Cleanup Action Plan
Kwang Property
Lakewood Station
Lakewood, Washington

January 24, 2006

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21-1-12180-007

TABLE OF CONTENTS

Page

LIST OF TABLES

Table No.

LIST OF FIGURES

Figure No.

CLEANUP ACTION PLAN
KWANG PROPERTY
LAKEWOOD STATION
LAKEWOOD, WASHINGTON

1.0 INTRODUCTION

1.1 Purpose

This Cleanup Action Plan (CAP) has been prepared on behalf of Sound Transit to provide guidance on cleanup, sampling and analysis, and disposal of contaminated soils at the Kwang property, located at 11536 and 11538 Pacific Highway SW, in Lakewood, Washington (Figure 1). The purpose of this plan is to assist Sound Transit in obtaining site closure with respect to environmental concerns identified in previous environmental investigations of the subject property, and will become a reference document to the project specifications. This property is located within the proposed Lakewood Station footprint (Figure 2).

1.2 Scope

This plan was developed in accordance with the Model Toxics Control Act (MTCA) requirements for cleanup actions and cleanup action plans. The objectives of this plan are to summarize the site history; describe site conditions, including the nature and extent of contamination encountered during previous environmental investigations; and describe proposed cleanup actions and cleanup/remediation levels for the property. This plan was prepared for submittal to, and discussions with, the Washington State Department of Ecology (Ecology). The goals of this plan are to perform appropriate cleanup actions under the guidance of Ecology (through the Voluntary Cleanup Program), and to obtain a No Further Action (NFA) designation from Ecology with respect to known contamination.

2.0 BACKGROUND INFORMATION

2.1 Subject Property

The Kwang property was historically occupied by a feed and fuel business as early as 1959. Since 1969 and to about early 2004, auto-related businesses (used car sales, auto wrecking, towing, repair) have occupied the property (Shannon & Wilson, Inc., 2004). The permit to

construct the existing building on site is dated 1963; up to five buildings were previously observed on the site in historic aerial photographs (URS, 2003a). The site has apparently always been unpaved.

Currently, the property is developed with a gravel-covered lot and metal-sided building, enclosed by a fence (Figure 3). The existing 100-foot-wide railroad right-of-way (ROW) and tracks are located adjacent to the north of the property. The property and adjacent parcels south of the railroad tracks are zoned commercial. Properties on the opposite side of the railroad ROW are a mix of commercial, residential, and multi-unit apartment buildings.

2.2 Area History

The Lakeview line of the Northern Pacific Railway was constructed in 1873. The railroad was used primarily to transport people and goods through the Western Washington corridor. Outside of the Tacoma city limits, development along the rail corridor was sparse until the 1950s and 1960s, when commercial businesses began developing land in Lakewood. This development was limited primarily to areas adjoining main arterials including Lakeview Avenue SW, Pacific Highway South, and Union Avenue SW. Residential developments filled in vacant land between these main arterials.

3.0 PROPOSED SITE DEVELOPMENT

The Kwang property is the southernmost parcel within the Lakewood Station footprint (Figure 2). The station footprint, from south to north, is comprised of the Kwang, Lakeview Auto, and Sweeting properties, and is approximately 1,250 feet in the north-south direction and 120 feet in the east-west direction. The site is bounded by Pacific Highway SW to the east, Sound Transit railroad ROW to the west, Burlington Northern Santa Fe Railway (BNSF) ROW to the north, and private property to the south (Figures 1 and 2). The Lakewood Station will serve as the south terminus of the Sounder Commuter Rail system (KPFF, 2005), and will be multi-modal, serving express bus, train, and local bus service along Pacific Highway SW. The facility will also include a structured parking lot, at the northern end of the station, which will serve as a park-and-ride. The long, narrow site will be laid out with the transit center at the south end of the site, including bus and train platforms, as well as a pull-out bus stop along Pacific Highway SW. To the north of the transit center, a pedestrian plaza will serve as a transition between the transit center and the parking garage. Fencing and signage will be placed on the

opposite (north) side of the tracks to discourage pedestrians from crossing the tracks and accessing the station from the north.

Specific development on the Kwang property will primarily be the transit center (Figure 2). The property will be paved with sidewalks and thick concrete slabs to support pedestrian and bus traffic. A stormwater infiltration gallery (approximately 7 feet below ground surface [bgs]) is proposed at the southern end of the property, and will be covered by minor landscaping. Limited plantings (trees and shrub beds) are proposed within the transit platform center.

Station construction will generally require demolition of existing buildings, clearing and grubbing (where applicable), and site excavation. Site excavation is expected to be limited to minor grading, excavation for garage footings and slabs-on-grade, utility installation, and excavation for the stormwater infiltration galleries.

4.0 SUBSURFACE SITE CONDITIONS

4.1 Soil

Test pits excavated at the Kwang property generally encountered about 1 foot of slightly silty to silty, gravelly sand, grading to dense, slightly silty to clean, sandy gravel with occasional to numerous cobbles (Steilacoom Gravel) to about 5 feet bgs (Shannon & Wilson, Inc., 2006). Moderate soil staining was observed in the upper 6 to 18 inches. Site borings generally encountered similar material down to 20 feet bgs (URS, 2003b).

4.2 Groundwater

Groundwater flow directions are typically westward or northwestward toward Puget Sound. However, local variations in groundwater flow direction are common, especially where groundwater pumping has disrupted the natural flow direction. In some cases, the groundwater flow in the upper aquifer has been reported to vary by 360 degrees, depending on the season and the status of nearby groundwater extraction. Previous site borings encountered groundwater between 15 to 18.5 feet bgs in May 2003 (URS, 2003b). No groundwater was encountered in recent test pits.

5.0 ENVIRONMENTAL CONDITIONS

Soil and groundwater sampling was conducted by URS (2003b) to evaluate the recognized environmental conditions (RECs) identified in their Phase I Environmental Site Assessment (2003a). Soil contamination was encountered during this study. Additional sampling was conducted in October/November 2005 to supplement previous data, and to evaluate the extent of site contamination (Shannon & Wilson, Inc., 2006). The analytical results from the recent study are summarized in Tables 1 through 3. For comparison purposes, the tables also include the MTCA Method A industrial cleanup criteria for each analyte (where available), and low to moderate, areawide metals concentrations (Ross and Associates, 2003). The analytical results from the 2003 study are provided as Tables 3-1 through 3-7. Sample locations and contaminant concentrations exceeding industrial cleanup criteria detected during both sampling events are presented in Figure 3.

5.1 Documented Area of Contamination

Soil contamination was encountered on site in 2003 and 2005. This contamination appears to be limited to the upper 6 to 12 inches of surficial dark brown/black soil, with the exception of KW-3 (Figure 3), where contamination extends to 18 inches but not as deep as 36 inches bgs. The contamination, likely caused by local surface releases, appears to be limited in nature. This contaminated soil will be encountered during site excavation to support station development.

Soil contaminants above cleanup levels included oil-range petroleum hydrocarbons, ranging from 2,000 to 8,100 milligrams per kilogram (mg/kg); and benzene at 0.082 mg/kg. The cleanup level for lube oil-range petroleum hydrocarbons is 2,000 mg/kg; the cleanup level for benzene is 0.03 mg/kg.

5.2 Contaminants of Potential Concern

Based on previous site data (historical site use and sampling), the following contaminants of concern in soil have been identified at the site.

- Petroleum hydrocarbons (lube oil-range)
- Benzene
- Metals (cadmium)

No contaminants of potential concern were detected in groundwater.

6.0 SELECTION OF CLEANUP/REMEDIATION LEVELS

This section outlines the points of compliance and site-specific standards that will be applied in cleanup. These standards consider future site development and all likely exposure pathways. They are protective of both humans and the environment.

6.1 Points of Compliance

For source-area soil cleanup, the point of compliance is assumed to be the entire site, in accordance with the MTCA cleanup regulation (Ecology, 2001). Currently, no groundwater contamination has been identified. However, if applicable, the point of compliance for cleanup of groundwater is assumed to be at the downgradient property boundary because future use or contact with on-site shallow groundwater is very unlikely.

6.2 Cleanup Criteria

MTCA Method A industrial cleanup criteria have been selected for use at the Kwang property. Additionally, the property appears to be an areawide metals-contaminated site because of its location (smelter fallout is documented in Lakewood), and the presence of smelter-related metals in surface soils, specifically arsenic, cadmium, and lead. Current results indicate no impacts to groundwater have occurred, but in the event cleanup is required, MTCA Method A criteria is selected for groundwater.

The rationale for selecting industrial cleanup criteria and a discussion of areawide contamination are provided below.

6.2.1 Model Toxics Control Act Method A Industrial Cleanup Criteria

To qualify as an industrial site, the property must meet the criteria outlined in Washington Administrative Code (WAC) 173-340-745 (Ecology, 2001). These criteria include:

- Does the site meet the definition of an industrial property?
- Will the proposed cleanup action limit potential exposure?
- Will hazardous substances remaining at the property pose a threat to human health or the environment or in adjacent non-industrial areas?

Based on our understanding of the regulations, "industrial" site use is based on an adult worker scenario. Proposed site development will meet an adult worker scenario, in that people

will not live on the property; access is to the general public will be limited in part by the adjacent railroad (innate caution associated with railroad tracks), and anticipated use of the property (short term periods waiting for transportation); no food is, or will be, grown on the property; the property may be characterized by noise and traffic (transit, rail); and lastly, the property surface will mostly be covered by buildings and paved access roads.

The second criterion involves limiting potential exposure to contaminants that may remain, if any, following remedial action. The long-term use or ownership of the property is not expected to change, therefore, if required, Sound Transit can place a covenant on the property restricting site use.

Lastly, any residual contamination that could remain at the property should not pose a threat to human health or the environment. The potential for access is limited by the railroad corridor and proposed fencing and signage. As a result of station construction, the direct soil contact pathway is incomplete based on placement of transit roads and platforms. Contaminants of concern (oil-range hydrocarbons) are not volatile (benzene contamination is expected to be completely removed); therefore, an air pathway is not complete. Groundwater apparently is not contaminated, and soil contamination appears limited to no deeper than about 36 inches bgs. Therefore, there does not appear to be a potential for groundwater to become contaminated, or for on- to off-site contaminant migration.

In the event differing conditions are encountered during construction, institutional controls will be installed to prevent future contact. Additionally, groundwater monitoring may be performed to evaluate the potential for off-site impacts. These institutional controls/post-construction items are discussed in Sections 8.0 and 9.0. Long-term use of the property is not expected to change.

This site qualifies as an industrial property; the three criteria have been met.

6.2.2 Areawide Soil Contamination

In many areas of Washington State, surficial soils have low-to-moderate levels of arsenic and lead due to historical emissions from metal smelters located in Tacoma, Harbor Island, Everett, Northport, and Trail, British Columbia. The Departments of Agriculture, Ecology, and

Health, and the Office of Community Development decided to examine the issues and concerns associated with arsenic and lead, and formed the Areawide Soil Contamination Task Force.

A report was completed by the task force in 2003 and presented to the four agencies (Ross and Associates, 2003). The report indicates that for properties where exposure of children is less likely or less frequent, such as commercial properties, parks, and camps, arsenic concentrations of up to 200 mg/kg, and lead concentrations of up to 700 to 1,000 mg/kg are within the low-to-moderate range of detected concentrations. The range of possible actions to address this contamination includes land-use controls, physical barriers, and contamination reduction. The report further states that "For commercial properties potentially affected by areawide soil contamination, the Task Force recommends that where commercial areas are covered with surfaces such as buildings, parking lots, or other effective soil cover, no further response actions are necessary to address areawide soil contamination."

An additional footprint study to evaluate the magnitude and spatial extent of soil contamination was conducted for western Pierce County (north and west of Interstate 5) (Glass, 2004). In Pierce County, lead was detected up to 6,670 mg/kg; arsenic was also found up to 1,050 mg/kg.

Prior to formation of the task force, a study was performed on Vashon/Maury Island to examine metals in soil downwind from the Tacoma smelter (Public Health – Seattle & King County [PHSKC], 2000). The report indicated that "Screening-level exposure and risk analyses have generally shown arsenic, lead, and cadmium to be the principal concerns for possible human health threats." During the course of the study, PHSKC decided to reduce cadmium analyses during the study based on the observed maximum magnitude and relatively high frequency of non-detect values. The maximum detected concentration of cadmium was 15 mg/kg. So although cadmium may not be present at levels as elevated as arsenic and lead, cadmium is a metal associated with smelter fallout.

For station development, areawide metals contamination will be addressed with land-use controls, physical barriers, and if needed, contamination reduction (see Section 9.0, Institutional Controls). Land-use controls may include zoning, permits and licenses, covenants, easements, deed and plat notices, and real estate disclosure. Physical barriers will include fences, vegetation, grass cover, wood chips, clean soil cover, geotextile fabric barriers, and/or pavement. Contamination reduction may include soil blending or tilling.

6.3 Discussion

At the Kwang property, no arsenic was detected; however, cadmium was detected between 0.81 and 6.1 mg/kg, exceeding its MTCA Method A cleanup criterion of 2 mg/kg. Lead was detected between 11 and 770 mg/kg. Some lead detections exceed residential cleanup criteria, but all are below industrial cleanup criteria. Both cadmium and lead were detected below the maximum concentrations measured on Vashon Island and in Pierce County (PHSKC, 2000; Glass, 2004). Based on the location of the property, the shallow depth of the detections, and the data collected to support areawide contamination studies, it is very likely that the metals are associated with smelter fallout. Therefore, metals-contaminated soil (above residential criteria) will be handled as areawide metals contamination, with land-use controls, physical barriers, and/or contamination reduction.

7.0 INITIAL REMEDIAL ACTIVITIES

Proposed cleanup actions, as required, will occur in phases:

- Excavation
- Capping and In Situ Remediation (if needed)
- Monitoring (if needed)

The initial step (excavation) is discussed below. Additional remedial actions, if warranted based on field conditions, are discussed in Section 8.0. No deep soil or groundwater contamination has been detected, so excavation is likely to be all that is required. However, additional actions are presented to provide contingencies so that station construction will not experience potential delays by remedial activities.

7.1 General Remedial Approach

Excavation will be required to support construction, and contamination appears to be limited to surface soil. Therefore excavation is the selected method for remediation. Based on the contaminants of concern, the cleanup criteria selected, and areawide metals contamination, petroleum is the primary contaminant of concern.

An effort will be made to excavate contaminated soil until proposed cleanup levels are achieved. However, contaminated soil may be left in place because of field conditions (proximity to City or railroad ROW, significant depth of contamination, depth to groundwater, significant

groundwater contamination). Residual contamination, if any, will be addressed by monitoring or another remedial measure, such as capping, blending, and/or in situ bioremediation.

7.2 Site Excavation

Contaminated soil will be excavated and removed from the property; excavation depth is expected to range between 1 and 3 feet bgs (Figure 4). An effort will be made to excavate contaminated soil until proposed cleanup levels are achieved. Observation tasks include determining the horizontal and vertical limits of the contamination through field screening and confirmation sampling. Petroleum hydrocarbon contamination is anticipated to be cleaned up to concentrations below the MTCA Method A cleanup levels for industrial use.

Once the limits of the contamination have been reached, based on field screening or requirements for construction, confirmation samples will be collected by the Owner's Representative. A minimum of five samples will be collected from the excavation, one from each sidewall (or one per 100 lineal feet of excavation), and one from the excavation floor. In addition, approximately one sample will be collected for every 200 square feet of excavation. Sample results will be used to evaluate remaining conditions and determine if contaminated soils above cleanup criteria remain in the ground. Excavations will remain open until receipt of analytical results. Samples will be tested for petroleum by Method Northwest Total Petroleum Hydrocarbons as Diesel-Extended (NWTPH-Dx), as gasoline with benzene, toluene, ethylbenzene, and xylenes (BTEX) distinction (NWTPH-Gx/BTEX), polynuclear aromatic hydrocarbons (PAHs) (U.S. Environmental Protection Agency [EPA] 8270C/SIM); and arsenic, cadmium, and lead (EPA 6010B/7471A). Sample testing will be conducted at a frequency to support construction activities.

If all soil with contaminant concentrations above industrial cleanup criteria is removed based on confirmation sample analytical results, construction of the proposed station will begin. If sampling results indicate that contaminated material remains, the residual contamination will be addressed as discussed in Section 8.0.

7.3 Soil Disposal

Soil that exceeds industrial cleanup criteria will be disposed of offsite at a permitted treatment facility or landfill. The Contractor will be responsible for collecting soil samples for chemical analysis to determine disposal options. Treatment or disposal options will depend on levels of

contamination found. Petroleum-contaminated soil, even at concentrations below MTCA cleanup criteria, may require additional sampling and thermal treatment or disposal at a landfill that is permitted to accept petroleum-contaminated soil. Disposal of soil containing metals at concentrations above the MTCA cleanup criteria will require coordination with a qualified, designated facility.

8.0 SECONDARY REMEDIAL ACTIVITIES

In addition to petroleum, surface soil is likely to contain carcinogenic PAHs and metals concentrations below industrial criteria, but above residential criteria. If this impacted soil is not removed during initial remedial activities and remains on site based on confirmation sampling, additional action (capping and/or blending) will be required. Additionally, contamination may extend off the property and cannot be addressed by excavation, or field conditions (i.e., deep contamination, utilities) may not allow for complete removal of on-site contamination. If so, secondary remedial actions may be required to meet cleanup levels and groundwater monitoring may also be necessary. The following sections describe procedures that will be followed only if residual contamination remains.

8.1 Soil Preparation

Pre-remedial test results indicate that carcinogenic PAHs and metals were detected in surface soil. Excavation to accomplish site development will remove the majority of this soil, but some may remain. If this soil remains, regulations require the soil be capped to prevent exposure (Ecology, 2001), or addressed with land-use controls, physical barriers, and if needed, contamination reduction (Ross & Associates, 2003). Land-use controls (see Section 9.0) may include zoning, permits and licenses, covenants, easements, deed and plat notices, and real estate disclosure. Physical barriers may include fences, vegetation, grass cover, wood chips, clean soil cover, geotextile fabric barriers, and/or pavement. Contamination reduction may include soil blending or tilling. The majority of the property will be paved as part of site development, reducing the majority of potential exposure. Therefore, minimal action is expected to be required. Any additional soil preparation action will be selected based on actual site conditions, and discussions with Sound Transit and Ecology.

8.2 Groundwater Remediation

Based on existing data, metals, petroleum, and carcinogenic PAHs have been detected in site soil. Metals and PAHs are not likely to migrate to groundwater because generally they are not soluble and like to bind to organics. Therefore, petroleum remains as the contaminant that could impact groundwater. If significant petroleum contamination is found to extend deeper than excavation to accomplish station construction, groundwater will be evaluated.

If groundwater if found to be contaminated, in situ bioremediation, or other appropriate method, will be the proposed remediation method to treat soil and groundwater. Bioremediation may consist of the injection of bacteria that removes petroleum hydrocarbons, or the installation of oxygen release compound (ORC) "socks" within monitoring wells. Installation and operation of an in situ bioremediation system, if necessary, will occur concurrent with or soon after site development. The system will be designed based on conditions after excavation; therefore, specifics are not stated here. In situ bioremediation will likely occur for a period of two months. Closure sampling (soil and groundwater) will be conducted at the end of the two-month period.

8.3 Monitoring Well Installation

If in situ bioremediation is required, three groundwater monitoring wells will be installed on site or within the City or railroad ROW adjacent to the property. The wells will be installed to monitor groundwater flow direction, to collect data to ensure that cleanup criteria are being met, to evaluate effectiveness of in situ bioremediation, if performed, and to act as points-of-compliance. These monitoring wells may be installed as part of the remediation phase. Soil sampling will be conducted during the installation of the wells; water sampling will occur immediately thereafter.

Monitoring wells will be 2-inch-diameter, polyvinyl chloride (PVC) pipe and screened across the water table. Four-inch monitoring wells may be installed to facilitate the use of ORC socks if bioremediation is warranted.

8.4 Groundwater Monitoring

Based on confirmation sampling conducted, several rounds of groundwater monitoring may be appropriate. For this plan, groundwater sampling on a quarterly basis for one year is proposed.

Groundwater samples will be analyzed for petroleum only, unless other contaminants of concern are determined during site remediation work.

9.0 INSTITUTIONAL CONTROLS

Institutional controls will be required where industrial soil cleanup levels are established and contaminant concentrations are present greater than residential criteria, to limit or prohibit activities that may interfere with the integrity of the remedial action. Institutional controls will be determined based on actual conditions encountered during construction. However, for review purposes, institutional controls may include: physical measures such as fences, a physical cap (clean soil, pavement, geotextile fabric); use restrictions; and/or maintenance requirements. Because of Sound Transit's anticipated use of the property, the likelihood of site conditions changing is minimal.

10.0 HEALTH AND SAFETY

Worker health and safety is governed by the Occupational Safety and Health Administration (OSHA) Title 29 Labor Part 1910 regulations and Washington Labor and Industries (L&I). The Contractor will be required to prepare a Site-Specific Health and Safety Plan (SSHSP) that will include sections on anticipated work conditions, exposure assessment, personal protective equipment (PPE), air monitoring requirements, emergency procedures, and notification requirements. Prior to starting the field investigation, all Contractor personnel will be required to read and understand the SSHSP. The Contractor will be responsible for identifying the proper health and safety requirements at the work sites and properly implementing them.

11.0 DOCUMENTATION

11.1 Voluntary Cleanup Report

Following completion of site remediation (excavation, capping and/or blending, and/or installation of the in situ bioremediation system and groundwater monitoring wells [if necessary]), a Voluntary Cleanup Report will be prepared to summarize remedial actions conducted on the property. The report will describe and depict soil removal areas; present confirmation sampling results; document off-site disposal of soil and groundwater, if any; and

indicate compliance with cleanup standards. The cleanup report will be submitted to Ecology for review under the Voluntary Cleanup Program. If contamination extends onto City or railroad property, the report should also be issued to the City for their files.

11.2 Groundwater Monitoring Reports

Currently, no groundwater contamination has been identified. In the event groundwater needs to be evaluated, brief groundwater monitoring reports will be prepared after receipt of analytical results following each quarterly monitoring event. The report will summarize analytical results, field observations, and recommendations, if any. The reports will be issued to Ecology for their information. The City should also receive a copy if contamination extends into the City ROW, or if wells are located within the ROW.

12.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The Contractor, analytical laboratory, and personnel responsible for completing site remediation are to be determined. Tasks will include mobilization of equipment, contaminated soil excavation and disposal, groundwater removal and disposal of contaminated (if applicable), and preparation of submittals for obtaining required site permits. The analytical laboratory will be responsible for the completing chemical analyses of the environmental samples collected from the site. Personnel collecting samples will be required to adhere to this CAP.

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TABLE 1
PETROLEUM, BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND METALS ANALYTICAL RESULTS
KWANG PROPERTY

Sample ID	Petroleum							Metals					TCLP
	Gasoline	Diesel	Oil	Benzene	Toluene	Ethyl benzene	Xylenes	Arsenic	Cadmium	Chromium	Lead	Mercury	Lead
KW-1	ND	ND	**170**	ND	ND	ND	ND	ND	**1.6**	**14**	**50**	ND	--
KW-1-1	--	**64**	**380**	--	--	--	--	--	**3.3**	--	**380**	--	--
KW-1-1.5	--	--	--	--	--	--	--	--	ND	--	**32**	--	--
KW-2	**53**	ND	**2,000**	**0.082**	**0.36**	**0.52**	**2.22**	ND	**3.5**	**14**	**230**	ND	ND
KW-2-1	ND	**52**	**520**	ND	ND	ND	ND	--	**0.81**	--	--	--	--
KW-2-1.5	--	--	--	--	--	--	--	--	--	--	--	--	--
KW-3	ND	ND	**8,100**	ND	ND	ND	ND	ND	**3.2**	**13**	**260**	ND	ND
KW-3-1	--	**410**	**2,800**	--	--	--	--	--	**6.1**	--	**770**	--	**1.8**
KW-3-18	--	ND	**2,900**	--	--	--	--	--	**3.9**	--	**480**	--	--
KW-3-3	--	ND	**120**	--	--	--	--	--	ND	--	**31**	--	--
KW-4	ND	ND	**130**	ND	ND	ND	ND	ND	**1.0**	**12**	**100**	ND	--
KW-5	ND	ND	**4,500**	ND	ND	ND	ND	ND	**2.4**	**15**	**280**	ND	**0.47**
KW-5-1	--	ND	ND	--	--	--	--	--	ND	--	ND	--	--
KW-5-1.5	--	--	--	--	--	--	--	--	--	--	--	--	--
KW-6 *	ND	ND	**6,700**	ND	ND	ND	ND	ND	**3.9**	**14**	**310**	ND	**0.35**
MTCA Method A Industrial Land Use	100	2,000	2,000	0.03	7	6	9	20	2	2,000[1]	1,000	2	--
Areawide Metals Concentrations (Low to Moderate)	--	--	--	--	--	--	--	up to 200	--	--	700 - 1,000	--	--
Dangerous Waste Criteria (mg/L)	--	--	--	--	--	--	--	--	--	--	--	--	5.0

[1] Cleanup criterion for chromium III.

* KW-6 is a duplicate of sample KW-3.

mg/kg - milligrams per kilogram

mg/L = milligrams per liter

MTCA = Washington Model Toxics Control Act

ND = Not Detected

TCLP = Toxicity Characteristic Leachate Procedure

Sample results measured in mg/kg, except TCLP results, which are reported in mg/L.

Shading indicates concentration exceeds MTCA industrial cleanup criterion.

See Tables 2 and 3 for a summary of detected polynuclear aromatic hydrocarbons (PAHs).

TABLE 2
POLYNUCLEAR AROMATIC HYDROCARBON ANALYTICAL RESULTS
KWANG PROPERTY

Sample ID	Naphtha-lene	2-Methyl naph-thalene	1-Methyl naph-thalene	Acenap-thylene	Acenap-thene	Fluorene	Phenan-threne	Anthra-cene	Fluoran-thene	Pyrene	*Carcinogenic PAHs*							Benzo [g,h,i] perylene	SVOCs[3] (cPAHs)
											Benzo [a] anthra-cene	*Chrysene*	*Benzo [b] fluoran-thene*	*Benzo [k] fluoran-thene*	*Benzo [a] pyrene*	*Indeno (1,2,3-c,d) pyrene*	*Dibenz [a,h] anthracene*		
KW-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.011	0.02
KW-2	0.084	0.11	0.065	0.060	ND	ND	0.12	0.052	0.51	1.4	0.29	0.45	0.96	0.25	0.82	0.64	0.13	1.0	1.09
KW-2-1	ND	ND	ND	0.0096	ND	ND	0.014	ND	0.056	0.088	0.033	0.040	0.075	0.022	0.067	0.069	0.012	0.11	0.09
KW-3	0.014	0.031	0.021	ND	ND	ND	0.016	ND	0.015	0.030	ND	0.0093	0.021	ND	0.014	0.0084	ND	0.016	0.02
KW-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0078	ND	ND	0.0083	ND	ND	ND	ND	0.0095	0.01
KW-5	ND	0.010	ND	ND	ND	ND	0.012	ND	0.019	0.025	ND	0.023	0.030	ND	0.012	0.018	ND	0.030	0.02
KW-6 *	0.011	0.025	0.017	ND	ND	ND	0.013	ND	0.019	0.037	ND	0.011	0.010	0.0083	0.012	0.0086	ND	0.017	0.02
MTCA Method A Industrial Land Use	5 [2]	5 [2]	5 [2]	***	***	***	***	***	***	***	See cPAHs				2	See cPAHs		***	2 [1]

[1] Sum of the toxic equivalency factor (TEF) for each carcinogenic polynuclear aromatic hydrocarbon (cPAH).

[2] Total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.

[3] See Table 3 for TEF calculations.

* KW-6 is a duplicate of sample KW-3.

*** No MTCA Method A cleanup criterion is established for this analyte.

cPAHs = carcinogenic polynuclear aromatic hydrocarbons

MTCA = Washington Model Toxics Control Act

ND = not detected

SVOCs = semi-volatile organic compounds

Soil sample results reported in milligrams per kilogram (mg/kg).

TABLE 3 SHANNON & WILSON, INC.

TOXICITY EQUIVALENCY FACTOR ADJUSTED POLYNUCLEAR AROMATIC HYDROCARBON CONCENTRATIONS KWANG PROPERTY

ADJUSTED TEF CONCENTRATION FOR SAMPLE KW-1

Analyte	Result for Sample KW-1 (mg/kg)	Method Detection Limit (mg/kg)	1/2 Method Detection Limit	Toxic Equivalency Factor	Adjusted Concentration[a] (mg/kg)
Benzo(a)anthracene	ND	0.0084	0.0042	0.1	0.00084
Chrysene	ND	0.0084	0.0042	0.01	0.000084
Benzo(b)fluoranthene	ND	0.0084	0.0042	0.1	0.00084
Benzo(k)fluoranthene	ND	0.0084	0.0042	0.1	0.00084
Benzo(a)pyrene	ND	0.0084	0.0042	1	0.0084
Indeno(1,2,3-c,d)pyrene	ND	0.0084	0.0042	0.1	0.00084
Dibenz(a,h)anthracene	ND	0.0084	0.0042	0.4	0.00336
Sum [b]					**0.02**
MTCA Method A Cleanup Level for Industrial Land Use					2.000

ADJUSTED TEF CONCENTRATION FOR SAMPLE KW-2

Analyte	Result for Sample KW-2 (mg/kg)	Method Detection Limit (mg/kg)	1/2 Method Detection Limit	Toxic Equivalency Factor	Adjusted Concentration[a] (mg/kg)
Benzo(a)anthracene	0.29	0.039	0.0195	0.1	0.029
Chrysene	0.45	0.039	0.0195	0.01	0.0045
Benzo(b)fluoranthene	0.96	0.039	0.0195	0.1	0.096
Benzo(k)fluoranthene	0.25	0.039	0.0195	0.1	0.025
Benzo(a)pyrene	0.82	0.039	0.0195	1	0.82
Indeno(1,2,3-c,d)pyrene	0.64	0.039	0.0195	0.1	0.064
Dibenz(a,h)anthracene	0.13	0.039	0.0195	0.4	0.052
Sum [b]					**1.09**
MTCA Method A Cleanup Level for Industrial Land Use					2.000

ADJUSTED TEF CONCENTRATION FOR SAMPLE KW-2-1

Analyte	Result for Sample KW-2 (mg/kg)	Method Detection Limit (mg/kg)	1/2 Method Detection Limit	Toxic Equivalency Factor	Adjusted Concentration[a] (mg/kg)
Benzo(a)anthracene	0.033	0.0091	0.00455	0.1	0.0033
Chrysene	0.040	0.0091	0.00455	0.01	0.0004
Benzo(b)fluoranthene	0.075	0.0091	0.00455	0.1	0.0075
Benzo(k)fluoranthene	0.022	0.0091	0.00455	0.1	0.0022
Benzo(a)pyrene	0.067	0.0091	0.00455	1	0.067
Indeno(1,2,3-c,d)pyrene	0.069	0.0091	0.00455	0.1	0.0069
Dibenz(a,h)anthracene	0.012	0.0091	0.00455	0.4	0.0048
Sum [b]					**0.09**
MTCA Method A Cleanup Level for Industrial Land Use					2.000

TABLE 3 SHANNON & WILSON, INC.

TOXICITY EQUIVALENCY FACTOR ADJUSTED POLYNUCLEAR AROMATIC HYDROCARBON CONCENTRATIONS KWANG PROPERTY

ADJUSTED TEF CONCENTRATION FOR SAMPLE KW-3

Analyte	Result for Sample KW-3 (mg/kg)	Method Detection Limit (mg/kg)	1/2 Method Detection Limit	Toxic Equivalency Factor	Adjusted Concentration[a] (mg/kg)
Benzo(a)anthracene	ND	0.0078	0.0039	0.1	0.00078
Chrysene	0.0093	0.0078	0.0039	0.01	0.000093
Benzo(b)fluoranthene	0.021	0.0078	0.0039	0.1	0.0021
Benzo(k)fluoranthene	ND	0.0078	0.0039	0.1	0.00078
Benzo(a)pyrene	0.014	0.0078	0.0039	1	0.014
Indeno(1,2,3-c,d)pyrene	0.0084	0.0078	0.0039	0.1	0.00084
Dibenz(a,h)anthracene	ND	0.0078	0.0039	0.4	0.00312
Sum [b]					**0.02**
MTCA Method A Cleanup Level for Industrial Land Use					2.000

ADJUSTED TEF CONCENTRATION FOR SAMPLE KW-4

Analyte	Result for Sample KW-4 (mg/kg)	Method Detection Limit (mg/kg)	1/2 Method Detection Limit	Toxic Equivalency Factor	Adjusted Concentration[a] (mg/kg)
Benzo(a)anthracene	ND	0.0073	0.00365	0.1	0.00073
Chrysene	ND	0.0073	0.00365	0.01	0.000073
Benzo(b)fluoranthene	0.0083	0.0073	0.00365	0.1	0.00083
Benzo(k)fluoranthene	ND	0.0073	0.00365	0.1	0.00073
Benzo(a)pyrene	ND	0.0073	0.00365	1	0.0073
Indeno(1,2,3-c,d)pyrene	ND	0.0073	0.00365	0.1	0.00073
Dibenz(a,h)anthracene	ND	0.0073	0.00365	0.4	0.00292
Sum [b]					**0.01**
MTCA Method A Cleanup Level for Industrial Land Use					2.000

ADJUSTED TEF CONCENTRATION FOR SAMPLE KW-5

Analyte	Result for Sample KW-5 (mg/kg)	Method Detection Limit (mg/kg)	1/2 Method Detection Limit	Toxic Equivalency Factor	Adjusted Concentration[a] (mg/kg)
Benzo(a)anthracene	ND	0.0075	0.00375	0.1	0.00075
Chrysene	0.023	0.0075	0.00375	0.01	0.00023
Benzo(b)fluoranthene	0.03	0.0075	0.00375	0.1	0.003
Benzo(k)fluoranthene	ND	0.0075	0.00375	0.1	0.00075
Benzo(a)pyrene	0.012	0.0075	0.00375	1	0.012
Indeno(1,2,3-c,d)pyrene	0.018	0.0075	0.00375	0.1	0.0018
Dibenz(a,h)anthracene	ND	0.0075	0.00375	0.4	0.003
Sum [b]					**0.02**
MTCA Method A Cleanup Level for Industrial Land Use					2.000

TABLE 3
TOXICITY EQUIVALENCY FACTOR ADJUSTED POLYNUCLEAR AROMATIC HYDROCARBON CONCENTRATIONS
KWANG PROPERTY

ADJUSTED TEF CONCENTRATION FOR SAMPLE KW-6

Analyte	Result for Sample KW-6 (mg/kg)	Method Detection Limit (mg/kg)	1/2 Method Detection Limit	Toxic Equivalency Factor	Adjusted Concentration[a] (mg/kg)
Benzo(a)anthracene	ND	0.0077	0.00385	0.1	0.00077
Chrysene	0.011	0.0077	0.00385	0.01	0.00011
Benzo(b)fluoranthene	0.01	0.0077	0.00385	0.1	0.001
Benzo(k)fluoranthene	0.0083	0.0077	0.00385	0.1	0.00083
Benzo(a)pyrene	0.012	0.0077	0.00385	1	0.012
Indeno(1,2,3-c,d)pyrene	0.0086	0.0077	0.00385	0.1	0.00086
Dibenz(a,h)anthracene	ND	0.0077	0.00385	0.4	0.00308
Sum [b]					**0.02**
MTCA Method A Cleanup Level for Industrial Land Use					2.000

[a] Calculated as the detected concentration times the TEF,
or as the method detection limit (if analyte is not detected) times the TEF.

[b] Sum of the TEF-adjusted carcinogenic PAHs.

MTCA = Washington Model Toxics Control Act

ND = not detected

PAHs = polynuclear aromatic hydrocarbons

TEF = toxicity equivalency factor

Results are reported in milligrams per kilogram (mg/kg).

Table 3-1
Soil and Groundwater Sampling Rational

Boring Number	Rationale For Boring	Depth (ft)[a]	Analyses Performed
KWSB-1	To assess soil and groundwater conditions in the location of stained soil adjacent to 55-gallon drums.	0.5	Total petroluem hydrocarbons (diesel, gasoline, and oil-range) and BTEX
KWSB-2	To assess soil and groundwater conditions in the location of stained soil adjacent to diesel AST.	0.5	Total petroluem hydrocarbons (diesel, gasoline, and oil-range) and BTEX
		3	
		8	
KWSB-3	To evaluate soil conditions from widespread surface stains evident in a historical aerial photograph.	0.5	Total petroluem hydrocarbons (diesel, gasoline, and oil-range), VOCs, and RCRA metals
		5	
		10	
		Groundwater	
KWSB-4		0.5	Total petroluem hydrocarbons (diesel, gasoline, and oil-range), VOCs, and RCRA metals
		5	
		10	
		Groundwater	

Table 3-2
Soil Sample Results for Gasoline/Diesel/Oil/BTEX

Sample ID Sample depth (ft bgs) Sample date	MTCA Industrial Cleanup Level		KWSB-1-0.5 0.5 5/14/2003	KWSB-2-0.5 0.5 5/14/2003	KWSB-2-5 5 5/14/2003	KWSB-2-8 8 5/14/2003	KWSB-3-0.5 0.5 5/9/2003	KWSB-3-5 5 5/9/2003	KWSB-3-10 10 5/9/2003	KWSB-4-0.5 0.5 5/9/2003	KWSB-4-5 5 5/9/2003	KWSB-4-10 10 5/9/2003
BTEX (mg/kg)	**Method A**	**Method B**										
Benzene	0.03	18.2	0.014 U	0.11 U	0.011 U	0.011 U	NA	NA	NA	NA	NA	NA
Toluene	7	16,000	0.068 U	0.057 U	0.053 U	0.053 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	6	8,000	0.068 U	0.057 U	0.053 U	0.053 U	NA	NA	NA	NA	NA	NA
m,p-xylene	9	160,000	0.068 U	0.057 U	0.053 U	0.053 U	NA	NA	NA	NA	NA	NA
o-xylene	9	160,000	0.068 U	0.057 U	0.053 U	0.053 U	NA	NA	NA	NA	NA	NA
TPH (mg/kg)	**MTCA Cleanup Level (Unrestricted Land Use)**											
	Method A	**Method B**										
Gasoline	100	NE	6.8 U	5.7 U	5.3 U	5.3 U	49	5.3 U	5.3 U	160	5.3 U	5.2 U
Diesel	2,000	NE	170 U	140 U	26 U	27 U	27 U	26 U	26 U	260 U	26 U	26 U
Oil	2,000	NE	**12,000**	940	53 U	53 U	**4,800**	160	53 U	**23,000**	69	52 U

U- analyte not detected above the reporting limit.
Bold- indicates that results is above the MTCA Cleanup Level
NA - Not analyzed
NE- Not established

Table 3-3
Soil Sample Results for Metals

Sample ID Sample depth (ft bgs) Sample date	MTCA Industrial Cleanup Level		KWSB3-0.5 0.5 5/9/2003	KWSB3-5 5 5/9/2003	KWSB3-10 10 5/9/2003	KWSB4-0.5 0.5 5/9/2003	KWSB4-5 5 5/9/2003	KWSB4-10 10 5/9/2003
Analyte (mg/kg)	**Method A**	**Method B**						
Arsenic	20	0.667	11 U	11 U	11 U	11 U	11 U	10 U
Barium	NE	5,600	92	63	67	63	77	74
Cadmium	2	80	**2.5**	0.53 U	0.53 U	1.1	0.53 U	0.52 U
Chromium	2,000 (Cr^{3+}), 19 (Cr6+)	120,000 (Cr^{3+})	18	16	40	15	19	22
Lead	1;000	NE	270	19	5.3 U	110	11	35
Mercury	2	24	0.27 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Selenium	NE	400	11 U	11 U	11 U	11 U	11 U	10 U
Silver	NE	400	0.54 U	0.53 U	0.53 U	0.53 U	0.53 U	0.52 U

U- analyte not detected above the reporting limit.
Bold- indicates that results is above the MTCA Cleanup Level
NE- Not established

Table 3-4
Soil Sample Results for VOCs

Sample ID Sample depth (ft bgs) Sample date	MTCA Industrial Cleanup Level		KWSB3-0.5 0.5 5/9/2003	KWSB3-5 5 5/9/2003	KWSB3-10 10 5/9/2003	KWSB4-0.5 0.5 5/9/2003	KWSB4-5 5 5/9/2003	KWSB4-10 10 5/9/2003
Analyte (mg/kg)	**Method A**	**Method B**						
1,1,1-Trichloroethane	2	72,000	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,1-Dichloroethane	NE	8,000	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,1-Dichloroethene	NE	11	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Chloroethane	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Tetrachloroethene	0.05	19.6	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Trichloroethene	0.03	90.9	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
cis-1,2-Dichloroethene	NE	800	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
trans-1,2-Dichloroethene	NE	1,600	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Vinyl chloride	NE	0.667	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Acetone	NE	8,000	0.0061 UJ	0.050 UJ	0.012 UJ	0.068 UJ	0.011 UJ	0.0084 UJ
Benzene	0.06	18.2	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Bromodichloromethane	NE	1	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Bromobenzene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Bromochloromethane	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Bromoform	NE	127	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Bromomethane	NE	112	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
2-Butanone	NE	48,000	0.0054 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0052 U
n-Butylbenzene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
sec-Butylbenzene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.13	0.0011 U	0.0010 U
tert-Butylbenzene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Carbon disulfide	NE	8,000	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Carbon tetrachloride	NE	7.69	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Chlorobenzene	NE	1,600	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
2-Chloroethylvinyl ether	NE	NE	0.0054 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0052 U
Chloroform	NE	164	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Chloromethane	NE	76.9	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
2-Chlorotoluene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
4-Chlorotoluene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Dibromochloromethane	NE	11.9	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,2-Dichlorobenzene	NE	7,200	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,3-Dichlorobenzene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,4-Dichlorobenzene	NE	41.7	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,3-Dichloropropane	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
2,2-Dichloropropane	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,1-Dichloropropene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,2-Dibromo-3-chloropropane	NE	NE	0.0054 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0052 U
1,2-Dibromoethane	NE	8,000	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Dibromomethane	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Dichlorodifluoromethane	NE	16,000	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,2-Dichloroethane	NE	8,000	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,2-Dichloropropane	NE	14.7	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
cis-1,3-Dichloropropene	NE	5.56	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
trans-1,3-Dichloropropene	NE	5.56	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Ethylbenzene	6	8,000	0.13	0.0011 U	0.0011 U	0.013	0.0011 U	0.0010 U
Hexachlorobutadiene	NE	12.8	0.0054 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0052 U
2-Hexanone	NE	NE	0.0054 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0052 U
Isopropylbenzene	NE	NE	0.0016	0.0011 U	0.0011 U	0.041	0.0011 U	0.0010 U
p-Isopropyltoluene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.16	0.0011 U	0.0010 U
Methylene chloride	0.02	133	0.0054 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0052 U
4-methyl-2-pentanone	NE	6,400	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Naphthalene	0.1	1,600	0.0011 U	0.0011 U	0.0011 U	0.025	0.0011 U	0.0010 U
n-Propylbenzene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.14	0.0011 U	0.0010 U
Styrene	NE	33.3	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,1,1,2-Tetrachloroethane	NE	38.5	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,1,2,2-Tetrachloroethane	NE	5	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Methyl Isobutyl Ketone	NE	6,400	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U

Table 3-4
Soil Sample Results for VOCs

Sample ID Sample depth (ft bgs) Sample date	MTCA Industrial Cleanup Level		KWSB3-0.5 0.5 5/9/2003	KWSB3-5 5 5/9/2003	KWSB3-10 10 5/9/2003	KWSB4-0.5 0.5 5/9/2003	KWSB4-5 5 5/9/2003	KWSB4-10 10 5/9/2003
Analyte (mg/kg)	**Method A**	**Method B**						
Toluene	7	16,000	0.0028	0.0017	0.0011 U	0.0065	0.0011 U	0.0010 U
1,2,3-Trichlorobenzene	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,2,4-Trichlorobenzene	NE	800	0.0031	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
MTBE	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,1,2-Trichloroethane	NE	17.5	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
Trichlorofluoromethane	NE	24,000	0.0011 U	0.0011 U	0.0011 U	0.0017	0.0011 U	0.0010 U
Trichlorotrifluoromethane	NE	NE	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U
1,2,4-Trimethylbenzene	NE	NE	0.0011 U	0.0011 U	0.0011 U	1.2	0.0011 U	0.0010 U
1,3,5-trimethylbenzene	NE	NE	0.0051	0.0011 U	0.0011 U	2.6	0.0011 U	0.0010 U
Vinyl acetate	NE	80,000	0.0054 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0052 U
m,p-Xylenes	9	160,000	0.25	0.0035	0.0021 U	0.11	0.0021 U	0.021 U
Total Xylenes	9	160,000	0.63	0.0017	0.0011 U	0.74	0.0011 U	0.0010 U

U- analyte not detected above the reporting limit.
J- results is estimated
Bold- indicates that results is above the MTCA Cleanup Level
NE- Not established

Table 3-5
Groundwater Sample Results for Gasoline/Diesel/Oil

Sample ID Sample date	MTCA Cleanup Level		KWSB-3-GW 5/9/2003	KWSB-4-GW 5/9/2003
TPH (ug/L)				
Gasoline Range	800 / 1,000*	NE	100 U	100 U
Diesel Range	500	NE	0.26 U	0.26 U
Heavy Oil Range	500	NE	0.41 U	0.41 U

Notes:

U- analyte not detected above the reporting limit.

NE- Not Established

Bold- indicates that results is above the MTCA Cleanup Level

*If benzene is present, cleanup level is 800 ug/L. If there is no detectable benzene, cleanup level is 1,000 ug/L

Table 3-6
Groundwater Sample Results for VOCs

Sample ID Sample date	MTCA Industrial Cleanup Level		KWSB-3-GW 5/9/2003	KWSB-4-GW 5/9/2003
Analyte (ug/L)	**Method A**	**Method B**		
1,1,1-Trichloroethane	200	7,200	0.20 U	0.20 U
1,1-Dichloroethane	NE	800	0.20 U	0.20 U
1,1-Dichloroethene	NE	0.0729	0.20 U	0.20 U
Chloroethane	NE	NE	0.20 U	0.20 U
Tetrachloroethene	5	0.858	0.20 U	0.20 U
Trichloroethene	5	3.98	0.20 U	0.20 U
cis-1,2-Dichloroethene	NE	80	0.20 U	0.20 U
trans-1,2-Dichloroethene	NE	160	0.20 U	0.20 U
Vinyl chloride	0.2	0.0292	0.20 U	0.20 U
Acetone	NE	800	5.0 U	5.0 U
Benzene	5	0.795	0.28	0.20 U
Bromodichloromethane	NE	0.706	0.20 U	0.20 U
Bromobenzene	NE	NE	0.20 U	0.20 U
Bromochloromethane	NE	NE	0.20 U	0.20 U
Bromoform	NE	5.54	1.0 U	1.0 U
Bromomethane	NE	11.2	0.20 U	0.20 U
2-Butanone	NE	4,800	5.0 U	5.0 U
n-Butylbenzene	NE	NE	0.20 U	0.20 U
sec-Butylbenzene	NE	NE	0.20 U	0.20 U
tert-Butylbenzene	NE	NE	0.20 U	0.20 U
Carbon disulfide	NE	800	0.20 U	0.20 U
Carbon tetrachloride	NE	0.337	0.20 U	0.20 U
Chlorobenzene	NE	160	0.20 U	0.20 U
2-Chloroethylvinyl ether	NE	NE	1.0 U	1.0 U
Chloroform	NE	7.17	0.20 U	0.20 U
Chloromethane	NE	3.37	0.20 U	0.20 U
2-Chlorotoluene	NE	NE	0.20 U	0.20 U
4-Chlorotoluene	NE	NE	0.20 U	0.20 U
Dibromochloromethane	NE	0.521	2.0 U	2.0 U
1,2-Dichlorobenzene	NE	720	0.20 U	0.20 U
1,3-Dichlorobenzene	NE	NE	0.20 U	0.20 U
1,4-Dichlorobenzene	NE	1.82	0.20 U	0.20 U
1,3-Dichloropropane	NE	NE	0.20 U	0.20 U
2,2-Dichloropropane	NE	NE	0.20 U	0.20 U
1,1-Dichloropropene	NE	NE	0.20 U	0.20 U
1,2-Dibromo-3-chloropropane	NE		1.0 U	1.0 U
1,2-Dibromoethane	NE	NE	0.20 U	0.20 U
Dibromomethane	NE	NE	0.20 U	0.20 U
Dichlorodifluoromethane	NE	1,600	0.20 U	0.20 U
1,2-Dichloroethane	NE	0.481	0.20 U	0.20 U
1,2-Dichloropropane	NE	0.643	0.20 U	0.20 U
cis-1,3-Dichloropropene	NE	0.243	0.20 U	0.20 U
trans-1,3-Dichloropropene	NE	0.243	0.20 U	0.20 U
Ethylbenzene	700	800	0.20 U	0.20 U
Hexachlorobutadiene	NE	1	0.20 U	0.20 U
2-Hexanone	NE	NE	0.20 U	0.20 U
Isopropylbenzene	NE	NE	0.20 U	0.20 U
p-Isopropyltoluene	NE	NE	0.20 U	0.20 U

Table 3-6
Groundwater Sample Results for VOCs

Sample ID Sample date	MTCA Industrial Cleanup Level		KWSB-3-GW 5/9/2003	KWSB-4-GW 5/9/2003
Analyte (ug/L)	**Method A**	**Method B**		
Methylene chloride	5	5.83	1.0 U	1.0 U
4-methyl-2-pentanone	NE	640	0.20 U	0.20 U
Naphthalene	160	160	1.0 U	1.0 U
n-Propylbenzene	NE	NE	0.20 U	0.20 U
Styrene	NE	1.46	0.20 U	0.20 U
1,1,1,2-Tetrachloroethane	NE	1.68	0.20 U	0.20 U
1,1,2,2-Tetrachloroethane	NE	0.219	0.20 U	0.20 U
Toluene	1,000	1,600	0.44	0.20 U
1,2,3-Trichlorobenzene	NE	1,600	0.20 U	0.20 U
1,2,4-Trichlorobenzene	NE	80	0.20 U	0.20 U
MTBE			0.20 U	0.20 U
1,1,2-Trichloroethane	NE	0.768	0.20 U	0.20 U
Trichlorofluoromethane	NE	2,400	0.20 U	0.20 U
Trichlorotrifluoromethane	NE	NE	0.20 U	0.20 U
1,2,4-Trimethylbenzene	NE	NE	0.20 U	0.20 U
1,3,5-trimethylbenzene	NE	NE	0.20 U	0.20 U
Vinyl acetate	NE	8,000	1.0 U	1.0 U
Total Xylenes	1,000	16,000	0.20 U	0.20 U

Notes

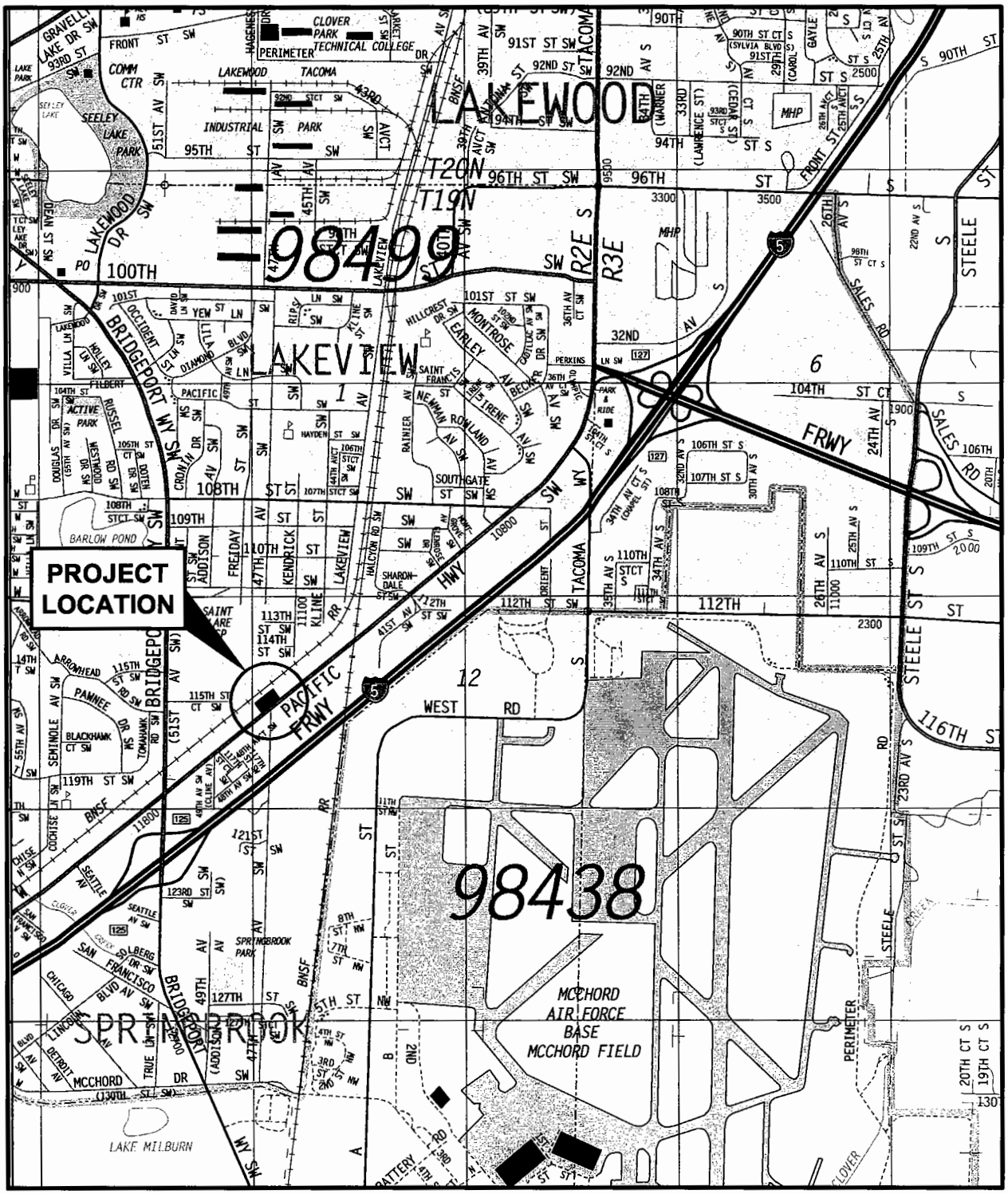
U- analyte not detected above the reporting limit.

Bold- indicates that results is above the MTCA Cleanup Level

Table 3-7
Groundwater Sample Results for Dissolved Metals

Sample ID **Sample date**	**MTCA Cleanup Level**		KWSB-3-GW 5/9/2003	KWSB-4-GW 5/9/2003
Analyte (ug/L)	**Level A**	**Level B**		
Arsenic	5	0.0583	3.0 U	3.0 U
Barium	NE	560	25 U	25 U
Cadmium	5	8	4.0 U	4.0 U
Chromium	50	24,000 (Cr^{3+})	10 U	10 U
Lead	15	NE	1.0 U	1.0 U
Mercury	2	4.8	0.5 U	0.5 U
Selenium	NE	230	5.0 U	5.0 U
Silver	NE	80	10 U	10 U

Notes:
U- analyte not detected above the reporting limit.
NE- Not Established
Bold- indicates that results is above the MTCA Cleanup Level



0 1/4 1/2 1

Scale in Miles

NOTE

Cleanup Action Plan
Kwang Property
Lakewood, Washington

VICINITY MAP

January 2006 21-1-12180-007

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FIG. 1

File: J:\21\12180-007\ST - Kwang\Cleanup Action Plan\21-1-12180-007 fig 1 (01-06).dwg Date: 01-17-2006 Author: CNT

Kwang Property

Lakeview Auto Property

Sweeting Property

PROPOSED TRANSIT CENTER

PROPOSED ABOVEGROUND PARKING GARAGE

Burlington Northern Santa Fe Railway Property

Approximate Location of Infiltration Gallery (Typ.)

Pacific Hwy SW

LEGEND

Existing Contours

Proposed Contours

Property Line

0 100 200

Scale in Feet

N

NOTE

This figure is based on drawings provided by KPFF, dated 11-21-2005 and 12-5-2005.

Cleanup Action Plan
Kwang Property
Lakewood, Washington

PROPOSED LAKEWOOD STATION DEVELOPMENT

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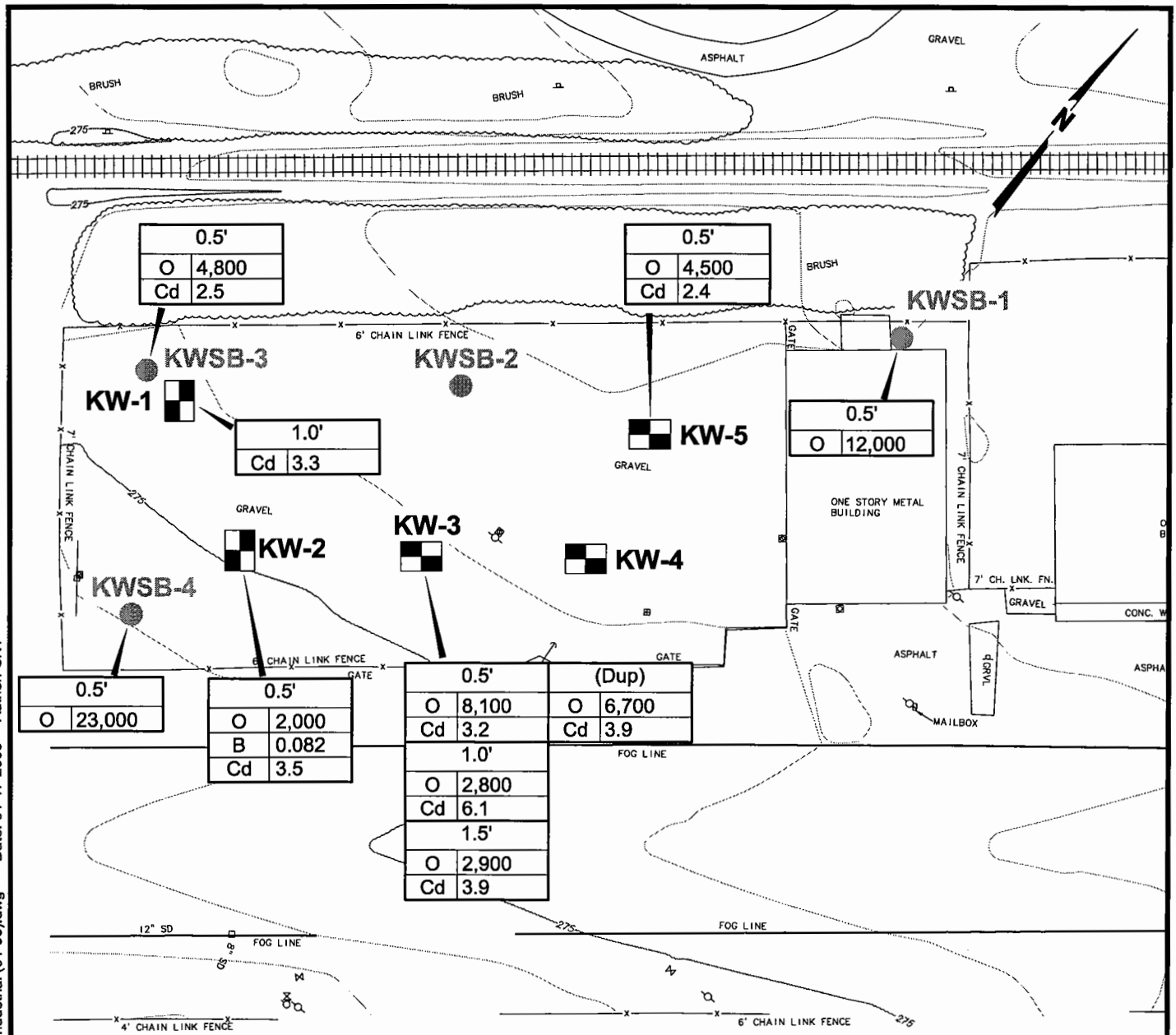
FIG. 2

File: J:\21\12180-007\ST - Kwang\Cleanup Action Plan\21-1-12180-007 fig 2 (01-06).dwg Date: 01-17-2006 Author: CNT



0 50 100

Scale in Feet

NOTES

1. This figure is based on drawings by True North, dated 10-13-2005.
2. Only contaminant concentrations exceeding cleanup criteria are shown. Concentrations are in milligrams per kilogram.

LEGEND

KW-1	Test Pit Designation and Approximate Location
KWSB-1	Boring Designation and Approximate Location (URS, 2003)
O	Oil
B	Benzene
Cd	Cadmium

Cleanup Action Plan
Kwang Property
Lakewood, Washington

ANALYTICAL RESULTS EXCEEDING INDUSTRIAL CRITERIA

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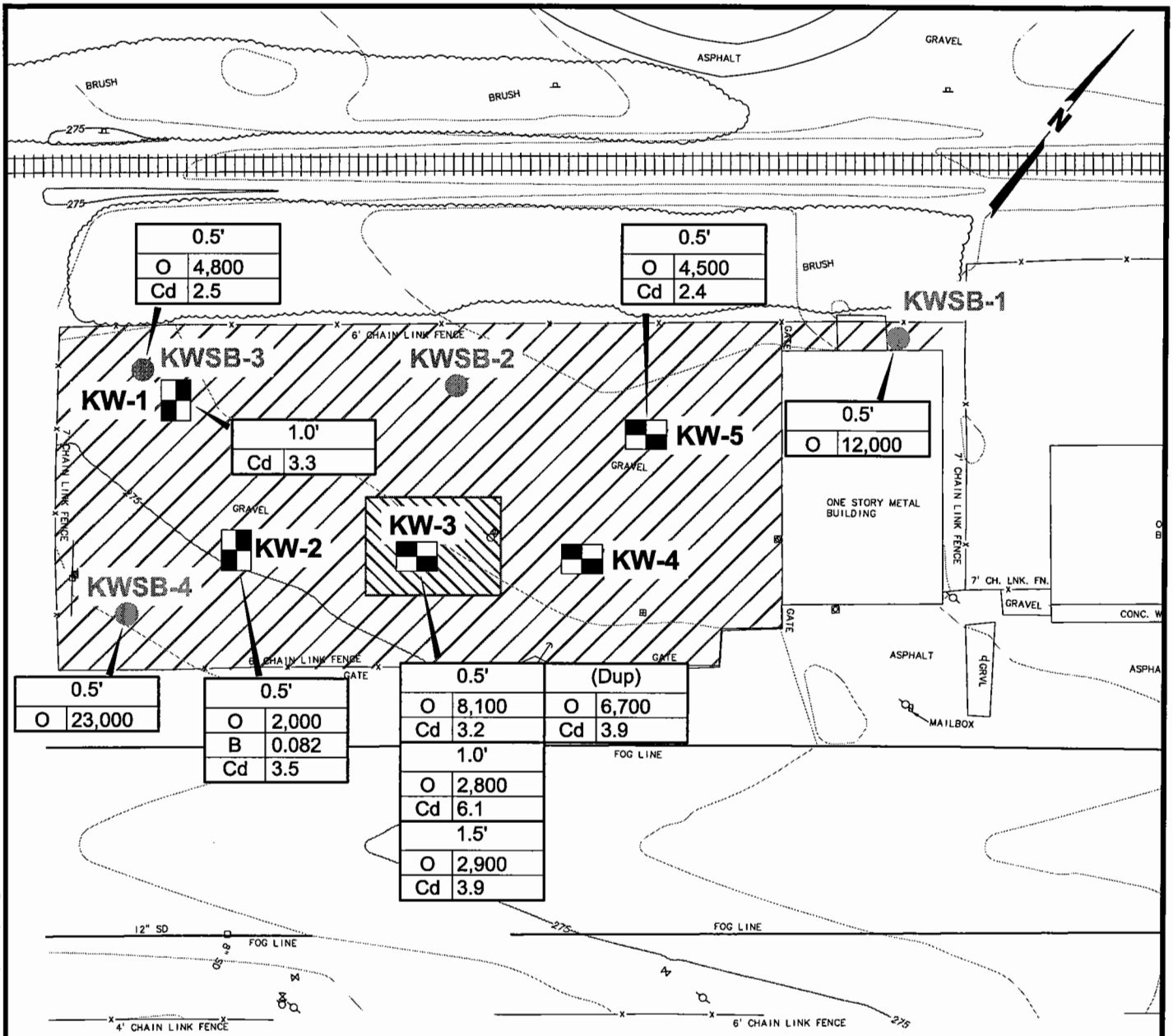
FIG. 3

File: J:\21\12180-007\ST - Kwang\Cleanup Action Plan\21-1-12180-007 fig 3 and 4-Industrial (01-06).dwg Date: 01-17-2006 Author: CNT



LEGEND

- **KW-1** — Test Pit Designation and Approximate Location
- **KWSB-1** — Boring Designation and Approximate Location (URS, 2003)
- O — Oil
- B — Benzene
- Cd — Cadmium
- Excavate to 1 Foot and Dispose of Soil Off-Site
- Excavate 1 to 3 Feet and Dispose of Soil Off-Site

NOTES

1. This figure is based on drawings by True North, dated 10-13-2005.
2. Only contaminant concentrations exceeding cleanup criteria are shown. Concentrations are in milligrams per kilogram.

Cleanup Action Plan
Kwang Property
Lakewood, Washington

REMEDIAL ACTION PLAN

January 2006 21-1-12180-007

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FIG. 4

File: J:\21\12180-007\ST - Kwang\Cleanup Action Plan\21-1-12180-007 fig 3 and 4-Industrial (01-06).dwg Date: 01-17-2006 Author: CNT