND | |
| 2,4,5-TP (Silvex)
2,4,5-T
Dinoseb
2,4-DB | 0.5 | ND
ND | ND
ND | | | ND | | |

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Ft, Richardson OU D Sita Building 35-752 Soil Sample Analytical Results Volstile Organic Compounds

| dry weight basis | | | | | | COOLING PONDS | | | | Peg |
|---------------------------------|-----------|-------------|-------------|-------------|--------------|---------------|-------------|-------------|-------------|------------|
| | Location: | S8 AP 3501 | | MW A | P 3502 | | | MWA | P 3503 | |
| | in Death: | 5-7 | 0-4" | 0-6 | 4-5 | g-13' | 0.0 | 6'-5 | 8-12 | 8-12 |
| | mpie IO: | 94575240SL | 94575227SL | 94575226SL | \$457522\$SL | \$4575230SL | 94575231SL | \$45752325L | \$4575Z33SL | #45752345 |
| | ah Code: | K947108-001 | K946995-001 | K945995-002 | K346995-003 | K945995-004 | K947040-001 | K947040-002 | K947040-003 | K947040-00 |
| Date | ciercies; | 11/11/94 | 11/7/64 | 11/7/54 | 11/7/94 | 11/7/94 | 11/6/94 | 11/8/94 | 11/8/94 | 11/8/94 |
| oistile Organic Compounds | I MRL | | | | | | | | | 1 |
| EPA Method 8260) | | | | | | | | | | |
| ichlarodilluoromethane (CFC 12) | 5 | ND | ND | ND | NO | NO | ND | NO | ND | ND |
| hioromothene | 5 | ND | ND | ND | ND | ND | NO | ND | ND | NO |
| inyl Chioride | 5 | ND | NO | ND | NO | ND | NO | ND | ND | ND |
| romomethana | 5 | ND | ND | ND | ND | ND | ND | ND | ND | NO |
| Noroethana | 5 | ND | ND | ND | NO | ND | ND | NÔ | UND . | NO |
| richlorofluoromethane (CFC 11) | 5 | ND | NO | NO | ND | ND | NO | ND | ND | ND |
| cetone | 50 | 59 | 420 | 710 | ND | ND | ND | NO | ND | NO |
| ,1-Dichloroothene | 5 | ND | ND | ND | ND | ND | ND | NO | ND | ND |
| Carbon Disutida | 5 | ND | ND | ND | NÖ | NO | ND | ND | ND | NO |
| leinylene Chlorida | 10 | ND | ND | NO | ND | ND | ND | ND | ND | NO |
| ans-1,2-Dichloroethene | 5 | ND | ND | ND | NED | ND | ND: | ND | NO | ND |
| 1-Dichlcrosthane | 5 | ND | NO | ND | NÖ | NO | ND | NO | ND | ND |
| -Butanone (MEK) | 20 | ND
ND | 80 | 120 | NO | ND | ND | NO | ND | NO |
| 2-Dichioropropane | 5 | ND | NO | NE3 | ND | ND | ND | NO | ND | NO |
| is-1,2-Dichlorosthene | 5 | ND | | NO | ND | ND | ND | ND | ND | ND |
| Chiloroform | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| romochioromethene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| ,1,1-Trichloroethane (TCA) | 5 | ND | ND | ND | NO | NO | NO | ND | ND | NÓ |
| 1-Dichloropropene | 5 | ND | ND | NO | NED | ND | ND | NO | NO | NO |
| Carbon Tetrachiorida | 5 | ND | ND | ND | NO | NO | ND | NO | ND | NO |
| ,2-Dichloroethane | 5 | ND | ND | NO | NO | ND | ND | ND | ND | ND |
| lenzene | 5 | ND | ND | ND | ND | ND | ND | ND | NO | ND |
| Victioroathane (TCE) | 5 | NO | ND | ND | 6 | NO | ND | NO | ND | ND |
| ,2-Dichloroprepane | 5 | ND | ND | ND | NO | NO | NO | ND | ND | ND |
| Iromodichioromethene | 5 | NO | NO | NO | ND | ND | ND | ND | ND | ND |
| Noromomethane | 5 | ND | ND | ND | NO | NO | ND | ND | ND | ND |
| Hexenone | 20 | ND | ND | ND | ND | ND | NO | NO | ND | ND |
| se-1,3-Dichloroprepene | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| loluene | 5 | ND | ND | NO | NO | NO | NO | ND | ND | ND |
| mns-1,3-Oichleropropene | 5 | ND | ND | ND | ND | ND | ND | NO | ND | ND |
| 1,1,2-Trichioroethane | 5 | ND | ND | NO | NO | ND | ND | ND | ND | NO |
| -Methyl-2-pantanene (MIBK) | 20 | NO | ND | ND | NO | ND | NO | NED | ND | NO |
| 1,3-Dichloropropene | 5 | ND | ND | ND | NO | ND | ND | NO | ND | ND |
| Tetrachlorosthene (PCE) | 5 | ND | ND | ND | NO | ND | ND | ND | ND | NO |
| Dibromochloromethane | 5 | ND | ND | ND | NO | ND | ND | ND | ND | ND |
| 1,2-Dibromoethane (EDB) | 20 | ND | NO | ND | ND | ND | ND | ND | NO | ND |
| Chiorobenzene | 5 | ND | NO | ND | NO | NO | NO | ND | ND | ND |
| 1,1,1,2-Tetrachioroettune | 5 | NO | ND | ND | NO | ND | ND | NO | ND | ND |
| Dybenzene | 5 | ND | NO | NÐ | NO | ND | ND | NO | ND | NO |
| Fotal Xylenes | 5 | ND | 14 | 11 | NO | ND | ND | NO | ND | ND |
| Styrene | 5 | ND | ND | ND | ND | NO | ND | NO | NO | NO |
| Bromoform | 5 | ND | ND | NO . | NO | NO | NO | NO | NO | NO |
| sopropyibenzene | 20 | 'ND ' | ND | ND | NO | ND | ND | ND | NO | ND |
| 1,1,2,2-Tetrachioreetune | 5 | ND | NO | NO | ND | ND | ND | ND | NO | ND |
| 2,3-Trichlorepropene | 5 | ND | ND | ND | ND | ND | ND | NO | ND | ND |
| Bromobenzene | 5 | ND | NO | NO | NO | ND | ND | NO | ND | ND |
| Propybonzone | 20 | ND | ND | ND | ND | ND | NO | ND | NO | ND |
| 2-Chiorotoluene | 20 | ND | ND | NO | NO | ND | ND | ND | NO | NO |
| Chiaratakione | 20 | ND | ND | NO | NO | ND | NED | NO | ND | ND |
| 3,5-Trimelingbonzane | 20 | NO | NO | NO | CIN CIN | MD | ND | ND | NO | ND |
| art-Butythenzene | 20 | ND | ND | NO | ND | ND | ND | ND | NO | ND |
| 2,4-Trimethylbenzene | 20 | ND | 21 | 44 | ND | NÓ | ND | ND | NO | ND |
| ec-Butylbenzene | 20 | ND | ND | ND | NO | NO | ND | NO | NO | NO |
| ,3-Dichlarabenzone | 5 | ND | ND | ND | ND | NO | ND | ND | ND | ND |
| Lisopropylioluene | 20 | ND | ND | 21 | ND | ND | ND | ND | NO | NO |
| ,4-Dichlorobenzene | 5 | 7 | ND | NO | 20 | NO | ND | NO | ND | ND |
| n-Butylbenzane | 20 | ND | ND | NO | NO | NO | NO | ND | ND | DN |
| 1,2-Olchiorobenzene | 5 | NĽ | ND | NÔ | NÖ | NO | ND | ND | NO | ND |
| 2-Dibromo-3-chioropropana (DBC) | າ 20 | ND | ND | NO | NO | ND | NO | NO | NO | ND |
| 1,2,4-Trichlorobenzene | 20 | ND | ND | NO | NO | ND | ND | NO | ND | NO |
| 1,2,3-Trichlorobenzane | 20 | ND | NO | NO | סא | ND | NO | NÖ | ND | ND |
| Naphthelene | 20 | NO | NO | 36 | NO | ND | ND | ND | ND | NO |
| Hexachiorobutadiane | 20 | NO | NO | ND | NO | ND | NO | ND | · · · · · | NO |

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Ft. Richardson OU D Site Building 35-752 Soll Sample Analytical Results Volatile Organic Compounds

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S | Antaritation;
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imple ID;
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MRL
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5 | 0-2
945752355L
10347072-001
11/994
ND
ND
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ND
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ND
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ND
ND
ND
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ND | 4-107
44-57225523
K3470722622
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ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | OLING PONDS (cd
MW AP 3504
41:10
45:10
45:752375L
K947072-003
11/8/94
ND
ND
ND
ND
ND
ND
ND | 10"-14"
945752385L
K547072-004
11/2/94
NO
NO
NO
NO
NO
NO
NO
NO | 14-15"
9457521951
K647072-005
11/8/94
NO
NO
NO
NO | | | | |
|---|--|---|--|---|---|--|----------|--------------|----------------|--|
| Samp
But
United States
Volatile Organic Compounds
(EPA Method 8250)
Dichlorodifueromethane (CFC 12)
Chloromethane
Viny Critoride
Bornomethane
Chloroditane
Chloroditane
Chloroditane
Chloroditane
Chloroditane
Chloroditane
Chloroditane
Chloroditane
Chloroditane
Chloroditane
Carbon Disuffide
Mettylene Chloride
trans-1.2-Dichloroditene
2-Butanone (MEK)
2.2-Dichloroditane
Carbon Disuffide | le Dupéh:
imple ID:
ab Code:
olimited in the second
MRL
5
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ND | 445752365L
K347972-002
11/204
NO
NO
NO
NO
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NO
NO
NO | 4-10"
945752375L
K947072-003
11/8/94
ND
ND
ND
ND
ND
ND
ND | 945752365L
K947072-004
11/8/94
NO
NO
NO
NO
NO
NO
NO | 945752395L
K947072-005
11/5/94
NO
NO
NO | | | | |
| Losse of Compounds (CFC 12) Chloromethane (CFC 12) Chloromethane (CFC 12) Chloromethane Chloromethane | State State ab Code: offer:end; offer:end; MRL S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 S 5 | 945752355L
13477072-001
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K347972-002
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NO
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NO
NO
NO
NO
NO | 945752375L
K947072-003
11/8/94
ND
ND
ND
ND
ND
ND
ND | 945752365L
K947072-004
11/8/94
NO
NO
NO
NO
NO
NO
NO | 945752395L
K947072-005
11/5/94
NO
NO
NO | | | | |
| L
Date (
Volatile Organic Compounds
(EPA Method 2200)
Octhorodifluoromethane (CFC 12)
Chloromethane
Chlorodifluoromethane
Chlorodifluoromethane
1,1-Dichloromethane
1,1-Dichloromethane
1,1-Dichloromethane
1,1-Dichloromethane
2-Butanone (MEK)
2,2-Dichloromethane
2-Butanone (MEK) | ab Code:
offincting;
MRL
5
5
5
5
5
5
5
5
5
5
5
5
5 | K047072-001
11/0/64
ND
NO
NO
NO
NO
NO
NO
NO
NO
NO
NO
NO
NO
NO | K947972-002
11/8/94
NO
NO
NO
NO
NO
NO
NO
NO
NO | K947072-003
11/8/94
NO
NO
NO
NO
NO
NO
NO
NO | K947572-004
11/4/94
NO
NO
NO
NO
NO
NO | K947072-005
11/9/94
NO
NO
NO | | | | |
| Date 4 Volatile Organic Compounds (EPA Method 2250) Dichlorodiflucromethane (CFC 12) Chloromethane Emonomethane Chloroethane Chloroethane Chloroethane (CFC 11) Acetone 1.1.0ichloroethane Carbon Disutfide Methylene Chloride tman-1.2-Dichloroethane 2-Butanone (MEK) 2.2.Dichloroethane Chloroethane Chloroethane Chloroethane Chloroethane Chloroethane Chloroethane | MRL 5 5 5 5 5 5 5 5 5 5 5 5 5 50 5 50 5 50 5 50 5 50 5 20 5 5 | 11/294 | 11/204 | 11/2/24
ND
ND
ND
ND
ND
ND
ND
ND | 11/8/94
NO
NO
NO
NO
NO | 11/9/94
NO
NO
NO
NO | | | | |
| Volatile Organic Compounds
(EPA Method 8260)
Dichlorodifluoromethane (CFC 12)
Chloromethane
Vinyi Chloridia
Bromomethane
Chloroethane
Trichloroitunomethane (CFC 11)
Acetone
1.1-Oichloroethane
Carbon Disulfide
Methylona Chloride
trans-1.2-Dichloroethane
2-Butanone (MEK)
2.2-Dichloroethane
2-Butanone (MEK)
2.2-Dichloroethane
2.3-Dichloroethane
Carbon Disulfide
Methylona Chloride | MRL
5
5
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2 | 2 2 2
2 2 2
2 2
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2 2 | NO
HO
NO
NO | | | | |
| (EPA Method 2250)
Dichlorodifluoromethane (CFC 12)
Choramethane
Bromomethane
Choraethane
Choraethane
Choraethane
Choraethane
1.1-Dichloroethane
Carbon Disutide
Methylene Chioride
Tane-1.2-Dichloroethane
2-Bichloroethane
2-Bichloroethane
Chloroethane
Chloroethane
Chloroethane | 5
5
5
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5
5
5
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5
5
5
5
5 | 20
20
20
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20
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20
20
20
2 | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | | NO
NO
NO
NO
NO | ND ND ND | | | | |
| Dichlorodifiueromethane (CFC 12)
Chloromethane
Vinyl Chloride
Bromomethane
Chlorodifiane
Trichloroliuoromethane (CFC 11)
Acctone
1,1-Dichloroethane
Carbon Disulfide
Methylone Chloride
Tanel 1,2-Dichloroethane
2-Butanone (MEK)
2,2-Dichloroethane
cin-1,2-Dichloroethane
Chloroethane | 5
5
5
5
50
5
5
5
5
5
5
5
5
5
5
5
5
5
5 | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | | NO
NO
NO
NO
NO | ND ND ND | | | | |
| Chloromethane
Vinyl Chlorode
Bromomethane
Chlorodhane
Trichlorodhane
Carbon Disulfide
Methyloro Chloride
Trans-1.2-Dichloroethane
2-Butanone (MEK)
2-2-Dichloroethane
2-Butanone (MEK)
2-2-Dichloroethane
Carbon Disulfide
Methyloroethane
2-Butanone (MEK)
2-2-Dichloroethane
Chlorodarm | 5
5
5
5
50
5
5
5
5
5
5
5
5
5
5
5
5
5
5 | 20
20
20
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20
20
20
20
20
20
20
2 | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | | NO
NO
NO
NO
NO | ND ND ND | | | | |
| Chloromethane
Vinyi Chlorida
Bromomethane
Chloroethane
Trichloroethane
Carbon Disulfide
Methylona Chloride
Hethylona Chloride
Hethylona Chloride
Trans-1 2-Dichloroethane
2-Butanone (MEK)
2-2-Dichloroethane
Carbon Disulfide
Methylona Chloride
Hethylona Chloride
Chloroethane
Chloroethane | 5
5
5
5
50
5
5
5
5
5
5
5
5
5
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5
5
5 | 20
20
20
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20
20
20
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20
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20
2 | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | | NO
NO
NO
NO
NO | ND ND ND | | | | |
| Vinyl Ctéoride
Bromomethane
Chioroethane
Chioroethane
Tideliomikuromethane (CPC 11)
Actione
1.1-Dichloroethane
Carbon Disutide
Methylene Chioride
Tane-1.2-Dichloroethane
2-Butanone (MEK)
2.2-Dichloroethane
chioroethane
Chioroethane | 5
5
5
50
5
5
5
10
5
5
5
5
70
5
5
5
5
5
5
5
5
5
5
5
5
5
5 | NO
NO
NO
NO
NO
NO
NO
NO
NO
NO
NO
NO
NO | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | | ND
ND
ND
ND | ND | | | | |
| Bromomothane
Chicrosthane
Trichloroituoromethane (CFC 11)
Acctone
1,1-Dichloroethene
Carbon Disulfide
Methylona Chicride
Iman-1,2-Dichloroethene
1,1-Dichloroethane
2-Butamone (MEK)
2,2-Dichloroethane
chicrostam | 5
5
50
5
5
10
5
5
5
5
70
5
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5
5
5
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5
5
5 | 20
20
20
20
20
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20
20
20
20
20
20
20
2 | ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND | ND
ND
ND | ND | | | | |
| Chloroethane
Tricklonethane (CFC 11)
Acetone
1.1.Oichforethane
Carbon Disulfde
Mettrytene Chloride
trans-1.2-Dichloroethane
2-Butanone (MEK)
2.2-Dichloroethane
dis-1.2-Dichloroethane
Chloroethane | 5
50
5
5
10
5
5
5
5
20
5
5
5
5
5 | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | ND
ND
ND
ND
ND
ND | ND
ND
ND
ND | ND
NO | | | | | |
| Trichlorofluoromethene (CPC 11)
Acetone
Carbon Disulfide
Methytens Choide
trans-1.2-Dichloroethene
1.1-Dichloroethene
2-Buttmone (MEK)
2.2-Dichloroethene
chiloroethene
Chiloroethene | 5
50
5
5
10
5
5
5
20
5
5
5 | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | NO
NO
NO
NO
NO | ND
ND
ND | NO | MD | | | | 1 |
| Acetone 1.1-Dichloroethane Carbon Disulfide Methylene Chloride imne-1.2-Dichloroethane 2-Butanone (MEK) 2-Butanone (MEK) 2-Dickloroethane Chloroethane Chloroethane Chloroethane | 50
5
10
5
5
20
5
5
5
5 | 2
2
2
2
2
2
2
2
2
2
2
2
2
2
2
2
2
2
2 | ND
ND
ND
ND | ND
ND | | | | | | |
| 1,1-Dichloroethene
Carbon Dieutifde
Methylone Chloride
Tanei 1,2-Dichloroethene
1,1-Dichloroethene
2-Butanone (MEK)
2,2-Dichloroptgeme_
cin-1,2-Dichloroethene
Cincloroterm | 5
5
10
5
5
20
5
5
5 | 20
20
20
20
20
20
20
20
20
20
20
20
20
2 | ND
ND
ND | ND | NT | ND | | | | |
| Carbon Disulfide
Methylons Chloride
Imme-1.2-Dichlorosthene
1.1-Dichlorosthene
2-Butanons (MEK)
2-Dichloropropuns
dis-1.2-Dichlorosthene
Chloroterm | 5
10
5
20
5
5 | ND
29
NC
ND | ND
ND | | | ND. | | | | |
| Methylene Chloride
Imme-1.2-Dichloroethene
1.1-Dichloroethene
2-Butmone (MEK)
2.2-Dichloropropame
chlorotorom
Chlorotorm | 10
5
20
5
5 | 20
NC
ND | ND | | NO | ND | | | | |
| Inne-1.2-Dichloroethene
1,1-Dichloroethene
2-Butmone (MEK)
2.2-Dichloropropame
cin-1.2-Dickloroethene
Chloroterm | 5
5
20
5
5 | ND
ND | | ND | NO | ND | | | | |
| 1,1-Dichloroethane
2-Butanone (MEK)
2,2-Dichloropropame
cla-1,2-Dichloroethene
Chlorotom | 5
20
5
5 | ND | | NO | ND | ND | | | | |
| 2-Butamone (MEK)
2,2-Dichloropropane
cis-1,2-Dichloroethene
Chlorotarm | 20
5
5 | | ND | ND | ND | NO | | | | |
| 2.2-Dichloropropane
cis-1.2-Dichloroethene
Chloroetam | 5 | | ND | ND | NÖ | ND | | | | |
| cis-1,2-Dichloroethene
Chlorolam | 5 | ND | NO | ND | ND | NO | | | | |
| cis-1,2-Dichloroethene
Chlorolam | 5 | NO | ND | NO | ON ON | NO | | | | r |
| Chierelans | | ND | ND | ND | NO | NO | | | | t |
| | | NO | ND | NO | ND | ND | | | | |
| C/OTIOCNOTOTHERSING | 5 | ND | ND | NO | ND | NÓ | | | | <u> </u> |
| 1.1.1-Trichloroethane (TCA) | 5 | ND | NO | ND | NO | NO | | · | | |
| 1,1-Dichloropropene | 5 | NO | NO | NO | ND | NO | - | | | · · · · · |
| Carbon Tetrachioride | 5 | NO | ND | NO | NO | NÖ | | <u> </u> | | |
| 1.2-Dichloroethene | - 5 | ND | ND | ND | NO | NO | | | | |
| Benzene | 5 | ND | ND | NO | NO | NO | | | | <u> </u> |
| Trichloroethene (TCE) | 5 | NO | 12 | 19 | NO | NO | | | | · |
| 1,2-Dichiaragrapene | <u>-</u> | NO | NO | NO | ND | NO | | ·· | | |
| Bromodichloremethane | 5 | NO NO | ND | ND | NO | ND | | | | <u> </u> |
| Dibromenana | 5 | ND | NO | NO | ND | NO | | | | |
| 2-Hexanone | | | | | | | | | | <u> </u> |
| | 20 | ND | ND | ND | ND | ND | | | | <u> </u> |
| cas-1,3-Dichlerepropene | 5 | ND | ND | ND | ND | NO | | | | |
| Taluene | 5 | ND | ND | ND | ND | NO | | | | Ļ |
| Tane-1,3-Cichlorepropene | 5 | ND | ND | ND | ND | ND | <u></u> | | | |
| 1,1,2-Trichloreethane | 5 | NO | ND | ND | ND | ND | | | | . |
| 4-Methyl-2-pentanone (MIRK) | 20 | ND | ND | ND | NO | NQ | · | · · | | |
| 1,3-Dichloreprepare | 5 | ND | ND | NO | ND | ND | | | | |
| Tetractelorosthane (PCE) | 5 | NÔ | NÖ | ND | NO | ND | | | | |
| Ditromochioromethane | 5 | ND | ND | ND | ND | ND | | | | |
| 1.2-Dibromoethane (EDB) | 20 | ND | NO | ND | ND | NO NO | | | | |
| Chiorobenzene | 5 | NO | ND | NO | ND. | ND | | | | |
| 1,1,1,2-Tetrachiorosthane | 5 | NO | ND | ND | NO | NO | | | | |
| Ethylbenzene | 5 | ND | NO | | ND CIN | ND | | | | |
| Total Xylenas | 5 | \$ | ND | ND | ND | ND | | | | · |
| Styrane | 5 | ND | NO | ND | NO | NO | | | | I |
| Bremolony | 5 | ND | ND | NO | ND | DM | | | | |
| Isopropyibenzene | 20 | ND | NO | ND | ND | NO | | | | |
| 1,1,2,2-Tetrachioroethene | 5 | ND | ND | ND | NO | ND | | | | |
| 1,2,3-Trichleropropene | 5 | NO | NO | ND | NO | NO | | | | 1 |
| Bromobenzene | 5 | ND | NO | NO | NO | NO | | | t | t |
| n-Propylbenzene | 20 | ND | ND | NO | ND | ND | | | <u> </u> | 1 |
| 2-Chiorototuene | 20 | ND | NO | ND | NO | ND | <u> </u> | | | † |
| 4-Chiorobuluene | 20 | ND | NO | ND | NO | ND | | · | _ | t |
| 1,3,5-Trimetrybenzene | 20 | ND | ND | NO | ND | NO | | | <u>├─</u> ── | <u> </u> |
| tert-Butythenzene | 20 | ND | ND | ND | NO | ND | <u> </u> | | | <u>† </u> |
| 1,2,4-Trimethylbenzene | 20 | ND | NO | NO | ND | ND | | | | + |
| sec-Butybertane | 20 | NO | NO | NO | NO | NO | | | <u> </u> | 1 |
| 1,3-Dichlorobenzene | 5 | ND | ND | NO | ND | NO | | | <u> </u> | <u>+</u> |
| 4-isopropytipiume | 20 | NO | NO | NO | NO | ND | | | <u> </u> | + |
| 1,4-Dichlorobenzene | - 5 | NO | ND | NO | ND | NO | | | <u> </u> | ├ ─── |
| n-Butythenzene | 20 | | ND | NO | - NO | | | | <u>├──</u> ─ · | ł |
| 1,2-Dichlorobenzene | 5 | | - NO | ND | NO | NO | · | <u> </u> | ł | + |
| 1,2-Oibromo-3-chioropropene (DBC | | NO | NO | | | NO | | | <u> </u> | ┥──── |
| 1,2,4-Trichlorobenzene | | | NO | 80 | NO | NO | _ | <u> </u> | ↓ . | + |
| | 20 | ND | NO
NO | NO | ND | | | <u> </u> | <u> </u> | ─── |
| 1,2,3-Trichlorobenzane
Naphihaleme | | ND | ND | NO | | ND | | | ł | + |
| | 20 | | | | ND | ND
NO | · | ├ ─── | <u> </u> | ┥─── |
| Hexachicrobutaciene
FOOTNOTES; ND = Non-d | 20 | ND
The method reporter | ND | <u>i NO</u> | ND | ND | | <u> </u> | 1 | <u> </u> |

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Ft, Richardson OU D Site Building 35-752 Soil Sample Analytical Results Semivolatile Organic Compounds

| iry weight basis | | | | | COOLIN | g PONOS | | | |
|---|------------------|-------------|------------------|-------------|-------------|------------------|-------------|-------------|------------|
| g/Kg | Location: | | MW A | P 3502 | | | | P 3503 | |
| | Sample Depth: | 0-4" | 9 - (| 4.6 | 8-13 | 0- 5 | 6-6 | §-12 | \$-12 |
| | Sample ID: | 945752275L | 9457522851, | 94575Z285L | 94575230SL | \$457523154 | 94575232SL | \$4575233SL | \$4575234S |
| | Lab Code: | K946995-001 | K\$45995-002 | K946995-003 | K946995-004 | K947040-001 | K947040-002 | K947040-003 | K947040-00 |
| | Quin Collected: | 11/7/54 | 11/7/94 | 11/7/94 | 11/7/94 | 11/5/94 | 11/6/94 | 11/6/94 | 11/8/94 |
| mivolatile Organic Compo | zuncis | | | | | | | _ | i |
| PA Methods 3560/8270 | MRL | | | | | | | | |
| Nirosodimethylamine | . 2 | ND | NO | ND | NO | ND | NO | NO | - ND |
| | 1 | ND | NO | NO | ND | NÖ | ND | ND | ND |
| a(2-chloroethyl) Ether
2-Dichlorobenzene | 0.3 | -ND
ND | NO | ND | ND | NO | ND | NO | |
| 2-Dichiorobenzene | د.0
د د ا | NO | ND | | ND | NO | NO | NO | ND |
| 4-Dictriorobenzene | | NO | NO | NO | NO | NO | NO | NO . | NO |
| e(2-chloroisopropyl) Ether | 20 | NO | ND | NO | ND | ND | ND | NO | ND |
| Nitreedi n propylamme | 0.3 | NO | NO | ND | NO | ND | NO | NO | ND |
| exachiorecthane | 0.3 | ND | ND | MD | ND | NO | NO | ND. | ND |
| itobenzone | 2.0 | ND | NO | ND | ND | NO | NÖ | ND. | ND |
| ophorane | 0.3 | ND | ND | NÔ | NED | ND | ND | NO_ | ND |
| is(2-chloroethory)methane | دە | ND | ND | ND | NO | NO | ND | ND. | ND |
| 2,4-Trichlorobenzene | 0.3 | NO | ND | ND | ND | ND | NO | NO. | ND |
| apitthelene | 20 | ND | ND | ND | ND | ND | ND | ND | ND |
| Chloroeniine | 0.3 | ND | NO | ND | ND | ND | ND | NO | ND |
| exachiorobutadame | 20 | ND | ND | NO | NO | NO | NO | NO | ND |
| Motivinaphihalene | 63 | ND | ND | ND | NO | NO | ND | ND | ND |
| exectionocyclopentaciene | 0.3 | ND | ND | ND | NO | ND | ND | ND | ND |
| Chioronaphthalene | 103 | ND | ND | ND | ND | ND | NO | NO | ND |
| Nitroaniline | 2 | ND | ND | NO | NO | NO | NO | ND | NO |
| imethyl Phihalata | 0.3 | NO | ND
ND | ND | ND ND | ND | NO | NO | |
| cenaphthylene | 03 | NO | | NO | NU | NO | NO | ND | NO |
| Nitroaniline | 2 | ND | ND | ND | ND | ND | ND | ND | ND |
| canaphihane
ibenzoturan | | ND | ND ND | ND | NO | NO | NO | NO | ND |
| 4-Dinitrotoluene | <u>ده</u> | ND | NO | NO | NO | NO | NO | ND | NO |
| 6-Dimitrotoluene | | ND | NO | NO | ND | NO | ND | NO | ND |
| icthyl Phihalala | 203 | NO | NO | ND | ND | ND | NO | NO | ND |
| Chlorophenyl Phenyl Ether | 0.3 | ND | NO | NO | NO | NO | ND | ND | ND |
| luorene | 0.3 | ND | NO | NO | ND | ND | NO | NO | NO |
| Nitroaniine | | NO | ND | ND | ND | NO | ND | NO | NO |
| Neceodiphenylamine | 0.3 | NO | ND | NO | NO | NO | ND | ND | ND |
| Bromophenyl Phenyl Ether | 0.3 | NO | ND | NO | NO | ND | ND | NO | ND |
| lexactionobenzane | 0.3 | ND | ND | ND | ND | NO | ND | ND | ND |
| hananthrene | 0.3 | NO | ND | ND | ND | ND | ND | NO | ND |
| Vitracane | 0.3 | ND | NÛ | ND | NÖ | NO | NO | NO | ND |
| X-n-butyl Philiplata | 0.3 | ND | NO | ND | ND | NO | ND | NĎ | NO |
| luoranthene | 20 | ND | ND | ND | ND | ND | NO | NO | ND |
| yrene | 63 | NÖ | NÖ | NO | NO | NO | ND | ND | NO |
| sutylbonzyl Phihalate | 0.3 | ND | NÖ | ND | | NO | NÖ | NÓ | ND |
| 3'-Dichlerobenzidine | 2 | ND | NÖ | NO | NO | NO | ND | ND | NO |
| Senz(a)enthrecene | 0.3 | ND | ND | ND | ND | ND | NO | ND | ND |
| ks(2-etinyinezyi) Pinihalate | C.0 | ND | | NO | NO | ND | NO | ND | ND |
| Chrysone
D-n-octyl Phthalate | 2.0
2.0 | NO | NO NO | NO 100 | ND
ND | ND ND | NO NO | ND " | ND |
| Jenzo(b)fluoranthane | 0.3 | ND | | NO | NO | NO | NO | | |
| enzo(k)iluoranihene | <u>د</u> ه
ده | ND | | NO NO | NO | | ND T | ND | ND |
| enzo(s)pyrane | 0.3 | ND | ND ND | NO | NO | NO | NO | ND | NO |
| ideno(1,2,3-cd)pyrene | 0.3 | NO | NO | NO | NO | NO | NO | NO | |
| Nomz(a,h)enthracene | 0.3 | NO | NO | ND | - ND | | NO | ND | NO |
| enzo(g,h,i)perylene | 0.3 | NO | NO | NO | NO | NO | ND | ND_ | NO |
| Thenol | 0.3 | | NO | NO | ND | ND | NO | NQ_ | ND |
| Chiorophenol | | ND | ND | ND | ND | NO | ND | ND | NO |
| lenzyi Alcohol | 0.3 | | NO | NO | ND | ND | NO | NO | ND |
| Metryphenol | 20 | | ND | ND | ŃD | ND | ND | ND | NO |
| - and 4-Methylphanol* | <u>ده</u> | | ND | ND | ND | ND | NO | ND | ND |
| Nimphenol | 203 | | ND | NO | NO | MO | ND | ND | ND |
| 4-Dimethylphenol | 0.3 | | NO | NO NO | ND | ND | NO | NO | ND |
| lenzoic Acid | 2 | NO | NO | NO | NO | NO | ND | ND | ND |
| 4-Dichlorophenal | 101 | | ND | ND | ND | NO | NO | ND | ND |
| -Chloro-3-methylphanal | 0.3 | | ND | ND | ND | ND | NÖ | NO | ND |
| 2,4,6-Trichlorophenol | E0 | | NO | ND | NO NO | NO | NO | NO | NO |
| 2,4,5-Trichlorophenol | 0.3 | | NO | ND | ND | <u><u>NO</u></u> | NO | NO | ND |
| 2,4-Dirvirophenal | 2 | | ND | NO
ND | NO
NO | NO | NO | NO | NO |
| 2-Methyl-4,6-dinitrophenol | | | ND | ND | NO 10 | - 10 | ND | NO | ND |
| Pentaciderophenol | | | | 10 | NO | <u> </u> | NO - | NO | NO |
| | | | (MRL). | | | · ~ | | . m | 1 |

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Ft. Richardson OU D Sita Building 35-752 Soil Sample Analytical Results Semivolatile Organic Compounds

| | Location:
pie Deptic
Bempie IO:
Lab Code:
Collected:
2
4
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | 0-2
945752155L
K947072-001
11/8/94
NO
NO
NO
NO
NO
NO
NO
NO
NO | 4'-10"
845752365L
K947072-002
11/3/64
NO
NO
NO
NO
NO | COOLING PH
MW AP 3504
4-107
M5752375L
K647072-003
11/8/94
ND
ND | 10-14'
945752385L
K947072-004
118994
ND | 14-16
945752385L
K947072-005
11/9/94 | S8 AP 3501
5-7
9457524051,
K947106-001
11/11/14 | | |
|--|--|---|--|--|---|---|---|--|--|
| Sam
Date
Samvoistile Organic Compounds
EPA Medvois 3660/8270
N-Niroseodimethylamine
Aniline
Bia(2-chlorobenzene
1.3-Dichlorobenzene
1.3-Dichlorobenzene
1.3-Dichlorobenzene
Bia(2-chlorobenzene
Bia(2-chlorophane)
N-Niroseod-n-propylamine
Hezzethoroefhane
N-Nirobenzene
Bia(2-chlorophane)
Bia(2-chlorophane)
Bia(2-chlorophane)
Bia(2-chlorophane)
Bia(2-chlorophane)
Bia(2-chlorophane)
Bia(2-chlorophane) | pie Deptic
Semple IO:
Lab Code:
Collected:
2
4
4
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | 945752155L
K947072-001
11/2694
NO
NO
NO
NO
NO
NO
NO | 945752365L
K947072-002
11/3/94
ND
ND
ND
ND
ND | 4-10
945752375L
K647072-003
11/9/94
ND
ND | 945752385L
K947072-004
11/8/94 | 945752395L
K947072-005
11/9/94 | 5-7
9457524051,
K947108-001
11/11/84 | | |
| Date Samwolatile Organic Compounds EPA Mechods 3560/8270 N-Nirosodimethylamine Anline Bis(2-chlorosity() Ether 1.3-Dichlorobenzene 1.3-Dichlorobenzene Bis(2-chlorobenzene Bis(2-chloroben | Sample IO:
Lab Code:
Collected:
2
4
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | 945752155L
K947072-001
11/2694
NO
NO
NO
NO
NO
NO
NO | 945752365L
K947072-002
11/3/94
ND
ND
ND
ND | 945752375L
K947072-003
11/9/94
ND
ND | 945752385L
K947072-004
11/8/94 | 945752395L
K947072-005
11/9/94 | 9457524054,
K947108-001
11/11/94 | | |
| Date Servivolatile Organic Compounds EPA Methods 3660/t270 N-Nirosodimethytemine Anilme Be(2-chlorobenzene 1.3-Dichlorobenzene Esc2-chlorobenzene Be(2-chlorobenzene | Lab Code:
Collected:
MPL
2
1
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | K947072-001
11/2/04
NO
NO
NO
NO
NO
NO | K947072-002
11/2/54
NO
NO
NO
NO | K947072-003
11/9/94
ND
ND
ND | K947072-004
11/8/94
ND | K947072-005
11/9/94 | K947108-001
11/11/94 | | |
| Samvolatile Organic Compounds
EPA Methods 3560/8270
N-Nitrosodimethylamine
Anline
Bia(2-chlorosthyl) Ether
1.3-Dichlorobenzene
1.3-Dichlorobenzene
Bia(2-chlorobenzene
Bia(2-chlorosthang
N-Nitrobenzene
Bia(2-chlorosthang
Nitrobenzene
Bia(2-chlorosthang
Bia(2-chlorosthang
Nitrobenzene
Bia(2-chlorosthang
Diaphorone
Bia(2-chlorosthang | Collected:
MRL
2
1
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | 11/2/04
NO
NO
NO
NO
NO
NO | 11/2/24
NO
NO
NO
NO
NO | 11/9/94
ND
ND
ND | 11/8/94 | 11/9/94 | 11/11/04 | | |
| Samvolatile Organic Compounds
EPA Methods 3560/8270
N-Nitrosodimethylamine
Anline
Bia(2-chlorosthyl) Ether
1.3-Dichlorobenzene
1.3-Dichlorobenzene
Bia(2-chlorobenzene
Bia(2-chlorosthang
N-Nitrobenzene
Bia(2-chlorosthang
Nitrobenzene
Bia(2-chlorosthang
Bia(2-chlorosthang
Nitrobenzene
Bia(2-chlorosthang
Diaphorone
Bia(2-chlorosthang | MRI
2
1
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | NO
NO
NO
NO
NO
NO | ND
NC
ND
ND
ND | NQ
NQ
NQ
NQ | ND | | | | |
| EPA Mechodis 3560/8270 N-Nitrosodimethytamine Aniline Bia(2-chlorosthyt) Ether 1.3-Dichlorobenzene 1.3-Dichlorobenzene Bia(2-chlorobenzene Bia(2-chlorobenzene Bia(2-chlorobenzene Bia(2-chlorobenzene Bia(2-chlorobenzene Bia(2-chlorosthane Itaphorone Bia(2-chlorosthane Ita) | 2
1
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | ND
ND
ND
ND
ND | NC
ND
ND
ND
ND | ND
ND | | ND | | | |
| N-Nitrosodimethylamine
Anline
Bia(2-chloroethyl) Ether
1.3-Dichlorobenzene
1.3-Dichlorobenzene
Bia(2-chloroethoroenzene
Bia(2-chloroethoro | 2
1
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | ND
ND
ND
ND
ND | NC
ND
ND
ND
ND | ND
ND | | ND | | | <u> </u> |
| Aniline
Bia(2-chloroethyl) Ether
1.3-Dichlorobenzene
1.3-Dichlorobenzene
Bia(2-chlorobenzene
Bia(2-chloroethane
N-Nitrobenzene
Bia(2-chloroethane
Bia(2-chloroethane
Bia(2-chloroethane
Bia(2-chloroethane)
Bia(2-chloroethane
1.2.4-Trichlerobenzene
Nachtheise | 1
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | ND
ND
ND
ND
ND | NC
ND
ND
ND
ND | ND
ND | | ND | | | |
| Aniline
Bia(2-chloroethyl) Ether
1.3-Dichlorobenzene
1.3-Dichlorobenzene
Bia(2-chlorobenzene
Bia(2-chloroethane
N-Nitrobenzene
Bia(2-chloroethane
Bia(2-chloroethane
Bia(2-chloroethane
Bia(2-chloroethane)
Bia(2-chloroethane
1.2.4-Trichlerobenzene
Nachtheise | 1
0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | ND
ND
ND
ND
ND | NC
ND
ND
ND
ND | ND
ND | | | | | |
| Bis(2-chiorosethyl) Ether
1.2-Dichiorobenzene
1.3-Dichiorobenzene
Bis(2-chioroshenzene
Bis(2-chioroshenzene
Bis(2-chioroshene
N-Nitrobenzene
Isophorone
Bis(2-chioroshoxy)mothene
1.2.4-Trichierobenzene
Nachtrisione | 0.3
0.3
0.3
0.3
0.3
0.3
0.3
0.3 | ND
ND
ND
ND | ND
ND
ND | ND | | ND | NU
NO | | l |
| 1.2-Dichlorobenzene
1.3-Dichlorobenzene
Bic/2-divarsinopropyi) Ether
N-Nitrosedi-n-propyiarime
Hazactiorositures
Isophorone
Bia(2-chlorositures
Isophorone
Bia(2-chlorositures)
Iz.4-Trichlerobenzene
Nachthistone | 0.3
0.3
0.3
0.3
0.3
0.3
0.3 | ND
20
20 | ND
ND | | NO | | | · | |
| 1.3-Dichlorobenzene
1.4-Dichlorobenzene
Bisc2-chloropylarime
Hazachloroeftane
Hazachloroeftane
Bisc2-chloroeftane
Bisc2-chloroeftane
Bisc2-chloroeftane
Bisc2-chloroeftane
1.2.4-Trichlerobenzene
Nachthistene | 0.3
0.3
0.3
0.3
0.3
0.3 | ND
ND | ND | | ND | | | | |
| 1.4-Dictionobenzene
Bie(2-chlaratinapropyi) Ether
N-Nirosodi-n-propyiaritate
Hazachi/oroefilanie
Nitrobenzene
Bie(2-chlaratethang)/mothane
Bia(2-chlaratethang)/mothane
1.2.4-Trictiferobenzene
Nicptifisione | 20
20
20
20 | ND | | ND | NO | NO | 20 | | l |
| Bis(2-chloroscof-n-propyt) Ether
N-Nirobacd-n-propytatime
Hazachlorosthane
Nirobarzene
Isophorone
Bis(2-chlorosthoxy)motione
1.2.4-Trichlerobanzene
Naptithisone | 2.0
2.0
2.0 | | NO | NO | 80 | NO | ND | | |
| N-Nérosodi-n-propylantane
Hazachloroidhane
Nitrobetzene
Isophorone
Bia(2-chloroidhooy)/mothane
1.2.4-Trichlérobetzene
Nachthistone | C0
0.3 | | ND | ND | ND | NO | | ├──── ┥ | |
| Hezachioroothane
Nitroberzwie
Iaophorone
Bia(2-chiorosthoxy)mothane
1.2.4-Trichiorobenzene
Naphthelone | 0.3 | NÔ | 29 | NO | 100 | ND | NO | <mark>┤──</mark> ┈───┥ | |
| Nitroberzene
Isophorone
Bis(2-chloroshoxy)mothane
1.2,4-Trichleroberzene
Naphthelone | | NO | NO | ND | ND | NO | ND | ┠─────┤ | h |
| Isophorone
Bis(2-chloroethoxy)mothane
1,2,4-Trichlerobanzane
Naphthelone | | ND | ND | NO | NO | NO | NO | <u></u> ╆╼╼╼╴ _╍ ┈ <u></u> ┻┻┙ | i |
| Bis(2-chlorosthoxy)methane
1.2.4-Trichlerobanzane
Naphthalone | 0.3 | NÔ | ND | NO | NO | ND | NO | <u> </u> | |
| 1,2,4-Trichlerobenzene
Naphthelone | 0.3 | NO | NO | NO | NO | 100 | NO | | <u> </u> |
| Naphthelone | 0.3 | NO | NO | NÖ | ND | NO | NO | ┟╌───┥ | |
| | 0.3 | NO | NO | NO | NO | NO | NO | ┝──── | ├ ──── |
| | 0.3 | NO | NO | NO | | NO | ND | ╂─────┤ | ·• • • • • • • • • • • • • • • • • • • |
| Hexachiorobutadiana | 0.3 | ND | ND | ND | NO | NO | NO | t | |
| 2-Methylnaphthalane | 0.3 | | N0 | NO | NO | NO | NO | | <u> </u> |
| Hexachiorocyclopentaciene | 10.3 | ND | NO | NÖ | - NO - | ND | NO NO | | <u>∤ • → · · · · · · · · · · · · · · · · · ·</u> |
| 2-Chloronapittalane | 0.3 | ND | | ND | NO | NO NO | NO | | |
| | 2 | | NO NO | NO | NO | NO 10 | NO NO | ┝── | l |
| Dimethyl Philhalate | 0.3 | NO | NO | NO | ND | - NO | NO | <u></u> | |
| Acomphiliylene | 0.3 | NO | ND | NO | NO | NO | NO | | |
| 3-Nitroaniline | 2 | NO | NO | NO | NO | NO | NO | | l |
| Aconachitrene | 0.3 | NO | | NO | NO | ND | NO | | • • • • • |
| Debenzoturen | | ND | ND | ND | NO | NO | ND | | |
| 2.4-Dinitratoures | 20 | ND | ND | ND | NO | | ND | {── ··── | Į |
| 2,6-Dinitrolatione | 60 | NO | ND | ND | NO | - NO | ND | | <u>↓</u> |
| | | NO | ND | NO | ND | | ND | | <u> </u> |
| Diethyl Phihalele | E.0 | ND | NO | NO | NO | NO | | | |
| 4-Chierophonyl Phenyl Ether | | | ND | NO | ND | NO | | <u> </u> | ļ |
| Fluorente | 0.3 | ND | NO | ND | NO | ND | ND | | |
| 4 Nitroaniine | 2 | NO I | NO | ND | ND | NO | | | |
| N-Nikosodiphenylamine | 0.3 | ND I | | | | | ND | | |
| 4-Bromophenyl Phenyl Ether | 0.3 | . NO | ND | NO | ND
NO | NO | ND | <u> </u> | |
| Hexachlorobenzone | دە | Ň | ND : | ND | NC | ND | ND | | ļ |
| Phenenitrene | 0.3 | ND | | ND | | | ND | <u> </u> | |
| Anthracene | 20 | NQ | ND ND | ND | ND | ND | ND | · | <u> </u> |
| Di-n-butyl Philhaime | ده | ND | | | ND | NO | ND | + | ļ |
| Fluorenthene | 0.3 | NO I | ND | NO | - | ND | ND | L | |
| Pyrane | 23 | ND | ND | ND | ND | NO NO | ND | · · · · · · · · · · · · | |
| Butylbenzyl Phthalate | 0.3 | NO | NO | ND | NO | NO | ND | | |
| 3,3'-Dichlorobenzidine | Z | ND | ND | ND | ND | NO | NO | ļ | |
| Benz(e)anthracene | 0.3 | ND | ND | NO | NO | NO | ND | · | <u> </u> |
| Sis(2-ethylhexyl) Philaiste | 20 | ND | NO | NO | NO S | NO | NO | | Į |
| Chrysene | 0,3 | ND | ND | NO | ND | N0 | ND | · | ļ |
| Di-n-octyl Philielete | 20 | ND | ND | NO | 20 | <u>ND - </u> | ND | | |
| Benzo(b)fluoranthene | 50 | 8 | NO 15 | NÖ | NO | NO | ND | | |
| Benzo(k)fluorenthene | 20 | ND | ND | ND | 29 | | NO | - | |
| Benzo(s)pyrene | 0.3 | N | NO | NO | NO | ND ND | NO | | <u> </u> |
| Indono(1,2,3-od)pyrane | 20 | ND | ND | ND | ND | NO | ND | · | 4 |
| Dibenz(e,h)enthracene | 6.0 | ND | ND ND | NO. | NO
NO | ND T | NO | ─── | J |
| Benzo(g,h,i)perylene | 0.3 | NO | NO | <u> </u> | ND | NO | NO | | |
| Phenol | 10 | . ND | NO | ND | NO | ND | NO | | ╄──── |
| Z-Chlorophenot | 101 | ND IS | | | | + | | + | |
| Benzyl Alcohol | <u>c</u> | NO | ND | ND | NO | <u> </u> | NO | | · |
| 2-Methylphanal | 0.3 | NO | NO | - NO | - DA - | <u> </u> | ND | | ─── |
| 3- and 4-Methylphenol" | 50 | NO | NO | ND | | <u> </u> | ND | | |
| 2-Nitrophenol | 20 | NO | NO | | ND ND | <u>M0</u> | 20 | ↓ | |
| 2,4 Dimethylphenel | 6.0 | NO | NO | NO. | NO | ND | NO | + | <u> </u> |
| Benzoic Add | 2 | NO | NO | | | | 2 | | <u> </u> |
| 2.4 Dichlorophenol | 2.0 | NO | ND. | ND | NÖ | <u>но</u> | NO . | | |
| 4-Chioro-3-methylphenal | 103 | NO | ND | NO | | ×0 | ND | <u> </u> | |
| 2,4,6-Trichlorophenol | 0.3 | ND I | NO | ND | NO | HD ND | NO | + | 4 |
| 2,4,5-Trichlorophanol | - 0.3 | ND | NO | NO | ND | ND | ND | + | |
| 2,4-Dintrophenol | 2 | ND | NO | ND | NO | ND | ND | | |
| 4-Nitrophenol | 2 | ND | ND | ND | ND | NO | ND | + | <u> </u> |
| 2-Methyl-4.6-dinitrophenol | Z | NÓ | NO | NO | NO | ND | ND | <u> </u> | + |
| Pentechlorophenol
FOOTNOTES: ND = Non- | - 1.2 | NO
Antibial Augusting Lond | ND | HD HD | I HD | | NO | 1 | 1 |

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Ft. Richardson OU D Site Building 35-752 Soll Sample Analytical Results Total Metals

| | Tota | I M | et | al | l |
|--|------|-----|----|----|---|
|--|------|-----|----|----|---|

| dry weight basi: | 1 | | | | Analyte: | Arsenic | Barlum | Cadmium | Chromlum | Lead | Mercury | Nickel | Selenium | Silver |
|------------------|-----------------|--------------------|-----------------|-------------------|----------|---------|--------|---------|----------|------|---------|--------|----------|--------|
| mg/Kg | | | | | Method: | 7060 | 6010A | 6010A | 6010A | 7421 | 7471 | 6010A | 7740 | 6010A |
| Location | Sample
Depth | Sample ID | Lab Code | Date
Collected | MRL: | 1 | 1 | 1 | 2 | 1 | 0.2 | 10 | 1 | 2 |
| COOLING POND | S | | | | | | | | | | | | | |
| SB AP 3501 | 5'-7' | 94575240SL | K710801 | 11/11/94 | | 5 | 57 | ND | 38 | 13 J | ND | 33 | ND | ND |
| WW AP 3502 | 0-4' | 94575227SL | K699501 | 11/7/94 | | 5 | 99 | ND | 33 | 9 | ND | 30 | ND | ND |
| MW AP 3502 | 0-4' | 94575228SL | K699502 | 11/7/94 | ł | 5 | 91 | ND | 34 | 11 | ND | 34 | ND | ND |
| MW AP 3502 | 4'-6' | 94575229SL | K699503 | 11/7/94 | - | 5 | 89 | ND | 37 | 7 | ND | 37 | ND | ND |
| WW AP 3502 | 9'-13' | 94575230SL | K699504 | 11/7/94 | | 5 | 48 | ND | 25 | 6 | ND | 30 | ND | ND |
| WW AP 3503 | 0-8' | 94575231SL | K704001 | 11/8/94 | | 5 | 47 | ND | 27 | 9 | ND | 38 | ND | ND |
| WW AP 3503 | 6'-8' | 04575232SL | K704002 | 11/8/94 | | 4 | 54 | ŃD | 21 | 5 | ND | - 44 | ND | ND |
| MW AP 3503 | 8'-12' | 94575233SL | K704003 | 11/8/94 | | 4 | 69 | ND | 30 | 7 | ND | 36 | ND | ND |
| WW AP 3503 | 8'-12' | 94575234SL | K704004 | 11/8/94 | | 4 | 58 | ND | 29 | 6 | ND | 31 | ND | ND |
| WW AP 3504 | 0-2' | 94575235SL | K707201 | 11/9/94 | | 5 J | 70 | ND | 32 | 12 | ND | 29 | ND | ND |
| WW AP 3504 | 4'-10' | 94575236SL | K707202 | 11/9/94 | | 4 J | 60 | ND | 38 | 5 | ND | 36 | ND | ND |
| WWAP 3504 | 4'-10' | 94575237SL | K707203 | 11/9/94 | | 5 J | 44 | ND | 31 | 8 | ND | 30 | ND | ND |
| WW AP 3504 | 10'-14' | 94575238SL | K707204 | 11/9/94 | | 4 J | 64 | ND | 38 | 5 | ND | 45 | ND | ND |
| WW AP 3504 | 14'-18' | 94575238SL | K707205 | 11/9/94 | | 6 J | 63 | ND | 36 | 6 | ND | 38 | ND | ND |
| FOOTNOTES: | ND = Non-d | letected at the me | sthod reporting | limit (MRL). | | | | | | | | | · | |
| | J ⊨ Value | is considered an | estimale. | | | | | | | | | | | |

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OMRICHMINALSIREPTABLES/035752-F.XL8|Motulo-Tbi5

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Petroleum Hydrocarbons

| dry weight basis | EPA Meth | | Analysis:
PA Method: | | Benzene
8260 | | 8260 | | Ethylbenzene
8260 | | 8260 | | GRO
0/8015 | DRO
3540/8100 | | TPH
9071/418. | | |
|------------------|-----------------|------------|--|-------------------|-----------------|---------------|----------|-------------|----------------------|-----------|-------|--------|---------------|------------------|-------|------------------|-------|-------|
| | | • | | Units: | µg/Kg | | µg/Kg | | µg/Kg | | µg/Kg | | mg/Kg | | mg/Kg | | mg/Kg | |
| Location | Sample
Depth | Sample ID | Lab Code | Date
Collected | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Resul |
| FORMER UST LOO | CATION | | · | | | | - | | | | | | | | · | | | |
| SB AP 3497 | 0-4' | 94575273SL | K946882-006 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | 6 | 5 | ND | 10 | 487 | 10 | 610 |
| SB AP 3497 | 4'-10' | 94575274SL | K946882-007 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | 6 | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3497 | 4'-10' | 94575275SL | K946882-008 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3497 | 14'-18' | 94575276SL | K946682-009 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3497 | 18'-20' | 94576278SL | K946882-010 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3498 | 0-4' | 94575279SL | K946882-011 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 15 | 10 | ND |
| SB AP 3488 | 4'-8' | 94575280SL | K946882-001 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3498 | 10'-12' | 94575281SL | K946882-002 | 11/2/94 | 5 | <1200 | 5 | <1200 | 5 | 2300 | 5 | 14000 | 5 | 920 | 10 | 8150 | 10 | 6900 |
| SB AP 3499 | 0-2' | 94575282SL | K946882-003 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 352 | 10 | 430 |
| SB AP 3499 | 4'-8' | 94575283SL | K946882-004 | 11/2/94 | 5 | NÐ | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 74 | 10 | 91 |
| SB AP 3499 | 8'-12' | 94575284SL | K948882-005 | 11/2/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND . | 5 | ND | 10 | 50 | 10 | 27 |
| SB AP 3500 | 0-4' | 94575286SL | K946921-005 | 11/3/94 | 5 | ND | . 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 10 | 10 | 35 |
| SB AP 3500 | 0-4' | 94575287SL | K946921-006 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | 5 | 5 | ND | 10 | 15 | 10 | 24 |
| SB AP 3500 | 4'-8' | 94575208SL | K946921-007 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 40 | 10 | 40 |
| SB AP 3500 | 8'-12' | 94575289SL | K946921-008 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3500 | 14'-16' | 94575290SL | K946921-009 | 11/3/94 | 5 | <1300 | 5 | <1300 | 5 | 2700 | 5 | 15000 | 5 | 910 | 10 | 1310 | 10 | 1800 |
| FOOTNOTES: | | | thod reporting limit
eporting limit has b | | ue lo m | atrix interfe | rences o | r sample re | quiring (| dilution. | | | | | | | | |

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FL Richardson OU D Site Building 35-752 Soil Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

| iry weight basis | | | | | FORMER US | T LOCATION | | | |
|---------------------------|----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| ng/Kg Lo | cation: | | | SB AP 3497 | | | | SB AP 3498 | |
| Sample | Depth: | 0-4' | 4'-10' | 4'-10' | 14'-16' | 18-20 | 0-4" | 4'-8' | 10-12 |
| San | npie ID: | 94575273SL | 94575274SL | 94575275SL | 94575276SL | 94575278SL | 94575279SL | 94575280SL | 945752B1SL |
| اهبا | Code; | K946882-006 | K946882-007 | K946882-008 | K946882-009 | K946882-010 | K946882-011 | K946882-001 | K946882-002 |
| Date Co | llected: | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 |
| Organochlorine Pesticider | , | | | | | | ····· | | |
| EPA Methods 3540/8080) | | | | | | | | | |
| | MRL | | | | | | | | |
| Alpha-BHC | 0.01 | ND |
| Beta-BHC | 0.03 | ND |
| Delta-BHC | 0.01 | ND |
| Heptachlor | 0.01 | ND |
| Aldrin | 0.01 | ND |
| Gamma-BHC (Lindane) | 0.01 | ND |
| Heptachlor Epoxide | 0.01 | ND |
| Endosulfan I | 0.01 | ND |
| Endrin | 0.01 | <0.08 | ND | ND | ND | NĎ | ND | ND | ND |
| Endosulfan II | 0.01 | <0.03 | ND |
| 4,4'-DDD | 0.01 | <0.04 | ND |
| Endrin Aldehyde | 0.01 | <0.07 | ND |
| Endosulfan Sulfate | 0.01 | NĎ | ND |
| 4,4'-DDT | 0.01 | <0.07 | ND | ND | ND | ND | <0.02 | ND | ND |
| 4,4'-DDE | 0.01 | <0.03 | ND | NĎ | ND | ND | ND | ND | ND |
| Dieldrin | 0.01 | ND |
| Methoxychior | 0.02 | ND |
| Toxaphene | 0.3 | <0.5 | DND | ND ND | ND | ND | ND | ND | ND |
| Chlordane | 0.1 | ND | ND | ND | ND | ND | DN | ND | ND |
| Polychiorinated Biphenyis | | | | ľ | | ļ | | | 1 |
| (ÉPA Methods 3640/8080) | • | | | | | | | | |
| | MRL | | } | 1 | 1 | } | } | } | |
| Aroclor 1016 | 0.1 | ND |
| Aroclor 1221 | 0.1 | | ND |
| Aroclor 1232 | 0.1 | ND | ND | ND | ND | ND | ND | | |
| Arocior 1242 | 0.1 | | ND | | ND | ND | ND | | ND |
| Aroclor 1242 | 0.1 | ND | ND | | | ND | ND | ND | |
| Arocior 1254 | 0.1 | | ND |
| Aroclor 1260 | 0.1 | 4.1 | | ND | ND | ND | 0.7 | ND | |
| | | | 1 | 1 | 1 | | | | |
| Chlorinated Herbicides | | | | | | Ì | | • | |
| (EPA Method 8150A Modi | fied) | | | | 1 | | | | |
| | MRL | | | | <u> </u> | | | · | ł |
| Dalapon | 1 | ND | ND | ND | ND | ND | ND | ND. | ND |
| MCPP | 20 | ND | ND | ND | ND | DN | ND | ND | ND |
| Dicamba | 0.1 | ND | ND | NĎ | ND | ND | ND | ND | ND |
| MCPA | 20 | ND |
| Dichloroprop | 0.1 | ND |
| 2,4-D | 0.2 | ND |
| 2.4.5-TP (Silvex) | 0.05 | ND |
| 2,4,5-T | 0.05 | ND |
| Dinoseb | 0.5 | | ND
ND | ND
ND | ND
ND | ND | ND | ND | ND |
| 2.4-DB | 0.5 | | | | | NO | ND ND | ND | ND |

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

| fry weight basis | | | | F | ORMER UST L | OCATION (cont | L) | | Page |
|---|--------------------------|----------------------|----------------|----------------|----------------|---------------|-------------|-------------|------------|
| | ocation: | | SB AP 3499 | | · · · · · | | SB AP 3500 | | |
| | le Depth: | 0-2 | 4'-8' | 8-12 | 0-4' | 0-4' | 4-8 | 8-12 | 14'-16' |
| S | mpie ID: | 94575282SL | 94575283SL | 94575284SL | 94575286SL | 94575287SL | 94575288SL | 94575289SL | 94575290S |
| | ab Code: | K946882-003 | K946882-004 | K946882-005 | K946921-005 | K946921-006 | K946921-007 | K946921-008 | K946921-00 |
| Date C | ollected: | 11/2/94 | 11/2/94 | 11/2/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 |
| Organochlorine Pesticid | es | | | <u> </u> | | | · | | |
| EPA Methods 3540/5080 | | | | | | | | | |
| | MRL | | | 1 | | | | | |
| Alpha-BHC | 0.01 | ND | ND | ND | ND | ND - | ND | ND | ND |
| Beta-BHC | 0.03 | ND | ND | ND | ND | ND | ND | ND | ND |
| Delta-BHC | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachior | 0.01 | ND | ND - | ND | ND | ND | ND | ND | ND |
| Ndrin | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Gamma-BHC (Lindane) | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| leptachior Epoxide | 0.01 | ND | ND | | ND | ND | ND | ND | ND |
| Endosulfan I | 0.01 | ND | ND | ND | ND | ND | | ND | |
| Endrin | 0.01 | <0.03 | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan II | 0.01 | ND | ND | ND | ND | ND | | ND | ND |
| 4.4'-DOD | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Endrin Aldehyde | 0.01 | <0.03 | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan Sulfate | 0.01 | ND | ND | ND | ND | ND - | ND | ND | ND |
| 4,4'-DDT | 0.01 | <0.04 | 0.01 | ND | ND | ND | ND | ND | ND |
| .4-DDE | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Dieldrin | 0.01 | ND | | ND | ND | ND | ND | ND | ND |
| Methoxychlor | 0.01 | ND | ND | ND | ND ND | ND | ND | ND | ND |
| Toxaphene | 0.3 | <0.05 | ND - | ND | ND | ND | ND | ND | ND |
| Chiordane | 0.1 | ND | ND | ND | ND | ND | ND ND | NĎ | ND |
| Polychlorinated Bipheny
(EPA Methods 3540/808/ |) | | | | | | | | |
| | MRL, | | | | | · · · · · · | | | |
| Aroclor 1016 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Arodor 1221 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1232 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1242 | 0.1 | ND | ND | ND | ND | | | ND | ND |
| Arocior 1248 | 0.1 | ND | | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | 0,1 | ND
0.9 | | | ND
ND | | | | ND |
| Chlorinated Herbicides | 1 | 0.9 | | | | | | | ND |
| | MRL | | | • | | <u> </u> | L | | |
| | 1 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 20 | ND | ND | ND | ND | ND | ND | ND | ND |
| | | ND | ND | ND | ND | ND | ND | ND | ND |
| MCPP
Dicamba | 0.1 | | | 1 | ND - | ND | ND | ND | ND |
| MCPP Dicamba MCPA | 20 | ND | ND | ND | | | | | |
| MCPP
Dicamba
MCPA
Dichloroprop | | ND
ND | ND
ND | ND
ND | ND | ND | ND | DND | ND |
| MCPP
Dicamba
MCPA
Dichloroprop | 20 | ND | | | ND
ND | ND
ND | | ND
ND | ND
ND |
| MCPP
Dicamba
MCPA
Dichloroprop
2,4-D | 20
0.1 | ND
ND | ND | ND | ND | | | | · |
| Dalapon
MCPP
Dicamba
MCPA
Dichloroprop
2,4-D
2,4,5-TP (Silvex)
2,4,5-T | 20
0.1
0.2 | ND
ND
ND | | ND
ND | ND
ND | ND | ND | ND | ND |
| MCPP
Dicamba
MCPA
Dichloroprop
2,4-D
2,4,5-TP (Silvex) | 20
0.1
0.2
0.05 | ND
ND
ND
ND | ND
ND
ND | ND
ND
ND | ND
ND
ND | ND
ND | ND
ND | ND
ND | ND
ND |

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< = Less than. Analytical reporting limit has been elevated due to matrix interferences or sample requiring cilution.</p>

 VQAQC/COMMON/RIGHT/RALES/BS/752 F.Q.S/Pue-Tb2

4/17/95

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FL Richardson OU D Site Building 35-752 Soil Sample Analytical Results Volatile Organic Compounds

| ry weight basis | | | | | FORMER US | TLOCATION | | | Page |
|--|----------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| g/Kg Loo | setion: | | | S8 AP 3497 | | | | S8 AP 3498 | |
| Sampie I | | 0-4' | 4 -10 | 4'-10 | 14'-16 | 16-20 | 0-4" | 4'-8' | 10-12 |
| | pia ID: | 94575273SL | 94575274SL | 94575275SL | #4575276SL | #457527#SL | 9457527951 | \$4575250SL | \$45752815L |
| | Code: | K946882-006 | K946882-007 | K946552-008 | K945552-009 | K945882-010 | K946682-011 | K946882-001 | K946882-002 |
| Data Coli | - | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 |
| slatile Organic Compounds
PA Method 8240) | MRL | | 1 | | | | | | |
| chlorodifuoromethene (CFC 12) | -5 | NO | ND | NO | ND | NO | NO | ND | <1200 |
| Noromethane | 5 | ND | NEO | NO | NO | NO | ND | NO | <1200 |
| nyl Chioride | 5 | ND | ND | ND | NO | ND | ND | ND | <1200 |
| omomethane | 5 | ND | ND | ND | ND | NO | ND | ND | <1200 |
| Noroethere | 5 | ND | ŃD | ND | NO | ND | ND | NO | <1200 |
| fichioro#uoromethane (CFC 11) | 5 | ND | ND | ND | ND | ND | ND | ND | <1200 |
| cetone | 50 | ND | ND | ŇD | ND | ND | NÓ | 76 | <12000 |
| 1-Dichloroethane | 5 | ND | NO | NO | ND | NO | NO | NO | <1200 |
| arbon Disulide | 5 | ND | ND | MD | ND | ND | NQ | ND | <1200 |
| ethylene Chloride | 10 | ND | NO | NO | ND | ND | ND | NO . | <2500 |
| ne-1,2-Dichloroethene | 5 | ND | HO | ND | ND | ND | ND | NO . | <1200 |
| 1-Dichloroethan | 5 | NO | ND | NO | ND | ND | ND | ND_ | <1200 |
| Butanone (MEK) | 20 | ND | ND | ND | ND | NO | ND | NO | <5000 |
| 2-Dichloropropene | 5 | NO | ND | ND | ND | ND | ND | ND | <1200 |
| e-1,2-Dichloroethene | 5 | ND | NO | ND | NO | ND | ND | ND | <1200 |
| Noroferm | 5 | ND | ND | ND | ND | ND | NO | NED | <1200 |
| romochkromelitene | 5 | ND | ND | ND | ND | ND | NO | NO | <1200 |
| 1,1-Trichlaroetiene (TCA) | 5 | ND | ND | ND | ND | NO | NÖ | ND | <1200 |
| 1-Dichloropropene | 5 | ND | NO | ND | NO | ND | NO | ND | <1200 |
| arbon Tetrachioride | 5 | ND | NO | ND | ND | ND | | ND | <1200 |
| 2-Dichloroethane | 5 | ND | ND | NO | | | ND | ND | <1200 |
| enzene | 5 | ND | NO | ND | ND | ND | | ND | <1200 |
| ichiorosthene (TCE) | 5 | 34 | 23 | | | | | ND | <1200 |
| 2-Dichloropropane | 5 | DND | NO | NO | ND | NO | ND | NO | <1200 |
| romodichioromethane | 5 | ND | ND | NO | NO NO | NO NO | ND | ND | <1200 |
| bromomethane | 5 | ND | ND | NO | ND | NO | NO | ND | |
| Hexanone | 20 | ND | ND
ND | NO NO | NO | NO | | | <5000 |
| | -5 | | | NO | NO | NO | ND | | <1200 |
| oluene anno 1,3-Dichteropropene | 5 | ND | NO | ND | ND | ND | NO | ND | <1200 |
| 1,2-Trichloroethane | -5 | ND | ND | NO | NO | NO | NO | NO | <1200 |
| Methyl-2-pantacione (MIBK) | 20 | NO | NO | ND | | NO | NO | ND | <000 |
| 3-Dichloropropana | 5 | | ND | NO | NO | NO | NO | NO | <1200 |
| strachiomethane (PCE) | 5 | ND | NO | NO | NO | NO | NO - | NO | <1200 |
| 200 mochicromethane | 5 | - ND | ND | ND | ND - | ND | NO | ND | <1200 |
| 2-Dibromosthane (EDB) | 20 | ND | ND | NO | NO | ND | NO | ND | <5000 |
| hiorobenzene | 5 | NO | NO | NO | ND | NO | NÔ | ND | <1200 |
| 1,1,2-Tetrachioroethane | 5 | NO | ND | NO | ND | ND | NO | ND | <1200 |
| Tybenzene | 5 | ND | ND | ND | ND | NO | NO | ND | 2300 |
| otal Xylenes | 5 | | 5 | ND | NO | ND | NO | NO | 14000 |
| ityrene | 5 | ND | NÖ | ND | ND | ND | ND | ND | <1200 |
| Bromokerm | 5 | ND | ND | ND | NO | ND | ND | ND | <1200 |
| opropyfoenzene | 20 | ND | ND | ND | NO | ND | NO | ND | <5000 |
| 1,2,2-Tetrachioroethane | 5 | ND | ND | NO | ND | ND | NED | NO | <1200 |
| 2,3-Trichioropropane | 5 | ND | ND | NO | NO | NO | ND | NO | <1200 |
| romobenzane | 5 | NO | NO | _NO | ND | ND | ND | ND | <1200 |
| PropyBonzene | 20 | ND | NO | ND | ND | ND | ND | ND | <5000 |
| Chiorotokusne | 20 | ND | ND | NO | ND | ND | NO | MD | <5000 |
| Chiorolakuone | 20 | ND | ND | ND | ND | ND | NO | NO | <\$000 |
| ,3,5-Trimelhybonzone | 20 | NO NO | ND | ND | ND | ND | NO NO | ND | 7800 |
| ert-Butythenzens | 20 | ND | ND | NO | ND | NO | ND | ND | <5000 |
| 2,4-Trimetrybenzene | 20 | ND | NO | ND | ND | ND | NÖ | NO | 18000 |
| 40-Butythenzene | 20 | ND | ND | NO | NO | NO | NO | NO | <5000 |
| 3-Dichiorobenzene | 5 | ND | NO | ND | ND | ND | ND | ND | <1200 |
| - Isopropyliolueria | 20 | ND | NO | NO | ND | ND | NO | ND | <5000 |
| ,4-Dictriombergane | 5 | ND | ND | NO | NO | NO | ND | | <1200 |
| Butythenzene | 20 | NO | NO | | ND | ND | ND | | <5000 |
| ,2-Dichlorobenzene | 5 | ND | ND | ND | ND | NO | <u>ND</u> | NO | <1200 |
| 2-Dibromo-3-chloroprepene (DBCP) | 20 | NO | ND | NO | ND | NO | ND | ND | <5000 |
| 2,4-Trichloropenzene | 20 | ND | ND | NO | NO | NO | HD | | <5000 |
| A | 20 | ND | ND | ND | NO | ND | <u>NO</u> | | <5000 |
| 2,3-Trichlorobenzane | 1 | | | | | | | | |
| 2,3-Trichlorobertzene
Nephthelene | 20
20 | ND | ND ND | NO
NO | | | ND | ND ND | <5000 |

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Volatile Organic Compounds

| iry weight basis | _ 1 | ···· | | FORME | R UST LOCATION | ((Cont.) | | | |
|------------------------------------|---------|-------------|-------------|-------------|----------------|-------------|-------------|---------------------------------------|------------|
| | cation: | | SB AP 3499 | | | | SB AP 3500 | | |
| Sample | | 0-2 | , _ | \$-12 | 0-4' | 6-4" | 4-5 | \$-12 | 147-167 |
| | çin 10: | 9457528251 | 94575283SL | \$4575264SL | 94575285SL | \$4575287SL | \$4575268SL | 94575289SL | 94575290SL |
| | Code: | K946882-003 | K946882-004 | K946482-005 | K946821-005 | K946921-005 | K946921-007 | K946921-006 | K946921-00 |
| Data Col | - | 11/2/94 | 11/2/94 | 11/2/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 |
| Inlatile Organic Compounds | MRL | - | | | | | | | |
| EPA Method 8260) | | | | | | | | | |
| | | | | | | | | | |
| ichlorodifuoromethane (CFC 12) | 5 | ND | ND | ND | ND | NO | ND | ND | <1300 |
| aloromettune | - 5 | ND | NO | NO | ND | ND | NO | ND | <1300 |
| Inyl Chloride | 5 | ND | ND | NO | ND | ND | ND | ND | <1300 |
| romonathane | 5 | ND | ND | HD | ND | NO | ND | NO | <1300 |
| | 5 | | NO | ND | | | | | |
| hiaroethane | | ND | | | ND | ND | ND | NO | <1300 |
| rictionaluoromethane (CFC 11) | 5 | ND | ND | ND | ND | NO | ND | ND | <1300 |
| colone | 50 | ND | ND | NÖ | ND | ND | ND | NO | <13000 |
| ,1-Dichloroethene | 5 | ND | ND | NO | ND | ND | NO | ND | <1300 |
| Carbon Disulfide | 5 | ND | ND | ND | ND | MO | ND | NO | <1300 |
| lethylene Chlorido | 10 | ND | ND | ND | NÜ | NO | ND | ND | <2600 |
| me-1,2 Dichloroethene | 5 | ND | NO | NO | NO | ND | NO | ND | <1300 |
| 1-Dichloroothane | 5 | ND | ND | NO | ND | ND | ND | . NO | <1300 |
| -Butanone (MEK) | 20 | ND | ND | NO | ND | NO | NO | NO | <300 |
| 2-Dichloropropene | 5 | NO | ND | NO | NO | NO | NO | ND | <1300 |
| is-1.2-Dichloroethene | 5 | 19 | ND | NO | NO | - ND | ND | NO | <1300 |
| historiom | 5 | ND . | ND | ND | NO | NO | ND | | |
| | | | | | | | | ND | <1300 |
| romochioromethane | 5 | NÖ | ND | ND | ND | ND | NO | NO | <1300 |
| ,1,1-Trichloroethane (TCA) | 5 | ND | ND | ND | ND | ND | ND | DIA | <1300 |
| 1-Dichloropropene | 5 | ND | ND | NO | NO | ND | NO | ND | <1300 |
| arbon Tetrachloride | 5 | ND | NO | NO | ND | NO | ND | NO | <1300 |
| 2-Dichlorosthane | 5 | NO | ND | NO | ND | DND | ND | ND | <1300 |
| enzene | 5 | ND | ND | ND | ND | ND | NO | NO | <1300 |
| richlororthana (TCE) | 5 | ND | NO | ND | ND | NO | NO | ND | <1300 |
| ,2-Dichloropropulve | 5 | ND | ND | ND | ND | NO | NO | NO | <1300 |
| romodichioromethane | 5 | NO | NO | NO | NO | ND | ND | ND | <1300 |
| Stromomethane | 5 | ND | ND | NO | ND | NO | ND | | <1300 |
| | | | | | | | | ND | |
| Hexanone | 20 | ND | ND | ND | ND | ND | ND | ND | <1300 |
| ia-1,3-Dichlorepropene | 5 | ND | ND | NO | NO | ND | ND | NO | <1300 |
| duene | 9 | NO | ND | NO | ND | NO | ND | ND | <1300 |
| rane-1,3-Dichloropropene | \$ | NÓ | NO NO | ND | ND | NO | NÖ | NO | <1300 |
| 1,1,2-Trichlerosthane | 5 | NO | ND | NÖ | ND | CN D | NO | ND | <1300 |
| Methyl-2-penierone (MIBK) | 20 | ND | ND | ND | ND | NO | ND | ND | <\$300 |
| 1,3-Dichloropropane | 5 | ND | NO | ND | ND | ND | NO | NO . | <1300 |
| Fetrachicrosthese (PCE) | 5 | ND | ND | NO | ND | ND | NO | NO | <1300 |
| Disromochioromethane | 5 | ND | ND | ND | | NO | ND | | <1300 |
| | | | NO | ND | NO | | | NO | |
| ,2-Dibromoethene (EDB) | 20 | ND | | | | | ND | NO | <300 |
| Norobenzene | 5 | ND | NO | NO | NO | ND | NO | ND | <1300 |
| 1,1,2-Tetrachioroethane | 5 | NÔ | NÔ | ND | ND | NO | ND | ND | <1300 |
| Brykenzene | 5 | NO | ND | NO | NO | ND | NO | NO | 2700 |
| fotal Xylenes | 5 | ND | ND | NO | ND | 5 | NO | ND | 15000 |
| Styrene | 5 | NO | NO | ND | ND | NO | NO | . ND | <1300 |
| Sromotorm | 5 | ND | ND | NO | NO | ND | NO | NO | <1300 |
| Popropythenzone | 20 | ND | ND | ND | NO | NO | 80 | NO | <\$300 |
| 1.1.2.2-Tetrachioroethane | 5 | | NO | NO | NO | NO | NO | ND | <1300 |
| 2,3-Trichkropropene | 5 | NO | NO | | NO | ND | NO | | <1300 |
| | | | | NO | | | | . NO | |
| Romobenzene | 5 | NO | ND | <u>.</u> | NO | ND | NO | ND | <1300 |
| Propybenzene | 20 | NÔ | ND | ND | ND | ND | ND | NO | <3300 |
| -Chiorotoluene | 20 | ND | NO | NÖ | ND | NO | NO | ND | <\$300 |
| Chlorotokane | 20 | NO | ND | NO | NO | NEO | NO | ND | <200 |
| ,3,5-Trimethythenzene | 20 | ND | NO | ND | NO | NO | ND | ND | 5500 |
| ert-Butylbenzene | 20 | NO | NO | NO | NO | ND | ND | ND | <\$300 |
| 2,4-Trimethybenzone | 20 | ND | ND | ND | ND | ND | ND | ND | 14000 |
| eo-Butythanzane | 20 | ND | ND | NO NO | NO | NO | NO | ND | <\$300 |
| 3-Okhlorobenzene | 5 | ND | NO NO | NO | NO | ND | NO | ND | <1300 |
| Hisopropytholume | 20 | ND | NO | NO | ND | NO | NO | ND | <5300 |
| 4-Dichlorobenzene | 5 | ND | NO | ND | NO | NO | NO | ND | <1300 |
| Butylbenzene | L | NO NO | NO | NO | ND | - NO | NO | · · · · · · · · · · · · · · · · · · · | <1300 |
| | 20 | | + • • • | | 1 | 1 | | | |
| 1,2-Okhlorobenzene | 5 | ND | ND | ND | ND | NO | ND | ND | <1300 |
| 1,2-Dibromo-3-chieropropene (DBCP) | 20 | ND | ND | ND | NO | ND | ND | ND | <300 |
| 1,2,4-Trichlorobenzene | 20 | ND | NÔ | ND | ND | ND | NO | NO | <5300 |
| 1,2,3-Trichlorobenzene | 20 | NO | ND | NO | NO | ND | NO | ND | <\$300 |
| Kaptahalana | 20 | ND | ND | ND | ND | ND | ND | ND | 5300 |
| | 20 | ND | ND | ND | NO | MO | NO | ND | <\$300 |
| lexechlorobutadiana | 1 20 | | | | | , | , | 1 100 | |

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FL Richardson OU D Site Building 35-752 Soil Sample Analytical Results Semivolatile Organic Compounds

| iry weight basis | | | | <u> </u> | FORMER US | TLOCATION | | | |
|----------------------------------|-----------------|-------------|-------------|-----------------|-------------|-------------|--------------|-------------|-------------|
| ng/Kg | Location: | | | SB AP 3497 | | , | | 58 AP 3498 | |
| | Sample Depth: | 0-4 | 4'-10" | 4'-10" | 14'-16' | 18-20 | 0-4" | 4-5 | 10-12 |
| | Sample 10: | 94575273SL | 94575274SL | 94575275SL | 94575276SL | \$4575278SL | \$457527\$SL | 94575260SL | P4575281SL |
| | Lab Code; | K946882-005 | K946882-007 | K946882-008 | K946882-009 | K946882-010 | K945882-011 | K946882-001 | K946882-002 |
| | Data Collected; | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 | 11/2/94 |
| iemivolatile Organic Comp | | | | | | | | | |
| | MRL | | | 1 | | | | | |
| PA Methods 3550/5270 | | | | | | | | | |
| | | | | <u> </u> | | | L | <u> </u> | |
| Nitosodimetrylamine | 2 | NÓ | ND | ND | ND | NO | | ND | -40 |
| eniline | 1 | ND | NO | ND | NÓ | NO | NO | ND | <20 |
| is(2-chioroethyl) Ether | ده | NÓ | ND | NO | - CIN | NO | ON CIN | NO | 4 |
| 2-Dichlorobenzene | <u> 20</u> | NÖ | ND | NO | ND | NO | NO | NO | 4 |
| 3-Dichlorobenzene | 0.3 | ND | NO | ND | ND | NO | ND | ND | |
| 4-Dichlorobenzene | 0.3 | NÖ | NO | ND ND | ŇO | NO | NO | ND | |
| is(2-chloroisopropyl) Ether | 0.3 | NÖ | ND | NO | ND | ND | NO | ND | |
| Nitrosodi n propylamine | 201 | NO | NÓ | ND | ND | ND | ND | ND | -35 |
| loxachioroethane | 0.3 | ND | NO | ND | NO | NÖ | DN D | NO. | ~ |
| irobenzene | 60 | NO | NO | ND | NO | ND | NO | ND. | |
| | 0.3 | ND | ND | ND | NO | NO | ND | NO. | |
| is(2-chierosthoxy)methane | 0.3 | ND | NO | ND | NO | ND | ND | NO. | |
| 2.4-Trichlorubenzane | 0.3 | ND | ND | NO | ND | ND | NO | NO. | |
| aphilitelene | | NO | NO | NO | NO | NO | ND | NO | |
| -Chioroaniline | | ND | NO | NO | NO | NO | NO | NO NO | |
| | 0.3 | ND | ND | NO | NO | ND | ND | | |
| lexachiorobutadiane | 20 | | | | NO | - ND | | ND | |
| Methylmaphthelene | 0.3 | ND | ND | ND | | | NO | ŇŌ | 10 |
| lexachlorocyclopentediene | 20 | ND | ND | ND | NO | ND | NO | ND | |
| Chloronaphthalese | E0 | ND | NÖ | ND | ND | ND | ND | NO | |
| Neroaniine | 2 | ND | NO | NÓ | ND | NO | | NO | -440 |
| Simelityi Fihihadata | 0.3 | NÔ | ND. | NO | NÖ | ND | NO | ND | 8 |
| canaphitrylone | 20 | NO | C ND | ON . | ND | NO | ND | ND | 4 |
| Nitroaniine | 2 | ND | NO | NÖ | NO | ND | ND | NO | <40 |
| comphilisene | 20 | ND | ND | NO | ND | NO | ND | NO | |
| benzoturun | 0.3 | ND | NO | ND | ND | ŃO | NO | NO | |
| 4-Dinitrotokusne | 20 | NO | ND | NO | NO | ND | NO | ND | |
| 5-Dinitrotoiuene | 0.3 | NO | ND | NO | ND | NED | NO | ND | |
| Destryl Philiplete | | ND | ND | NO | ND | NO | ND | NO | |
| -Chlorophenyl Phonyl Elber | | NO | ND | ND | NO | NO | NO | NO | |
| Prototoli and a statistic contra | | NO | ND | NO | NO | NO - | NO | NO | |
| Nitomiine | 2 | ND | NO | NO | NO | NO | NO | NO | -40 |
| | | ND | NO | NO | NO | NO | NO | | |
| Nitresectphenylamine | 0.3 | | | | NO | NO - | | ND | 4 |
| Bromephenyl Phenyl Ether | 0.3 | ND | NO | NO | | | ND | ND | - 45 |
| lexachiorobenzene | 2.0 | NO | ND | NO | ND | ND | ND | ND | <⊲5 |
| Phenandrane | 0.3 | ND | ND | ND | NÖ | ND | NO | | 4 |
| Antivacene | 6.5 | ND | NO | ND | ND | ND | NO | ND | 4 |
| Di-n-butyl Philhalate | 20 | NO | ND | NO | ND | NO | ND | NO | -4 |
| kioninthene | 0.3 | ND | ND | ND | NO | NO | NO | NO | |
| Pyrana | 2.0 | NO | ND | NO | ND | NO | ND | ND | ৰ |
| Butylbenzyl Philalete | 2.0 | ND | NO | ND | ND | NO | NO | ND | |
| 3,3'-Dichlorobenzicine | 2 | NO | NO | NO | ND | NO | ND | ND | <40 |
| Benz(a)anthracene | 0.3 | NO | NO | NO | NO | NO | NO | NO | |
| La(2-sthythexyl) Philadate | 0.3 | ND | NO | NO | NO | NO | ND DI | NO | |
| Chrysene | | NO | ND | NO | NO | ND | NO | ND | |
| Di-n-octyl Phillulate | | 07 | NO | ND | NO | NO | 0.36 | ND | |
| Senzo(b)iluoranihene | | NO | NO | ND | NO | | NO | NO | 4 |
| Benzo(k) iluoranthene | | 1 | NO | - 10 | NO | NO | NO | ND | |
| Benzo(a)pyrene | | | - ND - | NO | | NO | NO NO | NO | |
| | 0.3 | | ND | NO | NO | | NO | ND | |
| ndeno(1,2,3-cd)pyrene | | | | ND
 | NO | | | | 4 |
| Dibenz(a,h)anthracene | E0 | ND | NO | <u> </u> | NO
NO | NO | ND | ND- | 4 |
| Senzo(g,h,i)perylene | 0,3 | ND | NO | ND | | <u> </u> | | NO_ | |
| Trenol | 0.3 | | NO | NO | ND | NO | ND | ND | |
| 2-Chlorophenol | C0 | | NO | ND | NO | MD | NO | ND_ | 4 |
| Senzyl Alcohol | | | ND | ND | | NO | ND | NO | |
| 2-Methylphenol | 0.0 | | NO | ND | NO | NO | NO | ND | |
| - and 4-Methylphenol" | ده 📃 | | ND | NO | ND | MO | ND | NO | -4 |
| 2-Nitrophenol | 0.3 | | ND | ND | NO | NO | NO | ND | |
| 2,4-Dimethylphenol | 20 | NO | ND | NO | ND | ND | ND | ND | - 46 |
| Benzoic Acid | ź | | NÓ | NO | ND | NO | NO | ND | <40 |
| 2,4-Dichlorophenol | 60 | | NO | ND | NO | ND | NO | NO | -45 |
| 4-Chiore-3-methylphenol | 10 | | NO | NO | ND | NO | NO | NO | |
| 2,4,6 Trichlorophunal | <u></u> | | | NO | NO | NO | NO | ND | |
| 2,4,5-Trichlorephenel | 0.3 | | NO | NO | NO | NO | NO | ND ND | |
| 2,4-Dinitrophenol | Z | | NED | | ND | - NO | ND | ND | |
| 4-Nikophenol | - 2 | | NO | NO | NO | NO | NO | | |
| | | | ND | | | | ND | | |
| 2-Methyl-4,5-dinitrophenol | 2 | | ND ND | ND ND | | - NO | - HO | ND
NO | <40 |
| Pentachiorophenoi | | | | | | | | | |

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Ft. Richardson OU D Site Building 35-752 Soll Sample Analytical Results Semivolatile Organic Compounds

| Iry weight basis | | | | | FORMER UST I | OCATION (cont.) | | | Pag |
|--|-----------------|-----------------------|-------------|--------------|--------------|-----------------|-------------|---|----------------|
| ng/Kg | Location: | | 58 AP 3499 | | | | 58 AP 3500 | | • |
| | Sample Depth: | 0-Z | 4-5 | 6-1 2 | 0-6 | 0-6° | 4.4 | 5-1Z | 14-16 |
| | Sample (D: | 94575282SL | 94575283SL | 94575284SL | 94575286SL | 94575287SL | 94575268SL | 94575289SL | 94575290SL |
| | Lab Code: | K946482-003 | K946882-004 | K946882-005 | K946921-005 | K945221-005 | K946921-007 | K946921-008 | K946921-00 |
| | | | | - | 11/3/94 | 11/3/94 | | | |
| | Data Collected: | 11/2/94 | 11/2/94 | 11/2/94 | 11/3044 | 117.664 | 11/3/94 | 11/3/94 | 11/3/94 |
| entvolatile Organic Compou | | | | | | 1 | | | |
| PA Methods 3550/8270 | MRL | | | | | | | Į – – – – – – – – – – – – – – – – – – – | |
| | | | |] | | | | | |
| Nimeodimethylamine | 2 | ND | ND | NO | ND | ND | ND | NO | <10 |
| Ndinha | 1 | NŨ | NO | NO | NÓ | ND | ND | ND | 4 |
| a(2-chioroethyl) Ether | 2.0 | ND | ND | NO | NO | ND | ND | NO | <1.5 |
| 2-Dichlorobenzene | 0.3 | NO | NO | NÔ | NO
NO | NO | ND | ND | <1.5 |
| 3-Dichlorobenzene | 20 | ND | ND | ND | ŇD | ND | NO | NÖ | <1.5 |
| 4 Dichicrobenzene | 20 | NÜ | ND | ND | ON | ND | ND DIA | NO | \$1.5 |
| s(2-chiorosopropyi) Ether | 0.3 | NO | ND | ND | 80 | ND | NĎ | ND | <1.5 |
| Nitrosodi-n-propytanimi | 0.3 | ND | ND | NO | ND | ND | NO | ND | <1.5 |
| exactionofhane | 0.3 | NÔ | NÓ | ND | NO | ND | NO | ND | 4.5 |
| illioban.2004 | 0.3 | ND | ND | NÖ | ND | ND | ND | NÖ | <1.5 |
| ophorone | 0,3 | NO | ND | NO | NO | ND) | NO | NO | <1.5 |
| s(2-chicrosthoxy)methane | 20 | ND | ND | ND | ND | ND | NO | ND | <1.5 |
| 2,4-Trichlorobenzene | 0.3 | - ND | NÚ | ND | NO | NO | ND | ND | <1,5 |
| aphthalana | 0.3 | ND | ND | ND | NO | ND | NÓ | ND | 1,66 |
| Chloroaniline | 0.3 | ND | ND | NO | NO | ND | NO | NÓ | <1.5 |
| erachiorobutacione | 201 | ND | NO | ND | NO | ND | ND | NO | <1.5 |
| Methylnaphthalene | 0.3 | NO | NO | NO | NO | NO | NO | NO | 4.43 |
| exachiorocyclopentadiene | | NO | ND | ND | NO | NO | NO | NO | <1.5 |
| -Chioronaphthalene | 20 | ND | NO | NO | ND | NO | NO | ND | 4.5 |
| Nitroaniine | 2 | ND
ND | NO NO | ND | NO | NO | ND | ND | <13 |
| inchyl Phihalate | 2 | - NO | NO | NO | NO NO | NO | ND | | <10 |
| censpirityiene | | NO | ND | NO | ND - | - NO | ND | | <1.5 |
| Ninoeniline | 0.3 | | NO | NO | NO | NO | ND | ND
ND | <10 |
| | 2 | | | | ND | - NO | | | |
| omaphihana | 0.3 | ND | NO | ND | NO | | ND | ND | 4.5 |
| ibenzoturan | 0.3 | NO | NO | NO | | ND | ND | NO | 415 |
| 4-Dimitrotokiene | 20 | ND | ND | NO | ND | ND | NO | ND | <1.5 |
| 6-Dinitrotoluane | 0.3 | ND | ND | ND | ND | NO | NÖ | ND | <1.5 |
| intryl Philaise | 20 | NO | NO | ND | NO | ND | NÖ | ND | د له |
| -Chlorophenyl Phenyl Ether | 6.0 | ND | ND | ND | ND | NÖ | NC | ND | <1.5 |
| luorene | 0.3 | NO | NO | NO | NO. | ND | NÔ | ND | <1.5 |
| Nitroaniine | 2 | ND | ND | ND | - ND | ND ND | NÖ | NO | <10 |
| -Nitrosociphenylamme | 0.3 | ND | NO | NO | ND | NO | ND | ND | 45 |
| Bromophenyi Phenyi Ether | 6.3 | ND | ND | NO | ND | ND | NÖ | ND | <15 |
| fezachiorobenzene | 50 | ND | ND | ND | ND | NÓ | NO | NO | ۲ ۲ |
| honenerere | 0.3 | NO | NO | NÖ | NÔ | NO | NO | ND | 45 |
| Whracana | 0.3 | ND | ND. | ND | NO | ND ND | NÖ | NO | <1.5 |
| Di-n-butyl Philiplate | 0.3 | NÖ | ND | ND | ND | ND | ND | ND | <1.5 |
| waranthene | <u>.</u> | NO | NO | ND | ND | NO | ND | ND | <1,5 |
| утепе | 0.3 | NO | ND | NO | NO | ND | NÔ | NO | <1.5 |
| kityloonzyl Philialate | 0.3 | ND | ND | ND | ND | NO | ND | ND | <1.5 |
| 3'-Dichlorobenzidine | 2 | ND | ND | NO | NÓ | ND | NO | ND | <10 |
| enz(a)entvacene | 0.3 | NO | ND | ND | ND . | 54 | NO | ND | <1.5 |
| is(2-ethythexyt) Philiplete | E.0 | NO | NO | NO | ND | NO | ND | ND | <1.5 |
| hiysone | 20 | NO | ND | ND | ND | ND | NO | ND | <1,5 |
| in-octyl Philippier | 0.3 | NO | NO | NO | NO | NO | NO | NO | <1.5 |
| enzo(b)fluoranthene | 0.3 | ND | NO | NO | ND | NO | ND | ND | جاية |
| enzo(k)ikvoranihane | 0.3 | ND | ND | NO | NO | NO | NO | ND | 4.5 |
| lenzo(a)pyrene | 6.0 | NO | HO HO | NO | NO | - NO | NO | NO - | ব এ |
| ndeno(1,2,3-cd)pyrane | 0.3 | | NO | NO | NO | HD - | NO | ND | <1.3
<1.5 |
| benz(a,h)antivacene | 20 | NO 10 | NO | NO | NO | - NO | NO | NO | <1.5 |
| enzo(g,h,i)perylene | 0.3 | NO | ND | NO | NO | | NO | ND | ব হ |
| henal | 0.3 | NO | - NO | NO 10 | | NO | NO | NO NO | <1.5
<1.5 |
| -Chiorophanol | 0.3 | NO | ND | | 80 | ND | ND | | <1.5 |
| enzyl Alcohol | 0.3 | ND | NO | ND | - ND | NO | NO NO | NO
NO | |
| |
 | | ND ND | NO | ND ND | ND ND | | | 45 |
| -Mothylphanal
- and 4-Methylphanal* | | NO 10 | ND | | ND | NO | ND
NO | ON NO | <1.5 |
| | <u> </u> | 10 | NO | | | | | NÖ | 15 |
| -Nitrophenol | <u>ده</u> | ND | | | M0 | ND ND | ND ND | NO | <1.5 |
| 4-Dimethylphanol | <u></u> | ND S | NO | ND | NO | - ND | 110 | NO | 15 |
| lenzoic Acid | 2 | NO | NO | ND | ND IN | N0 | ND | ND | -10 |
| 4-Dichlorophenol | 0.3 | ND | ND | NC | NO | ND | ND | ND | বত |
| -Chioro-3-methylphenol | 20 | NO | NO | ND | ND | N0 | NO | NO | <1.5 |
| 2,4.6-Trichlorophenol | ده | ND | NO | NO | NO | ND | ND | NO | <15 |
| 4,5-Trichlorophenol | 63 | - | NO | NO | ND | N0 | ND | ND | <u>د ا></u> |
| 2,4-Dimitrophenol | 2 | NO | ND | ND | ND | NO | ND | ND | <10 |
| Nitrophenol | 2 | ND | NÖ | NO | ND | NO | ND | NO | <10 |
| Methyl 4,6-dintrophenol | 2 | ND | ND | NÓ | NO | ND | ND | ND | <10 |
| | | ND | NO | MO NO | - DK | 1 20 | NO OH | | 1 |
| entachiorophenol
FOOTNOTES: NO = | 2 | Matter Reporting Sind | | RU | | | | NO | <10 |

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Ft. Richardson OU D Site Building 35-752 Soli Sample Analytical Results Total Metals

| dry weight basie
mg/Kg | | | | | Analyte:
Method: | Arsenic
7060 | Barlum
6010A | Cadmlum
6010A | Chromlum
6010A | Lead
7421 | Mercury
7471 | Nickel
6010A | Selanium
7740 | Silver
6010A |
|---------------------------|-----------------|------------|----------|-------------------|---------------------|-----------------|-----------------|------------------|-------------------|--------------|-----------------|-----------------|------------------|-----------------|
| Location | Sample
Depth | Sample ID | Lab Code | Date
Collected | MRL: | t | 1 | 1 | 2 | 1 | 0.2 | 10 | 1 | 2 |
| Former UST Loc | ation | | | · · · · · · · | | | | | | | | | | |
| SB AP 3497 | 0-4' | 94575273SL | K688200 | 11/2/94 | _ | 6 | 66 | ND | 27 | 20 | ND | 31 | 1 UJ | ND |
| SB AP 3497 | 4'-10' | 94575274SL | K688207 | 11/2/94 | | 4 | 50 | ND | 36 | 6 | ND | 32 | 1 UJ | ND |
| SB AP 3497 | 4'-10' | 94575275SL | K688208 | 11/2/94 | | 4 | 46 | ND | 35 | 7 | ND | 37 | 103 | ND |
| 58 AP 3497 | 14'-16' | 94575278SL | K688209 | 11/2/94 | | 5 | 42 | ND | 30 | 7 | ND | 34 | 1 UJ | ND |
| SB AP 3497 | 16'-20' | 94575270SL | K688210 | 11/2/94 | | 5 | 37 | ND | 31 | 5 | ND | 35 | 1 UJ | ND |
| B AP 3498 | 0-4' | 94575279SL | K606211 | 11/2/94 | | 4 | 59 | NÖ | 26 | 5 | ND | 29 | 101 | ND |
| SB AP 3498 | 4'-8' | 94575260SL | K686201 | 11/2/94 | | 5 | 72 | ND | 42 | 6 | ND | 37 | 101 | ND |
| SB AP 3498 | 10'-12' | 04575281SL | K666202 | 11/2/94 | | 5 | - 44 | ND | 28 | 6 | ND | 30 | t ÜJ | ND |
| S8 AP 3499 | 0-2' | 04575282SL | K688203 | 11/2/04 | | 6 | 56 | ND | 20 | 94 | ND | 24 | 101 | ND |
| SB AP 3499 | 4'-8' | 94575283SL | K688204 | 11/2/94 | | 5 | 84 | ND | 31 | 8 | ND | 30 | 1 UJ | ND |
| SB AP 3499 | 8'-12' | 94575284SL | K688205 | 11/2/94 | | 6 | 50 | ND | 30 | θ | ND | 30 | 1 UJ | ND |
| SB AP 3500 | 0-4' | 94576286SL | K692105 | 11/3/94 | | 8 | 75 | ND | 28 | 0 | ND | 35 | 1 UJ | ND |
| SB AP 3500 | 0-4' | 94576287SL | K692106 | 11/3/94 | | 5 | 61 | ND | 32 | 5 | ND | 33 | 1 UJ | ND |
| SB AP 3500 | 4'-8' | 04575288SL | K692107 | 11/3/94 | _ | 6 | 90 | ND | 32 | 5 | ND | 36 | 1 UJ | ND |
| SB AP 3500 | B'-12' | 94575289SL | K692108 | 11/3/94 | | 5 | 50 | ND | 28 | 5 | ND | 29 | 1 UJ | ND |
| SB AP 3500 | 14'-16' | 94575290SL | K692109 | 11/3/94 | | 5 | 57 | ND | 31 | 5 | ND | 35 | 1 UJ | ND |

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Petroleum Hydrocarbons

| | | | | | | | - 77 - | | I colori | | 7.4.1 | Victoria | | 100 | | | | Page 1 |
|------------------|-------------|-------------------|----------------------|------------|-----|--------|----------|--------|----------|---------|----------|----------|-----|--------|-----|---------|-------|------------|
| dry weight basis | | | _ | Analysis: | | nzene | | luene | | benzene | | Xylenes | | RO | | ORO | | TPH |
| | | | E | PA Method: | | 1260 | | 1260 | | 3260 | 1 | 260 | | 0/8015 | r . | 0/8100 | | 1/418.1 |
| | | 1 | | Units: | μμ | g/Kg | <u>н</u> | g/Kg | <u> </u> | g/Kg | <u>μ</u> | g/Kg | m | g/Kg | m | g/Kg | | ig/Kg |
| İ | Sample | | | Date | | | | | | | | | | | | | | |
| Location | Depth | Sample ID | Lab Code | Collected | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MRL | Result | MKL | Result | MRL | Result |
| DRUM ACCUMUL | ····· | | 7 | ····· | | | | | | | | | | | | | | |
| SB AP 3505 | 0-4' | 94575219SL | K946921-001 | 11/3/94 | 5 | ND | 5 | 5 | 5 | ND | 5 | 9 | 5 | ND | 10 | 81 | 10 | 146 |
| SB AP 3505 | 4'-8' | 94575220SL | K946921-002 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | 6 | 5 | ND | 10 | 61 | 10 | 56 |
| SB AP 3505 | 9'-11' | 94575221SL | K946921-003 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | 7 | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3505 | 12'-16' | 94575222SL | K946921-004 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | •ND | 10 | ND | 10 | ND |
| SB AP 3506 | 0-2' | 94575223SL | K946921-010 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 83 | 10 | 350 |
| SB AP 3508 | 4'-8' | 94575224SL | K946921-011 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3508 | 8'-12' | 94575225SL | K946921-012 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SB AP 3506 | 14'-16' | 94575226SL | K946921-013 | 11/3/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SS 1 | 6" | 94575201SL | K946240-001 | 10/6/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 55 | 10 | 182 |
| SS 1 | 6" | 94575202SL | K946240-002 | 10/6/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 50 | 10 | 27 |
| SS 1 | 2' | 94575218SL | K946306-008 | 10/10/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | 13 J |
| SS 2 | 6* | 94575203SL | K946240-003 | 10/6/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 18 | 10 | 28 |
| SS 2 | 2' | 94575217SL | K946306-007 | 10/10/94 | 5 | ND | 5 | 8 | 5 | 6 | 5 | 38 | 5 | ND | 10 | 15 | 10 | 27 J |
| SS 3 | 6" | 94575204SL | K946240-004 | 10/6/94 | 5 | ND | 5 | 6 | 5 | ND | 5 | 6 | 5 | ND | 10 | 70 | 10 | 43 |
| SS 3 | 2' | 94575216SL | K946306-006 | 10/10/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | 16 J |
| SS 4 | 6" | 94575205SL | K946240-005 | 10/6/94 | 5 | ND | 5 | 6 | 5 | ND | 5 | 6 | 5 | ND | 10 | 92 | 10 | 270 |
| SS 4 | 2' | 94575215SL | K946306-005 | 10/10/94 | 5 | ND | 5 | ND | 5 | ND | 5 | NÐ | 5 | ND | 10 | 61 | 10 | 35 J |
| SS 5 | 6" | 94575206SL | K946243-001 | 10/6/94 | 5 | ND | 5 | ŇD | 5 | ND | 5 | ND | 5 | ND | 10 | 192 | 10 | 740 |
| SS 5 | 2' | 94575213SL | K946306-003 | 10/10/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 778 | 10 | 1300 J |
| SS 5 | 2' | 94575214SL | K946306-004 | 10/10/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 669 | 10 | 1700 J |
| SS 0 | 6" | 94575207SL | K946243-002 | 10/6/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 97 | 10 | 41 |
| SS 6 | 2' | 94575212SL | K946308-002 | 10/10/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | 52 | 10 | 87 J |
| SS 7 | 6" | 94575208SL | K945243-003 | 10/6/94 | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 5 | ND | 10 | ND | 10 | ND |
| SS 7 | 2' | 94575211SL | K946306-001 | 10/10/94 | 5 | ND | 5 | ND | | ND | 5 | ND | 5 | ND | 10 | 17 | 10 | 14 J |
| SS 8 | 6" | 94575209SL | K946243-004 | 10/6/94 | 5 | ND | 5 | ND | -5 | ND | 5 | ND | 5 | ND | 10 | 100 | 10 | 48 |
| SS 8 | 2' | | K946243-005 | 10/6/94 | 5 | ND | 5 | 5 | 5 | ND ND | 5 | ND | 5 | ND | 10 | -ND - | 10 | 13 |
| FOOTNOTES: | ND = Non-de | stected at the me | thod reporting limit | (MRL). | | | | | | | | | | | | لي تنتي | ليتنب | — <u> </u> |
| | | s considered an o | | | | | | | | | | | | | | | | |
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FL Richardson OU D Site Building 35-752 Soil Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

| dry weight basis | | | | | DRUM ACCUM | JLATION AREA | | | |
|--|---|---|---|--|--|---|--|--|--|
| mg/Kg | Location: | | SB AF | P 3505 | | | SB AF | ² 3506 | |
| Sam | pie Depth: | 0-4' | 4'-6' | 9'-11' | 12-16 | 0-2 | 4'-8' | 8-12 | 14'-16' |
| 5 | Sample ID: | 94575219SL | 94575220SL | 94575221SL | 94575222SL | 94575223SL | 94575224SL | 94575225SL | 94575226St |
| 1 | Lab Code: | K946921-001 | K946921-002 | K946921-003 | K946921-004 | K946921-010 | K946921-011 | K946921-012 | K946921-01 |
| Date | Collected: | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 |
| Organochlorine Pestici | ies | | | | | | | | |
| EPA Methods 3540/808 | 0) | | | | | | | | |
| | MRL | | | | 1 | | | | |
| Alpha-BHC | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Beta-BHC | 0.03 | ND | ND | ND | ND | ND | ND | ND | ND |
| Delta-BHC | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aldrin | 0.01 | ND | ND | ND | ND | ND | ND | ND_ | ND |
| Gamma-BHC (Lindane) | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| Heptachlor Epoxide | 0.01 | <0,1 | <0.06 | ND | ND | ND | ND | ND | ND |
| Endosulfan I | 0.01 | <0.1 | <0.06 | ND | ND | ND | ND | | ND |
| Endrin | 0.01 | <0.1 | <0.06 | ND | ND | ND | ND | ND | ND |
| Endosulfan II | 0.01 | <0.1 | <0.1 | ND | ND | ND | ND | ND | ND |
| 4.4'-DDD | 0.01 | <0.1 | <0.06 | ND | ND | ND | ND | ND | ND |
| Endrin Aldehyde | 0.01 | <0.1 | <0.06 | ND | ND | ND | ND | ND | ND |
| Endosulfan Sulfate | 0.01 | <0.1 | <0.06 | ND | ND | ND | ND | ND | ND |
| 4,4-DDT | 0.01 | <0.1 | <0.1 | ND | ND | <0.02 | ND | ND | ND |
| 4.4'-DDE | 0.01 | <0.1 | <0.06 | ND | ND | ND | ND | ND | ND |
| Dieldrin | 0.01 | <0.1 | <0.06 | ND | ND | ND | ND | ND | |
| Methoxychlor | 0.02 | <0.3 | <0.2 | ND | ND | ND | ND | NÓ | |
| Toxaphene | 0.3 | ND | ND | ND | ND ND | ND | ND | ND | ND |
| Chiordane | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| | | | | | | | | | |
| Polychlorinated Bipher | yis | | | | | | | | |
| (EPA Methods 3540/808 | ;0) | ł | | 1 | | | | | |
| | MRL | ļ | | | | | | | |
| Arocior 1016 | 0,1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1221 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1232 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1242 | 0.1 | ND | ND | ND | ND | NĎ | ND | ND | ND |
| | | | | | | | ND | ND | ND |
| Arocior 1248 | 0.1 | ND | ND | ND | ND | ND | NU NU | | |
| | 0.1 | ND
ND | ND
ND | ND
ND | ND
ND | ND
ND | ND | ND - | ND |
| Aroclor 1254 | | | | | | | | ND
ND | ND |
| Aroclor 1254
Aroclor 1260 | 0.1
0.1 | ND | ND | ND | ND | ND | ND | | |
| Aroclor 1254
Aroclor 1260
Chlorinated Herbicides | 0.1 | ND | ND | ND | ND | ND | ND | | |
| Aroclor 1254
Aroclor 1260 | 0.1
0.1 | ND | ND | ND | ND | ND | ND | | |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo | 0.1
0.1
xdiffied)
MRL | ND
3.4 | ND
1.1 | ND
ND | | ND
0.3 | ND
ND | NĎ | ND |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon | 0.1
0.1
xdified)
MRL
1 | ND
3.4 | ND
1.1 | ND
ND | ND
ND | ND
0.3
ND | ND
ND
ND | | |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon
MCPP | 0,1
0,1
0,1
MRL
1
20 | ND
3.4
ND
ND | ND
1.1
ND
ND | ND
ND
ND
ND | ND
ND
ND
ND | ND
0.3
ND
ND | ND
ND
ND | | |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon
MCPP
Dicamba | 0,1
0,1
0,1
MRL
1
20
0,1 | ND
3.4
ND
ND | ND
1.1
ND
ND
ND | ND
ND
ND
ND
ND | ND
ND
ND
ND
ND | ND
0.3
ND
ND
ND | ND
ND
ND
ND
ND | ND
ND
ND
ND | |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon
MCPP
Dicamba
MCPA | 0,1
0,1
MRL
1
20
0,1
20 | ND
3.4
ND
ND
ND
ND | ND
1.1
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND | ND
0.3
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND | | ND
ND
ND
ND
ND |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon
MCPP
Dicamba
MCPA
Dichloroprop | 0,1
0,1
MRL
1
20
0,1
20
0,1 | ND
3.4
ND
ND
ND
ND
ND | ND
1.1
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
0.3
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon
MCPP
Dicamba
MCPA
Dichloroprop
2,4-D | 0.1
0.1
MRL
1
20
0.1
20
0.1
20
0.1
0.2 | ND
3.4
ND
ND
ND
ND
ND
ND
ND | ND
1.1
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
0.3
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon
MCPP
Dicamba
MCPA
Dichloroprop
2,4-D
2,4,5-TP (Silvex) | 0.1
0.1
0.1
MRL
1
20
0.1
20
0.1
0.2
0.05 | ND
3.4
ND
ND
ND
ND
ND
ND
ND
ND | ND
1.1
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
0.3
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND |
| Arodor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon
MCPP
Dicamba
MCPA
Dichloroprop
2,4-D
2,4,5-TP (Silvex)
2,4,5-T | 0.1
0.1
0.1
0.1
1
20
0.1
20
0.1
20
0.1
0.2
0.05
0.05 | ND
3.4
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
1.1
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND 0.3 ND ND | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND |
| Aroclor 1254
Aroclor 1260
Chiorinated Herbicidea
(EPA Method 8150A Mo
Dalapon
MCPP
Dicamba
MCPA
Dichloroprop
2,4-D
2,4,5-TP (Silvex) | 0.1
0.1
0.1
MRL
1
20
0.1
20
0.1
0.2
0.05 | ND
3.4
ND
ND
ND
ND
ND
ND
ND
ND | ND
1.1
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
0.3
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND
ND
ND
ND
ND
ND |

< = Less that. Analytical reporting limit has been elevated due to metrix interferences or sample requiring dilution. VAGCCOMMONRICH/FINALS/REPTABLES/835752 FXLSP/ws/15/2

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

| ry weight basis | | | | DRUM AC | CUMULATION AF | REA (cont.) | | |
|--------------------------|---------------------------------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|
| ng/Kg L | ocation: | | SS 1 | | S | 52 | SS | 33 |
|
Sampl | e Depth: | 6 | 6 | z | 6 | 2' | 6" | 2 |
| S | mpie ID: | 94575201SL | 94575202SL | 94575218SL | 94575203SL | 94575217SL | 94575204SL | 94575216SL |
| և | b Code: | K945240-001 | K945240-002 | K946308-008 | K945240-003 | K946306-007 | K945240-004 | K946306-006 |
| Date C | oliected: | 10/6/94 | 10/6/94 | 10/10/94 | 10/6/94 | 10/10/94 | 10/6/94 | 10/10/94 |
| Organochiorine Pesticide | 5 | | | | | | | |
| EPA Methods 3540/8080 | | | 1 | | | | | |
| | MRL | | | | | | | |
| Npha-BHC | 0.01 | ND | ND | NĎ | ND | ND | ND | ND |
| Beta-BHC | 0.03 | ND | ND | ND | ND | ND | ND | ND |
| eita-BHC | 0.01 | | ND | ND | ND | ND | ND | ND |
| leptachlor | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Ndrin | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Samma-BHC (Lindane) | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| leptachlor Epoxide | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan I | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Endrin | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| ndosulfan II | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| .4'-DDD | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Endrin Aklehyde | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan Sulfate | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| .4-DDT | 0.01 | ND | 0.04 | ND | ND | ND | 0.02 · | ND |
| A-DDE | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Dieidrín | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| dethoxychlor | 0.02 | ND | ND | ND | ND | NÓ | ND | ND |
| foxaphene | 0.3 | ND | ND | ND | | ND | ND | ND |
| Chlordane | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| | · · · · · · · · · · · · · · · · · · · | | | | | | í | |
| Polychiorinated Bipheny | 16 | | | | | | | |
| (EPA Methods 3540/8080 |) | | | | } | | | |
| | MRL | | | | | | | 1 |
| Aroclor 1016 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1221 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1232 | 0.1 | ND | ND | ND | DND | ND | ND | ND |
| Arocior 1242 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Arodor 1248 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Aracior 1260 | 0,1 | ND | ND | ND | - <u>ди</u> - | ND | ND | ND |
| Chlorinsted Herbicides | | | | | | | | |
| (EPA Method 8150A Mod |
Uffeet\ | ļ. | | | | | | |
| | MRL | | | | | | | |
| Dalapon | 1 | ND | ND | ND ND | ND | ND | - ND | ND |
| MCPP | 20 | | ND ND | ND | ND | ND | ND | ND |
| Dicamba | 0.1 | ND | ND | ND ND | | ND | ND | ND
ND |
| MCPA | 20 | ND | ND | ND | ND | ND | | ND |
| Dichloroprop | 0.1 | ND | ND | | NO | ND | ND | ND |
| 2,4-D | 0.1 | ND | ND | ND | ND | ND | | ND
ND |
| 2,4,5-TP (Silvex) | 0.05 | ND
ND | | | NO | ND | | ND ND |
| | 0.05 | | ND | ND | ND | ND | ND | ND |
| 245.T | 1 4.40 | 1 10 | 1 100 | | | | | NU |
| 2,4,5-T
Dinoseb | 0.5 | ND | ND | ND | ND | NĎ | ND | ND |

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

| lry weight b≛≴is | | | | DRUM AC | CUMULATION AF | REA (cont.) | | |
|---|--|--|---|--|---|---|--|---|
| ng/Kg Li | ocation: | SS | 54 | | SS 5 | <u> </u> | S | 56 |
| Sar
La | • Depth:
mple ID:
b Code:
pliected: | 6"
94575205SL
K945240-005
10/6/94 | 2'
94575215SL
K946306-005
10/10/94 | 6"
94575206SL
K946242-001
10/6/94 | 2'
94575213SL
K946306-003
10/10/94 | 2"
94575214SL
K946306-004
10/10/94 | 6"
94575207SL
K946242-002
10/6/94 | 2'
94575212SL
K946306-002
10/10/94 |
| Organochlorine Pesticide | | | | | | <u> </u> | | |
| EPA Methods 3540/8080) | | | | | | | | |
| | MRL | | | | | | | |
| Npha-BHC | 0.01 | ND | ND | ND | ND | | ND | ND |
| Beta-BHC | 0.03 | ND | ND | ND | ND | ND | ND | ND |
| Delta-BHC | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| leptachior | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Ndrin | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Gamma-BHC (Lindane) | 0.01 | ND | ND | ND ND | ND | ND | ND | ND |
| leptachlor Epoxide | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Endosulfan (| 0.01 | ND | ND | ND | ND | ND | ND | ND - |
| Endrin | 0.01 | ND | ND | ND | ND | ND | ND | <0.02 |
| Endosulfan II | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| 4-DDD | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Endrin Aldehyde | 0.01 | | ND | <0.03 | ND | ND | <0.03 | -0.02 |
| Endosulfan Sulfate | 0.01 | ND | ND | ND | ND | ND - | ND | ND |
| 4-DDT | 0.01 | 0.12 | ND | ND | ND | ND | ND | <0.04 |
| 4-DDE | 0.01 | ND | ND | ND | ND | ND | ND | ND |
| Dieldrin | 0.01 | ND | ND | <0.01 | ND | ND | <0.0z | ND |
| Methoxychior | 0.02 | ND | ND | ND | ND | ND | NĎ | ND |
| Toxaphene | 0.3 | ND | ND | NĎ | ND | ND | ND | ND |
| Chlordane | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Polychlorinated Biphenyl
(EPA Methods 3540/8080) | MRL. | | | | | | | |
| Aroclor 1016 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Arodor 1221 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1232 | 0.1 | | ND | | ND | | ND | ND |
| Arodor 1242 | 0.1 | ND | ND | ND | ND | ND | NĎ | ND |
| Arocior 1248 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1260 | 0.1 | 0,5 | ND | 1.1 | ND ND | ND | 1.1 | 0.6 |
| Chlorinated Herbicides
(EPA Method 8150A Modi | ified)
MRL | | | | | | | |
| Dalapon | 1 | ND | ND | ND | ND | ND | ND | ND |
| MCPP | 20 | ND | ND | ND | ND | ND | ND | ND |
| Dicamba | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| MCPA | 20 | ND | ND | ND | ND | ND | NÓ | ND |
| Dichloroprop | 0.1 | ND | ND | ND | ND | ND | ND | ND |
| 2, 4 -D | 0.2 | ND | ND | ND | I ND | ND | ND | ND |
| 2,4,5-TP (Silvex) | 0.05 | ND | ND | ND D | ND | ND | ND | ND |
| 2,4,5-T | 0.05 | ND | ND | DN | ND | ND | ND | ND |
| Dinoseb | 0.5 | ND | ND | ND | ND | ND | - ND | ND |
| 2,4-08 | 0.5 | ND | ND | ND | ND | ND | ND - | ND |

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4/17/95

FL Richardson OU D Site Building 35-752 Soil Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

| dry weight basis | Т | D | RUM ACCUMULA | TION AREA (con | t.) | | | |
|--------------------------|------------|-------------|--------------|----------------|-------------|---|------------|----------|
| mg/Kg L | ocation: | SS | \$7 | S | 58 | | | |
| Sampi | e Depth: | 67 | 2 | 6" | 2 | | 1 | |
| Şa | mple ID: | 94575208SL | 94575211SL | 94575209SL | 94575210SL | | | |
| نا | b Code: | K946242-003 | K946306-001 | K946242-004 | K946242-005 | | | |
| Date C | ollected: | 10/5/94 | 10/10/94 | 10/6/94 | 10/6/94 | | | |
| Organochiorine Pesticide | rs i | ···· | _ | | | | | |
| (EPA Methods 3540/8080 |) | | | | | | | |
| | MRL | | | | | | | |
| Alpha-BHC | 0.01 | ND | ND | ND | ND | | | |
| Beta-BHC | 0.03 | ND | ND | ND | ND | | _ | _ |
| Delta-8HC | 0.01 | ND | ND | ND | NO | | | |
| Heptachlor | 0,01 | ND | ND | ND | ND | | | |
| Aldrin | 0.01 | ND | ND | ND | ND | | | |
| Gamma-BHC (Lindane) | 0.01 | ND | ND | ND | ND | | | |
| Heptachlor Epoxide | 0.01 | ND | ND | ND | ND | | | |
| Endosulfan I | 0.01 | | ND | ND | ND | | | |
| Endrin | 0.01 | <0.05 | ND | ND | ⊲0.4 | | | |
| Endosulfan II | 0.01 | ND | ND | ND | <0.02 | | | |
| 4,4'-DDD | 0.01 | ND | ND | <0.06 | 0.01 | | | |
| Endrin Aldehyde | 0.01 | <0.03 | ND | <0.30 | <0.04 | | <u> </u> | |
| Endosulfan Sulfate | 0.01 | ND | | ND | ND | | | · |
| 4,4'-DDT | 0.01 | <0.04 | <0.02 | ⊲0.50 | <0.04 | | | |
| 4.4-DDE | 0.01 | ND | ND | <0_07 | ND | | _ <u>_</u> | |
| Dieldrin | 0.01 | ND | ND | | ND | | <u> </u> | |
| Methoxychlor | 0.02 | ND | ND | | ND | | | |
| Toxaphene | 0.3 | ND | ND | ND | ND | | <u> </u> | |
| Chlordane | 0.1 | ND | ND | ND | ND | | | |
| | <u> </u> _ | | | | | | _ | |
| Polychiorinated Bipheny | ts 🛛 | | | | | | | |
| (EPA Methods 3540/8080 |) | | | 1 | | | | |
| | MRL | | 1 | | | | | |
| Arocior 1016 | 0.1 | ND | NO | ND | ND | | | |
| Aroclor 1221 | 0.1 | ND | ND | ND | ND | | | |
| Aroclor 1232 | 0.1 | ND | ND | ND | ND | | | _ |
| Aroclor 1242 | 0.1 | ND | ND | ND | ND | | | _ |
| Aroclor 1248 | 0.1 | ND | ND | ND | ND | | | |
| Aroclor 1254 | 0.1 | ND | NO | 4 | ND | | | |
| Aractor 1260 | 0,1 | 1.9 | 0.5 | 15,6 | 1.9 | | | |
| Obladated II - Alicia | | | | | 1 | | | 1 |
| Chlorinated Herbicides | | | 1 | | | | 1 | |
| (EPA Method 8150A Mod | , ' | | 1 | | | | | |
| | MRL | | ļ | | | | · | |
| Dalapon | 1 | ND | ND | ND | ND | | | |
| MCPP | 20 | ND | ND | ND | ND | | | <u> </u> |
| Dicamba | 0.1 | ND | ND | ND | ND | | | |
| MCPA | 20 | ND | ND | ND | ND | Į | | |
| Dichloroprop | 0,1 | ND | ND | ND | ND | ļ | | |
| 2,4-D | 0.2 | ND | ND | ND | ND | ļ | | _ |
| 2,4,5-TP (Silvex) | 0.05 | ND | ND | ND | ND | ! | | |
| 2,4,5-T | 0.05 | ND | ND | ND | ND | ļ | _ | |
| Dinoseb | 0.5 | ND | ND | ND | ND | | | |
| 2.4-DB | 0.5 | ND | ND | ND | NÔ | | | |

FOOTNOTES: ND = Non-delected at the method reporting limit (MRL). < = Less than, Analytical reporting limit has been elevated due to matrix interferences or sample requiring dilution. VAACCCOMMONRICH/FINALS/REPTABLES/835752/FXLS/Pwet-Toz

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FL Richardson OU D Site Building 35-752 Soil Sample Analytical Results Volatile Organic Compounds

| Feinachicroethene (PCE) 5 ND ND ND 26/070024/scrameframe 5 ND ND ND ND 12-Ditromoethere (EDB) 20 ND ND ND ND 12-Ditromoethere (EDB) 20 ND ND ND ND 11.12-Teinschloroethere 5 ND ND ND ND Ehystemane 5 ND ND ND ND Ehystemane 5 ND ND ND ND Strimostmane 5 ND ND ND ND Strimostmane 5 ND ND ND ND Strimostmane 5 ND ND ND ND 12,3-Trinethytematere 5 ND ND ND ND 12,3-Trinethytematere 20 ND ND ND ND 2-Chorotekalene 20 ND ND ND ND 12,3-Trinethytematere 20 | | T | | | |
|--|-------------|-------------|-------------|-------------|-------------|
| Sample Deptit Q-F 4-f-F P-11 Lab Code, K45/2118L, M45/2218L, M45/2218L, M45/2218L, Labita Crypnic Compounds BIRL 11/2/4 11/2/4 11/2/4 Antis Compounds BIRL NO NO NO A Method \$250) S NO NO NO Chioradityscomethare (CFC 12) S NO NO NO Moronethare S NO NO NO NO Moronethare S NO NO NO NO Moronethare S NO NO NO NO Informatians S NO NO NO NO Info | | | \$8 A | P 3506 | |
| Lak Code V4572:158.,
K346821-002 V4572:158.,
K346821-002 V45821-002 K346821-002 Detaile Organic Compounds MRL 11/3/44 11/3/44 11/3/44 A Method 6260) S ND ND ND ichardsflavormstrume (CPC 12) S ND ND ND ichardsflavormstrume (CPC 12) S ND ND ND ichardsflavormstrume (CPC 11) S ND ND | 12-16 | 0.2 | 4-8 | 5-12 | 14'-16' |
| Lak Color. K846921-001 K846921-002 K86692 | \$45752225L | 9457522351 | 94575224SL | 9457522551 | 045752265L |
| Des Columné 11/3/94 11/3/94 11/3/94 china Granic Compounds MRL china di successiones MRL china di successiones 5 NO NO NO NO michi di constituio composituines 5 NO NO NO NO michi di constituio composituines 5 NO NO NO NO indiventame 5 NO NO NO NO | K946921-004 | K946921-010 | K946921-011 | K946921-012 | K946921-013 |
| Idela Organic Compounds MRL ND ND ND Individual Status of Market Law (CFC 12) 5 ND ND ND Individual Status of Market Law (CFC 12) 5 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individual Status of Market Law (CFC 11) 20 ND ND ND Individual Status of Market Law (CFC 11) 5 ND ND ND Individua | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 |
| PA Method 8260) ND ND ND Ichioradilucromethane (CFC 12) 5 ND ND ND Indications 5 ND ND ND | | | (1/.334 | LINGAR | 1030 |
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| Normediane S NO NO NO Inf Charles 5 NO NO NO Noteretrane 50 NO NO NO Idelization 50 NO NO NO Idelization 5 NO NO NO | ļ | Ļ | | | |
| try/ Chiorida 5 ND ND ND indimensional and second | ND | ND | NO | ND | ND |
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| 2-Dictionsprogene 5 ND ND ND = 12-Dictionsethene 5 ND ND ND Nationam 5 ND ND ND Nationam 5 ND ND ND Nonmochiconsetiene 5 ND ND ND 1,1-Tricthorostheme (TGA) 5 ND ND ND 2-Dictionsetiene 5 ND ND ND Intermedictionsetiene 5 ND ND ND Intereteee | NO | NO | ND | ND . | ND |
| -12-Dictaionestiane 5 ND ND ND Natorism 5 ND ND ND Introduction 5 ND ND ND 1.1-Trichtorestiane (TCA) 5 ND ND ND 1.1-Trichtorestiane (TCA) 5 ND ND ND 1.1-Trichtorestiane (TCA) 5 ND ND ND 2.2Dichtoroptopent 5 ND ND ND action 5 ND ND ND ND 2.Dichtoroptopent 5 ND ND ND ND 2.Dichtoroptopent 5 ND ND ND ND action 5 ND ND ND ND actionorestactions5 ND ND | ND | ND | ND | NO | ND |
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| Formochloromatiane 5 ND ND ND 1,1-Trichlorostiane 5 ND ND ND 1-Dichloroproperia 5 ND ND ND 1-Dichloroproperia 5 ND ND ND 2-Dichloroptoperia 5 ND ND ND 4-13-Dichloroptoperia 5 ND ND ND 4-2-Dichloroptoperia 5 ND ND ND 3-Dichloroptoperia 5 ND ND ND 3-Dichloroptoperia 5 ND ND ND 3-Dichloroptoperia 5 ND ND ND 3-Dichl | NO | NO | ND | NO | ND |
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| arbon Tetracharda 5 NO NO NO 2-Dicharostharje S ND NO NO ionzarna S ND ND ND ionzarna S ND ND ND ionandicharonnetame S ND ND ND ionandicharonnetame S ND ND ND istracharosthane S ND ND ND idenee S ND ND ND istracharosthane S ND ND | NO | NO | | | NO |
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| ND ND ND ND Hexanore 20 ND ND ND #-Hexanore 20 ND ND ND #-1,3-Dichloropropane 5 ND ND ND ana-1,3-Dichloropropane 5 ND ND ND ana-1,3-Dichloropropane 5 ND ND ND -Methyl-2-pantanone (MBK) 20 ND ND ND -Mortholographie 5 ND ND ND Mortholographie 5 ND ND ND -1,1,2-Toffac/Mortholographie 5 ND ND ND -1,1,2-Toffac/Mortholographie 5 ND ND ND -1,1,2-Toffac/Mortholographie 5 ND ND ND | ND | ND | ND | ND | ND |
| Hexanone 20 ND ND ND 6-1,3-Dichloroproperie S ND ND ND akerne S ND ND ND akerne S S ND ND akerne S ND ND ND akerne/s-Dichloropropene S ND ND ND 1,2-Tricteoroethane S ND ND ND Atterty/s2-pentamene S ND ND ND Stochkoroptingen S ND ND ND Atterty/s2-pentamene S ND ND ND Stochkoroptingen S ND ND ND Aborobencane S ND ND ND Altorobencane S ND ND ND Altoree S ND ND ND Altorobencane S ND ND ND Altorobencane S ND ND <td>NO</td> <td>ND</td> <td>ND</td> <td>ND</td> <td>ND</td> | NO | ND | ND | ND | ND |
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| k=1.3-Dichloroprepane 5 ND ND ND cistere 5 5 ND ND cistere 5 5 ND ND cistere 5 5 ND ND cistere 5 ND ND ND cistere 5 ND ND ND .1.3-Dichloropropene 5 ND ND ND .4.4ertyl-2-pertances (MBK) 20 ND ND ND .3-Dichloropropene 5 ND ND ND .3-Dichloropropene 5 ND ND ND .3-Dichloropropene 5 ND ND ND .3-Dichloropene 5 ND ND ND .1.2-Torthoropene 5 ND ND ND .1.2-Torthoropene 5 ND ND ND Storopenzene | NO | NO | ND | NO | ND |
| state i 5 5 ND ND state i j.2 Trichtoropropane 5 ND ND ND 1,2 Trichtoropropane 5 ND ND ND 3-2 Trichtoropropane 5 ND ND ND 3-2 Trichtoropropane 5 ND ND ND 3-Dichtoropropane 5 ND ND ND ND ortholograpane 5 ND ND ND Altoropanzane 5 ND ND ND Striptomizane 5 ND ND ND Striptomizane 5 ND ND ND Striptomizane 5 ND ND ND Striptopintizane 5 | NO | ND | ND | NO | ND |
| International Construction 5 ND ND ND 1.2-Ticktorosetiane 5 ND ND ND Histiyl-2-partamone (MBK) 20 ND ND ND -Mestryl-2-partamone (MBK) 20 ND ND ND -Mestryl-2-partamone (MBK) 20 ND ND ND *Arachkorostheme (PCE) 5 ND ND ND *Arachkorostheme (PCE) 5 ND ND ND 2-Dibromoethame (EDB) 20 ND ND ND 2-Dibromoethame (EDB) 20 ND ND ND 1.1.2-Tetractionorthame 5 ND ND ND 2-Dibromoethame 5 ND ND ND 1.1.2-Tetractionorthame 5 ND ND ND 2-Dibromoethame 5 ND ND ND 1.1.2-Tetractionorthame 5 ND ND ND 1.1.2-Tetractionorthame 5 ND ND | ND | ND - | ND | NO | ND |
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| 1.2.2-Tetrachtoroethane 5 ND ND ND 2.3-Ticklooporepane 5 ND ND ND 2.3-Ticklooporepane 5 ND ND ND Immoberizame 5 ND ND ND Propyberizame 20 ND ND ND Indicatane 20 ND ND <t< td=""><td>ND</td><td>NO</td><td>ND</td><td>ND</td><td>ND</td></t<> | ND | NO | ND | ND | ND |
| 2.3-Trichloropropane 5 ND ND ND Iromobertane 5 ND ND ND Propyljenzene 5 ND ND ND Progljenzene 20 ND ND ND Chtorotekane 20 ND ND ND Chtorotekane 20 ND ND ND S.5-Trimethyberczene 20 ND ND ND richtwyberczene 20 ND ND ND z.4-Trimethyberczene 20 ND ND ND z.4-Trimethyberczene 20 ND ND ND z.4-Trimethyberczene 20 ND ND ND z-Dichloroberzene 5 ND ND ND z-Dichloroberzene | ND | ND | NO | ND | NO |
| Inmodenziane 5 ND ND ND Propylenzene 20 ND ND ND ND 4-Discriptionzene 20 ND ND ND ND 4-Discriptionzene 20 ND ND ND ND 3.5-Trimethyberzene 20 ND ND ND ND 3.5-Trimethyberzene 20 ND ND ND ND 1.2,4-Trimethyberzene 20 ND ND ND ND 40-Butybenzene 20 ND ND ND ND ND 1.2,4-Trimethyberzene 20 ND ND ND ND ND 1.2,3-Dickfordberzene 5 ND ND ND ND ND 1.4-Dickfordberzene 20 ND ND ND ND ND 1.4-Dickfordberzene 20 ND ND ND ND ND ND ND ND 12-Dickfordberzene 5 | NO | ND | ND | ND | ND |
| Propybletzene 20 ND ND ND Chlorodelsume 20 ND ND ND ND Chlorodelsume 20 ND ND ND ND Chlorodelsume 20 ND ND ND ND Schlorodelsume 20 ND ND ND ND Schlorodelsume 20 ND ND ND ND Id-Schlorodelsume 5 ND ND ND ND Id-Dichlorodelsume 5 ND | NO | ND | ND | NO | NO |
| Inc. Inc. <th< td=""><td>NO</td><td>NO</td><td>ND</td><td>ND .</td><td>NO</td></th<> | NO | NO | ND | ND . | NO |
| Chlorolatuana 20 ND MO ND Chlorolatuana 20 ND ND ND ND Chlorolatuana 20 ND ND ND ND ND 3.5-TrimethyBorzana 20 ND ND ND ND ND z.4-TrimethyBorzana 20 ND ND ND ND ND z.4-TrimethyBorzana 20 ND ND ND ND ND z.4-TrimethyBorzana 20 ND ND ND ND ND z.0-Edv/benzena 20 ND ND ND ND ND z-Dichlorobenzena 5 ND ND ND ND ND ND ND z-Dichlorobenzena 5 ND ND ND ND ND ND ZD ND ND ZD ND ND ND ZD ND ND ZD ND ND ND ZD ND | ND | ND | ND | ND | ND |
| Chlorobakene 20 ND ND ND 3.5-Trimethybercane 20 ND ND ND 3.5-Trimethybercane 20 ND ND ND 2.4-Trimethybercane 20 ND ND ND 2.4-Trimethybercane 20 ND ND ND 3.5-Trimethybercane 20 ND ND ND 3.4-Trimethybercane 20 ND ND ND 3.5-Chthorbergane 5 ND ND ND 3.5-Chthorbergane 5 ND ND ND 4-Dechlorobergane 5 ND ND ND -Buybergane 20 ND ND ND -Buybergane 5 ND ND ND -Solthorobergane 5 | NO | ND | NO | ND | ND |
| 3.5-Trimethyberzene 20 ND ND ND art-Butyberzene 20 ND ND ND ND 1.2.4-Trimethyberzene 20 ND ND ND ND ace-Butyberzene 20 ND ND ND ND ace-Butyberzene 20 ND ND ND ND ace-Butyberzene 5 ND ND ND ND ace-Ditrene-a-a-thorepenee 5 ND | NO | NO | ND | NO | ND |
| art-Butytbanzane 20 ND ND ND 1,2,4-Trimetrytbanzane 20 ND NO ND ND wo-Butytbanzane 20 ND ND ND ND ND wo-Butytbanzane 5 ND ND ND ND ND Joicht/storbenzane 5 ND ND ND ND ND Heopropytialuane 20 ND ND ND ND ND J-Dickforobenzane 5 ND ND ND ND ND J-Dickforobenzane 5 ND | NO | ND | NO | ND T | NO |
| 2.4-Trimethybenzene 20 ND ND ND exeBulybenzene 20 ND ND ND ND J-Dichlorobenzene 5 ND ND ND ND Z-Dichlorobenzene 5 ND ND ND ND Z-Dichlorobenzene 5 ND ND ND ND | ND | ND | ND | NO | ND |
| so-Butybenzerve 20 ND ND ND J-Dichkoroberzerve 5 ND ND ND Hopropyfickume 20 ND ND ND J-Dichkoroberzerve 5 ND ND ND J-Dickhoroberzerve 5 ND ND ND J-Dickoroberzerve 5 ND ND ND J-Dickoroberzerve 5 ND ND ND | ND ND | | NO | | ND |
| 3-Dichikorobengane 5 ND ND ND Hopropylitikuene 20 ND ND ND 4-Dichikorobengane 5 ND ND ND -Butybengane 20 ND ND ND -Butybengane 20 ND ND ND -Butybengane 5 ND ND ND -Butybengane 5 NO ND ND -Butybengane 5 ND ND ND | HD HD | - NO - | NO | - NO - | NO |
| Hopprop/fiduane 20 ND ND ND .4-Dictionoberzone 5 ND ND ND .6-Unitionoberzone 20 ND ND ND .6-Unitionoberzone 20 ND ND ND .6-Unitionoberzone 5 ND ND ND .2-Oldridonoberzone 5 NO ND ND .2-Oldridonoberzone 20 ND ND ND | | | | | |
| 4-Dichlorobergene 5 ND ND ND -Butylbargane 20 ND ND ND ND 2-Dichlorobergane 5 ND ND ND ND 2-Dichlorobergane 5 ND ND ND ND 2-Dibromo-3-chloropropene (DBCP) 20 ND ND ND ND | ND | | NO | NO | NO |
| -Butytberssene 20 ND ND ND
2-Dictiforsberssene 5 ND ND ND
2-Dibromo-J-chloropropene (DBCP) 20 ND ND ND | ND | NO | ND | ND | ND |
| 2-Okthiorobergane 5 NO NO NO
2-Diarsmo-3-chioropropene (DBCP) 20 ND ND NO | ND | NO | NO | ND | ND DM |
| 2-Dibromo-3-chloropropene (DBCP) 20 ND ND ND ND | NO | NO NO | ND | ND | ND |
| 2-Obromo-3-chloropropene (DBCP) 20 ND ND ND ND | ND | NO | NO | NO | ND |
| | HD | ND | NO | ND | NO |
| | ND | NO | ND - | NO | ND |
| 2,3-Trichlorebetizene 20 ND ND ND ND | NO | NO | NO | ND | NO |
| Aucharten 20 NO NO NO | NO | HO | NO | | NO |
| letectricrobutadiene 20 ND ND ND | | NO | | | NO |
| FOOTNOTES; ND = Non-delected at the method reporting fant (MRL). | | <u></u> | <u> </u> | 1 | <u>L NU</u> |

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FL Richardson OU D Site Building 35-752 Soil Sample Analytical Results Volatile Organic Compounds

| dry weight basis | | | | | DRUM AC | CUMULATION AP | EA (cont.) | | ······································ | Page |
|--------------------------------|---------------|-------------|-------------|-------------|-------------|---------------|--------------|-------------|--|------------|
| | Location: | | SS 1 | | | 52 | | 33 | | \$4 |
| | mpie Depth: | 6 | e | 2 | <u>۲</u> | Z | 6 | 2 | 6" | 2 |
| | Sample IQ; | 94575201SL | 94575202SL | 94575218SL | \$45752035L | 94575217SL | 9457520451 | 9457521651 | 94575205SL | 9457521551 |
| | Lab Code: | K346240-001 | K946240-002 | K946306-008 | K946240-003 | K945305-007 | K\$46240-004 | X946305-006 | K946240-005 | K946306-00 |
| De | to Collected: | 10/6/94 | 10/6/94 | 10/10/94 | 10/5/94 | 10/10/94 | 10/6/94 | 10/10/94 | 10/5/94 | 10/10/94 |
| /olatile Organic Compounds | MRL, | | | | | | | | | |
| EPA Method 8260) | | | | | | | | | · | ł |
| | | | | | | | | | | 1 |
| Schlorodiluoromethane (CFC 12 |) 5 | ND | ND | ND | NO | NO | ND. | ND | ND | ND |
| Chieromethane | 5 | ND | ND | NO | ND | NO | NO | NO | ND | NO |
| /inyl Chloride | 5 | | 20 | ND | NO | ND | Ð | ND | ND | ND |
| iconometrana | 5 | ND | ND | NO | ND | ND | ND | ND | ND | NO |
| Chloroethane | 5 | ND | NO | ND | NO | ND | NO | ND | ND | ND |
| fichlorofuoromethane (CFC 11) | 5 | ND | ND | | ND | NO | NO | ND | ND | ND |
| Vostone | 5 | ND | ND | ND | NO | ND | ND | NO | ND | NO |
| ,1-Dichloroethene | 5 | NO | ND | ND | ND | ND | ND | ND | ND | NO |
| Carbon Disultide | 5 | ND | N | ND | NÖ | ND | ND | ND | ND | ND |
| delitylene Chioride | 10 | ND | NO | ND | NO | ND | ND | ND | ND | NÚ |
| ram-1,2-Dichloroethone | 5 | 80 | NO | NO | ND | DM D | ND | ND | ND | ND |
| 1-Dichloromitame | 5 | R | ND | NO | ND | NO | ND | ND | ND | NO |
| Butanone (MEK) | 20 | ND | ND | NÖ | ŇO | ND | ND | ND | ND | ND |
| 2-Dichloropropane | 5 | ND | ND | ND. | ND | ND | ND | ND | ND | ND |
| is-1,2-Dichlaroethene | 5 | ND | ND | NO | ND | ND | DIN D | ND | ND | ND |
| hioroform | 5 | ND | ND | DBN D | ND | ND | N.O. | NO | ND | NO |
| Iromochloromethane | . 5 | NQ | ND | CIN CIN | NO | ND | ND | ND | ND | ND |
| 1,1-Trichloroethane (TCA) | 5 | ND | ND | NO | ND | ND | NO | ND | NO | ND |
| ,1-Dichloropropene | 5 | ND | NO | ND | ND | ND | ND | ND | ND | NO |
| Serbon Tetrachioride | 5 | NO | ND | NO | ND | NO | ND | ND | ND | ND |
| 2-Dichloroethane | 5 | ND | ND | NO | ND | NO | NO | ND | ND | ND |
| Senzone | 5 | ND | ND | ND | 04 | ND | HD | ND | NO | ND |
| fichloroethene (TCE) | 5 | N | ND | NO | - OK | ND | ND | NO | NO | NO |
| 2-Dichloropropene | 5 | ND | ND | ND | NO | ND | ND | ND | ND | ND |
| komodichioremethane | 5 | ND | NO | - 34 | NO | ND | ND | ND | ND | ND |
| Stromomethene | 5 | ND | ND | ND | NO | ND | MD | ND | NO | ND |
| Histinete | 20 | ND | ND | NO | ND | ND | ND | ND | NO | ND |
| =-1,3-Dichloropropene | 5 | ND | NO | NÖ | NO | ND_ | ND | ND | ND | ND |
| Coluene | 5 | ND | NO | ND | ND | 8 | 6 | NO | | ND |
| rane-1,3-Dichloropropene | 5 | ND | ND . | ND | NO | ND | ND | NÓ | ND | ND |
| 1,1,2-Trichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Methyl-2-pentenone (MIBK) | 20 | ND | ND | ND | ND | NO | NO | NO | ND | ND |
| 1,3-Dichloropropane | 5 | NO | ND | ND | NO | NO. | ND | ND | ND | ND |
| Terschioroethene (PCE) | 5 | NO | ND | ND | ND | NO | ND | NO | ND | NO |
| Dibromochloromethane | 5 | ND | ND | MD | ND | ND | ND | ND | NO | ND |
| 1,2-Oibromoethane (EDB) | 20 | ND | ND | ND | ND | NO | 80 | ND | ND DI | NO |
| Chierobenzene | 5 | ND | ND | ND | NÔ | ND | NO | ND | ND | ND |
| 1,1,1,2-Tetrachloroethane | 5 | ND | NO | ND | ND | ND | ND | ND | NO | ND |
| Ethylbenzone | 5 | ND | NO | ND | ND | 5 | NO | ND | ND | ND |
| Total Xylenes | 5 | NO ON | ND | ND | ND | 38 | 6 | ND | 6 | DN |
| Styrene | 5 | ND | ND | ND | NO | ND | MO | NO | NO | ON D |
| Bromoform | 5 | ND | ND | - CM | NO | ND | ND | ND | NO | NO |
| eopropythenzene | 20 | NO | NO | NÖ | NO | ND | NO | NO | ND | ND |
| 1,1,2,2-Tetractionosthane | 5 | NO | D ND | ND | ND | NO | ND | ND | ND | ND |
| 2,3-Trichloropropune | 5 | ND | ND | NZ) | NO | ND | ND | ND | NO | ND |
| Bromobenzane | 5 | NO | ND | NO | ND | NO | ND | ND | ND | ND |
| Propybenzene | 20 | ND | ND | NO | NO | NO. | ŇO | ND | ND | NO |
| 2-Chiorototuana | 20 | ND | ND | NO | ND | ND | NO | ND | ND | NO |
| -Chiaraloluene | 20 | ND | NO | ND | NO | ND | ND | ND | ND | ND |
| 1,3,5-Trimethytherszene | 20 | ND | ND | NO | ND | ND | MD | NO | NO | NO |
| ert-Butytoenzone | 20 | NO | ND | NÓ | NO | ND | ND | NO | ND | ND |
| 2,4-Trimethybenzene | 20 | NO | ND | NÖ | NO | 23 | мо | ND | ND | NO |
| neo-Butylbenzene | 20 | ND | ND | NO | NO | NO | NO | ND | ND | ND |
| 1,3-Dichlorobenzene | 5 | ND | ND | NO | ND | HD . | NO | | ND | ND |
| Lisopropyttolume | 20 | | ND | NO | ND | NO | ND | ND | ND | NO |
| 1,4-Dichlorobenzene | . 5 | ND | ND | ND | ND | NO | MD | NO | ND | ND |
| n-Butyfoenzene | 20 | ND . | NO | ND | NO | ND | ND | ND | NO | NO |
| 1.2-Dichlorobenzene | 5 | NO | ND | NO | ND | NO | ND | ND | NO | NO |
| 1,2-Oibromo-3-chioropropene (D | BCP) 20 | NO | ND | ND ND | ND | ND | NO | | ND | ND |
| 1,2,4-Trichlorobenzene | 20 | ND | NO | NO | ND | NO | NO | ND | ND | NO |
| 1,2,3-Trichlorobenzane | 20 | NO | ND | NO | NO | ND | ND | ND | MO | ND |
| Naphthalene | 20 | ND | NO | ND | ND | ND | NO | ND | ND | ND |
| Herechlorobutediene | 20 | ND | NO | ND | ND | NO | NO | ND | ND | NO. |
| | | | | | | | | | | |

VALUE COMPONENT AND A SHEET AND A SHEET AND A THE

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Volatile Organic Compounds

| iry weight basis | | | | | | CUMULATION AP | | | | |
|--|---------------|-------------|-------------|-------------|--------------|---------------|-------------|-------------|--------------|-------------|
| ng/Kg | Location | | SS 5 | | | 56 | \$ | 37 | S | 58 |
| = | ample Depth: | 6 | z | z | د | Ż | 6 | z | 6 | z |
| | Sample ID: | 94575206SL | 94575213SL | 94575214SL | 9457520751 | 94575212SL | \$4575206SL | 94575211SL | 94575209SL | 9457521051 |
| | Lab Cede: | K946243-001 | K946306-003 | K946305-004 | K946243-002 | K946306-002 | K945243-003 | K945305-001 | K\$46243-004 | K945243-005 |
| 0. | an Collected: | 10/6/94 | 10/10/94 | 10/10/54 | 1045/94 | 10/10/94 | 10/5/94 | 10/10/94 | 10/6/94 | 10/6/94 |
| olatile Organic Compounds | MRL | | | | | | | | | |
| EPA Method #260) | 1 | |) | | | | | | | |
| | | | | | | | | | | |
| | | | | | NO | NO | ND | ND | · · · · · | |
| Ichlorodifluoramethane (CFC 12 | · | ND | ND | | | | | | ND | ND |
| hioromethane | 5 | ND | DM. | ND | ND | NO | ND | ND | ND | ND |
| inyl Chloride | 5 | NO | ND | NÖ | _ ND | ND | ND | ND | ND | NO |
| romonathane | 5 | ND | ND | ND | ND | ND | ND | NO | ND | NO |
| hioroethana | 5 | NO | NÓ | NO | ND | ND | ND | NO | ND | NO |
| richlarofivoromethane (CFC 11) | 5 | NO. | ND | ND | ND | ND | ND | ND | ND | ND |
| cetone | 50 | ND | ND | NO | ND | NO | NO | ND | ND | NO |
| S-Dichloroethene | 5 | ND | NO | NO | NO | ND | NO | ND | ND | ND |
| arbon Disultide | 5 | NO | NO | ND | ND | NO | NO | ND | ND | ND |
| | 10 | | NO | NO | NO | ND | NO | NO | ND | NO |
| lethylene Chloride | | | | | | | | | | |
| ans-1,2-Dichloroethane | 5 | ND | ND | ND | ND | ND | ND | ND | NO | ND |
| 1-Dichlorpethane | 5 | ND | ND | ND | NO | ND | ND | ND | ND | ND |
| Butanone (MEK) | 20 | ND | NÓ | ND | NO | ND | ND | ND | ND | NO |
| 2-Dichloropropene | 5 | ND | ND | NÔ | ND | ND | ND | ND | ND | ND |
| is-1,2-Dichlorostheme | 5 | ND | ND | NO | ND | ND | ND | NO | ND | NO |
| hioreform | 5 | ND | ND | NO | NO | NO | ND | ND | ND | ND |
| romochiaromethene | 5 | ND | ND | NO | NO | ND | ND | NO | NO | ND |
| | - 5 | NO NO | NO | | ND - | NO | NO | NO | ND | NO |
| ,1,1-Trichloroethane (TCA) | | | | | | ND | | | | |
| ,1-Dichloropropone | 5_ | ND | ND | ND | ND | | ND | ND | ND | ND |
| arbon Tetrachioride | 5 | ND | ND | ND | ND | ND | ND | ND | NO | ND |
| 2-Dichloroethere | 5 | ND | ND | ND | ND | ND | ND | ND | NO | NO |
| lenzane . | 5 | ND | NO | NO | NO | ND | ND | NO | ND | ND |
| richiorouthene (TCE) | 5 | NO | NO | ND | ND | ND | ND | ND | NO | ND |
| 2-Dichioropropene | 5 | NO | ND | NO | ND | NO | NO | NO | ŃQ | ND |
| mmodichioromettume | | NO | ND | NO | NO | ND | NO | NO | NO | NO |
| Aromomethene | 5 | NO | NO | NO | ND | NO | NO | NO | NO | ND |
| Hereitene | | | | NO | | ND | NO | ND | | |
| | 20 | NO | NO | | | | | | ND | ND |
| is-1,3-Dichloropropene | 5 | ND | ND | ND | NO | ND | ND | NO | ND | ND |
| Totuene | 5 | ND | NÖ | ND | ND | ND | NÓ | ND | ND | 5 |
| rane-1,3-Dichioropropene | 5 | NO | NO | ND | ND _ | ND | NO | ND | NO | ND |
| 1.2-Trichloroethane | 5 | ND | ND | NO | ND | ND | ND | ŇO | NO | ND |
| Methyl 2-pentanone (MIEK) | 20 | ND | ND | ND | ND | NO | NO | ND | ND | ND |
| 3-Dichiorographia | 5 | ND | NO | ND | NO | NO | NO | NO | NO | NO |
| etachioreethene (PCE) | 5 | ND | NO | ND | NO | ND | NO | ND | NO | NO |
| Dibromochloromethane | 5 | ND | NO | NO | ND | NO | ND | ND | | NO |
| | | | | | | | | | | <u> </u> |
| ,2-Dibromoethane (EDB) | 20 | ND | ND | ND | ND | | ND | ND | ND | NO |
| Norobenzene | 5 | ND | ND | ND | ND | ND | ND | ND | NO | ND |
| 1,1,1.2-Tetrachioroethane | 5 | ND | ND | ND | NO | NO | ND | ND | NO | ND |
| thylbonzeno | 5 | ND | ND | ND | NO | ND | ND | NO | ND | ND |
| lotal Xylenes | 5 | NO | ND | NO | ND | NO | ND | NO | ND | ND |
| Styrana | - 5 | | NO | ND | NO | ND | NO | NO | ND | ND |
| Bromolorm | | ND | ND | 1 10 | | NZD | HD HD | NO | ND - | ND |
| sopropyibenzene | - 20 | NO | NO | ND | - NO | | NO | | NO | ND |
| and the second | - 20 | NO | | NO | NO | ND | ND ND | NÖ | | |
| 1.2.2-Tetrachioroethere | | | | | | | | | ND | ND |
| 2.3-Trichloropropane | 5 | ND | ND | NO | NO | NO | NO | ND | ND | ND |
| Sromoberizana | 5 | NO | ND | ND | ND | ND | NO | ND | ND | NO |
| Propybenzene | 20 | NO | NO | ND | ND | NO | NO | ND | ND | NO |
| Chiorototuene | 20 | ND | ND | NO | NO | NO | ND | ND | ND | NO |
| Chiorololume | 20 | NO | ND | NO | NED . | ND | ND | NO | -ND | NO |
| 3,5-Trimetrytoenzene | 20 | NO | NO | ND | ND | NO | NO | NO | ND | ND |
| ant-Butylbenzane | 20 | ND | ND | NO | ND | ND | ND | ND | NO | NÖ |
| 2.4-Trimetrybenzene | 20 | ND | ND | ND | NO | ND | NO | NO | ND | HO - |
| eo-Butyberzene | 20 | ND | NO | | NO | NO | NO | NO | 10 | NO |
| 3-Dictionoberizana | 5 | NO | NO 10 | NO | NO | NO - | | NO | NO | NO |
| | | | | | NO | NO | | | | |
| Heopropyliniuene | 20 | ND | NO | ND | | | ND | NO | ND | ND |
| 4-Dichlorobenzene | . 5 | ND | - CIM | ND | ND | NÖ | ND | NO | NO | ND |
| -Butylbanzene | 20 | ND | ND | ND | ND | NO | NO | ND | NO | NO |
| 2-Dichiorobenzene | 5 | ND | ND | ND | ND | ND | ND | NO | ND | ND |
| 2-Ditromo-3-chicropropene (E | 3BCP) 20 | ND | ND | NO | NO | ND | ND | NO | ND | ND |
| 1,2,4-Trichiarobenzene | 20 | ND | ND | ND | ND | ND | NO | ND | ND | ND |
| 1,2,3-Trichlorobenzene | 20 | NO | | NO | NO | NO | ND | NO | ND | NO |
| Nachiliate | 20 | NO | ND | T NO | ND | - 10 | NO | NO | - ND | NO |
| iezechiarabuteciene | 20 | ND | NO | - NO | NO | NO | | ND | NO | ND |
| | | | | | | | | | | |

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Samivolatile Organic Compounds

| | | | | | | | | | Page |
|--|-----------------|--------------|-------------|---------------|-------------|--------------|-------------|-------------|-------------|
| y weight besis | | | | | DRUM ACCUM | ULATION AREA | | | |
| gKg | Location: | | | P 3505 | | | | P 3596 | |
| | Sample Depth: | 0-4" | 4-6 | #- 11 | 17-15 | 0-2' | 4-4 | 8-12 | 14'-16' |
| | Sampia ID: | 94575219SL | \$4575220SL | \$4575221SL | 945752225L | P45752235L | \$4575Z245L | M\$752255L | \$4575226SL |
| | Lab Code: | K946921-001 | K946921-002 | K\$45921-003 | K946921-004 | K945921-010 | K946921-011 | K946821-012 | K946921-013 |
| | Data Collected; | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/94 | 11/3/04 | 11/3/94 |
| emivolatile Organic Compo | unda | | | | | | | | |
| PA Methods 3550/8270 | MRL | | | | | | | | |
| Nitosodimetrylamine | 2 | વ | ND | ND | NO | | ND | NO | NO |
| niine | 1 | Q | NO | NO | NÔ | Ŷ | ND | ND DIA | NÖ |
| in(2-chlorowhyl) Ether | . 0.3 | <0,6 | ND | ND | ND | 3.0> | ND | NO | ND |
| 2-Dichlorobenzene | ¢0 | 8.0> | NÔ | NO | NO | 4.6 | ND | ND | ND " |
| ,3-Dichiorobenzene | دة | 416 | NO | NO | ND | 46 | NO | NO | ND |
| 4-Dichlorobenzene | 0.3 | -05 | ND | NO | NO | <0.6 | NO | NÖ | ND |
| in(2-chloroisepropyl) Eliver | 0.3 | -0.6 | ND | ND | NO | ⊲.s | NO | ND | ND |
| Histored n propylamine | 20 | 4 ,6 | ND | NÖ | NO | 20× | NO | ND | NÛ |
| lexachioroethane | 0.3 | 40 <i>5</i> | NO | ND | - OM | <0.5 | ND | ND | NO |
| litubenzane | 0.3 | <0.6 | ND | NO | NO | 40,6 | ND | NO | ND |
| ophorone | 0.3 | ⊲0.6 | ND | ND | ND | <0.6 | ND | ND | ND |
| in(Z-chloroethory)methane | 0.3 | <0.6 | ND | NO | NÔ | <0.6 | - ND | ND | ND |
| 2,4-Trichlombenzene | 20 | <0.6 | ND | ND | ND | <0.5 | ND | ND | NO |
| spinihelene | 0.3 | <0.6 | NO | ND | ND | | NO | ND | ND |
| Chioroaniline | 0.3 | <0.6 | ND | NO | NO | <0.5 | ND | NO | ND |
| lexechiorobutaciene | | ⊲.6 | NO | ND | NO | ⊲.6 | ND | ND | NO |
| Memvinaphiltulene | 0.3 | -0.6 | ND | NO | NO | -9.6 | NO | NO | NO |
| lezachiorocyclopontecione | 0.3 | | NO | ND | NO | -9.6 | ND | ND | ND |
| -Chioronaohthaiene | 20 | | NO | NO | NO | | ND | NO | ND |
| -Nitoaniine | 2 | | NO | NO | ND | | NO | NO | NO |
| And the second sec | 103 | 3.6> | NO | ND | | | | | NO |
| Centrely Installed | | 3.0 | NO | | | -9.5 | ND | NO | |
| -Nitroeniline | 2 | | NO | NO | NO NO | -46 | ND | ND | ND |
| canaphilitana | 0.3 | | | NO | ND | | NO | NO | NO |
| ibenzeturan | 0.3 | 40.6 | ND | | ND | | NO | | |
| | | | | | NO | | | | NO |
| 4-Ointrotoluene | 0.3 | A (D) | ND | NO | | | ND | NO | NÖ |
| 6-Dinitrotaluene | £.0 | 40,6 | ND | ND | NO | | ND | ND | NÓ |
| Nettyl Philippine | 63 | 3.0× | NO | NO | ND | - 46 | ND | NO | ND |
| Chlorophenyl Phenyl Ether | 0.3 | <0.6 | ND | ND | ND | -9.6 | ND | NO | NÔ |
| luorene | 0.3 | ⊲0.6 | ND | ND | NÔ | <0,6 | ND | ND | ND D |
| Niroeniine | 2 | -4 | NO | ND | ND | - 4 | ND | ND | ND |
| Nitrocodiphenylemine | 0.3 | -0.5 | ND | NO | ND | -9.5 | ND | ND | ND |
| -Bromophenyl Phenyl Efter | 0.3 | ⊲9.6 | ND | NO | ND | -0.6 | NO | ND | ND |
| fexection/oberszene | 20 | -0,6 | ND | ND | - 04 | <0.6 | ND | ND | ND |
| Themanifesing | 0.3 | <0.6 | ND | NO | NO | 4.6 | ND | NO | ND |
| Indiracume | 203 | <0.6 | HD | NÖ | NO | <0.5 | ND | ND | NO |
| X-n-butyl Philadele | 0.3 | <0.6 | ND | ND | ND | -9,5 | ND | NO | NO |
| lucranthene | £0 | =0.6 | 0.73 | MD | NÖ | <0.6 | - NO - | ND | ND |
| утеле | 0.3 | <0.6 | 0.64 | ND | ND | <0.6 | ND | ND | ND |
| Autyloenzyl Phihaiate | 0.3 | <0.6 | ND | ND | ND | -41,6 | ND | NO | NO |
| .3 -Ochiorobenzidine | 2 | | NO | NO | NO | | ND | ND | ND |
| Senz(a)anthracane | 0.3 | -0.5 | NO | ND | ND | -0,6 | NO | NO | ND |
| 4(2-othylheryl) Phihalate | | <0.6 | NO | NO | NO | 0.80 | ND | NO | ND |
| Annana Anna A | 0.3 | <0.5 | 0.45 | NO | | | NO | NO | |
| X-n-octyl Philialate | | 4.6 | 1 0.97 | ND | NO | 1.32 | 0.36 | 0.41 | 20 |
| lenzo(b)ilueranthene | | 0.7 | 0.93 | NO | ND | 45 | NO | NO | ND |
| anzo(s)iluoranthone | - 03 | 0.7 | 0.55 | NO | NO NO | | ND ND | NO | ND ND |
| Henzo(a)pyrawe | | | 0.65 | NO 10 | NO NO | | ND ND | | |
| | - 0.3 | | | | ND | | NO NO | ND | ND |
| ideno(1,2,3-cd)pyrene | | | | NO NO | | 40.6 | | ND | ND |
| Woenz(s.h)anthracane | | | | | | | ND | NO | ND |
| lenzo(g,h,i)perytene | | -0.6 | NÖ | NO
NO | | | NO - | ND | ND |
| henol | 03 | 40.6 | | | | | ND | ND | ND |
| Chiaraphenol | | <0.6 | NO | NO | ND | - 4.6 | ND | <u>NÖ</u> | NO |
| lenzyl Alcohol | ده 👘 | -9.5 | NO | ND | NO | 40 | ND | ND | ND |
| Methylphanol | 0.3 | -0.6 | NO | NÖ | NO | <0.5 | MO | NO | ND |
| - and 4-Methylphanol" | 0.3 | 3,6 | ND | ND | HO | 415 | ND | ND | NÔ |
| Nirophenoi | 0.3 | ⊲0.6 | NO | NO | ND | 4.6 | ND | ND | NO |
| 4-Dweetryiphonol | 20 | -0.6 | ND | ND . | NO | -0.6 | ND | ND | NÔ |
| lenzoic Acid | Ż | -4 | MD | CM C | ND | 4 | ND | ND | ND |
| 4-Dichlorophenol | 2.0 | <9.5 | ND | ND | | -0.s | NO | NO | ND |
| Chioro-3-methylphenol | دە | <0.6 | MD | CM C | NO NO | -0.5 | ND | NO | DM |
| 2,4,6-Trichlorophenol | 0.3 | 45 | ND | NO | ND | -0.8 | NO | NO | ND |
| 4,5-Trichlorophenol | 0.3 | 4.5 | ND | ND | - 04 | 20> | ND | ND | NO |
| .4-Dinitrophenol | 2 | - 4 | NO | NO | NO | | NO | NO | NO |
| Nitrophenol | | | ND | NO | NO | | - 100 | NO | NO |
| -Methyl-4,6-dinitrophenol | - 2 | | | NO | - ND | | NO | | NO |
| witachiorophence | | | - NO | - | | | | | - 10 - |
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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Semivolatile Organic Compounds

| dry weight basis | | | | | DRUM AC | CUMULATION A | LEA (cont.) | | | Page |
|--|-----------------|-------------|-------------|-------------|-----------------|--------------|-------------|-------------|-------------|------------|
| ng/Kg | Location; | | \$\$ 1 | | | SZ | | 53 | 2 | S 4 |
| | Sample Depth: | | | z | | | 5 | 2 | <u> </u> | 7 z |
| | Sample 10: | 94575201SL | 9457520251 | \$4575218SL | \$4575203SL | H\$752175L | \$4575204SL | H575216SL | M575205SL | #45752155 |
| | Lab Code: | K946240-001 | K945240-002 | K946305-006 | K945240-003 | K946308-007 | K946240-004 | K946306-006 | K#46240-005 | K946306-00 |
| | Data Collected: | 10/5/94 | 10/6/94 | 10/10/94 | 10/6/94 | 10/10/94 | 10/5/94 | 10/10/94 | 10/6/94 | 10/10/94 |
| iemivolatile Organic Compo | | | , | | | | | | 10034 | |
| PA Methods 3550/8270 | MRL | | | | | | | | | |
| TA MERCER JOBS/12/0 | - I = KL | | | | | | | | { | 1 |
| -Nitrosodimethylamine | 2 | ND | NÖ | ND | NO | ND | - NO | | | |
| viline | | NO | ND | ND | | ND | NO | ND - | ND | ND |
| in(2-chloroethyl) Ether | | - NO | NO | ND | ND | NO | ND - | NO | ND - | NO |
| 2-Dichiorobenzene | 0.3 | NO | NO | NO | <u></u> | NO | NO | | NO | ND |
| .3-Dichlorobenzene | | NO | ND | ND | - 70 | NO | NO | ND | NO | |
| ,4-Dichicrobenzane | 0.3 | NO | NO | ND | ND | NO | ND | ND | NO - | NO |
| 34(2-chloroisopropyl) Elher | 0.3 | ND | NO | NO | 100 | ND | - ND | NO | ND | NO |
| -Nitrosod-n-propylarnine | 2.0 | NO | ND | NO | NO | NO | NO | | ND | NO |
| lexachioroethane | 0.3 | ND | ND | ND | | NO | ND | ND | ND | ND |
| Wrobenzene | 0.3 | ND | NO | ND | ND | NO | ND | NO | . ND | NO |
| sophorone | 0.3 | ND | ND | ND | ND | ND | NO | ND | ND | ND |
| Sa(2-chioroethoxy)methane | 0.3 | ND | NO | NO | 80 | ND | NO | ND ND | . NO | ND |
| 2,4-Trichlorobenzene | 0.3 | ND | ND | ND | ND | - 04 | ND | | ND | NO - |
| Vaphthalene | 2.0 | NO | NO | NO | NO | NO | NO | ND | ND | NO |
| Chicrosofine | 0.3 | ND | ND | ND | NO | ND | NO | NO | NO | NO |
| | 0.3 | ND | ND | ND | NO | ND | NO | NO | ND | ND |
| 2-Methylnaphthalana | | ND | ND | NO | NO | ND | ND | ND | NO | NO |
| fexectionscyclopeniadiane | 0.3 | NO | ND | ND | ND | NO | ND | ND | NO | NO |
| 2-Chioronaphthelene | 63 | ND | ND | ND | NO | NÔ | NO | NO | ND | NO |
| 2-Nitroeniline | 2 | NO | ND | ND | ND - | ND | ND | ND | ND | NO |
| Dimetryl Phthalate | 0.3 | NÔ | ND | NO | NO | NO | - NO | ND | ND | ND |
| Acenaphiliyione | 0.3 | ND | ND | NO | ND | ND | NO NO | NO | NO | ND |
| 3-Niltouniine | 2 | NO | ND | NO | NO | ND DA | ND | ND | ND | NO |
| Acenaphilitene | 0.3 | ND | ND | NÓ | ND | - ND | ND | ND | NO | ND |
| Dibenzolumn | 0.3 | ND | NO | NO | NO | NO | NO | NO | ND | ND |
| 2.4-Dinitratolumne | 0.3 | ND | ND | ND | ND ND | NÖ | ND | ND | NO | NO |
| 2,5-Dinitrotoluene | 0.3 | ND | NO | ND | DM | ND | ND | NO | ND | ND |
| Distryl Phtheiste | E.0 | ND | NO | NO | NO | ND | ND | NÖ | NO | NO |
| 4-Chlorophanyl Phenyl Ether | 20 | ND | ND | ND | NÖ | ND | NO | ND | NO | NO |
| Fluorene | 0.3 | ND | NÖ | ND | ND | NO | ND | ND | ND | NO |
| 4 Nikoaniine | 2 | NO | NO | NO | NÖ | ND | ND | NO | ND | NÖ |
| N-Nitrosodiphenylexine | ده | Ω. | ND | ND | NO | NO | NO | NO | NO | ND |
| 4-Bromophenyl Phenyl Ether | 0.3 | ND | NÖ | ND | ND | ND | ND | ND | ND | ND |
| Hexachierebanzene | 20 | NO | NO | [ND | NO . | ND | - ND | NO | NO | ND |
| Phenenilhrense | 0.3 | ND | ND | ND | NÖ | NO | NO | ND | ND | ND |
| Anthracene | 0,3 | ND | NÖ | ND | ND | ND | ND | NO | ND | NO |
| Ol-n-butyl Phithalatia | 0.3 | ND | NÖ | NO | NO | ND | N | ND | NO | ND |
| Fluoramhene | 0.3 | ND | NÔ | ND | NO | NÖ | ND | ND | ND | NO |
| Pyrene | 0.3 | ND | NO | NÖ | NÖ | ND | ND | ND | NO | ND |
| Butylbenzyl Phthalate | 0.3 | ND | ND | ND | ND | NO | NO | ND | ND | NÖ |
| 3,3'-Orchlorobenzidine | Z | ND | NO | NO | ND | ND | ND | ND | ND | ND |
| Benz(a)entivacene | 0.3 | NO | ND | NO | ND | NO | ND | ND . | NO | ND |
| Bis(2-ethylhexyl) Phihelate | 0.3 | NO | 8 | ND | ND | NO | ND | ND | NO | ND |
| Chrysene
Di-n-octvl Philhelete | ده
ده | ND | ND | ND | NO | NO
NO | NO
ND | ND | 0,3 | ND |
| Di-n-octyl Philiplate
Benzo(b)Buonanthane | 20
20 | ND | ND
NO | ND
NO | NO NO | NO NO | | ND | ND | NO |
| Benzo(k)fuoranthene | 0.3 | NO | ND | ND . | NO | ND | ND ND | | NO | MD ND |
| Benzo(K)#Uoranenene
Benzo(a)pyrane | | ND | ND
ND | NO | NO | ND | ND | NO | NO | ND |
| Indeno(1,2,3-cd)pyrane | 20 | ND ND | ND
NO | NO | | ND ND | ND ND | ND | | NO |
| Dibenz(s,h)entivaciene | 0.3 | NO | NO | | NO | NO | NO | ND NO | ND | ND |
| Benzo(g,h,j)perviene | 0.3 | ND | | NO | NO
NO | - 100 | NO | ND ND | ND
_ND | ND
ND |
| Phenol | | NO | NO | NO | NO | 80 | NO | ND | | |
| 2-Chiorophenol | L0 0.3 | NO | HO HO | NO | NO | NO | NO | ND | | NO |
| Benzyl Alcohol | | NO | NO | NO | NO | | NO | | NO | NO |
| 2-Methylphenol | 0.3 | NO | ND | ND | NO | NO | NO | ND | NO | ND |
| 3- and 4-Methylphenol* | | ND | HO | NO | NO | MD | NO | NO | NO | NO |
| 2-Nitrophanol | 0.3 | NO | ND | ND | NO | NO | ND | ND | NO | NO |
| 2.4-Dimethylphenol | 20 | ND | NO | NO | NO | ND | NO | ND | ND | NO |
| Bonzuic Acid | 2 | ND | ND | ND | NO | NO | ND | ND | ND | NO |
| 2.4 Oichlorophenal | 20 | ND | NO | NO | NO | ND | NO | NO | ND | NO |
| 4-Chiaro-3-methylphanol | 10.3 | ND | ND | ND | NO | ND | NO | NO | NO | ND |
| 2,4,6-Trichlorophenoi | | NO | NO | NO | ND | NO | NO | NO | NO | NÜ |
| 2,4,5-Trichlorophenol | 0.3 | ND | ND | ND | NO | NO | NO | ND | ND - | ND |
| 2,4-Dinitrophenol | 2 | NO | ND | NO | NO | ND | ND | ND | NO | NO |
| 4-Nirophanol | 2 | NO | ND | NO | NO | ND | NO | NO | ND | NO |
| | | NÖ | ND | NÓ | NO | NO | NO | ND | ND | ND |
| 2-Methyl-4,8-citairophenol | | | | | | | | | | |

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Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Semivolatile Organic Compounds

| | | | | | Part of a local data | THE PARTY OF | | | | Page |
|--|-----------------------------|-------------|-------------|--------------|----------------------|--------------|-------------------|------------------|------------------|--------------------------|
| ry weigint basis | | | | | | CUMULATION A | | | | |
| ng/Kg | Location: | 5' | 55 5 | 2 | 6 | 2 | <u> </u> | 37 | | 58 |
| • | Sample Depth:
Sample ID; | 94575206SL | 4575213SL | M5752145L | 94575207SL | 9457521251 | #4575206SL | 2
\$4575211SL | 5"
94575209SL | 7 |
| | Lab Code: | K946243-001 | K946305-003 | K946305-004 | K945243-002 | K946305-002 | K940243-003 | K946306-001 | K945243-004 | 94575210SL
K946243-00 |
| , | Lab Collected: | 10/5/94 | 10/10/94 | 10/10/94 | 105/94 | 10/10/94 | 10/5/94 | 10/10/94 | 10/5/94 | 10/5/94 |
| | | 10034 | 101000 | | | | 14034 | | 1040/344 | 10/0/346 |
| emivolatila Organic Compou
PA Methods 3650/8270 | | | | | 1 | l | | ļ, | | |
| PA MARIOUS JAGUAZ/U | | | | 1 | | | | | | |
| Nirosodimetrylamine | | ND | ND | -4 | NO | NO | NO | ND | NE | |
| | | | ND | ~~~~ | ND | ND | NO | NO | | ND |
| is(2-chioroetyl) Ether | - 103 | NO | | | NO | NO | ND | NO | ND | ND |
| 2-Dichlorobenzene | | ND | NO | 4.7 | NO | NO | NO | NO | NO | NO |
| 3-Dichlorobenzone | 0.3 | NO | NO | -0.7 | ND | ND | NO | NO | ND | ND |
| 4-Dichlarabergene | 0.3 | ND | ND | -9.7 | ND | ŃO | NO | NO | NO | NO |
| is(2-chlorosopropyl) Ether | 0.3 | ND | ND | -0.7 | NO | NO | NO | NO | NO | ND |
| Ninceod-n-propylamine | 0.3 | ND | NO | 417 | NO | ND | NO | ND | NO | ND |
| icxechicroethane | 0.3 | ND | NÖ | <0.7 | ND | NO | NO | ND | ND | ND |
| Tobenzena | 5.0 | ND | ND | -9.7 | NO | NO | ND | ND | ND | ND |
| rephotone | 0.3 | ND | NO | =0.7 | NÖ | ND | NO | NO | NÖ | ND |
| is(2-chloroethoxy)methane | 20 | ND | NO | 40.7 | ND | ND | ND | ND | ND | ND |
| 2,4-Trichkorobenzene | 6.0 | NO | ND | <0.7 | NO | NO | NO | ND | ND | NO |
| Inphilipiene | 0.3 | NO | ND | 40.7 | NO | | ND | ND | ND | NO |
| Chicroaniline | <u></u> | NO | ND | -9.7
-9.7 | NO | ND | NO | NO | ND_ | NO |
| lezachlorobulacione
-Molinyinaphihaione | 0.3 | ND | ND ND | 40.7 | NO NO | NO | NO | | NO | NO |
| Methylaphilaione | 0.3 | NO | NO | <0.7 | ND | ND | ND
XQ | NO | ND | - ND
- ND |
| -Chioronephthalene | | | ND | | | NO | NO - | | | NO |
| Nizoaniine | 2 | ND | NO | | NO | NO | NO | ND - | ND | NO |
| Amentryl Phyliniate | - 103 | ND | ND | | NO | NO | ND | ND | ND | ND |
| cenaphilitylene | 0.3 | ND | NO | 4.7 | NO | NO | NO | NO | ND | ND |
| Nitromiine | 2 | NO | ND | - 4 | ND | ND | NO | NO | NO | ND |
| cenaphilisana | 0.3 | NO | NO | -0.7 | NO | ŇÖ | NO | NO | ND | ND |
| ibenzolumn | 0.3 | ND | ND | 40.7 | ND | ND | NO | NO | NÓ | NO |
| 4-Diminstrativene | 0.3 | ND | NO | to- | NO | ND | ND | NÖ | ND | ND |
| 6-Déstrokuent | 20 | NO | ND | -40.7 | NO | ND | ND | NO | ND | ND |
| Notityl Philiplate | 201 | ND | ND | <0.7 | ND | NO | NO | ND | NÖ | ND |
| Chierophenyl Phenyl Ether | 0.3 | ND | NO | -0.7 | NO | ND | NO | ND | ŇD | ND |
| Norane | 63 | ND | NO | | ND | MD . | ND | ND | ND | ND |
| Nitroantine | 2 | ND | ND | -4 | NO | ND | ND | NO | ND | NĐ |
| N Nitrosodiphenytamine | 0.3 | ND | ND | <0.7 | ND | NO | NO | ND | NO | NO |
| Bromophenyl Phenyl Ether | 03 | ND | ND | 4)
(P | ND
NO | ND | ND | ND | ND | ND |
| lexectionabenzene | 201 | NO | ND | 40.7 | | NO | ND | NO | ND | NO |
| heninitrane
Antracene | 6.0
6.0 | ND ND | ND | | NO NO | - ND - | NO | ND NO | NO | NO |
| Di-n-butyl Philhalate | | NO | ND | | - Ro | NO | NO - | NÓ | ND | ND |
| Fluoranthene | | ND | NO | | - NO | NO | NO | NO | 9.8 | ND |
| Vicie | | ND | NO | | NO | NO | ND | NO | 0.7 | NÓ |
| Sutylbenzyl Phthalate | 0.3 | ND | ND | 40.7 | NO | ND | NO | ND | NO | ND |
| 3,3'-Dichiorobenzidine | | ND | NO | | NO | ND | NO | NO | ND - | |
| Benz(#)#ft@wacene | 2.0 | NO | ND | <0.7 | - NO | NO | NO | NO | NO | NO |
| Bis(2-sthylhexyl) Phthalate | 0.3 | ND | ND | 40,7 | NO | ND | NO | NO | NO | ND |
| Chrysene | 0.3 | ND | NO | <0.7 | NO | NO | ND | - NO | 0.8 | ND |
| N-n-octyl Phthalate | 6.3 | NED | ND | 40.7 | NÖ | ND | ND | ND | NÖ | ND |
| Bonzo(b)fixoranthese | ¢0 | MED | NO | <0,7 | ND | ND | NO | ND | 0.8 | ND |
| enzo(k)iuomnihene | 6,3 | ND | NÖ | 407 | ND | NO | NO | NÖ | 0.7 | NÖ |
| Senzo(@)pyrane | 0.3 | NO | ND | 47 | -NO | ND | ND | NID . | 0.3 | NO |
| ndeno(1,2,3-cd)pyrene | 0.3 | ND | NO | 40.7 | ND | ND | NO | | 2.0 | NO |
| Noenz(#,h)amhracone | · 03 | ND | ND | 407 | NO | NO | NO | <u>NÓ</u> | NO | NO |
| Senzo(g,h,j)perylene | 0.3 | NO | NO | | ND
NO | NO | ND | NO | | ND |
| Phenol
2-Chiorophenol | £0
£0 | NO
HO | 10 | 40.7 | ND ND | | NO | ND | | |
| Senzyl Alcohol | | NO | | 40.7 | | NO | NO - | NO | ND NO | NO |
| 2-Methylphenol | | NO | NO | | | No - | NO | NO | NO | NO |
| - and 4-Mothylphanol" | | | NO | 4.7 | - NO | NO | - - NO | HD HD | 1 NO | NO |
| Nitophenol | - 03 | ND | NO | 40.7 | ND | NO - | HID - | NO | NO | NO |
| 2,4-Dimethylphanal | 0.3 | NO | ND | =4.7 | NO | ND | NO | ND | NO | ND |
| Senzoic Acid | 2 | ND | ND | - 4 | NO | ND | ND | NO | ND | NO |
| 4-Dichlorophenol | 20 | NO | ND | 4.7 | NO | NO | NO | NO | NO | NO |
| Chioro-3-methylphenol | 0,3 | NO | NO | <0.7 | ND | NO | NO | ND | NO | ND |
| 2,4,6-Trichkoruphenol | 0.3 | | ND | <0.7 | NO | ND | NO | ND | NO | ND |
| 2,4,5-Trichlamphenol | 0.3 | | ND | 41 7 | ND | NO | HD | NÖ | ND D | ND |
| 2,4-Dinirophonal | 2 | NO | NO | *4 | NO | NO | NO | ND | ND | NO |
| 4-Nitrophenol | 2 | ND | NO | 4 | ND | NO | NÖ | NO | ND | DN D |
| 2 Methyl-4,5-cinitrophenol | 2 | | ND | - 4 | | NO | ND | NO | ND | ND |
| Pentachiorophenol | 2 | NO | | 4 | - MO | NO | NO | NO NO | ND | T ND |
| FOOTNOTES: NO ++ | | | | | | | | | | |

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Ft. Richardson OU D Site Buliding 35-752 Soil Sample Analytical Results Total Metals

| dry weight basis | | | | | Analyte; | Arsenic | Barium | Cedmium | Chromium | Lead | Mercury | Nickel | Selenium | Silver |
|------------------|-----------------|------------|----------|-------------------|----------|---------|--------|---------|----------|------|---------|--------|----------|--------|
| mg/Kg | | | | | Method: | 7060 | 6010A | 6010A | 8010A | 7421 | 7471 | 6010A | 7740 | 6010A |
| Location | Sample
Depth | Sample ID | Leb Code | Date
Collected | MRL: | 1 | 1 | 1 | 2 | 1 | 0.2 | 10 | 1 | 2 |
| DRUM ACCUMUL | ATION ARE | A | • | <u>'</u> | | | | | | | | | | |
| SB AP 3505 | 0-4' | 94575219SL | K692101 | 11/3/94 | | 8 | 69 | ND | 26 | 18 | ND | 31 | 1 UJ | ND |
| S8 AP 3505 | 4'-6' | 94575220SL | K692102 | 11/3/94 | | 7 | 76 | ND | 28 | 0 | ND | 30 | 1 UJ | ND |
| SB AP 3505 | 9'-11' | 94575221SL | K892103 | 11/3/94 | | 4 | 44 | ND | 30 | 4 | ND | 25 | 1 ÜĴ | ND |
| SB AP 3505 | 12'-18' | 94575222SL | K692104 | 11/3/94 | | 6 | 37 | ND | 27 | 5 | ND | 32 | 1 UJ | ND |
| SB AP 3500 | 0-2' | 94575223SL | K692110 | 11/3/94 | f | 5 | 70 | ND | 30 | 24 | ND | 33 | 1 UJ | ND |
| GB AP 3508 | 4'-8' | 94575224SL | K692111 | 11/3/94 | | 4 | 63 | ND | 40 | 6 | ND | 33 | 1 ÚJ | ND |
| SB AP 3500 | 8'-12' | 94575225SL | K692112 | 11/3/94 | | đ | 44 | ND | 31 | 6 | ND | 30 | 1 UJ | ND |
| SB AP 3500 | 14'-16' | 94575226SL | K692113 | 11/3/94 | | 6 | 44 | ND | 32 | 6 | ND | 39 | 1 UJ | ND |
| SS 1 | 6* | 94575201SL | K624001 | 10/6/94 | | 6 J | 77 | ND | 29 | 5 | ND | 33 | 1 UJ | ND |
| SS 1 | 6, | 94576202SL | K624002 | 10/6/94 | | 10 J | 97 | ND | 35 | 8 | ND | 42 | 1 UJ | ND |
| SS 1 | 2' | 94675218SL | K630808 | 10/10/94 | | 5 | 58 | ND | 30 | 6 | ND | 37 | ND | ND |
| SS 2 | 6" | 94675203SL | K624003 | 10/6/04 | | 7 J | 64 | ND | 29 | 8 | ND | 33 | 1 UJ | ND |
| SS 2 | 2' | 94575217SL | K830807 | 10/10/94 | | 7 | 57 | ND | 38 | 8 | ND | 44 | ND | ND |
| SS 3 | 6" | 94575204SL | K624004 | 10/6/94 | | 8 J | 99 | ND | 36 | 12 | ND | 49 | 1 UJ | ND |
| 65 3 | 2' | 94575216SL | K830608 | 10/10/94 | | 6 | 49 | ND | 24 | 5 | ND | 27 | ND | ND |
| SS 4 | <u>0</u> " | 94575205SL | K824005 | 10/6/04 | | 7 J | 110 | ND | 30 | 10 | ND | 30 | 1 UJ | ND |
| 5S 4 | 2' | 94575215SL | K630605 | 10/10/94 | | 6 | 81 | ND ' | 36 | 10 | ND | 36 | ND | ND |
| SS 5 | 6" | 94575206SL | K824301 | 10/8/94 | | 5 | 220 J | ND | 23 | 36 | ND | 23 | 1 UJ | ND |
| SS 5 | 2' | 94575213SL | K630603 | 10/10/94 | | Ĝ | 61 | ND | 31 | 11 | ND | 32 | ND | ND |
| SS 5 | 2' | 94575214SL | K630604 | 10/10/94 | | 8 | 93 | ND | 38 | 18 | ND | 38 | ND | ND |
| S 6 | 6" | 94575207SL | K824302 | 10/6/94 | | 7 | 73 J | ND | 25 | 8 | ND | 27 | 1 UJ | ND |
| SS 8 | 2' | 84575212SL | K830802 | 10/10/94 | | 6 | 83 | ND | 34 | 10 | ND | 34 | ND | ND |
| IS 7 | 6* | 84575206SL | K624303 | 10/6/94 | | 7 | 67 J | ND | 30 | Û | ND | 30 | 1 UJ | ND |
| \$ 7 | 2' | 94575211SL | K830601 | 10/10/94 | t | 8 | 90 | ND | 34 | 16 | ND | 40 | ND | ND |
| S 0 | 6" | 94575209SL | K824304 | 10/8/94 | | 7 | 83 J | ND | 33 | 13 | ND | 34 | 1 UJ | ND |
| IS 0 | 2' | 94575210SL | K624305 | 10/8/94 | | 7 | 92 J | ND | 32 | 7 | ND | 29 | 101 | ND |

UJ = The analyte was not detected at the MRL, however, the MRL is considered an estimate.

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VOAQCVCOMMONRICH/FINAL6/REPTABLES/835752-F.XL8/Metale-This

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4/17/95

Ft. Richardson OU D Site Building 35-752 Soil Sample Analytical Results Total Metals

| ng/Kg | | | | | | | | | | | | | | |
|------------------|-----------------|------------|----------|-------------------|---------------------|--------------------|-----------------|------------------|----------|---------------|-------|-------|-------|-------|
| | | | | | Method: | 6010A | 6010A | 6010A | 6010A | 6010A | 6010A | 6010A | 6010A | 6010A |
| .ocation | Sample
Depth | Sumple ID | Lab Code | Date
Collected | MRL: | 10 | 10 | t | 10 | 2 | 2 | 4 | 2 | 1 |
| DRUM ACCUMUL | ATION ARE | A | <u></u> | | | | | | | | | | | |
| SS 1 | 6* | 94575201SL | K624001 | 10/8/94 | | 15100 | ND | ND | 4360 | 11 | 28 | 25100 | 7420 | 564 |
| SS 1 | 6" | 94575202SL | K624002 | 10/8/94 | | 19200 | ND | ND | 5230 | 13 | 39 | 30800 | 9240 | 720 |
| SS 2 | 6" | 94675203SL | K624003 | 10/6/94 | | 13300 | ND | ND | 3940 | 10 | 28 | 22000 | 7300 | 477 |
| SS 3 | 6" | 94575204SL | X624004 | 10/6/94 | | 18700 | ND | ND | 5670 | 13 | 31 | 30900 | 10300 | 669 |
| SS 4 | θ" | 94575205SL | K824005 | 10/6/94 | | 17300 | ND | ND | 3150 | 11 | 20 | 22700 | 5930 | 472 |
| SS 5 | 6" | 94575208SL | K624301 | 10/6/94 | | 8620 | ND | ND | 7220 | 7 | 22 | 18500 | 6620 | 383 |
| S 0 | 6" | 94575207SL | K824302 | 10/8/94 | | 13300 | ND | ND | 3310 | 10 | 24 | 22400 | 6250 | 455 |
| S 7 | 6* | 94575208SL | K624303 | 10/8/94 | | 14600 | ND | ND | 4110 | 10 | 28 | 26600 | 7430 | 502 |
| SS 8 | 6" | 84575209SL | K824304 | 10/6/94 | | 16200 | ND | ND | 4240 | 12 | 34 | 28800 | 8170 | 544 |
| 6S 8 | 2' | 94575210SL | K824305 | 10/8/94 | | 17000 | ND | ND | 5620 | 12 | 29 | 28800 | 7840 | 628 |
| iry weight basie | | | | | Analyte:
Melbod: | Potaselum
6010A | Sodium
6010A | Thailium
7641 | Vanedium | Zinc
6010A | | | | |
| ng/Kg | | · · · · | | | Method: | 8010A | 6010A | 7641 | 6010A | 5010A | | | | |
| ocation | Sample
Depth | Sample ID | Lab Code | Date
Collected | MRL: | 400 | 20 | 1 | 2 | 2 | | | | |
| RUM ACCUMUL | TION ARE | A | | <u> </u> | | | | | | | | | | |
| IS 1 | 6* | 04575201SL | K824001 | 10/8/94 | | 440 | 122 | ND | 45 | 57 | | | | |
| IS 1 | 6" | 94575202SL | K824002 | 10/6/94 | | 590 | 158 | ND | 57 | 72 | | | | |
| IS 2 | 6" | 94575203SL | K824003 | 10/6/94 | | 440 | 108 | ND | 41 | 52 | | | 1 | |
| 5 3 | 6" | 94676204SL | K624004 | 10/6/94 | | 590 | 171 | ND | 60 | 72 | | | 1 | |
| IS 4 | 6" | 94575205SL | K824005 | 10/6/04 | - <i>î</i> | ND | 118 | ND | 48 | 47 | | | | |
| IS 5 | 6* | 84575208SL | K624301 | 10/8/94 | | ND | 65 | ND | 28 | 86 | | | | |
| S 6 | 6* | 94575207SL | K824302 | 10/8/94 | | 450 | 111 | ND | 41 | 53 | | | | |
| S 7 | 6" | 94575206SL | K624303 | 10/8/94 | | 610 | 118 | ND | 47 | 61 | | | 1 | |
| Sð | 6" | 94575209SL | K624304 | 10/6/94 | | 530 | 112 | ND | 50 | 68 | | | | |
| S 8 | 2 | 94575210SL | K824305 | 10/6/94 | | 570 | 134 | ND | 50 | 63 | | | | |

V2AQCICOMMOMRICH/FINALS/REPTABLES/B35752-F.XLS/Metale-Tb/5

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4/17/85

Ft. Richardson OU D Site

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Building 35-752 Cooling Pond Groundwater Sample Analytical Results

Petroleum Hydrocarbons

| | <u> </u> | | Anabata | | | | | E thur | h | 7.4.1 | Vidence | | 200 | _ | | | Page 1 |
|------------|---------------------------------------|-------------------|-------------------------|-------|----------------|--------------|----------------|----------|-----------------|-------|-----------------|-----|----------------|-----|----------------|----------|----------------|
| | | E1 | Analysis:
PA Method: | | inzene
8260 | 1 | livene
3260 | | benzene
1260 | | Xylenes
3260 | | GRO
10/8015 | | DRO
10/8100 | | TPH
1/418.1 |
| | | E | Unita: | | | | | | | | | | | | | | |
| | ····· | <u> </u> | | | µg/L | ⁻ | ug/L. | <u> </u> | .g/L | | Jg/L | | ւց/Լ | | ug/L | P | 1g/L |
| Location | Sample ID | Lab Code | Date
Collected | MRL | Result | MRL | Result | MRL | Result | MRL. | Result | MRL | Result | MRL | Result | MRL | Result |
| MW AP 3502 | 9457528AGW | K948015-003 | 12/21/94 | 0,5 | ND | 0.5 | ND | 0.5 | ND | 0,5 | ND | 50 | ND | 50 | 105 | 200 | ND |
| MW AP 3503 | 9457525AGW | K947974-005 | 12/20/94 | 0,5 | ND | 0,5 | ND | 0.5 | ND | 0.5 | ND | 50 | ND | 50 | 89 J | 200 | ND |
| MW AP 3504 | 9457521AGW | K947938-001 | 12/19/94 | 0,5 | ND | 0.5 | ND | 0.5 | ND | 0.5 | ND | 50 | ND | 50 | ND | 200 | ND |
| MW AP 3504 | 9457522AGW | K947938-002 | 12/19/94 | 0.5 | NA | 0.5 | NA | 0.5 | NA | 0.5 | NA | 50 | NA | 50 | ND | 200 | ND |
| MW AP 2982 | 9457523AGW | K948015-001 | 12/20/94 | 0.5 | 46 | 0.5 | 2.8 | 0.5 | 22 | 0,5 | 56 | 50 | 292 | 50 | 226 | 200 | ND |
| MW AP 2983 | 9457526AGW | K947974-001 | 12/20/94 | 0.5 | ND | 0.5 | ND | 0.5 | ND | 0.5 | ND | 50 | ND | 50 | ND | 200 | ND |
| MW AP 2986 | 9457527AGW | K947974-007 | 12/20/94 | 0.5 | ND | 0,5 | ND | 0.5 | ND | 0.5 | ND | 50 | ND | 50 | 566 J | 200 | 500 |
| MW AP 2987 | 9457524AGW | K947974-003 | 12/20/94 | 0.5 | 1,6 | 0,5 | ND | 0.5 | ND | 0.5 | ND | 50 | ND | 50 | 1310 | 200 | ND |
| MW AP 3502 | Trip Blank | K948015-004 | | 0,5 | ND | 0.5 | ND | 0,5 | ND | ND | ND | 50 | ND | 50 | NA | 200 | NA |
| MW AP 3503 | Trip Blank | K947974-006 | - | 0,5 | ND | 0.5 | ND | 0.5 | ND | 0.6 | ND | 50 | ND | 50 | NA | 200 | NA |
| MW AP 3504 | Trip Blank | K947938-003 | - | 0.5 | ND | 0,5 | ND | 0.5 | ND | 0.5 | ND | 50 | ND | 50 | NA | 200 | NA |
| MW AP 2982 | Trip Blank | K948015-002 | - | 0.5 | ND | 0,5 | ND | 0,5 | ND | 0.5 | ND | 50 | ND | 50 | NA | 200 | NA |
| MW AP 2983 | Trip Blank | K947974-002 | - | 0.5 | ND | 0.5 | ND | 0.5 | ND | 0,5 | ND | 50 | ND | 50 | NA | 200 | NA |
| MW AP 2988 | Trip Blank | K947974-008 | + | 0.5 | ND | 0.5 | ND | 0,5 | ND | 0.5 | ND | 50 | ND, | 50 | NA | 200 | NA |
| MW AP 2987 | Trip Blank | K947974-004 | - | 0.5 | ND | 0.5 | ND | 0,5 | ND | 0.5 | ND | 50 | ND | 50 | NA | 200 | NA |
| FOOTNOTES: | ND = Non-detecte
NA = Not analyzer | | porting limit (N | łRL). | | | | | | | | | | | | <u> </u> | |
| | J = Value is con | idered an estimat | te. | | | | | | | | | | | | | | |

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VQAQCICOMMONRICH/FINALS/REPTABLES/B35752FW/XLS/Pathydro-Tbit

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Ft. Richardson OU D Site Building 35-752 Cooling Pond Groundwater Sample Analytical Results Pesticides/PCBs and Chlorinated Herbicides

| Lab
Date Coli
Drganochiorine Pesticides
EPA Methods 3510/8080
Alpha-BHC
Beta-BHC
Detta-BHC
Heptachlor
Aldrin
Gamma-BHC (Lindane)
Heptachlor Epoxide
Endosulfan I
Endrin | Code: | 9457528AGW
K948015-003
12/21/94
ND
ND
ND
ND
ND
ND
ND
ND | 9457525AGW
K947974-005
12/20/94
ND
ND
ND
ND
ND | 9457521AGW
K947938-001
12/19/94
ND
ND
ND
ND | 9457522AGW
K947938-002
12/19/94
NA
NA | 9457523AGW
K948015-001
12/20/94
ND
ND | 9457526AGW
K947974-001
12/20/94
NA
NA | 9457527AGW
K947974-007
12/20/94
ND | K947974-003
12/20/94 |
|---|--|---|---|---|---|---|---|---|-------------------------|
| Date Coli
Drganochiorine Pesticides
EPA Methods 3510/8080
Npha-BHC
Seta-BHC
Delta-BHC
Heptachior
Ndrin
Samma-BHC (Undane)
Heptachior Epoxide
Endosulfan I
Endrin
Endosulfan II
Ad-DDD
Endrin Aldehyde
Endosulfan Sulfate
A-DDT
A-DDE | ected:
MRL
0.04
0.04
0.04
0.04
0.04
0.04
0.04
0.0 | 12/21/94
ND
ND
ND
ND
ND
ND
ND
ND | 12/20/94
ND
ND
ND
ND
ND | 12/19/94
ND
ND
ND
ND | 12/19/94
NA
NA | 12/20/94 | 12/20/94
NA | 12/20/94 | 12/20/94 |
| Drganochlorine Pesticides
PA Methods 3510/8080
Vpha-BHC
Veta-BHC
Veta-BHC
Veta-BHC
Veta-BHC
Veta-BHC
Veta-BHC
Veta-BHC
Veta-BHC
Veta-BHC
Nor
Nor
Nor
Nor
Nor
Nor
Nor
Nor | MRL
0.04
0.1
0.04
0.04
0.04
0.04
0.04
0.04 | ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
ND
N | ND
NO
ND
ND
ND | ND
ND
ND
ND | NA
NA | ND | NA | | |
| PA Methods 3510/8080
Npha-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
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Seta-Seta-Seta
Seta-Seta-Seta
Seta-Seta-Seta-Seta
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Seta-Seta-Seta-Seta-Seta-Seta-Seta-Seta- | 0,04
0.1
0.04
0.04
0.04
0.04
0.04
0.04
0.0 | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND | ND
ND
ND | NA | | | ND | |
| PA Methods 3510/8080
Npha-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
Seta-BHC
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Seta-Seta-Seta
Seta-Seta-Seta
Seta-Seta-Seta
Seta-Seta-Seta
Seta-Seta-Seta
Seta-Seta-Seta
Seta-Seta-Seta-Seta
Seta-Seta-Seta-Seta
Seta-Seta-Seta-Seta-Seta-Seta-Seta-Seta- | 0,04
0.1
0.04
0.04
0.04
0.04
0.04
0.04
0.0 | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND | ND
ND
ND | NA | | | ND | 0.0111 |
| Npha-BHC Jeta-BHC Deta-BHC teptachlor Vidrin Samma-BHC (Undane) teptachlor Epoxide Endosulfan I Endosulfan II K4-DDD Endosulfan Sulfate K4-DDT K4-DDE | 0.1
0.04
0.04
0.04
0.04
0.04
0.04
0.04
0 | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND | ND
ND
ND | NA | | | ND | |
| Jeta-BHC Jeta-BHC teptachlor Ndrin Samma-BHC (Undane) teptachlor Epoxide Endosulfan I Endosulfan I Endosulfan II A4-DDD Endosulfan Sulfate I-A-DDT I-A-DDE | 0.1
0.04
0.04
0.04
0.04
0.04
0.04
0.04
0 | ND
ND
ND
ND
ND
ND
ND
ND | ND
ND
ND
ND | ND
ND
ND | NA | | | ND | 0.0111 |
| Detta-BHC
teptachlor
Aldrin
Samma-BHC (Undane)
teptachlor Epoxide
Endosulfan I
Endrin
Endosulfan II
A.4-DDD
Endrin Aldehyde
Endosulfan Sulfate
A.4-DDT
A.4-DDE | 0.04
0.04
0.04
0.04
0.04
0.04
0.04
0.04 | ND
ND
ND
ND
ND
ND | ND
ND
ND | ND
ND | | ND | 6.94 | | 0.04 UJ |
| teptachlor
Aldrin
Barnma-BHC (Undane)
teptachlor Epoxide
Endosulfan I
Endrin
Endosulfan II
Ald-DDD
Endrin Aldehyde
Endosulfan Sulfate
Al-DDT
Ad-DDE | 0.04
0.04
0.04
0.04
0.04
0.04
0.04 | ND
ND
ND
ND
ND | ND
ND | ND | NA | | | ND | 0.1 UJ |
| Ndrin
Samma-BHC (Undane)
Heptachlor Epoxide
Endosulfan I
Endrin
Endosulfan II
N,4-DDD
Endrin Aldehyde
Endosulfan Sulfate
4,4-DDT
4,4-DDE | 0.04
0.04
0.04
0.04
0.04
0.04 | ND
ND
ND | ND | | | ND | NA | ND | 0.04 UJ |
| Samma-BHC (Lindane)
Heptachlor Epoxide
Endosulfan I
Endosulfan II
Ad-DDD
Endrin Aldehyde
Endosulfan Sulfate
Ad-DDT
Ad-DDE | 0.04
0.04
0.04
0.04
0.04 | ND
ND | | | NA | ND | NA | ND | 0.04 UJ |
| Heptachlor Epoxide Endosulfan I Endosulfan II Endosulfan II Ar-DDD Endosulfan Sulfate Ar-DDT Ar-DDE | 0.04
0.04
0.04
0.04 | ND | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| ndosulfan I
Endrin
Endosulfan II
4,4'-DDD
Endrin Aldehyde
Endosulfan Sulfate
4,4'-DDT
4,4'-DDE | 0.04
0.04
0.04 | | | ND | NA | ND | NA | ND | 0.04 UJ |
| Indrin
Indosulfan II
Indosulfan II
Indrin Aldehyde
Indosulfan Sulfate
Indosulfan Sulfate
Indosulfan Sulfate | 0.04 | ND | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| Endosulfan II
4,4'-DDD
Endrin Aldehyde
Endosulfan Sulfate
4,4'-DDT
4,4'-DDE | 0.04 | | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| 4,4-DDD
Endrin Aldehyde
Endosulfan Sulfate
4,4-DDT
4,4-DDE | | ND | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| Endrin Aldehyde
Endosulfan Sulfate
4,4-DDT
4,4-DDE | D D4 T | ND | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| Endosulfan Sulfate | | ND | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| 4.4-DDT
4.4-DDE | 0.04 | ND | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| 4.4'-DDE | 0.04 | ND | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| | 0.04 | ND | ND | ND | NA | ND | NA | <0.5 | 0.04 UJ |
| Violddo | 0.04 | ND | ND | ND | NA | ND | NA . | ND | 0.04 UJ |
| | 0.04 | ND | ND | ND | NA | ND | NA | ND | 0.04 UJ |
| Methoxychlor | 0.1 | ND | ND | ND | NA | ND | NA | ND | 0.1 UJ |
| Toxaphene | 1 | ND | ND | ND | NA | ND | NA | ND | 100 |
| Chiordane | 0.5 | ND | ND | ND | NA | ND | NA | ND | 0.5 UJ |
| Polychlorinated Biphenyls (PCB
EPA Methods 3510/8080 | | | | | | | | | |
| Aroclor 1016 | 0.2 | ND | ND | ND | ND | ND | ND | ND | 0.2 UJ |
| Aroclor 1221 | 0.2 | ND | ND | ND | ND | ND | ND | ND | 0.2 UJ |
| Aroclor 1232 | 0.2 | ND | ND | ND | ND | ND | ND | ND | 0.2 UJ |
| Aroclor 1242 | 0.2 | ND | ND | ND | ND | ND | ND | ND | 0.2 UJ |
| Aroclor 1248 | 0.2 | ND | ND | ND | ND | ND | ND | ND | 0200 |
| Aroclor 1254 | 0.2 | ND | ND | ND | ND | ND | ND | ND | 0.2 UJ |
| Arodor 1260 | 0.2 | ND | ND | ND | ND | ND | ND | 0.7 | 0.2 UJ |
| Chlorinated Herbickles
EPA Method 8150A Modified | | | | | | | | | |
| Dalapon | 5 | ND | ND | ND | ND | ND | ND | ND | ND |
| MCPP | 200 | ND | ND | ND | ND | ND | ND | ND | ND |
| Dicamba | 0.5 | ND | ND | ND | ND | ND | ND | ND | ND |
| MCPA | 200 | ND | ND | ND | ND | ND | ND | ND | ND |
| Dichloroprop | 0.6 | ND | NO | ND | ND | ND | ND | ND | ND |
| 2,4-D | 1 | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4,5-TP (Silvex) | 0.Z | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4,5-T | 0.2 | ND | ND | ND | ND | ND | ND | ND | DND |
| Dinoseb | 2 | ND | ND | ND | ND | ND | ND | ND | ND |
| 2,4-DB | 2 | NO | ND | ND | NO | ND | | DN D | ND |

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Ft. Richardson OU D Site Building 35-752 Cooling Pond Groundwater Sample Analytical Results Volatile Organic Compounds

| • | xation: | MW AP 3502 | MW AP 3503 | MW AP 3504 | MW AP 2982 | MW AP 2983 | MW AP 2986 | MW AP 2987 |
|--|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | npia iQ: | 9457528AGW | 9457525AGW | 9457521AGW | \$457523AGW | 9457525AGW | 9457527AGW | 8457524AGW |
| | b Code: | K948015-003 | K947974-005 | K947938-001 | K948015-001 | K947974-001 | K947974-007 | K947974-003 |
| Date Co | | 12/21/94 | 12/20/94 | 12/19/94 | 12/20/94 | 12/20/94 | 12/20/94 | 12/20/94 |
| elatile Organic Compounds
PA Method 8260) | MRL | | | | | | | · · · · · · |
| chlorodifuoromettune (CFC 12) | 0.5 | ND | NO | NO | ND | NO | NO | ND |
| hioromethane | 0.5 | 5 | NO | NED | NO | NO | ND | NO |
| nyl Chlaride | 0.5 | ND |
| omometrane | 0.5 | NÓ | ND | ND | ND | ND | ND | NO |
| loroethane | 0.5 | NO | ND | - MD | NO | ND | ND | ND |
| ichiorofluoromethane (CFC 11) | 0.5 | ND | ND | NÖ | ND | NÖ | ND | ND |
| catoliki | 20 | ND | ND | NO | | NO | ND | NO |
| 1-Dictionethene | 0.5 | ND | ND | ND | ND | NO | NO | ND |
| erbon Disutide | 0.5 | ND | 20 | NO | NO | NO | NO | NO |
| ethylene Chloride | 1 1 | ND | NO | ND | | NO | ND | ND |
| ans-1,2-Dichloroethene | 0.5 | NO | ND | | 0.5 | ND | NO | NO |
| 1-Dichloroethene | 0.5 | ND | NO | ND ND | NO | | ND | NO |
| Butanone (MEK) | 20 | ND | 2 3 | | NO | NO - | NO | ND |
| 2-Dichloropane | 0.5
0.5 | ND | ND | ND
ND | NO | NO | ND | ND |
| I-1_2-Dichloroethene | 20 | | ND | ND | | ND | ND | ND |
| worotheromethane | 0.5 | ND
ND | ND | ND | ND | ND | | ND |
| 1,1-Trichlaroethane (TCA) | 0.5 | ND | NU
NO | 3.4 | 3.7 | ND | ND | |
| 1-Dichloropropene | 0.5 | ND | NO | ND | ND | NO | | NO NO |
| ston Tetrachioride | 0.5 | ND | NO | NO | ND | NO | <u>NO</u> | NO |
| 2-Dichlorosthene | 0.5 | NO | NO | | NO | NO | NO | NO |
| • Zene | 0.5 | NO 04 | ND | ND | 45 | NO | NO | 1.5 |
| ichlamethene (TCE) | 0.5 | ND | NO | 0.5 | 9.5 | 0.5 | ND | 0.6 |
| 2-Dichloropropene | 0.5 | NO | ND | ND | NO | ND | NO | NO |
| omodichiaramethene | 0.5 | ND | ND | NO | NO | NO | ND | NO |
| Bromomethane | 0.5 | ND | ND | NO | ND | ND | NO | NO |
| Hexanone | 20 | ND | NO | ND | NO | ND | ND | NO |
| e-1,3-Dichloropropene | 0.5 | ND | NO | - COM | NO | ND | NO | |
| civene | 0.5 | NO | ND | NO | 7.8 | NO | NO | NO |
| are-1,3-Dichioropropene | 0.5 | ND | NO | ND | NO | ND | ND | ND |
| 1,2-Trichlorgethane | 0.5 | ND | ND | ND | NO | NO | NO | ND |
| Methyl-2-pertenone (MBK) | 20 | ND | ND | NO | NO | ND | NO | ND |
| 3-Dichloropropana | 0.5 | ND | NO | NO | ND | NO | ND | ND |
| et schlarosthene (PCE) | 0.5 | ND |
| ibromochioronathane | 0.5 | NO | ND | NO | ND | NO | NO | ND |
| 2-Dibromestiene (EDB) | Z | ND | NO | ND | NO | ND | NO | NO |
| hiambenzene | 0.5 | NO | ND | NO | ND | ND | NO | ND |
| 1,1.2-Tetrachioroethane | 0.5 | ND | ND | NO | ND | NO | ND | ND |
| thylbenzene | 0.5 | ND | NO | ND | 22 | ND | ND | ND |
| otal Xylenes | 0.5 | NQ | ND | NÜ | 56 | ND | NO | ND |
| lyrene | 0.5 | NO | NO | ND | ND | NO | NO | ND |
| romoform | 0,5 | ND | ND | NO | ND | ND | ND | ND |
| opropybenzene | Z | R
R | NO | ND | ND | ND | NO | ND |
| 1,2,2-Tetrachiorostiane | 0.5 | NO NO | ND | ND | NO | ND | NO | DN |
| 2,3-Trichloropropane | 0.5 | ND | ND | ND | NO | NO | ND | ND |
| romobenzene | 0.5 | ND | NO | NO | ND | ND | NO | NO |
| Propylbenzene | 2 | ND | ND | NO | NO | ND | NO | ND |
| Chlorololume | 2 | NO | NO | NO | ND | NO | NÖ | NO |
| Chlorotoluene | 2 | ND | ND | <u>NO</u> | ND | ND | ND | ND |
| 3,5-Trimetrybenzene | 2 | ND | NO | NO | 2
ND | NO | ND | NO |
| 7 A Trimette de arrene | 2 | ND | NO NO | NO ND | | NO | NO | NO NO |
| 2,4-Trimethyborzone | + <u>z</u> _ | NO | NO | ND | | | ND ND | <u>ND</u> |
| 3-Dichioroberzane | 2 | ND | ND ND | ND | ND | NO | NO | ND |
| isopropyliniuene | 2 | ND | ND | NO NO | NO | NO | ND ND | ND
NO |
| 4-Dichlorobenzana | 0.5 | ND | ND | | NO | ND | ND | ND |
| Butythenzene | 2 | ND | NO | NO | | NO T | ND
NO | NO |
| 2-Dichlorobenzene | 0.5 | NO NO | ND | NO | NO | | | ND ND |
| 2-Dibromo-3-chiotopropene (DBCP) | 2 | | NO | | ND | NO | | NO NO |
| 2.4-Tricticrobenzene | 2 | NO | 1 10 | - NO | NO | NO NO | NO | ND ND |
| 2,3-Trichlorobenzene | 2 | ND | NO NO | | - NO | ND | NO | |
| | 2 | NO | NO | | | | NO | NO |
| | 1 4 | | | | | | | |
| laphthalana | 2 | ND | NO | NO | NO | NO | NO | ND |

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Ft. Richardson OU D Site Building 35-752 Cooling Pond Groundwater Sample Analytical Results Volatile Organic Compounds

| лg/L | Location: | MW AP 3502 | MW AP 3503 | MW AP 3504 | MW AP 2982 | HW AP 2963 | MW AP 2986 | MW AP 2967 |
|--|---------------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|
| | Sample ID: | Trip Blank | Trip Blank | Trip Blank | Trip Blank | Trip Ellenit | Trip Blank | Trip Blenk |
| | Lab Code: | K948015-004 | K\$47974-005 | K947938-003 | K948015-002 | K947974-002 | K947974-005 | K947974-004 |
| | ta Collected: | | | | <u> </u> | | | |
| olatile Organic Compounds
PA Method 8260) | MRL. | | | | | | | |
| ichlorodifluoromethane (CFC 12) | 5 | ND | ND | - ND | NO | | NO | |
| hioromethane | - 5 | NO | NO | ND | NÖ | ND | NO | |
| inyl Chiaride | 5 | ND | ND | ND | ND | ND | ND | ND |
| remonsthane | 5 | ND | ND | ND | ND | NÖ | ND | NO |
| hioroethane | 5 | ND | NO | DI | NO | NO | ND | NO |
| richiarofluoromethane (CFC 11) | 5 | ND | ND | NO | ND | ND | ND | NO |
| celone | 50 | 20 | ND | NO | ND | NO | ND | ND |
| ,1-Dichloroethene | 5 | ND | ND | ND | ND | ND | ND | NO |
| arbon Disutide | 5 | ND | NO | ND | ND | NO | ND | ND |
| Anthylene Chioride | - 10 | NO | NO | HÓ | ND_ | ND | NO | ND |
| rans-1,2-Dictrioroethene | 5 | ND ND | ND | ND ND | ND | NO | ND
ND | ND |
| Butanone (MEK) | 20 | ND | NO | NO | NO | ND | NO | NO |
| 2-Dichloropropane | - 5 | ND | ND | NO | NO | ND | NO | ND |
| = 1.2-Dichlorosthene | - 5 | ND | | NO | ND | ND | NO | ND |
| Noroform | - 5 | ND | ND | ND | NO | NO | ND | NO |
| somochioromethane | 5 | ND | NO | ND | ND | ND | NO | ND |
| .1,1-Trichloroethane (TCA) | 5 | ND | ND | NO | ND | NO | ND | NO |
| .1-Dichiompropone | 5 | ND | ND | ND | NO | ND | ND | ND |
| arbon Tetrachioride | 5 | NO | NO | NO | ND | HD | ND | ND |
| ,2-Dichloroethane | 5 | NO. | ND _ | ND | ND | NO | ND | ND |
| Benzene | 5 | ND | ND | ND | ND | ND | ND | ND |
| richionselhene (TCE) | 5 | ND | ND | ND | ND | NO | NO | ND |
| | | ND | ND
ND | NO | ND | ND | ND | NO |
| Bromedichiaramethane | 5 | | ND ND | ND
ND | ND . | NO | ND
ND | ND |
| Abremomentane | - 20 | ND | NO | - NO | NO | NO | ND ND | ND ND |
| is-1,3-Dichloropropene | 5 | | NO 1 | NO | NO | NO | NO | ND |
| Tokene | | NO | NO | NO | ND | ND | NO | |
| rans-1,3-Dichioropropene | - 5 | ND | NO | ND | NO | ND | NO | NO |
| 1,1,2-Trichloroethene | | ND | NO | NO | ND | ND | NO | ND |
| -Methyl-2-puntancese (MIBK) | - 20 | ND | NO | ŃÓ | ND | NO | NO | ND |
| 1,3-Dichioropropane | 5 | ND | ND | NO | NO | NO | NO | NO |
| Tetrachleroethene (PCE) | 5 | ND | NO | ND | NO | ND | ND | ND |
| Disromechianemethene | 5 | NÔ | ND | ND | NO | NO | ND | NÖ |
| 1,2-Dibremoethane (EDB) | 20 | ND | ND | ND | NO | NO | ND | NO |
| Chiorobanzane | 5 | NO | NO | ND | NO | ND | NO | NO |
| 1,1,1,2-Tetrachloroethane | 5 | NO | ND | NO | ND | NO | ND | ND |
| Elfylbenzene | 5 | ND | ND
ND | ND | ND ND | NO
NO | ND ND | ND |
| Total Xylenes | - 5 | | NO | | | NO | | ND ND |
| Sromoform | ~ 5 | ND | NO | NED | NO NO | | ND | |
| sopropyibenzene | 20 | NO | ND | NO | NO | | | ND ND |
| 1.1.2.2-Tetrachioroethane | 5 | ND | ND | NO | NO | NO | ND | 100 |
| 1,2,3-Trichloropropene | - 5 | NO | NO | ND | NO | ND | ND | ND |
| Bromobenzene | | NED | ND | NO | ND | ND | ND | ND. |
| Propybonzene | 20 | ND | ND | NO | ND | ND | ND | ND |
| 2-Chierotokuene | 20 | ND | ND | NO | NO | NO | ND | ND |
| 4-Chiorotoluene | 20 | ND | ND | ND | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 20 | ND | ND | NO | | ND | ND | ND |
| ert-Butytbenzene | 20 | NO | NO | ND | NO | | ND | NO |
| 1.2.4-Trimethylburgane | 20 | ND | - ND | NO NO | | ND
ND | ND | NO |
| sec Butybanzane
1,3-Dichtorobanzane | 20 | NO | ND ND | ND
NO | ND
ND | | ND ND | NO |
| 1,2-Cichlorobenzene
4-leopropyliciuene | 20 | NO | ND | NO | NO | | ND | NU |
| 1,4-Dichlorobet2ane | 5 | ND | ND | | NO | NO | NO | ND ND |
| n-Butybenzene | 20 | ND | ND | NO | NO | NO | NO | ND |
| 1,2-Dichlorobenzene | 5 | NO | NO | NO 1 | NO | | NO | |
| 1,2-Dibromo-3-chioropropene (DBCF | | NO | ND | NO | ND | NO | ND | ND |
| 1,2,4-Trichlorobenzene | 20 | ND | NO | NO | ND | ND | ND | ND |
| 1.2.3-Trichlorobenzene | 20 | ND | NÖ | ND | ND | OK . | ND | NO |
| Naphthalene | 20 | NO | NO | ND | NO | NO | ND | NO |
| Hexechlorobuildiene | 20 | NO | NO | NO | ND | NO | ND | NO |

CARGE COMMENTS IN THE FREE TABLES OF THE STORE THE

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Ft. Richardson OU D Site Building 35-752 Cooling Pond Groundwater Sample Analytical Results Semivolatile Organic Compounda

| ф/L | Location: | MW AP 3502 | MW AP 3503 | | P 3504 | MW AP 2962 | MW AP 2983 | MW AP 2986 | MW AP 295 |
|---|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------|
| | Semple 10: | 0457528AGW | \$457525AGW | 9457521AGW | 9457522AGW | 9457573AGW | #457526AGW | 9457527AGW | 9457524AGV |
| | Lab Code: | K948015-003 | K947974-005 | K#47938-001 | K947938-002 | K946015-001 | K947374-001 | K947974-007 | K947974-00 |
| | - Collected: | 12/21/94 | 12/20/94 | 12/10/94 | 12/19/94 | 12/21/04 | 12/20/94 | 12/20/94 | 12/20/94 |
| mivolatile Organic Compound:
A Methods 3660/1270 | MRL | | | | i | | | | |
| Nirmodimothylemine | 25 | NO | ND | ND | ND | ND | NO | ND | ND |
| dinte | 25 | ND | ND | NO | ND | NO | 80 | NO | NO |
| e(2-chloroethyl) Ether | 10 | ND | NQ | ND | NO | ND | ND | ND | ND |
| 2-Dichlarobenzene
3-Dichlarobenzene | 10 | ND | NO | NO | NO NO | N 10 | NO NO | ND | ND
ND |
| 4 Dichlorobenzene | 10 | | ND
NO | NO | | NO | ND | ND | |
| e(2-chlorosopropyl) Ether | 10 | NO | ND | NO | NO | NO | ND | NO | NO NO |
| Nitrosod-n-propylamine | 10 | | NO | ND | NO | NO | NO | <u>NO</u> — | NO |
| exachioroethane | 10 | ND | NO | ND | ND | NO | NO | NO | ND |
| Tobenzene | 10 | ND | ND | NO | NO | NO | NO | NO | NO |
| ophorone | 10 | ND | ND . | ND | NO | NÓ | NO | NÓ | ND |
| a(2-chloroethory)methane | 10 | ND | NO | NO | ND | NO | ND | NO | NO |
| 2,4-Trichlorobenzwne | 10 | ND | ND | ND | NO | ND | NO | ND | NO |
| aphthalene | 10 | ND | ND | ND | NO | NO | NO | ND | ND |
| Chloroeniine | 10 | ND | NO | NO | ND | | NO | NO | NO |
| txachiorotutaciene
Methyinaphihalene | 10 | ND
ND | ND | ND ND | NO | ND
ND | | ND | ND |
| azachiorocyclepentadiene | 10 | | ND - | ND | NO | NO | | | |
| Chioronaphitulene | 10 | ND . | ND T | NO | NO | NO | NO | | ND |
| Nievenäine | 25 | | ND | ND | NO | ND | NO | | NO |
| imethyl Philalala | 10 | ND | ND | ND | ND | NÓ | ND | NO | ND |
| canaphilitylone | 10 | ND | NO | ND | ND | NO | ND | NO | ND |
| Nitroaniine | 2 | ND | NO | ND | ND | ND | ND | ND | NÖ |
| comptitions | 10 | ND | ND | ND | NO | ND | NO | ND | ND ND |
| ibonzoturan | 10 | ND | NO | NO | ND | ND | ND | ND | ND |
| 4-Dimitroipluene | 10 | NO | NŬ | ND | NÖ | ND | NO | ND | ND |
| 5 Dinitralajene | 10 | ND | ND | ND | ND | NO | NO | ND | ND |
| iettyi Philialata | 10 | ND | NO | NÖ | ND | ND | NO | NO | ND |
| Chicrophenyl Phenyl Efter | 10 | | ND - | ND | | NO | NO | NO | ND ND |
| Nitraniine | 28 | ND | NO | ND | NO | NO | NO | NO | NO |
| Nitrosofiphenylamine | 10 | NID | | NO | ND | NO | NO | | NO |
| Bromophenyl Phenyl Ether | 10 | NĎ | ND | NO | DND | ND | NO | NO | NO |
| lexachterobenzene | 10 | ND | NO | NO | 80 | NO | NO | ND | NO |
| tionanthrome | 10 | ND | NO | ND | ND | ND | NQ | ND | ND |
| offencene | 10 | . ND | ND | | NO | ND | ND | ND | ND |
| i-n-butyl Philalata | 10 | ND | ND | ND | ND | ND | 20 | | NÖ |
| koranthene | 10 | ND | ND | - 10
10 | ND | NO | NO NO | ND | ND |
| yrene
kutytbenzyl Phthelate | 10 | NO | NO NO | NÚ
NÔ | NO | NO
NO | | NO
NO | NO |
| 3'-Dichlorobenzidine | 25 | 80 | ND | | NO | NO | NO | | |
| enz(s)entiveceme | 10 | ND | NO | NO | ND | NO | NO | NO | ND - |
| is(2-ethylineryl) Philaiste | 10 | ND | ND | NO | NO | ND | NO | 11 | NO |
| hrysene | 10 | ND | ND | NO | ND | NO | NO | NO | NO |
| -n-octyl Philialate | 10 | ND | ND | NO | NO | NO | NO - | NO | ND |
| enzo(b)filionanihane | . 10 | ND | ND | ND | ND | NO | NO | NO | NO |
| enzo(k)fuoranthene | 10 | ND | ND | NO | ND | NO | NO | NÖ | ND |
| chzo(a)pyrane | 10 | ND | ND | ND | NO | ND | ND | ND | ND |
| deno(1,2,3-cd)pyrana | 10 | NO | NO | NO | ND | NO | NO | | NO |
| (benz(n.h)enthracene | 10 | | ND
ND | NO NO | 0M
ND | NO | ND | | ND |
| enzo(g.h.l)perylene
benol | 10 | ND | NO NO | NO | ND | NO | NO
NO | | NO
NO |
| -Chiorophenol | 10 | NO - | NO | ND | NO | | NO | NO | NO |
| enzyl Alcohol | 10 | ND | - ND | | ND | | | ND | NO |
| Methylphenal | 10 | NO | ND | ND | NO | NO | ND | NO | ND |
| and 4 Methylphonol" | 10 | ND | NO | NO | ND | ND | NO | ND | NO |
| Nérophenal | 10 | ND | ND | ND | NO | NO | ND | NO | NO |
| 4-Dimetrylphenol | 10 | ND | NO | NO | ND | NO | ND | ND | NO |
| enzolo Acid | 8 | . NO | ND | ND | NO | ND | ND | NO | ND |
| 4-Dichlorophenol | 10 | ND | NO | ND | ND | ND | NO | NO | ND |
| Chloro-3-methylphonol | 10 | NO | ND | ND | ND | NO | NO | NO | ND |
| 4.6-Trichlorophenol | 10 | ND . | NO | ND | ND | NO | NO | ND | NO |
| ,4,5-Trichlorophenol
,4-Dinitrophenol | 10 | | ND | NO | ND | ND | NO | NO | |
| Nitrophenol | 25 | ND
ND | NO
ND | ND ND | NO | ND
NO | ND ND | NO | NO
NO |
| -Methyl-4.6-dintrophenol | 25 | - ND | ND
NO | NO | NO | ND | | NO - | |
| | | - 20- | | NO | NO | - 70- | | - 76 | - 700 |
| entachlorophenol | 25 | | | | | | | | |

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| μg/L | | | | Analyte: | Arsenic | Barlum | Cadmlum | Chromium | Lead | Mercury | Nickel | Selenium | Sliver |
|------------|------------|---------------------------------------|-------------------|-----------|--------------|------------------|----------------|------------------|-------|---------|----------|----------|--------|
| | | | | Method: | 7060 | 6010A | 6010A | 6010A | 7421 | 7470 | 6010A | 7740 | 6010A |
| Location | Sample ID | Lab Code | Date
Collected | MRL: | 5 | 5 | 3 | 5 | 2 | 0.5 | 20 | 5 | 10 |
| MW AP 3502 | 9457528AGW | K848015-003 | 12/21/94 | | 5 | 129 | ND | 17 | 5 | ND | 25 | <10 | ND |
| MW AP 3503 | 9457525AGW | K947974-005 | 12/20/94 | | 52 J | 1480 | 8 | 402 | 112 | 1,8 | 546 | <10 | <20 |
| MW AP 3504 | 9457521AGW | K947938-001 | 12/19/94 | | 29 | 683 | ND | 206 | 48 | 1.2 | 318 | <20 | ND |
| MW AP 3504 | 9457522AGW | K94793B-002 | 12/19/94 | 1 1 | 34 | 722 | ND | 229 | 53 | 1.2 | 345 | ND | ND |
| MW AP 2082 | 9457523AGW | K948015-001 | 12/20/94 | | 27 | 424 | ND | 97 | 26 | 0.7 | 153 | <10 | ND |
| MW AP 2883 | 9457526AGW | K947974-001 | 12/20/94 | | 28 J | 781 | ND | 182 | · 64 | 1.5 | 290 | ND | ND |
| MW AP 2986 | 8457527AGW | K947974-007 | 12/20/94 | | 48 J | 245 | ND | 72 | 44 | 0.7 | 102 | ND | ND |
| MW AP 2987 | 9457524AGW | K947974-003 | 12/20/94 | | 27 J | 604 | ND | 154 | 52 | 1.1 | 229 | ND | ND |
| FOOTNOTES | | Analytical report
sidered an estim | - | avele neo | ed due to ma | itrix Interferen | ices or sample | e requiring dilu | tion, | | <u> </u> | <u></u> | |

Ft. Richardson OU D Site Building 35-752 Cooling Pond Groundwater Sample Analytical Results Total Metals

RICH/FINAL WREPTABLES/B35762FW/XLS/M

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4/18/95

Ft. Richardson OU D Site Building 35-752 Concrete Floor Wipe Sample Analytical Results PCBs

| µg/wipe Sa | mple ID; | 94575249MI | 94575250MI | 94575251MI * | 94575252M | 94575253MI | 94575254MI | B4575255MI | 94575256MI | 84575257Mi | 94575258MI | 84575259M |
|----------------------------------|-----------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|
| L | b Code: | K947753-001 | K947753-002 | K947753-003 | K947753-004 | K947753-005 | K947753-006 | K947753-007 | K947753-008 | K947753-009 | K947753-010 | K947753-01 |
| Date C | ollected: | 12/9/94 | 12/9/94 | 12/9/84 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 |
| Polychiorinated Biphenyls (PCBs) | MRL | | | | | | | | | | | |
| EPA Method 3540/8080 | | | | | | | | | | | | |
| Arodor 1016 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1221 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1232 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroctor 1242 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | NO | ND | ND |
| Aroctor 1248 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | 1 | 750 | 18 | 37 | 41 | 41 | 82 | 78 | 6 | 88 | 64 | 130 |
| Arodor 1280 | 1 | ND | ND | ND | 8 | 24 | 14 | ND | ND | ND | ND | ND |

QAQCICOMMON/RICH/FINALBIREPTABLEB/B35762FW.XL8/PCB+-Wp+

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Ft. Richardson OU D Site Building 35-752 Concrete Floor Wipe Sample Analytical Results PCBs

| µg/wlpe Sr | imple ID: | 94575260M | 94575261 MI * | 94575262MI | 94575263M | 94575264MI | 94575265MI * | 94575266MI | 94575267MI | 94575268MI | 94575269MI | 94575270M |
|---|-----------|----------------------|---------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|
| L | b Code: | K947753-012 | K947753-013 | K947753-014 | K947753-015 | K947753-016 | K947753-017 | K947753-018 | K947753-019 | K947753-020 | K947753-021 | K947753-022 |
| Date C | ollected: | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 |
| Polychiorinated Biphenyls (PCBs) | MRL | | | | | | | | | | | |
| EPA Method 3540/8080 | | | | | | | | | | | | |
| Aroclor 1018 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroctor 1221 | 1 | ND | ND | ND | NÖ | ND | ND | ND | ND | ND | ND | ND |
| Arocior 1232 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1242 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Arodor 1248 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Aroclor 1254 | 1 | 40 | 10 | 38 | 33 | 34 | 19 | 71 | 140 | 71 | 580 | 120 |
| Aroclor 1260 | \$ | ND | ND | 3 | ND | 4 | 2 | 12 | 13 | 17 | 29 | 24 |
| FOOTNOTES: *: Duplicate of p
ND = Non-detected at
VOAOCICOMMON/RICHFINALS/REPTABLES/U | the metho | i reporting limit (i | MRL). | | | | | | | | | 4/16/95 |

OUD 0025773

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Page 2

Ft. Richardson OU D Site Building 35-752 Concrete Floor Wipe Sample Analytical Results

PCBs

| µg/wipe Sa | mple JD; | 94575271MI | 94575291MI | 94575292MI | 94575293Mi | 84575294Mi * | 94575295MI | 94575296MI | 94575297MI | 94575296MI | 94575299MI | |
|----------------------------------|-----------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|----|
| L | b Code: | K947753-023 | K947753-024 | K947753-025 | X947753-026 | K947753-027 | K947753-028 | K947753-029 | K947753-030 | K947753-031 | K047753-032 | _ |
| Date C | ollected: | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | 12/9/94 | |
| Potychlorinated Biphenyls (PCBs) | MRL | | | | | | | | | | | |
| EPA Method 3540/8080 | | | | | | | | | | | | |
| Aroclor 1016 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | <5 | ND | |
| Aroclor 1221 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | <5 | ND | |
| Aroclor 1232 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | <5 | ND | |
| Aroclor 1242 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | <5 | ND | _ |
| Aroclor 1248 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | <5 | ND | - |
| Aroclor 1254 | \$ | 63 | 22 | 140 | 810 | 160 | 62 | 9 | 27 | 50 | 73 | /= |
| Aroclor 1260 | 1 | 35 | 32 | 27 | 39 | ND | 8 | ND | 10 | 31 | 24 | |

= Less than. Analytical reporting limit has been elevated due to matrix interferences or sample requiring dilution.

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| ENSR Field
Designation | COE Permanent
Designation | Date
Completed |
|---------------------------|------------------------------|-------------------|
| SB-1 | AP 3497 | 11/2/94 |
| SB-2 | AP 3498 | 11/2/94 |
| SB-3 | AP 3499 | 11/2/94 |
| SB-4 | AP 3500 | 11/2/94 |
| SB-5 | AP 3501 | 12/8/94 |
| MW-1 | AP 3502 | 11/7/94 |
| MW-2 | AP 3503 | 11/8/94 |
| MW-3 | AP 3504 | 11/7/94 |
| ВН-9 | AP 3505 | 11/3/94 |
| BH-10 | AP 3506 | 11/3/94 |

Building 35-752 - Soil Boring Summary

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| Page | 1 | of | 1 | |
|------|---|----|---|--|
|------|---|----|---|--|

FILENAME: AP3497

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BORING LOG

OUD 0025776

| CLIENT: United States Army Corps of Engineers |
|--|
| PROJECT NAME: Fort Richardson, Operable Unit D |
| PROJECT LOCATION: Building 35-752 |
| JOB NUMBER: 9000-036 |
| LOGGED BY: J. Winkler APPROVED BY: S. Wing |
| DRILLED BY: Hughes Drilling Co. |
| METHOD: 4 25" ID HSA |

| BORING DEPTH (ft): 20 |
|---------------------------------|
| BORING DIAMETER (in): 6 |
| WELL DEPTH (ft): NA |
| WELL DIAMETER (in): NA |
| REFERENCE ELEVATION (ft): 262.7 |
| CASING STICKUP (ft): NA |
| FIELD PARTY: H. Kent |

FILTER PACK: NA DATE STARTED: 11-2-94 DATE COMPLETED: 11-2-94 NORTHING: 113156.78

SCREEN LENGTH (ft): NA

SCREEN TYPE: NA SLOT SIZE (in): NA

EASTING: 125670.72

| | APIL | * | AP3497 | <i>.</i> . | | | , | | EASTING: 125670.72 | - |
|--------------------|--------|----------|-----------|------------|---|--------------------------------------|-------------|------------|---|---|
| DEPTH
feet | LENGTH | RECOVERY | SAMP, NO. | SAMP. TYP. | BLOWS/6 in. | PID (ppm) | GRAPHIC LOG | SOIL CLASS | DESCRIPTION AND REMARKS | WELL DIAGRAM |
| | | | | | 7
6
5
5
7
11
15
6
9
10
10
8
10
14
16
8
23
21
23 | 166.6
233.
6.6
19.9
33.3 | | GW | Medium orangish-brown SANDY GRAVEL (GW), coarse rounded to
subangular gravel, fine to medium sand, slight coarse sand, dry, loose, no
odor.
same as above
same as above
Brownish-gray SANDY GRAVEL (GW), medium to coarse subrounded
gravel, fine sand, slight medium to coarse sand, slight silt, dry, loose, no
odor.
same as above
Drilling very hard, GRAVEL (GW) | - |
| | | | | | 8
12
20
18
15
17
14
16
12
18
23
32 | 1 4.1 | | SW 1 | Medium gray SAND (SW), medium to coarse, slight fine sand, silt, gravel,
very moist, loose, moderate to strong hydrocarbon odor.
same as above, Very strong hydrocarbon odor, very moist.
Medium brownish-gray SAND (SW), medium to coarse, slight fine sand and
silt, some rounded medium gravel, bottom 2" angular to rounded gravel,
saturated to wet, slight hydrocarbon odor
Total depth = 20 feet | -
-
-
-
-
-
-
-
- |
| 25
-
-
30 | | | | | | | | | | - |
| | | | | | | | | | | |

| Page 1 of 1 |
|-------------|
|-------------|

CLIENT: United States Army Corps of Engineers

PROJECT NAME: Fort Richardsc1, Operable Unit D

APPROVED BY: S. Wing

PROJECT LOCATION: Building 35-752

DRILLED BY: Hughes Drilling Co.

JOB NUMBER: 9000-036

LOGGED BY: J. Winkler

METHOD: 4.25" ID HSA

FILENAME: AP3498

BORING LOG

| BORING NUMBER: AP-3498 |
|------------------------|
|------------------------|

NA

OUD 0025777

| BORING DEPTH (ft): 16 | SCREEN LENGTH (ft): |
|---------------------------------|---------------------|
| BORING DIAMETER (in): 6 | SCREEN TYPE: NA |
| WELL DEPTH (ft): NA | SLOT SIZE (in): NA |
| WELL DIAMETER (in): NA | FILTER PACK: NA |
| REFERENCE ELEVATION (ft): 264.6 | DATE STARTED: 11-2- |
| CASING STICKUP (ft): NA | DATE COMPLETED: 11- |
| FIELD PARTY: H. Kent | NORTHING: 113116.16 |

-94 2-94

EASTING: 125711.42

GRAPHIC LOG CLASS Ë ΤΥΡ. (mqq) LENGTH RECOVER ĝ DEPTH feet BLOWS/6 SAMP. SAMP. DESCRIPTION AND REMARKS WELL DIAGRAM ЫО SOIL G₩ Dark brown SANDY GRAVEL (GW), medium sand, medium to coarse З 0 5 rounded gravel, slight fine sand and silt, moist, no odor, 2.20 5 5 same as above, color change to medium orangish-brown at 3.5', increase 0 in fine sand and silt റ 8 3.6 0 8 Medium orangish-brown SANDY GRAVEL (GW), coarse rounded to 9 5 0 subrounded gravel, fine to medium sand, some coarse sand with depth, 0 moist, no odor. 1.8 11 n same as above 11 0 9 0 16 6.2 17 C 26 8 0 10 7 SW ٠ 11 Medium gray SAND (SW), medium to coarse, slight fine sand, silt, and 14 medium gravel, very moist, loose, strong hydrocarbon odor. 1242. . 15 . 5 G₩ C Medium gray SANDY GRAVEL (GW), coarse sand, subrounded to angular 11 0 gravel, very strong hydrocarbon odor, sheen on sampler, very moist. t ₽ 16 13.90 17 Total depth = 16 feet 20 25 30

| Ρ | ad | е | 1 | of | 1 |
|---|----|----|---|----|---|
| | ΨН | ÷. | | ÷. | |

BORING LOG

| BORING DEPTH (ft): 16 | SCREEN LENGTH (ft): NA |
|---------------------------------|------------------------|
| BORING DIAMETER (in): 6 | SCREEN TYPE: NA |
| WELL DEPTH (ft): NA | SLOT SIZE (in): NA |
| WELL DIAMETER (in): NA | FILTER PACK: NA |
| REFERENCE ELEVATION (ft): 264.6 | DATE STARTED: 11-2-94 |
| CASING STICKUP (ft): NA | DATE COMPLETED: 11-2-9 |
| FIELD PARTY: H. Kent | NORTHING: 113122,18 |

NA OUD 0025778 NA NA : 11-2-94 ED: 11-2-94 3122.18

METHOD: 4.25" ID HSA FILENAME: AP3499

JOB NUMBER: 9000-036

LOGGED BY: J. Winkter

CLIENT: United States Army Corps of Engineers

PROJECT NAME: Fort Richardson, Operable Unit D

APPROVED BY: S. Wing

PROJECT LOCATION: Building 35-752

DRILLED BY: Hughes Drilling Co.

| FILE | FILENAME: AP3499 EASTING: 125674.32 | | | | | | | | | |
|---------------|-------------------------------------|----------|-----------|------------|---------------------|-----------|-------------|--------------|--|--------------|
| DEPTH
feel | LENGTH | RECOVERY | SAMP. NO. | SAMP. TYP. | Blows/6 in. | PID (ppm) | GRAPHIC LOG | SOIL CLASS | DESCRIPTION AND REMARKS | WELL DIAGRAM |
| - | | | | | 1
2
5
6 | 8.7 | | GW
-
- | Dark brown SANDY GRAVEL (GW), medium to coarse sand, medium to coarse rounded gravel, slight silt, moist, no odor. | - |
| 5 | Z | | | : | 4
2
4
6 | 5.5 | | SM
_ | Medium orangish-brown SANDY SILT (SM), fine sand, slight medium sand
and gravel, few pockets of light gray clay, some wood, moist | |
| - | Z | | | | 222 | 22.5 | | _ | same as above, clay increasing with depth and sand decreasing. | - |
| 10- | Ζ | | | | 1
1
2
6 | 5.5 | ••• | SW - | Medium orangish-brown SAND (SW), medium to coarse sand, slight rounded gravel, very moist, no odor. | - |
| - | | | | | 11
5 | 8.0 | ••• | - | same as above, some silt, some gravel, moist to wet, | |
| - | 7 | | | | 12
15
12 | | • | _ | same as above, soil gray, strong hydrocarbon odor, saturated | - |
| 15- | 7 | | | | 13
12
15 | 87 | |
 | Medium gray SAND (SW), medium to coarse sand, some subrounded to angular gravel, saturated, strong hydrocarbon odor | - |
| - | | | | | 33
8
11
21 | 0.1 | | | Total depth = 16 feet | - |
| - | | | | | 18 | | | - | | - |
| 20 | | | | | | | | - | | - |
| - | | | | | | | | - | | - |
| - 25— | | | | | - | | | - | - | _ |
| - | | | | | | | | - | | - |
| | | | | | | | | | | |
| 30— | | | | | | | | - | | _ |
| | | | | | | | | | | |
| | | | | | | | ł | | | |

| Page | 1 | of | £ | |
|------|---|----|---|--|
| | | | | |

BORING LOG

| Boring Ni | JMBER:AP- | -3500 |
|-----------|-----------|-------|
|-----------|-----------|-------|

| CLIENT: United States Army Corps of Engineers | | | | | | | |
|--|--|--|--|--|--|--|--|
| PROJECT NAME: Fort Richardson, Operable Unit D | | | | | | | |
| PROJECT LOCATION: Building 35-752 | | | | | | | |
| JOB NUMBER: 9000-036 | | | | | | | |
| LOGGED BY: J. Winkler APPROVED BY: S. Wing | | | | | | | |
| DRILLED BY: Hughes Drilling Co. | | | | | | | |
| METHOD: 4.25" ID HSA | | | | | | | |

FILENAME: AP3500 -

BORING DEPTH (ft): 18 BORING DIAMETER (in): 6 WELL DEPTH (ft): NA WELL DIAMETER (in); NA REFERENCE ELEVATION (ft): 262.5 CASING STICKUP (ft): NA FIELD PARTY: H. Kent

SCREENTENGTH (ft) NA

| OCHELN LENGTH (H). NA | |
|-------------------------|---------|
| SCREEN TYPE: NA | ø |
| SLOT SIZE (in): NA | 17 |
| FILTER PACK: NA | 00257 |
| DATE STARTED: 11-2-94 | S |
| DATE COMPLETED: 11-2-94 | an
C |
| NORTHING: 113153.19 | ō |
| | |

EASTING: 125735.07

| | | | | | | | | | EASTING: 125735.07 | |
|---------------|--------|----------|-----------|------------|--|--------------|-------------|--------------|--|------------------|
| DEPTH
feet | LENGTH | RECOVERY | SAMP. NO. | SAMP. TYP. | BLOWS/6 in. | (mqq) OI9 | GRAPHIC LOG | SOIL CLASS | DESCRIPTION AND REMARKS | WELL DIAGRAM |
| - | | | | 1 | 1 3 4 3 3 4 3 | 16.4
30.9 | \circ | GW _ | Dark brown SANDY GRAVEL (GW), fine to medium sand, medium to coarse
rounded gravel, slight coarse sand and silt, very moist, no odor. | - |
| 5 | | | | | 3
3
2
2
4
10
11
13 | 8.0 | | SM
GW | Medium brown SANDY SILT/SILTY SAND (SM), fine sand, slight gravel at
top, clay at bottom, homogeneous, very moist to wet, moderate
Thydrocarbon (diesel?) odor
Medium brownish-gray SANDY GRAVEL (GW), medium to coarse sand,
slight fine sand, rounded to subrounded gravel, dry to moist, no odor. | |
| | Z | | | | 14
14
7
12
17
22
10
22 | 302 | | | same as above | |
| 15 | | | | | 25
17
31
28
27
27
33
25 | | 0 a | S₩
-
Ţ | Medium gray SAND (SW), medium to coarse sand, some subrounded to
angular gravel, very moist to wet, very strong hydrocarbon odor.
Medium orange-brown SAND (SW), medium to coarse sand, very moist,
very strong hydrocarbon odor. | |
| -
20—
- | | | | | 28
31 | | | 1 | Total depth = 18 feet | |
| 25 | | | | | | | | | | -
-
-
- |
| 30- | | | | | | | | | | - |
| | | | | | | | | | | |

| Page | 1 | of | 1 |
|------|---|----|---|
| | | | |

BORING LOG

| BORING | NUMBER: AP- | -3501 |
|--------|-------------|-------|
| | | |

OUD 0025780

| CLIENT: U.S. Army Corps of Engineers | BORING DEPTH (ft): 15 |
|--|---------------------------|
| PROJECT NAME: Fort Richardser, Operable Unit D | BORING DIAMETER (in): 6 |
| PROJECT LOCATION: Building 35-752 | WELL DEPTH (ft): NA |
| JOB NUMBER: 9000-036 | WELL DIAMETER (in): NA |
| LOGGED BY: J. Winkler APPROVED BY: S. Wing | REFERENCE ELEVATION (ft): |
| DRILLED BY: Hughes Drilling | CASING STICKUP (ft): NA |
| METHOD: 4.25" ID HSA | FIELD PARTY: H. Kent |
| FILENAME: AP3501 | |
| | |

SCREEN LENGTH (ft): NA SCREEN TYPE: NA SLOT SIZE (in): NA FILTER PACK: NA 262.4 DATE STARTED: 12/8/95 DATE COMPLETED: 12/8/95 NORTHING: 125620.33

EASTING: 113126.81

| | | | AP3501 | | | | | | EASTING: 113126.81 | |
|---------------|--------|----------|-----------|------------|-------------|-----------|-------------|------------|--|--------------|
| DEPTH
feet | LENGTH | RECOVERY | ŚAMP. NO. | SAMP. TYP. | BLOWS/6 in. | (mqq) (IP | GRAPHIC LOG | SOIL CLASS | DESCRIPTION AND REMARKS | WELL DIAGRAM |
| | | | | | | | | | Angle boring: deviated 45 degrees from vertical, beginning at grade
level.
SANDY GRAVEL, dark brown to black, fine to medium sandy gravel,
medium to coarse gravel, saturated at 4 ft bgs.
GRAVEL, sandy to coarse, medium to dark-brown, wet, no odors. | |

15

Page 1 of 1

CLIENT: United States Army Corps of Engineers PROJECT NAME: Operable Unit D

PROJECT LOCATION: Building 35-752

JOB NUMBER: 9000-036

LOGGED BY: J. Winkler APPROVED BY: S. Wing

DRILLED BY: Hughes Brilling Co.

METHOD: 4.25" ID HSA

FILENAME: B752MW-1

BORING DEPTH (ft): 22 BORING DIAMETER (in): 6 WELL DEPTH (ft): 80 WELL DIAMETER (in): 2 SURFACE ELEVATION (ft): 261.3 TOP OF PVC ELEVATION (ft): 261.05 DATE COMPLETED: 11-7-94 FIELD PARTY: H. Kent

SCREEN LENGTH (ft): 10 SCREEN TYPE: Slotted PVC SLOT SIZE (in): 0.020 FILTER PACK: 10-20 silica DATE STARTED: 11-7-94 NORTHING: 113150.70

EASTING: 125618.86

| <i></i> | | _ | r | | <u> </u> | | | | · | EASTING. 125018.80 | |
|---------|---------------|--------|----------|-----------|------------|---|------------------------|-------------|---------------------------------------|--|--|
| | DEPTH
feet | LENGTH | RECOVERY | SAMP. NO. | SAMP. TYP. | BLOWS/6 in. | PID (ppm) | GRAPHIC LOG | SOIL CLASS | DESCRIPTION AND REMARKS | WELL DIAGRAM |
| | | | | ζο
 | SA | 118 1 2 4 4 4 9 5 3 4 3 5 9 7 21 0 0 5 8 2 0 4 8 2 4 9 5 3 4 3 5 9 7 21 0 0 5 8 2 0 6 4 8 2 4 | 0.8
0.5
0.4
2 | | S S S S S S S S S S S S S S S S S S S | Dark to medium brown SILTY SAND (SM), fine sand, homomgeneous, very
moist, slight natural (organic) odor.
same as above
same as above, grain size increasing with depth, very moist, no odor.
Medium brown SAND (SW), fine to medium with slight coarse sand, some
interbedded gravel, some iron oxidation staining (orange), moist, no odor
same as above
same as above, saturated at 15'
drill ahead
Total depth = 22 feet. | * 2" SCH. 40 PVC, 8 SLOT SCREEN ** 2" SCH. 40 PVC * 111111111111111111111111111111111111 |
| | | | | | | | | | | | |

OUD 0025781

Page 1 of 1

, ~·· , CLIENT: United States Army Corps of Engineers PROJECT NAME: Operable Unit D

PROJECT LOCATION: Building 35-752

JOB NUMBER: 9000-036

LOGGED BY: J. Winkler APPROVED BY: S. Wing

DRILLED BY: Hughes Drilling Co.

METHOD: 4.25" ID HSA

FILENAME: B752MW-2

BORING LOG BORING NUMBER: AP-3503

| BORING DEPTH (ft): 19 | SCR |
|-----------------------------------|------|
| BORING DIAMETER (in): 6 | SCR |
| WELL DEPTH (ft): 80 | SLO |
| WELL DIAMETER (in): 2 | FILT |
| SURFACE ELEVATION (ft): 260.9 | DAT |
| TOP OF PVC ELEVATION (ft): 263.66 | DAT |
| FIELD PARTY: H. Kent | NOR |

SCREEN LENGTH (ft): 10 SCREEN TYPE: Slotted PVC SLOT SIZE (in): 0.020 FILTER PACK: 10-20 silica DATE STARTED: 11-8-94 DATE COMPLETED: 11-8-94 NORTHING:

EASTING:

| | | | 37.32MM | | | | | | EASTING: | | |
|---------------|--------|----------|-----------|------------|-------------------|-----------|-------------|------------|---|---------|------------|
| DEPTH
feet | LENGTH | RECOVERY | SAMP, NO, | SAMP, TYP. | BLOWS/6 in. | (mqq) OIA | GRAPHIC LOG | SOIL CLASS | DESCRIPTION AND REMARKS | W | GRAM |
| - | | | | | 2
1
2 | 2.4 | 000 | GW _ | SANDY GRAVEL (GW), possible fill | 1 | T |
| | 7 | | | | 3
3
2 | 2.1 | | SM
- | Med. brown SANDY SILT to SILTY SAND (SM), fine to medium sand, trace coarse rounded gravel, moist, no odor. | - JAd | - GROUT |
| -
5 | 7 | | | | 2
3
3 | 2.2 | | - | same as above, sand grain size increasing with depth, very moist, no
odor | SCH. 40 | *- |
| | 7 | | | | 4
3
3 | 1.9 | | SW - | Med. brown SAND (SW), fine to medium with slight coarse sand, some silt, slight gravel, very moist, no odor. | 5.2 | ★ - |
| - | 7 | | | | 4447 | 1.9 | | - | same as above, increase in gravel (6" gravel layer @8.5"). | * | |
| 10 | 7 | | | | 7
6
9
16 | 1.1 | | ¥ - | Med. brown SAND (SW), fine to medium sand, subangular to rounded interbedded gravel, saturated @11', no odor. | Screen | |
| | | | | | 23
7
37 | | • | - | drill ahead | 8 SL0T | SAND PACK |
| - 15 | | | | | 30
35 | | • | - | | 40 PVC, | |
| - | | | | | | | • | | | SCH. | |
| | | | | | | | • | _ | - | 5 | |
| 20- | | | | | | | | - | Total depth = 19 feet | | _ |
| | | | | | | | | _ | | | 1 |
| - 25— | | | | | | | | - | | | |
| | | | | | | | | - | | | 1 |
| | | | | | | | | _ | | | 11 |
| 30— | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | L | | | | | | | | |

CLIENT: United States Army Corps of Engineers PROJECT NAME: Operable Unit 2 PROJECT LOCATION: Building 35-752

JOB NUMBER: 9000-036

LOGGED BY: J. Winkler APPROVED BY: S. Wing DRILLED BY: Hughes Drilling Co.

METHOD: 4.25" ID HSA

FILENAME: B752MW-3 ~

BORING LOG BORING NUMBER: AP-3504

BORING DEPTH (ft): 24 BORING DIAMETER (in): 6 WELL DEPTH (ft): 24 WELL DIAMETER (in); 2 SURFACE ELEVATION (ft): 261.6 TOP OF PVC ELEVATION (ft): 261.54 DATE COMPLETED: 11-7-94 FIELD PARTY: H. Kent

SCREEN LENGTH (ft): 10 SCREEN TYPE: Slotted PVC SLOT SIZE (in): 0.020 FILTER PACK: 10-20 silica DATE STARTED: 11-7-94 NORTHING: 113208.25

OUD 0025783

EASTING: 125603.48

| H |
|---|
| 42 O G SAMUY GRAVEL (GW), possible FLL, bottom f SILTY SAND (SM) 42 O G Medium brown SLTY SAND (SM), fine sand, homongeneous, soil has orange tint (possible iron oxidation staining), dry, no odor. 3 18 Image: Smith and the same as above Smith and the same as above 9 0.9 O G GM orange tint (possible iron oxidation staining), dry, no odor. 3 18 Image: Smith and the same as above Smith and the same as above. 9 0.9 O G GM orange tint (possible iron oxidation staining), dry, no odor. 3 18 Image: Smith and the same as above. Smith and the same as above. 9 O G GM orange tint (possible iron oxidation proven SANDY GRAVEL (GW), fine to medium same as above, with slight orange staining (iron oxidation). Same as above, with slight orange staining (iron oxidation). 14 0.4 O G Same as above, coarse sand increasing with depth. Same as above, saturated at 16' 20 O G O G Same as above, saturated at 16' Same as above, saturated at 16' 12 O G O G O G Same as above, saturated at 16' Same as above, saturated at 16' 20 O G O G O G O G Same as abov |
| |

| BORIN | NG LOG |
|--|---------------------------------|
| CLIENT: United States Army Corps of Engineers | BORING DEPTH (ft): 16 |
| PROJECT NAME: Fort Richardson, Operable Unit D | BORING DIAMETER (in): 6 |
| PROJECT LOCATION: Building 35-752 | WELL DEPTH (ft): NA |
| JOB NUMBER: 9000-036 | WELL DIAMETER (in): NA |
| LOGGED BY: J. Winkler APPROVED BY: S. Wing | REFERENCE ELEVATION (ft): 262.9 |
| DRILLED BY: Hughes Drilling Co. | CASING STICKUP (ft): NA |
| METHOD: 4.25" ID HSA | FIELD PARTY: H. Kent |
| FILENAME: AP3505 | |

BORING NUMBER: AP-3505

| SCREEN LENGTH (ft): NA | |
|------------------------|-------|
| SCREEN TYPE: NA | 4 |
| SLOT SIZE (in): NA | 78, |
| FILTER PACK: NA | 00257 |
| DATE STARTED: 11-3-94 | 8 |
| DATE COMPLETED: 11-3-9 | a duc |
| NORTHING: 113175.73 | อี |
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GRAPHIC LOG SOIL CLASS ÷. (mqq) DEPTH feel LENGTH RECOVERY SAMP. TYP. SAMP. NO. BLOWS/6 DESCRIPTION AND REMARKS WELL DIAGRAM DID 5.2 3 SM Medium brown SANDY SILT to SILTY SAND (SM), fine sand, slight coarse 3 rounded gravel, slight clay, moist, no odor, top 1-1.5' FILL З 5 3.1 same as above 4 4 6 3.1 same as above, increase in fine sand. 10 5 6 9 13 11 11 6.9 SP `ھ. 16 Medium grayish-brown SAND (SP), fine to medium sand, with subangular 10 to rounded gravel interbedded, moist, no odor. 24 • 42 10 2.3 G₩ 0 15 Medium orange-brown SANDY GRAVEL (GW), medium to coarse sand. 0 14 15 angular subrounded gravel, very moist, no odor. \mathcal{D} 2.0 0 same as above 8 15 $^{\circ}$ 16 С 00 8 Δ Total depth = 16 feet 20 20 25-30-

Page 1 of 1

BORING LOG

| BORING | NUMBER: AP- | -3506 |
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| CLIENT: | United Sta | tes Army Corps of Engineers |
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| PROJECT | NAME: Fo | rt Richardson, Operable Unit D |
| PROJECT | LOCATION: | Building 35-752 |

JOB NUMBER: 9000-036

LOGGED BY: J. Winkler APPROVED BY: S. Wing

DRILLED BY: Hughes Drilling Co.

METHOD: 4.25" ID HSA

FILENAME: AP3506

BORING DEPTH (ft): 16 BORING DIAMETER (in): 6 WELL DEPTH (ft): NA WELL DIAMETER (in): NA REFERENCE ELEVATION (ft): 263.3 DATE STARTED: 11-3-94 CASING STICKUP (ft): NA FIELD PARTY: H. Kent

SCREEN LENGTH (ft): NA SCREEN TYPE: NA SLOT SIZE (in): NA FILTER PACK: NA DATE COMPLETED: 11-3-94 NORTHING: 113172.32

EASTING: 125771.18

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same as above | -

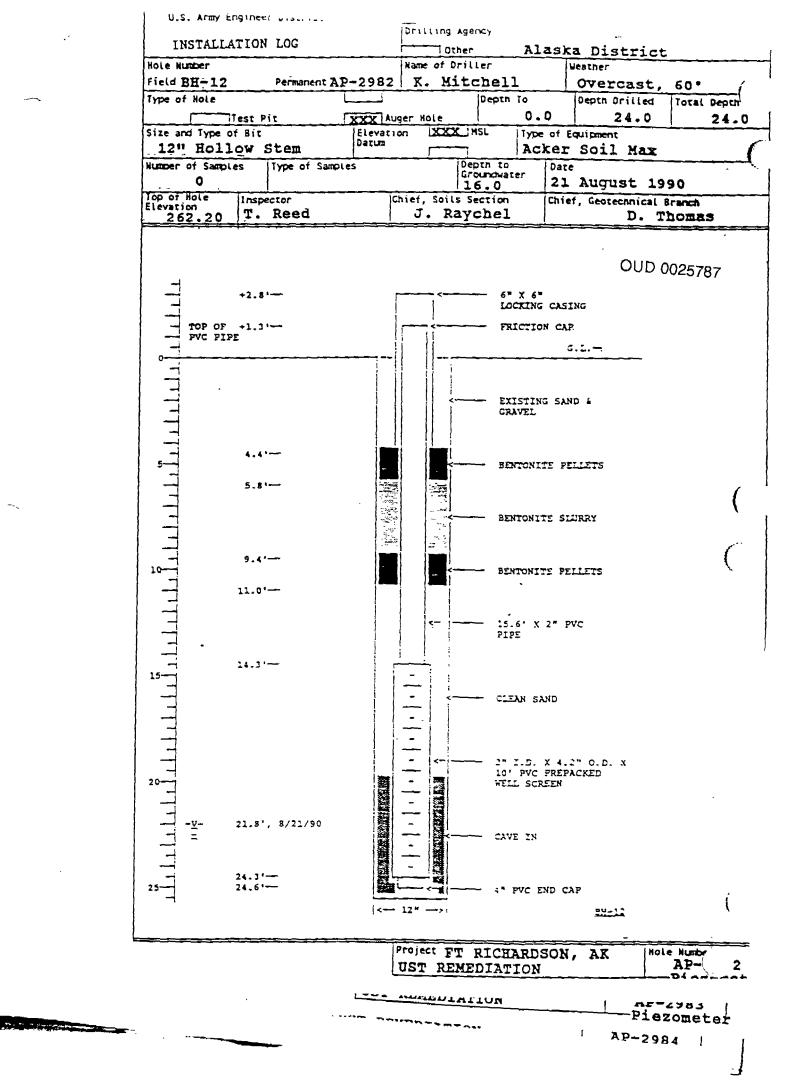
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3.6 | | GW | Medium orange-brown SANDY GRAVEL (GW), mectum to coarse sand,
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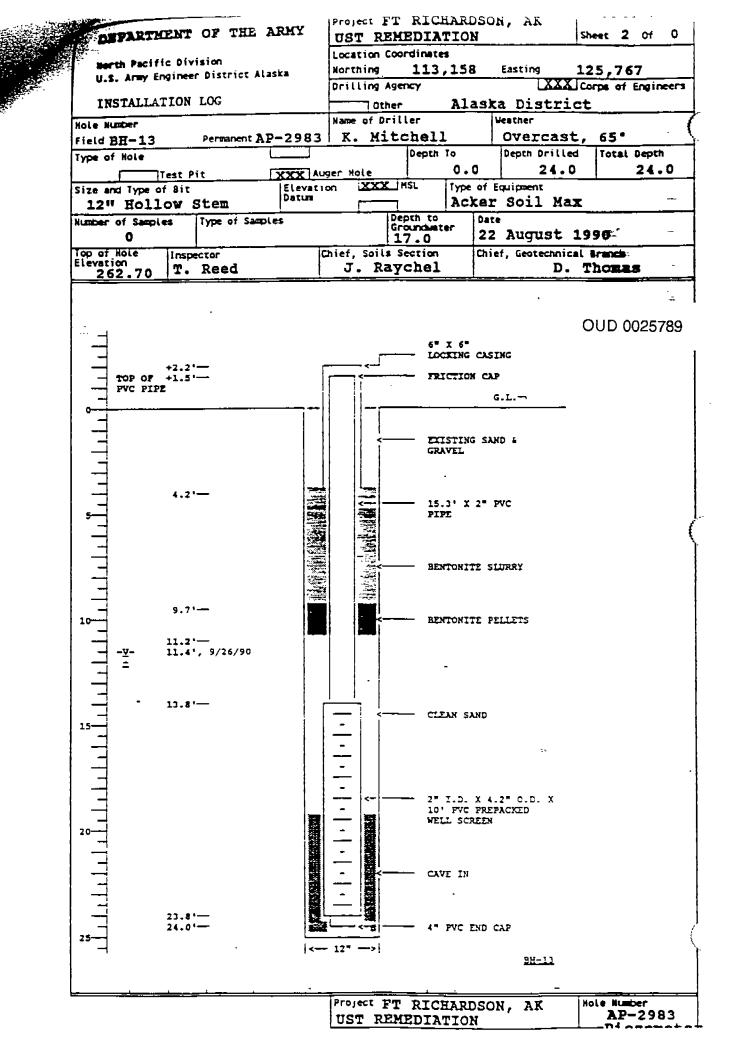


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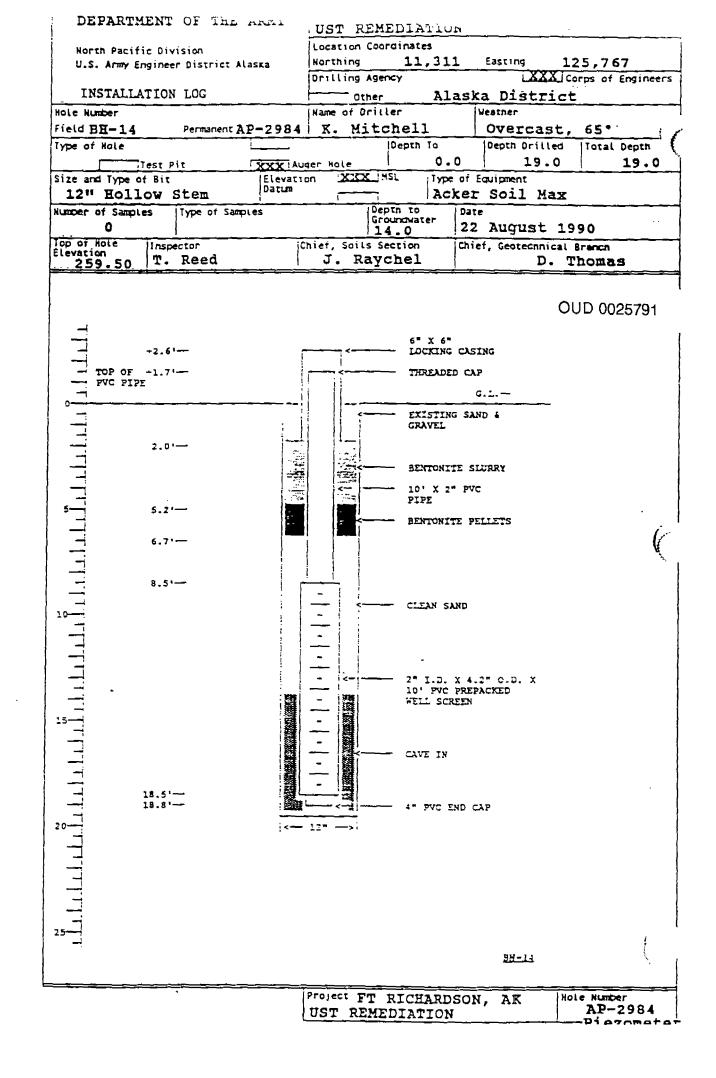


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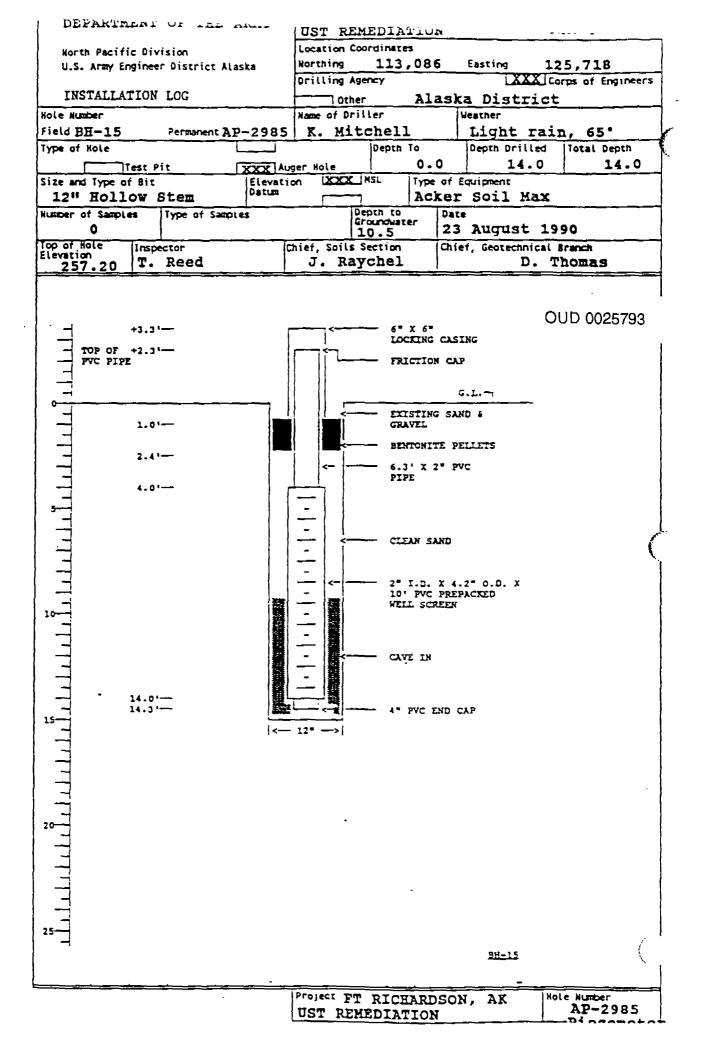
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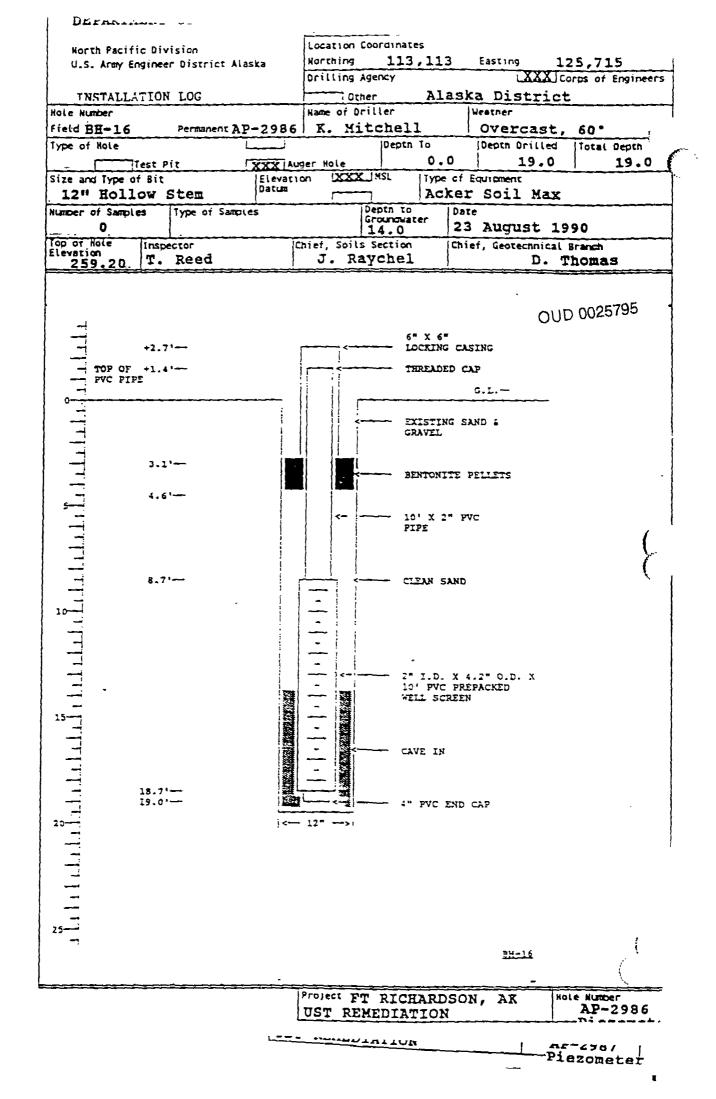
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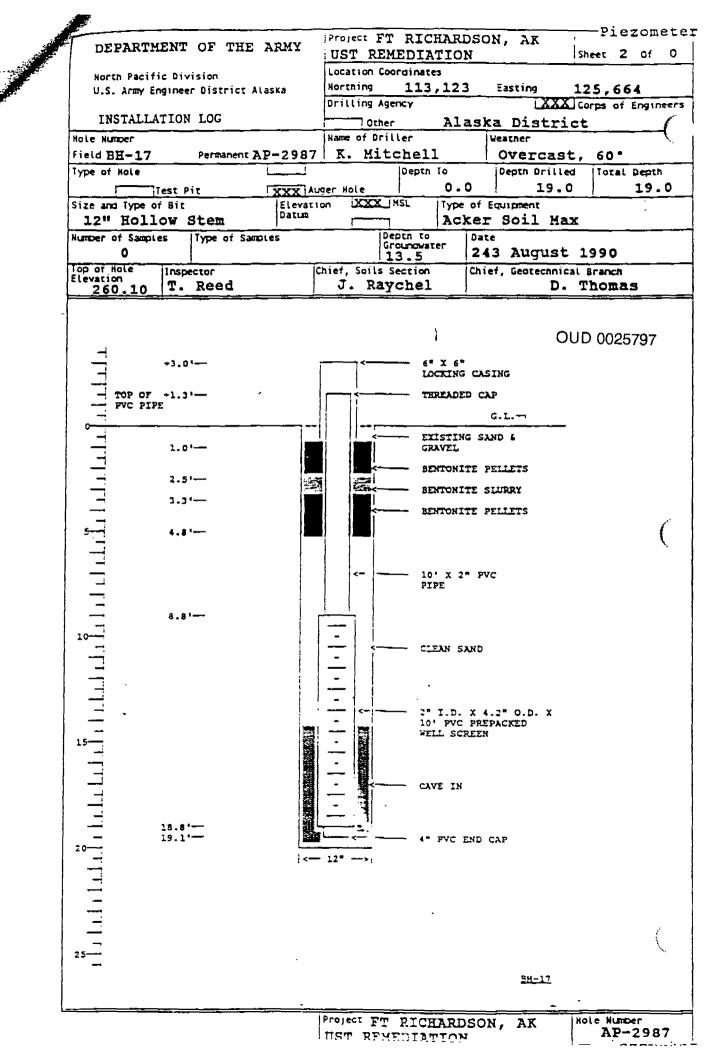
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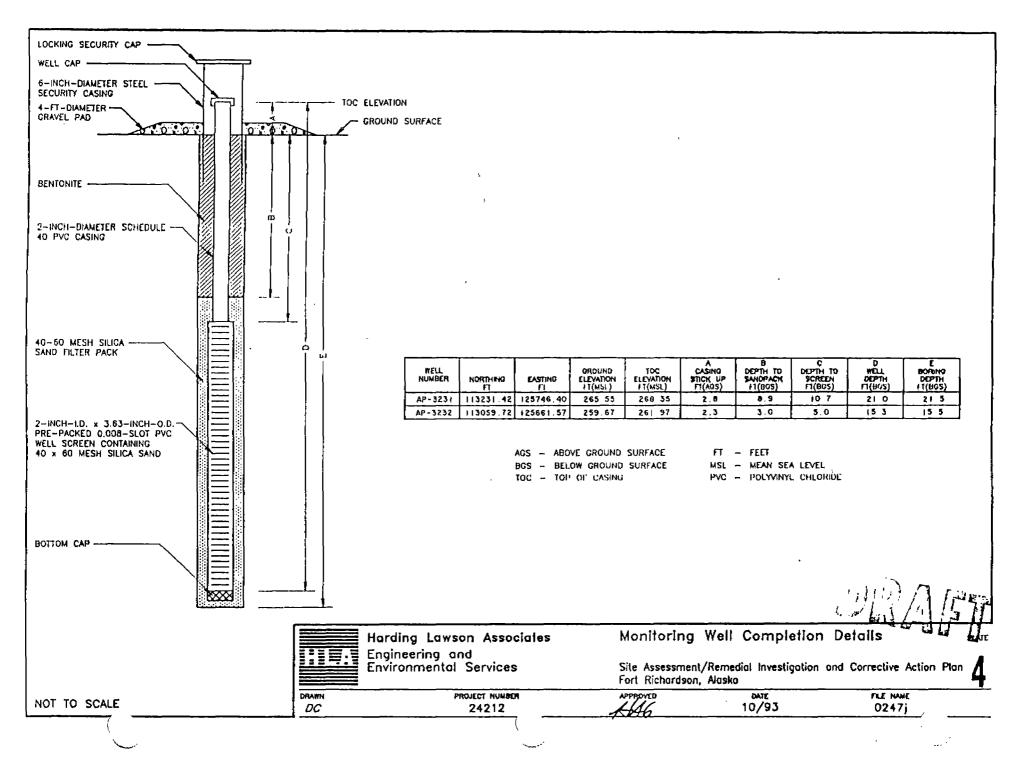
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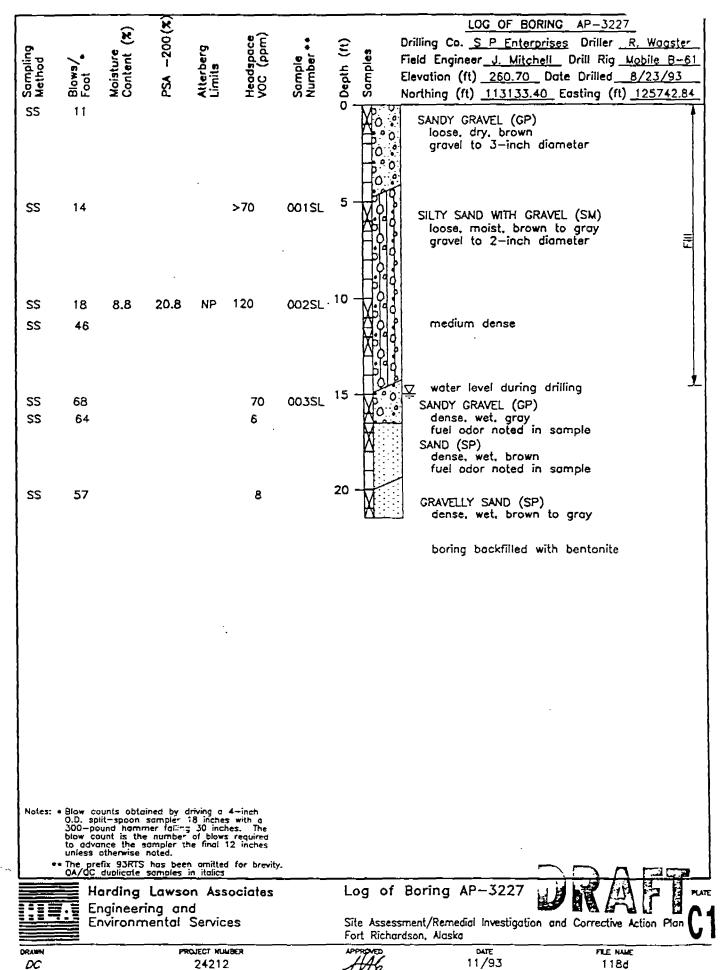


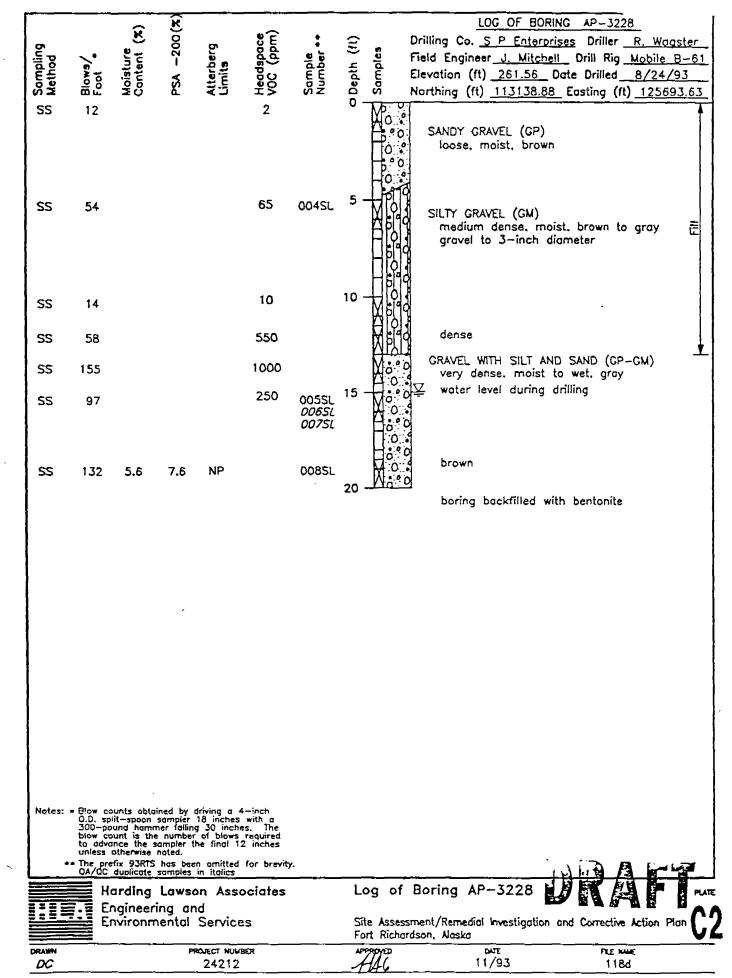
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Agency | 13, | 123 Easting | 125,664 | 213 |
| | Hole Numb
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Type of H | er
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ole | | Permanent | AP-298 | Name of I | itche | | Weather
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| | Size and | Type of
Hollo | | tem | Elevat | | MSL | 1 | Type of Equipment
Acker Soil M | ax | |
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3 | s (1 | ype of S | and Driv | | Depth
Ground
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tvate:
5 | Date
24 August | 1990 | |
| | Top of Ho
Elevation
260 | | Inspec
T. 1 | Reed | | Chief, Soi
J. R | ls Secti
laych | | Chief, Geotecnn
D | . Thomas | |
| | Depth | 1z | Sample | Soil
Legend | Classificat | ion | | Max
Size | Description and Ren | arks | |
| | | | | | | | | 4"
 | brown, moist
sandy gravel
medium to co
HNu=0 at 2' | , rounded
w/ cobbles
arse sand,
depth, Fill | |
| | 5 | | 1 | GP-GM | Poorly
GRAVEL
Sand, a | with SI | ilt, | 511 | 69%Gr 23%Sa
brown, moist
gravel, fine
sand, HNu=0 | 8%Pines S1
, subangula
to medium
*32/60 for | r |
| (| 10 | | 2 | GW | Well-Gr
with Sa | aded GI | RAVEL | 311 | 66%Gr 29%Sa
gray, wet, s
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um to coard
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| | | | 3 | SP | Poorly
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Cobbles | avel ar | SAND | 611
- | 43%Gr 53%Sa
gray, wet, r
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| | 20 | | | | <u> </u> | | | } | Bottom of ho
Elevation 2
Groundwater
estimated du | elev. 246. | 6
ng |
| | 25 | | | | | | | | *Number of h
a 23" I.D. s
sampler each
with a 300-p
falling 30" | lows to dri | ve |
| | | | | | | | | | Monitoring w
(see install | ell install
ation log) | ed |
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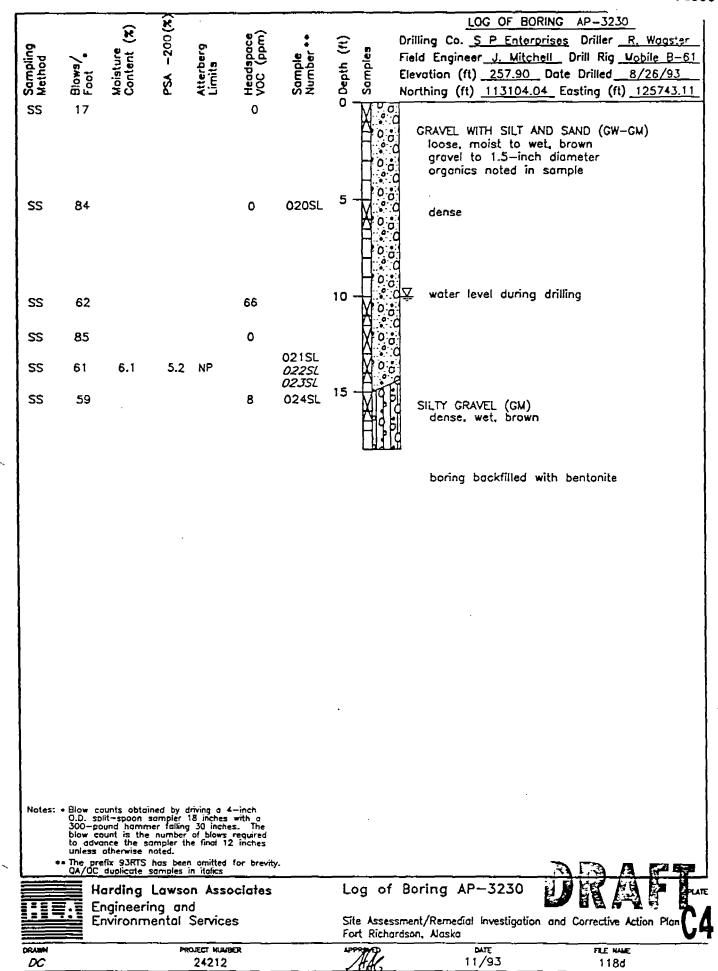


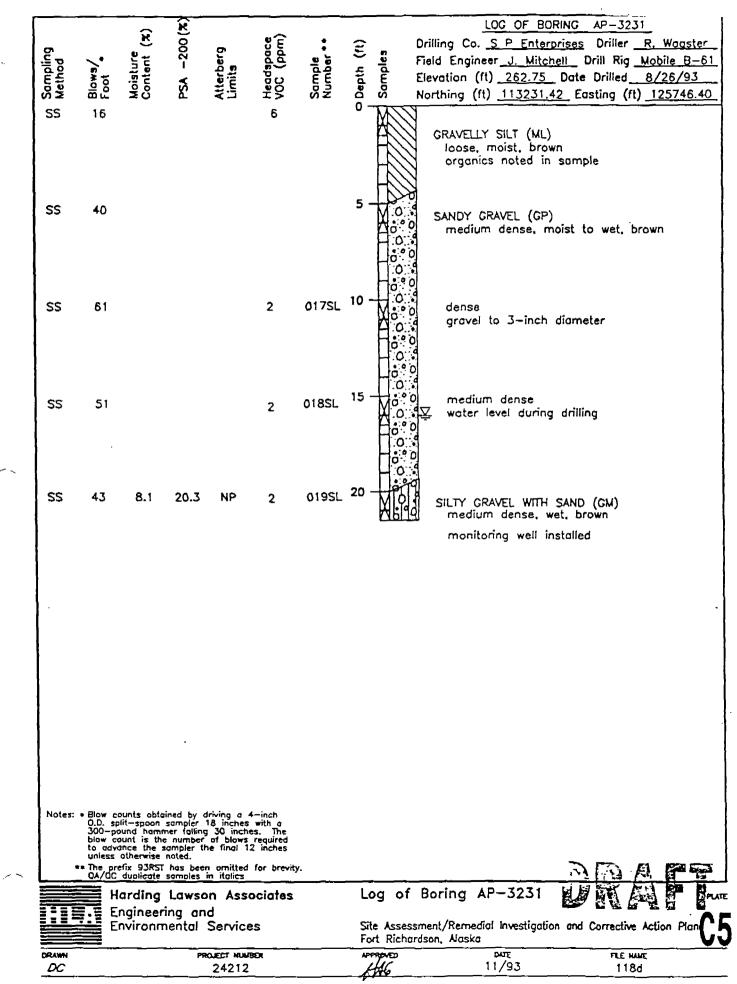
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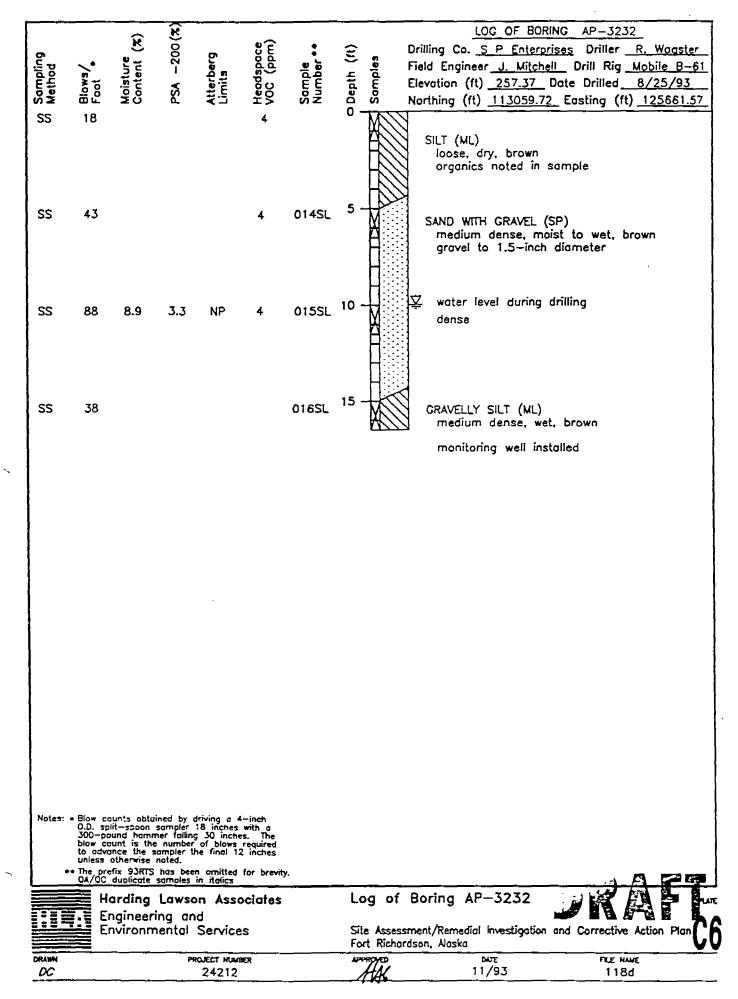














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ENSR Consulting and Engineering

Monitoring Well Development Record

| | | 0. | 0.000.0 | | Beginning | |
|-------------------------------------|------------------|--------------------|-----------------------|------------------------------|---|---|
| JOD NO .: 900-03 | | | B 35-752 Date: | | — | |
| Well No.: MW | | | NOT SIDE OF POND | | | W. WILBER |
| Likely Contaminants: | HERBICI | | STICIDES, OIL | (- <i>ME</i> ASC | 5, <u>502</u> V | ENTS |
| Development Method: | Dispo | SABLE | HAND BAILER | | | |
| | | · | | ··· | | |
| | | ···· <u></u> ····· | · | | | |
| | | | | <u> </u> | <u> </u> | |
| | 2" / (| <u> // -z / ,</u> | <u> </u> | | | <u> </u> |
| Well I.D. (in./ft) | / | D. 167 '= d. | | | | |
| Screen Interval (ft) | | | (gai) = (V) | 18 | | |
| Depth to Water (ft) | [6.55 | - 1 | | | | |
| | | | Water Added During Di | rilling/ | | |
| Saturated Interval (ft) | 5.69 | = b | Installation (gal) | <u> </u> | | = v ₁ |
| Aquifer Lithology | | | Casing Volume (gal) | | | 3 = .93 gar |
| | | | | = v ₂ = | ≠ (0.5 d _w) ² b | |
| Estimated Hydraulic
Conductivity | | | | V | - 2(| .93 JAL) = 2.8 |
| (gal/(day x ft ²)) | | | Annular Volume (gal) | | | |
| | | | | 5 | • 0.35 ((1 (0.5) | d _b) ² b - v ₂)] |
| | | | | Not es;
V = v, | + 6 (v ₂ , + v ₃ |) |
| Borehole Diameter (in. | / 0 1 | / - | - d _b | 7.48 ga | al = 1 ft ³
porosity of fil | |
| - | | / | נדי | - 640 | porosity of in | |
| Rate | Volume | للم | Conductivity | T | Silt | Cales/Odas |
| (gal/min) | _(gal) | pH | (#mhos) | <u>(C)</u> | <u>(ml/l)</u> | <u>Color/Odor</u> |
| <u> </u> | <u>-5gar -</u> | | <u> </u> | | | CLEAR |
| | <u>.9 gru</u> | <u>_</u> | Part Dail | <u> </u> | | SLIGHTY CLOUDY |
| | <u></u> | | BAILED DRY | _ <u></u> | <u> </u> | |
| | | ····· | | | | - <u></u> |
| | | | · | | | |
| Signature | | r |)isposition of | | | |
| Jate | <u>-</u> | | evelopment Water | | <u> </u> | |
| | | · | | | | |

| | | ENSR Consulting and | Engineering | 0 | UD 0025805 |
|--|---|--|----------------|--|--|
| 2 | ENSK | Monitoring Well Develop | oment Record | | - |
| Job No.: <u>9000 · OSk</u>
Well No.: <u>MW L</u>
Likely Contaminants:
Development Method: |) Job Site: <u>Fr</u>
Well Location:
<u>HAND</u> BAIL | 12 000 B35-752 Date:
EAST SIDE OF PO | - <u>-</u> | Beginning
Time:
H. Kev | W. WICZER |
| Well I.D. (in./ft) | /_0.167 | 1 = d _w | | | |
| Screen interval (ft) | | —
Predevelopment Vol:
(gal) ≠ (V) | ume | | |
| Depth to Water (ft) | 16.68' | (gay = (*) | <u></u> | | <u> </u> |
| Saturated Interval (ft) | 5.481 | Water Added During
= b Installation (gal) | Drilling/ | | - v ₁ |
| Ac ~ Lithology _ | ······································ | Casing Volume (gal) | Va | - 2.60 | Ign |
| Estimated Hydraulic
Conductivity | | - | | ∙ τ (0.5 d _w) ² t | |
| (gal/(day x ft ²)) | | Annular Volume (ga | J) | | <u> </u> |
| | | | - | = 0.35 ((+ (0.5 | id _b) ² b - v ₂)] |
| Borehole Diameter (in./ft | | - d ₂ | 7.48 g | 1 + 6 (v ₂ + v
al = 1 ft ²
• porosity of f | |
| Rate Vo | nulative
olume
gal) pH | Conductivity
(#mhos) | T
ීරා | Silt
(ml/l) | Color/Odor |
| | 8gAL | Day | | | CLEAR/NOM |
| RGRERA | | Dry | | | CLOUPY/NON |
| 2.0 | <u>5 gm 578</u>
689 | | 5.6 | | |
| | <u> </u> | 269
 | <u></u>
5.6 | | <u>`</u> ` <u>_</u> _ |
| Sior-rure | | Disposition of
Development Water | | | |

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ENSR Consulting and Engineering

Monitoring Well Development Record

| Job No.: 9000-036 | Job Site: | Are ous | 835-752 Date: | 12.19.94 | Beginning
Time: | 10:40 |
|---|--|-----------------|--|--------------------|--|--------------------------------------|
| Well No .: NW2 | Well Location | : <u>Bu</u> | WING 35-752 | Developers: | H. KENT, | W. WILZER |
| Likely Contaminants: | HODICI | ०ह्य रेन्ट्रा | WODES, al | GNEASE | SOLVER | <u>UTS</u> |
| Development Method: | HAND | | | | | <u></u> |
| | | | | | | |
| | | | | | | |
| Well I.D. (in./ft) | <u>8 </u> |).167 ' = dw | | | | |
| Screen Interval (ft) | | | Predevelopment Volume
(gal) = (V) | 9 | | |
| Depth to Water (ft) | 17.78' | | _ | - | | |
| Saturated Interval (ft) | 4.42' | - b | -
Water Added During Dr
Installation (gal) | (| <u>0</u> | = v ₁ |
| | | | Casing Volume (gal) | <u> </u> | - 0.968 8 | E ³ = .724 G |
| ` | | | | = v ₂ = | τ (0.5 d _w) ² b | |
| Estimated Hydraulic
Conductivity
(gal/(day x ft ²)) | | | _ Annuiar Volume (gai) | <u> ۲</u> | = 3(.7 | 24) |
| | | | | = v ₃ = | 0.35 [(7 (0.5d _b) |) ² b - v ₂)] |
| | | | | Notes: | | |
| Borenole Diameter (in./ft) | <u> </u> | <u>-667</u> - c | L | | + 6. $(v_2 + v_3)$
$u = 1 ft^3$
porosity of filter | r pack |
| Rate Vo | nulative
slume
gal) | <u>pH</u> | Conductivity
(embos) | т
(°C) | Silt
(ml/l) | Color/Odor |
| - <u></u> | <u> </u> | | time Day | | <u> </u> | · |
| | | | 1
 | | | |
| | <u> </u> | | | <u></u> | | |
| | | | | <u> </u> | | |
| | | | | | | |
| Signature | | | position of
velopment Water | | | |
|) Date | | | •• | | | |

| · | | ISR Consulting and En | gineering | | 6 |
|---|---|---|-------------------|-------------------------------|-------------------------------|
| | | nitoring Well Developm | ent Record | | •••• |
| No.: 900 036
all No.: . <u>MW 3</u>
wely Contaminants:
welopment Method: | | 35752 Date: | 12-9-94 | leginning
ime:
buy kewt | 9.15
NevDEWIZER |
| <u></u> | <u></u> | | | L | |
| | ,107 | | | | |
| | <u>/</u> | Predevelopment Volume
(gzi) = (V) | 6.7 | ~) | - 05 35 |
| pth to Water (ft)
turated Interval (ft) | <u>16.24</u>
<u>u.3</u> 2 | Water Added During Dr
Instatiation (gal) | mg/ | <u>)</u>
))b | v₁ -138
V₂= ₩€€ (|
| imated Hydraulic
Inductivity
al/(day x ft ²)) | | Annular Volume (gal) | $= v_2 = \pi (t)$ | | 2 1.26
b·v ₂)] |
| encle Diameter (in./ft) | 4.251 12= | - 4 = - 354 | 7.48 gai - | rosity of filter p | ack |
| roduction Cumu
Rate Volu
Jal/min) (ga | me | Conductivity
(amhos) | т
(СС) | Sibt | Calor/Odor |
| 25/MIN 301 | 6ml 10:35 AM. | | | (mi/l) | BILTY /LIGHT BRONT |
| 1.35 (6.24
140 (6.50
145 (6.50
16.7 | 5 <u>9.05</u>
0 <u>9.09</u>
17
17.80 | 215
194
182
Disposition of | 4.5
4.6
4.9 | 5 | NO ODOR |
| | 12.9.94 | 13 GAL | | - | |



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| Job No. <u>9000 - 036</u>
Location: <u>FTL 0 VD_B35-752</u> | Date: | - 19-94 Samplers: | <u>H ke</u> | MW 3
NT
NBERL |
|--|----------------------|---------------------------------------|-------------------|-----------------------|
| Weather Conditions: | F | | · | |
| 1. WATER LEVEL DATA: (from ToC) | 1 | | levation (from L | S) |
| a. Total Well Length (+ TC) | 22.56 (knc | wn, meas) Tape (| Corr. (TC) | |
| b. Water Table Elev. (+ TC) | 16-16' | Well D |)ia. | 0.1671 |
| c. Length of Water Column | <u>(0 - L/</u> (a-b) |) | | |
| 2. WELL PURGING DATA: | | | | |
| a. Purge Method | BAILER | | | |
| b. Required Purge Volume (@ | veil
volumes) | 3.14 g+L - | | |
| c. Field Testing: Equipment Used | | | | |
| Volume Removed T° C | pH | Spec. Cond. | | Color |
| 3.14 AL 5.3 | 8.05 | 170 | | |
| <u> </u> | 7.69 | 172 | | |
| <u> </u> | 7.57 | 172 | | |
| ······································ | | | _ <u>·</u> | |
| 3. SAMPLE COLLECTION: Method | HAND | BAILER | | |
| Container Type | Pres | servation | Requir | ed EPA Test Method |
| 1 e Amoon GLASS(2) | HCL | | (anzi IU) | (5.1) (3510/8100M |
| 40 NE VOA VIALS (6) | HCL | | | 015)(8260) |
| 12 ANBER (12A55 (3) | NONE | <u></u> | $(2510/8)^{-1}$ | 3)(<u>8080</u>)(815 |
| | +INO-2 | | (3050/ | <u>καια</u> |
| | | | <u></u> _/ | |
| Comments: | | | | |
| | <u></u> | | | |
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Groundwater Water Sample Collection Record

OUD 0025809

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| | | | | | Well No. | MW | 2 |
|-----------------------------|----------|------------------|----------------|-----------|---------------|-------------|--|
| JOB NO. 9000 - 036 | | Date: | 2.20.94 | Samplers: | H . | Kent | |
| Location: | ····· |
Time:S | | | W. | WILBER | ~ |
| | | F F | | | | | |
| Weather Conditions: | | | | · | | | |
| 1. WATER LEVEL DATA: (from | ToC) | | | ToC E | levation (fro | om LS) | |
| a. Total Well Length (+ TC) | - | 2 <u>2.38'</u> | (known, meas.) | Tape | Corr. (TC) | | <u>.</u> |
| b. Water Table Elev. (+ TC) | | 17.86 | 1 | Well D |)ia. | | |
| c. Length of Water Column | | <u>4.52'</u> | (a-b) | | | | |
| 2. WELL PURGING DATA: | .1 | | | | | | |
| a. Purge Method | HAND | DAIL | ER_ | | | | <u>· · · · ·</u> |
| b. Required Purge Volume (| @ | well
volumes) | 2.22 | GAL | | | |
| c. Field Testing: Equipmen | t Used | | | | • • | | · · · · · · · · · · · · · · · · · · · |
| Jume Removed | ۳ | рН | Spec | Cond. | | | Color (|
| 1.2 apr | | | Drug | | | SANA | No oper |
| 0.8 GAL | | | Druf_ | | · · · · · · | | |
| 1.0 atr | 37 | 6.88 | Dry | 207 | | SUGHTY | CLOUDY NO DOC |
| 0 | 4.0 | 6.93 | | 210 | | | |
| | 4.2 | 6-90 | | 211 | | ۲ | |
| 3. SAMPLE COLLECTION: | Method | | | | | | |
| Container Type | | | Preservation | | R | equired EPA | Test Method |
| 1 & Amaon Grass (| (2) | Hec | _ | | (907 | 1/418.1 |)(3510/8100m) |
| 40 Ml VOA VIALS | | He | | | (5030 | 1801571 | 8260) |
| Le AMBOR GLASS | | po | NE | | (3510/8 | 270)(35 | 570/8080) (8150) |
| HOPE () | ••• | H | 20 | | | 10/1001 | |
| Comments: | | | | | . <u>.</u> . | | |
| .~ | <u>_</u> | | | | · · · | <u>.</u> | (|
| | · | | | | | | ······································ |
| | | | | | | | |
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| Job No. <u>9000 - 036</u>
Location: <u>FIR OUD B35-752-</u> | Date:/2 -
Time: S
F | <u> 20.94</u> Samplers: | Well No.
 | AP 2982
KENT
WILBER |
|--|----------------------------|----------------------------------|---------------------|--|
| Weather Conditions: | | | | |
| 1. WATER LEVEL DATA: (from ToC) | I | ToC E | levation (fr | om LS) |
| a. Total Well Length (+ TC) | <u>7538</u> (kno | wn, meas.) Tape | Corr. (TC) | <u> </u> |
| b. Water Table Elev. (+ TC) | 17.881 | Weil D |)ia. | |
| c. Length of Water Column | 7.5' (a-b) | | | |
| 2. WELL PURGING DATA: | _ | | | |
| a. Purge Method |) BAILER | | | |
| b. Required Purge Volume (@ | well
volumes) | 3.68 gAL | | |
| c. Field Testing: Equipment Used | | | | ······································ |
| Volume Removed T° 3.68 5.7 5.9 6.0 | рн
7.85
7.69
7.75 | Spec. Cond.
203
202
201 | | Color
SUGHT OCON, NOT PETRUC
OLANDE PARTICLES
OLANDE FLO ATIVE ON T |
| 3. SAMPLE COLLECTION: Method
Container Type | | servation | | Required EPA Test Method |
| | | | | |
| 1 l Amaon Grand (2) | <u> </u> | <u> </u> | (<u>907</u> | 1/418.1) (3510/8100 M |
| 40 ML VOA VIALS (6) | Hei | | (<u>503</u> | 0/8015) (8260) |
| 1 & AMBER GLASS(3) | Non | | | 10/62:70)(3510/8080)(8 |
| HOPE (1) | HNO. | <u> </u> | (| 3050/6010) |
| Comments: AFTOL DAMPLING | : <u> </u> | 7.61 | <u>Covo.</u>
179 | |
| ~ | 5.2 | 7.25 | 185 | |
| | 6.0 | 7.10 | 188 | |

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| | | | v | Vell No. AP | 2987 |
|---------------------------------------|---------------------|------------|------------|------------------|---------------------|
| JOB NO. 9000 · 036 | Date: 12- | 20.94 | Samplers: | H. KENT | <u>0707</u> |
| Location: PTIL ON B35-752 | | <u> </u> | | 6. Wirs | |
| | – <u>– – –</u>
F | | | | |
| Weather Conditions: | | · · · | | | |
| 1. WATER LEVEL DATA: (from ToC) | 1 | | ToC Elev | vation (from LS) | |
| a. Total Well Length (+ TC) | 20.46 (know | wn, meas.) | Tape Co | rr. (TC) | |
| b. Water Table Eiev. (+ TC) | 15.921 | | Well Dia. | | 0.167' |
| c. Length of Water Column | <u>4.54'</u> (a-b) | | | | |
| 2. WELL PURGING DATA: | | | | | |
| a. Purge Method | NO BAILE | n | | | |
| b. Required Purge Volume (@ | weli
volumes) | 2.23 | <u></u> | | _ |
| c. Field Testing: Equipment Used | | | ·) | | |
| olume Removed T° | pH | | Cond. | | Color |
| 2.2351- 4.5 | 7.4
7.25 | 71
R | <u>\</u> | CCOUX
HyDrocu | LEON WOM |
| 5.3 | 7.15 . | 20 | <u>-+</u> | | <u></u> |
| | 6.61 | |
7- | | <u> </u> |
| <u>>. %</u> | 6.64 | 711 | · | <u> </u> | |
| <u> </u> | <u>_v_</u> . | | | | |
| 3. SAMPLE COLLECTION: Method | | | | | |
| Container Type | Pres | ervation | <u> </u> | Required E | PA Test Method |
| 12 Ambor Gurss (2) | the | | | (9071/4/8.1) | (3570/8100 m) |
| 40 ml VOA VIAús (6) | HCL | | | (5030/8012 | - / |
| I & AMBER GLASS (3) | NONE | | | | 3 (3510/8080) 8150) |
| HOPE (1) | HNOZ | | | (3050/6 | |
| | | _ | | | · · · · · |
| Comments: | | | | | |
| ~~~~~~ | | | | | |
| | | | - <u>-</u> | | <u> </u> |
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| | | | Well No. AP 2983 |
|---------------------------------------|---------------------------|------------------|---------------------------------------|
| JOB NO. 9000 - 030 | Date: 2 | 2094 Samplers: | N. Kens |
| | | | W. WILBER |
| <u>1 (1 - 0 - () - (</u> | <u> </u> | · <u>·</u> ···· | |
| Weather Conditions: | | | · |
| 1. WATER LEVEL DATA: (from | ToC) | ToC | Elevation (from LS) |
| a. Total Well Length (+ TC) | | | Corr. (TC) |
| b. Water Table Elev. (+ TC) | 18.441 | Well | Dia. |
| c. Length of Water Column | <u>(0.58</u> ' (a- |) | |
| 2. WELL PURGING DATA: | | | |
| a. Purge Method | HAND BA | ILER | |
| b. Required Purge Volume (| @ well
volumes) | <u>3.23 g</u> AL | |
| c. Field Testing: Equipment | Used | | |
| | | | |
| Volume Removed | Т°рН | Spec. Cond. | Color |
| 2 . | 4.4 (0.60 | 203 | |
| <u> </u> | <u>4.6</u>
<u>6.64</u> | 703 | |
| | 4.6 <u>6.55</u> | 205 | |
| | | | |
| · · · · · · · · · · · · · · · · · · · | | | |
| 3. SAMPLE COLLECTION: | Method HAMO | BAILER | |
| | | | |
| Container Type | Pr | eservation | Required EPA Test Method |
| 1 l AmBon Gerso | (2) H | L | (9071/418.1 (3570/8KOM) |
| 40 Mil VOA VIALS (| (b) <u>H</u> | | (530/8015) (8260) |
| Il AMBOR GRASS | | NE | (3510/8270) (3570/8080) 2 |
| | I) HN | 0-3 | (30-20/6010) |
| Comments: AFTER | SAUPLINES T | e DH | Cons. |
| | 4.4 | | 203 |
| | <u> </u> | | 204 |
| • | <u> </u> | | 207 |
| | | | · · · · · · · · · · · · · · · · · · · |
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| | | Well NoMW (|
|----------------------------------|-----------------------|---|
| JOB NO. <u>9000 - 036</u> | Date: 12-21-94 Sample | ers: <u>H-KENST</u> |
| Location: AR OWD 335.752 | Time:S | W- WILDER |
| | F | |
| Weather Conditions: | | |
| 1. WATER LEVEL DATA: (from ToC) | т | oC Elevation (from LS) |
| a. Total Well Length (+ TC) | 22.16 (known, neas) T | ape Corr. (TC) |
| b. Water Table Elev. (+ TC) | <u>16.68'</u> v | Vell Dia. |
| c. Length of Water Column | <u>5.48</u> (a-b) | |
| 2. WELL PURGING DATA: | | |
| a Purge Method | IN BAILOR | |
| b. Required Purge Volume (@ | volumes) No Diela No- | DONE PRIOR TO SAMPLING |
| c. Field Testing: Equipment Used | 1 | LECOVENY. |
| | | |
| olume Removed T | | Color |
| | | (|
| · | | · |
| | <u> </u> | |
| | | |
| · | <u> </u> | |
| | | |
| 3. SAMPLE COLLECTION: Method | d | |
| Container Type | Preservation | Required EPA Test Method |
| | HCL | $\left(\frac{1}{2} + \frac{1}{2} + \frac{1}{2} \right) \left(\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} \right)$ |
| Il AMBER GLASS (2) _ | | (9671/418.1)(3570)(8100m) |
| 40 M. R. VOA VIALS (6) | HCL | $- \frac{(3)30/815)(8260)}{(3)}$ |
| 1 l Amar Grass (3) | NONE | (3510/8270)(3510/80F0)(81S |
| <u> </u> | HNO-3 | (3050/6010) |
| | | |
| Comments: | | |
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| Job No. <u>900-636</u>
Location: <u>FTR WD B35-75</u> | | 1.94 Samplers: | Well No. <u>AP</u>
<u>H. Keni</u>
<u>10 - Wil</u> | 7986
T
Bon_ |
|--|---|--|---|-------------------|
| | F | | · | |
| Weather Conditions: | | | | · |
| 1. WATER LEVEL DATA: (from ToC) | 20.46 (known | | Elevation (from LS) | |
| a. Total Well Length (+ TC) | 15-13' | , meas.) Tape
Well | Corr. (TC) | 7/12/ |
| b. Water Table Elev. (+ TC) | | AAGU | Ula | 0.1671 |
| c. Length of Water Column | <u>3.33'</u> (a-b) | | | |
| 2. WELL PURGING DATA: | 11 - 7 | \sim | | |
| a. Purge Method | HAND BAIL | <u>د ،ر</u> | | ······ |
| b, Required Purge Volume (@ | veli
volumes) | 2.62 gAL | | |
| c. Field Testing: Equipment Used | | | | |
| Volume Removed T°
2.55KL (2.1
5.5
5.4
5.3 | <u><u></u><u></u><u><u></u><u><u></u><u></u><u><u></u><u></u><u></u><u><u></u><u>7.78</u></u>
<u>7.78</u>
<u>7.41</u>
<u>7.33</u></u></u></u></u> | Spec. Cond.
183
183
187
187
183 | | Color |
| 3. SAMPLE COLLECTION: Me | thod HANN | BAILER | • | |
| Container Type | Presen | vation | Required | EPA Test Method |
| 12 AMBOR GLASS (Z) | Ha | _ | (9071/418.) | (3510) (81001 |
| 40 ML VOA VIALS (6) | He | <u> </u> | | 015)(8260) |
| 1 l AMBOR (JEADS= (3) | NON | x | (3510/8 | 270 (3570/808 |
| HOPE (1) | HADO | 2 | (3050/ | 6010) |
| Comments: <u>AFTER SAM</u> | ants: T | ć ptt. | Cono | 2 |
| 1.1.00 | <u>4.8</u> | | 173 | |
| ······································ | 5.7 | | 175 | |
| | | | | |
| | 5.7 | . 7.03 | 17-4 | |

Building 35-752: Survey Elevation Data for Monitoring Wells.

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ENSR requested resurveying of monitoring well elevations at Building 35-752. The COE (Jerry Zuspan) completed this resurvey on August 4, 1995. The results of this survey are to replace elevation data provided in previous reports and on the original boring logs and monitoring well completion diagrams. Compiled by Stephen Wing, August 8, 1995.

| Well No. | Description | Depth
(feet) |
|----------|--|--------------------------------------|
| AP 2982 | Top of PVC
Top of Casing ¹
Ground at Well | 263.61
264.96
262.5 |
| AP 2987 | Top of PVC (New)
Top of Casing ¹
Ground at Well ²
Joint at PVC ³ | 261.75
262.66
260.3
261.39 |
| AP 3232 | Top of PVC
Top of Casing ¹
Ground at Well ² | 259.79
260.72
257.6 |
| AP 2985 | Top of PVC
Top of Casing ¹
Ground at Well ² | 259.54
259.85
257.35 |
| AP 2984 | Top of PVC (New)
Top of Casing ¹
Ground at Well ²
Joint at PVC ³ | 261.80
261.90
260.05
261.44 |
| AP 2986 | Top of PVC (New)
Top of Casing ¹
Ground at Well ²
Joint at PVC ³ | 260.98
261.23
259.3
260.62 |
| AP 2983 | Top of PVC
Top of Casing ¹
Ground at Well ² | 264.24
264.55
263.0 |
| AP 3502 | Top of PVC
Top of Casing ¹
Ground at Well ² | 261.05
261.40
261.3 |

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| Well No. | Description | Depth
(feet) |
|----------|---|---------------------------|
| AP 3503 | Top of PVC
Top of Casing ¹
Ground at Well ² | 263.66
263.88
260.9 |
| AP 3504 | Top of PVC
Top of Casing ¹
Ground at Well ² | 261.54
261.67
261.6 |
| AP 3231 | Top of PVC
Top of Casing ¹
Ground at Well ² | 265.62
266.07
262.8 |

Building 35-752: Survey Elevation Data for Monitoring Wells (Cont'd).

¹ With well cover open.

² Average ground elevation at well.

³ 4.32 inches of PVC piping has been added to the original PVC piping. This elevation is to the PVC joint without the additional PVC piping added.

Building 35-752

Page 2 of 2

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Building 35-752: Monitoring Well Measurements to Groundwater.

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Conducted by Merlin Peterson, COE, August 7, 1995; faxed to ENSR August 8, 1995.

| Well No. | Date | Time | Top of PVC
to Groundwater
(feet) | Notes |
|----------|--------|-------|--|-------|
| AP 2982 | 8/7/95 | 11:37 | 13.28 | |
| AP 2987 | 8/7/95 | 11:40 | 11.12 | |
| AP 3232 | 8/7/95 | 11:44 | 9.24 | |
| AP 2985 | 8/7/95 | 11:48 | 8.67 | |
| AP 2986 | 8/7/95 | 11:54 | 10.29 | |
| AP 2984 | 8/7/95 | 11:59 | 10.24 | |
| AP 2983 | 8/7/95 | 12:03 | 13.19 | |
| AP 3502 | 8/7/95 | 12:06 | 11.16 | |
| AP 3503 | 8/7/95 | 12:10 | 13.92 | |
| AP 3504 | 8/7/95 | 12:15 | 12.18 | |
| AP 3231 | 8/7/95 | 12:21 | 14.94 | |

| Well | Top of
PVC ¹ | Terminal
Depth | 8/7/95
DTW | Lithologic
Contacts | 8/7/95
SWL |
|---------|----------------------------|-------------------|---------------|--------------------------------|---------------|
| AP 3502 | +261.05 | 22.5 | 11.16 | SM → 9, SP → 22 | +249.89 |
| AP 3504 | +261.54 | 24 | 12.18 | GW → 2, SM → 6, SW → 24 | +249.36 |
| AP 3503 | +263.66 | 19.0 | 13.92 | GW → 2, SM → 6, SW → 19 | +249.74 |
| AP 2982 | +263.61 | 24.6 | 13.28 | GC → 7.5, GW/GM → | +250.33 |
| AP 2983 | +264.24 | 24.0 | 13.19 | GP/GW → 17, SP → 24 | +251.05 |
| AP 2987 | +261.75 | 19.1 | 11.12 | GP/GM/GW → 12.5, SP → 19 | +250.63 |
| AP 3232 | + 259.79 | 16.5 | 9.24 | ML → 4.5, SP → 14.5, ML → 16.5 | +250.55 |
| AP 2985 | +259.54 | 14.3 | 8.67 | GW → 7.5, SP → 14 | +250.87 |
| AP 2986 | +260.98 | 19.0 | 10.29 | GW/GM → 19 | +250.69 |
| AP 2984 | +261.80 | 19.0 | 10.24 | ML → 7.5, GW → 19 | +251.56 |
| AP 3231 | +265.62 | 21.5 | 14.94 | GP → 5, GM → 20 | +250.68 |

Building 35-752: August 7, 1995, Monitoring Well Sounding Summary.

DTW = Depth to water. SWL = Static water level. Notes:

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Top of PVC elevations: Jerry Zaspan, COE, 8/4/95. DTW measurements: Merlin Peterson, COE, 8/7/95. 2



DEPARTMENT OF THE ARMY NORTH PACIFIC DIVISION LABORATORY CORPS OF ENGINEERS 1491 N.W. GRAHAM AVENUE TROUTDALE, OREGON 97060-9503

February 15, 1995

Wende Wilber/Steve Wing ENSR Consulting and Engineering 4600 Business Park Blvd., Suite 22 Anchorage, Alaska 99503-7143

1. Enclosed is report of mechanical analysis for 17 soil samples submitted from the Ft. Richardson OUD-Bldg 35-752 project sampled by ENSR Engineering and Consulting from 2 through 11 November 1994. Included are:

a) Enclosure 1, Summary of Water Content and Soil Classification.

b) Enclosures 2 through 18, Report of Particle Size Analysis and Classification Tests, one for each sample submitted.

2. Samples tested by Braun Intertec Northwest, Portland, Oregon.

3. This completes all physical analysis requested to date for this project.

Sincerely,

Enclosures

JAMES K. HINDS, PE Deputy Director North Pacific Division Laboratory

CENPD-ET-PL (95-016)

FT. RICHARDSON OUD - BLDG 35-752 Ft. Richardson, Alaska

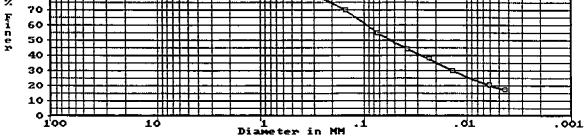
Summary of Water Content and Soil Classification

| Sample Id. | | Water | Soil
Classification | Frost
Classification | |
|------------|------|------------|------------------------|-------------------------|--|
| Location | No. | Content, % | ASTM D-2487 | TM5-818-2 | |
| | | _ | | | |
| 94-5752 | 19SL | 13.7 | ML | F4 | |
| | 22SL | 4.9 | GW | S1 · | |
| | 24SL | 1.2 | GP | PFS | |
| | 25SL | 2.0 | GW | PFS | |
| | 27SL | 14.1 | GM | F3 | |
| | 30SL | 4.2 | GP | S1 | |
| | 38SL | 6.9 | SW-SM | F2 | |
| | 39SL | 5.1 | SP-SM | S2 | |
| | 40SL | 6.2 | GP-GM | F1 | |
| | 77SL | 7.8 | GP-GM | S1 | |
| | 78SL | 5.2 | SP-SM | S2 | |
| | 79SL | 4.6 | GW | S1 | |
| | 80SL | 6.5 | GW | S1 | |
| | 83SL | 19.0 | SM | F4 | |
| | 85SL | 11.0 | GW-GM | S1 | |
| | 88SL | 4.9 | GP-GM | S1 | |
| | 89SL | 1.7 | GP-GM | S1 | |

North Pacific Division Laboratory nos. 5078, 5083, 5085 and 5090. Samples received 4 through 21 November 1994.

* * * CORPS OF ENGINEERS - NORTH PACIFIC DIVISION LABORATORY * * * OUD 0025821 FT. RICHARDSON OUD - BLDG 35-752 95-016

| | | Boring: | 94-5752 | Sample: 1951 | . Deptl | h: Lab N | o.: 016001 | | |
|--|---|------------------------------------|---|--------------|----------------|---|-------------------|--------------------------------------|--|
| (| | eve Analysi
Cumulative
Grams | Percent | Sample | Weight
Temp | Hydrometer A
t:98.89 gr.
Hydrometer | Start
Diameter | Time:0000 | |
| | Sieve | Retained | | Time | | Reading | | Finer | |
| | 3 In.
2 In.
1.5 In.
1 In.
3/4 In.
1/2 In.
3/8 In.
No. 4
No. 10
Pan
No. 16
No. 30
No. 50
No. 100
No. 100
No. 200 | 0.00
0.00
0.00 | 100.0
100.0
98.4
97.7
94.7
93.0
89.9
86.4
0.0
84.5
82.1 | | | 50.9
43.4
34.4
23.1
19.7 | | 44.4
38.0
30.2
20.4
17.5 | |
| | Pan | 98.89 | 0.0 | | | | | | |
| | D85: 1.36 D60: .092 D50: .054 D30: .014 mm
Liquid Limit: NP Plasticity Index: NP
Fines Type Used for Classification: ML, SILT
Gravel: 10.1% Sand: 34.6% Fines: 55.3% | | | | | | | | |
| | | | | ML Sandy | SILT | | | | |
| i | ` | | | | | | | | |
| | | ·- - | TM 5-8 | 18-2 Frost C | lassifi | ication | | | |
| Percent finer than 0.02 mm: 35.6 Frost Classification: F4
WATER CONTENT=13.7% | | | | | | | | | |
| | | . | | . | | | | | |
| | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | | |



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* * * CORPS OF ENGINEERS ~ NORTH PACIFIC DIVISION LABORATORY * * *

FT. RICHARDSON OUD - BLDG 35-752 95-016 . Boring: 94-5752 Sample: 22SL Depth: -- Lab No.: 016002 ----- Hydrometer Analysis ----------- Sieve Analysis ------Cumulative Sample Weight: 99.88 gr. Start Time:0000 Grams Percent Temp Hydrometer Diameter Percent (C)^{*} Reading in mm Sieve Retained Passing Time Finer _____ -----**----**--------------_ _ _ _ _

 3
 20.0
 13.6

 10
 20.0
 11.1

 100
 20.0
 8.1

 200
 20.0
 6.6

 0.0290 0.0161 0.0067 3 In. 0.00 100.0 3.9 2 In. 1.5 In. 0.00 100.0 3.2 194.60 95.5 2.4 1 In. 579.20 86.5 0.0048 2.0 3/4 In. 1/2 In. 79.3 887.60 1553.20 63.8 3/8 In. 1824.60 57.4 No. 4 No. 10 2452.90 42.8 3081.60 28.1 Pan 4284.90 0.0 No. 16 No. 30 No. 50 No. 100 16.32 23.5 40.80 65.08 78.18 16.6 9.8 6.1 No. 200 83.70 99.88 4.5 Pan 0.0 D85: 23.8 D60: 10.8 D50: 6.76 D30: 2.29 D15: 0.51 D10: 0.30 mm Cu: 35.6 Cc: 1.60 Liquid Limit: NP Plasticity Index: NP Fines Type Used for Classification: ML, SILT Gravel: 57.2% Sand: 38.3% Fines: 4.5% --------- ASTM D 2487 Classification -------GW Well-graded GRAVEL with sand ----- TM 5-818-2 Frost Classification ------Percent finer than 0.02 mm: 3.5 Frost Classification: S1 -WATER CONTENT=4.9% -COULD NOT TAKE 1 MIN. HYDRO. READING DUE TO EXCESSIVE FOAMING OF SAMPLE . _ _ . Sieve 3" 2" <u>Sieve numbers</u> 20 40 100 200 <u>sizes</u> 1" 0.5" 10 4 100 ╂╬╢╢ ┟╋╋╋╋╋ 90 80 z 70 Fices 60 **|| | | | | | | |** ╫╫╂╂ 50 40 **│**│ │ │ │ │ │ │ │ 30 ┥┥╧┼┤ 20 10 0 1'00 10 .1 . Ø1 . obi 1 Diameter in MM