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Exponent™

Pre-Remedial Investigation Assessment Report Oregon Steel Mills, Inc. Portland, Oregon Mill

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January 2002

Doc. No. 8601526.001 0304 1201 LM19

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Acronyms and Abbreviations

AST	aboveground storage tanks
bgs	below ground surface
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAS	Columbia Analytical Services
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
COI	constituent of interest
CRBG	Columbia River Basalt Group
CRL/INV	Confirmed Release List/Inventory List
CSM	conceptual site model
DEQ	Department of Environmental Quality
DRD	direct reduction division
EAF	electric arc furnace
EPA	U.S. Environmental Protection Agency
HPAH	high molecular weight polycyclic aromatic hydrocarbon
LMF	ladle metallurgy furnace
LPAH	low molecular weight polycyclic aromatic hydrocarbon
MEK	methyl ethyl ketone
MTBE	methyl *tert*-butyl ether
NCCW	Noncontact cooling water
NGVD	National Geodetic Vertical Datum
NPDES	National Pollutant Discharge Elimination System
OSM	Oregon Steel Mills, Inc.
PA	preliminary assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCS	petroleum-contaminated soil
PID	photoionization detector
Port	Port of Portland
ppm	part per million
Pre-RI	Pre-Remedial Investigation
PRG	preliminary remediation goal
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TCLP	toxicity characteristic leaching procedure
TOC	total organic carbon
TSCA	Toxic Substances Control Act
TPH	total petroleum hydrocarbon
UST	underground storage tank
VOC	volatile organic compound
WRD	Oregon Water Resources Division

1 Introduction

1.1 Purpose of Pre-Remedial Investigation

The Pre-Remedial Investigation (Pre-RI) was undertaken in accordance with the June 14, 2000 Voluntary Agreement (No. WPMVC-NWR-00-10) between Oregon Steel Mills (OSM) and the Oregon Department of Environmental Quality (DEQ). According to the Voluntary Agreement, the purpose of the Pre-RI assessment is to determine whether further action is needed to ensure protection of present and future public health, safety, and welfare, or the environment. The original focus of the Pre-RI was to evaluate the potential for hazardous substances associated with the site to affect the Willamette River. However, the scope of the Pre-RI has been expanded to include all of the elements of a preliminary assessment (PA), as outlined by Oregon state law (ORS 465.245) and administrative rules (OAR 340-122-0072(4)). The objective of the Pre-RI assessment is, therefore, to gather and compile the information necessary to establish the presence or absence of a source or sources of hazardous substances at the OSM facility and to evaluate potential pathways for the transport of these substances to potential receptors.

To achieve this objective, the Pre-RI includes the following components:

- Compilation and evaluation of historical data regarding site use both prior to and after the purchase of the property by Gilmore Steel (now doing business as Oregon Steel Mills, Inc.) in 1967, in order to identify potential sources of constituents of interest (COIs) that may affect public health, safety, and welfare, or the environment.
- Compilation and evaluation of data regarding current site operations in order to identify potential sources of COIs that may affect public health, safety, and welfare, or the environment.
- Evaluation of potential transport pathways for identified COIs, including groundwater, surface water, air, and direct contact pathways.
- Limited sampling of soil, groundwater, riverbank sediments, and storm drain catch basin sediments to evaluate potential source areas and potential transport pathways of COIs.
- Screening of measured COI concentrations in site media against available background concentrations to determine whether those concentrations may have been elevated as a result of facility operations. COI concentrations are also screened against appropriate human health (soil) or ecological risk assessment screening (groundwater and sediment) values to provide a preliminary indication of which COIs may present risks either to human health or the environment. As directed by DEQ, both factors (exceedance of background concentrations and exceedance of risk-based criteria) will be

considered in deciding whether additional sampling and analyses may be required in the RI.

This report addresses each of these components and is submitted in fulfillment of both the Pre-RI reporting requirements and the PA information requirements.

1.2 Site Setting

This section presents brief descriptions of the physical setting, geology, and hydrogeology of the site.

1.2.1 Physical Setting

The OSM site is situated on the eastern bank of the Willamette River in the Rivergate industrial area of Portland, Oregon. The property consist of approximately 145 acres, with a physical address of 14400 Rivergate, Portland, Oregon (Figure 1). The OSM site is used for manufacturing of steel slabs, plates, and coils from scrap metal and raw materials or purchased steel slabs.

The area is generally characterized as an historic flood plain between the Willamette and Columbia Rivers and is located approximately 2 miles southwest of the confluence between the two rivers. The terrain at the site is relatively flat, with elevations between 30–35 ft National Geodetic Vertical Datum (NGVD) in the main plant and storage areas. In the northern portion of the site, elevations reach approximately 40–65 ft NGVD at the tops of two closed landfills. Several large buildings are present at the site including the melt shop, combination mill, rolling mill, storage and maintenance buildings, cut-to-length facility, oxygen plant, main substation, and administration building. Other features include the cooling pond, slab scarfing area, parking lots, and several gravel storage and staging areas. The site is mostly fenced, except along the Willamette River on the west and where railroad spurs prohibit fencing to the east. The existing site features are shown on Figure 2.

The site is surrounded by other industrial facilities including Consolidated Metco Inc. and the Rivergate Credit Union on the south; the Kinder Morgan Bulk Terminal and Port of Portland (Port) on the north; and railroad spurs directly to the east of the site. The Willamette River bounds the site on the west. Many other industrial facilities are located upstream (south) of the site, including the Time Oil Northwest Terminal and the Port's Terminal 4.

1.2.2 Geology and Hydrogeology

According to Beeson et al. (1991), two soil stratigraphic units outcrop or are found at the ground surface in this general area of north Portland: artificial fill from dredging operations; and Quaternary alluvium deposits consisting of sand, silt, and clay with subordinate gravels. The alluvium, which can reach thicknesses in excess of 100 ft, overlies conglomerates of the Miocene- to Pliocene-aged Troutdale Formation. The Columbia River Basalt Group (CRBG) volcanic deposits are present at depth underlying the Troutdale Formation.

Review of geotechnical borehole logs completed during the construction of the facility in the late 1960s indicates that 10–15 ft of fill is present in the western portion of the site (i.e., close to the Willamette River). Fill was also present to depths of 0–5 ft below ground surface (bgs) on the eastern portion of the site (Dames & Moore 1967). The fill consists of fine to medium sand, with zones of soft clayey to sandy silt. The surface fill layer is underlain by gray silty clay and clayey or sandy silt (Dames & Moore 1967).

Based on previous work at the site, three water-bearing zones have been identified: a shallow unconfined zone (0–20 ft bgs) within the fill deposits; a confined intermediate zone (20–60 ft bgs) in native fine-to-medium sands; and a confined deeper zone (60–100 ft bgs) in medium-to-coarse sands overlying the Troutdale Formation (Hart Crowser 1993). According to Hart Crowser (1993), the shallow zone is separated from the intermediate zone by discontinuous semipermeable deposits (silts and clays). Groundwater levels in the shallow water-bearing zone can be 5 ft bgs or less. Groundwater flow in the shallow and intermediate zones is toward the river (westerly); limited information exists for the deeper zone. Both the intermediate and deeper zones are influenced by tides and river stage (Hart Crowser 1993). Well records (accessed via the Oregon Water Resources Department [WRD] gridweb internet site) for deeper wells in the site vicinity (in excess of 100 ft bgs) suggest the Troutdale Formation occurs at a depth approximately 160 ft bgs or more based on the reported presence of gravel, boulders, and conglomerate.

Groundwater within the alluvial deposits and the Troutdale Formation is generally considered viable for beneficial groundwater use in the Portland area. There is limited, if any, beneficial use of groundwater within the CRBG in the site vicinity due to its depth below the surface and the readily available groundwater supply in the overlying formations.

There is no reported beneficial use of groundwater beneath the OSM property. Preliminary review of state water well records (accessed via the WRD gridweb internet site) indicates there is limited beneficial use (primarily industrial) of groundwater in the site vicinity.

1.3 Site History prior to Property Purchase

The site was purchased by Gilmore Steel Mills (now doing business as Oregon Steel Mills) from the Port in 1967. Prior to the purchase, the Port owned the property, on which an oil sump was operated from 1943 to 1960. Since the preparation of the *Pre-Remedial Investigation Historical Investigation Report* (Exponent 2001b), OSM has received documents from the Port that outline in detail the construction, operation, and eventual closure and burial of the oil sump. The summary of the oil sump history that follows is based on the reference documents that were provided by the Port and are included in Appendix A.

Figures 3a through 3f present a series of aerial photographs documenting the construction and demolition of the oil sump. Although the spatial coverage varies slightly from photograph to photograph, all six panels have been scaled similarly so that direct comparisons between the figures can be made. Between May 1944 and November 1956, the oil sump appears as a collection of one or more bermed ponds visible in the aerial photographs (Figures 3a through 3c), but is absent, apparently due to filling and regrading, in a November 1961 aerial photograph

(Figure 3d). Note that these are the same photographs included in the *Pre-Remedial Investigation Historical Investigation Report* (Exponent 2001b), except that sump area estimates have been revised to reflect total area of the sump (as opposed to the increase in sump area between successive figures, as was included in the previous report). Also, based on information contained in the documents provided by the Port, the fourth pond (the northeastern triangular area seen under construction in the 1956 photograph) is now known to have been filled in the late 1950s. This results in a revised maximum area estimate for the oil sump of approximately 250,000 ft^2. The oil sump's historical dimensions, size, and location should be considered best estimates based on the map and aerial photo information that was reviewed for this report.

In addition, Figures 3g and 3h cover a larger region and show the historical development (or lack thereof) on the portion of the OSM site north of the former oil sump. As with the remainder of the OSM site, dredged materials were deposited in the area north of the oil sump prior to 1967. No facilities or operations were known to exist on the northern portion of the site prior to its purchase in 1967.

Among the documents currently available, the earliest record of the sump is in a letter dated February 5, 1943, in which the Port granted permission to Gilpin Construction (and notes that permission had previously been granted to Standard Oil Company and Shaver Transportation Company) to deposit "bilge water carrying oil on the lands of the Port of Portland" (Port of Portland 1943). The available documents do not indicate the precise date, but some time prior to 1944, the Port granted permission (for a fee to cover maintenance charges) to the War Shipping Administration to contract with local companies to construct and operate an oil sump on what was later to become OSM property in the Rivergate district (Port of Portland 1946a). This is corroborated by a letter from the War Shipping Administration dated July 30, 1946, which states that in early 1944, the War Shipping Administration's contractor constructed a "pipe line and oil sump" (War Shipping Administration 1946).

After the end of the Second World War, Shaver Transportation Co. was interested in repairing and operating the pipe line and oil sump (Port of Portland 1946a). The War Shipping Administration agreed to turn over to the Port the pipe line and oil sump that were, at that time, in a state of disrepair, (War Shipping Administration 1946; Port of Portland 1946b). In a letter dated August 1, 1946, the Port argued that the War Shipping Administration "abandoned ... a timber trestle and pipe line. Both were in bad order ... The pipe leaked badly, thus allowing oil to discharge into the river rather than be carried into the oil sump" (Port of Portland 1946b).

On at least one occasion, overland flow of oil from the oil sump was documented. In May 1953, "the oil sump dike broke and oil flowed into the Willamette River and onto the Ledbetter (sic) land at Ramsey Lake..." (Port of Portland 1953). In a 1959 meeting, overflows from the oil sump to surrounding land were also mentioned, although specific dates were not given (Shaver 1959), and Shaver Transportation Co. continued to operate the oil sump through 1959, at which time the Oregon State Air Pollution Authority gave notice that they would not permit the burning of oil in the open sumps after January 1, 1960 (Port of Portland 1959a). Burning of oils within the oil sump was apparently the usual method of reducing the level of oil in the sump. A transcript of a discussion between Mr. Shaver, Mr. Gamlin, and representatives of the Port provides information on sump operations and types of materials deposited in the sump. Mr. Shaver indicated that "oil and water and various paint cleaning products" were transferred into

the sump. Mr. Shaver also indicated that the sump was burned to remove the oily material and that every summer it was burned down to approximately 2 ft (Shaver 1959). The transcript also records discussions of proposals to remove the oil by separating the oil from the water and recycling it. At the conclusion of the meeting, the participants agreed to try and remove as much liquid (oil and water) as possible and then bury the remaining "tar" (Shaver 1959).

Attempts to reduce the level of the sump by pumping as much oil-saturated water into ditches as possible and burning the remaining oil-enriched ponds were unsuccessful. The sump was ultimately closed by draining the water/oil/tar mixture into ditches extending radially from the oil sump ponds, and covering the material with soil (Port of Portland 1959c,d; 1960). Although the final geometry, volume, and horizontal extent of these trenches are unknown, a minimum value (calculated in October 1959 when the Port believed that only the aqueous component of the sump would need to be pumped into the trenches) was calculated at approximately 7,000,000 gal and 5,000 lineal ft of ditch (Port of Portland 1959b). By November 1961 the sump ponds and trenches had all been covered with fill (see aerial photo on Figure 3d).

1.4 Current and Historic Site Operations

This section summarizes information regarding current and historic site operations (beginning with the purchase of the property from the Port in 1967). Separate descriptions of the manufacturing process, waste identification and management, and waste water treatment and discharge operations are provided. The current site operations were evaluated through document review, site inspections, and interviews with OSM environmental staff. Operations and waste management facilities and practices were not inspected in detail.

1.4.1 Manufacturing Process

The OSM facility manufactures carbon steel slabs, coils, and plates from recycled scrap metal, raw metals, and additives. Facility operations are described and potential sources of COIs are discussed in detail in the *Oregon Steel Mills Storm Water Pollution Control Plan* (OSM 2001a). A copy of the storm water pollution control plan is provided in Appendix B for reference. Primary facilities at the site include scrap processing, a steel melt shop that includes slab casting and scarfing, plate rolling, plate coiling, surface processing, and a cut-to-length facility. Support facilities include those associated with maintenance, utilities, oxygen production, waste water treatment, slab storage, and transport of materials and products. Activities and potential hazardous materials used at these and other parts of this site are summarized in Table 1. A manufacturing process flow diagram is provided on Figure 4.

The following presents brief summaries of the activities associated with primary site processes:

- **Scrap Yard:** On average, approximately 60,000 tons of processed scrap steel may be stored uncovered in the scrap yard. Slab steel product is also stored uncovered on the north and south sides of the site, and in a portion of the scrap yard.

- **Vehicle Maintenance and Ancillary Shop:** Vehicle maintenance is conducted indoors in a maintenance building located near the site entrance. New and waste oils are stored under cover in this area. Waste oil and waste antifreeze are stored in drums prior to offsite transfer and recycling in accordance with state and federal waste regulations. Equipment and trucks are cleaned at the nearby steam cleaning area. The wash water from the steam clean area is collected, treated, and discharged to the City of Portland sanitary sewer.

- **Melt Shop:** At the melt shop, scrap metal is melted as the initial step in the steelmaking process. Approximately 80–85 percent of the steel arrives at the facility already processed (i.e., cut into manageable pieces). The remaining 15–20 percent require processing at the Mosely Shear, where they are reduced to manageable size (using a hydraulic shear, rail breaker, and/or cutting torches). The scrap metal, carbon, and flux are added to the electric arc furnace (EAF) and melted. Oxygen is injected to make the melting process more efficient and to reduce carbon monoxide emissions. Slag is poured off, processed onsite, and sold. The molten metal is then transferred to the ladle metallurgy furnace (LMF) for refining. If there is no need to degas the steel, it moves directly from the LMF to the casting area. If required by the customer specification, the molten metal is moved from the LMF to the vacuum degasser where gaseous impurities are removed. Emissions produced from the melting and refining process are captured and contained in a baghouse. The refined steel is then delivered to the casting area where air pressure is used to inject the molten steel into graphite-lined molds sprayed with mullite (kaolinite clay, a release agent). Cooling water is flushed through the carbon blocks, and then the slab is removed from the mold and placed in cooling boxes to control the cooling rate of the slab.

- **Slab Scarfing Facility:** The steel travels to the slab scarfing facility where oxidized steel and residual mullite are removed through both machine and hand scarfing. Used mullite is transported offsite for recycling or disposal. Emissions from the machine scarfing process are captured and contained in a baghouse. Steel dust from the baghouse is recycled. The resulting master slab is then moved to the slab yard between the melt shop and the rolling mill or sent to other slab storage areas on the north and south sides of the plant.

- **Plate Rolling Mill and Combination Mill Building:** If necessary, scarfed master slabs are cut using gas torches and the pieces are transferred to the rolling mill where they are reheated in a furnace and rolled into steel plate or coil. Plates are then sheared or torch-cut to the proper width and length requirements. Excess plate is returned to the scrap processing department to be remelted.

- **Cut-to-Length Facility:** Finished steel coil requiring cutting is transported to the cut-to-length facility. The coil is cold cut (sheared) to specified lengths. Excess coil is returned to the scrap processing department to be remelted.

- **Shipping Bay:** Steel plates may be stored, sent directly to the customer, or, for approximately 20 percent of the products, shipped to the heat-treating facility and/or sent to the surface processing site for further surface preparation. Finished steel plates are loaded onto railcars or trucks for shipment offsite to the customer.

- **Surface Processing:** At surface processing, steel plate is cleaned of surface imperfections (by shotblasting) and may or may not be coated depending on customer specifications. Spent shot and fumes collected during the shotblasting process are collected and recycled in the EAF. Particulate is collected in a baghouse and is combined with mill scale and recycled and/or sold.

- **Glassification Plant:** The glassification plant is no longer in operation. In the early 1990s, it was built to recycle EAF dust into various products. However, the procedure was not cost-effective and the facility was closed.

- **Water Treatment Facility (including the associated cooling pond):** Water is treated and discharged directly to the Willamette River under National Pollutant Discharge Elimination System (NPDES) waste discharge permit number 101007. The process water outfall 001, located immediately upstream of storm water outfall 001, terminates approximately 100 ft into the river at a depth of approximately 35 ft.

- **Baghouses:** The baghouses collect exhaust fumes produced within the melt shop (graphite, scarfing, and furnaces) and surface processing facility (shotblast). The EAF dust is shipped offsite to a permitted landfill. Graphite and scarfing dust are recycled offsite, and shotblast is recycled onsite.

- **Utility Area (oxygen plant, engineering building, etc.):** The oxygen plant is operated by Air Products and produces pure oxygen from atmospheric gas for use by the EAF, scarfing torch, and throughout the plant. Other buildings in this area include the plant engineering buildings, two small maintenance shops, a parts warehouse, and other ancillary buildings.

- **Dock:** It is believed that the dock has not been used for any over-water activities since the termination of the direct reduction division (DRD) process in 1980. OSM does occasionally rent the dock space to ships in need of temporary berthing.

1.4.2 Waste Identification and Management

All wastes generated at OSM are either transported offsite for treatment and/or disposal or are recycled onsite or offsite (Table 2). Materials used and recycled onsite include scrap metal, carbon/graphite, spent steel shotblast, and empty metal drums. Carbon from milling machines is collected in a baghouse and recycled as an additive.

Detailed descriptions of current waste identification, management, and reduction practices at OSM are described in the following documents: *Storm Water Pollution Control Plan* (OSM 2001a, provided in Appendix B), and *Toxic Substance and Hazardous Waste Reduction Policy* (OSM 2001b, provided in Appendix C). Potentially hazardous substances and recyclable materials temporarily stored onsite are described in the OSM document entitled *Oregon State Fire Marshal Hazardous Substance Information Survey* (OSM 2001c, provided in Appendix D). These materials are summarized below based on process area:

- **Steel Production:** EAF dust, carbon/graphite, graphite (electrodes), slag, mill scale, furnace lining (brick ladle), mullite (clay), lime, coke, recycled and scrap metal, and metal alloys (primarily chromium, manganese, nickel, copper, titanium, and boron)
- **Surface Processing:** Paint (toluene, xylenes, methyl ethyl ketone [MEK], and zinc),cleaning solvents, spent steel shotblast, and paint wastes
- **Electrical Distribution System:** Transformer oils that do not contain polychlorinated biphenyls (PCBs) or that contain less than 50 parts per million (ppm) PCBs
- **Operations and Maintenance:** Absorbent pads, aerosol cans, petroleum products (fuels and oils), antifreeze, batteries, equipment/vehicle cleaning/maintenance products (lubricants, fluids, oils) wash water, and empty drums
- **Petroleum-Affected Soil Removal:** Petroleum-contaminated soil (PCS) generated during the remediation of oil or fuel hydrocarbons
- **Water Cooling/Treatment System:** Silicone, aluminum chlorhydrate, ferric chloride, polymer flocculants, sodium hypochlorite, sodium hydroxide (caustic soda), and sulfuric acid.

Waste streams characterized as Resource Conversation and Recovery Act (RCRA) listed or characteristic hazardous wastes include: EAF dust (K061), spent solvent, and spent aerosol can liquids. The EAF dust is transferred directly from the ICA baghouse into rail cars and transported offsite for disposal. The smaller volumes of hazardous wastes are placed in containers and stored indoors in designated storage areas. These wastes are transported offsite directly from the storage area, or the hazardous wastes are moved to a waste transfer station located at the northwest corner of the combination mill building (Figure 2) for temporary storage prior to offsite shipment. The waste transfer station includes both inside and outside storage of hazardous and nonhazardous wastes. The waste transfer station is underlain by concrete.

The only known, current use of PCBs at the facility is transformers that contain very low, residual PCBs. Most transformers contain oil without PCBs, but selected transformers contain PCB concentrations less than 50 ppm (treated as "non-PCB" transformers under the Toxic Substances Control Action [TSCA]). There are approximately 60 or more transformers located throughout the facility; however, only 9 are reported to contain oil with any PCBs (with

Aroclors® 1242, 1254, or 1260). The locations of transformers with residual PCB-containing oil are shown on Figure 2. In the event the oil is removed from the transformer, the oil is transported offsite for recycling.

Large and bulk nonhazardous waste materials that are stored outside and are generally covered include lime, mullite, mill scale, and refractory (furnace lining). Steel product, scrap metal, slag, and carbon are also stored outside but are uncovered. Smaller volumes of nonhazardous materials are placed in containers and for the most part stored indoors or covered temporarily at or near the point of generation in designated storage areas. The smaller volumes of nonhazardous materials are directly transferred offsite from storage areas or moved to the waste transfer station.

Fuels and waste oils (i.e., hydraulic oil) are stored in drums or aboveground storage tanks (ASTs). The locations, sizes, and contents of ASTs are listed in the *OSM Storm Water Pollution Control Plan* (OSM 2001a), and are summarized in Table 3. All underground storage tanks (USTs) have been removed from the site. Based on information provided by an onsite Castrol Oil representative, hydraulic oils currently used at the site do not contain PCBs.

Historically, PCS has generally been excavated promptly upon discovery of an oil or fuel hydrocarbon release (i.e., USTs, hose ruptures, transformers) and either immediately transported offsite or stored in a designated storage area north of the scrap yard (Figure 2). The PCS storage area is underlain by steel plates, bermed, and the material is covered with plastic.

Wash water generated during equipment and vehicle washing is diverted to the OSM service water treatment or other treatment system and discharged to the sanitary sewer.

OSM implements many waste management and spill prevention practices. These include, but are not limited to, best management practices (BMPs), waste reduction, good housekeeping, waste containers and indoor storage, storm water diversion and control, designated storage areas, spill control (i.e., berms, secondary containment) and response, employee education and training, and recordkeeping. Detailed descriptions of the current waste management practices are included in the above-mentioned reference documents. All lubricants, waste oils, or other liquids are stored inside whenever possible. Onsite disposal of some solid wastes has occurred in the past; however, there is currently no onsite disposal of solid or liquid wastes at the facility. The most recent onsite disposal activity occurred in 2001 in a state-permitted non-municipal landfill northeast of the cut-to-length facility (Figure 2). A stockpile of primarily refractory material (spent ladle bricks composed of dolomite) mixed with melt shop debris (approximately 20 percent gloves, trash, boxes, and wood) was covered and closed in accordance with DEQ regulations. Testing of the landfill material in 2000 (Hart Crowser 2000c) indicated toxicity characteristic leaching procedure (TCLP) concentrations for metals were well below RCRA hazardous waste criteria. The landfill is closed, and an engineering plan for landfill closure is being prepared by Hart Crowser.

1.4.3 Water Treatment and Discharge

The facility operates two central waste water treatment systems (melt shop contact water and plant service water treatment systems). Effluent from these onsite water treatment units is

primarily recycled onsite for process manufacturing reuse. Periodically, water is discharged to the Willamette River via water treatment outfalls under NPDES Permit No. 101007. The water treatment outfalls are separate and distinct from the onsite storm water drainage outfalls discussed in Section 2.4.

Discharge from treatment water outfalls 002 and 003 is recycled back into the process water system. Treatment water outfalls 001 (containing treated water) and 004 (containing excess water from the intake system) discharge into the Willamette River. The treatment water outfall 001 is submerged in the Willamette River approximately 100 ft from the OSM property shoreline. According to OSM, approximately 200,000 to 300,000 gal of treatment water is discharged to the Willamette River two to three times a month. This volume can vary depending on production and weather conditions. No chemicals are added to the intake treatment system, and backwash (excess) water from the intake treatment system is discharged to process water outfall 004. The melt shop contact water treatment system discharges to the plant service water treatment system, and the plant service water treatment system recycles water for reuse at the site or discharges treated water to process water outfall 001. Reacting agents are added to the central water treatment systems to modify physical characteristics of the water (i.e., reduce turbidity and biofouling, and promote flocculation). The reacting agents include ferric chloride, ionic polymers, aluminum chlorhydrate, sodium hypochlorite, and antifoaming agents. Sodium hydroxide (caustic soda) and sulfuric acid are also added to control pH.

Influent sources to the central water treatment systems include:

- Noncontact cooling water (NCCW)
- Vacuum degasser water treatment blowdown (via process water [recycled] outfall 002) and boiler blowdown
- Pressure caster contact cooling and cleaning water (blowdown)
- Cooling water (City water) leakage from the site's air compressor
- Groundwater seepage into buildings
- Some storm water from catch basins near the melt shop baghouses
- Scarfing sump effluent
- Contact water and roll grinder effluent from the Combination Mill
- Combination Mill NCCW via process water (recycled) outfall 003.

Various onsite waters are discharged to the City of Portland sanitary sewer system: sanitary waters, diluted laboratory wash water, some process treated water, and oil/water separator effluent from maintenance.

1.4.4 Historic Site Operations

With the exception of the oil sump (discussed in Section 1.3, above), industrial use at the site has historically been limited to steel production that started in 1969 by OSM (formerly Gilmore Steel Mills). The melt shop (with EAF and portions of the pressure caster) was present at that time, with additions to the manufacturing process (LMF, vacuum degasser, additional pressure caster components, combination mill, cut-to-length facility) added intermittently. The cut-to-length facility is the most recent addition, in 2000. The current manufacturing processes generally reflect historic operations and use of raw materials and the potentially hazardous substances discussed above. Details of historic site operations (i.e., DRD pond) that differ from current operations are discussed in Section 2.1, below.

1.5 Regulatory History

Table 4 presents a summary of current and historic permits issued to the OSM facility related to management or discharge of potentially hazardous substances. The wastes include air, storm water, waste water, solid wastes, hazardous wastes, and dredge materials. Table 4 also includes the date and brief description of permit violations.

Notable regulatory events include:

- October 1986: The DRD facility was closed by both DEQ and U.S. Environmental Protection Agency (EPA), who determined that no further action was required (Hart Crowser 2000a).
- February 1990: DEQ performed a site evaluation and recommended a State Basic Preliminary Assessment, which was conducted the following day.
- September 1991: The OSM facility was added to the EPA Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list.
- 1992: A RCRA PA was conducted by EPA at the OSM facility. A memorandum by Hart Crowser in February 1999 (Hart Crowser 1999a) outlined corrective actions conducted by OSM to address PA issues and demonstrated no further action required on any of the solid waste management units (SWMUs).
- August 1999: DEQ performed an additional site evaluation and recommended high priority for remedial investigation (RI).
- November 1999: OSM received an initial proposal for listing on DEQ's Confirmed Release List and Inventory List (CRL/INV). DEQ oversight was transferred to the Voluntary Cleanup Section.
- February 2000: OSM entered into a voluntary agreement with DEQ to conduct an RI.

- October 2000: DEQ decided to defer evaluation of the proposed CRL/INV listing pending outcome of the Pre-RI assessment.
- June 2001: OSM received a second proposal for CRL/INV listing.

2 Potential Source Areas and Waste Characteristics

2.1 Previous Investigation and Documentation

Much of the information on OSM's investigations of prior releases of hazardous substances and on associated remedial actions has been provided to DEQ in earlier reports. Most recently (March 21, 2001), OSM submitted a report entitled *Pre-Remedial Investigation Historical Investigation Report* (Exponent 2001b). Table 5 and Figure 5 summarize the locations of previous investigations, and remedial actions through December 2001 (excluding reported spills, which are discussed separately below). The table also notes which areas have been addressed or closed as a source of concern, and which may require further action or investigation. A brief chronological summary of each of these areas is presented below (letters in bold refer to symbols in Table 5 and Figure 5).

- **A:** The former oil sump is described in Section 1.3 of this report. This area remains a potential source of COIs.
- **B:** The asphalt-lined DRD storage/slurry pond was in use from approximately 1969 through 1980 (SAIC 1992). Steel stock material was off-loaded from ships, using the dock currently present at the OSM site, and placed into the DRD pond. The material was transferred from the pond to the DRD facility and formed into pellets to be used as feedstock for the furnace. When operation of the DRD pond ceased in 1980, it is believed that unloading of material at the dock also ceased. From June 1980 until March 1981 (prior to EAF dust being listed as a hazardous waste, K061), EAF dust was placed in the DRD pond (Hart Crowser 2000a). The contents of the pond (including the EAF dust) were excavated and sold between 1984 and 1986 (Hart Crowser 2000a). Beginning in 1984, groundwater monitoring for standard drinking water parameters (selected metals, selected organochlorine pesticides, and chlorophenoxy acid herbicides) was conducted over a 2-year period. No substances of concern exceeded EPA safe drinking water standards. In 1986, DEQ and EPA approved backfilling of the empty pond (Appendix C of Hart Crowser 2000a). Based on groundwater monitoring results, there was no evidence that any hazardous constituents were released from the DRD pond, and by 1987 EPA and DEQ determined that the pond was administratively closed as a regulatory concern (Appendix C of Hart Crowser 2000a).
- **C:** In 1982, two PCB spills and subsequent cleanup activities were reported to DEQ (OSM 1982a,b, included in Appendix E). The first spill occurred on February 11, 1982 (OSM 1982a) when three capacitors were punctured and leaked oil onto the concrete floor within the melt shop (marked C1 on Figure 5). Records indicate that the cleanup followed existing regulatory standards, and no soil was affected. The second spill occurred on November 9, 1982

(OSM 1982b) when four capacitors burned out in the capacitor bank (marked C2 on Figure 5). The spill was cleaned up, following existing regulatory standards; however, some transformer oil did affect nearby soils. It is unclear whether the affected soils were completely removed during cleanup. PCB releases that resulted from the event will be addressed in the RI, as needed.

- **D:** Between the summer of 1985 and April 1986, a total of seven USTs were removed by OSM (OSM 1985a). The first tank, located near the vehicle maintenance facility (D1 on Figure 5), originally contained approximately 600–700 gal of oil and was removed by OSM in April 1985 (OSM 1985a). In the summer of 1985, two empty USTs (with volumes of approximately 3,000 and 5,000 gal) previously used for gasoline and diesel storage were removed from the area near the DRD pond (D2 on Figure 5) (OSM 1985a). In April of 1986, OSM removed four other USTs (OSM 1986; Crosby and Overton 1986). Two gasoline tanks were removed from the western portion of the scrap yard (D3 on Figure 5) with volumes of 6,000 and 8,000 gal (OSM 1986). One 10,000-gal gasoline tank and one 10,000-gal diesel tank were also removed from the Mosely Shear area (D4 on Figure 5) (OSM 1986). Tank closure reports prepared by the subcontractor note that in all four cases, the tank and connecting pipe appeared to be intact and there was no visible soil contamination. Since these activities predated DEQ's UST program, no additional information is available. In 1986, OSM also determined that two additional tanks listed on the 1985 UST survey were not USTs, but instead were emergency spill tanks for the #1 and #2 furnaces in the melt shop. These two emergency spill tanks were not removed and are still in place.

- **E:** In 1985, a PCB release from a transformer near the former DRD pond was reported to DEQ (OSM 1985b, included in Appendix E). A total of 16 soil samples were analyzed and found to have PCB concentrations ranging from 0.8 to 7.9 mg/kg. Statistical evaluation of these data in accordance with DEQ's 1998 risk assessment guidance indicates that the 90-percent upper confidence limit on the mean is 4.54 mg/kg, well below the 7.5 mg/kg risk-based protective levels for industrial sites. Therefore, PCB concentrations did not pose unacceptable risks, but to further reduce any remaining risk, some of the soil was excavated and disposed of offsite (Hart Crowser 2000a). This area was further investigated in the Phase II Pre-RI field activities (discussed in Section 3.22) and PCBs were found in the soils. PCB releases from this transformer area will be further addressed in the RI.

- **F:** In April 1985, a compliance inspection conducted jointly by EPA and DEQ prompted the closure of the waste solvent container area formerly located near the paint storage building at the surface processing facility (Hart Crowser 2000a). Gravel and soil were removed from the area, and subsequent testing indicated concentrations of MEK less than 1 ppm (Appendix A of Hart Crowser 2000a). This release was cleaned up to a level consistent with Oregon regulations and requires no further action.

- **G:** Prior to 1986, paint wastes appear to have been deposited in ponds both to the north and south of the surface processing facility. Based on the issuance of a one-time permit (Letter Authorization #A-184) obtained for the disposal of paint waste in the landfill (Appendix B of Hart Crowser 2000a), it is believed that these ponds were excavated and the paint wastes were deposited in the landfill in the northwest section of the property. Visual observation of near-surface soils in the pond areas suggests that paint residue may remain in the soils both north and south of surface processing. Due to the probable small volumes of materials released and the large distance to the river (i.e., greater than 2,000 ft), it is unlikely that materials in the ponds here reached the Willamette River. This area was investigated during the Phase II Pre-RI. Although the Phase II results (discussed in Section 3.2.3) indicate that volatile organic compounds (VOCs) are not a concern, elevated concentrations of selected metals indicate that the area will need to be addressed further during the RI.

- **H:** During dredging activities in May 1986, a sediment area described as "debris and creosote" was encountered about 100–150 ft offshore and about 3 ft below the river bottom (Woods 1986, pers. comm.). Dredging was subsequently halted in that area. Since creosote has never been used or produced in the OSM facility, the material encountered is unlikely to have originated from historic or current operations on OSM property. It is likely that the material identified as creosote is related to the oils handled at the former oil sump, which was operated from 1942 through 1960, when the property was owned and managed by the Port.

- **I:** On April 1, 1987, a PCB-filled capacitor in the main substation ruptured (OSM 1987, included in Appendix E). Both DEQ and EPA were notified, the spill was cleaned up, and the ruptured capacitor was removed. Another capacitor failed in March 1989 (but did not leak), prompting OSM to replace two of the capacitor banks. In 1989, soil samples were collected 6 and 12 in. from the edge of the concrete slab on which the capacitor banks were located (OSM 1989, included in Appendix E) and PCB concentrations were found to range from 0.9 to 4,160 mg/kg. Approximately 42 yd^3 of soil were removed to a depth of approximately 1.5 ft bgs outside the perimeter of the concrete slabs (OSM 1989). A subsequent round of soil confirmation sampling indicated that all areas were under the 50 ppm maximum allowable PCB concentration (at the time) for an enclosed, restricted substation. Soils that were left in place may contain sufficiently high residual PCB concentrations such that this area will require further investigation during the RI.

- **J:** During an inspection November 7, 1990, a spill was noted from a transformer (located in a locked, fenced, covered outdoor substation, with concrete pads and gravel) located in the southwest corner of the Rolling Mill building. The spill was cleaned up in March of 1991 (OSM 1991, included in Appendix E) and final wipe test results from the slab indicate residual ppm concentrations less than 1 ppm. No soil excavation was required. This

release was therefore cleaned up to a level consistent with Oregon regulations, and does not require further investigation.

- **K:** Between August 1990 and July 1992, OSM removed (in 10 cases) or retrofitted (in 6 cases) all transformers containing PCB concentrations greater than 50 ppm (Hart Crowser 2000a). A survey of PCB and PCB-contaminated transformers completed in late 1990 (OSM 1990, included in Appendix E) indicates that five of these transformers were leaking prior to removal or retrofitting. One of these is the transformer discussed above in "J." The locations of the remaining four transformers that experienced leaks are indicated with a "K2" on Figure 5. The locations of the 11 transformers that had no indication of leaks are indicated with a "K1" on Figure 5. Although it was previously reported (Hart Crowser 2000a) that the concrete slabs and soil beneath the transformers were sampled and materials containing PCBs at concentrations above 1 ppm were excavated for offsite disposal, further research indicates that in at least one case, soil with PCB concentrations as high as 15 ppm may have been left in place (Westinghouse 1991, included in Appendix E). This location is indicated with "K1*" on Figure 5. Due to the lack of documentation of leaks and/or spills from these areas, these areas will require further investigation during the RI.

- In 1992, a RCRA PA of the facility and its operations was conducted for EPA (SAIC 1992). The PA recommended corrective actions on 6 of the 18 identified SWMUs. These six units included the former PCB storage shed, the scarfing area concrete-lined sumps, the landfill, the melt shop furnace, the vehicle maintenance accumulation area, and the scrap piles. In a memorandum dated February 12, 1999, Hart Crowser described corrective actions conducted by OSM to address each of those six SWMUs and provided supporting documentation to demonstrate EPA and DEQ closure and that no further action should be required (Hart Crowser 1999a).

- **L:** In 1993, a landfill (SWMU 8 in the RCRA PA) site characterization was completed by Hart Crowser. The landfill covers an area of approximately 3 acres, and contains approximately 60,000 yd^3 of mullite, ceramic refractory, furnace slag, and mill scale (Hart Crowser 1993). In 1986, a one-time permit (Letter Authorization #A-184) was obtained for the disposal of paint waste in the landfill (Appendix B of Hart Crowser 2000a). In 1995, OSM capped the landfill with 18 in. of silty sand, bentonite, and a coarse slag-derived aggregate to form a wearing layer (Hart Crowser 1995). OSM obtained a closure permit and formally closed the landfill in 1995 (Appendix B of Hart Crowser 2000a). During 2 years of groundwater monitoring of two downgradient, one upgradient, and one cross-gradient wells, no constituents were detected above drinking water standards or the conditions set forth in the closure permit (Hart Crowser 2000a). The landfill does not require further investigation.

- **M:** In 1994, six test pits were excavated to depths of 6–10 ft bgs in the scrap yard (approximately 0.5 miles from the Willamette River). Analysis of soil

samples showed elevated levels of total petroleum hydrocarbons (TPH), barium, chromium, copper, lead, manganese, and nickel (Hart Crowser 1994). Hydrocarbons and metals from this area are potential COIs because of the potential for their transport to the river by storm water runoff. All runoff from this area enters the storm water drainage system through a pair of catch basins (stations SD-3 and SD-4) sampled as part of the Phase II Pre-RI fieldwork, as discussed in Section 3.2.5.

- **N:** In 1996 during installation of a concrete pad at the Mosely Shear, soil stained with petroleum hydrocarbons was observed (Hart Crowser 1996). Hart Crowser directed the excavation and stockpiling of approximately 24 yd^3 of soil. One sample of the stockpiled soil contained diesel and heavier-range hydrocarbons and low levels of PCBs and VOCs (Hart Crowser 1996). Storm water runoff from this area was investigated during the Phase II Pre-RI field activities (discussed in Section 3.2.6). Based on the results of the Pre-RI, this area requires further investigation during the RI.

- **O:** In October 1998, approximately 728 yd^3 of sediments were dredged from the area along the shoreward side of the dock and near the facility's cooling water intake (OSM 1999). The dredging contractor observed that the sediments contained a petroleum substance that appeared to be "Bunker C" oil, which is used as a fuel oil by ships and some facilities on land. The dredged sediments were stockpiled on shore at the facility and samples were chemically analyzed (Appendix L of OSM 1999). The results of those analyses are consistent with a mixture of diesel and a heavier weight petroleum hydrocarbon. The stockpiled sediments were landfilled onsite (per DEQ Solid Waste Letter Authorization 2574, dated January 27, 2000). These sediments may be related to the former oil sump which was operated from 1942 through 1960, when the property was owned and managed by the Port.

- **P:** The most recent onsite disposal activity occurred in 2001 in a permitted non-municipal landfill northeast of the cut-to-length facility (Figure 5). A stockpile of primarily refractory material (spent ladle bricks) mixed with melt shop debris (approximately 20 percent gloves, trash, boxes, and wood) was covered and closed in accordance with DEQ regulations. The stockpile contained approximately 140,000 yd^3 of material. Testing of the landfill material in 2000 (Hart Crowser 2000c) indicated TCLP concentrations for metals were well below RCRA hazardous waste criteria. The landfill is closed, and an engineering plan of landfill closure is being prepared by Hart Crowser. The landfill does not require further investigation.

2.2 Reported Spills

The *Pre-Remedial Investigation Historical Investigation Report* (Exponent 2001b) provided information regarding historic spills. Additional spills have been identified since the report was submitted. Table 6 and Figure 6 summarize the details and locations of reported spills. The

table also notes which areas have been addressed or closed as a source of concern, and which may require further action or investigation.

Except for spills AA and II discussed below, all of the spills reported in this section were due to a release of short duration, were identified immediately or shortly after the release, and received corrective action immediately to control the spill and contain the released substance. In most cases, the affected soils were also excavated immediately or within 1 or 2 days, thereby allowing little or no time for significant migration of COIs.

Note that spills BB, FF, GG, JJ, and LL below are categorized as having had environmental issues addressed ("Yes" concern in Table 6), despite the fact that no confirmation samples were collected. These areas are not considered to be potential sources of COIs due to the small size and volume of the release, immediate response, and removal of all visibly affected soils, or the fact that the material was spilled on a paved area and immediately cleaned up as stated in the spill reports. Disposal documentation for the affected soils is available for all of these spills. The primary consideration for a "Yes" determination for these spills is the reported removal of all affected soils.

A brief chronological summary of spills is presented below (letters in bold refer to symbols on Table 6 and Figure 6).

- **AA:** In 1995, a release from a 5,000-gal gasoline UST near the rolling mill was discovered (Hart Crowser 2000a). The UST was decommissioned in January/February 1996, and approximately 150 tons of affected soil were excavated and treated. Groundwater monitoring activities have been ongoing since 1996, and indicate that benzene, toluene, ethylbenzene, and total xylenes (BTEX) are present in shallow groundwater near the former UST (Appendix C of OSM 1999). OSM has signed a cost recovery agreement with DEQ's UST program and is pursuing closure under DEQ oversight using a risk-based closure approach. Groundwater monitoring indicates that affected groundwater is limited to the area of the former UST and is not migrating to the Willamette River.

- **BB:** On June 8, 1997, a small quantity (estimated to be less than 50 gal) of vacuum degasser sludge was released due to a broken nozzle on the sludge tank located adjacent to the vacuum degasser cooling tower (DEQ 1997a). Metal oxides in the sludge were present at nonhazardous levels. The spill occurred primarily on asphalt and some gravel and was immediately contained. Affected soils were immediately excavated until visibly clean. Four 55-gal drums of affected soil were generated. No confirmation samples were collected; however, this site is not a source of COIs due to the small size of the release, immediate response, and reported removal of all visibly affected soils.

- **CC:** On September 9, 1997, a spill of approximately 500 gal of gasoline from a temporary AST owned by a contractor occurred in the northwestern corner of the site (DEQ 1997b; Hart Crowser 1999b; 2000a,b). Approxi-

mately 240 yd^3 of soil were excavated and treated. OSM has installed monitoring wells and has been conducting groundwater monitoring since 1998. Groundwater monitoring activities have indicated low levels of BTEX and methyl *tert*-butyl ether (MTBE) in shallow groundwater. OSM is pursuing closure using a risk-based approach under the independent cleanup pathway (Hart Crowser 2000a). Groundwater monitoring indicates that affected groundwater is limited to the area of the former AST and has not migrated to the Willamette River.

- **DD:** On December 22, 1997, a release of approximately 15 gal of hydraulic fluid occurred from a leaking hose south of the melt shop (DEQ 1997c). The hydraulic fluid was released on an impermeable surface and entered a storm drain catch basin that discharged to the river via storm water outfall 001. The discharge affected surface water (sheen) and shoreline soils (location indicated by "DD" on Figure 6). Initial response measures included cleaning the catch basin, purging the storm drain line of remaining fluid (with approval of the Coast Guard), placing absorbent materials at the end of the outfall to prevent further releases to the river, and excavating approximately 20 yd^3 of affected shoreline soils until there were no visibly affected soils remaining. Although the spill report indicates that the remaining soil at the shoreline water level had no evidence of contamination, no analytical data were available in the spill report. While the volume of the release was small, there is a potential that river sediments could have been affected by the release. Sampling of the area around outfall 001 was conducted during the Phase I Pre-RI (Exponent 2001a).

- **EE:** On December 29, 1997, red liquid discharging from the city's storm water outfall (002 on Ramsey Blvd) was reported by an employee of nearby Ash Grove Cement and a similar liquid was observed in an onsite storm drain by OSM personnel (OSM 1998). OSM personnel did not observe a sheen at the outfall, but the storm water outfall was nevertheless boomed with oil absorbents as a precaution. Two small diesel fuel releases (estimated 40 gal total) were subsequently discovered in the surface processing area adjacent to a catch basin. Spilled buckets containing diesel fuel were the apparent cause of the release (due to an apparent intentional spill by an employee of an outside contractor and not an OSM employee). Approximately 20 yd^3 of affected soil were removed from two excavations (around the catch basin), and approximately 2,000 gal of groundwater (2–3 ft bgs) were pumped from the larger excavation (located adjacent to the storm drain). Petroleum hydrocarbons were not detected in the confirmation soil samples from the two excavations. A sample of the removed groundwater was apparently not collected; however, because of the small size of the release, the immediate response, and reported removal of all apparent affected soils and groundwater, this site is not considered for further investigation.

- **FF:** On November 15, 1998, a drum containing 45 gal of motor and hydraulic oil was spilled in the Mosely Shear area (DEQ 1998a). The spill occurred on gravel and was immediately contained, and visibly affected soils were immediately excavated. Approximately 2–3 yd^3 of affected soil were excavated. No confirmation samples were collected. This site is not considered for further investigation because of the small size of the release, immediate response, and reported removal of all apparent affected soils.

- **GG:** On November 24, 1998, a hydraulic pipe leaked approximately 300 gal of hydraulic oil at the southwest corner of the reheat furnace (DEQ 1998b). The spill occurred on gravel and was immediately contained. Within 3 hours, all visibly affected soils were excavated. Approximately 4–6 yd^3 of affected soil were excavated. No confirmation samples were collected; however, this site is not considered for further investigation because of the small size of the release, immediate response, and reported removal of all apparent affected soils.

- **HH:** In May 1999, a broken hydraulic oil line released 100–200 gal of hydraulic oil near the west end of the Combination Mill building. This spill was contained and affected soils were excavated in a cleanup that followed existing regulatory standards (DEQ 1999); however, confirmation samples were not collected.

- **II:** In March 2000, a damaged diesel line released approximately 5 gal of diesel fuel at the melt shop dispenser, and 20 yd^3 of affected soils were removed. After removal, a diesel odor remained, which may be attributed to historic releases of diesel into surrounding soils (DEQ 2000a). This area may require further investigation during the RI.

- **JJ:** On November 6, 2000, approximately 125 gal of hydraulic oil were released from a leaking valve at the Rolling Mill end shear centering guide. The spill was immediately contained and visibly affected soils were removed on the same day. The affected soil was transported offsite, and clean aggregate was used to fill the excavated area (DEQ 2000b). This site is not considered a source of COIs and does not require further investigation because of the small size of the release, immediate response, and reported removal of all apparent affected soils.

- **KK:** After fueling his vehicle on November 29, 2000, an employee inadvertently failed to release the trigger on a diesel dispensing nozzle, thereby allowing the diesel to continue to discharge. Approximately 100 gal of diesel were released before the discharge was stopped. Approximately 50 yd^3 of affected soil were removed the next day (DEQ 2000c). Affected soils were reportedly excavated only "to the extent possible." No confirmation samples were collected.

- **LL:** On December 14, 2000, a piece of scrap punctured the diesel fuel tank of a switch engine (locomotive) traveling through the scrap yard.

Approximately 300 gal of diesel fuel were released to surrounding soils. The spill was immediately contained, and approximately 50 yd^3 of visibly affected soil were immediately removed (DEQ 2000d). This site is not considered a source of COIs and does not require further investigation because of the small size of the release, immediate response, and reported removal of all apparent affected soils.

- **MM:** On December 31, 2000, the Rolling Mill scale pit overflowed, releasing water containing petroleum hydrocarbons onto the surrounding soils. The estimated volume of petroleum released was 100–150 gal. The spill was immediately contained, and approximately 15 yd^3 of soil of affected soil were excavated). An additional 35 yd^3 of soil were excavated January 15, 2001 (DEQ 2001c). Confirmatory samples from the base of a subsequent (deeper) excavation in this area were analyzed as a result of a separate overflow incident that occurred on January 18, 2001 (see item NN below). Further investigation of diesel- and oil-range hydrocarbons may be required in this area during the RI.

- **NN:** On January 18, 2001, the Rolling Mill scale pit overflowed, releasing water containing petroleum hydrocarbons onto the surrounding soils. The estimated volume of petroleum released was less than 100 gal. The spill was immediately contained, and approximately 150 yd^3 of soil were excavated over the next 2 days (DEQ 2001a). The area was subsequently paved to prevent any potential future overflow events from releasing petroleum hydrocarbons into the surrounding soils. After the soil was excavated and prior to paving, seven soil samples were collected from the base of the excavated area. These samples were analyzed for diesel-range hydrocarbons (undetected to 61.6 mg/kg) and heavy oil-range hydrocarbons (undetected to 173 mg/kg). The residual concentrations are below the DEQ Soil Matrix Level 2 (DEQ 1998c) cleanup levels (which are likely applicable to this site). However, the vertical extent of impacts and potential impacts to groundwater are unknown. Further investigation of diesel- and oil-range hydrocarbons may therefore be required in this area during the RI.

- **OO:** On April 9, 2001, approximately 60 gal of hydraulic fluid were spilled on the ground near the hydraulic room door at the west end of the Rolling Mill. The spill was immediately contained, and approximately 12 yd^3 of affected soil were removed. Two soil samples were collected from the east and west points of the excavated area. Diesel-range hydrocarbons (127 and 815 mg/kg) and heavy oil-range hydrocarbons (1,520 and 10,300 mg/kg) were detected in the samples (DEQ 2001b). The source of these hydrocarbons (i.e., the April 9, 2001 spill vs. another source) is not known. This area may require further investigation during the RI.

- **PP:** On May 3, 2001, approximately 60 gal of hydraulic oil were released from a ruptured hose on a forklift west of the cut-to-length line. Approximately 25 yd^3 of soil were excavated and two soil samples were collected from the excavated area. Diesel- and heavy-oil-range hydrocarbons

were not detected in the confirmation samples (DEQ 2001c). This area does not require further investigation.

- **QQ:** On November 7, 2001, approximately 250–300 gal of Hyspin AW46® hydraulic fluid were released from a ruptured hose located in the north shipping bay and some of the hydraulic fluid flowed onto an unpaved area (DEQ 2001d). The spill was immediately contained and cleaned up. Approximately 75 yd^3 of visibly stained soils attributable to the spill were excavated to a depth of approximately 2 ft bgs. Three soil samples were collected from the base of the excavation. Analytical results of the samples indicated up to 5,940 mg/kg of heavily weathered diesel-range hydrocarbons and up to 17,500 mg/kg of heavy oil-range hydrocarbons were detected. Polycyclic aromatic hydrocarbons (PAHs) were not detected in a soil stockpile composite sample, but 0.355 mg/kg PCBs (Aroclor® 1248) were detected. The lack of PAHs, weathered nature of the diesel, and the fact that there is reportedly no current use of PCBs in hydraulic oils at the site strongly suggest that the detected hydrocarbons and PCBs are unrelated to the recent hydraulic oil spill. Hydrocarbons and PCBs may require further investigation in this area.

2.3 Current Operations

Nonhazardous and hazardous wastes are generated and stored throughout the site. Waste storage areas do not inherently represent potential source areas of COIs unless a leak or spill occurs that is not discovered and mitigated promptly before significantly affecting environmental media (soil, sediment, surface water, and groundwater). Historic and recent spills are discussed in Section 2.2.

There are some materials temporarily stored outside at the facility that potentially could allow exposure to storm water. These materials include new and scrap metals, slag, used vehicle and steel production parts, and PCS. Areas of the site where substantial quantities of these materials are stored include the scrap yard, Mosely Shear, steel storage near the southern property boundary, slab cutting yard, and slag crushing/processing at the northeast corner of the property. All of these areas are unpaved. COIs have been found at the scrap metal and Mosely Shear areas. Potentially hazardous materials associated with outdoor storage of metal products are primarily metals and petroleum hydrocarbons. Unknown COIs may also be associated with scrap metal storage. Although maintenance and cleaning of equipment and vehicles are generally performed indoors, there are numerous locations at the site where used equipment and parts are stored outdoors. Potentially hazardous materials associated with outdoor storage of equipment and parts are petroleum hydrocarbons (lubricants, oils, and fuels). In addition, petroleum hydrocarbons are associated with the outdoor storage of PCS.

There are no current sources of COIs related to onsite disposal units because all liquid and solid wastes generated at the facility are recycled onsite or transported offsite for recycling, treatment, and/or disposal. A stockpile of primarily refractory material (ladle bricks composed primarily of dolomite) northeast of the cut-to-length facility was covered and closed (landfilled) in 2001

in accordance with DEQ regulations. This permitted landfill is not considered a potential source of COIs based on the nonhazardous nature of the material and landfill material testing results.

2.4 Storm Water Drainage System

OSM's storm water pollution control plan (OSM 2001a) is re-evaluated and updated annually as required by OSM's NPDES storm water permit (General Permit No. 1200-Z). Site storm water is collected within a network of storm drains and catch basins at the facility and is currently discharged to three outfalls (storm water outfalls 001, 002, and 003). The storm water drainage network and outfall locations are shown on Figures 2 and 7. Storm water outfalls 001 and 003 discharge directly into the Willamette River. Outfall 002 discharges into the City of Portland's storm water system near the entrance to the facility, and is subsequently discharged to the Willamette River after the runoff combines with runoff from various other facilities. A berm, constructed of material recovered from excavations during plant construction, extends between the northern and southern property boundaries along the riverbank, and prevents direct storm water runoff from entering the Willamette River at locations other than the storm water outfalls.

Modifications or upgrades to the storm water drainage system have been ongoing since 1996. Notable changes to the system have included the addition of carbon dioxide treatment systems to control pH at outfalls 002 and 003; Vortechnics™ oil and grit separator at outfall 003; paving of previously unpaved or poorly paved areas; improved and more frequent inspection and cleaning of catch basins; and upgrades to catch basins. Storm water treatment consists of sediment catch basins, the carbon dioxide and Vortechnics™ treatment systems, and storm water pollution control and prevention measures. The pH control is required because runoff from slag used as aggregate throughout the facility may otherwise have an unacceptably high pH. The Vortechnics™ system was added in 2000 to upgrade the system (as required by the City whenever new construction is added to an industrial site) and enhances the removal of oil, grease, and suspended solids.

The central portion of the facility, including the melt shop, the south yard, part of the rolling mill, and water treatment facilities, is serviced by a network of storm drains and catch basins that discharge to the river through outfall 001. The northern portion of the facility, including the north side of the rolling mill, the cut-to-length facility, and the northern storage areas, is serviced by a network of storm drains and catch basins that discharge to the river through outfall 003. The southeast portion of the facility, including the south side of the scrap yard, the maintenance shop, the employee parking lot, and the administration building, is serviced by outfall 002, which drains into the City of Portland's separate storm water sewer system. In portions of the facility outside the drainage basins for the aforementioned outfalls, the ground is unpaved and sufficiently permeable such that precipitation infiltrates and does not flow offsite. Storm water drainage basin boundaries, adapted from Hart Crowser (1998), are shown on Figure 7.

Storm water runoff from the Mosely Shear area and from the turnings and boring pad is evaporated and not discharged offsite.

Specific practices undertaken to minimize exposure of COIs to storm water (OSM 2001a) include:

- Topographic barriers prevent storm water discharge from the southern portion of the scrap yard.
- The facility's manufacturing processes, including scrap melting, slab casting, machine scarfing, plate rolling, and surface processing, are located indoors. Most vehicle maintenance is also performed indoors.
- Most hazardous substances are stored indoors in designated storage areas.
- All hazardous substances are stored, as required, in properly labeled containers within berms or other secondary containment devices to prevent leaks and spills from entering storm water runoff.
- Equipment is washed only in a designated area at the maintenance shop, and wash water from the steam cleaning area is collected and treated onsite prior to discharge to the City of Portland sanitary sewer.
- Precipitation that collects in the Mosely Shear containment pad and the turnings and boring pad is collected and evaporated. Runoff from these areas is pumped to an evaporation holding tank.
- Heavily used roads are paved to limit erosion, and all paved areas are inspected and swept as needed with a diesel powered mobile sweeper.
- Minimal volumes of water (not oil) are applied to unpaved roads for dust control.
- Drip pans are placed under equipment and vehicles to capture leaks.
- When possible, dry methods (e.g., sweeping or vacuuming instead of washing) are used for cleaning process and maintenance areas.
- Emergency spill kits are located throughout the plant.
- Dry methods (e.g., spreading absorbent, sweeping, and collection) are used for cleaning leaks and spills.
- Weekly and monthly environmental and housekeeping site walks are conducted by plant employees and departmental managers to identify and resolve potential problems.
- Monthly and quarterly inspections are conducted by the Storm Water Pollution Prevention Team to determine whether pollution controls have been properly implemented.
- A storm water pollution and prevention education program exists for employees, which includes instruction on the implementation of control

measures, proper inspection, handling, and storage procedures, and maintenance programs.

- Storm water samples are collected twice yearly from each of the three outfalls and analyzed according to the test procedures approved under 40 CFR Part 136.

The storm water drainage system collected storm water runoff from historic (and current) potential source areas of COIs. As a result, the storm water drainage system is considered a secondary source area of COIs potentially entering the Willamette River. Based on the results of the Phase I and II assessments, there is a potential for some of the COIs to have been discharged (past or present) via the site storm water collection and discharge system. Potentially hazardous substances associated with the storm water drainage system include metals, petroleum hydrocarbons, and PCBs.

3 Pre-Remedial Investigation Sampling and Analysis Program

Pre-RI field activities were conducted at the OSM site in two phases. The first phase took place in October 2000 and included the collection of soil, groundwater, and sediment samples at selected locations of the site. The eight Geoprobe® boreholes (two in the vicinity of the former oil sump and six along the berm adjacent to the Willamette River) were targeted to identify the presence or absence of hazardous chemicals related to the former oil sump. The sediment samples were collected to identify the presence or absence of chemicals in sediments adjacent to the OSM site. The second phase of the RI field work was conducted in September 2001 and included five Geoprobe® boreholes, two shallow test pit trench excavations, and sediment samples collected from four catch basins along the storm drain system. The Phase II activities were conducted to further evaluate potential source areas and transport pathways.

Section 3.1 provides a brief summary of Phase I sampling objectives, methods, and results that were previously reported to DEQ (Exponent 2001a). Section 3.2 provides a brief summary of Phase II sampling objectives and methods, and reports for the first time the results of Phase II sampling and analyses.

3.1 Phase I Sampling Objectives, Procedures, and Results

Phase I activities were completed in accordance with the DEQ-approved *Pre-Remedial Investigation Assessment Work Plan* (Exponent 2000a) and Pre-RI work plan addendum dated September 28, 2000 (Exponent 2000b). The results of these activities (including tables, figures, borehole logs, laboratory analytical reports, and a quality assurance report) were previously submitted to DEQ on February 2, 2001 in a report titled *Pre-Remedial Investigation Field Activities Data Report* (Exponent 2001a). A brief summary of the Phase I sediment sampling along the riverbank and of Geoprobe® sampling in the vicinity of the former oil sump and along the western margin of the site is provided in the following sections. Phase I sampling stations are shown in Figure 8. Data tables and summary figures from that report are reproduced in Appendix F. Geoprobe® borehole logs are provided in Appendix G.

3.1.1 Sediment Sampling

Sediment sampling in the vicinity of storm water outfalls was conducted to investigate storm water as a potential pathway for the transport of COIs to the Willamette River and/or its sediments. Four surface (0–10 cm) samples were collected in the vicinity of each of the storm water outfalls (001 and 003); two surface samples were collected near the "upstream" (southern) property boundary (RB11 and RB12); two surface samples were collected near the "downstream" (northern) property boundary (RB1 and RB2); and three subsurface samples (two 0–30 cm samples and one 30–60 cm) were collected from the northern outfall (RB13 and RB4) (Figure 8).

Phase I sediment samples were analyzed for priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, silver, and zinc) by EPA Method 200.7; semivolatile organic compounds (SVOCs) by EPA Method 8270C; PCBs by EPA method 8082; total organic carbon (TOC); and grain size. In addition, the two deeper samples were analyzed for petroleum hydrocarbons by EPA Method 8015B. The results of these analyses are outlined in detail in the *Pre-Remedial Investigation Field Activities Data Report* (Exponent 2001a) and data tables are reproduced in Appendix F.

Antimony, beryllium, selenium, and thallium were not detected in any of the 15 sediment samples. Silver was detected in two samples, at concentrations of 2.2 and 2.3 mg/kg. Cadmium was detected in three samples, at concentrations ranging from 1.5 to 2.1 mg/kg. Mercury was detected in nine samples, at concentrations ranging from 0.020 to 0.060 mg/kg. Lead was also detected in nine samples, at concentrations ranging from 40.9 to 166 mg/kg. Arsenic, chromium, copper, nickel, and zinc were detected in all 15 samples, at concentrations ranging from 1.8 to 132 mg/kg, 13.1*J* to 819*J* mg/kg, 11.1 to 145 mg/kg, 12.4 to 60.8 mg/kg, and 43.1 to 823 mg/kg, respectively. Two types of PCBs were detected in sediments: Aroclor®1248 was detected in 12 samples at concentrations ranging from 0.14 to 9.3 mg/kg; and Aroclor®1260 was detected in 8 samples at concentrations ranging from 0.13 to 0.39 mg/kg. Low molecular weight polycyclic aromatic hydrocarbons (LPAHs) were detected in three samples at concentrations ranging from 0.10 *L* to 15 mg/kg. High molecular weight polycyclic aromatic hydrocarbons (HPAHs) were detected in 11 samples at concentrations ranging from 0.13 to 40 mg/kg. In the two subsurface samples in which petroleum hydrocarbons were analyzed, the only compound identified was oil-range hydrocarbons, at concentrations of 79 and 81 mg/kg.

3.1.2 Geoprobe® Borehole Sampling in the Vicinity of the Former Oil Sump

Two Geoprobe® boreholes were advanced to characterize the residual materials from the historical oil sump (Figure 8). Soil samples from borehole B-1 were analyzed from the 8–10 ft bgs interval (in visibly contaminated soils) and from the 31–32 ft bgs interval (below the base of the visibly contaminated soils). The groundwater sample from B-1 was obtained from the 24–28 ft bgs interval. Soil samples from B-2 were analyzed from the 6–8 ft bgs and 18–20 ft bgs intervals. These intervals were selected to sample a contaminated interval (that had the highest photoionization detector [PID] concentration) and an interval that was not visibly contaminated. The groundwater sample at B-2 was obtained from the 14–24 ft bgs interval. The four soil and two groundwater samples from boreholes B-1 and B-2 were analyzed for priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, silver, and zinc) by EPA Method 200.7, petroleum hydrocarbons by EPA Method 8015B, SVOCs by EPA Method 8270C, and PCBs by EPA Method 8082. The results of these analyses are outlined in detail in the *Pre-Remedial Investigation Field Activities Data Report* (Exponent 2001a) and data tables from that report are reproduced in Appendix F.

From the two boreholes in the vicinity of the former oil sump, antimony, beryllium, cadmium, lead, selenium, silver, and thallium were not detected in any of the four soil samples. Arsenic, chromium, copper, mercury, nickel, and zinc were detected in the soils at concentrations ranging

from 3.3 to 5.4 mg/kg, 16.5 to 25.0 mg/kg, 17.6 to 25.1 mg/kg, 0.030 to 0.050 mg/kg, 16.8 to 26.1 mg/kg, and 61.6 to 69.3 mg/kg, respectively. Groundwater from B-1 had detected metal concentrations of 10.1 μg/L arsenic, 9.1 μg/L chromium, 34.5 μg/L copper, 24.5 μg/L lead, and 56.5 μg/L zinc. The only metal detected in groundwater from B-2 was arsenic, at a concentration of 15.7 μg/L (average of sample and sample duplicate). No PCBs were detected in any of the soil or groundwater samples.

In these two boreholes in the vicinity of the oil sump, LPAHs were detected in shallow soils (above the water table) at concentrations of 110 *LJ* mg/kg and 330 *LJ* mg/kg, and HPAHs were detected at concentrations of 47 *LJ* mg/kg and 180 *LJ* mg/kg, respectively. LPAHs were undetected in the two deeper soil samples, and HPAHs were detected only in the 18–20 ft bgs sample from B-2, at a concentration of 0.13 *LJ* mg/kg. In the groundwater samples, LPAHs were detected at concentrations of 12 *L* and 68 *L* μg/L, and HPAHs were detected at concentrations of 1.3 *L* and 2.1 *L* μg/L. Among the petroleum hydrocarbons, diesel-range (9,100 and 26,000 mg/kg) and oil-range (8,200 and 15,000 mg/kg) hydrocarbons were detected in the two shallow soil samples, but undetected in the deeper soil samples. Diesel-range hydrocarbons (at concentrations of 1,000 and 9,100 μg/L) were the only petroleum hydrocarbons detected in the groundwater samples.

3.1.3 Geoprobe® Borehole Sampling Along the Western Margin of the Site

Six Geoprobe® boreholes were advanced on the western margin of the site (along the Willamette River) to provide preliminary information on the groundwater-to-river pathway (Figure 8). These boreholes were spaced at approximately 100–200 ft intervals to assess the potential migration of petroleum hydrocarbons or affected groundwater from the inferred area of the oil sump to the Willamette River. The boreholes were extended to depths of 40 ft bgs, the approximate depth of the oily sediments dredged from the shoreward side of the dock near the facility's cooling water intake in 1998. Soil samples were collected for laboratory analysis of petroleum hydrocarbons (by EPA Method 8015B) and SVOCs (by EPA Method 8270C) from the approximate vadose zone/water table interface in each borehole (depths range from 22 to 26 ft bgs). In addition, grab groundwater samples were collected from each Geoprobe® borehole (depths range from 22 to 40 ft bgs) and analyzed for petroleum hydrocarbons (by EPA Method 8015B) and SVOCs (by EPA Method 8270C). The results of these analyses are reported in the *Pre-Remedial Investigation Field Activities Data Report* (Exponent 2001a) and data tables from that report are reproduced in Appendix F.

From these six boreholes, LPAHs and HPAHs were detected in only one of the six soil samples (B-7), at concentrations of 0.058 *L* and 0.88 mg/kg, respectively. HPAHs were undetected in all six water samples, but LPAHs were detected in three of the six groundwater samples, at concentrations ranging from 0.79 *L* to 5.3 *L* μg/L. Petroleum hydrocarbons (30 mg/kg diesel-range hydrocarbons and 140 mg/kg oil-range hydrocarbons) were detected in only one of the six soil samples (24–26 ft bgs in B-7). Diesel fuel-range hydrocarbons were detected in all six groundwater samples (at concentrations ranging from 140 to 6,100 μg/L). Gasoline-range hydrocarbons were detected in one groundwater sample (260 μg/L in B-8), and oil-range hydrocarbons were also detected in one groundwater sample (340 μg/L in B-6).

3.2 Phase II Sampling Objectives, Procedures, and Results

Except for the deviations described below, Phase II activities were completed in accordance with the DEQ-approved *Oregon Steel Mills Pre-RI Work Plan Addendum* dated August 6, 2001 (Exponent 2001c), as modified in the *Response to DEQ Comments on Pre-RI Work Plan Addendum* dated September 7, 2001 (Exponent 2001d). Phase II sampling stations are shown in Figure 8. Laboratory analyses were completed by Columbia Analytical Systems (CAS) of Kelso, Washington. Analytical results are summarized in Tables 7 through 9 and Figures 9 and 10. Geoprobe® borehole and test pit logs are provided in Appendix G. Laboratory reports are provided in Appendix H. A quality assurance review for the data is provided in Appendix I. Note that in the following discussion, analytical results from stations where duplicate samples were analyzed are reported as the average of the sample and the sample duplicate.

3.2.1 Groundwater Sampling Downgradient from the Fueling Area

The purpose of this task was to investigate the presence or absence of petroleum products in groundwater downgradient from areas where documented and potentially undocumented spills of petroleum fuels have occurred. Releases of diesel fuel have been documented from the former UST areas and the fueling station in the center of the site (Appendix C of OSM 1999; DEQ 2000a; DEQ 2000d) (Figure 8). Based on the limited existing hydrogeologic flow characterization data in these areas, groundwater is estimated to migrate west and northwest toward the Willamette River. Three Geoprobe® boreholes were advanced at stations B-12, B-13, and B-14 (Figure 8). The borehole locations were selected to sample groundwater along a representative cross-section downgradient of the potential source areas (Figure 8). At each borehole, soil was logged continuously; the borehole logs are provided in Appendix G. Groundwater samples were collected from each borehole using Geoprobe® groundwater sampling techniques equivalent to those used during the previous Pre-RI field investigations (Exponent 2000a, 2001a). At each station, groundwater was encountered approximately 7 ft bgs. At stations B-12 and B-13, groundwater samples were collected from a 5-ft interval (7–12 ft bgs) using a 1-in. diameter, 0.010-in. slot PVC screen. Due to unstable soils in B-14, the groundwater sample was collected from a 4-ft interval (8–12 ft bgs) using a 1-in. diameter, 0.010-in. slot stainless-steel screen. The groundwater samples were analyzed for BTEX by EPA Method 602 and for TPH by Method NWTPH-Dx. The Geoprobe® boreholes were then abandoned and backfilled with bentonite grout.

No BTEX compounds were detected in any of the three groundwater samples (Table 7 and Figure 9). Diesel-range hydrocarbons (at concentrations ranging from 1,100 *JN* to 3,100 µg/L) were detected in all three samples and oil-range hydrocarbons (at concentrations of 1,900 *JN* and 4,000 *JN* µg/L) were detected at the two northernmost sample locations (B-13 and B-14).

3.2.2 Soil Sampling in the Vicinity of the Former Transformer Storage Area

The purpose of this task was to investigate the presence or absence of residual PCBs in soil that may have resulted from a documented spill in 1985 or any undocumented spills of transformer

oil from a transformer formerly located in the southeast storage area (Figure 8). Based on aerial photographs from 1985, the target study area was located within the approximately 25×25 ft^2 area where low concentrations of PCBs were found immediately after the PCB spill incident (OSM 1985b). The work plan proposed three boreholes within this study area. Several Geoprobe® boreholes were attempted; however, all met with refusal because of concrete after approximately 1–2 ft bgs. A backhoe was mobilized to the site, and two test pits (each approximately 3 ft wide by 8 ft long) were excavated. The trenches exposed a reinforced concrete foundation at a depth of 1–2 ft bgs. This foundation appears to be the foundation of the DRD facility identified from historical site maps and aerial photos. The foundation was not removed during soil remediation and excavation activities in 1985. In consultation with a DEQ representative, the proposed sampling plan was modified to include two soil samples (B-9 and B-11) from the base of each of the two trenches at depths of 1.8–2.0 and 0.9–1.1 ft bgs, respectively. Soil lithologic logs were prepared based on the soils observed in the walls of each of the two trenches (see Appendix G). The two soil samples were submitted for analysis of PCBs by EPA Method 8082. After sampling, the test pits were filled with the stockpiled soils.

PCBs were detected in the two soil samples collected in the vicinity of the former transformer storage area (Table 8 and Figure 9). At station B-9 (1.8–2.0 ft bgs), Aroclor®1248 was detected at a concentration of 1.1 mg/kg, and Aroclor®1254 was detected at a concentration of 0.42 mg/kg. At station B-11 (0.9–1.1 ft bgs), Aroclor®1242 was detected at a concentration of 44 mg/kg.

3.2.3 Soil Sampling in the Footprint of the Former "Paint Waste Ponds" Located at Surface Processing

The purpose of this task was to investigate the presence or absence of potential COIs associated with stained soils in the vicinity of the former "paint waste ponds" located near the surface processing facility (Exponent 2001b). Based on aerial photographs from the early 1980s, stations B-15 and B-16 were located in the center of each former "paint waste pond" (Figure 8). At each station, a Geoprobe® borehole was advanced to approximately 5 ft bgs. Soil lithology was continuously logged and borehole logs are included in Appendix G. In both boreholes, paint-stained soils were encountered at approximately 2.5–3.0 ft bgs. Soil samples were collected from the 2–3 ft bgs interval in each borehole. The soil samples were submitted for analysis of VOCs by EPA Method 8260B and for selected metals that could be associated with paint products (cadmium, chromium, copper, lead, manganese, and zinc) by EPA Method 200.7. The boreholes were abandoned and backfilled with bentonite grout.

VOCs were not detected in soil from borehole B-15. The only VOCs detected in the soil from B-16 were *meta- & para*-xylenes at a concentration of 0.015 *J* mg/kg (Table 9 and Figure 9). Analysis for selected metals that may be associated with paint products (cadmium, chromium, copper, lead, manganese, and zinc) was requested for the soil samples collected at both B-15 and B-16. The analytical laboratory reported concentrations for a longer list of metals (arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, silver, vanadium, and zinc) for B-15, which are included in Table 8 and Figure 9. Detected metals included: arsenic (6.2 mg/kg), barium (280 mg/kg), cadmium (0.60 and 3.2 mg/kg), chromium (2,800 and 4,300 mg/kg), cobalt (5.9 mg/kg), copper (160 and 550 mg/kg), lead (11 and 180 mg/kg), manganese

(11,000 and 30,000 mg/kg), nickel (56 mg/kg), silver (1.2 mg/kg), vanadium (450 mg/kg), and zinc (53 and 26,000 mg/kg).

3.2.4 Sediment Sampling from the Catch Basin Associated with Outfall 003

The purpose of this task was to investigate the potential for PCBs, which were detected in sediment samples collected from the shore of the Willamette River during the first phase of the Pre-RI, to have been derived from upland sources on the OSM property. The work plan proposed the collection of two samples from two catch basins identified from OSM's storm water pollution control plan (OSM 2001a). During the field reconnaissance to identify sample stations, only one of the two proposed stations (SD-1, near the terminus of the northern outfall could be accessed (Figure 8). One sediment sample was obtained from the Vortechnics™ treatment system catch basin. In order to avoid entering the catch basin, a sediment sample was obtained by means of a dedicated 500-mL sample container attached with a swivel-mount to a 15-ft-long pole. The sediment collected in the sample container was homogenized in a pre-cleaned stainless-steel bowl using a dedicated, disposable scoop and transferred to an appropriate sample container. The sediment sample was analyzed for PCBs by EPA Method 8082.

PCBs were detected in the sediment sample collected from the Vortechnics™ treatment system catch basin. Aroclor®1248 was detected at a concentration of 1.5 mg/kg, and Aroclor®1254 was detected at a concentration of 0.63 mg/kg (Table 8 and Figure 9).

3.2.5 Sediment Sampling from the Catch Basins Adjacent to the OSM Scrap Yard

The purpose of this task was to investigate the potential for petroleum hydrocarbons and metals to be transported from the OSM scrap yard to Willamette River sediments via sediment particles in the storm drain system. All storm water that drains from the scrap yard is collected in two catch basins (SD-3 and SD-4) at the upgradient ends of two storm drain trunk lines (Figure 8). A sediment sample was collected from the top 3 in. of sediment in the catch basin located at SD-3 by means of a dedicated 500-mL sample container attached with a swivel-mount to a 10-ft-long pole. At station SD-4, the base of the catch basin was only approximately 1 ft bgs. A sediment sample was therefore collected using a pre-cleaned stainless-steel spoon. At both stations, the sediment sample was homogenized in a pre-cleaned stainless-steel bowl and transferred to appropriate sample containers for laboratory analysis. A new 500-mL sample container and scoop was used for each catch basin. The two sediment samples were submitted for analysis of TPH by Method NWTPH-Dx and selected metals (arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, silver, vanadium, and zinc) by EPA Method 200.7.

Diesel-range hydrocarbons (at concentrations of 400 *JN* and 850 *JN* mg/kg) and oil-range hydrocarbons (at a concentration of 2,900 *JN* mg/kg in both samples) were detected in sediment samples from both catch basins SD3 and SD4 adjacent to the scrap yard (Table 8 and Figure 9).

Detected metals (see Table 9 and Figure 9) include: arsenic (3.8 and 4.2 mg/kg), barium (170 and 210 mg/kg), cadmium (1.1 and 1.3 mg/kg), chromium (2,000 and 4,100 mg/kg), cobalt (7.0 and 8.0 mg/kg), copper (130 and 180 mg/kg), lead (38 and 54 mg/kg), manganese (15,000 and 36,000 mg/kg), mercury (0.06 and 0.09 mg/kg), nickel (51 and 67 mg/kg), silver (0.48 and 0.55 mg/kg), vanadium (210 and 590 mg/kg), and zinc (420 and 430 mg/kg). In addition, the laboratory reported results of PCB analysis of the sediment sample from SD4. The results are included on Table 8 and Figure 9. Aroclor®1248 was detected at a concentration of 0.17 mg/kg.

3.2.6 Sediment Sampling from the Catch Basin Adjacent to the Mosely Shear

The purpose of this task was to investigate the potential for petroleum hydrocarbons, PCBs, and VOCs to be transported from the surface processing area and from the Mosely Shear to Willamette River sediments via sediment particles in the OSM storm drain system and subsequently through city outfall 002 on Ramsey Boulevard. Although most of the storm water runoff from the Mosely Shear area drains into a local groundwater sump (i.e., closed basin) on the southeast corner of the property, a small portion of the storm water in this area joins surface water runoff from surface processing and drains into catch basin SD-5 (Figure 8). As the base of this catch basin was only 2 ft bgs, a sediment sample was collected using a pre-cleaned stainless-steel spoon. To prevent loss of volatile components, a portion of the sediment sample was placed immediately in a glass jar (with minimum disturbance of the sample) for VOC analysis. The remaining sediment was homogenized in a pre-cleaned stainless-steel bowl using a disposable scoop and transferred to appropriate sample containers for the remaining laboratory analyses. The sediment sample was analyzed for TPH by Method NWTPH-Dx, PCBs by EPA Method 8082, VOCs by EPA Method 8260B, and for selected metals (arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, silver, vanadium, and zinc) by EPA Method 200.7.VOCs were not detected in the sediment sample obtained from station SD5 (Table 9). Diesel-range hydrocarbons (1,100 *JN* mg/kg) and oil-range hydrocarbons (6,000 *JN* mg/kg) were both detected in the sediment sample (Table 8 and Figure 10). Detected metals (see Table 8 and Figure 10) included: arsenic (3.8 mg/kg), barium (200 mg/kg), cadmium (1.4 mg/kg), chromium (1,600 mg/kg), cobalt (8.6 mg/kg), copper (140 mg/kg), lead (83 mg/kg), manganese (13,000 mg/kg), mercury (0.16 mg/kg), nickel (47 mg/kg), silver (0.51 mg/kg), vanadium (240 mg/kg), and zinc (1,300 mg/kg). PCBs were detected in the sediment sample. Aroclor®1248 was detected at a concentration of 0.57 mg/kg, and Aroclor®1254 was detected at a concentration of 0.45 mg/kg (Table 8 and Figure 9).

4 Evaluation of Areas of Potential Concern

The objective of this section is to evaluate which of the areas identified in Sections 2 and 3, above, have COI concentrations in environmental media (i.e., soil, groundwater, or sediment) above appropriate background values, and, therefore, may have had releases from site-related activities. It is also of interest to evaluate whether any of the COIs are present in environmental media at concentrations that are sufficiently high to represent risks to public health, safety, and welfare, or to the environment. This is accomplished by comparing all of the available analytical data to appropriate human health or ecological risk assessment screening values.

4.1 Identification of Appropriate Screening Values for Evaluating Areas of Potential Concern

DEQ requested that OSM propose background screening levels to be used for the purpose described in the preceding paragraph. Agreement on appropriate background concentrations in environmental media is difficult, especially when the COIs are naturally occurring chemicals (e.g., metals) that are generally present, albeit at low concentrations, everywhere in the environment. Even for anthropogenic chemicals, there may be a ubiquitous "background" concentration attributable to regional (or even global) sources that may not be attributable to a specific facility. In a December 12, 2001 letter (Exponent 2001e), Exponent proposed, on behalf of OSM, background screening levels for soil, groundwater, and sediment (Exponent 2001e). For soil, Exponent proposed use of two regional data sets (Ecology 1994; Boerngen and Shacklette 1981) for appropriate background metals concentrations (there are no similar data available for organic chemicals). For sediment, Exponent proposed use of Portland Harbor sediment baseline values that had been used previously by DEQ (Fortuna 2001, pers. comm.) for identifying and prioritizing sites in the area for preliminary assessments or remedial investigations. It was recognized that the Portland Harbor sediment baseline values do not represent pristine conditions in the absence of anthropogenic sources, and that they likely include influence from sources within Portland Harbor as well as contributions from upstream sources. For groundwater, Exponent proposed use of metals concentrations from deep groundwater samples at the McCormick & Baxter site in Portland (PTI 1992). These OSM-recommended background values for soil and groundwater are listed in Tables 10 and 11 under the heading "OSM-recommended primary comparison criteria," and for sediments are listed in Table 12 under the heading "OSM-recommended comparison criteria."

In a December 14, 2001 letter, DEQ (2001) rejected all of the background screening levels that had been proposed by Exponent. For soil, DEQ proposed three possible alternatives:

- Use the lowest values from two site-specific data sets (i.e., Blue Lagoon [PTI 1995]; OSM [Hart Crowser 1994]).
- Calculate a background value using a statistical analysis of the two site-specific data sets in accordance with DEQ guidance.

- Collect additional data and continue to refine the site-specific values, as needed.

For groundwater, DEQ believes that there are no appropriate background data presently available. In lieu of comparisons with background groundwater concentrations of COIs, DEQ suggested that the OSM groundwater data be evaluated by comparisons with DEQ's risk-based ecological screening values and/or ambient water quality criteria, depending on the receptor and pathway being evaluated. If, following this preliminary screening step, it appears that some COIs may be associated with background conditions of groundwater entering the upgradient property boundary, DEQ states that additional evaluations of appropriate groundwater conditions can occur at that time. For sediment, DEQ now rejects use of the Portland Harbor sediment baseline values because they do not represent naturally occurring background conditions. Instead, DEQ is requiring screening of the sediment data against DEQ's own, recently developed, risk-based ecological screening values. The DEQ-recommended screening values are listed in Tables 10 through 12.

Pursuant to DEQ's request for screening of soil data in this report, OSM has chosen to make comparisons with the lowest values from the two site-specific data sets (i.e., Blue Lagoon [PTI 1995]; OSM [Hart Crowser 1994]). The available data from those two studies are likely too limited to conduct the statistical analyses suggested by DEQ in their guidance. During the course of the RI, it may become necessary to collect additional site-specific data for establishment of appropriate soil background COI concentrations. Therefore DEQ's first alternative (the lowest of the site-specific background values) is used in Tables 10 and 13.

From a risk-based perspective, OSM is of the opinion that the site soil data should appropriately be compared with human health-based criteria for industrial sites. Use of the site is expected to remain industrial, so the only likely human exposures would occur in an industrial setting. The largely industrial nature of the site precludes the presence of any significant ecological habitat, and, indeed, ecological receptors are rarely present on any exposed soils at the site. Therefore, OSM believes that comparisons with ecological risk-based screening values for soil would not be appropriate, given the nature of the site. OSM also contends that a full assessment of the soil data should consider not only comparisons with the DEQ-proposed background data, but also comparisons with the commonly cited U.S. EPA Region 9 preliminary remediation goals (PRGs), which DEQ has used in the past at numerous industrial sites and found appropriate (Tables 10 and 13). If the concentrations of one or more COIs exceed background, it is also of interest to know whether they are present at concentrations that would potentially represent unacceptable risks to industrial workers at the site.

For screening of groundwater data in this report, OSM agrees with DEQ that there may not be any appropriate background data presently available. Because there is no current or likely future use of groundwater at the OSM site, there would be no reason to compare the COI concentrations in site groundwater to human health-based screening values (e.g., U.S. EPA Region 9 PRGs for industrial sites). At DEQ's request, the groundwater COI concentrations will be compared with the risk-based ecological screening levels proposed by DEQ (Tables 11 and 14), but it should be recognized that this does not reflect any conclusion that ecological receptors may be at risk. Ecological receptors have no direct exposure to groundwater at this site. The only way that ecological receptors might be exposed to COIs in groundwater is if the

groundwater discharges to the Willamette River. However, COI concentrations measured in groundwater at inland locations at the OSM site would almost certainly be reduced by attenuation within the aquifer prior to discharge of the groundwater to the Willamette River. Furthermore, upon discharge of groundwater to the river, there would be rapid dilution and dispersion by river water of any COIs present in the groundwater, such that much lower concentrations would likely ensue. Ambient water quality criteria are based on the assumption that there will be extended exposure (on the order of hours to days) of the target receptor to the concentration of a given chemical. If the exposure is of much shorter duration (on the order of seconds to minutes), such criteria would likely be poor predictors of adverse effects. Therefore, it is only reasonable to consider the magnitude of any exceedance of DEQ's recommended risk-based ecological screening values in assessing the likelihood of adverse effects to ecological receptors.

For screening of sediment data in this report, OSM will compare the sediment COI concentrations with the risk-based ecological screening levels proposed by DEQ (Tables 12 and 15). However, OSM is of the opinion that DEQ's sediment screening levels are extremely conservative and have not been shown to be good predictors of adverse effects to aquatic receptors. Furthermore, OSM still believes that comparisons with the Portland Harbor sediment screening baseline values (also provided in Tables 12 and 15) are worthwhile because, even if the risk-based levels are exceeded, it is still of interest to know whether the presence of COIs in the sediments adjacent to the OSM site could be attributable to more ubiquitous, upstream sources within Portland Harbor. It should be noted that there are currently no human health-based risk assessment screening levels for sediment (e.g., similar to the U.S. EPA Region 9 PRGs for soil).

4.2 Screening of Available Analytical Data

Screening of available analytical data against the appropriate screening values was carried out for all of the historical investigations and reports (Table 5) and reported spills (Table 6) for which environmental concerns have not yet been addressed. The available analytical data for soil, groundwater, and sediment samples from each of these investigations or spills are summarized in Tables 13, 14, and 15, respectively. In cases where no analytical data have been obtained and/or no screening values are available, the potential COIs are retained for further evaluation in the RI. In cases where both data and screening values are available, the maximum measured concentration is compared with appropriate screening values, as described above. In cases where measured concentrations exceed the screening values, the COIs are retained for further evaluation in the RI. The location of each investigation/spill that is of potential concern is shown on Figure 11. A brief summary of each of these areas is provided below:

- A (Former Oil Sump): Selected metals in soil are above background screening levels and are retained as COIs, although their concentrations (with the exception of arsenic) are well below industrial soil PRGs. Petroleum hydrocarbons and PAHs are retained as COIs because they were detected but there are no background soil screening levels or PRGs with which they can be compared. Copper and lead in groundwater are above ecorisk screening levels for surface water and are retained as COIs. Petroleum hydrocarbons

and PAHs are retained as COIs for groundwater because they were detected but there are no ecorisk screening levels with which they can be compared.

- C (1982 PCB spills): Because no data are available, PCBs are retained as COIs.
- D1 and D3 (USTs removed from the scrap yard and the vehicle maintenance facility): Groundwater data indicate that BTEX was not detected and therefore is not a COI, but that diesel-range and heavy oil-range hydrocarbons should be retained as COIs. No soil data are available.
- D2 and D4 (USTs removed from the DRD facility and Mosely Shear): No data are available; therefore, petroleum hydrocarbons are retained as COIs for both soil and groundwater.
- E (PCB release in 1985): PCBs are retained as COIs based on their exceedance of the industrial soil PRG.
- G (Paint waste ponds near surface processing): Selected metals in soil are above background screening levels and are retained as COIs, although their concentrations (with the exception of chromium) are well below industrial soil PRGs. VOCs (xylenes only) are retained as COIs for groundwater because they were detected in soils; however, it should be noted that their concentration was well below the industrial soil PRG.
- H ("Creosote" encountered during 1986 dredging): No data are available. This material is suspected to be related to the operation of the former oil sump; therefore, the oil sump COIs, petroleum hydrocarbons and PAHs, are retained for this area.
- I (Capacitor bank PCB release in 1987): PCBs in soil were reported at a concentration above the industrial soil PRG and therefore will be retained as COIs.
- K (Transformer retrofit): PCBs in soil were reported at a concentration above the industrial soil PRG and therefore will be retained as COIs.
- M (Scrap yard): Metals (with the exception of mercury and silver) were present in soil at concentrations above background and will be retained as COIs; however, only arsenic, chromium, and lead were reported at concentrations above the industrial soil PRGs. Petroleum hydrocarbons were detected in soil and will be retained as COIs because there are neither background concentrations nor industrial soil PRGs with which they can be compared. Analysis of sediments sampled from the storm drains indicates that concentrations of cadmium, chromium, copper, lead, manganese, nickel, zinc, and PCBs exceed DEQ's sediment ecorisk screening levels and therefore will be retained as COIs. It should be noted that the PCB concentration is below the Portland Harbor baseline screening level. It should also be noted that the comparison of sediment samples from site catch

basins to ecorisk screening values is a very conservative (protective) approach to assessing whether these are COIs for Willamette River sediments. Petroleum hydrocarbons were also detected in those sediments and will be retained as COIs, although there are neither ecorisk screening levels nor Portland Harbor baseline screening levels with which they can be compared.

- N (Mosely Shear): Some limited analysis of excavated soils in 1996 suggests that metals, petroleum hydrocarbons, and oil-range hydrocarbons should be retained as COIs. BTEX and PCE were detected in soil at concentrations well below the industrial soil PRGs and are not retained as COIs. PCBs were detected at a concentration just above the industrial soil PRG. Analysis of sediments sampled from the storm drains indicates that cadmium, chromium, copper, lead, manganese, nickel, zinc, and PCBs exceed DEQ's sediment ecorisk screening levels and therefore will be retained as COIs. Petroleum hydrocarbons were also detected in those sediments and will be retained as COIs, although there are neither ecorisk screening levels nor Portland Harbor baseline screening levels with which they can be compared.

- O (Sediments near dock): Based on the analysis of pre-dredging samples obtained in 1998, cadmium, chromium, lead, nickel, zinc, PCBs, LPAHs, and HPAHs exceed DEQ's sediment ecorisk screening levels and therefore will be retained as COIs; however, the source of the COIs for the sediments remains unknown. It should be noted that the concentrations of chromium, nickel, LPAHs, and HPAHs are below the Portland Harbor baseline screening level.

- DD (1997 hydraulic oil release): Because no data are available, hydraulic oil is retained as a COI.

- HH (1999 hydraulic oil release): Because no data are available, hydraulic oil is retained as a COI.

- II (2000 diesel fuel release): Because no data are available, petroleum hydrocarbons are retained as COIs.

- KK (2000 diesel fuel release): Because no data are available, petroleum hydrocarbons are retained as COIs.

- OO (2001 hydraulic oil release): Diesel- and oil-range hydrocarbons were detected in soil but there are neither background concentrations nor industrial soil PRGs with which they can be compared; therefore, they will be retained as COIs in this area, although they may have another source, unrelated to the spill of hydraulic oil.

- QQ (2001 hydraulic oil release): Diesel- and oil-range hydrocarbons were detected in soil but there are neither background concentrations nor industrial soil PRGs with which they can be compared; therefore, they will be retained

as COIs in this area, although they may have another source, unrelated to the spill of hydraulic oil.

As discussed in Section 2.3 above, there are no current sources of COIs related to onsite disposal units and waste storage areas do not inherently represent potential source areas of COIs. However, some materials temporarily stored outside at the facility could be a source of COIs via storm water runoff. Areas of the site where substantial quantities of new steel products, scrap metals, and slag are exposed to precipitation include the scrap yard, Mosely Shear, steel storage near the southern property boundary, and slab scarfing area. The presence of COIs in sediments transported from the scrap yard and Mosely Shear areas is discussed above (items L and N). These two areas, and other areas where ongoing storm water runoff is a source of potential concern, are indicated on Figure 11. COIs associated with these areas are metals and petroleum hydrocarbons.

In addition to the historical investigation and spill areas discussed above, riverbank sediments were sampled in three areas (Figure 7) during Phase I of the Pre-RI investigation. The measured concentrations of COIs in these sediments have been evaluated for identification of areas of potential concern. For this evaluation, the sediments were separated into three categories: those stations located away from either of OSM's outfalls (RB1, RB2, RB11, and RB12), those stations near outfall 001 (RB7 through RB10), and those stations near outfall 003 (RB3 through RB6 and RB13). Maximum measured concentrations for each COI at each of these areas are summarized in Table 15.

In the areas away from the two outfalls, the maximum concentration of nickel marginally exceeded DEQ's sediment ecorisk screening levels and therefore it might be retained as a COI. The maximum concentration of PCBs was also above DEQ's sediment ecorisk screening level and they might be retained as a COI. It should be noted, however, that neither nickel nor PCBs exceeded the Portland Harbor baseline screening levels in these areas, calling into question the need for further evaluation of these chemicals at these locations.

Near outfall 001, the maximum concentrations of arsenic, cadmium, chromium, copper, lead, nickel, zinc, PCBs, LPAHs, and HPAHs all exceeded DEQ's sediment ecorisk screening levels and therefore they might be retained as COIs. It should be noted, however, that neither LPAHs nor HPAHs exceeded the Portland Harbor baseline screening levels in these areas, calling into question the need for further evaluation of these chemicals at these locations.

Near outfall 003, the maximum concentrations of arsenic, cadmium, chromium, copper, lead, nickel, zinc, PCBs, LPAHs, and HPAHs all exceeded both DEQ's sediment ecorisk screening levels and the Portland Harbor baseline screening levels; therefore, they will be retained as COIs.

5 Site Conceptual Exposure Model

A conceptual site model (CSM) is a site-specific evaluation of potential sources of COIs, exposure pathways, and receptors applicable to a site based on current and reasonably likely future land and water use, hydrogeologic data, and site investigation results completed to date. The human health and ecological CSMs for the OSM facility are based on the findings of the Pre-RI and current knowledge of site conditions. It should be noted that a detailed beneficial land and water use evaluation was not conducted as part of the Pre-RI. Additional data will be needed to further evaluate potentially complete exposure pathways applicable to the site.

There is not a single source of COIs at the site. Rather, there are many potential sources of COIs. As a result, the primary sources of COIs have been divided into above-ground releases and below-ground releases. Potential sources of above-ground releases include pipes, hoses, containers, tanks, transformers, and metal storage areas (new and scrap metal). Potential sources of below-ground releases include the former USTs, the former oil sump, and solid waste disposal (i.e., paint wastes). COIs associated with these potential sources include petroleum hydrocarbons (gasoline, diesel, and oils), PAHs, PCBs, VOCs, and residual metals.

There are no residential receptors on or in the vicinity of the site (within a 1/4-mile radius), and the site and adjacent properties are zoned for heavy industrial use. Therefore, residential receptor populations were excluded from the CSM. A CSM for human health risk assessment is provided on Figure 12. Potential human receptors include onsite occupational workers, onsite construction workers, and offsite recreational users on the Willamette River. Onsite receptors are adults only; offsite recreational users include adults and children.

A CSM for ecological risk assessment is provided on Figure 13. Potential ecological receptors include onsite and offsite terrestrial organisms and birds, and offsite aquatic organisms. It is anticipated, however, that there is little if any ecological habitat or receptors on the upland portions of the OSM site due to the industrial nature of the facility.

Although several exposure pathways and ecological receptors have been identified, they are presented for conceptual purpose only to identify possible exposure pathways. Presentation of the exposure pathways does not imply that exposure to COIs by potential receptors is occurring or has occurred in the past, or that ecological receptor populations are present. Actual exposure to COIs by onsite or offsite ecological receptors may be unlikely or insignificant. An exposure pathway is considered to be complete only if a receptor has been exposed to COIs. Therefore, for the purpose of this report, the exposure pathways presented on Figures 12 and 13 are only considered to be potentially complete.

5.1 Direct Contact Pathway

Above-ground spills, leaks, or discharges of petroleum hydrocarbons and PCBs have occurred at various parts of the site and have affected surface soils. In addition, metals, petroleum hydrocarbons, and PCBs may be transported in surface water runoff. There is a potential for

direct contact (incidental ingestion and dermal contact) with these COIs only for onsite workers and construction workers. The site is fenced and security personnel provide 24-hour security. Therefore, onsite trespassers are not reasonably expected to be significantly exposed to affected surface soils.

COIs within surface soils may be transported to subsurface soils and groundwater (via leaching and infiltration) and to sediments and surface water (via runoff entering the storm water drainage system). A berm extending along the riverbank prevents storm water runoff from entering the Willamette River at locations other than the storm water outfalls. Direct contact with subsurface soils and groundwater could occur during excavation activities. During excavation, there is a potential for onsite construction workers to be exposed to subsurface soils and groundwater; however, onsite workers are not reasonably expected to have significant, direct contact exposure to subsurface media. Offsite recreational users on the Willamette River could potentially have direct contact to river sediments and surface water.

Incidental ingestion of soils, surface water, and potentially affected fish by terrestrial organisms and birds could occur. Incidental ingestion and dermal contact of surface water and sediments by aquatic organisms could also occur. Subsurface-dwelling, terrestrial organisms may also be exposed by dermal contact.

5.2 Groundwater Pathway

In parts of the site, groundwater has been affected by releases of COIs. As discussed in the previous section, there is a potential for incidental ingestion and dermal contact with COIs for construction workers (i.e., trench workers), but not for onsite workers.

There are no beneficial uses of groundwater beneath the OSM property. Preliminary evaluation of offsite groundwater use indicates limited beneficial use (primarily industrial) of groundwater in the site vicinity. Potable water for consumption at the OSM facility is provided by the City of Portland public water supply, which is procured from distant sources (Bull Run watershed or Portland wellfield). Therefore, ingestion of groundwater was excluded as a potentially complete exposure pathway.

Three water-bearing zones have been identified beneath the OSM site (unconfined shallow zone and semiconfined to confined intermediate and deeper zones) to a depth of 100 ft bgs or more. The deeper water-bearing zone is underlain by the Troutdale Formation. Groundwater levels in the shallow water-bearing zone can be 5 ft bgs or less. Groundwater flow in the shallow and intermediate zones is toward the river (westerly); limited information exists for the deeper zone. Both the intermediate and deeper zones are influenced by tides and river stage (Hart Crowser 1993).

Groundwater from the shallow and intermediate zones flows toward and likely discharges to the Willamette River. Surface water and river sediments could potentially be affected by the transport of COIs in groundwater migrating to the river. The groundwater flow system and resulting migration pathways beneath the OSM property have not been fully evaluated. Notable data gaps regarding the groundwater system include:

- The hydraulic properties of the affected water-bearing zones are unknown
- The interaction between groundwater and surface water is unknown (i.e., discharge rate and volume).

5.3 Surface Water Pathway

Surface water bodies located within 2 miles of the OSM facility include:

- The Willamette River is located adjacent to the western OSM property boundary
- The Willamette River flows north to the confluence with the Columbia River, located approximately 2 miles downstream of the OSM property
- The confluence of the Multnomah Channel and the Willamette River is approximately 0.5 miles south (upstream) of the OSM property
- Ramsey Lake, Bybee Lake, and the Columbia Slough are located approximately 0.5–1.2 miles west (hydraulically upgradient) of the western OSM property boundary.

The Multnomah Channel, Ramsey and Bybee Lakes, and the Columbia Slough are located either upstream or hydraulically upgradient of the site. There is no potential for COIs to be transported to these surface water bodies due to their location and distance relative to the site. Similarly, the mouth of the Multnomah Channel is located upstream from the OSM site and therefore could not be affected by site COIs.

COIs detected in Willamette River sediments near the shoreline of the OSM property could be from upstream sources or from potential onsite sources of COIs transported to the river via groundwater discharge or from storm water drainage system discharge. Beneficial uses of the Willamette River include industrial use, recreational use, and ecological habitat.

Surface water rights were reviewed via a water rights map accessed via the WRD website. The map shows a diversion point associated with the river intake for the OSM facility. There is one other surface water diversion point downstream between the site and the Columbia River, approximately 0.75 miles downstream from the site. The user of this diversion point is unknown, but it is likely that the diversion point is used for industrial purposes based on the area land use.

There is a potential for direct contact (incidental ingestion and dermal contact) with the COIs in surface water and sediments for offsite recreational users (i.e., boaters, fishermen, water skiers, swimmers) of the Willamette River. There is also a potential for indirect exposure through ingestion of potentially affected fish by recreational users. Incidental ingestion and dermal contact of surface water and sediments by aquatic organisms may also occur.

5.4 Air Pathway

Except for VOCs, the COIs are generally considered to be nonvolatile (metals) or semivolatile (PCBs, oil-range hydrocarbons, and diesel-range hydrocarbons). As a result, volatilization of COIs from affected media (surface soil, subsurface soil, and groundwater) is not anticipated to be significant. Inhalation exposure to selected COIs could occur through airborne particulate transport. Potential receptors for inhalation exposure to particulates are onsite workers and construction workers. As described in Section 1.1, the site is fenced and guarded; therefore, onsite trespassers are not expected to be significantly exposed to COIs via the inhalation exposure route.

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Figures

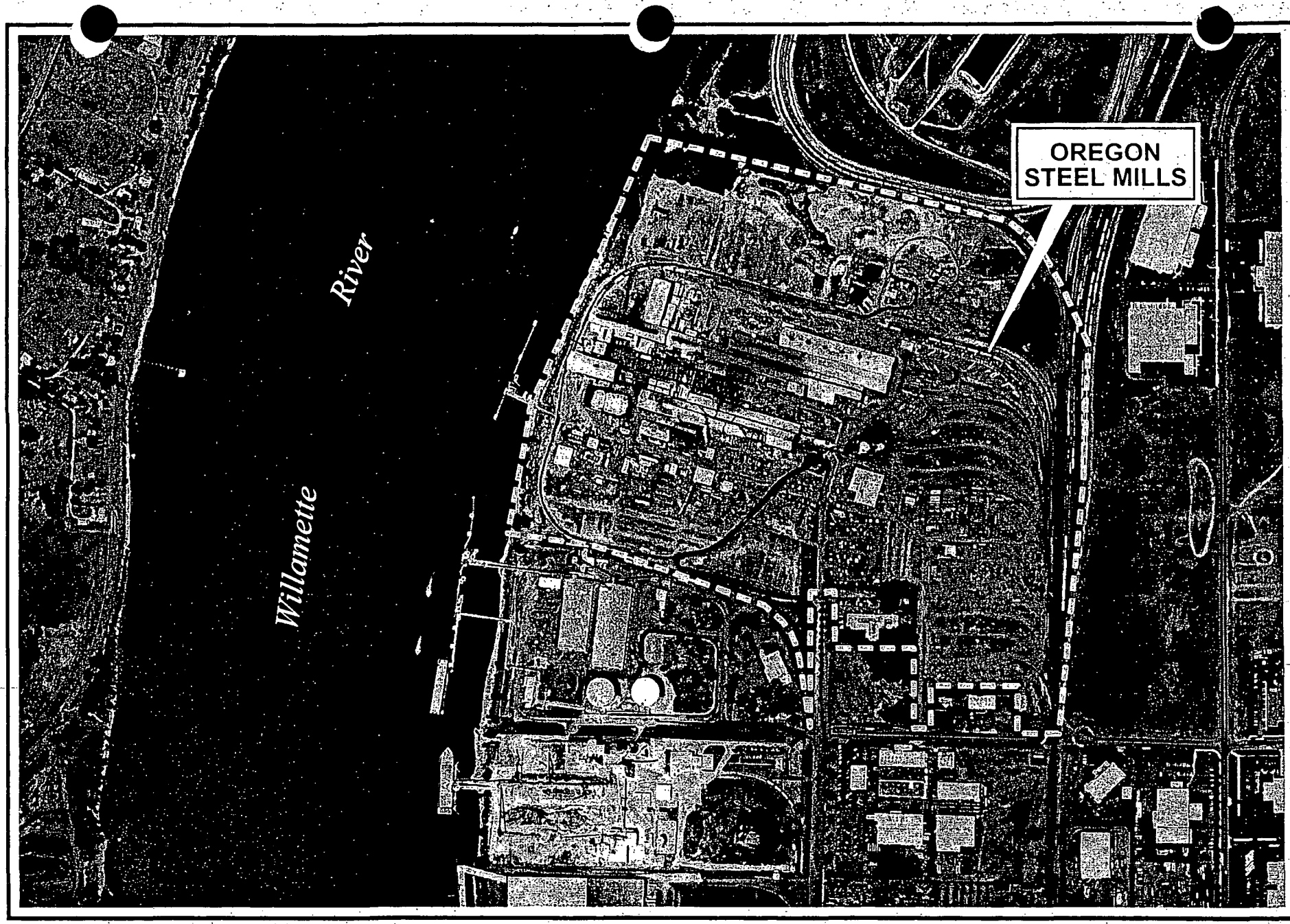
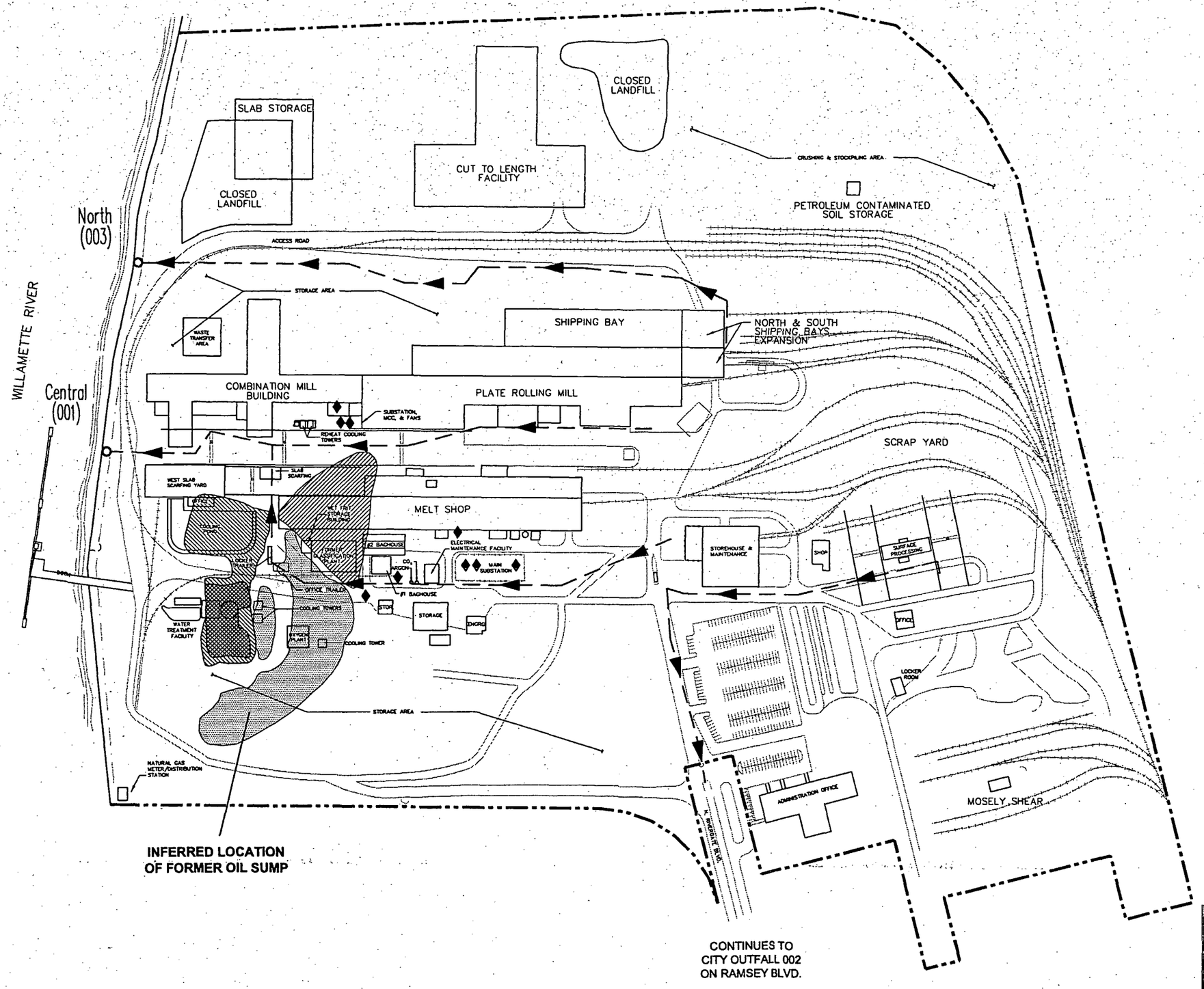


Figure 1. Site location.

8601526.001.0101/ SITE.fh7 03/02/01 OR



LEGEND

- Buildings
- Railroad
- Outfall NPDES sampling stations
- Transformer with PCB-containing oil (<50 ppm)
- Property line
- Storm drain trunk line

Approximate expansion of former oil sump by year (based on aerial photography):

1944 1948 1956 1960

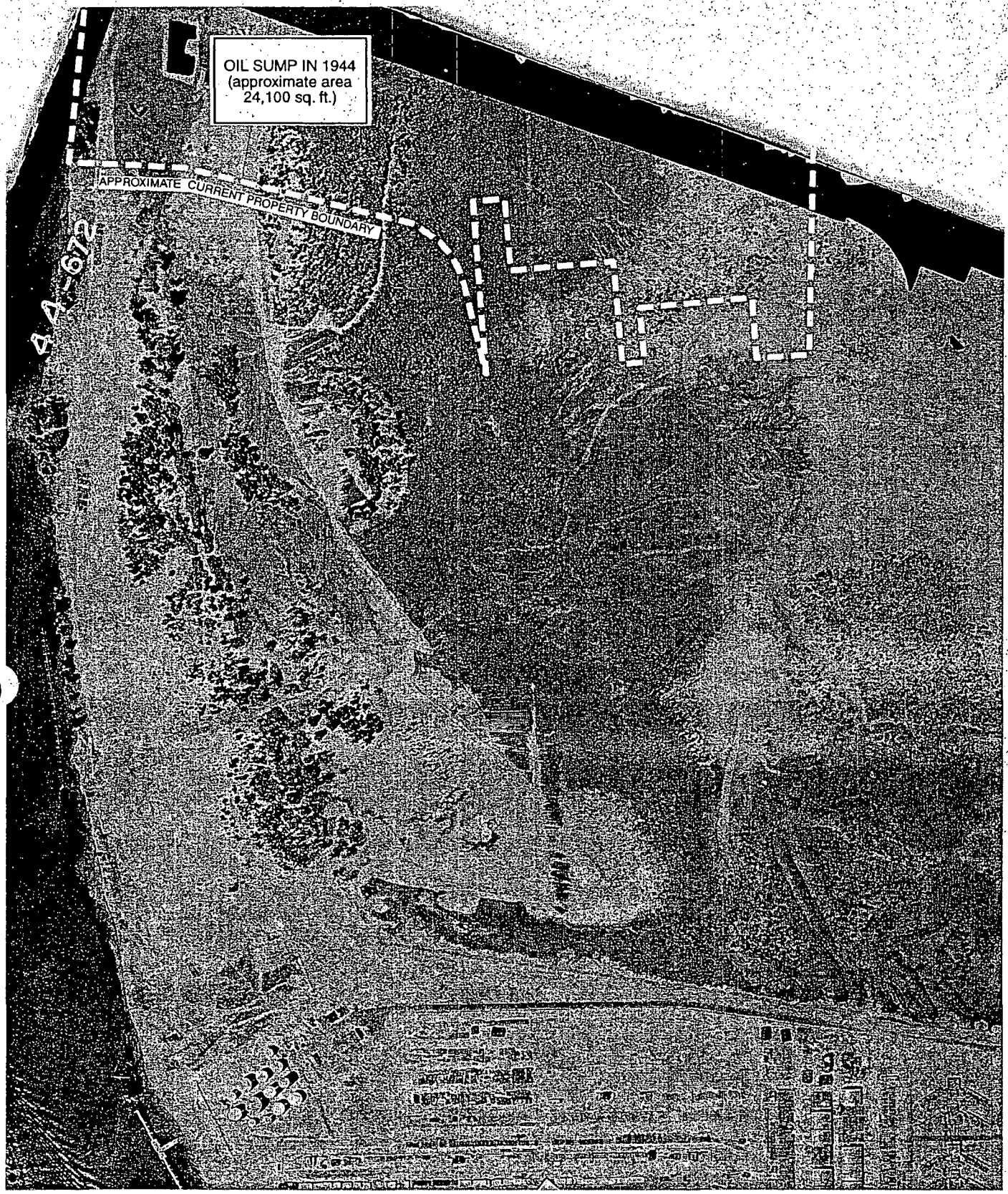
0 150 300 feet

Source: Oregon Steel Mills, Inc. and Hart Crowser, Inc.

Exponent

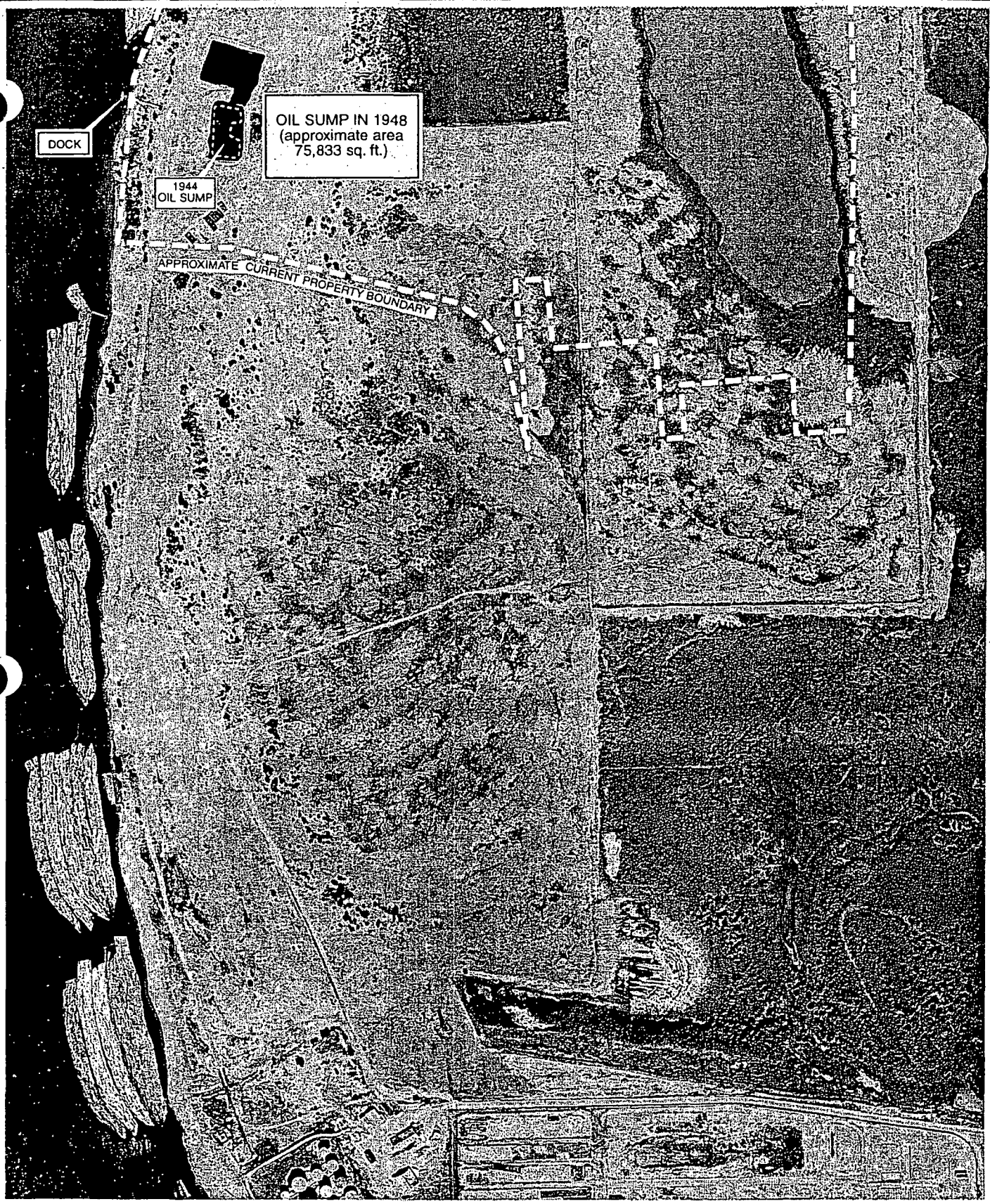
Figure 2. Site map.

oswego2\data\graphics\OSM\0304 SITE MAP.dwg 12/12/01 OR



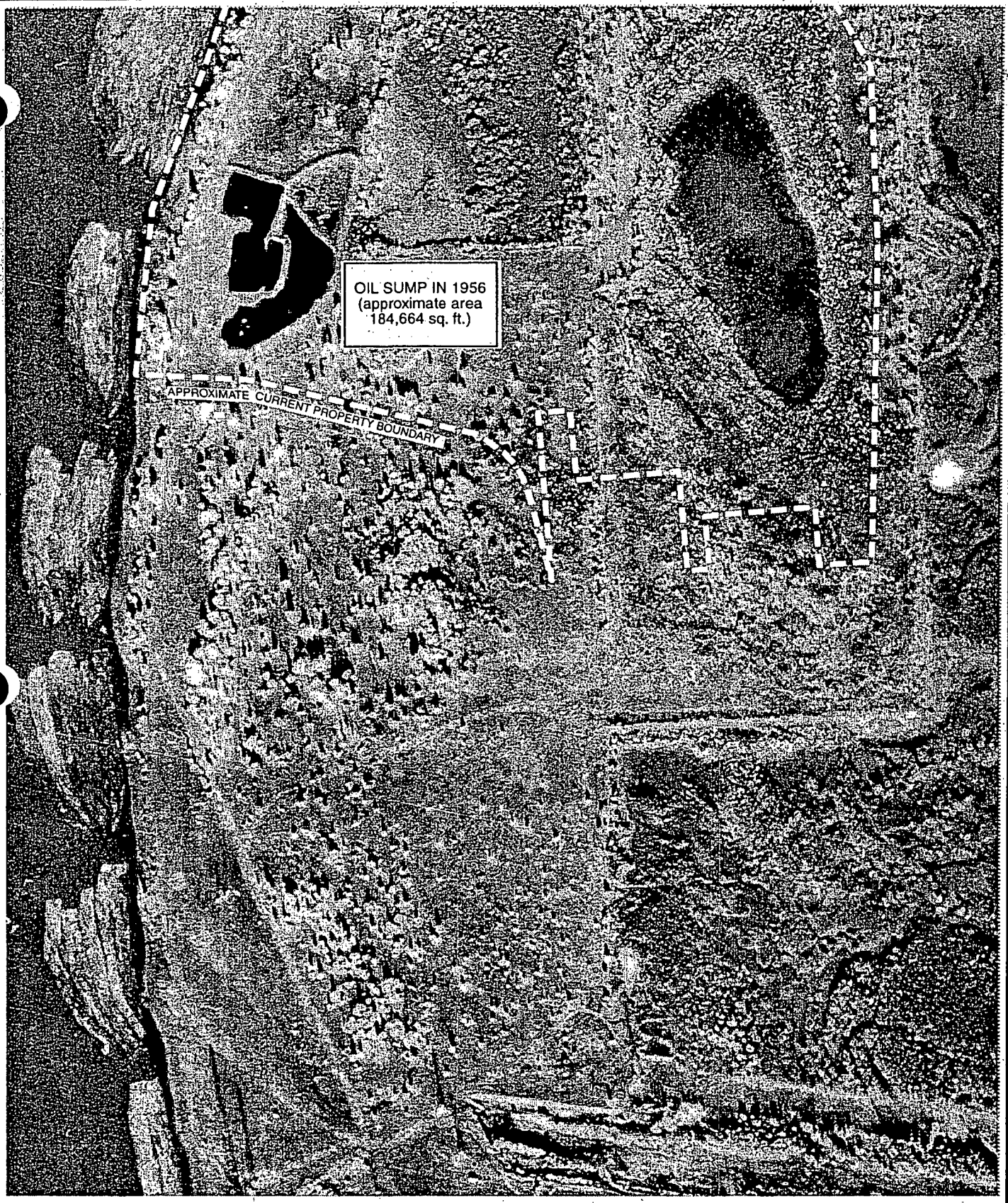
Source: US Army Corps of Engineers

Figure 3a. Aerial photo - May 1944.



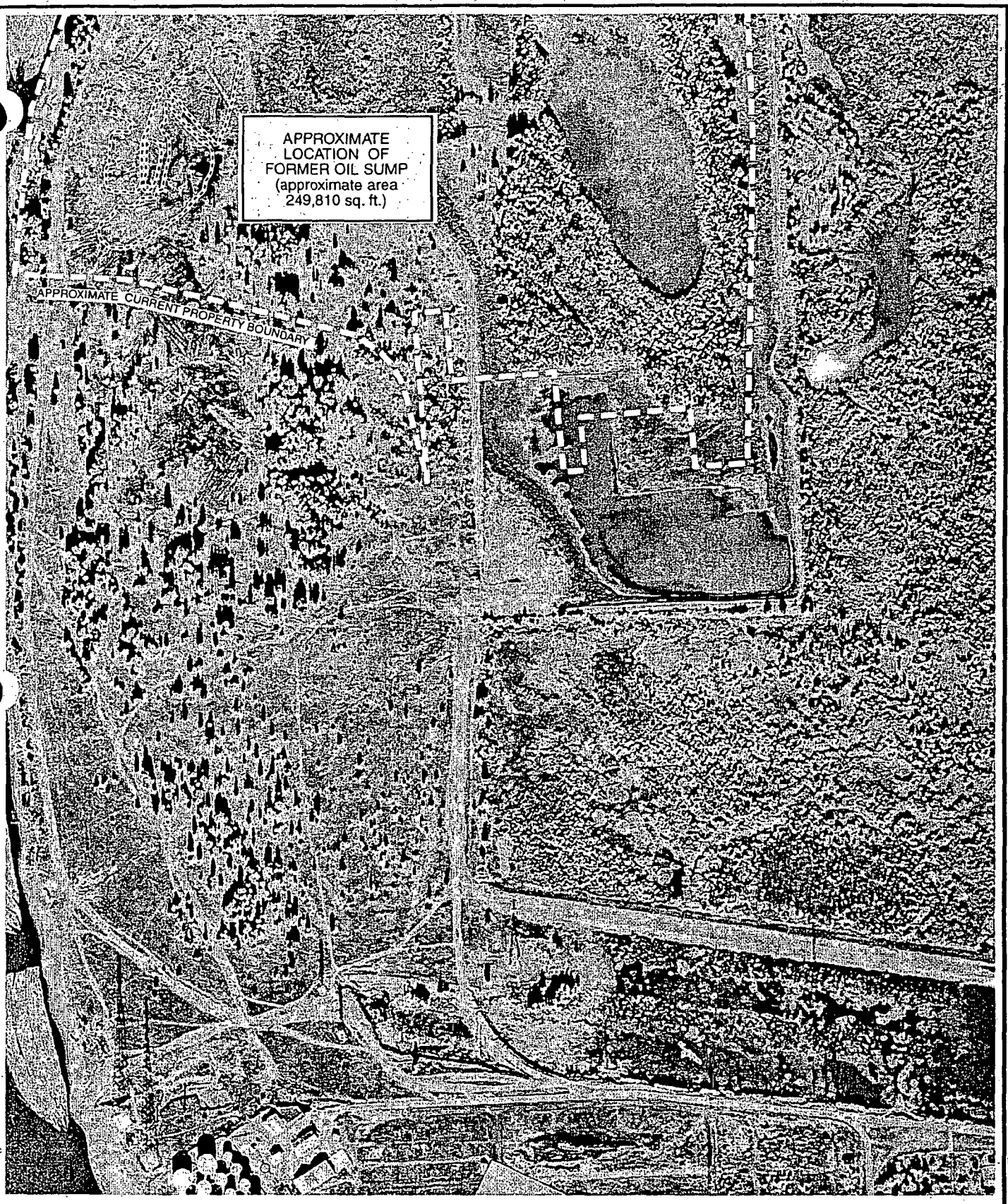
Source: US Army Corps of Engineers

Figure 3b. Aerial photo - July 1948.



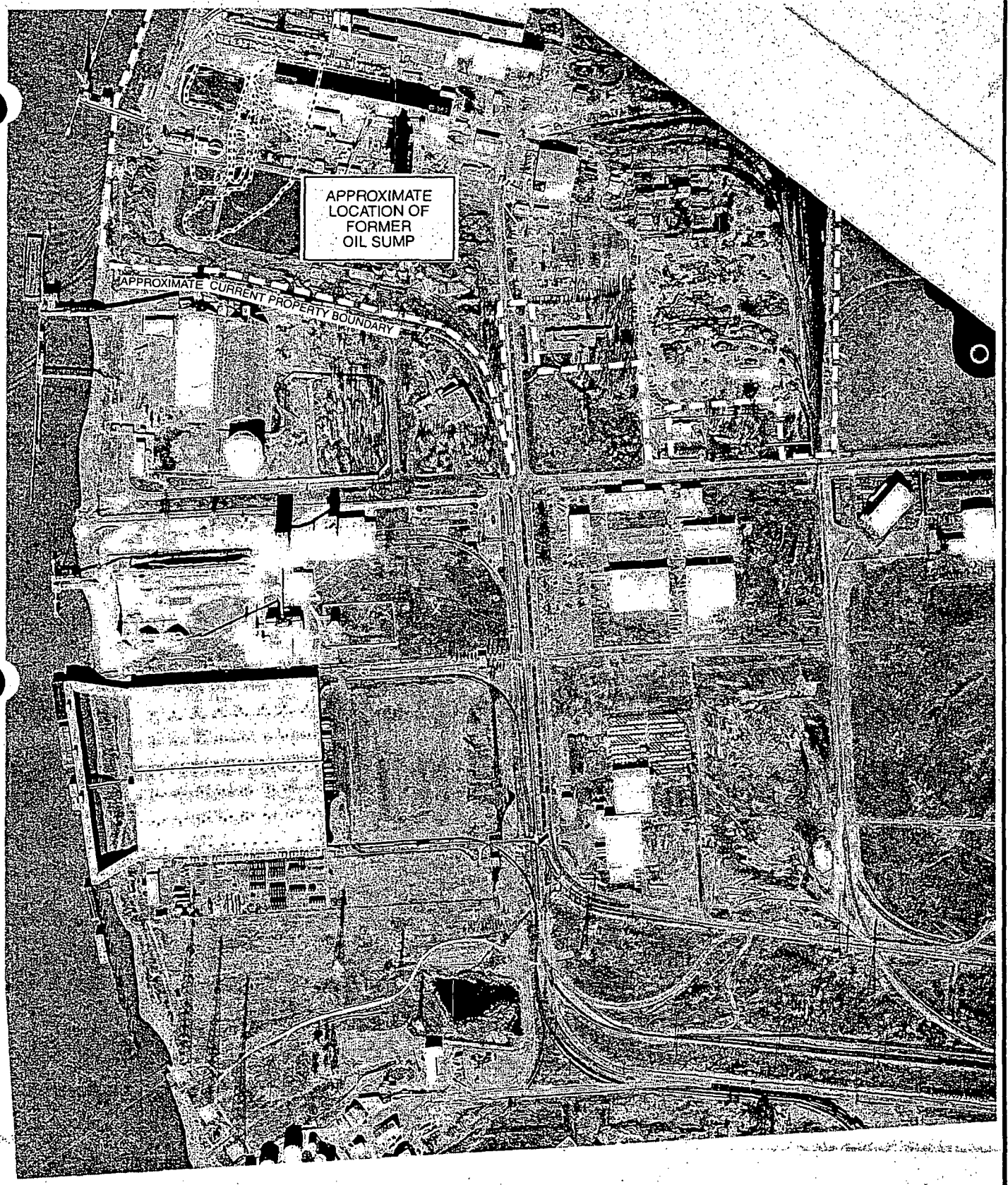
Source: US Army Corps of Engineers

Figure 3c. Aerial photo - November 1956.



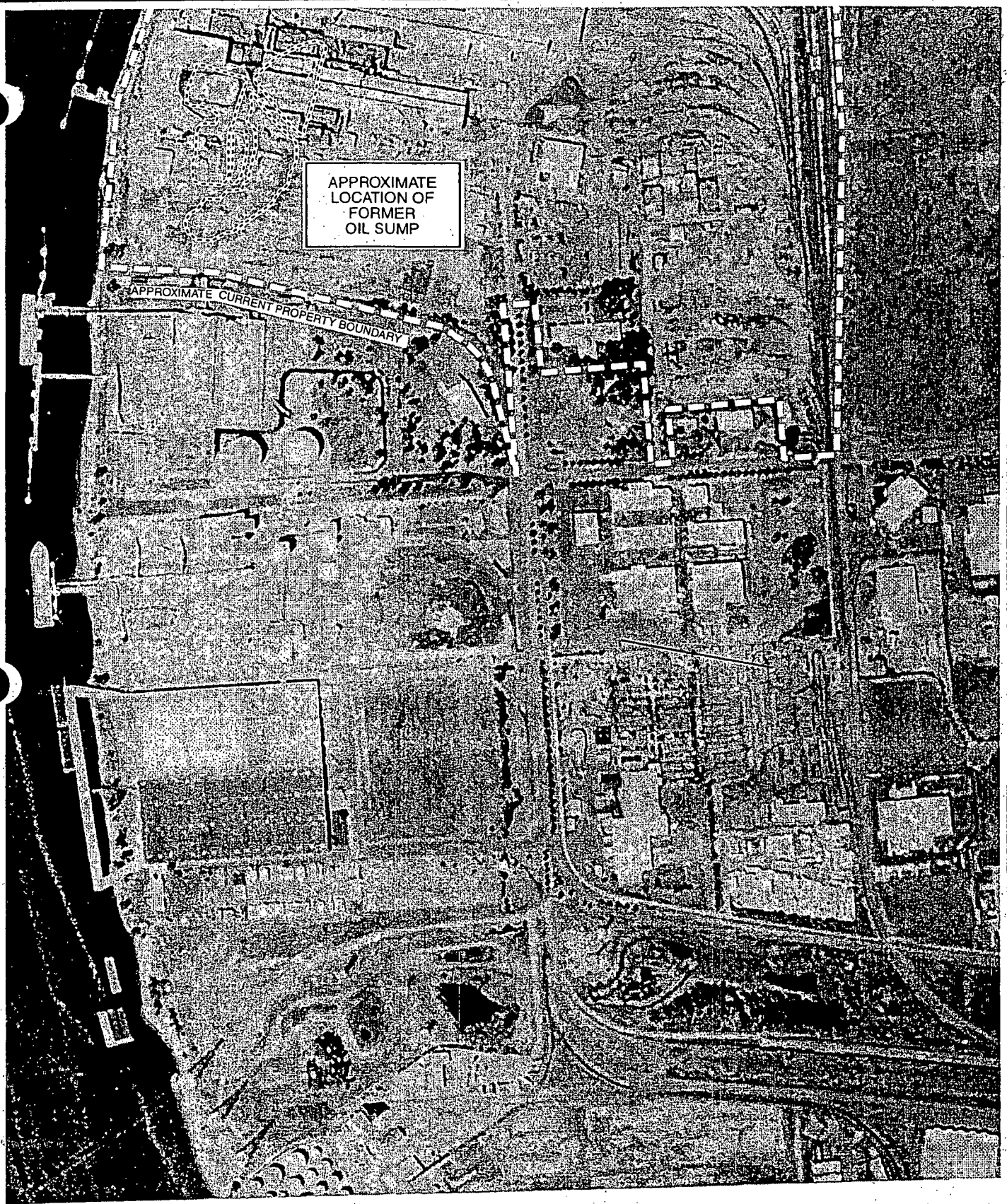
Source: US Army Corps of Engineers

Figure 3d. Aerial photo - November 1961.



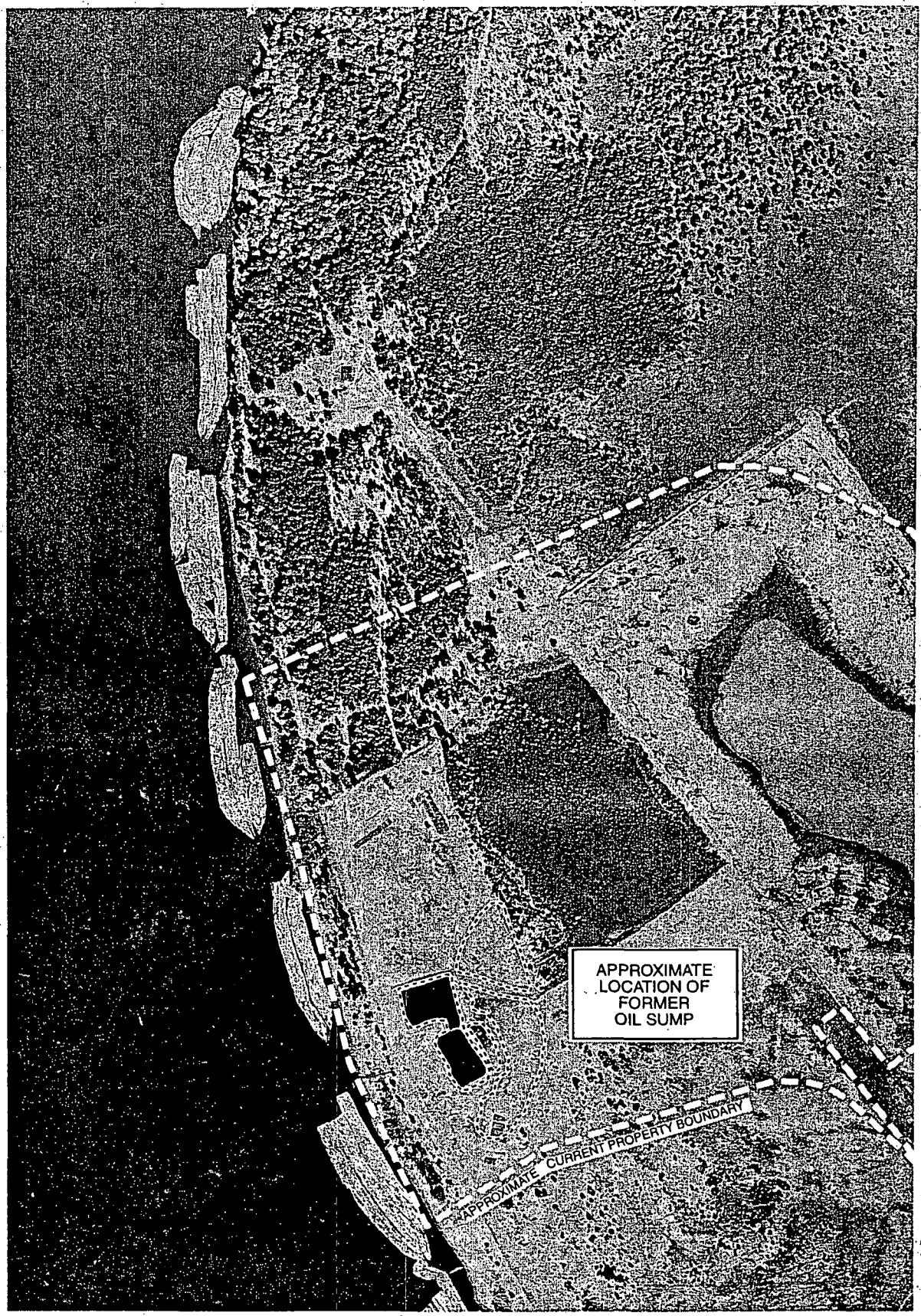
Source: US Army Corps of Engineers

Figure 3e. Aerial photo - January 1980.



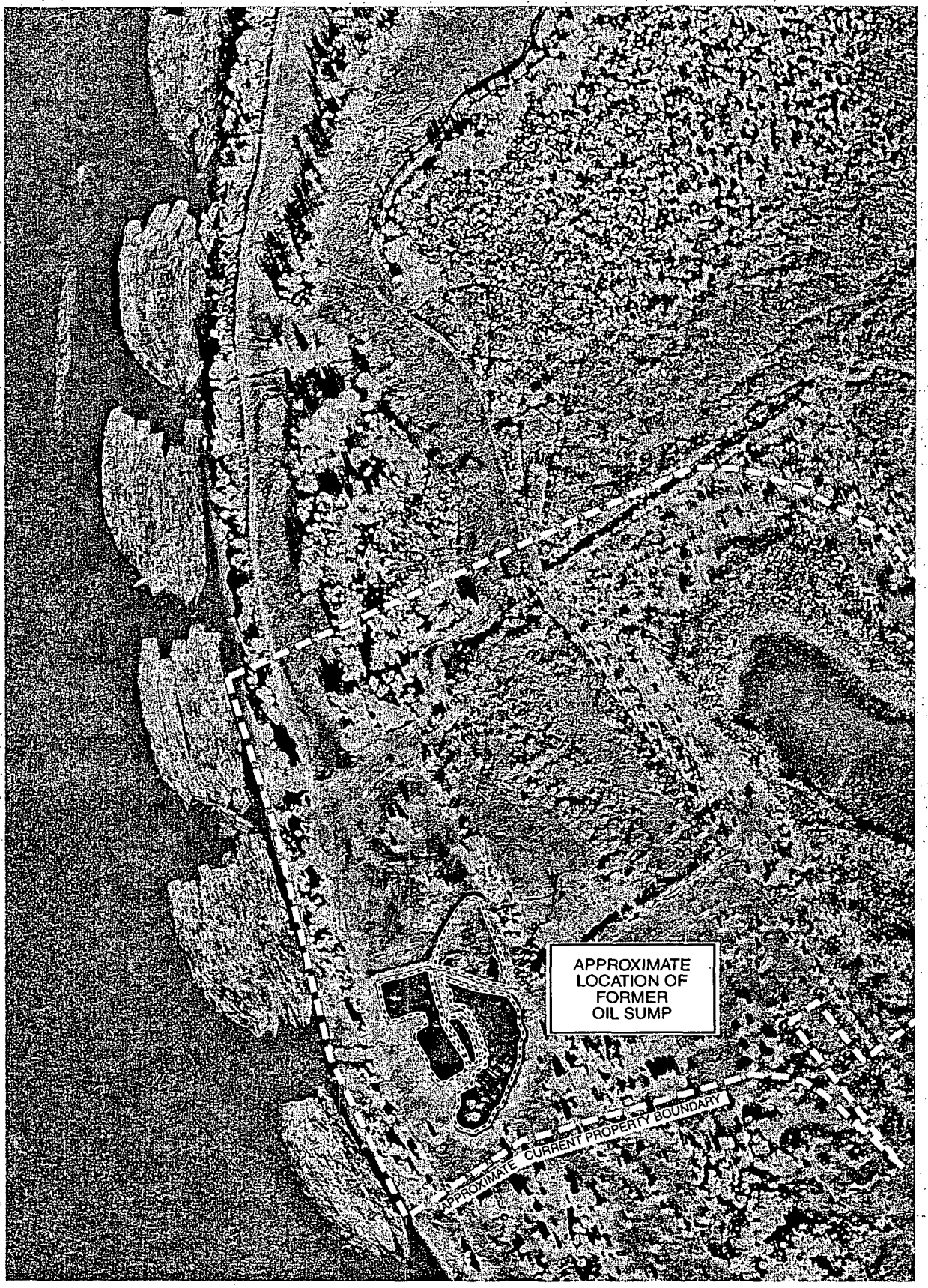
Source: US Army Corps of Engineers

Figure 3f. Aerial photo - July 1999.



Source: US Army Corps of Engineers

Figure 3g. Aerial photo covering entire site - July 1948.



Source: US Army Corps of Engineers

Figure 3h. Aerial photo covering entire site - November 1956.

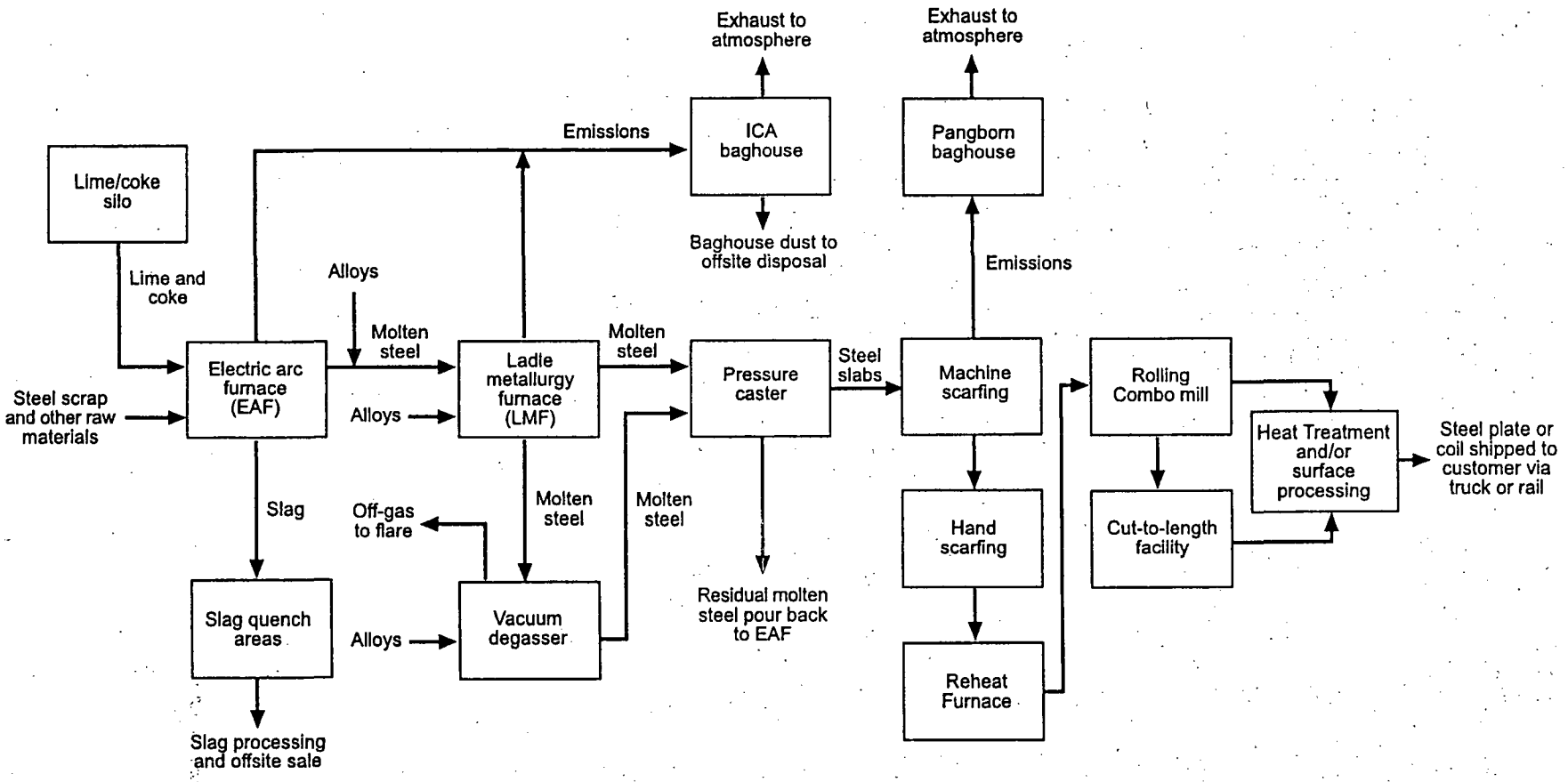
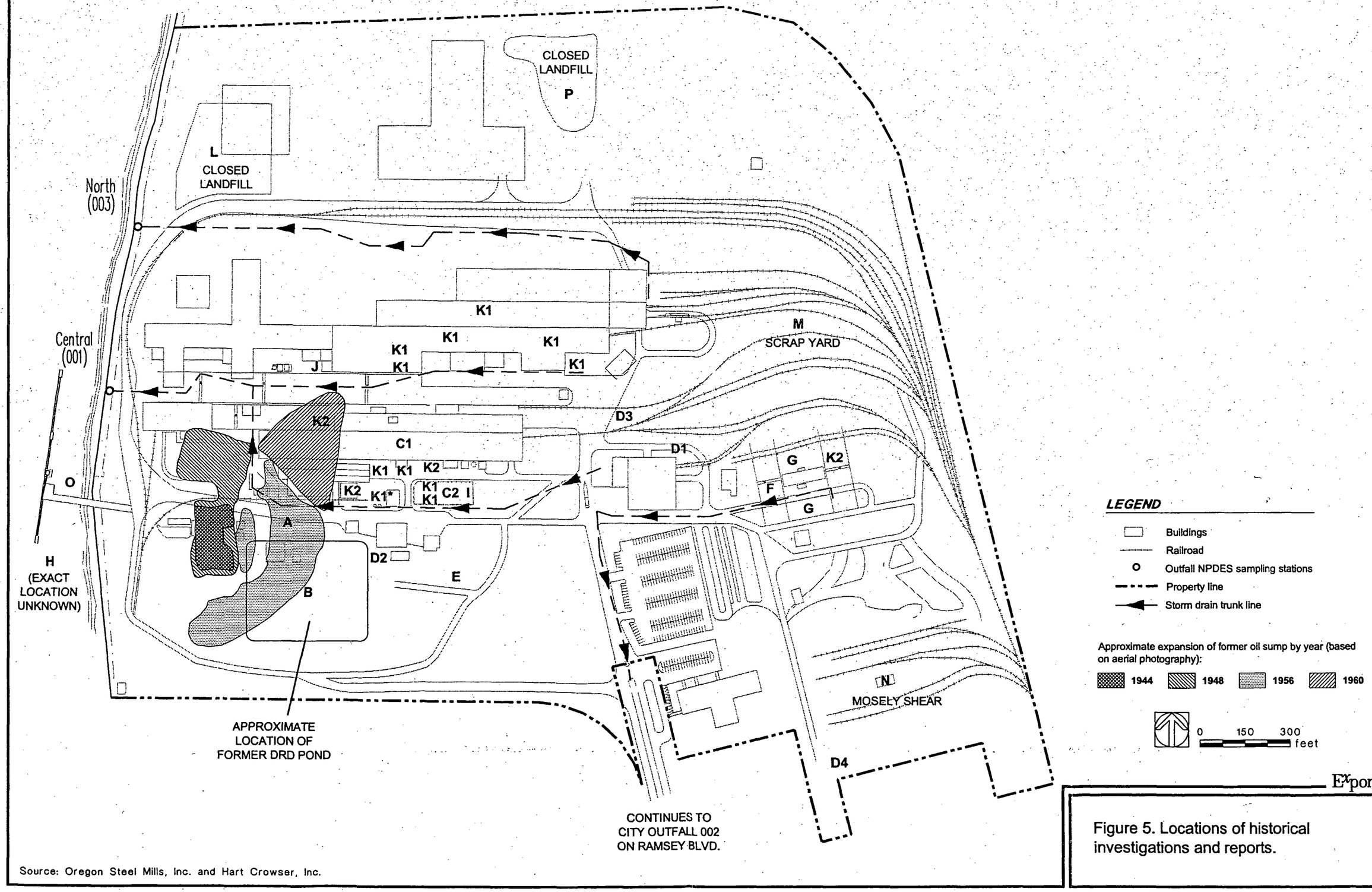


Figure 4. Manufacturing process flow diagram.

8601526.001.0101/ MPF Diagram2.fh7 01/17/02 OR

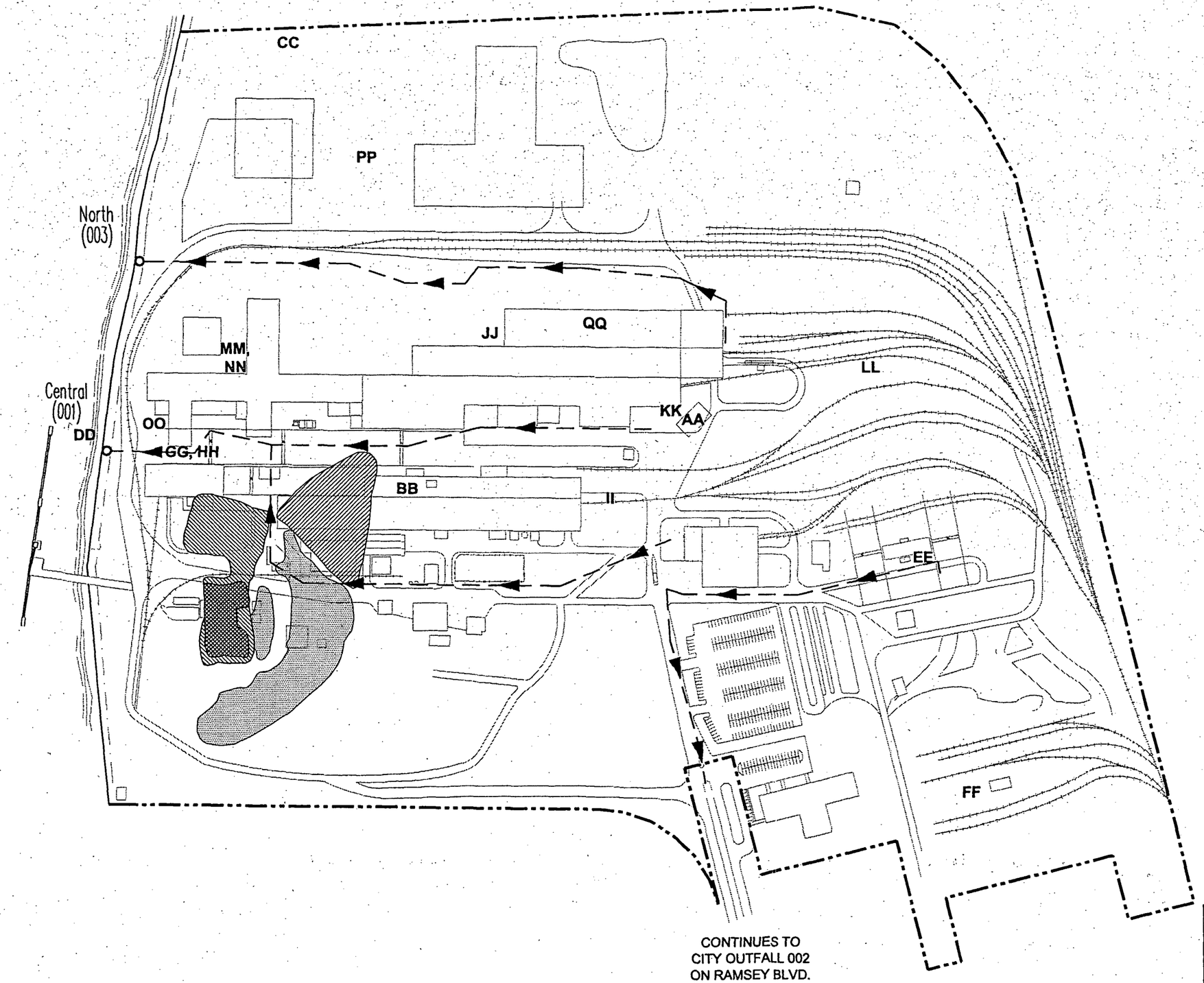


Source: Oregon Steel Mills, Inc. and Hart Crowser, Inc.

Exponent

Figure 5. Locations of historical investigations and reports.

oswego2\data\graphics\OSM\0304 HIST INVEST.dwg 12/20/01 OR



LEGEND

- Buildings
- Railroad
- Outfall NPDES sampling stations
- Property line
- Storm drain trunk line

Approximate expansion of former oil sump by year (based on aerial photography):

1944 1948 1956 1960

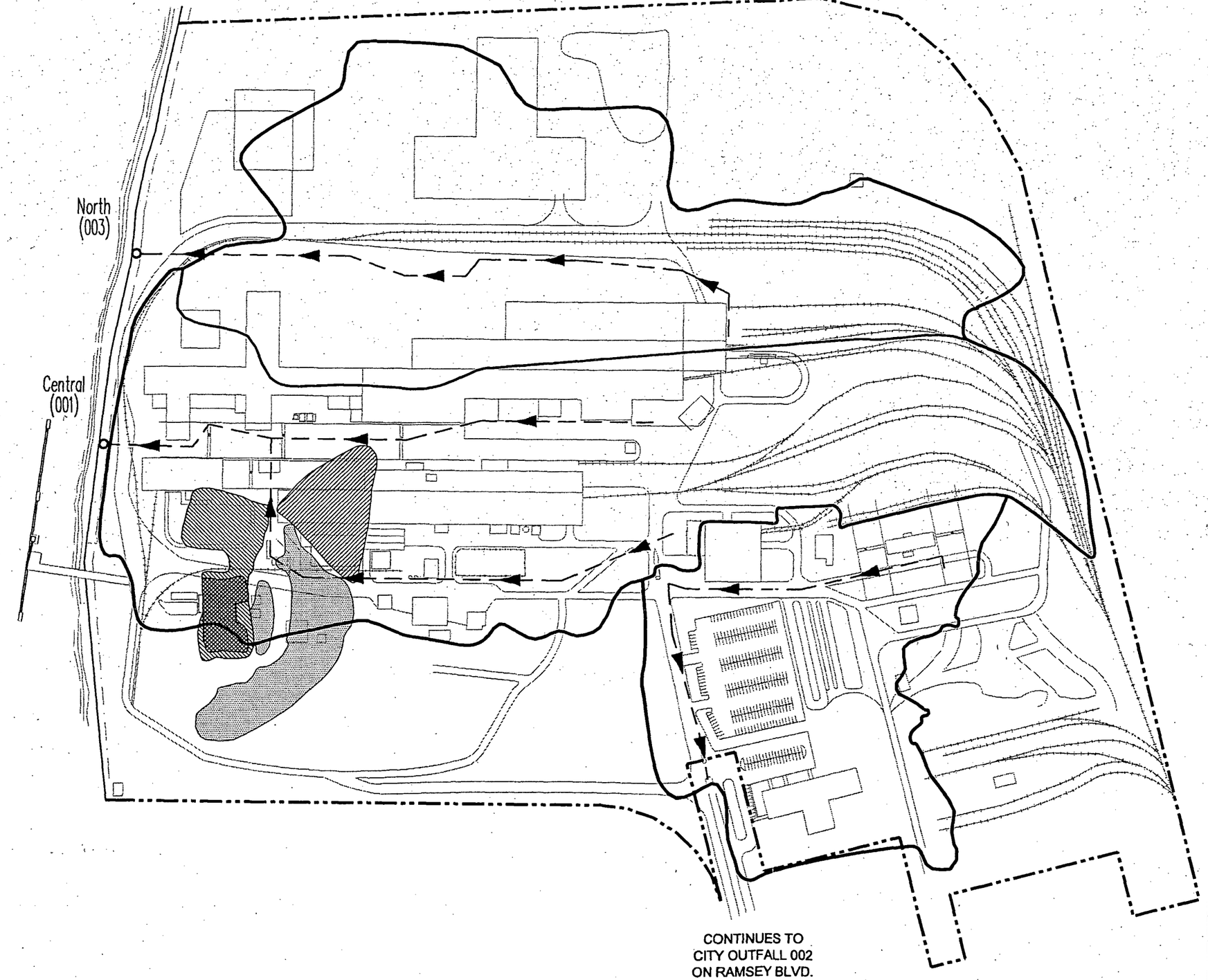
0 150 300 feet

Source: Oregon Steel Mills, Inc. and Hart Crowser, Inc.

Exponent

Figure 6. Locations of historical spills.

oswego2\data\graphics\OSM\0304 HISTORICAL.dwg 12/12/01 OR



Source: Oregon Steel Mills, Inc. and Hart Crowser, Inc.

LEGEND

- Buildings
- Railroad
- Outfall NPDES sampling stations
- Property line
- Strom water drainage basin
- Storm drain trunk line

Approximate expansion of former oil sump by year (based on aerial photography):

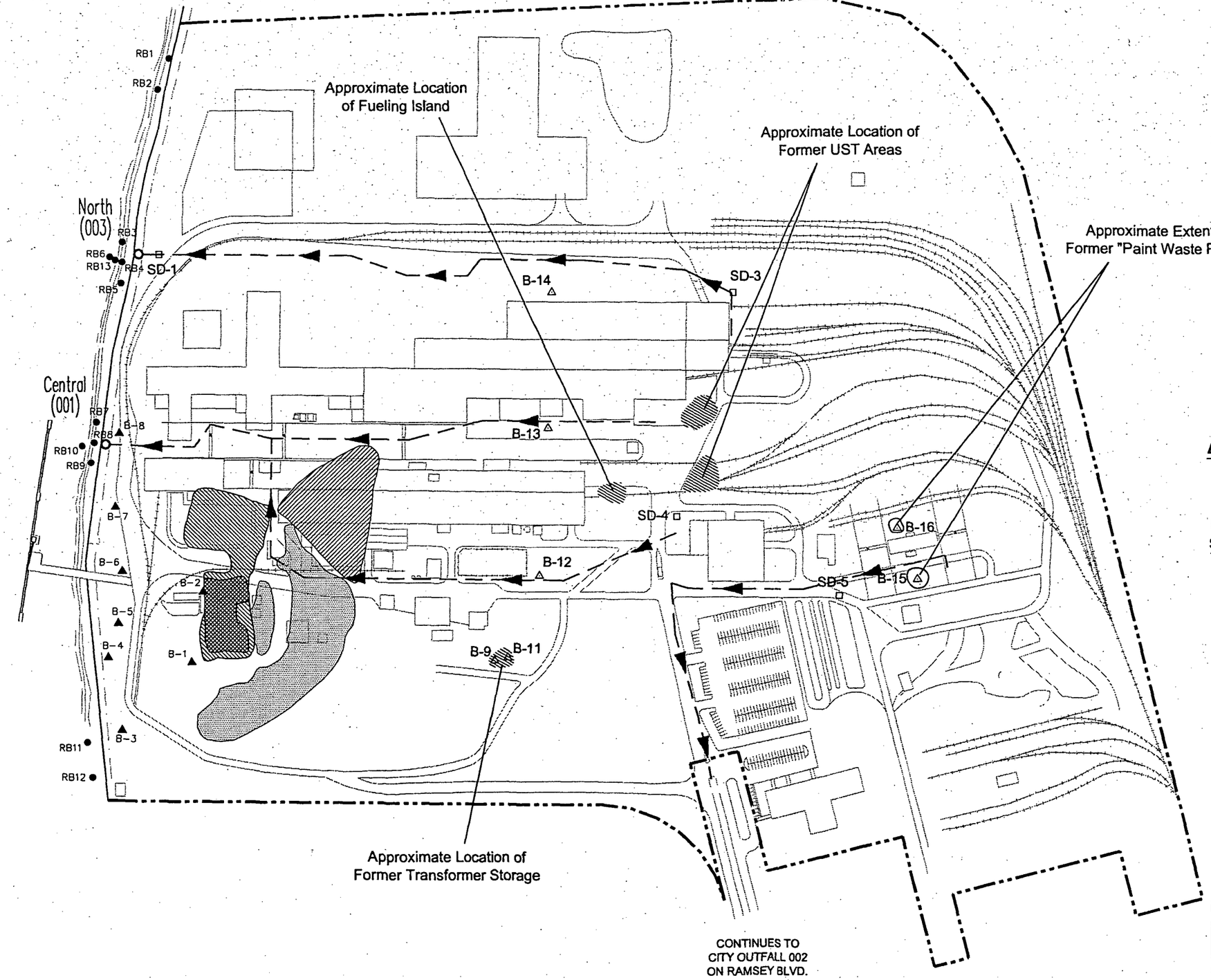
1944 1948 1956 1960

0 150 300 feet

Exponent

Figure 7. Storm water drainage system.

oswego2\data\graphics\OSM\0304 SW drainage.dwg 12/12/01 OR

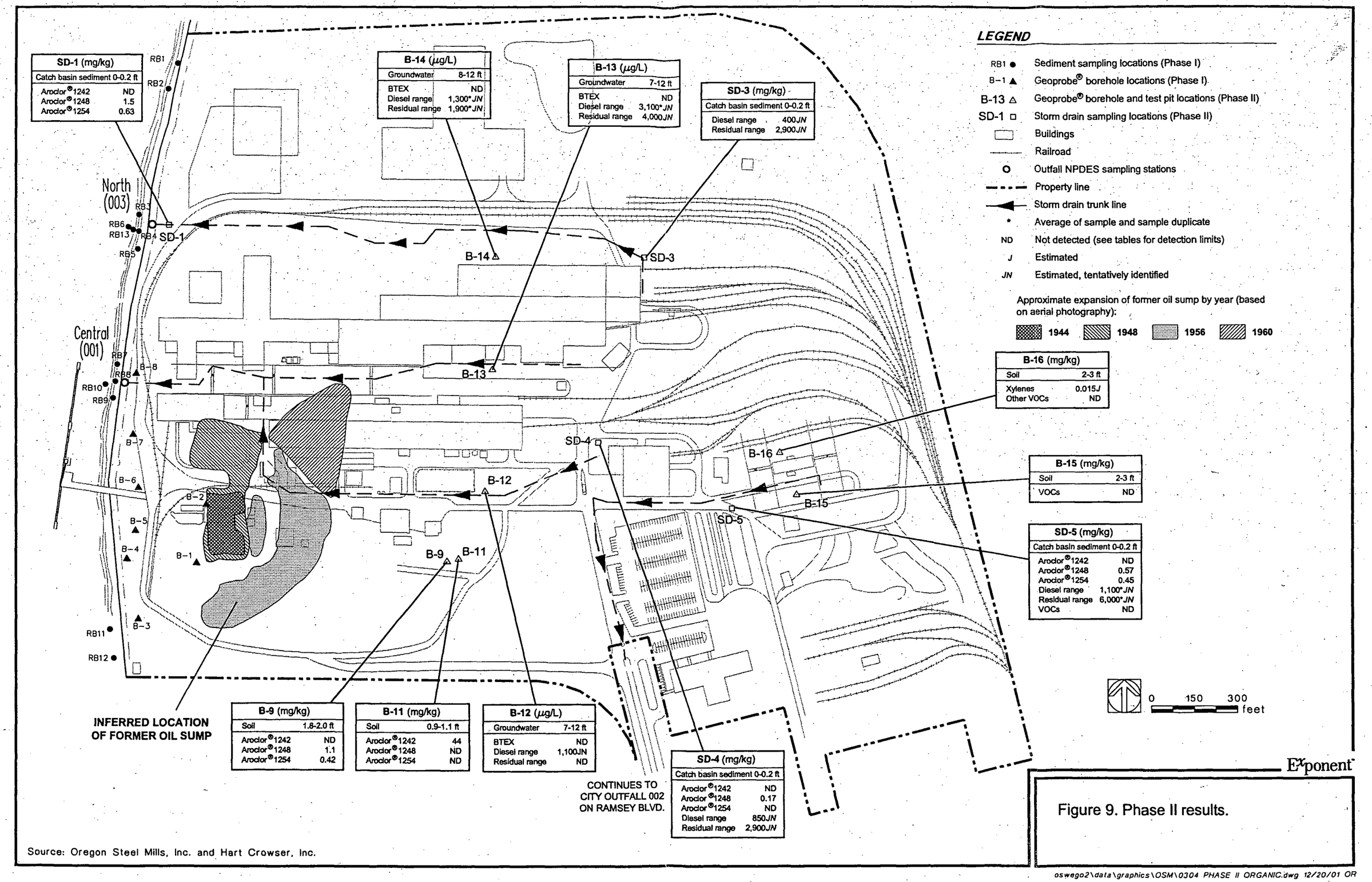


Source: Oregon Steel Mills, Inc. and Hart Crowser, Inc.

Exponent

Figure 8. Phase I & II sampling stations.

oswego2\data\graphics\OSM\0304 P I & II LOCS.dwg 12/12/01 OR

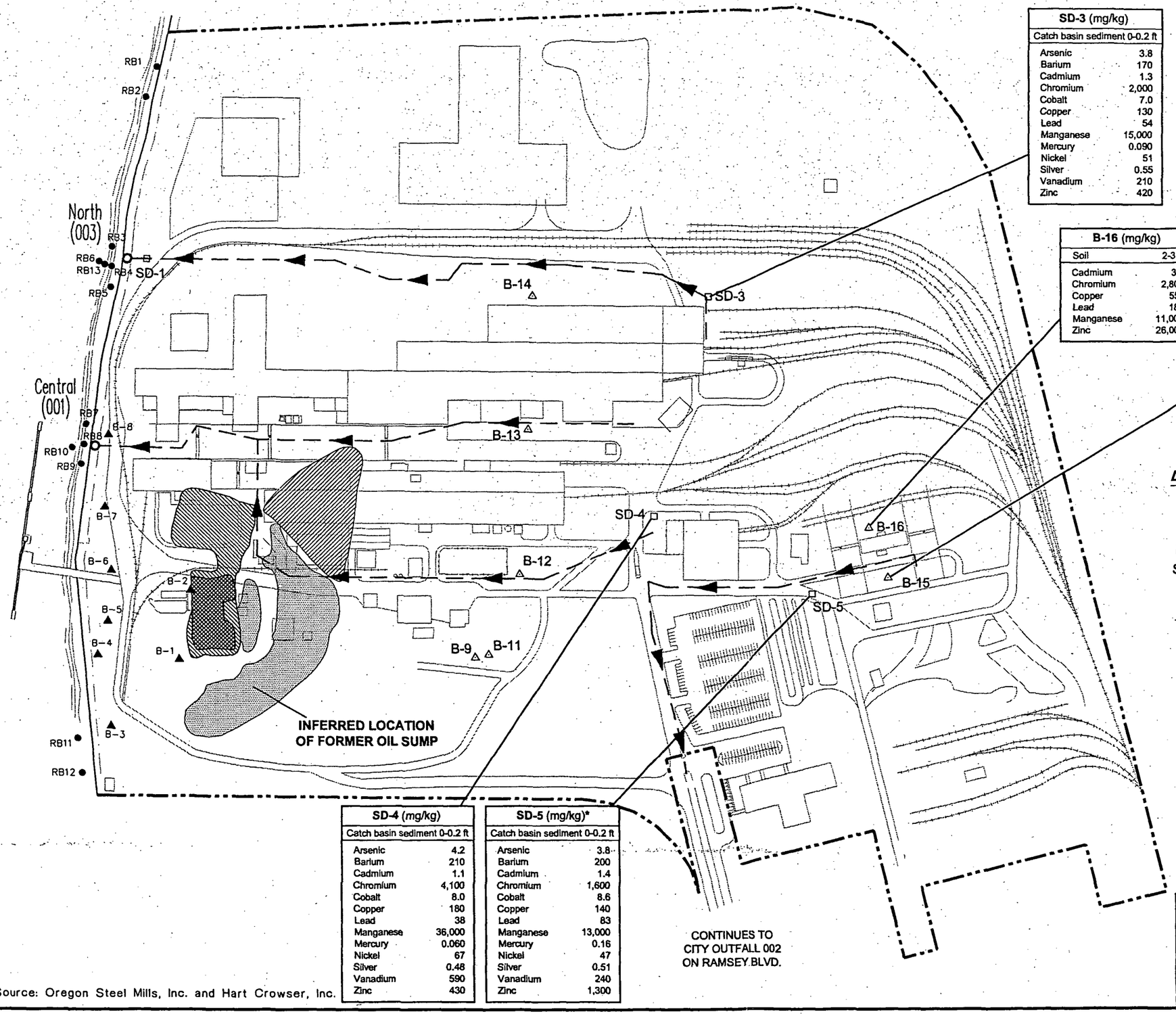


Source: Oregon Steel Mills, Inc. and Hart Crowser, Inc.

Exponent

Figure 9. Phase II results.

oswego2\data\graphics\OSM\0304 PHASE II ORGANIC.dwg 12/20/01 OR



SD-3 (mg/kg)	
Catch basin sediment 0-0.2 ft	
Arsenic	3.8
Barium	170
Cadmium	1.3
Chromium	2,000
Cobalt	7.0
Copper	130
Lead	54
Manganese	15,000
Mercury	0.090
Nickel	51
Silver	0.55
Vanadium	210
Zinc	420

B-16 (mg/kg)	
Soil	2-3 ft
Cadmium	3.2
Chromium	2,800
Copper	550
Lead	180
Manganese	11,000
Zinc	26,000

B-15 (mg/kg)	
Soil	2-3 ft
Arsenic	6.2
Barium	280
Cadmium	0.60
Chromium	4,300
Cobalt	5.9
Copper	160
Lead	11
Manganese	30,000
Nickel	56
Silver	1.2
Vanadium	450
Zinc	53

SD-4 (mg/kg)	
Catch basin sediment 0-0.2 ft	
Arsenic	4.2
Barium	210
Cadmium	1.1
Chromium	4,100
Cobalt	8.0
Copper	180
Lead	38
Manganese	36,000
Mercury	0.060
Nickel	67
Silver	0.48
Vanadium	590
Zinc	430

SD-5 (mg/kg)*	
Catch basin sediment 0-0.2 ft	
Arsenic	3.8
Barium	200
Cadmium	1.4
Chromium	1,600
Cobalt	8.6
Copper	140
Lead	83
Manganese	13,000
Mercury	0.16
Nickel	47
Silver	0.51
Vanadium	240
Zinc	1,300

LEGEND

- RB1 ● Sediment sampling locations (Phase I)
- B-1 ▲ Geoprobe® borehole locations (Phase I)
- B-13 △ Geoprobe® borehole and test pit locations (Phase II)
- SD-1 □ Storm drain sampling locations (Phase II)
- Buildings
- Railroad
- Outfall NPDES sampling stations
- Property line
- Storm drain trunk line
- * Average of sample and sample duplicate
- --- Not analyzed

Approximate expansion of former oil sump by year (based on aerial photography):

1944 1948 1956 1960

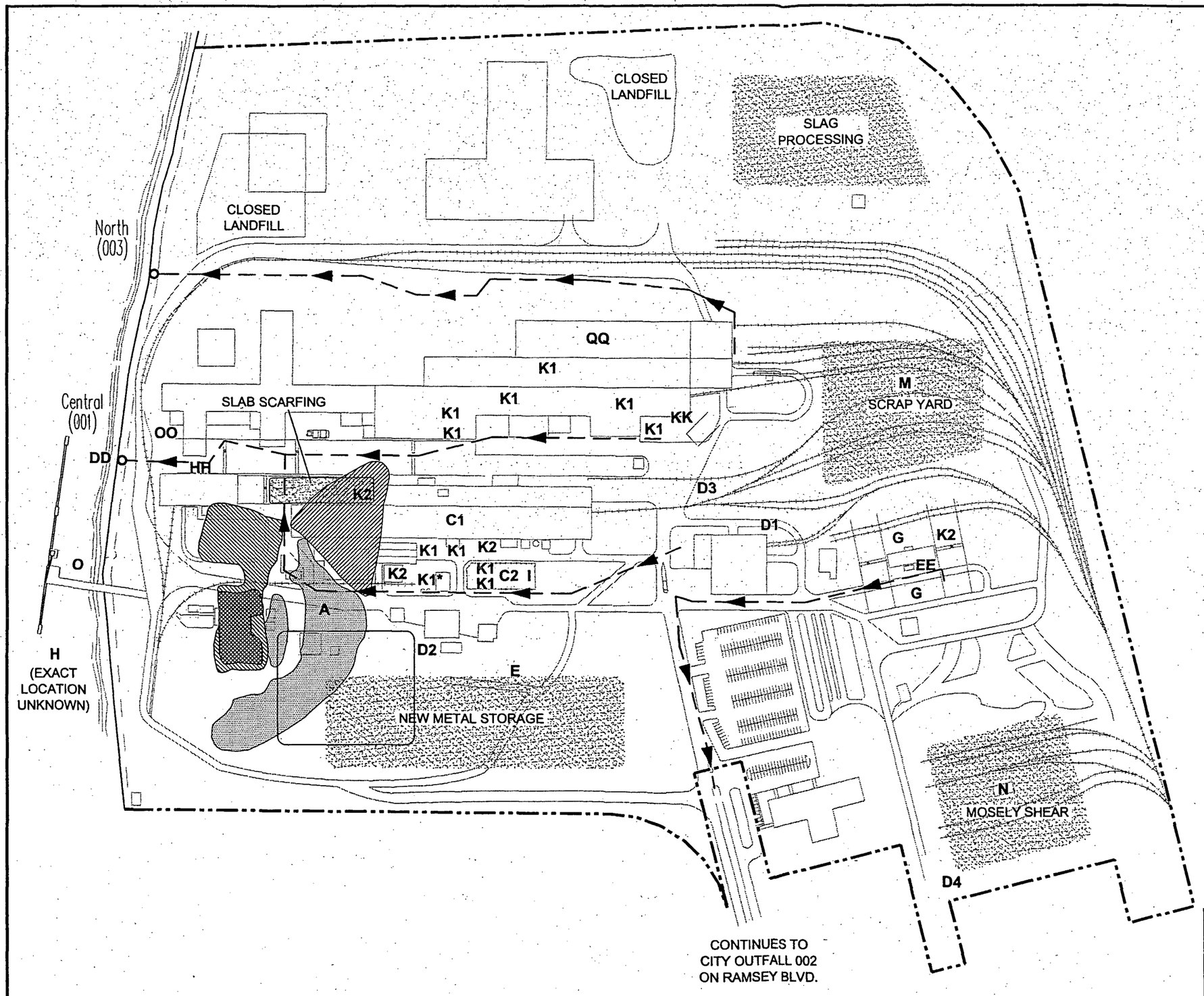
0 150 300 feet

Source: Oregon Steel Mills, Inc. and Hart Crowser, Inc.

Exponent

Figure 10. Phase II metals results.

oswego2\data\graphics\OSM\0304 PHASE II METALS.dwg 12/20/01 OR



LEGEND

- Buildings
- Railroad
- Outfall NPDES sampling stations
- Property line
- Storm drain trunk line
- Area of concern for potential storm water runoff

Approximate expansion of former oil sump by year (based on aerial photography):

1944 1948 1956 1960

0 150 300 feet

Source: Oregon Steel Mills, Inc. and Hart Crowser, Inc.

Exponent

Figure 11. Areas of potential concern.

oswego2\data\graphics\OSM\0304 APC.dwg 01/17/02 OR

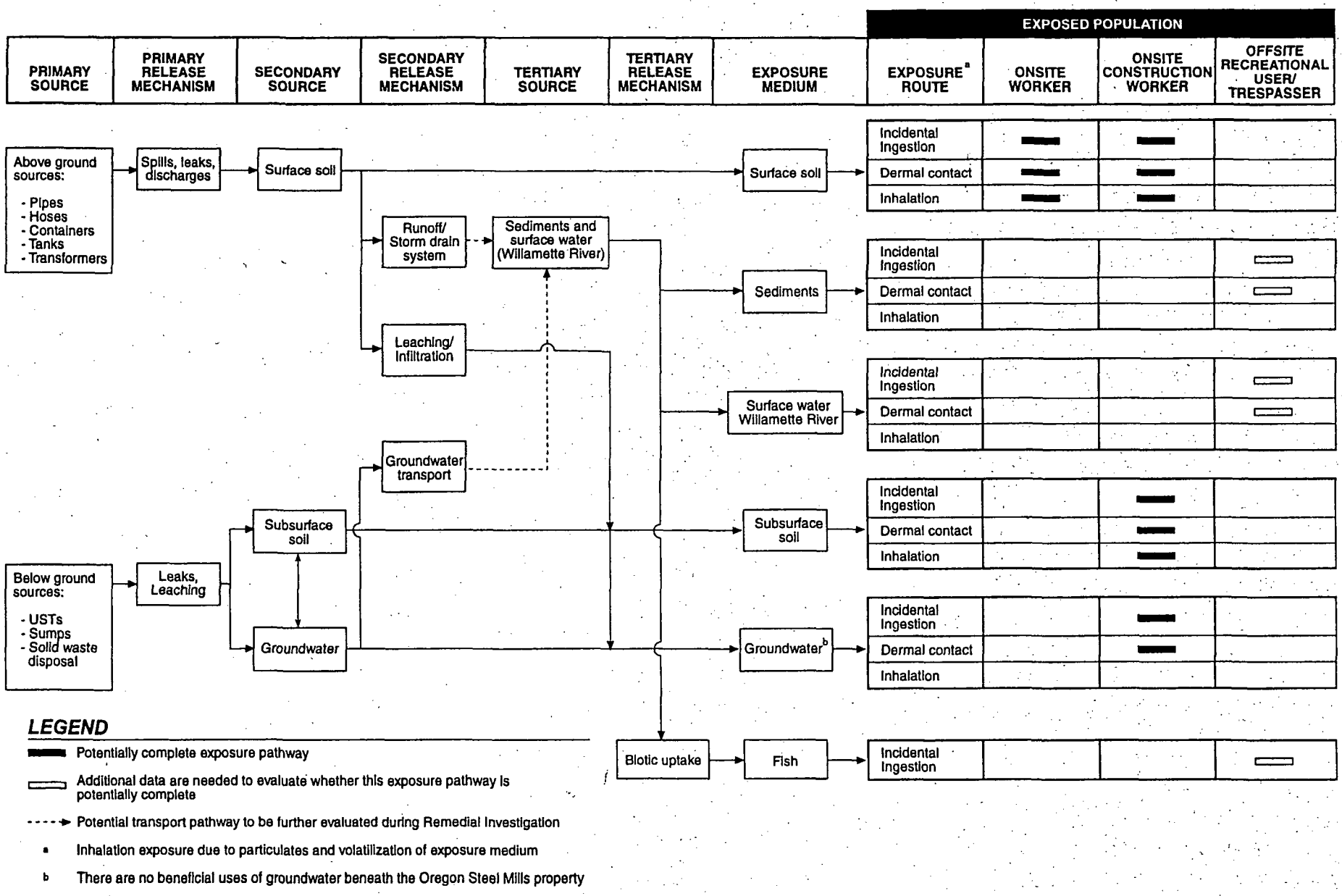


Figure 12. Conceptual site model for human health risk assessment.

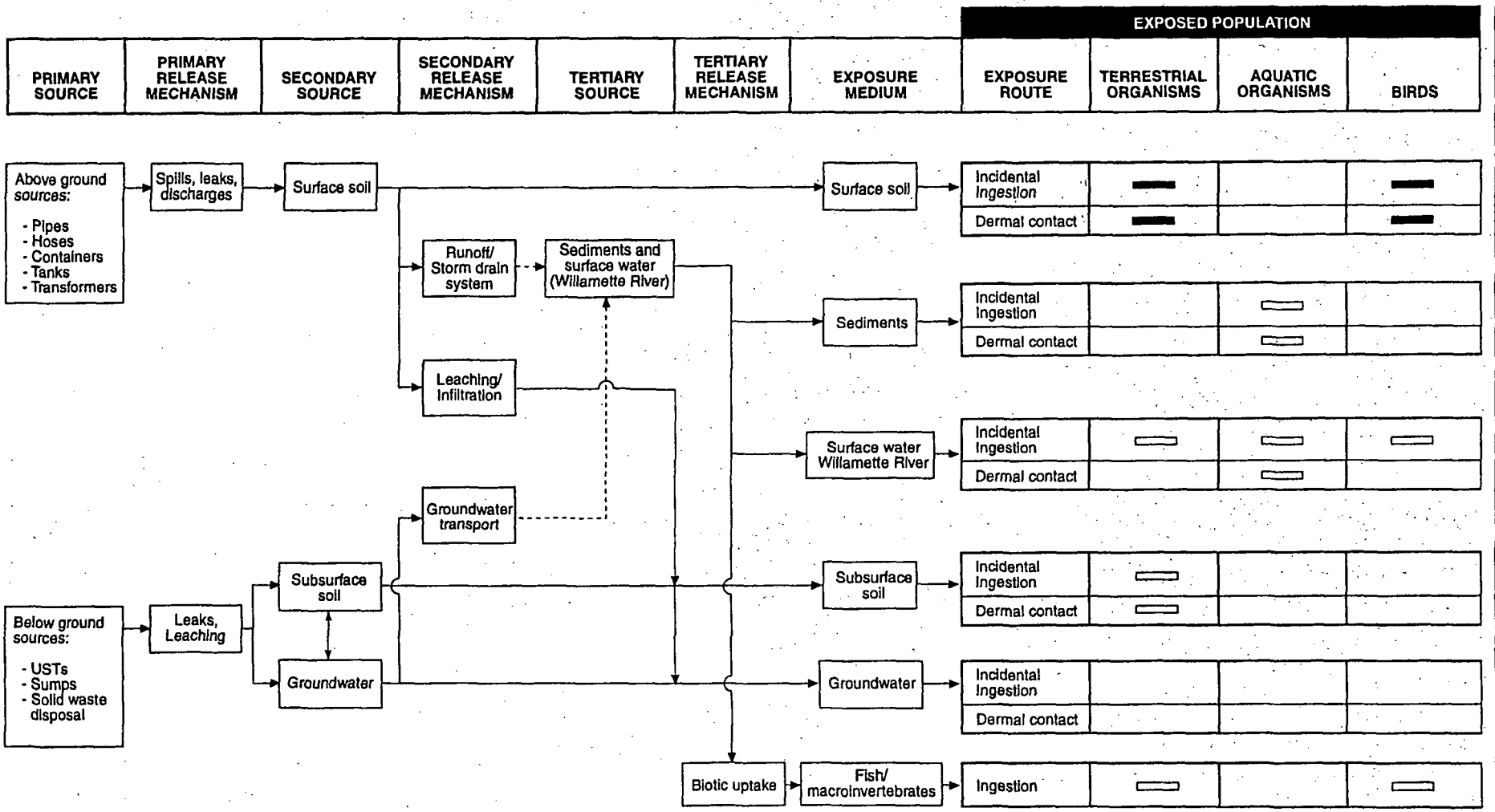


Figure 13. Conceptual site model for ecological risk assessment.

Figures

Table 1. Characteristics of plant facilities

Facility	Activities	Potentially Hazardous Materials Used	NPDES Outfall Basin
Melt Shop	Scrap melting, steel manufacturing, slab scarfing, material storage, 3 baghouses, oxygen production	Metals, petroleum products, baghouse products (EAF dust, scarfing dust, graphite)	001, 002
Rolling Mill/ Shipping	Plate and coil rolling, torching, cutting, shipping	Metals, petroleum products	001, 003
Cut-to-Length Facility	Steel plate cutting, coil storage	Metals, petroleum products	003
Water Treatment	Temporary waste water ponding, cooling, and treatment	Acids, bases	001
Scrap Yard/ Mosely Shear	Slag and scrap storage	Metals, petroleum products	001, 002
Slab Yard	Crane operation, torch cutting, slab storage	Metals, petroleum products	001
Slag Processing	Slag crushing, sorting, and storage, vehicle maintenance	Metals, petroleum products	Ground infiltration
Surface Processing	Plate coating, shotblasting, baghouse	Metals, paint waste, xylene, toluene, MEK, paints, steel preservatives	002
Rail Tracks	Loading and unloading	Metals, petroleum products	001, 002, 003
Maintenance Building	Equipment and vehicle fueling and maintenance	Petroleum products, VOCs	002

Note: EAF - electric arc furnace
MEK - methyl ethyl ketone
NPDES - National Pollutant Discharge Elimination System
VOC - volatile organic compound

Table 2. Summary of used materials and disposition

Process/ System	Materials In	Materials Out	Storage	Ultimate Disposition
		Materials Out		
Steel Production	Coal and Carbon	Steel (Steel Product)	Outside Storage	Offsite Consumer Use
	Scrap Metal	Scrap Metal	Outside Storage	Onsite Recycling (Feedstock)
	Metal Alloys	EAF Dust	Baghouse Collection/Rail Cars	Offsite Waste Disposal (Landfill)
	- Chromium	Graphite	Baghouse Collection, Inside/Outside Storage	Onsite (Feedstock) and Offsite Recycling
	- Manganese			
	- Nickel	Mullite	Inside/Outside Bulk Storage	Offsite Recycling or Disposal (Landfill)
	- Boron	Slag	Inside/Outside Storage	Offsite Sale
	- Titanium	Mill Scale	Outside Storage	Onsite Storage for Sale
	Mullite (Kaolinite)	Furnace Lining	Outside Storage	Offsite Waste Disposal (Landfill)
	Coke/Lime	Fugitive Emissions	Baghouse Collection	Offsite Waste Disposal (Landfill)
		Coke/Lime	Baghouse Collection	Onsite Recycling (Additive)
Surface Processing	Paint (toluene, zinc, xylenes, MEK)	Paint Wastes	Drums; Designated Accumulation Area	Offsite Waste Disposal (Incineration/Fuel Blending)
	Mineral Spirits	Cleaning Wastes	Drums; Designated Accumulation Area	Offsite Waste Disposal (Incineration/Fuel Blending)
	Steel Shot Blast	Spent Steel Shot Blast	Baghouse Collection/Bin	Onsite Recycling (Feedstock)
Electrical Distribution System	Transformer Oil (PCBs absent or less than 50 ppm)	Used Oil	Transformer Containment (Product Use)	Offsite Waste Recycling
Operations and Maintenance	Cleaning/Degreasing Solvents	Absorbent Pads	Drums; Designated Accumulation Area	Offsite Waste Disposal (Incineration)
	Aerosol Cans (solvent, paint)	Used Cans/Liquids	Drums; Designated Accumulation Area	Liquids: Offsite Waste Disposal (Incineration/Fuel Blending) Cans: Recycled Onsite
	Fuel/Oils/Greases - Gasoline, Diesel - Motor Oil - Kerosene (for heaters) - Hydraulic Fluid - Greases	Virgin Product Used Oil/Grease	Drums or ASTs	Offsite Recycling
	Antifreeze	Used Antifreeze	Drums; Designated Accumulation Area	Offsite Recycling
	Batteries	Used Batteries	Fiberglass Containers	Offsite Recycling
	Empty Drums	Used Drums	Inside/Outside Storage	Onsite Recycling (Feedstock)

Table 2. (cont.)

Process/ System	Materials In	Materials Out	Materials Out	Materials Out
		Materials Out	Storage	Ultimate Disposition
Steam Clean Area*	Wash Water	Wastewater	Service Water/ Sanitary Sewer System	Onsite Treatment and Offsite Discharge
Petroleum-affected Soil Removal	Not Applicable	Petroleum-contaminated Soil	Bermed/Covered Stockpile on Steel Plates	Offsite Waste Disposal (Incineration)
Wastewater Treatment	Thickening, Flocculation, and Biofouling Agents Sodium Hypochlorite Sulfuric Acid Sodium Hydroxide	Wastewater Filter Cake	Cooling Pond Process Storage	Onsite Recycling or Offsite Discharge Offsite Recycling

Note: AST - aboveground storage tank
EAF - electric arc furnace
PCB - polychlorinated biphenyl
ppm - part per million
* - located in rolling mill; discharges to service water

Table 3. Summary of current and historic USTs and ASTs

Type	Location	Size	Contents	Status
AST	On top of Mosely Shack	500 gal	Hydraulic fluid	In operation
AST	SE end of Rolling Mill	15,000 gal	Diesel	In operation
AST	SE end of Rolling Mill	5,000 gal	Gasoline	In operation
AST	N side of melt shop	Totes and drums	Oil and hydraulic fluid	In operation
AST	N of IMS offices/shop	450 gal	Gasoline	In operation
AST	N of IMS offices/shop	18,000 gal	High sulfur diesel	In operation
AST	N of IMS offices/shop	325 gal	Low sulfur diesel	In operation
AST	E of IMS offices/shop	350 gal	Waste oil	In operation
AST	Inside IMS shop (E side)	3-275 gal	Motor oil and hydraulic fluid	In operation
AST	E side of oil storage shed	500 gal	Kerosene	In operation
AST	S side of glassification plant	1,000 gal	Storm water runoff	In operation
AST	#3 furnace hydraulic room (melt shop)	Totes and tanks	Hydraulic fluid	In operation
AST	LMF/degas hydraulic room (melt shop)	Totes and tanks	Hydraulic fluid	In operation
AST	Mold hydraulic room (melt shop)	Totes and tanks	Hydraulic fluid	In operation
AST	Reheat furnace hydraulic room (Rolling Mill)	Totes and tanks	Hydraulic fluid	In operation
UST	Vehicle maintenance facility	600–700 gal	Oil	Removed 1985
UST	Former DRD pond	3,000 gal	Gasoline or diesel	Removed 1985
UST	Former DRD pond	5,000 gal	Gasoline or diesel	Removed 1985
UST	W side of scrap yard	6,000 gal	Gasoline	Removed 1986
UST	W side of scrap yard	8,000 gal	Gasoline	Removed 1986
UST	S side of Mosely shear	10,000 gal	Gasoline	Removed 1986
UST	S side of Mosely Shear	10,000 gal	Diesel	Removed 1986
UST	SE end of Rolling Mill	5,000 gal	Gasoline	Removed 1991

Note: AST - aboveground storage tank
DRD - Direct Reduction Division
E - east
IMS - International mill service
LMF - the ladle metallurgy furnace
N - north
S - south
SE - southeast
UST - underground storage tank
W - west

Table 4. Permit and violation summary

Permit No.	Issue Date[a]	Expiration Date	Agency	Year(s) Inspected	Violations
Air					
26-1865 (Air discharge)	08-Oct-1976	01-June-1997	DEQ	1978; 1982-1984; 1986-1998; 2000	1992 – NON #92-428 (later rescinded—3/25/93) 1993 – NON #93-311 (opacity violation) 1997 – NON #97-060 (opacity violation) 2000 – NON #00-020 (opacity violation)
26-1865 (Title V)	15-Dec-2000	01-Jan-2004	DEQ	2001	2001 – Reporting pending
Water					
1458-J (NPDES)	19-Mar-1973	30-June-1975	DEQ	None	None
2234-J (NPDES)	26-June-1975	30-June-1980	DEQ	None	None
3267-J (NPDES)	13-Oct-1980	31-July-1985	DEQ	1985	None
100170 (NPDES)	31-Mar-1986	28-Feb-1991	DEQ	1987	None
101007[b] (NPDES)	17-June-1993	30-Nov-1997	DEQ	1992	None
95-081 (NPDES – MAO)	14-Mar-1995	31-Dec-1996	DEQ	None	None
1200-H (NPDES)	24-Sept-1991	30-Sept-1996	DEQ	1994; 1996	1994 – NOV #74-045 (service water violation) 1996 – NON #95-172 (storm water violation)
1200-Z (NPDES)	28-Oct-1997	30-June-2002	DEQ	1998; 2001	None
G-13014 (Appropriate Public Water)	27-Nov-1996	01-Oct-2001	DEQ	None	None
300-008 (POTW)	01-Oct-1992	01-Oct-2002	City of Portland	1988, 1994-1999, 2001; None	None
Solid Waste					
A-187 (SWLA)	23-June-1986	23-Dec-1986	DEQ	None	None
1174 (SWLA)	31-July-1995	23-June-1997	DEQ	None	None
2574 (SWLA)	27-Jan-2000	27-July-2002	DEQ	None	None
2612 (SWLA)	13-Sept-2001	13-Mar-2002	DEQ	None	None
Hazardous Waste					
ORD00910655	Unknown	Active	EPA	1994; 1998; 2001	1995 – NON #95-002 (markings/waste determination) 1995 – NOV #95-032 (markings/labeling/etc.) 1998 – NON #98-016 (markings/waste determination)
Dredging					
RP-1476	16-Sept-1998	14-Nov-1998	DEQ	None	None

Notes on following page

Table 4. (cont.)

Note: DEQ - Oregon Department of Environmental Quality
EPA - Environmental Protection Agency
MAO - Mutual Agreement and Order
NON - Notice of Non-Compliance (issued by DEQ)
NOV - Notice of Violation (issued by DEQ)
NPDES - National Pollutant Discharge and Elimination System
POTW - publicly owned treatment works
SWLA - Solid Waste Letter of Authorization

[a] Permit modifications or addendums are not included.
[b] NPDES permit renewal (application No. 992007) submitted to DEQ on June 30, 1997. Still pending.

Table 5. Historical investigations and reports (through November 2001)

Area ID [a]	Description	Potential COIs	Closed or Environmental Concerns Addressed?
A	"Oil sump" from 1940s and 1950s	Petroleum hydrocarbons	No
B	DRD pond in use 1969–1980	EAF dust; metals	Yes
C1, C2	PCB releases in 1982	PCBs	No
D1, D2, D3, D4	USTs removed in 1985 and 1986	Petroleum hydrocarbons	No
E	PCB release in 1985	PCBs	No
F	Waste solvent container area identified in 1985 inspection	MEK	Yes
G	Paint waste around surface processing facility	Paint waste	No
H	"Creosote" encountered during 1986 dredging	Petroleum hydrocarbons	No
I	PCB release from capacitor bank, cleanup in 1987 and 1989	PCBs	No
J	PCB release in 1990/1991	PCBs	Yes
K1, K2	Transformer removal/retrofit in 1990–1992	PCBs	No
--	RCRA report in 1992 identifies 6 units requiring further action: the former PCB storage shed, the scarfing area collection ponds, the landfill, the melt shop furnace, the vehicle maintenance accumulation area, and the scrap piles	Varies; see descriptions of individual areas	Yes
L	Landfill study 1993, closed in 1995	Paint waste	Yes
M	Scrap yard water runoff, 1994 soil sampling	Petroleum hydrocarbons, metals	No
N	Mosely Shear oil contamination, 1996	Hydrocarbons, PCBs, VOCs	No
O	"Bunker C" oil found in dredged sediments near dock, 1998	Petroleum hydrocarbons	No
P	Second landfill, closed in 2001	Refractory material	Yes

Note: COI - constituent of interest
DRD - Direct Reduction Division
EAF - electric arc furnace
MEK - methyl ethyl ketone
PCB - polychlorinated biphenyl
RCRA - Resource Conservation and Recovery Act
UST - underground storage tank
VOC - volatile organic compound

[a] Shown on Figure 5.

Table 6. Summary of recorded spills (through November 2001)

Area ID [a]	Description	Potential COIs	Closed or Environmental Concerns Addressed?
AA	~5,000 gal UST gasoline release, 1995	Petroleum products	Monitoring [b]
BB	<50 gal degasser sludge release, 1997	Metals	Yes
CC	~500 gal AST gasoline release, 1997	Petroleum hydrocarbons	Monitoring [b]
DD	~15 gal hydraulic oil release, 1997	Hydraulic oil	No
EE	~40 gal diesel fuel release, 1997	Petroleum hydrocarbons	Yes
FF	45 gal used motor/hydraulic oil release, 1998	Motor/hydraulic oil	Yes
GG	~300 gal hydraulic oil release, 1998	Hydraulic oil	Yes
HH	100–200 gal hydraulic oil release, 1999	Hydraulic oil	No
II	~5 gal diesel fuel release, 2000	Petroleum products	No
JJ	~125 gal hydraulic oil release, 2000	Hydraulic oil	Yes
KK	~100 gal diesel fuel release, 2000	Petroleum hydrocarbons	No
LL	~300 gal diesel fuel release, 2000	Petroleum hydrocarbons	Yes
MM	100–150 gal petroleum-affected water release, 2000	Petroleum hydrocarbons	Yes
NN	<100 gal petroleum-affected water release, 2001	Petroleum hydrocarbons	Yes
OO	~60 gal hydraulic oil release, 2001	Hydraulic oil	No
PP	~60 gal hydraulic oil release, 2001	Hydraulic oil	Yes
QQ	250–300 gal hydraulic oil release, 2001	Petroleum hydrocarbons, PCBs (likely unrelated)	No [c]

Note: AST - aboveground storage tank
COI - constituent of interest
PCB - polychlorinated biphenyl
UST - underground storage tank

[a] Shown on Figure 6.

[b] Groundwater monitoring indicates that release does not pose a threat to the Willamette River and Oregon Steel Mills, Inc. is pursuing closure under a separate Department of Environmental Quality program (i.e., Leaking Underground Storage Tank Program).

[c] The potential COIs are likely unrelated to the hydraulic oil release, but are retained due to their presence in the release area.

Table 7. Phase II groundwater data

Chemical	Method	Units	B12 9/12/01 GW1205 7 - 12 ft	B13 9/11/01 GW1200 7 - 12 ft	B14 9/12/01 GW1201 8 - 12 ft	B14 (dup) 9/12/01 GW1202 8 - 12 ft
Organics						
Benzene	8021B	µg/L	0.50 *U*	0.50 *U*		0.50 *U*
Ethylbenzene	8021B	µg/L	1.0 *U*	1.0 *U*		1.0 *U*
meta- & para- Xylenes	8021B	µg/L	1.0 *U*	1.0 *U*		1.0 *U*
ortho-Xylene	8021B	µg/L	1.0 *U*	1.0 *U*		1.0 *U*
Toluene	8021B	µg/L	1.0 *U*	1.0 *U*		1.0 *U*
Diesel-range hydrocarbons	NWTPHD	µg/L	1,100 *JN*	3,100	1,200 *JN*	1,300 *JN*
Oil-range hydrocarbons	NWTPHD	µg/L	500 *U*	4,000 *JN*	1,700 *JN*	2,100 *JN*
Field Parameters						
Conductivity	UNK	mS/cm	1,300	1,690	1,300	
Dissolved oxygen, wt/vol	UNK	mg/L	1.45	0.610	0.440	
Oxidation/reduction potential	UNK	mV	-272	-373	-243	
pH	UNK	pH	6.48	6.41	6.39	
Temperature	UNK	°C	26.0	24.6	21.2	

Note: *JN* - estimated, tentatively identified
U - undetected at detection limit shown

Table 8. Phase II soil and sediment data

		Soil				Catch Basin Sediment				
		B9	B11	B15	B16	SD1	SD3	SD4	SD5	SD5 (dup)
		9/11/01	9/11/01	9/11/01	9/11/01	9/10/01	9/10/01	9/10/01	9/10/01	9/10/01
		SO0152	SO0153	SO0151	SO0150	SD0024	SD0023	SD0022	SD0020	SD0021
Chemical	Method	1.8 - 2 ft	0.9 - 1.1 ft	2 - 3 ft	2 - 3 ft	0 - 0.2 ft	0 - 0.2 ft	0 - 0.2 ft	0 - 0.2 ft	0 - 0.2 ft
Metals										
Arsenic	200.8			6.2			3.8	4.2	3.6	4.0
Barium	200.8			280			170	210	170	220
Cadmium	200.8			0.60	3.2		1.3	1.1	1.2	1.5
Chromium	6010B			4,300	2,800		2,000	4,100	1,300	1,900
Cobalt	200.8			5.9			7.0	8.0	8.2	8.9
Copper	200.8			160	550		130	180	120	160
Lead	200.8			11	180		54	38	68	98
Manganese	6010B			30,000	11,000		15,000	36,000	11,000	15,000
Mercury (total)	7471A						0.090	0.060	0.14	0.17
Nickel	200.8			56			51	67	39	54
Silver	200.8			1.2			0.55	0.48	0.40	0.62
Vanadium	6010B			450			210	590	180	290
Zinc	200.8			53	26,000		420	430	880	1,800
PCBs										
Aroclor® 1016	8082	0.12 *U*	5.8 *U*			0.52 *U*		0.11 *U*		0.16 *U*
Aroclor® 1221	8082	0.23 *U*	12 *U*			1.1 *U*		0.21 *U*		0.31 *U*
Aroclor® 1232	8082	0.12 *U*	5.8 *U*			0.52 *U*		0.11 *U*		0.16 *U*
Aroclor® 1242	8082	0.12 *U*	44			0.52 *U*		0.11 *U*		0.16 *U*
Aroclor® 1248	8082	1.1	5.8 *U*			1.5		0.17		0.57
Aroclor® 1254	8082	0.42	5.8 *U*			0.63		0.11 *U*		0.45
Aroclor® 1260	8082	0.12 *U*	5.8 *U*			0.52 *U*		0.11 *U*		0.16 *U*
Organics										
Diesel-range hydrocarbons	NWTPHD						400 *JN*	850 *JN*	1,000 *JN*	1,100 *JN*
Oil-range hydrocarbons	NWTPHD						2,900 *JN*	2,900 *JN*	5,900 *JN*	6,100 *JN*

Note: units are in mg/kg
JN - estimated, tentatively identified
PCB - polychlorinated biphenyl
U - undetected at detection limit shown

Table 9. Phase II soil and sediment volatile organic compound data

		Soil		Catch Basin Sediment	
		B15	B16	SD5	SD5 (dup)
		9/11/01	9/11/01	9/10/01	9/10/01
		SO0151	SO0150	SD0020	SD0021
Chemical	Method	2 - 3 ft	2 - 3 ft	0 - 0.2 ft	0 - 0.2 ft
1,1,1,2-Tetrachloroethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,1,1-Trichloroethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,1,2,2-Tetrachloroethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *UJ*	7.5 *UJ*
1,1,2-Trichloroethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,1-Dichloroethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,1-Dichloroethene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,1-Dichloropropene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,2,3-Trichlorobenzene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
1,2,3-Trichloropropane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *UJ*	7.5 *UJ*
1,2,4-Trichlorobenzene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
1,2,4-Trimethylbenzene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
1,2-Dibromo-3-chloropropane	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
1,2-Dibromoethane	8260B	23 *UJ*	24 *UJ*	28 *U*	30 *U*
1,2-Dichlorobenzene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *UJ*	7.5 *UJ*
1,2-Dichloroethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,2-Dichloropropane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,3,5-Trimethylbenzene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
1,3-Dichlorobenzene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *UJ*	7.5 *UJ*
1,3-Dichloropropane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
1,4-Dichlorobenzene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *UJ*	7.5 *UJ*
2,2-Dichloropropane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
2-Butanone	8260B	23 *UJ*	24 *UJ*	28 *U*	30 *U*
2-Chlorotoluene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
2-Hexanone	8260B	23 *UJ*	24 *UJ*	28 *U*	30 *U*
4-Chlorotoluene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
4-Isopropyltoluene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
4-Methyl-2-pentanone	8260B	23 *UJ*	24 *UJ*	28 *U*	30 *U*
Acetone	8260B	56 *UJ*	59 *UJ*	69 *U*	75 *U*
Benzene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Bromobenzene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *UJ*	7.5 *UJ*
Bromochloromethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Bromodichloromethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Bromoform	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Bromomethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Carbon disulfide	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Carbon tetrachloride	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Chlorobenzene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Chloroethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Chloroform	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Chloromethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
cis-1,2-Dichloroethene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
cis-1,3-Dichloropropene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Dibromochloromethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Dibromomethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Dichlorodifluoromethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Ethylbenzene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Hexachlorobutadiene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
Isopropylbenzene	8260B	23 *UJ*	24 *UJ*	28 *U*	30 *U*
meta & para Xylenes	8260B	5.6 *UJ*	15 *J*	6.9 *U*	7.5 *U*
Methylene chloride	8260B	12 *UJ*	12 *UJ*	14 *U*	15 *U*
Naphthalene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*

Table 9. (cont.)

		Soil		Catch Basin Sediment	
		B15	B16	SD5	SD5 (dup)
		9/11/01	9/11/01	9/10/01	9/10/01
		SO0151	SO0150	SD0020	SD0021
Chemical	Method	2 - 3 ft	2 - 3 ft	0 - 0.2 ft	0 - 0.2 ft
n-Butylbenzene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
n-Propylbenzene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
ortho-Xylene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
sec-Butylbenzene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
Styrene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
tert-Butylbenzene	8260B	23 *UJ*	24 *UJ*	28 *UJ*	30 *UJ*
Tetrachloroethene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Toluene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
trans-1,2-dichloroethene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
trans-1,3-Dichloropropene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Trichloroethene	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Trichlorofluoromethane	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*
Vinyl chloride	8260B	5.6 *UJ*	5.9 *UJ*	6.9 *U*	7.5 *U*

Note: units in μg/kg
J - estimated
U - undetected at detection limit shown

Table 10. Comparison criteria -- soil

Analyte	OSM-recommended Primary Comparison Criteria (Background (Concentration)	OSM-recommended Secondary Comparison Criteria[b] (U.S. EPA Region 9 PRG)	DEQ-recommended Screening Levels (Lowest of the Background Values) (mg/kg)
Metals			
Arsenic	6 [a]	2.7 cancer endpoint	2.3
Barium	600 [c]	100,000	56
Cadmium	1 [a]	810	0.2 *U*
Chromium	27 [a]	450	9
Cobalt	16 [c]	100,000	--
Copper	34 [a]	76,000	10
Lead	17 [a]	750	5
Manganese	1,500 [a]	32,000	239
Mercury (total)	0.04 [a]	610	0.02 *U*
Nickel	21 [a]	41,000	12
Silver	0.3 *U* [d]	10,000	0.3 *U*
Vanadium	240 [c]	14,000	--
Zinc	96 [a]	100,000	54
Organics			
PCBs (total)	--	1	--
Diesel-range hydrocarbons	--	--	--
Oil/residual-range hydrocarbons	--	--	--
LPAHs	--	--	--
HPAHs	--	--	--
Benzene	--	1.5	--
Ethylbenzene	--	230	--
Toluene	--	520	--
Xylenes	--	210	--
Tetrachloroethane	--	7.0	--

Note: all concentrations are in mg/kg
-- not available
bgs - below ground surface
HPAH - high molecular weight polycyclic aromatic hydrocarbons
LPAH - low molecular weight polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyl
PRG - preliminary remediation goal
U - undetected at detection limit shown

[a] WA Dept. of Ecology 1994
[b] Region 9 PRG Values, EPA 2001
[c] Boerngen and Shacklette 1981
[d] Blue Lagoon, PTI 1995

Table 11. Comparison criteria – groundwater

Analyte	OSM-recommended Primary Comparison Criteria[a] (Background (Concentration) (µg/L)	DEQ-recommended Ecorisk Level II Screening Levels Surface Water - Aquatic Receptors[b] (µg/L)
Metals		
Arsenic	1.4	150
Barium	--	4
Cadmium	--	2.2
Chromium	2 *U*	74
Cobalt	--	23
Copper	4.3	9
Lead	--	2.5
Manganese	--	120
Mercury (total)	--	0.77
Nickel	--	52
Silver	--	0.12
Vanadium	--	20
Zinc	11	120
Organics		
BTEX	--	--
PCBs (total)	--	0.014
Diesel-range hydrocarbons	--	
Oil/residual-range hydrocarbons	--	
LPAHs	--	--
HPAHs	--	--
Benzene	--	--
Ethylbenzene	--	--
Toluene	--	--
Xylenes	--	--
Tetrachloroethane	--	--
TPH	--	--

Note: In accordance with DEQ policy, application of these ecorisk screening levels for evaluation of groundwater assumes that there is a discharge of groundwater to surface water (without allowance for dilution) and that aquatic receptors are those potentially exposed.

-- not available

BTEX - benzene, toluene, ethylbenzene, and xylene

HPAH - high molecular weight polycyclic aromatic hydrocarbons

LPAH - low molecular weight polycyclic aromatic hydrocarbons

PCB - polychlorinated biphenyl

TPH - total petroleum hydrocarbon

U - undetected at detection limit shown

[a] McCormick & Baxter, PTI 1992

[b] DEQ 2001

Table 12. Comparison criteria -- sediments

Analyte	OSM-recommended Comparison Criteria [a] (Portland Harbor Baseline)	DEQ-recommended Ecorisk Level II Screening Levels [b] Freshwater Sediment (mg/kg)
Metals		
Arsenic	<5	6
Barium	195	--
Cadmium	0.6	0.6
Chromium	41	37
Cobalt	19.7	--
Copper	60	36
Lead	30	35
Manganese	810	1,100
Mercury (total)	0.1	0.2
Nickel	32	18
Silver	1.4	4.5
Vanadium	112	--
Zinc	118	123
Organics		
PCBs (total)	<0.18	0.034
Diesel-range hydrocarbons	--	--
Oil/residual-range hydrocarbons	--	--
LPAHs	0.70	0.076
HPAHs	2.4	0.193
Benzene	--	--
Ethylbenzene	--	--
Toluene	--	--
Xylenes	--	--
TPH	--	--

Note: all concentrations are in mg/kg
-- not available
HPAH - high molecular weight polycyclic aromatic hydrocarbons
LPAH - low molecular weight polycyclic aromatic hydrocarbons
PCB - polychlorinated biphenyl
TPH - total petroleum hydrocarbon

[a] Fortuna 2001
[b] DEQ 2001

Table 13. Evaluation of soil data for identification of areas of potential concern

Historic Investigation or Spill Location (from Tables 5 & 6)	Chemical	Existing Analytical Data (Maximum Concentration)	Source	Comparison to Background: Site-Specific Background Concentration[a]	Comparison to Background: Elevated Above Background?	Comparison to Human Health Criteria: U.S. EPA Region 9 PRG	Comparison to Human Health Criteria: Above PRG?	Retained as COI?/Requires Further Evaluation?[b]
A[c]	Arsenic	5.4	Phase I Pre-RI	2.3	Yes	2.7[d]	Yes	Yes
	Chromium	25	Phase I Pre-RI	9	Yes	450	No	Yes
	Copper	25.1	Phase I Pre-RI	10	Yes	76,000	No	Yes
	Mercury	0.05	Phase I Pre-RI	0.02 *U*	Yes	88[e]	No	Yes
	Nickel	26.1	Phase I Pre-RI	12	Yes	41,000	No	Yes
	Zinc	69.3	Phase I Pre-RI	54	Yes	100,000	No	Yes
	Diesel-range hydrocarbons	26,000	Phase I Pre-RI	--	--	--	--	Yes
	Oil-range hydrocarbons	15,000	Phase I Pre-RI	--	--	--	--	Yes
	PCBs	ND	Phase I Pre-RI	--	--	1	No	No
	LPAHs	330 *LJ*	Phase I Pre-RI	--	--	--	--	Yes
	HPAHs	180 *LJ*	Phase I Pre-RI	--	--	--	--	Yes
C1,C2	PCBs	No data		NA	NA	NA	NA	Yes
D1 and D3	Petroleum hydrocarbons	No data		NA	NA	NA	NA	Yes
D2 and D4	Petroleum hydrocarbons	No data		NA	NA	NA	NA	Yes
E	PCBs	44	Phase II Pre-RI	--	--	1	Yes	Yes
G	Cadmium	3.2	Phase II Pre-RI	0.2 *U*	Yes	810	No	Yes
	Chromium	4,300	Phase II Pre-RI	9	Yes	450	Yes	Yes
	Copper	550	Phase II Pre-RI	10	Yes	76,000	No	Yes
	Lead	180	Phase II Pre-RI	5	Yes	750	No	Yes
	Manganese	30,000	Phase II Pre-RI	239	Yes	32,000	No	Yes
	Zinc	26,000	Phase II Pre-RI	54	Yes	100,000	No	Yes
	VOCs	0.015 *J* (xylenes only)	Phase II Pre-RI	--	--	210 (xylenes only)	No	No
I	PCBs	44.2	OSM 1989	--	--	1	Yes	Yes

Table 13. (cont.)

Historic Investigation or Spill Location (from Tables 5 & 6)	Chemical	Existing Analytical Data (Maximum Concentration)	Existing Analytical Data Source	Comparison to Background: Site-Specific Background Concentration[a]	Comparison to Background: Elevated Above Background?	Comparison to Human Health Criteria: U.S. EPA Region 9 PRG	Comparison to Human Health Criteria: Above PRG?	Retained as COI?/Requires Further Evaluation?[b]
K1,K2	PCBs	15	Westinghouse 1991	--	--	1	Yes	Yes
M	Arsenic	8.9	Hart Crowser 1994	2.3	Yes	2.7[d]	Yes	Yes
	Barium	374	Hart Crowser 1994	56	Yes	100,000	No	Yes
	Cadmium	13	Hart Crowser 1994	0.2 *U*	Yes	810	No	Yes
	Chromium	2,340	Hart Crowser 1994	9	Yes	450	Yes	Yes
	Copper	2,790	Hart Crowser 1994	10	Yes	76,000	No	Yes
	Lead	820	Hart Crowser 1994	5	Yes	750	Yes	Yes
	Manganese	17,500	Hart Crowser 1994	239	Yes	32,000	No	Yes
	Mercury	ND	Hart Crowser 1994	0.02 *U*	No	88[e]	No	No
	Nickel	270	Hart Crowser 1994	12	Yes	41,000	No	Yes
	Selenium	ND	Hart Crowser 1994	--	--	10,000	No	No
	Silver	ND	Hart Crowser 1994	0.3 *U*	No	10,000	No	No
	TPH	2,700	Hart Crowser 1994	--	--	--	--	Yes
N	Metals	No data		NA	NA	NA	NA	Yes
	Oil-range hydrocarbons	*Not quantified*	Hart Crowser 1996 (excavated soils)	NA	NA	NA	NA	Yes
	TPH	32,000	Hart Crowser 1996 (excavated soils)	--	--	--	--	Yes
	BTEX	0.59 (ethylbenzene and xylenes only)	Hart Crowser 1996 (excavated soils)	--	--	230 (ethylbenzene) 210 (xylenes)	No	No
	Tetrachloro-ethylene (PCE)	0.074	Hart Crowser 1996 (excavated soils)	--	--	19	No	No
	PCBs	3	Hart Crowser 1996 (excavated soils)	--	--	1	Yes	Yes
DD	Hydraulic oil	No data	DEQ 1997c	NA	NA	NA	NA	Yes

Table 13. (cont.)

Historic Investigation or Spill Location (from Tables 5 & 6)	Chemical	Existing Analytical Data (Maximum Concentration)	Source	Comparison to Background: Site-Specific Background Concentration[a]	Comparison to Background: Elevated Above Background?	Comparison to Human Health Criteria: U.S. EPA Region 9 PRG	Comparison to Human Health Criteria: Above PRG?	Retained as COI?/Requires Further Evaluation?[b]
HH	Hydraulic oil	No data	DEQ 1999	NA	NA	NA	NA	Yes
II	Diesel-range hydrocarbons	No data	DEQ 2000a	NA	NA	NA	NA	Yes
KK	Petroleum hydrocarbons	No data	DEQ 2000d	NA	NA	NA	NA	Yes
OO	Diesel-range hydrocarbons	815	DEQ 2001b	--	--	--	--	Yes, although COIs may have a source other than the spill
	Oil-range hydrocarbons	10,300	DEQ 2001b	--	--	--	--	Yes, although COIs may have a source other than the spill
QQ	Diesel-range hydrocarbons	5,940	DEQ 2001d	--	--	--	--	Yes, although COIs may have a source other than the spill
	Oil-range hydrocarbons	17,500	DEQ 2001d	--	--	--	--	Yes, although COIs may have a source other than the spill
	PCBs	0.355	DEQ 2001d	--	--	1	No	No

Notes on following page

Table 13. (cont.)

Note: All soil concentrations are in mg/kg.
-- no background soil concentration (or PRG) available
BTEX - benzene, toluene, ethylbenzene, and xylene
HPAH - high molecular weight polycyclic aromatic hydrocarbons
J - estimated
L - maximum concentration because the full detection limit is included for all undetected compounds
LPAH - low molecular weight polycyclic aromatic hydrocarbons
NA - not applicable
ND - not detected
PCB - polychlorinated biphenyl
TPH - total petroleum hydrocarbons
U - undetected at detection limit shown
VOC - volatile organic compound

[a] Lowest value from two site-specific data sets presented in Exponent's evaluation of background screening levels letter (Exponent 2001e).
[b] A chemical was retained as a COI and will require further evaluation: 1) if it was detected at a concentration above background, 2) if it was detected and there is no background level for comparison but its concentration is above the PRG (if available), or 3) if there are no data available. A chemical was rejected as a COI: 1) if it was detected at a concentration below background, 2) if it was detected and there is no background level for comparison but its concentration is below the PRG (if available), or 3) if it was analyzed for but not detected.
[c] Note that antimony, beryllium, cadmium, lead, selenium, silver, and thallium were undetected and therefore not considered potential COIs.
[d] Cancer endpoint concentration.
[e] Methyl mercury; elemental mercury value not available.

Table 14. Evaluation of groundwater data for identification of areas of potential concern

Historic Investigation or Spill Location (from Tables 5 & 6)	Chemical	Existing Analytical Data (Maximum Concentration)	Source	Comparison to Surface Water Ecorisk Criteria: DEQ Ecorisk Screening Level	Comparison to Surface Water Ecorisk Criteria: Above Screening Level?	Retained as COI?/Requires Further Evaluation?[b]
A[a]	Arsenic	15.9	Phase I Pre-RI	150	No	No
	Chromium	9.1	Phase I Pre-RI	74[c]	No	No
	Copper	34.5	Phase I Pre-RI	9	Yes	Yes
	Lead	24.5	Phase I Pre-RI	2.5	Yes	Yes
	Zinc	56.5	Phase I Pre-RI	120	No	No
	Diesel-range hydrocarbons	9,100	Phase I Pre-RI	--	--	Yes
	Oil-range *hydrocarbons*	ND	Phase I Pre-RI	--	--	No
	PCBs	ND	Phase I Pre-RI	0.014	No	No
	LPAHs	68 *L*	Phase I Pre-RI	--	--	Yes
	HPAHs	2.1 *L*	Phase I Pre-RI	--	--	Yes
D1 and D3[a]	BTEX	ND	Phase II Pre-RI	--	--	No
	Diesel-range hydrocarbons	3,100	Phase II Pre-RI	--	--	Yes
	Heavy oil-range hydrocarbons	4,000 *JN*	Phase II Pre-RI	--	--	Yes
D2 and D4[a]	Petroleum hydrocarbons	No data		NA	NA	Yes
EE	Petroleum hydrocarbons	No data	OSM 1998	NA	NA	Yes

Notes on following page

Table 14. (cont.)

Note: All groundwater concentrations are in µg/L.
-- no ecorisk surface water screening level available
BTEX - benzene, toluene, ethylbenzene, and xylene
HPAH - high molecular weight polycyclic aromatic hydrocarbons
JN - estimated, tentatively identified
L - maximum concentration because the full detection limit is included for all undetected compounds
LPAH - low molecular weight polycyclic aromatic hydrocarbons
NA - not applicable
ND - not detected
PCB - polychlorinated biphenyl

[a] Note that antimony, beryllium, cadmium, mercury, nickel, selenium, silver, and thallium were undetected and therefore not considered potential COIs.

[b] A chemical was retained as a COI and will require further evaluation: 1) if it was detected at a concentration above the screening level, 2) if it was detected and there is no screening level for comparison, or 3) if there are no data available. A chemical was rejected as a COI: 1) if it was detected at a concentration below the screening level, or 2) if it was analyzed for but not detected.

[c] Chromium III screening level.

Table 15. Evaluation of sediment data for identification of areas of potential concern

Historic Investigation or Spill Location (from Tables 5 & 6)	Chemical	Existing Analytical Data (Maximum Concentration)	Source	Comparison to Sediment Ecorisk Criteria: DEQ Ecorisk Screening Level	Comparison to Sediment Ecorisk Criteria: Above Screening Level?	Comparison to Portland Harbor Baseline Levels: Portland Harbor Baseline Screening Level	Comparison to Portland Harbor Baseline Levels: Above Baseline?	Retained as COI?/Requires Further Evaluation?[a]
H (river sediments)	"Creosote", Petroleum hydrocarbons	No data		NA	NA	NA	NA	Yes
M (storm drain sediments)	Arsenic	4.2	Phase II Pre-RI	6[b]	No	<5	No	No
	Barium	210	Phase II Pre-RI	--	--	195	Yes	Yes
	Cadmium	1.3	Phase II Pre-RI	0.6	Yes	0.6	Yes	Yes
	Chromium	4,100	Phase II Pre-RI	37	Yes	41	Yes	Yes
	Cobalt	8.0	Phase II Pre-RI	--	--	19.7	No	No
	Copper	180	Phase II Pre-RI	36	Yes	60	Yes	Yes
	Lead	54	Phase II Pre-RI	35	Yes	30	Yes	Yes
	Manganese	36,000	Phase II Pre-RI	1,100	Yes	810	Yes	Yes
	Mercury	0.090	Phase II Pre-RI	0.2[c]	No	0.10[c]	No	No
	Nickel	67	Phase II Pre-RI	18	Yes	32	Yes	Yes
	Silver	0.55	Phase II Pre-RI	4.5	No	1.4	No	No
	Vanadium	590	Phase II Pre-RI	--	--	112	Yes	Yes
	Zinc	430	Phase II Pre-RI	123	Yes	118	Yes	Yes
	PCBs	0.17	Phase II Pre-RI	0.034	Yes	<0.18	No	Yes?
	Diesel-range hydrocarbons	850 *JN*	Phase II Pre-RI	--	--	--	--	Yes
	Heavy oil-range hydrocarbons	2,900 *JN*	Phase II Pre-RI	--	--	--	--	Yes
N (storm drain sediments)	Arsenic	3.8	Phase II Pre-RI	6[b]	No	<5	No	No
	Barium	190	Phase II Pre-RI	--	--	195	No	No
	Cadmium	1.4	Phase II Pre-RI	0.6	Yes	0.6	Yes	Yes
	Chromium	1,600	Phase II Pre-RI	37	Yes	41	Yes	Yes
	Cobalt	8.6	Phase II Pre-RI	--	--	19.7	No	No
	Copper	140	Phase II Pre-RI	36	Yes	60	Yes	Yes
	Lead	83	Phase II Pre-RI	35	Yes	30	Yes	Yes
	Manganese	13,000	Phase II Pre-RI	1,100	Yes	810	Yes	Yes
	Mercury	0.16	Phase II Pre-RI	0.2[c]	No	0.10[c]	Yes	No
	Nickel	47	Phase II Pre-RI	18	Yes	32	Yes	Yes
	Silver	0.51	Phase II Pre-RI	4.5	No	1.4	No	No

Table 15. (cont.)

Historic Investigation or Spill Location (from Tables 5 & 6)	Chemical	Existing Analytical Data (Maximum Concentration)	Source	Comparison to Sediment Ecorisk Criteria: DEQ Ecorisk Screening Level	Comparison to Sediment Ecorisk Criteria: Above Screening Level?	Comparison to Portland Harbor Baseline Levels: Portland Harbor Baseline Screening Level	Comparison to Portland Harbor Baseline Levels: Above Baseline?	Retained as COI?/Requires Further Evaluation?[a]
	Vanadium	240	Phase II Pre-RI	--	--	112	Yes	Yes
	Zinc	1,300	Phase II Pre-RI	123	Yes	118	Yes	Yes
	PCBs	1.02	Phase II Pre-RI	0.034	Yes	<0.18	Yes	Yes
	Diesel-range hydrocarbons	1,100 *JN*	Phase II Pre-RI	--	--	--	--	Yes
	Heavy oil-range hydrocarbons	6,000 *JN*	Phase II Pre-RI	--	--	--	--	Yes
O (river sediments)	Arsenic	3.8	OSM 1999	6[b]	No	<5	No	No
	Cadmium	1.35	OSM 1999	0.6	Yes	0.6	Yes	Yes
	Chromium	38.3	OSM 1999	37	Yes	41	No	Yes?
	Copper	33.6	OSM 1999	36	No	60	No	No
	Lead	101	OSM 1999	35	Yes	30	Yes	Yes
	Mercury	0.07	OSM 1999	0.2[c]	No	0.10[c]	No	No
	Nickel	20	OSM 1999	18	Yes	32	No	Yes?
	Silver	0.35	OSM 1999	4.5	No	1.4	No	No
	Zinc	474	OSM 1999	123	Yes	118	Yes	Yes
	PCBs	1.97	OSM 1999	0.034	Yes	<0.18	Yes	Yes
	LPAHs	0.181 *L*	OSM 1999	0.076	Yes	0.70	No	Yes?
	HPAHs	1.655 *L*	OSM 1999	0.193	Yes	2.4	No	Yes?
RB1, RB2, RB11, RB12 (river sediments away *from outfalls*)	Arsenic	2.2	Phase I Pre-RI	6[b]	No	<5	No	No
	Chromium	26.1 *J*	Phase I Pre-RI	37	No	41	No	No
	Copper	13.4	Phase I Pre-RI	36	No	60	No	No
	Nickel	19.5	Phase I Pre-RI	18	Yes	32.0	No	Yes?
	Zinc	74.3	Phase I Pre-RI	123	No	118	No	No
	PCBs	0.18	Phase I Pre-RI	0.034	Yes	<0.18	Yes	Yes?
	LPAHs	ND	Phase I Pre-RI	0.076	No	0.7	No	No
	HPAHs	ND	Phase I Pre-RI	0.193	No	2.4	No	No
RB7 through RB10 (river sediments near outfall 001)	Arsenic	132	Phase I Pre-RI	6[b]	Yes	<5	Yes	Yes
	Cadmium	2.1	Phase I Pre-RI	0.6	Yes	0.6	Yes	Yes
	Chromium	544 *J*	Phase I Pre-RI	37	Yes	41	Yes	Yes
	Copper	145	Phase I Pre-RI	36	Yes	60	Yes	Yes

Table 15. (cont.)

Historic Investigation or Spill Location (from Tables 5 & 6)	Chemical	Existing Analytical Data (Maximum Concentration)	Source	Comparison to Sediment Ecorisk Criteria: DEQ Ecorisk Screening Level	Comparison to Sediment Ecorisk Criteria: Above Screening Level?	Comparison to Portland Harbor Baseline Levels: Portland Harbor Baseline Screening Level	Comparison to Portland Harbor Baseline Levels: Above Baseline?	Retained as COI?/Requires Further Evaluation?[a]
	Lead	166	Phase I Pre-RI	35	Yes	30	Yes	Yes
	Mercury	0.060	Phase I Pre-RI	0.2[c]	No	0.10[c]	No	No
	Nickel	60.8	Phase I Pre-RI	18	Yes	32	Yes	Yes
	Silver	2.3	Phase I Pre-RI	4.5	No	1.4	Yes	Yes
	Zinc	823	Phase I Pre-RI	123	Yes	118	Yes	Yes
	PCBs	0.42	Phase I Pre-RI	0.034	Yes	<0.18	Yes	Yes
	LPAHs	0.12 *L*	Phase I Pre-RI	0.076	Yes	0.70	No	Yes?
	HPAHs	1.5 *L*	Phase I Pre-RI	0.193	Yes	2.4	No	Yes?
RB3 through RB6, RB13 (river sediments near outfall 003)	Arsenic	6.8	Phase I Pre-RI	6[b]	Yes	<5	Yes	Yes
	Cadmium	1.5	Phase I Pre-RI	0.6	Yes	0.6	Yes	Yes
	Chromium	819 *J*	Phase I Pre-RI	37	Yes	41	Yes	Yes
	Copper	148	Phase I Pre-RI	36	Yes	60	Yes	Yes
	Lead	109	Phase I Pre-RI	35	Yes	30	Yes	Yes
	Mercury	0.070	Phase I Pre-RI	0.2[c]	No	0.10[c]	No	No
	Nickel	58.4	Phase I Pre-RI	18	Yes	32	Yes	Yes
	Zinv	698	Phase I Pre-RI	123	Yes	118	Yes	Yes
	PCBs	9.3	Phase I Pre-RI	0.034	Yes	<0.18	Yes	Yes
	LPAHs	15	Phase I Pre-RI	0.076	Yes	0.70	Yes	Yes
	HPAHs	40	Phase I Pre-RI	0.193	Yes	2.4	Yes	Yes

Notes on following page

Table 15. (cont.)

Note: All sediment concentrations are in mg/kg.

-- no ecorisk sediment screening level (or baseline level) available
HPAH - high molecular weight polycyclic aromatic hydrocarbons
J - estimated
JN - estimated, tentatively identified
L - maximum concentration because the full detection limit is included for all undetected compounds
LPAH - low molecular weight polycyclic aromatic hydrocarbons
NA - not applicable
ND - not detected
PCB - polychlorinated biphenyl

[a] A chemical was retained as a COI and will require further evaluation: 1) if it was detected at a concentration above the screening levels, 2) if it was detected and there are no screening levels for comparison, or 3) if there are no data available. A chemical was rejected as a COI: 1) if it was detected at a concentration below the screening levels, or 2) if it was analyzed for but not detected. If the concentration exceeded the ecorisk screening level but was below the Portland Harbor baseline level, there is reason to question the need for further evaluation based on the ecorisk screening level alone.

[b] Arsenic III screening level.

[c] Total elemental mercury screening level.

Appendix A

Selected Documents Pertaining to the Oil Sump

Port of Portland (1943)

THE PORT OF PORTLAND

2-9

COPY

February 5, 1943

Gilpin Construction
4850 N.W. Front Ave.
City

Gentlemen:

Subject: Deposit of Bilge Water and Oil on Port Lands.

This is to confirm permission given you over the telephone today, and previously given to Standard Oil Company and Shaver Transportation Company, in respect to proposed pumping of bilge water carrying oil on lands of The Port of Portland.

An area on the Port's lands in Section 27, approximately 3000 ft. north of the Bonneville power line crossing of the Willamette River, being an area of approximately 100' x 200' , where indicated by our Mr. R. W. Nelson, may be used as a settling/sump for the discharge of bilge waste.

You are to throw up suitable holding berms around the boundary of the sump and to maintain these intact to prevent escape of liquid discharged into the sump or settling basin.

You may pump into this area during such time as your operations will not interfere with filling by the dredge on these lands, it being understood that dredging operations will not disturb you for at least 60 days.

It is the intent of the Port in giving this permission to afford a disposal area for bilge water containing oil; that such use of the lands shall be without cost to the Port and you will install and remove as required such mooring facilities and pipe as is required and you will fully maintain the protecting berm to prevent the escape of oil from the sump area.

Should it be necessary for you to continue such disposal over a long period of time, or in such quantity as would exceed the capacity of the area indicated, the Port will be willing to revise arrangements to the extent practicable.

Yours very truly,

THE PORT OF PORTLAND

By_____
Manager

JPD/rg
cc Shaver Trans.Co.
Standard Oil Co.

COPY

Port of Portland (1946a)

ovision of the dry dock tariff
s. The question pertained as to
ould be no charge unless work we
aturday, Sunday and holidays ,
The question arose when a hal
. The Manager suggested such p
nue as the vessel would necessa
ed on subsequent days as necess
Sunday were the final lay day

ommission interprets the Dry Do
would otherwise be non-chargea
tariff basis, for time worked

Y 1, 1946:

ng indicated expenditures for
the detailed estimates cover
ogether with expected receipt
applied against the expendit

udget had been reviewed by P
d had met with his approval.
in detail and it was upon mo
and submitted to the Tax Sup
nomah County as required by
roved was as follows:

Budget Estimates for
Ending June 30, 1947

& dredge plant:
d-by

el hull,stern
undetermined
e is ------- $300,000.00
pated net rental
1946 - - 14,000.00
ge Service - --

No. Item

land & Troutdale Airports
& service fac.-plans
de , -- minimum

Industrial Lands Surveys and Tests --		$10,000.00
Administration		
General Office & Executive	$28,600.00	
Consulting,Technical & legal service ---	8,400.00	37,000.00
Port Service & Traffic Promotion:		
Port Traffic Dev.Bur, jointly financed with P.Ch. of C.	5,500.00	
Rate Service & Shipping Report-Port.Trf.Assn.$2500;Merchants Exchange - $1100 ----------	3,600.00	
Contingencies ----	5,000.00	14,100.00
Total General Purpose Expenditures ---		$725,100.00
Real Estate Income:		
Rentals: Oil Tanker Basin -leased	13,520.00	
Waterfront lands - "	6,000.00	
Total Applied General Purpose --------		19,520.00
GENERAL PURPOSE NET TOTAL		$705,580.00
Balances Allocated:		
Fr.Towboat Maint.Res.Bal.est.as at 6/30/46 for towboat construct.	211,000.00	
Fr.Airport Fac.Res. to provide for airport building item ----	60,000.00	
Fr.Gen'l Fund, est.accumulated bal. fr. prev. yrs. ---------	203,000.00	
Total Available Fund ----------		474,000.00
Required from Tax - GENERAL PURPOSES.....		$231,580.00
Required from Tax - BONDED DEBT		69,811.25
Total Required From Taxes		$301,391.25

OIL SUMP - SHAVER TRANSPORTATION CO.

It was reported that the War Shipping Administration
s seemingly abandoned any further interest in maintaining an
l sump on the lands of the Port on the lower Willamette River
d that there is still a demand for a place where waste oil taken
om vessels by repairers can be disposed of and burned. The
nager stated that Shaver Transportation Co. which operates a
udge barge in connection with its towing operations, has indicated
llingness to restore the trestle and pipe line and to maintain
e sump and to backfill same when its use is discontinued, if the
rt will give it a cancellable permit to deposit the oil in the
cavated basin in the sand, as in the past. It was reported that
e Port has a claim of some $1100 against the War Shipping
ministration for maintenance of the sump in the past but has
arged no rental for the land, being desirous of providing a place
ere waste oil could be disposed of and thus avoid the damage

caused by oil being allowed to escape when vessels are under repa

It was agreed that the officers are authorized to enter such an arrangement with Shaver Transportation Company at a nomin rental basis, the lessee assuming responsibility for burning oil from time to time and restoring the surface of the land when the sump is discontinued.

There being no further matters presented, the Commissio upon motion adjourned.

Approved June 11, 1946

Henry L. Corbett
President

Submitted by:
E. F. Doyle
Assistant Secretary

Portland, Oregon, June 11, 1946

The regular monthly meeting of the Board of Commissio of The Port of Portland was convened at 10:30 A.M. this date.

There were present H. L. Corbett, presiding, F.N.Youn E. F. Doyle, James H. Cassell, Clyde Raabe, and Robert H. Atkin

MINUTES APPROVED:

The minutes of the meetings of April 9 and May 14 wer approved as entered in the record.

PENSION OPINION:

Reference was made to the opinion of the attorney in to legality of the Port paying pensions under existing laws, opinion was submitted at the meeting of May 14.

The President, reporting on behalf of the employees fare committee, stated he has been in communication with Lee who has been acting as attorney for the public employees grou pensions, and had agreed that the Port committee will now co with a representative of the employees group and discuss the bility of additional legislation and the pension matter in ge

DREDGE WAGES:

Comparative statements were submitted showing sched wages in effect for dredge crews after the same were raised a of 10¢ per hour in April, indicating the monthly earnings of t hourly rated men will be considerably reduced by reason of li the work week to 40 hours, effective June 1, as authorized at

meeting of May 14. Listing s which would result from a furt representatives of employees h and which request has been rej for the hourly rated men, it w earnings less than at the old This difference per month was rated men and $1.00 to $4.00 a After discussion of the compar earnings of dry dock employees for a 40 hour week, and noting be received by dredge employees Atkinson, seconded by Commissi employees of the dredging plan hour, effective for the curren This motion was put and carrie

CO-ORDINATOR APPOINTMENT - D.

The President report committee recently established representative of the Commissi Kneddemann, designated by the organized Port Development Com representative of the Port of The Committee in rec of numerous applicants for the the person heretofore desig report as a "co-ordinator", wh generally understood through p selected and appointed Capt. D ties approximately June 1, w ties as deputy for the Pacif Office of Defense and Transpor previous activities and refer record of Capt. McGarrity as k and set the compensation of th per year, the term of service not terminable at the pleasure ment further provided that Cap in the city and is authorized

War Shipping Administration (1946)

74

WAR SHIPPING ADMINISTRATION
WASHINGTON

VIA AIR MAIL

July 30, 1946

Port Authority
Port of Portland, Oregon

Attention: Mr. J. P. Doyle, Manager

Gentlemen:

Subject: Disposition of Pipe Line and Oil Sump

There has been referred to this office for determination the matter of disposition to be made of the "pipe line and oil sump" constructed by Poole, McGonigle and Jennings for the War Shipping Administration early in 1944 on property belonging to the city of Portland. It is the understanding that your Mr. J. P. Doyle is familiar with the reasons for constructing the above facility, at which time no agreement was ever negotiated between the Port Authorities and representatives of the War Shipping Administration regarding the ownership of the facility, its operation, maintenance, rental thereof, etc.

It appears that the Port Authority maintained the facility from February 1944 to date and are now seeking reimbursement from the Administration for maintenance charges in the amount of $1,204.84, with the further understanding that upon receipt of payment therefor, the Port Authority is willing to take over and operate the facility, which arrangement would be the solution to a confusing situation.

The Administration is desirous of disposing of the facility, either by having same dismantled or transferred to the Port Authority for operation and maintenance. It is assumed that the Port Authority would want to continue the operation of the facility in order to meet the requirements of the Harbor Pollution Act, etc. and would be willing to submit a reasonable offer to the Administration for same.

We would appreciate if you will arrange to present the facts to the proper authorities, suggesting that an offer to buy the facility be made to the Administration and promptly advise of their decision in the matter. Pending receipt of your reply, action with respect to payment of your maintenance charges in the amount of $1,204.84 will be held in abeyance as we would like to dispose of the case by one action.

Very truly yours,

D. S. Brierley
Assistant Deputy Administrator
for Maintenance and Repair

Port of Portland (1946b)

August 1,1946

War Shipping Administration
Washington, D.C.

Attention: D. S. Brierley, Asst.Deputy Adm. for
Maintenance and Repair.

Gentlemen:

Subject: Oil Sump at Portland, Oregon

We acknowledge your letter of July 30 re disposition of the above.

We heartily agree that disposal of the "facility" and settlement of our billing for past maintenance should be concluded together. Accordingly, we present this statement of facts. There is appended copies of all correspondence in our files, as listed below, to verify the facts:

Letter of 2/5/43 to Gilpin Construction Co.
" " 5/3/44 " War Shipping Administration.
" " 11/16/44 " War Shipping Administration.
" " 12/29/45 from War Shipping Administration.
" " 1/7/46 to War Shipping Administration.
" " 3/6/46 " War Shipping Administration.

It is our view that you have no "facility" to dispose of - that you abandoned such as you once had, i.e., a timber trestle and pipe line. Both were in bad order and would not serve to deliver oil to the sump. The pipe leaked badly, thus allowing oil to discharge into the river rather than be carried into the sump. The pipe was not good in the first instance, being salvage material. It is now lying on the beach and is not worth picking up. The trestle was mostly eliminated when dredging was done, as was indicated in our letter of March 6, 1946.

The Port is willing to settle all claims it may have against the War Shipping Administration or its contractors in consideration of payment to the Port of the costs for bulldozing to protect the sump by sand dikes. This is the amount heretofore billed to the War Shipping Administration, viz., $1204.84.

The Port will waive any claim against the War Shipping Administration for future burning of the oil and backfilling the sump, which items were estimated at $750 and claimed in the correspondence above cited.

Since June 1, 1946 we have an arrangement in effect whereby Shaver Transportation Company installed a new pipe line, after river dredging was done, from the new mooring location to the sump; agrees to let all vessels and repair contractors use the same; assumes responsibility for maintaining the sump dikes and burning the sludge oil and for backfilling and eliminating the sump when use of same is discontinued. They are to charge all users a tariff representing a pro rata of the costs they assumed, i.e., for pipe line and sump, in addition to their towing and barge rental. This makes it possible for all vessels, including Navy craft being decommissioned here, to dispose of sludge oil safely and at reasonable cost.

We agree with your view that the Port will find it desirable to continue making a waste oil sump available. Apparently this can be accomplished under the present arrangement with the operators of tugs and sludge barges. The Port makes no charge for use of the land; it is very willing to donate use of land so long as the vessels served pay the actual disposal costs charged by the tug-barge operators.

As above stated, the Port will give a complete release to the War Shipping Administration in consideration of reimbursement to the Port of the maintenance expenditures heretofore billed in the amount of $1204.84.

Yours very truly,

THE PORT OF PORTLAND

By _____
Manager

JPD/r
Encls. 6

Port of Portland (1953)

THE PORT OF PORTLAND
PORTLAND, OREGON

Fall
— 1-13

MEMORANDUM

DATE May 14, 1953

FROM Mr. Charleson

TO Mr. Winn

SUBJECT Oil Sump Break-Out

Between Sunday midnight and 7:30 a. m. Monday, the oil sump dike broke and oil flowed into the Willamette River and onto the Ledbetter land at Ramsey Lake. Apparently it was caused by Shaver Transportation Company over-filling the sump, which caused an overflow and subsequent dike break. The oil was confined by log booms in the Willamette and by a dike on the Rampsey Lake side. (None reached Ramsey Lake).

Straw is being used to clean up the spilled oil.

They are now attempting to burn the free oil off the property, using straw, tires, and gasoline as igniting agents, so far without success.

It's a mess.

DMC

mc

Port of Portland (1959a)

29A3
29A3

June 16, 1959

Captain Homer Shaver
Shaver Transportation Company
4900 N. W. Front Avenue
Portland, Oregon

Dear Captain Shaver:

With reference to the oil sump at Ramsey Lake, your attention is drawn to the fact that "The Oregon State Air Pollution Authority has recently adopted a regulation prohibiting burning at open dumps less than six miles from any city with a population of more than 45,000 or less than three miles from a city with a population between 10,000 and 45,000. These regulations become effective January 1, 1960.

"Open refuse burning may be allowed in some instances. Counties which have regulations relating to refuse and garbage disposal may permit variances upon the recommendation of the County Health Authority 'If no public nuisance is created by the discharge of any air pollutant into the atmosphere . . . . '. In counties where no such regulations have been adopted, requests for variance will be considered by the Air Pollution Authority. Cities with ordinances regulating refuse disposal may permit variances if no public nuisance is created and if the permit is signed by the authorized city officer."

You have informed me that you have contacted Mr. Gamlen to discuss methods of recovery and doing away with waste. I should be glad to be kept informed of this matter, since the Port will have to follow the requirements of the Air Pollution Authority.

Very truly yours,

THE PORT OF PORTLAND

JOHN J. WINN, JR.
General Manager

JJW:bb

bbc: Maritime Committee
Realty Committee

Shaver (1959)

John Pierce 29A3 Food Rivet File 29A3

23 June 1959

CONFERENCE IN THE OFFICES OF SHAVER TRANSPORTATION COMPANY, PORTLAND, OREGON

Present: Captain Homer Shaver, Mr. Harry Gamlen, Mr. George Shaver, Mr. Alfred Biles, Mr. R. A. Neumeister and Mr. D. Peabody.

MR. G. SHAVER: Gentlemen, we have a problem. We have been kicking around a lot of thoughts about it. Basically, that sump pump is a headache to the Port as well as to us. Potentially, the dump can fill with water to where the dike will break and dump a jillion gallons of oil into the river. Property down there is becoming potentially more valuable. It is of no value with that oil on it. We built the facility while you people provided the property. The business we get today in sludge disposal is a fraction of what it was ten years ago.

MR. BILES: Fortunately.

MR. G. SHAVER: We now lose money because we have the routine maintenance and other expenses as well. That is the basic problem.

MR. GAMLEN: It goes further. All cities are faced with the same problem. These dumps are getting full and there is no more space for them. Residential districts surround many of these dumps now and it is difficult to find a more suitable place for another dump. Once again I say all major cities are faced with the same problem and have to do something whether they want to or not.

MR. G. SHAVER: We used to go down there during the summer and pump oil and water and various paint cleaning products into that sump. During the summer when the water in the tank got warm the water would drop to the bottom and the oil come to the top. We would set it on fire then get calls from everyone in town regarding the fire. Finally we called the fire marshal before we lit off instead of after. It would burn for an hour and then the heat generated by the fire itself would actually extinguish the fire. You could see the flames rushing off and all of a sudden she'd die right out. There would be a blanket of steam. Every summer we would burn it down as much as we could and get down to maybe two feet. Today we hardly put any oil in the dump. Maybe once every 4 or 5 months we put in 4 or 5 thousand barrels. The heights of the pools are raised by rain water instead of oil. The thing is getting to the point where it is up to within 2 feet of the top.

MR. NEUMEISTER: It is actually closer than that. Last time I looked it was up to 18 inches or so.

MR. G. SHAVER: We also recognize the problem exists and should not forget the fact. When did Duane go in there?

MR. PEABODY: Oh, about a year ago, 16 or 18 months.

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MR. G. SHAVER: But he went into there in an attempt to convert that to a marketable product and, as far as I know, it was not a roaring success by any means.

MR. PEABODY: The only reason it was not a success was internal friction. Through Mr. Gamlen's efforts we had it down to where we could supply them a chemical that would break the stuff down to usable fuel, to a burnable oil.

MR. G. SHAVER: What we roughly propose or we think that we can do this, but don't know for sure. We do know that we could, with the Port's blessing, eliminate the sump dump.

We think that that would be an advantage to the Port. In other words, to take the oil, water, and the whole works out of there and convert it back to the same condition as that of the adjacent property which is usable and marketable.

MR. NEUMEISTER: No question it would be an advantage to the Port.

MR. G. SHAVER: We propose to go in there. We don't know what we are doing, to be honest about it, but if we could make some arrangement with you people we could go in there on a time and material basis and eliminate the sump dump. Actually part of the physical material down there belongs to us, that is the piping and the cat-walks, dolphins, and that is about it other than we paid for having all the dikes built. We would propose to eliminate all that and convert it back to property. In conjunction with that, and again I am dealing on a policy matter of the Port, does the Port have a feeling of responsibility to the marine industry as well as people who have to dispose of sludge, to maintain some facility to dispose of sludge.

MR. NEUMEISTER: Well, we on the staff are going on that assumption, but it has not been confirmed by the Commission. We are trying to get enough information to put the question to the Commission and let them come up with their present thinking on the matter.

MR. CAMDEN: If I may assist you in this, to guide you in your decision, there is quite a movement going on throughout the world today on this idea tying in with pollution of the streams and harbors and pollution of the atmosphere, and the encroachment of industrial and residential districts on these dumps. It really came to life as a result of the North Sea Conference just a few years ago where, as a result of all these large tankers and ships being restricted in their cleaning operations in port, went out into the middle of the North Sea, did their butterworth wash, you all know what that is, and then dumped this slop overboard. The oil washed up on the various beaches surrounding the North Sea and everyone got up in arms about it. They had a big meeting and the report was written up. The British Government called me in to ask my advice on this subject and this resulted in what we call the Newcastle Project.. This Newcastle Project started out in a very simple manner. This is not the entire picture of the project but the start of it and - I don't seem to have the Newcastle Project here. I thought I had it, but it doesn't make - Here it is. This is the Newcastle Project and how it started. The Government of England decided to stand the expense of this installation. First, a dock on the river to berth two tankers, so two tankers could be cleaned in one operation and this supplied 1 or 2 thousand tons of slop. In this particular operation water is 90% of the slop, an average of 10% of oil, and so this was the wash tank first to wash the slop from this tank and this was simply an off-storage tank (demonstrating from blueprints). Here is a sump pit overflow on the river. There is a small boiler house and a laboratory. I made this. This has got to be bigger now because they found out it was quite successful. The Government paid for the entire installation because they couldn't get anyone else to do it. No one was interested, so the Governments of these various countries, England, Denmark, Sweden, and more particularly Holland, the trend seemed to be the winds blew that way. Most of them down in that area, although in certain times of the year this oil would wash on to these little islands where people go off on vacation where the entire families go around in the nude and stay there for three months of the year, so this started something going. Canada picked it up. The Canadian Government then proposed putting the same size tank, 2,000 ton tank, in the big Canadian ports. As far as the west was concerned, Vancouver, Victoria and Port Alberni. They made the mistake that this job was designed for something entirely different from what the Canadian Government desired to do. In Vancouver, while they installed a 2,000 ton tank they filled it full of slop and sludge and washing deposits and now comes the problem, what are they going to do with it when it is full. So they had to put it into barges and went to great expense to try to liquify the solid substances and haul it off in barges and dump it off into the sea and cause the same conditions they complained about in the North Sea. So you see what some of these other countries have tried to do is to set up a storage tank in ports to receive all the slop and sludge and wash it and dispose of it. The best means to dispose of this material is to set up a proper little plant which can be quite resilient. It can be quite simple or it can be quite elaborate and I have never advised anyone to start off with an elaborate system; just sufficient for the moment but big enough for the area with reservations for bigger operations later on. We don't know what is coming so we could start off by this simple system which is simply a wash

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tank (shows blueprint). This is the plans I designed for the U.S. Steel Co. to handle lube oil. The same identical system of wash tank and storage tank can be used for any system. It can be any size tank. This is specifically for steel mill operations in lube systems in rolling mills where the average quantity is from 8 to 10,000 gallons. Now, since this oil never wears out, they can recover all this oil. You can see how much it costs. Not much at all. Simply a 10,000 gilon tank standing on legs, steel coils, pumps, a water connection, that is all they need to save themselves thousands and thousands of dollars. This same tank or same design can be used in any oil recovery system. Then, if we want to go a little bit more elaborately on the project, the kind of project you might get into would be a dual system two wash tanks, 4 receiving tanks for different qualities of oil, and 4 storage tanks, sump tank. We have got open drains, concrete, it is a concrete slab, and these trickle to keep on taking the last of the water from this oil into a sump tank. It overflows from one sump into another sump so that we can pick up any oil overflow and send it back again. We have exchange pumps and we have hose racks. And so that is all it amounts to. That is about as elaborate as you could possibly make it to do the job. These are 500 barrel tanks, so tanks are not expensive. The expense involved in setting up a real system is not as extensive as it might seem on the surface. Now, as far as the operation is concerned, you start off in a small installation. Just put in a wash tank and two storage tanks, but prepare for a bigger system so you can build on to it at a later date. You must give them a little laboratory to test the samples and it starts off with one man and as it grows, a night watchman. We don't need a chemist. All we need is a man who knows how to test oil. That is about all there is to it. We can elaborate on these things, but it starts in very simple form and the thing is tailor made for the job. Now, as far as the slop and sludge and oil and contamination which is present, if this sump at the moment, any oil that is present can be recovered and converted to usable oil, or taken off and used on roads. It can be used for weed killing purposes. It can be used in the schools, anywhere we can trun this material into fuel. We can turn it into fuel and fuel is worth $3. a barrel. It's impossible to know - I haven't seen this particular sump - but I have seen lots of sumps. It is impossible to know how much it is going to cost to reclaim this land presently occupied by the sump. There are too many unknowns involved, but it is not an expensive project. We are probably the world's largest company making oil additives and I have been making them for may, many years. There is not a problem involved in any sludge, or oil, contaminated oil, we cannot solve in a very short time. We have a tremendous backlog of experience. Naturally, every locality is a little bit different, but my understanding is that this company, the Shaver Company, have some facilities and probably can use a barge instead of going into a large system for the time being. It is entirely resilient subject to your decision how you would like to go about it. My experience in other cities around the world indicate it is a problem that you must some day meet head on and decide what to do about it. It is not something you can dismiss because it is still there. It keeps on raining and the winds blow dust all over it. The oil keeps on rising and the water keeps collecting. The pores of the earth refuse to accept any more of it and so you reach a point where you might have anticipated in the very beginning. This is just the easiest way of getting rid of it. There is a right way and the right way is to recover it. As ports and cities grow, as we get more into the problem and the qualities of the oil, the refiners taking all the cream out of the crude the material we call fuel today is a scraping from the bottom of the barrel. Ships must be repaired. Have to wash the tanks. They can't pump this slop into the river any more so we have several functions by going at the proposition right and putting in a system to take care of it. Chicago has a very serious problem at the end of the Lake. Cleveland has a more serious problem. On the Cuyahoga river all the motorboats and the industry along the river are pumping oil into the Cuyahoga. It is a crooked river and the wind blows oil from the lake down into this river. All of these cities have their own individual problems and the plant that is put in is tailor-made for that particular area and it is not expensive. It is quite inexpensive. How much does a 500 barrel tank cost? Not much.

MR. PEABODY: Well, there is another thing that should be pointed out, too. With the advent of water transportation progressing to the point it has progressed in Portland you have more to deal with than just California or Eastern crude. You of course know I represent Mr. Gamlen here in this area, but I don't know of any other company that has the manufacturing experience, worldwide, of Gamlen Chemical Company.

MR. GAMLEN: I have specialized for many many years on oil. I was one of the young engineers present when the first oil well was brought in in California. Signal Hill, June 24. 1921. We cover most of the earth today except communist countries. with

manufacturing facilities all of these countries, even in the orient, so we can't expand any more excepting go into communist countries which we refuse to do. But these problems that face you here in Portland are the same identical ones that face every city in the world, some of them more severely than this one, and when you consider that the port of Rotterdam has 5,000 ships per month. That is a lot of ships. It is a lot of oil. The next one, Antwerp. They have a very serious problem on the Scheldt river. It is a long way into these ports. They are inland ports, in other words, and they have to face these problems and it is more serious in those countries than it is here. But they are facing them in a realistic manner. They are going at it right. There are more wrong ways to do it. It is wrong to start a sump or a dump. You can't keep going on forever. There comes a time when we must dispose of this sump and do it in a proper manner, and all of these oils, if the job is done right, can be recovered and put back into use.

CAPT. SHAVER: I think the Navy realized that during the war, because Commerce Iron Works built a plant for the U.S. Navy to just take care of what we are talking about.

MR. GAMLEN: That is right. I know all about it.

MR. PEABODY: Don't the Navy have one in Mare Island?

MR. GAMLEN: They went at some of these problems in kind of a crazy way. I designed a system where you have two sumps, have a big storage tank. Put everything in a big storage tank, again run it out in batches and the oil floats on the surface of the water. That is one way, but it is the hard way to do it. I have something here (at this point MR. GAMLEN made a demonstration with the KB SLUDGE KIT). These are the simple kits our men use. This is typical sludge from a seagoing vessel. That is asphaltum base oil and sea-water where the ships have had to use ballast and it is all churned up in the ship and it comes back with tons of this stuff in the bottom of the ship. This is the material they must dispose of in port, in Portland or anywhere else. Sometimes it is hard enough to walk on it. Sometimes more sloppy than this but that is emulsified with sea water, particularly, and so we have various products we call emulsion breakers. They are simply things, no odor, non-corrosive, non-acid, non-alkali, and so by putting a few drops of this material on that sludge, and we agitate it just a little, it converts back to oil and water very quickly.

Now it is costly to shovel this stuff out of a ship, but very inexpensive to handle it in a scientific way. Now if we handle it just a little bit we can get all of this oil and water recovered. Most of them just as simple as that, and we tackle this one in the sump. Maybe sometimes we have to feel our way along just a little bit. The subject might change along the line, but the operator, we supply him with various products which we think, in fact we will give him 300 of them if that is what is required.

MR. G. SHAVER: Bet you would.

MR. GAMLEN: The operator makes a simple test and chooses the emulsion breaker required, takes one drop of that material and - well, this is a little portable laboratory our fellows carry around with them on jobs. We can set up a very simple laboratory. It requires an electric battery and it requires a heater, a centrifuge, a few hydrometers, a viscosity meter - for under a thousand dollars the laboratory is equipped. That is all.

Now we must teach him how to use these tools. We tried that particular one on that product and if we wait a few minutes we will see where that oil and water will separate with a clear line of demarcation with the interface and the oil that comes to the surface will be better oil than when it went into the tank because we have taken all the tension out of it. I defy anyone to re-emulsify this oil by all the agitation he may apply to it. We have taken all the power that made it possible to emulsify, killed it, in other words. It is not an acid, not an alkali, nothing injurious about it, and we have been doing this for the past 30 years all over the world, and still do.

MR. G. SHAVER: This is about what we propose to do with the sumppump. We thought you would be interested to see what we propose to do with it.

MR. GAMLEN: Now, as I say, that will separate as clear water, as clear as if it came from the faucet. It is salt water. It can be discharged into the river. Any drop of oil that might get through comes on the surface and flows over to the next sump and then we skim it off and pump it back to the sump. If any further clarification is necessary we run it through excelsior so that only good clean water goes into the river. We'll know about it if any oil goes into the river from the other 4-Cont.-

departments, Fish and Game, Harbor Patrol, Coast Guard, and so on, and if you burn the stuff the Health Department gets you, so various kinds of Government Departments must also come into this picture. We can't upset them. It's got to be engineered right. That is why we come knowing what we can do because we have been doing it for years. The trend is that whilst I have talked to individual groups in the big ports throughout the world, they hesitate to install the plant because they have no laws to compel the material to come to this installation. The port authority has that authority, say this is where you put your slop. That is what they did in England, Canada, Australia and other countries.

MR. G. SHAVER: I don't believe that is a fact. Is the Port Authority a law making body that can force this? Those laws already exist, don't they Bob?

MR. GAMLEN: The U.S. Coast Guard has a $2,500 fine for this infraction. We have been called many, many times over the years to clean up an oil spill. We have products that will do exactly that operation, make oil look like milk.

CAPT. SHAVER: We use your products here in the harbor to take care of these oil spills.

MR. HILES: What happens to those spills?

MR. GAMLEN: Well, to tell you the truth, the day comes, after it goes on out on the sea, it does separate. I have made emulsions that last for 14 years, but we have much better quality materials today than we used to have years ago and we can guarantee an emulsion on thesurface of the water, a material we call GAMOSOL.

MR. PEABODY: We use CW and D.

MR. G. SHAVER: We are right now using a product similar to GAMOSOL. We got a barrel DUBOIS, which, in talking to your man down there, is the same thing as GAMOSOL.

MR. GAMLEN: DUBOIS is a soap. That will separate. GAMOSOL has been approved by many institutions, the Navy, Coast Guard, Department of Fisheries. We demonstrated to the entire group of them and that is the best product I know of.

MR. G. SHAVER: Incidentally, Harry, in talking to your man down there, Burton, he was going to send us up some material which we were going to take and use.

MR. GAMLEN: We also have another product used in the tanks of ships during the time vessels are underway - that is SEA CLEAN.

We find some differences in these. Where we see the material is not working as efficiently as we designed it to do, then it is because the characteristics of the sludge is changed. At this point the operator either makes his own test and goes at it from a different angle, making a different selection, or a combination of the two, but usually one product will do the entire job. Many of these emulsions can be broken instantly without any heat. We should be seeing some demarcation between the oil and water by now. It's a little dirty looking at the moment (referring to the bottle of sludge into which the EB had been placed earlier) but it will become clear after a while. This material, the emulsion breaker, has the strange characteristic - it is not soluble in the water and it is not soluble in the oil, initially. First it blends or spends it's power on the water. All the power is attracted by the water and as soon as it receives it and has broken the tension and separated the molecules, it decides it doesn't want anything more to do with the water and floats on the surface constantly at an interface and after a considerable time, days or weeks, the oil will absorb it, reducing the tension. Now that oil was bunker C. Now it doesn't look like bunker C any more, does it? Because we have taken the glue out of it, the factal tension, interfacial tension, we are working at the interface first. The resulting oil is better than it was initially and is usable. It doesn't have to be thrown away. It doesn't have to be burned in a dump. It can be burned in a boiler. It is recovered.

MR. NEUMEISTER: What is your idea, basically? There was talk about a barge of some sort which is mobile to handle the problem at the sump, and not only there but to handle the material as it -

MR. G. SHAVER: Right. Our problem is to initially clean the sump and restore the value

of the property down there where the sump is today. Secondly, we would continue to maintain the Port's obligation, if they fall they have one and apparently they do from evidence of the sump, we would continue to satisfy the port's obligation to - what would it be - to the port district, so to speak, whatever qualifications there is in that area, and that is about it. We give you back your property and we take over the obligations. Is that right, Captain?

CAPTAIN SHAVER: That is what it amounts to.

MR. GAMLEN: You must include item B in this, that while recovering the oil, or recovering the land to usable land again and taking away this oil to process it or dispose of it, that any additional oil gathered in the port, we must make provision for this simultaneously, both together. You can't just get rid of one and then stop. You still have the oil. You have to take care of this new oil and this new oil is feast and famine. Today there might be several ship cleaning jobs and the oil must be picked up. Some of these things, or some of these conditions, can be performed in a barge quite well. Just as easily as you saw, that by adding this material and using a pump and recovering it and putting the water back into the river after putting it through excelsior. Two operations must go on at the same time.

MR. NEUMEISTER: Is this an operation that would support itself?

MR. GEORGE SHAVER: Not at the present volume, Bob.

MR. NEUMEISTER: Would it support itself once the original investment is taken care of?

MR. GAMLEN: That depends on the slop -

MR. G. SHAVER: He calls it slop. I call it crap.

MR. NEUMEISTER: I think of a word too -

MR. G. SHAVER: We can't sit here and estimate how much material will be available. It means converting a portion of the facilities we have.

MR. BILES: You would recover this way that you have not had in the past?

MR. G. SHAVER: Right. I don't feel that the port can continue to maintain the facility in its present fashion. In other words, you can't burn that crap.

MR. GAMLEN: You reach a point where it is impossible to burn it any more. Nice clean oil that came to the surface, you can burn. When you get down a little lower it is emulsified and you can't burn it.

MR. PEABODY: You can burn it, Harry, if the air pollution allows -

MR. G. SHAVER: No. You can only burn that stuff after you put in a little choice fuel. Once that goes you can't burn any longer.

MR. PEABODY: But your air pollution authority is going to say you can't burn any of it, even your top oil.

MR. BILES: Didn't Mr. Wynn say you can't burn after the first of the year?

MR. NEUMEISTER: Of course the city is facing the same thing out there with their garbage disposal, too. They are talking about raising the price of garbage two or three times and people won't sit still for it. They had rather have the smoke.

MR. GAMLEN: Several of these garbage installations burn oil in the garbage furnaces - keeps a good high temperature to reduce the pollution.

MR. NEUMEISTER: Also, this is sort of a service, too. Isn't there any contributions, or isn't it possible to get payment from the other people like yourselves, or the shippers, for getting rid of this material?

MR. G. SHAVER: Yes, there is. However, our - to use the word capitalize - we have capitalized this oil removal thing now by having a barge in this service which we can

[illegible] longer use in any service other than that. During the war you had a considerable volume of this stuff that you were disposing of and since that time, since I more or less inherited the job of running the sump, there are fewer and fewer shipments of this crude [illegible] we end up with the barge showing a loss even though we charge the shipper, or [illegible] wants to dispose of this oil, for doing it.

MR. NEUMEISTER: This facility I presume would be placed on the same barge?

MR. G. SHAVER: It would require two barges. We would have to have two barges to inaugurate this service

MR. NEUMEISTER: What I mean, looking at it as a supposition, the port says well, we have a responsibility so long as it doesn't cost us any money, but we haven't got any money, so right now we won't do anything about it. How much help is available in the local area?

MR. G. SHAVER: That is where I think the obligation of the port comes in. Do they, or do they not, have to furnish the service of eliminating that crud? I don't know. Initially, they did have that obligation. Is that right, Captain?

CAPTAIN SHAVER: Well, I don't know as the port has the obligation. The port took it upon themselves the obligation. They built the sump down there and together we put the facility in to take care of these ships that were being decommissioned in the Navy and so we had this old wooden oil barge and we put it into that service and of course in those days there was quite a bit of it. When we brought it down there we pumped it in and then we burned it. When we first put it in the water went through into the ground pretty well and the oil stayed on top and we had some good fires down there and burned it up pretty well, but when winter came along it would fill up and be so much rain in it until finally the surface of that pool got to where it wouldn't take any more. At first it was a crime the barrels of pure diesel oil that went into that sump. The worst mess we ever got into was the gas company.

MR. CAMLEN: There are two opposing forces, petroleum and coal tar products, and one will convert the other to glass it is so hard..

[illegible]. SHAVER: Well, this is not a coal tar product from the gas company. It doesn't come [illegible] coal. It comes from oil.

MR. CAMLEN: All right. Then we have an opportunity, Captain, because this gas -

CAPTAIN SHAVER: Because this gas company here never, well they might have used coal years and years ago, but for years and years they are using bunker C oil to make their gas. We had to shovel the damn stuff out of the barge. We couldn't pump it. The Portland Shipbuilding Company has a bunch of it they haven't been able to dispose of.

MR. CAMLEN: When you burn thesurface of these sumps then you go into a refining process and the end product results in tar. You are making the problem more difficult by burning.

MR. NEUMEISTER: Well, before you came up, Captain, I mentioned the fact that the staff was assuming that we had somewhat of an obligation there because we do operate the sump and we have provided land for a sump, and along that line we're collecting information as to what we can do now that we are faced with the abandonment of that sump, and as I say, that is just an assumption on the part of the staff and when we get the information together we are in a position to give it to the Commission and see what they want to do. Apparently you have a lot of information and are close to some type of proposal on it.

MR. G. SHAVER: I think the thing to do would be to send you people a letter of intent, what the facility would be that we could provide and what consideration we would expect for providing it, and that sort of thing, and in turn what we would do for you.

CAPT. SHAVER: We would have to revamp our oil barge that we use in the regular oil service I think somewhat. We would have to repipe it from the standpoint of the coil, put additional pumps on and maybe tanks, deck tanks, maybe. It has a boiler on it and it has heating coils in the bottom.

[illegible]. PEABODY: Two levels -

[illegible]. CAMLEN: You are half way there already.

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APT. SHAVER: Yes, we have the boilers and we have the barge - the only one in the river ith it's own boiler - and then we have the sludge barge which would be used also. The arge with the boiler has never been used for anything but just bunker "C" oil.

R. NEUMEISTER: Have you been through any of these facilities in these other locations?

R. G. SHAVER: No.

APT. SHAVER: The only one I know of, Bob, is the one we built up here for the Navy.

R. NEUMEISTER: Are any of these in operation anywhere in the area?

R. GAMLEN: Only by independents who end up the same way as this independent here. They can't get the support. It's impossible to get a man to go out and bid on that thing at a price, unless it is a fantastic price.

CAPT. SHAVER: There is an outfit in San Francisco, isn't there, Harry?

R. GAMLEN: Oth, there are several companies that will pick up your oil. There is only one way to handle it - that is the 10% system.

R. NEUMEISTER: I was just wondering if there was a facility somewhere where a person could look at it and see it in operation.

R. GAMLEN: The only people who have tried this, various people down in Texas and Calif. who start with a pipe dream, a rainbow, In other words. They get so far advanced in the project and then give it up. It's got to be a coordinated project.
R. NEUMEISTER: Is this a patented process where you supply the chemicals or -

AMLEN: In these installations - where I am called in to design an installation - have a fee. Naturally, that fee is not based on my time. I used to make all of these drawings and do the work myself. Now the problems around the world are too great for me to go into-a great amount of the ground work has been done and we employ draftsmen at a fee of about $50 to $100. a day. We are not going to take anyone for a ride. We make our profit after the thing is going.

R. NEUMEISTER: Where is one of these facilities that you might have engineered, or guided?

R. GAMLEN: The biggest one is in England. There is one in Rotterdam doing the same thing but usually we have nothing to do with the operation once it has got going. A lot of these things, we simply gave them the idea. We put in a tremendous amount of time and travel getting them started on these things and never was paid for it. Today we can't do that. I can't spare the time away from my job and give advice, consultation, etc., for free. We must get some kind of a reward from it. So we have representatives in almost every city, every port, throughout the world and they handle these things themselves. It is a constant, daily thing. A lot of these recovery programs go on. We break down the sludge on the ships themselves. So, I say, for the most part our services of this type are not required because they do it on board the ship - break the emulsion, put it into the settling tank, etc.

R. NEUMEISTER: Your primary interest is the sales of the product?

R. GAMLEN: The sales of the products once it is gotten started. I worked in many cities and helped them out of these problems and then invariably they run into the same problem you face at the moment - who is going to finance the situation - and it is not very often you find anyone, individually or in a group, who is willing to go ahead and do it because as I say, it is a feast or famine proposition because they can't see into the future. All they can see is the problem. The problem must be solved. They can't put any more oil in the sump.

NEUMEISTER: You are reasonably sure of the success of the operation, I take it. are almost to the point of making a proposal, George?

R. G. SHAVER: Yes, we make a proposal -

R. NEUMEISTER: What I'm getting at is, are we getting into an experimental thing, or

are we getting into something where we can expect some known results.

MR. G. SHAVER. If you are including - let me say right off the bat - I won't stick my neck out and say this will be a paying proposition, but I am reasonably satisfied that the oil can be removed.

MR. GAMLEN. You are sure of one point - that your dump can be eliminated. Now comes the second problem of what are we going to do with future slop that can't go in the dump. The Shaver Transportation Co. has facilities for handling any slop initially. What the future may hold, that is something else again, but any time in all of these cities, Pittsburgh, New Orleans, or any where where they tried to interest individuals in recovering oil from ships, it always comes back again, who is going to install the plant to do it? So far some of these big cities, particularly the British, have put up a great big tank and then after the tank gets full there is a serious problem, how do we get it out of the tank and what are we going to do with it? There is only one thing to do with it, that is to recover it. They can't dump it into the sea any more. We are treating oil in every part of the world. There is no specific installation of this type installed to my knowledge because who is going to finance it? No individuals will do it.

CAPT. SHAVER: I think, Bob, if this was a steady business that you could get some private industry.

MR. NEUMEISTER: I know there are people on the east coast engaged in picking up the material and getting rid of it. I don't know how they do it.

MR. GAMLEN: We sell emulsion breaker to these various individuals.

MR. NEUMEISTER: But the amount in this area is not in that quantity.

CAPT. SHAVER: That is the trouble. It is a hit or miss deal, like Harry says. It is a feast sometime or a long famine. We have two problems here. The first is to eliminate the sump.

MR. GAMLEN: That is problem #1. Then we have to arrive at some system to take care of the problem from there on out. There is another problem. Usually, in a city government proposition, or even a federal government proposition, it is a service contract for one year. This is not one of those, George, that if you put in an installation that it can be stopped on some given date. You just can't do it like that. It's got to be a going concern.

MR. NEUMEISTER: Have you made any cost estimate on the installation?

MR. GEORGE SHAVER: No.

MR. GAMLEN: Didn't I get the prices of tanks for you two or three years ago?

MR. PEABODY: Yes.

CAPT. SHAVER: You might tell the boys, George told me, about this company that handles lube oil, cleans up the lube oil and sells it back to the airlines.

MR. GAMLEN: Lube oil never wears out. It is only contacts with water and other things that cause contamination. While it is a different subject, it is not quite as easy to handle as fuel oil. All of these lube oils can be recovered. If they have been overheated and lost some of those high fracs, we replace those fracs and return it back to reusable oils. But this is a different and separate phase of the operation. Some people have set themselves up in business who go around to these various garages collecting what they call crankcase drippings, take it back to the plant and they repack it and place it back on the market. We educated steel mills and other large institutions make their own recovery, particularly in a rolling mill where tremendous quantities of lube oil is used, and other installations such as strip mills where in each one there is at least10,000 gallons of lube in it. That is a full tank car of lube oil. That is

Page 9 - continued -

x_asive. Because of the metallic dust and the rolling operation and squirting water on he barge, this oil becomes emulsified and contaminated with iron dust so it reaches a oint where they can't pump it through the pipes any more. It requires too much pressure o force it into these barges and these barges are half as big as this room, some of them. t is a hell of a job for replacement - thousands of dollars just for the ends of the ournal on the ends of the roller. Now they have caught on to the idea of keeping the il clean so we supply emulsion breakers in these particular operations in most of the teel mills and it requires insignificant amounts. A 5 gallon can in 10,000 gallons of oil ertainly is not costing much, isit? That simple wash system takes the oil, gives it a est and it is beautiful oil when they put it back.

MR. PEABODY: Harry, you say it is harder to recover lube oil?

MR. GAMLEN: It requires a little different technique, yes. You are dealing with barges that cost thousands and thousands of dollars. A piece of equipment may have cost a million dollars, so it is a little more expensive and requires a little more care.

MR. PEABODY: That answers Bob's question whether you are buying a tried and true procedure or an experiment.

MR. NEUMEISTER: Yes.

MR. GAMLEN: Let's be realistic about this, about this recovery of lube oil. The man goes around to all these various gas stations, the various industrial companies, etc., and collects slop oil, all different kinds of oil, or a composite of a great number of different brands - all have different kinds of additives - these are additives we use here. These lubes can be used in certain industry. We can clean them up until they are perfectly clean. You would never know the difference, but when you are dealing with expensive machinery you ought to know the difference.

. SHAVER: We were interested in it from our own standpoint of possibly treating that ourselves, but I question, at this time, whether we could treat it in the barge facility that we propose -

MR. GAMLEN: I would not. That requires separate installations and forced filtration.

CAPT. SHAVER: In that sump we have quite a problem. There is a conglomeration of crap in that sump that is out of this world.

MR. GAMLEN: In lube oil, in the composite of lube oils taken from crankcase drainings you at least have 20% of slate. This precipitation of metallic flour settles down by reducing the interfacial tension. We can cause these fine particles, we cause them to come down to the bottom as a precipitate. It looks like slate and we call it slate. All of this whenever we treat it must collect in the bottom of the tank and this one must be designed just a little bit differently so we get a walk-in proposition - so we can go in and shovel it out or in this particular system we use a dump valve and flush it out before it becomes solid with the handle gate here for that specific purpose - this quick opening dump valve becomes plugged with this hard deposit. That must be disposed of. We don't have the same problem to that extent with slop oil taken from washings of machines, however, they do collect sawdust, particularly, and iron rust which has been washed off the sides of the tanks. We must have some way to recover this rust from the bottom of the treatment tank. A walk-in door.

CAPT. SHAVER: You would be surprised what comes out of the tanks of these ships.

MR. GAMLEN: Everything gets in these tanks.

MR. G. SHAVER: We have a special screen built for this crap, it is designed about the size of this table, so we don't have to clean it so damn often.

NEUMEISTER: Do you have any figures as to average operating cost from just the prod ion standpoint - you would know what you had to have in the way of personnel.

d. G. SHAVER: No. All we have now to come up with the price is the value of the equipment which we propose to put into the venture and we haven't treated any emulsion before to see what we could get out of it. We just merely - I came across this thing - well the thing that started it, Don Carlson called me up and said we can't burn the sump any more. Then I called Peabody and I went to San Francisco and went over and saw Harry. Then I thought

about it some more and this is just about the end of it right there, other than we have accumulated a little data on it. But this is kind of what we were thinking and what we would initially propose to the Port that we would do and we haven't any financial data other than the money and facilities we would have to put in. We don't know what the chemicals would cost.

MR. NEUMEISTER: That goes without saying.

MR. GAMLEN: Whatever it costs, it is very reasonable indeed. In talking about the sump operation, I wouldn't venture to guess, or to try to mislead you. Sometimes we run into a large quantity of free-flowing oil and water. Very simple. It costs then one part of this EB to 10,000 parts of that slop, or 40,000 parts. Sometimes it might cost one part in 1,000 or one part in 500. This is something that is unknown until we get into it. So what we do, we get a representative sample or composite sample, send it down to the laboratory and we test them. We try various parts. We get a lead on one particular product that is doing a job here and we play that lead for all it is worth to reduce the cost and increase the efficiency of this one product that is doing the job. We must play with unknowns, so having secured the lead of which chemical is doing the best job, we build on it in order to give the customer the best product for the price.

MR. BILES: I wonder if there is any sludge problem around here that isn't included in what comes off ships.

MR. NEUMEISTER: Oh, I think without any question.

MR. GAMLEN: It comes from all sources.

MR. BILES: But there has been other sludge dumped in that sump besides what has come off ships?

MR. G. SHAVER: Yes, I would say it is stuff people have to get rid of. The oil companies when they clean a tank usually call upon us to take the material out that they have removed from the tank and we put it in the sump down here.

MR. BILES: Then you are practically handling a community problem, as it is.

MR. G. SHAVER: No.

MR. BILES: So far as it is being handled here.

MR. G. SHAVER: Other than what is going over to the city. The city takes care of surplus oil and then a number of the oil companies have their own sumps that they dump in.

MR. NEUMEISTER: Would you be ging into a more expanded phase? Would you be going into a cleaning process such as tanks and ships, etc?

MR. G. SHAVER: Would we propose to clean tanks and ships?

MR. NEUMEISTER: Would you be, more or less, in that business along with this?

MR. G. SHAVER: No. Initially we propose to handle the material from them. There are other firms that do this work.

MR. GAMLEN: We supply the material and the services for such work. We have such men in all ports.

MR. BILES: I would think the Port might consider whether they would require all the waste oil products to be turned over for recovery.

MR. GAMLEN: The British made no bones about it. They said that is what you are going to do.

MR. GEORGE SHAVER: We don't care. Why should the Port care whether it is turned over for recovery or not? We are interested in whether it is turned over for recovery - to the extent it is not dumped in the river or buried in the ground or somewheres else.

MR. GAMLEN: Usually, in all of these ports, if these people know that facilities are

-- 11 --

available they will use them and be glad to do so.

MR. PEABODY: Well, there is nobody else, so far as I know, trying to recover any of the crudes or slops. There are two outfits that I know of that are recovering lube oils. They go around to the service stations and pick up the crankcase drippings, etc. There are two of them over on this side. I don't know about Vancouver.

MR. BILES: Penn Salt said the other day they were sending their lube oil over to Vancouver for processing and then they reuse it.

MR. PEABODY: I didn't know about this.

MR. G. SHAVER: But the lube oil thing in itself - we are not particularly concerned with it.

MR. CAMLEN: There are facilities in nearly every city for recovering lube oil.

MR. BILES: As far as river pollution is concerned, there is a lot of lube oil spilled into the river. If the Navy insists on not allowing us to control the lube oil that goes through the Navy oil, they have a pumping system for lube oil which pumps into the water pumps and spilling a lot of oil into the water which goes down the river.

MR. G. SHAVER: We collect ours and pump it out of the tugs and then in the sump or we take it down and oil our logging roads with it.

MR. CAMLEN: To sum this up, temporarily the dump is the City problem, or the Harbor problem. Is it your Commissioners' problem?

MR. NEUMEISTER: We can't say for sure. Up to this point we have been participating the problem because it has been easy and hasn't cost any money yet. From here on it we get into more money so naturally we are going to take a look at it first.

MR. CAMLEN: If you could recover this land that is being occupied by this sump - dump - that would be money in your pocket.

MR. NEUMEISTER: That is right. We are basically assuming that in recovering the land - maybe with no thought as to how, but we assume we will recover the land.

MR. PEABODY: How much land is involved?

MR. NEUMEISTER: Well, the whole thing is, the whole peninsula is what, 5,000 acres?

MR. PEABODY: Just the pools themselves.

MR. NEUMEISTER: Just the oil pools, I don't know.

MR. PEABODY: What would your guess be, George?

MR. G. SHAVER: About 10 to 15 acres.

MR. BILES: That spilled over, somewhat, didn't it?

MR. G. SHAVER: Did you have to bring that up.

MR. BILES: It's a hazard.

MR. CAMLEN: From here on out the ground is so soaked up any rains can continue to raise it. If you burn it any more you will make more tar and your problem becomes more complicated as time goes by and eventually costs are more to recover it. The sooner it's done the better.

page 12 - cont'd -

MR. NEUMEISTER: The only ' t I'm getting at is, it would ' hard for us to justify to the Commissioners, the valu_ of the land as justification f_ the expenditure, because of e fact that they may be-subconsciously they feel they have the land now and even [redacted] something has to be done, the basic assumption has been that, well, that will be and the land will be available. We are not looking at it right now as though it is a total loss.

MR. GAMLEN: It is a headache that won't cure itself without some medicine and a doctor.

MR. NEUMEISTER: We have always had the head, but now we have the ache along with it.

MR. GAMLEN: It will ache more as time goes on. Is it a question now as to who would finance it, or what? The Harbor or the City?

MR. NEUMEISTER: Well, there would be a question. The city wouldn't be involved to any extent. It would just be the people who would be interested in it which would be the Port, yourselves, the benefactors would be the only ones interested, I would think.

MR. G. SHAVER: At this time we are not the recipients of any benefits. We are just maintaining an old dead horse that we use every three months. If we say to the marine industry "To hell with you. You figure out some place to put it" you people in turn are going to say "We don't want it". I think the rains are going to bring this problem to a head within a year.

MR. NEUMEISTER: I think the fact you have gotten some facts and figures you can put together, and whatever proposal you can make that in itself will bring it to a head and make us determine whether or not it is our responsibility.

MR. G. SHAVER: So we are in turn providing the impetus.

MR. GAMLEN: How many barrels of oil do you think is present?

MR. NEUMEISTER: I have no idea of even the area without going out and surveying it.

[redacted] GAMLEN: It might cost you $0.05 a barrel or $3.00 a barrel.

[redacted] PEABODY: What is the present price of fuel?

MR. GAMLEN: Anywheres from $3. to $3.50 a barrel. In other words it could be recovered and balance the cost.

MR. HILES: You propose to pump it back into this recovery system, at least on a trial basis, and see what happens?

MR. G. SHAVER: Un-hunh.

MR. GAMLEN: We have worked on this problem before and developed a product for this specific slop which I understand was doing a very, very good job until internal friction between the operators caused a halt. The cost initially by their particular methods was $.03 per gallon to recover what they were recovering at that time and they were selling usable oil and must have been making a profit.

MR. PEABODY: Harry, that three cents a gallon was the end product with the dual pump added. It seems to me they also had trucking operations. They also added DP to it after recovery.

MR. GAMLEN: I am sure if we get started again under proper supervision that two men might well handle the situation 8 hours per day, a gradual process until it was entirely eliminated.

MR. G. SHAVER: We - If we proposed to take it out as they were doing it, we would take it out in 5,000 barrel lots.

MR. GAMLEN: Start filling the one end of the pool and force the sludge on to the other end and the tar at the bottom could remain there - only the liquid would be forced along to the end of the pool and then after a few years it might sink a little bit, which can [redacted] filled again, then you would have solid ground. That tar makes a fine foundation. [redacted]rd as a rock and would certainly not be washed away by rain. I assure you the problem [redacted]

tent with that particular job.

MR. BILES: Without getting curious as to what you propose to do with it, we might be interested in a plan to have more than one end product.

MR. G. SHAVER: Just taking that oil and trying to sell it to somebody. That is all we propose to do.

MR. BILES: That is much more apt to succeed than to try to elaborate.

MR. GAMLEN: You won't have any complaints about the water after it separates.

MR. BILES: What I was thinking was that each subsequent separation would leave another something to get rid of. If it is separated once, then the water is all that has to be gotten rid of outside of the end product.

MR. G. SHAVER: Yes, I see what you mean. We don't end up with some foreign compound that we have to try and take somewhere else.

CAPT. SHAVER: Any further questions?

MR. GAMLEN: Problem #1 is, who pays the bill, who gets the benefit. Problem #2, What you do in the future. And so I think the two of us, Shaver and Gamlen, can solve the problem for you.

The meeting digressed to general conversation and adjourned at about 445 p.m.

RECEIVED
JUL 1 1 1952
PORT OF PORTLAND

Port of Portland (1959b)

24A3 24A3

October 6, 1939

SUBJECT: Ramsey Lake Slop Oil Disposal.

Attached please find an aerial photograph of the subject area, engineer's estimate form complete, and a breakdown of a preliminary cost estimate covering the work.

The basic plan of accomplishing this work is to construct several trenches extending radially from the oil sump, and then pump the water out from between the surface oil scum and the settled sludge into the trenches. It is anticipated that the greater portion of the water can be removed without undue disturbance of either the scum or the sludge, and that this water will seep out of the ditches in a relatively short period of time. Upon removal of all water possible, the oil and sludge will be burned as completely as possible. After burning, the remaining waste will be covered over and buried.

The estimated volume of water to be pumped is approximately 7,000,000 gallons. The trench excavation required was estimated on the basis of actual need for a storage capacity of 1/4 the amount of water to be pumped, or approximately 5000 lineal feet of ditch. The attached aerial photograph has been marked in red to indicate suggested locations of this amount of open ditch. Estimating that an/bull dozer can excavate approximately 100 cubic yards per hour, indicates that approximately 22,000 gallons of storage capacity can be provided per hour by one bull dozer. This figure is referred to below.

Suitable pumping equipment complete, driven by combustion engines, are available in 10,000 and 20,000 gallon per hour sizes. In view of the uncertainties which face such an operation as this, it is felt that a pump of the smaller capacity would be more practical to use. Use of one or more of the 10,000 gallon per hour units would also provide greater flexibility in the field operations. Upon completion of the construction of one trench in the vicinity of each of the larger ponds, pumping operations can begin immediately. This would allow observance of the actual seepage rates from the trenches, and the excavation operations can be governed accordingly. Since the above estimated rate of trench excavation is approximately twice the pumping rate per unit, one bull dozer could probably keep ahead of two pumps without difficulty.

Please note that a relatively large contingency has been provided. The reason for this is the possible lower seepage rate than has been estimated, which would require additional trenching to be constructed. The hourly rates shown for both bull dozing and pumping operations are based on estimated rental rates per piece of equipment, complete with an operator.

RRA:mb
Attachments

TO: R. A. Bannister

Port of Portland (1959c)

29A3

November 20, 1959

SUBJECT: Slop Oil Basin

Burning attempts made between 5 and 8 p.m. on November 19 in subject basin were not felt to be successful. Although the pool was set ablaze, the length of burning time in any one large area was limited.

Indications to date are that the layer of water in the pools has been removed as far as practically possible and that the remaining sludge is a composite of which a large share of at least the surface material is emulsified. This means that, in any burning process, generating heat creates a "breaking" condition, separating the oil products and the water and allowing the water to put out, or lower the temperature of, the fire.

It appears that the next method of proceeding will be that of drainage ditches to drain off the material, after which the basin and ditches can be covered with oats. It is not felt that this process will in any way destroy the value of this property, as this material, in thin layers, has a tendency to harden, and it is not felt that it will be troublesome in the future other than the fact that it will be present in the area.

The estimated cost in my memo of November 11 is still felt to be adequate under these changed conditions, and it is requested that a poll be taken of the Commission on this subject before proceeding as per your instructions last staff meeting.

RN:mh

TO: JOHN J. WINN, JR.

cc: A. J. Heinsman

Port of Portland (1959d)

29A3
2 of 3

December 3, 1959

SUBJECT: Removal of Ramsey Lake Slop Oil Pools

Reference is made to conversation with Mr. Winn to the effect that authorization be requested at the next regular Commission meeting to proceed with subject work by a revised method from that described in my memorandum of November 11, 1959, sent to the Commission.

The monies requested in subject memorandum amounted to $2,000 for the elimination of Pools "B" and "C" and an additional $2,000 for the elimination of Pool "A." These cost estimates, totaling $4,000, are in addition to the presently authorized $1,000. As authorized by the General Manager, it is assumed that a $5,000 package authorization should be requested at the next regular Commission meeting.

The change in method of elimination was brought about by the failure of the burning attempts, and it is now intended to drain the material into the surrounding area, eliminating all possible water, burning the residue as much as practical, and covering over the remaining residue.

RN:mh

TO: K. W. BAUER

cc: C. H. Cover

Port of Portland (1960)

Considerable interest in negotiations has been demonstrated by both City and State officials.

Ramsey Lake Oil Sump

The Engineering Department has initiated the removal of the Ramsey Lake oil sump. The oil is being drained into trenches and covered over with earth.

Airport Properties

A national concern interested in a 1½ to 2 acre site in the Portland International Airport industrial area for a distribution warehouse has submitted additional plant data to the Realty Department. A special report by a consultant on the industrial development at the airport may be indicated.

Flightcraft lease negotiations are continuing; analysis of a draft lease submitted to the base operator by the Port revealed a number of disagreements. Flightcraft's comments are being reviewed by the Port's attorneys.

The Maloney & Hutchins tract at Portland International Airport has been purchased for $4,000.00, discontinuing condemnation proceedings. The tract includes approximately 170 feet of water frontage.

Acquisition of several parcels of land at Troutdale is practically completed.

AVIATION

Mr. J. V. Fryberger, formerly Port construction engineer, became Aviation Department Manager at the end of December. He replaced Mr. R. A. Mills, who left Port employ for a position with American Airlines.

Operations

Through November, inbound-outbound passenger traffic at Portland International Airport totaled 792,522, which was approximately 106,000 more than for the first 11 months of 1958. Other categories of traffic, including freight and express, mail and airline operations, show increases of from 8 to 18 percent over the last year.

Airlines and Service

United Air Lines has informed the Port it will locate its reservations department in the downtown area, rather than in the terminal building.

Appendix B

Oregon Steel Mills Storm Water Pollution Control Plan

Oregon Steel Mills, Inc.

STORM WATER POLLUTION CONTROL PLAN

Rivergate Plant
Portland, Oregon
(Multnomah County)

Revision Date
July 12, 2001

NPDES Storm Water Permit 1200-Z Permit File Number 64905

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STORM WATER POLLUTION CONTROL PLAN
OREGON STEEL MILLS
RIVERGATE PLANT - PORTLAND, OREGON

1.0 OVERVIEW AND CERTIFICATION

1.1 Introduction1.1

This Storm Water Pollution Control Plan covers the operations of the Oregon Steel Mills (OSM) Facility, located at 14400 North Rivergate Drive, in Portland, Oregon. It was prepared in accordance with the requirements of the Oregon Department of Environmental Quality (DEQ) National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge General Permit Number 1200-Z. In preparing this plan, the Guidance Document for Preparation of the NPDES Storm Water Pollution Control Plan (September 1999) and the U.S. Environmental Protection Agency model permit for the scrap processing and recycling industry, published in 1993, were used as guidance.

This Plan describes the facility and its operations, identifies potential sources of storm water pollution, describes control measures that will prevent and/or treat storm water pollution, and provides for annual review of this plan. This plan is an update of the previous storm water pollution control plan (dated February, 2000) and will be retained on file in the facility environmental office at all times.

1.2 General Plant Information

The following is a brief summary of Plant information; more details are provided in Section 3.0.

Name of Plant:	Oregon Steel Mills – Rivergate Facility
Plant Address:	P.O. Box 2760 14400 North Rivergate Boulevard Portland, Oregon 97208
Plant Contact:	Drew Gilpin, Manager of Environmental Services Telephone No: (503) 978-6189
Owner/Operator:	Oregon Steel Mills, Inc.
Number of Employees:	650 to 700

General Plant Description:	Facilities located at the site include a scrap processing facility, a steel melt shop (utilizing an electric arc furnace), slab casting and scarfing equipment, plate rolling facilities, and surface processing facilities. Support facilities include those associated with maintenance, utilities, oxygen production, waste water treatment, and transport of materials and products. Products include carbon steel slabs, coil and plates.
Standard Industrial Classification (SIC) Code:	Number: 3312 Description: Steel works, rolling & finishing mills
NPDES Storm Water Permit Number:	1200-Z
Permit File Number:	64905
Expiration Date:	6/30/02
Permitted Storm Water Outfalls/Receiving Waters	Outfall 001 – Willamette River. Outfall 002 – Willamette River via City of Portland separate storm sewer. Outfall 003 – Willamette River
Site Drainage Characteristics:	The site is predominantly flat. Storm water either drains by sheet flow to a system of catchbasins and storm drains or percolates to groundwater. Storm drains convey runoff to the outfalls identified above.

1.3 Plan Objectives

The U.S. Environmental Protection Agency (EPA) published regulations in November 1990 to control storm water discharges under the NPDES permit program. The goal of the storm water permit program is to improve the water quality of surface waters by reducing the amount of pollutants potentially contained in storm water runoff. Industrial facilities subject to an NPDES storm water discharge permit must prepare and implement a Storm Water Pollution Control Plan. In the State of Oregon, the DEQ has been granted the authority to administer the permits and oversee implementation of the plans. The DEQ has issued the Permit for heavy industrial activities associated with Standard

Industrial Classification (SIC) codes 28 through 33 which include primary metals.

The objectives of this Plan are twofold:

- To identify potential sources of pollution at the Plant which may affect the quality of storm water discharges; and
- To describe pollution control measures that address the potential pollution sources and storm water quality needs for this facility.

Control measures include physical controls and support programs such as a facility inspection program, a site compliance evaluation program, and improved record keeping and reporting procedures that will help the facility management and staff comply with the terms and conditions of the NPDES Permit.

Completed storm water improvement projects:

In 1997, Oregon Steel Mills completed an extensive storm water engineering study of the facility to establish baseline flow and system capacity information, identify pollutant source areas and develop remedial alternatives. OSM's remedial focus currently is on pH and suspended solids control. Projects completed to date include:

1. In 1996, installed CO_2 treatment systems to control pH
2. In 1997 and 1998, 1999 paved several previously unpaved or poorly paved areas, including the electric arc furnace baghouse, shipping, engineering, shell rebuild, east end of slab yard, scrap preparation, surface processing, and portions of the slag loading area. Paving projects continue to be evaluated.
3. In 1997, surveyed and identified catch-basins warranting upgrade, repair, or replacement
4. In 1999 revised and improved the monthly catch basin inspection throughout the plant.
5. In 1999 increased the frequency of cleaning problem catch basins. Now, OSM is scheduling cleaning as needed based on monthly catch basin inspections.
6. In spring 2000 completed upgrade of numerous substandard catchbasins.
7. In November 2000, OSM installed a Vortechnics storm water treatment system on Outfall 003. Vortechnics system is designed to capture suspended solids as well as act as an oil capturing system.

8. In February, 2001, installation of an automatic pH control system was installed on Outfall 003. The control system regulates the amount of CO_2 bubbled into the storm water and adjusts the CO_2 flow according to the amount of storm water flow.
9. In March, 2001 work to divert storm water collected under and surrounding the ICA Baghouse where Electric Arc Furnace (K061) is collected and conveyed into rail cars for disposal was completed. Storm water is now diverted to OSM's water treatment system from this area.

Future storm water improvement projects:

Sampling conducted by OSM Spring sampling of 2001 indicated some constituents exceeded the benchmarks as stated in OSM's NPDES 1200-Z General Stormwater Permit. The Spring , 2001 sampling indicated the benchmark for total suspended solids was exceeded for all three outfalls and the benchmark for zinc was exceeded for outfall 002 and 003. OSM has the following storm water improvement projects planned for this year:

1. OSM is planning on covering the slag loading area at the east end of the melt shop. This will decrease the amounts of suspended solids that collect in near by catch basins.
2. Install a pH control system on Outfall 002. The control system will regulate the amount of CO_2 that is bubbled into the storm water and will adjust the CO_2 flow according to the amount of storm water flow. This will allow OSM to maintain a pH within benchmark parameters with the fluctuation of storm water flow events.
3. OSM installed a Vortechnics stormwater treatment system in November 2000. The Vortechnics system is designed to capture suspended solids as well as act as an oil capturing system. OSM plans to use data from the Vortechnics system to evaluate the effectiveness and feasibility of additional systems on other outfalls.
4. OSM is planning to continue with specific paving projects that are designed to improve storm water. Two areas will have paving added or improved in 2001 include the slag loading area and the east end of the slab yard. OSM will continue to evaluate areas for paving that will improve storm water.

1.4 Plan Organization

This Plan is organized as follows:

- **Section 2.0 - Storm Water Pollution Prevention Team.** Identifies those individuals responsible for implementing, maintaining, and periodically updating this Plan. This section specifies the responsibilities of each team member.

- **Section 3.0 - Site Description.** This section presents a description of facility activities and an inventory of significant materials exposed to storm water, a description of facility areas and potential sources of pollutants, and a list of spills of toxic or hazardous substances.

- **Section 4.0 - Storm Water Pollution Controls.** Describes storm water management controls, spill prevention and response procedures, preventive maintenance measures, the employee training program, record keeping and reporting procedures, and the annual plan review recommended for this facility.

- **Section 5.0 - Monitoring Program.** The monitoring program prescribes the parameters for which each storm water outfall sample will be analyzed, and the records/reporting requirements.

- **Section 6.0 - Implementation Schedule.** This section establishes an implementation schedule for storm water management controls.

- **Section 7.0 - Other Permit Requirements.** This section addresses Oregon Administrative Rules for the Willamette River basin and on-site disposal facilities.

- **Section 8.0 - References.** Provides a listing of documents either referenced or used in the preparation of this plan.

Table 1 lists the provisions of the Permit and the corresponding section within this Plan that addresses each provision.

1.5 Certification of Plan

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Certification by Plant Owner/Operator

Signature:_____

Name:_____

Date:_____

Company:_____

2.0 STORM WATER POLLUTION PREVENTION TEAM

The Storm Water Pollution Prevention Team is responsible for developing, implementing, maintaining, and revising this plan. The members of the team are familiar with the management and operations of the facility and compliance with environmental regulations. Team members and their primary responsibilities are described below:

Name/Title: Drew Gilpin, Manager of Environmental Services
Office Phone: (503) 978-6189
Alternate: Debbie Deetz, Safety/Environmental Specialist
Office Phone: (503) 978-6044

Responsibilities:

- Oversee day-to-day environmental compliance and Plan implementation at the facility;
- Direct storm water compliance programs for OSM;
- Prepare budgets and schedules for implementation of pollution control measures as specified in the Plan;
- Keep and submit required reports and records; and
- Train employees, supervise storm water inspections and annual site compliance evaluation.

Additional information on the pollution prevention team is included in Table 2.

3.0 SITE DESCRIPTION

3.1 General Site Layout

The Plant is located at 14400 N. Rivergate Boulevard, in Portland, Oregon in the Rivergate industrial area on the Willamette River (Figure 1) less than a mile south of the confluence of the Willamette and Columbia Rivers. The Plant occupies approximately 125 acres bordered on the north by the Port of Portland's potash handling facility at Terminal 5, on the east by the Union Pacific railroad tracks, on the south by N. Ramsey Boulevard and a bulk storage facility owned by Simplot, and on the west by the Willamette River. The main access road to the site is Rivergate Boulevard with entry from the south. Rail spurs connect the site to the Union Pacific railroad tracks. Approximately 23% of the site is covered by impervious materials including buildings, roads, and other paved areas.

A site map is provided on Figure 2 which shows the property boundary and facility layout. A site detail is provided on Figure 3 which shows the locations of outfalls where storm water is discharged from the facility property;

Drainage area boundaries for each storm water outfall are described in Section 4.

3.2 Description of Plant Areas and Activities

There are five main operational areas at the Plant. The site map detail (Figure 2) shows an approximate boundary for each operational area. The drainage basins for the three storm water discharges are shown on Figure 3.

The operational areas are:

- Steel Making;
- Operations;
- Maintenance;
- Scrap Processing; and
- Utilities.

Table 3 lists the operational areas that have storm water runoff contributing flow to the outfalls, describes industrial activities conducted in each area, and indicates the outfall(s) to which each area drains.

There are five major categories of activities that are conducted at the facility, as described below:

Raw Materials Receiving and Distribution. Unloading and transporting materials that enter the site by either rail or truck. These materials include mostly steel scrap, along with additives, fluxes (such as lime), and binders. Scrap and some additives are taken into the melt shop along rail tracks. Lime is stored in a tank outside the south wall of the melt shop. Other materials and additives are stored inside the melt shop.

Storage. To the maximum extent practical, scrap and other materials are confined to designated storage or processing locations. Materials generally stored uncovered include scrap steel, some additives, slag, finished products, and some process-related equipment. On average, approximately 60,000 tons of scrap steel may be stored uncovered east of the Melt Shop. Slab steel product is also stored uncovered in several areas around the plant. The steel slabs stored on the north and south sides of the site, and a portion of the scrap storage area

are not included in any drainage area, with storm water in these areas ponding in low areas and infiltrating into the ground.

Hazardous substances and recyclable materials stored on-site include gasoline and diesel fuels, coal, water treatment chemicals, paints, lubricants, solvents, degreasers, waste oil, antifreeze, and ferrous alloys. Runoff contacting vehicles, equipment, and materials is controlled and directed to the on-site storm drainage system or percolates into the ground.

Processing/Fabrication. A hydraulic shear, rail breaker, and cutting torches are used to reduce large scrap pieces to a smaller size for manageability. Mobile equipment used for transporting and handling scrap include switch engines, cranes, and trucks.

The basic melting process operation begins with furnace charging, in which scrap steel, carbon, and flux are added to the furnace and melted. Oxygen is injected into the molten steel to homogenize the solution and to facilitate the movement of impurities to the slag layer on top of the steel batch. The slag layer is poured off and the molten metal is moved to the metallurgical furnace station for refining and chemistry verification. If required by the customer grade, the molten metal is moved to the vacuum degasser for further refining. Here, argon gas is used under vacuum to remove gases that are detrimental to the specifications desired. Exhaust substances during melting and refining are pulled into and collected by the baghouse.

Next, the refined steel is delivered to the casting area where air pressure is used to blow the molten steel into molds lined with a release agent (i.e., mullite). Cooling water is flushed through the carbon blocks of the mold to cool and solidify the steel into a master slab. The master slab is then removed from the mold and put in boxes for further cooling and solidification. The slabs then undergo a machine scarfing process, where mill scale and mullite are removed from each side of the slab. After being machined scarfed, a hand scarfing process is used to remove any remaining surface defects. After machine and hand scarfing, the scarfed master slab is moved to the yardway between the Melt Shop and the Rolling Mill.

Next, scarfed master slabs are cut into smaller slab pieces using gas torches. Cut slabs are moved to the Rolling Mill, reheated in a reheat furnace, and rolled into steel plate or coil to fulfill customer plate orders. The plate is then leveled, inspected, and any defects removed. Depending upon the customer requirements and the thickness of the plate ordered, a plate can be either sheared or torch burned to the proper width and length requirements. Plates that do not meet certain specifications and customer requirements can be scrapped. Scrapped plate is returned to the scrap processing department to be remelted.

Finished plate is stored and distributed from the shipping department area by truck or rail to the customer, to the heat treat facility for heat treating, or to the surface processing department on the plant site for further surface preparation. Quality assurance testing of products is performed in the quality assurance laboratory.

Major equipment used during the processing/fabrication activities include the electric arc furnace, ladle metallurgy furnace, vacuum degasser, slab molds, furnace baghouse, scarfing baghouse, reheat furnace, rolling mill, coil furnaces and leveler. Several types of equipment are used for handling scrap and slag, such as cranes which run on rail mountings, switch engines, and trucks, back hoes, fork lifts, and front-end loaders.

Shipment. Steel plates are loaded onto railcars or trucks for shipment off-site.

Water Treatment System Operation. The process water treatment system consists of various treatment equipment and associated cooling pond. The system is located in the western portion of the property. Treated process water will on occasion be discharged to the Willamette River through a separate outfall as allowed by NPDES waste discharge permit number 101007 (DEQ 1991b).

The reheat furnace cooling tower will discharge, when necessary, to the storm drain system associated with Outfall 1 (This discharge is identified as 003 in the waste water discharge NPDES permit).

Other miscellaneous activities conducted at the Plant include the following:

- Truck/Vehicle Maintenance - conducted indoors in the maintenance building at the central eastern portion of the site. New and used oil and products are stored indoors or under cover in this area of the site. Used oil and used antifreeze are stored prior to off-site transfer and for recycling in accordance with state and federal waste regulations;

- Truck/Vehicle Washing - Equipment and trucks are cleaned at the steam cleaning and carpentry shop located between the Maintenance and Surface Processing Buildings. The wash water is collected, treated, and discharged to the City of Portland sanitary sewer;

- Parking - Heavy truck traffic occurs on areas of the site as shown on the site map. Employee parking is located next to the administration building, in the southeast portion of the site, east of Rivergate Boulevard; and

- Fueling - Gasoline and diesel fuel are stored in aboveground tanks at the southeast corner of the Rolling Mill. Additional gas and diesel fueling occurs at the Slag Processing area located at the NE area of the plant.

3.3 Significant Materials and Potential Storm Water Pollutants

The General Permit requires a general inventory of significant materials handled at the facility, which may potentially be exposed to storm water. Currently, OSM has an inventory program that in addition to satisfying the permit's inventory requirements also includes significant materials that would not be exposed to storm water. The Storm Water NPDES Permit General Conditions defines significant materials as including "...but not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101 (14) of CERCLA; any chemical the Plant is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes and sludge that have the potential to be released with storm water discharges."

Although all of the following materials are handled, used, and stored in accordance with best management practices (BMPs), there are significant materials (to the extent known by the permittee) that have been handled, or stored, at the facility in a manner which could allow exposure to storm water. These include: ferrous scrap; slag; steel slabs; other finished steel products; refractories; oil and chemical products for vehicle and equipment maintenance; used oil and chemicals from vehicle and equipment maintenance; trash (stored in dumpsters); electric arc furnace dust; baghouse dust; gasoline and diesel fuel; mullite; lime; coal; equipment storage; used paints; and mill scale. The use and disposal of significant materials and potential pollutants are listed according to Source Area in Table 3.

3.4 List of Significant Spills or Leaks

The General Permit requires a listing of significant spills or leaks of toxic or hazardous pollutants that have occurred in areas exposed to storm water within three years prior to the effective date of the Permit. A significant spill or leak is defined as any release within a 24-hour period of toxic chemicals reported on EPA Form R or a hazardous substance or oil in an amount equal to or in excess of a reportable quantity as listed in 40 CFR 110 and 117. Documentation of significant spills is maintained in the Environmental Files.

3.5 Groundwater Discharged to Storm Water Drain System

Schedule D, condition 6 of the NPDES permit, requires that non-process groundwater that is discharged to the storm drainage system be identified in this plan. Known discharges of infiltrating groundwater are listed below:

- Groundwater infiltrates the storm drain system at various system pipe joints and sleeve connections as well as fracture points that are below the groundwater level.
- Infiltrating groundwater is discharged from the No. 1 shear electrical vault to the storm drain system of Outfall 1.
- Infiltrating groundwater adjacent to the rotary shear is discharged from a well to the storm drain system of Outfall 1. The well is protected from potential process material releases by concrete curbs and a well-head cover.
- Seasonally shallow groundwater is discharged from two sumps at the east end of the Rolling Mill to the storm drain system of Outfall 3.

4.0 STORM WATER POLLUTION CONTROLS

This section describes the storm water pollution controls which are being either implemented or planned in order to reduce the amount of pollutants in storm water discharged from the facility. The following categories of pollution controls are addressed as required by the NPDES permit:

- Storm Water Management (Containment, Oil and Grease Separation, Debris Erosion and Sediment Control, Storm Water Diversion, Covering Activities, Housekeeping, Other Management Controls and Waste Chemical Storage and Material Disposal;)
- Spill Prevention and Response;
- Preventative Maintenance;
- Employee Education;
- Record Keeping and Internal Reporting Procedures; and
- Annual Plan Review.

4.1 Storm Water Management

Storm water may become polluted when in contact with pollutants on exposed surfaces. Pollutants may dissolve, become suspended or float on the surface of

the water, or may attach to particulate in the water. Storm water at the facility could be affected by contact with vehicles and equipment, chemicals, waste materials, petroleum products, scrap metal, and dirty surfaces. Storm water may impact the quality of receiving waters when it runs off and flows into these receiving waters. Most of the storm water on this site drains as sheet flow into catchbasins and is routed through storm sewer pipes to storm water outfalls. Drainage areas are shown on Figure 3 and described below.

Drainage Area 1. Drainage area 1 contains most of the manufacturing areas of the site including the Melt Shop, slab storage, part of the Rolling Mill, and water treatment facilities. Storm water is collected and diverted by a storm drainage system to Outfall 1 west of the slab scarfing area and discharges into the Willamette River.

Drainage Area 2. Drainage Area 2 consists of surface processing, the south side of the scrap storage area, the employee parking lot, and the maintenance shop. Storm water from the parking lot and building downspouts is collected and discharged via Outfall 2 into the City of Portland's separate storm sewer system.

Drainage Area 3. Drainage Area 3 services the northern side of the facility, including slag processing, the north side of the rolling mill, and the northern storage areas. This outfall was renovated in 1997 in conjunction with the construction of the new Combination Mill.

A variety of storm water pollution controls and structural modifications have been implemented to minimize pollution of storm water runoff from this site. There are two general categories of storm water pollution controls. Source controls are practices that minimize potential contact of storm water with pollutants or eliminate non-storm water discharges. Structural controls are end-of-pipe treatments and volume controls. In general, source controls are given the highest priority for implementation in this plan.

Existing and proposed storm water pollution control measures are described below. The implementation schedule is presented in Section 6.

4.1.1 Containment

Existing containment practices which minimize the exposure of significant materials to storm water include the following:

- Topographic barriers prevent storm water discharge from the southern portion of the scrap processing area;

- Electric arc furnace dust (K061) from melting operations is collected in a baghouse and conveyed through a closed system to vehicles (rail or truck) for disposal at a permitted landfill;
- Most vehicle maintenance is performed indoors;
- The facility's manufacturing processes including scrap melting, slab casting, machine scarfing, plate rolling, and surface processing are located indoors;
- Most hazardous substances are stored indoors in designated storage areas;
- Hazardous substances are stored as required within berms, or other secondary containment devices to prevent leaks and spills from entering storm water runoff;
- Discharges from the sandblasting and steam cleaning area east of the Maintenance Building are collected and treated prior to discharge to the City sanitary sewer;
- Rainwater from the Mosley Shear containment pad and turnings and boring pad are collected and treated;
- Hydraulic equipment is inspected and maintained;
- Routine inspections and draining of bermed areas and secondary containment structures are conducted as needed;
- Preventing discharge of wash water from industrial areas; and
- Directing wash water to on-site treatment.

4.1.2 Oil and Grease Separation

Existing activities include:

- Products and spent or recyclable materials are stored in designated areas with adequate containment, spill kits or absorbents provided; and
- Off-site transfer for recycling or disposal is conducted by licensed contractors.
- Vortechnics storm water treatment system installed at Outfall 003 is designed to act as an oil capturing system if necessary.
- Visual inspections for releases in outside areas where oil, grease and petroleum products are conducted on a regular basis.

4.1.3 Debris, Erosion and Sediment Control

Existing controls include the following:

- Heavily used roads are paved to limit erosion (additional paving projects are planned);
- Paved areas are inspected and swept as needed with a diesel powered mobile sweeper;
- Storm drain inlets are inspected and cleaned as needed, based on results of monthly drainage inspections; and
- Minimal volumes of water is applied for dust control.
- Areas under baghouses are swept as needed.

4.1.4 Storm Water Diversion

Existing controls include the following:

- Wash water from the steam cleaning and sandblasting operations at the Maintenance Building is collected, pretreated, and discharged to City sanitary sewer;
- Conduct visual inspections monthly to verify that catchbasins and pipes drain as have been assumed within each area. Deficiencies, if any, will be corrected with engineered alterations to existing grades and storm drainage system, as appropriate, and
- In February of 2001 OSM installed catch basins and sump pumps that divert storm water from the pad under the ICA and Pangborn baghouses to OSM's service water system. This work was done in an effort to eliminate any potential of a release from the baghouses reaching the storm water system

4.1.5 Covering Activities

Existing practices which minimize the exposure of significant materials to storm water include the following:

- Most manufacturing and maintenance operations are conducted indoors;
- Most hazardous substances and recyclable materials are stored indoors; and
- Secondary containment around outdoor drum storage areas.

Other storm water pollution controls that are ongoing or are being planned include the following:

- To the extent practicable, move indoors, cover, or otherwise protect from storm water any lubricants, waste oils and other liquids that are temporarily

located outside due to maintenance or repair of vehicles and outdoor equipment; and

- An ongoing engineering study to evaluate alternatives to treat or control runoff from potential source areas.
- An extension of the east end of Steelmaking where slag loading is conducted to prevent run off to near by storm drains is planned for completion in 2001.

4.1.6 Good Housekeeping Practices

OSM currently implements a routine program of monthly site inspections. Examples of inspection checklists are included in Appendix C. Completed checklists are maintained in the environmental files. Other existing good housekeeping practices designed to maintain a clean and orderly site include the following:

- Placement of drip pans where feasible under equipment and vehicles to capture leaks;
- When feasible, oily or greasy equipment and/or parts will be stored under cover on a low-permeability surface. If these materials must be stored outdoors, they should be covered if practical and feasible.
- Paved areas of the site (mainly roads) are swept using a diesel powered mobile sweeper;
- All drums and containers of hazardous substances are properly labeled and stored;
- Monthly environmental, and housekeeping site walks are conducted by plant and departmental managers to identify and resolve potential problems;
- The area around the Lime Tower is swept as needed to contain spilled lime. Regular inspections of the area assess the effectiveness of the sweeping;
- Limiting use of water for dust control in paved areas;
- Stenciling of storm drain inlets.
- Providing employee education to prohibit the dumping of materials into catchbasins and storm drains;
- Washing equipment in designated areas only;
- Use of dry methods for cleaning process and maintenance areas (e.g., sweeping or vacuuming instead of washing);
- Use of dry methods for cleaning leaks and spills (e.g., spread absorbent, sweep, and collect); and
- Inspection of outdoor equipment storage areas regularly to determine which items can be discarded or recycled.

4.1.7 Other Operational Controls

Other existing storm water pollution controls include:

- Outfall 002 and 003 are equipped with CO_2 bubblers to control discharge pH;
- OSM maintains a written corporate environmental policy statement that clearly outlines our commitment to comply with all relevant environmental laws and regulations, and to educate employees accordingly;
- OSM has developed and implemented plant wide an extensive Environmental Management System that is modeled after the ISO 14000 standards,
- Many wood and paper products, solvents, used oils, and process wastes are recycled;
- OSM has implemented a plan to reduce the usage of toxic substances and generation of hazardous wastes (OSM - TURHWR plan, 1999);
- Air pollution control devices (including the graphite, shotblast, scarfing, and furnace baghouses) reduce particulate emissions from the Plant; and
- OSM routinely reviews and evaluates products used in processing, fabrication, and maintenance for hazardous contents and where possible replaces with non-hazardous substitutes.

4.1.8 Waste Chemical, Storage and Material Disposal

Wastes (e.g., used absorbent pads) and recyclable materials (e.g., used oil, solvents) are properly contained and stored in designated areas. Wastes and chemicals are managed according to State and Federal regulations.

4.2 Spill Prevention and Response

Potential causes of spills or leaks at this Plant could include container failures, equipment or vehicle leaks, and materials handling activities. Frequent inspections of storage areas, manufacturing/process areas, equipment and vehicles will reduce the likelihood for spills and help ensure that identified spills are cleaned up immediately before entering the storm drain system.

Emergency spill kits are located throughout the Plant. In the event of a spill, these kits are available for either spill cleanup or to prevent the spill from reaching the storm drain system.

Petroleum products are endemic in American society and at large and small industrial facilities. For this reason, small or de-minimus oil releases which do not pose a known and verifiable threat to surface waters (i.e. small areas of stained gravel in vehicle or equipment storage areas) will be addressed when feasible and practical and subject to the judgement of on-site personnel. Oregon Steel will continue to evaluate and implement measures to eliminate or minimize the number and extent of these minor or de-minimus releases.

The procedures used for cleanup and notification of spills are described in the facility's Spill Prevention Control and Countermeasure Plan, the Hazardous Waste Preparedness and Prevention Plan, and the Hazardous Waste Contingency Plan and Emergency Procedures (dated March, 2001).

4.3 Preventive Maintenance Measures

Preventive maintenance involves the regular inspection, cleaning, and any necessary repair of equipment and storm water and management structures, along with other activities that reduce the likelihood of spills and leaks. Copies of the storm water inspection forms are located in Appendix C. Also included are inspection and testing procedures to detect conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters. In addition to the measures described above, facility maintenance managers also conduct periodic reviews of the program for routine preventive inspection and maintenance of major equipment and vehicles used or stored outside. This review includes:

- Service checklists and maintenance logs for each major piece of equipment;
- Employee education and instruction materials;
- Manufacturer-recommended frequency of parts replacement and maintenance; and
- Testing and inspection of equipment and vehicles for any fluid leaks, malfunctioning parts, parts (such as gaskets) in need of replacement, and worn or corroded equipment.
- Regular inspections of waste storage areas and bulk storage units are also conducted.

4.4 Employee Education and Training

A training and education program is already in place for employees. Storm water pollution prevention is part of the existing program, and addresses those actions and conditions that cause storm water pollution, effective

implementation of the control measures presented in this plan, proper inspection, handling, and storage procedures to prevent storm water pollution, and the inspection and maintenance programs described above. Information related to storm water pollution prevention is presented through the existing training program and as appropriate at departmental meetings. OSM's storm water training plan is outlined in Appendix D. Training records are maintained at the environmental office.

4.5 Record Keeping and Reporting Procedures

This Plan, all inspection and site compliance evaluation records, related training records, records of spills and corrective action, and preventative maintenance records and monitoring results will be retained at the facility as required.

These records will be made available, upon request, to authorized representatives of the DEQ and the City of Portland. Reporting activities will include tabulating sampling data and submitting a report to the DEQ Northwest Regional Office and the City of Portland Bureau of Environmental Services by July 15 of each year.

4.6 Plan Review

The designated member of the Storm Water Pollution Prevention Team or their designee (see Section 2.0) will conduct periodic inspections of the facility. The inspections are performed to determine whether potential pollution sources are being sufficiently controlled, and whether pollution controls specified in the Plan have been properly implemented. Potential storm water pollution areas (source areas) indicated on Table 3 will be included in the inspection. Each inspection will be documented, and the recorded results retained at the Plant as indicated in Section 4.5. Examples of checklists for the routine inspections are included in Appendix C.

In addition to the facility inspection described above, the NPDES permit requires that a comprehensive full plan review be conducted annually. The objective of the full plan review is to assess the overall effectiveness of this plan and to modify or improve the plan, as appropriate. The annual full plan review will include the following elements:

- Modify or update the site map to reflect current conditions;
- Visually inspect the potential pollution sources at the Plant;

- Evaluate the pollution controls to determine whether they have been properly implemented and whether they are adequate;
- Inspect structure water quality control measures, if present, to ensure they are operating correctly; and
- Inspect spill response equipment and supplies.

The annual full plan review will be performed by the designated member of the Storm Water Pollution Prevention Team. The Plan will be updated as necessary. Changes to the Plan will be implemented within 90 days of the evaluation or as scheduled if engineered solutions are elected.

5.0 MONITORING PROGRAM

Storm water samples will be collected twice each year as required by the 1200-Z NPDES permit. The samples will be collected from each of the three outfalls (shown on Figure 3). Sampling will be conducted according to the test procedures approved under 40 CFR Part 136. Samples collected at and analyzed for parameters shown as shown in the following table as required by the Permit.

Sampling Outfall	Sampling Location	Sampling Time Frames	Sampling Parameter & Benchmarks
Rivergate Outfall 001	End of pipe on river bank west of Hand Scarfing	Fall/Winter (Oct – Dec) and Spring/Summer (March-June)	Oil & Grease =10 mg/l pH =5.5 – 9 S. U. TSS = 130 mg/l Metals: Cu, = 0.1 mg/l Pb, = 0.4 mg/l Zn = 0.6 mg/l
Rivergate Outfall 002	Open trench piping in Manhole just west of employee parking in road way		
Rivergate Outfall 003	End of pipe on riverbank West of Cut to Length Line and NW of curve in Haul Road		

Visual monitoring for floating solids (associated with industrial activities), oil & grease sheen at the outfall and areas of potential pollutant contact is to be done at least once each month.

The sampling results, along with visual inspection records, will be analyzed by the pollution prevention team during the annual site evaluation to determine if new management practices and/or treatment controls are warranted. Modifications will be made to the plan as appropriate, and employees will be informed of the changes.

6.0 IMPLEMENTATION SCHEDULE

A schedule for ongoing implementation of the pollution control measures proposed in Section 4 is presented in Table 4. This schedule will be reviewed and updated by the Storm Water Pollution Prevention Team as part of the annual full plan review.

7.0 OTHER PERMIT REQUIREMENTS

7.1 Oregon Administrative Rules for the River Basin

The OSM Plant is located in the Willamette River basin as designated by Oregon Administrative Rule (OAR) 886:1020.2. DEQ has established total maximum daily loads (TMDLs) for certain water bodies designated as water quality limited in accordance with the Clean Water Act. For the Willamette River basin, a TMDL has been set for dioxin. The Rivergate Plant does not discharge dioxin.

DEQ is currently in the process of performing a water quality study for the Willamette River basin which could result in the establishment of additional TMDLs.

7.2 On-Site Waste Disposal Wells for Surface Drainage

There are no on-site waste disposal wells for storm drainage at OSM.

8.0 REFERENCES

Oregon Steel Mills, 1998. Hazardous Materials and Waste Management Plan.

Oregon Steel Mills. 1994b. Environmental Requirements and Permits.

Oregon Steel Mills, 2000. Storm Water Pollution Control Plan - Rivergate Facility.

Oregon Steel Mills, 1992. Registration Application for General Storm Water Permit.

Oregon Steel Mills, 2001. Spill Prevention Control and Countermeasure Plan.

Oregon Steel Mills, 1999. Toxic Substance Use Reduction and Hazardous Waste Reduction Plan.

Oregon Steel Mills. No Date. SARA Title 313, Form R Reporting.

Oregon Department of Environmental Quality. 1999. Guidance Document for Preparation of the NPDES Storm Water Pollution Control Plan.

Oregon Department of Environmental Quality. 1991a. NPDES Waste Discharge Permit. No. 101007, File No. 64905.

Oregon Department of Environmental Quality. 1991b. General Permit: NPDES Storm Water Discharge Permit. No. 1200-H, File No. 64905.

Oregon Department of Environmental Quality. 1999. Best Management Practices for Storm Water Discharges Associated with Industrial Activities.

Table 1
Plan Compliance with Permit Provisions

Provision	NPDES Permit Reference	Plan Reference
Schedule A – Storm Water Pollution Control Plan		
Site Description	2.a	3
Description of Industrial Activities	2.a.i	3.1, 3.2
Description of Significant Materials	2.a..i	3.2
Description of Treatment, Storage or Disposal of Significant Materials	2.a.i	3.2
General Location Map	2.a.ii	3.1
Site Map	2.a.iii	3.1
Estimates of Impervious Areas on Site	2.a.iv	3.1
Description fo Potential Storm Water Pollutants	2.a.v	3.3
List of Receiving Waters	2.a.vi	3.1
Description of Discharge Outfalls	2.a.vii	3.1, 3.3
Storm Water Pollution Prevention Controls	2.b	4.1
Description of Storm Water Best Management Practices	2.b.i	4.1.1 – 4.1.8
Spill Prevention and Response Procedures	2.b.ii	4.2
Preventative Maintenance	2.b.ii	4.3
Rainfall Season Inspections	2.b.iii.1 and 2	4.3
Regular Cleaning and Repair Program During Rainfall Season	2.b.iii 3	4.3
Employee Education	2.b.iv	4.4
Record keeping and Internal Reporting Procedures	2.c	4.5
Annual Plan Review	10	4.6
Local River Basin-Specific Requirements	6	7
Discharge Benchmarks and Monitoring Requirements	9	7
Specific Storm Water Discharge Benchmarks	9	5
Water Quality Standards	7	5
Storm Water Discharge	5	1
Schedule B – Monitoring and Reporting Requirements		
Parameters	1	5
Representative Sampling	1	5
Frequency of Monitoring	2	5
Records Retention and/or Reporting	3	5
Schedule C – Compliance Conditions and Schedules		
Storm water Pollution Control Plan	1	6
Compliance Timing	1.a	6
Compliance Schedule	1.a	6
Schedule D – Special Contitions		
Release in Excess of Reportable Quantities	1	N/A
Availability of SWPCP and Monitoring Data	2	4.5
Definitions	3	N/A

Table 2

Pollution Prevention Team and Telephone Numbers

Oregon Steel Mills

Portland, Oregon

Position	Name	Extension or Office No.	Home Telephone	Pager Number	Cellular Number
General					
Manager of Environmental Services	Drew Gilpin	978-6189	(b) (6)		(b) (6)
Alternate					
Environmental Specialist	Debbie Deetz Silva	978-6044	(b) (6)		N/A

Table 3
Characteristics of Plant Areas

Facilities	Activities	Significant Materials/Potential Sources of Pollutants	Potential Pollutants	Storm Water Discharge Outfall(s)
Steelmaking Area				
Melt Shop	Slab Storage, Scrap Processing and Storage, Material Storage, Equipment Storage	Coal, Spent Mulite, Lime, Hydraulic Oil, Electric Arc Furnace Dust, Slag Trash in Dumpsters	TSS, pH, Metals, TPH	1 and 2
Slag Processing	Slag Storage, Scrap Storage	Ferrous Scrap, Slag, Refractory	TSS, Metals	ground infiltration
Slab Yard	Crane Operation, Torch Cutting	Slabs	Metals	1
Rail Tracks	Loading and Unloading	Scrap Metal, Lubricants, Fuel	TSS, Metals, Oil and Grease, TPH	1
Operations Area				
Mill, Slab Storage	Slab and Equipment Storage	Equipment Storage, Slabs, Mill Scale	TSS, Metals, TPH	1,2 and 3
Surface Processing	Plate Coating	Paints, Trash in Dumpsters	Metals, VOC	2
Maintenatce Area				
Maintenance Building	Equipment and Vehicle Fueling	Gasoline and Diesel Fuel Chemicals from vehicle and equipment maintenance.	TPH	2
Utilities Area				
Baghouses Water Treatment	Capture of Particulate Emissions Water Treatment System	Dust Water Treatment Solids	TSS, Metals	1

Table 4
Storm Water Pollution Controls

Control		Frequency
Maintenance (Central Shop)		
Store and use oils and fluids indoors or under cover		Continuous
Use dry methods for cleaning up spills and work areas		Continuous
Inspect and maintain spill kits	✔	Monthly
Operations (Mill, SPD)		
Sweep area around Surface Processing baghouse	✔	As Needed
Steelmaking		
Maintain west end of Melt Shop to capture graphite and debris from cleaning furnace molds and shells		As Needed
Sweep area surrounding Lime Tower to capture spilled lime	✔	As Needed
Inspect, maintain and repair hydraulic equipment	✔	Monthly
Utilities		
Apply water sparingly for dust control (not oil)		As Needed
Sweep heavily used paved roads and areas		As Needed
Inspect storm drain inlets around Melt Shop	✔	Monthly
Inspect and clean sediment and debris from other on-site storm drain inlets	✔	As Needed
General (All Areas, DJJ, IMS)		
Where possible, cover and store outdoor drums within secondary containment		Continuous
Post signs or other markings to prohibit dumping of materials into catchbasins or storm drain inlets		As Needed
Check for accumulated water in secondary containment	✔	Monthly
Clean up any spills to the ground immediately. Report spills to environmental department for determination of reporting requirements		As Appropriate
Inspect hydraulic systems, gear boxes, and bearings for leakage	✔	Monthly
Wash equipemnt and vehicles in designated areas only		Continuous
Use sorbent pads or dry absorbent material to clean up spills of hydraulic fluid and lubricants		As Needed
Place Drip pans beneath equipment and vehicles to capture leaks during maintenance and repair activities. Inspect and drain drip pans.	✔	As Needed
Inspect outdoor equipment storage areas. Discard or recycle materials.	✔	Monthly
Post signs and provide training to employees for fueling operations and spill/overfill prevention techniques		Continuous
Remove petroleum-impacted soils from areas areound facility		Continuous
Inspect process, maintenance, and storage areas. Schedule replacement and repair of containers.	✔	Monthly
Inspect and sweep paved areas.	✔	Continuous
Inspect sumps that accumulate sediment and water. Collect and dospose of accumulated material as needed.	✔	Monthly
Continue engineering studies to identify non-storm water discharges and to evaluate alternatives to eliminate or control such discharges		Continuous
Continue engineering studies to evaluate alternatives to treat or control runoff from potential pollutant source areas		Continuous
Conduct training for employees on storm water management and spill contol		Continuous

Notes:

✔ Item is found on Storm Water Inspection Checklist

Table 5
Bulk Storage Tanks
Oregon Steel Mills
Portland, Oregon

Source I.D.	Equipment Description	Equipment Location[1]	Qty[2]	Total Oil Volume (gallons)	Oil Type	Drainage Pathway	Existing Spill Containment and Control Measures[3]
T1	Gasoline AST, steel construction	Outside, SE Corner of Mill	1	2,000	Gasoline	Unpaved ground surface is flat. Nearest storm drain is across the road.	Double wall tank
T2	Diesel AST, steel construction	Outside, SB Corner of Mill	1	11,500	Diesel	Unpaved ground surface is flat. Nearest storm drain is across the road.	Double wall tank
T3	Kerosene AST, steel construction	Outside, Container Storage Area S of Mill	1	300	Kerosene	Unpaved ground surface is flat. Nearest storm drain is across the road.	Double wall tank
T4	Gasoline AST, steel construction	Outside, N of IMS Shop	1	400	Gasoline	Unpaved ground surface.	Steel containment tank
T5	Diesel AST, steel construction	Outside, N of IMS Shop	1	350	Low Sulfur Diesel	Unpaved ground surface.	Steel containment tank
T6	Diesel AST, steel construction	Outside, N of IMS Shop	1	14,000	Diesel	Unpaved ground surface.	Steel containment tank
T7	Used oil AST, steel construction	Outside, E of IMS Shop	1	275	Used oil	Unpaved ground surface.	Steel containment tank
T8, T9, T10	New oil ASTs, steel construction	Inside, NE corner IMS Shop	3	275	Motor oil	Shop floor, outside ground surface is unpaved.	Double wall tanks
T11	Hydraulic Fluid AST, steel construction	Outside, LMF Hydraulic Room	1	350	Hydraulic Fluid	Paved ground surface, storm drain 20 feet to the south.	Steel containment building
T12	Hydraulic Fluid AST, polyethylene construction	Inside, Re-Heat Furnace Hydraulic Room	1	350	Hydraulic Fluid	Hydraulic room floor, outside ground surface is unpaved.	Polyethylene containment tank
T13, T14A, T14B, T14C	Hydraulic Fluid ASTs, polyethylene construction	Inside, Mill Hydraulic Room	4	1,400	Hydraulic Fluid	Hydraulic room floor, outside to paved ground surface that drains into the Mill wastewater treatment pond.	Polyethylene containment tank
T15	Hydraulic Fluid AST, polyethylene construction	Inside, Leveller Hydraulic Room	1	350	Hydraulic Fluid	Hydraulic room floor, outside ground surface is unpaved.	Polyethylene containment tank
T16	Used oil AST, steel construction	Furnace Wastewater Treatment Pond	1	500	Used oil	Drains back to pond.	Drains to pond.

Notes:

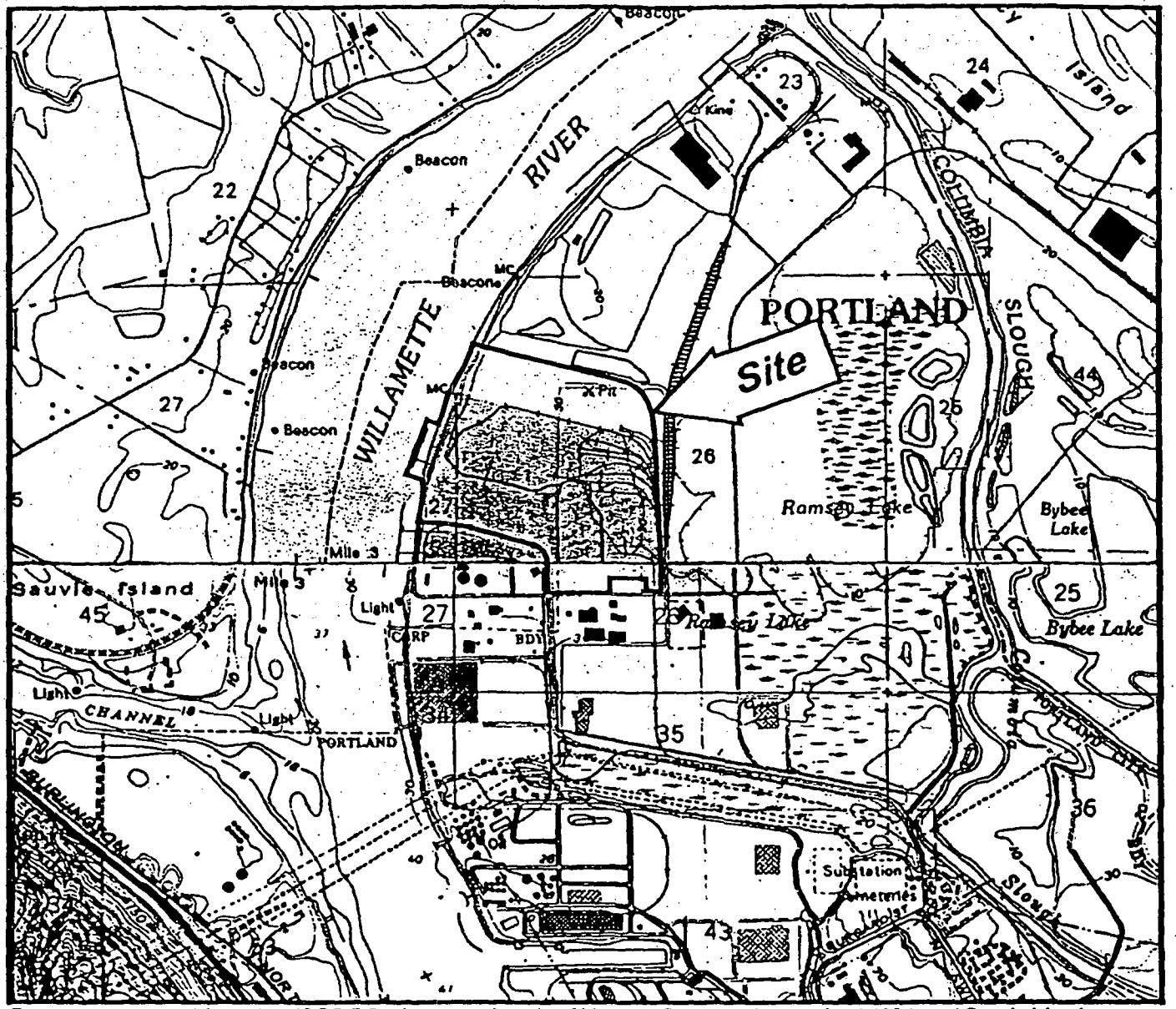
[1] If not indicated otherwise, equipment is outdoor.

[2] Quantity indicates the number of identical pieces of equipment, which are all listed together for brevity. The total oil volume is the total volume of all equipment items, i.e., the individual volumes m

3 Spill control and containment measures are further discussed in the text.

Site Location Map

Oregon Steel Mills
Portland, Oregon



Base map prepared from the USGS 7.5-minute quadrangle of Linnton, Oregon, photorevised 1984, and Sauvie Island, Oregon, dated 1990.

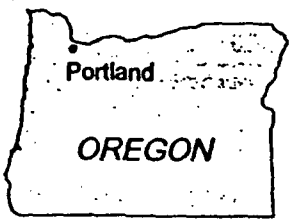
SCALE 1 : 24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

CONTOUR INTERVAL 10 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929



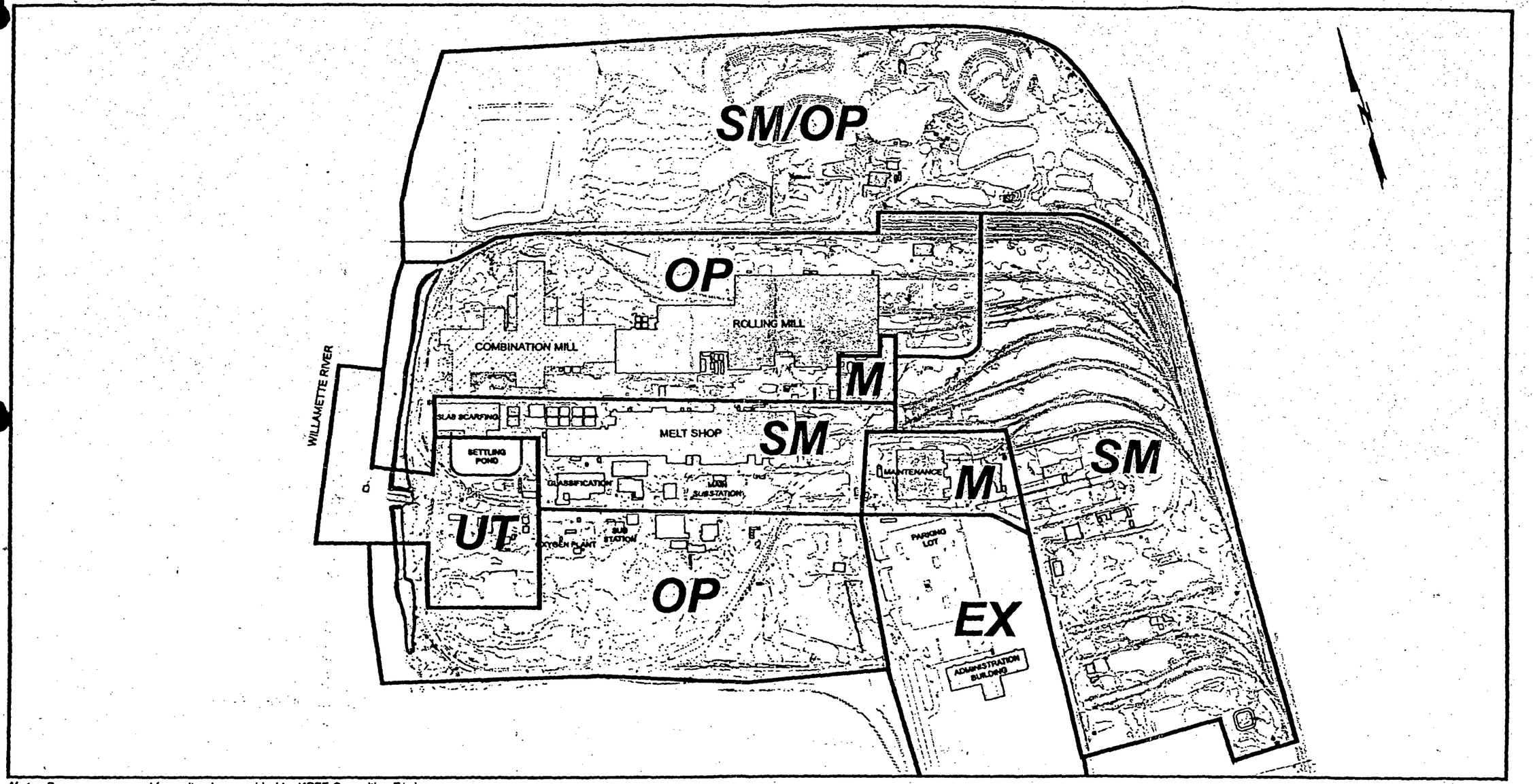
HARTCROWSER

J-5599 12/96

Figure 1

Facility Divisions

Oregon Steel Mills
Portland, Oregon



Note: Base map prepared from site plan provided by KPFF Consulting Engineers.

Legend:

SM	Steel Making	*M*	Maintenance
OP	Operations	*UT*	Utilities

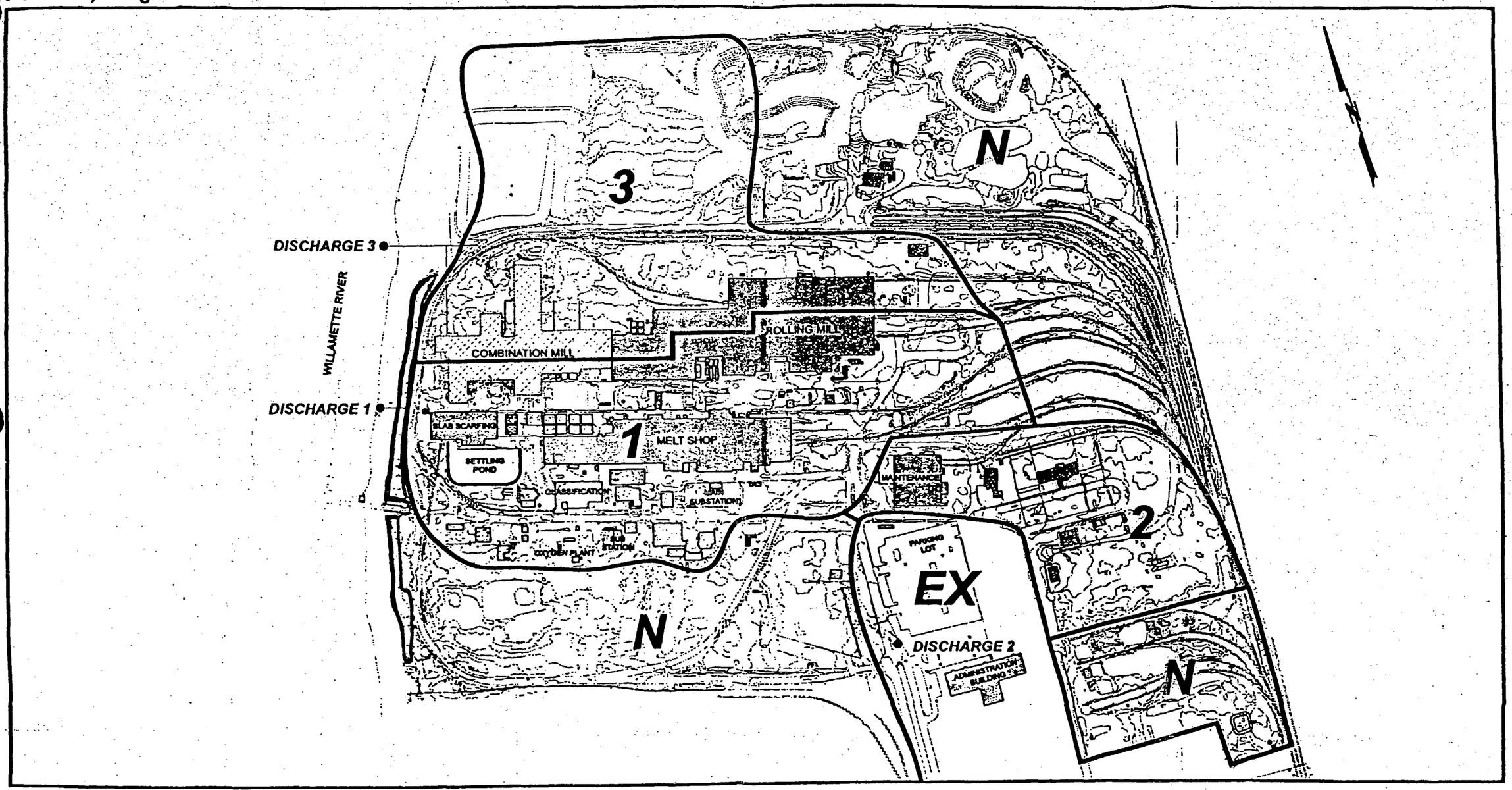
0 300 600
Approximate Scale in Feet

HARTCROW

J-5599
Figure 2

Drainage Basins

Oregon Steel Mills
Portland, Oregon



Note: Base map prepared from site plan provided by KPFF Consulting Engineers.

Legend:

1, 2, 3	Drainage Area Associated With Each Discharge
EX	Exempt Drainage Area
N	No Storm Drainage

DISCHARGE 1 ● Storm Water Discharge Point

0 300 600

Approximate Scale In Feet

HARTCROWE

J-5599
Figure 3

APPENDIX A
GLOSSARY

BMP	Best Management Practice
CFR	Code of Federal Regulations
CO_2	Carbon Dioxide
DEQ	Oregon Department of Environmental Quality
Mullite	A kaolinite clay release agent that promotes separation of slab castings from slab molds.
NPDES	National Pollutant Discharge Elimination System
SWPCP	Storm Water Pollution Control Plan
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TURHWR	Toxic Use Reduction Hazardous Waste Reduction
WPCF	Water Pollution Control Federation

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

NORTHWEST REGION

28 October 1997

Oregon Steel Mills, Inc.
Andrew J. Gilpin
PO Box 2760
Portland OR 97208

Re: NPDES General Permit 1200Z
File No.64905
ORR 20-0167
Multnomah County

The Oregon Department of Environmental Quality has received your application for renewal of National Pollutant Discharge Elimination System (NPDES) General Permit No. 1200H and the appropriate fees and is enclosing the requested permit. Additionally, we are enclosing a memo dated September 22, 1997 which discusses changes to the new NPDES General Permit 1200Z.

Please read the permit and the enclosed memo carefully to become familiar with the terms and conditions to which you must comply. We ask that you particularly observe the monitoring and reporting requirements outlined on pages 9 and 10 of the permit.

Should you have any questions, please contact the Northwest Region Office at 229-5552.

Sincerely,

Neil J. Mullane

Neil J. Mullane, Manager
Water Quality Source Control
Northwest Region

rcd
Enclosures
cc: File

John A. Kitzhaber
Governor

2020 SW Fourth A ..u
Suite 400
Portland, OR 97201-49
(503) 229-5263 Voice
TTY (503) 229-5471
DEQ-1

GENERAL PERMIT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORM WATER DISCHARGE PERMIT

Department of Environmental Quality
811 Southwest Sixth Avenue, Portland, OR 97204
Telephone: (503) 229-5279

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:

All Owners Or Operators Of Storm Water Point Source Discharges That Are Covered By This Permit

Issued 10-28-97 GEN12Z MULTNOMAH/NWR
File No. 64905 Orr20-0167

Oregon Steel Mills, Inc.
PO Box 2760
Portland OR 97208
Site: 14400 N. Rivergate Blvd., Portland OR

SOURCES COVERED BY THIS PERMIT

Facilities identified in 40 Code of Federal Regulation (CFR) §122.26(b)(14)(i -ix, xi) with storm water discharges. Construction activities, asphalt mix batch plants, concrete batch plants and Standard Industrial Classification code 14, *Mining and Quarrying of Nonmetallic Minerals, Except Fuels* are excluded from this permit. These activities are regulated under separate permits.

See Table 1: Sources Covered, pages 2-3, for more information on the CFR regulated industries covered by this permit.

Michael T. Llewelyn, Administrator
Water Quality Division

JULY 22, 1997
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify, or operate storm water treatment and/or control facilities, and to discharge storm water to public waters in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

			Page
Schedule A	-	Storm Water Pollution Control Plan, Additional Requirements, Limitations, and Benchmarks	4-8
Schedule B	-	Monitoring and Reporting Requirements	9-10
Schedule C	-	Compliance Conditions and Schedules	11
Schedule D	-	Special Conditions	12
Schedule F	-	General Conditions	13

Unless authorized by another NPDES permit, all other direct and indirect discharges to public waters are prohibited.

TABLE 1: Sources Covered (cont.)

Previous Permit Type	Sources Covered
1200-M	Facilities with the following primary Standard Industrial Classification codes: 10 Metal Mining 12 Coal Mining 13 Oil and Gas Extraction
1200-P	Facilities with primary Standard Industrial Classification code 26 Paper and Allied Products. Facilities with SIC codes 265 and 267 are only required to apply for permit if storm water is exposed to material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery.
1200-R	Hazardous Waste Treatment, Storage and Disposal Facilities, and facilities with primary Standard Industrial Classification codes 5015 Motor Vehicle Parts, Used, and 5093 Scrap and Waste Materials.
1200-S	Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, recycling, and reclamation of municipal or domestic sewage (including land dedicated to the disposal of sewage sludge that are located within the confines of the facility) with the design flow capacity of 1.0 mgd or more, or required to have a pretreatment program under 40 CFR § 403.
1200-T	Facilities with the following primary Standard Industrial Classification codes that have vehicle maintenance shops (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or airport deicing operations: 40 Railroad Transportation 41 Local and Suburban Transit and Interurban Highway Passenger Transportation 42 Motor Freight Transportation and Warehousing (excluding 4221 Farm Product Warehousing and Storage, 4222 Refrigerated Warehousing and Storage, and 4225 General Warehousing and Storage) 43 United States Postal Service 44 Water Transportation 45 Transportation by Air 5171 Petroleum Bulk Stations and Terminals
1200-W	Facilities with the following primary Standard Industrial Classification codes: 24 Lumber and Wood Products, Except Furniture (excluding 2491 Wood Preserving and 2411 Logging) 25 Furniture and Fixtures Facilities with SIC codes 2434 and 25 are only required to apply for permit if storm water is exposed to material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery.

vii) Identification of the discharge outfall(s) and the point(s) where storm water monitoring will occur as required by Schedule B. If multiple discharge outfalls exist but will not all be monitored (as allowed in Schedule B.1.c), a description supporting this approach shall also be included.

b) Site Controls The permittee shall maintain existing controls and/or develop new controls appropriate for the site. The purpose of these controls is to eliminate or minimize the exposure of pollutants to storm water. In developing a control strategy, the SWPCP shall have the following minimum components. A description of each component shall be included in the SWPCP.

i) *Storm Water Best Management Practices* If technically and economically feasible, the following best management practices shall be employed at the site. A schedule for implementation of these practices shall be included in the SWPCP if the practice has not already been accomplished. This schedule must be consistent with the requirements for developing and implementing the SWPCP in Schedule C of the permit.

(1) Containment - All hazardous materials (see Schedule D.3, Definitions) shall be stored within berms or other secondary containment devices to prevent leaks and spills from contaminating storm water. If the use of berms or secondary containment devices is not possible, then hazardous materials shall be stored in areas that do not drain to the storm sewer system.

(2) Oil and Grease - Oil/Water separators, booms, skimmers or other methods shall be employed to eliminate or minimize oil and grease contamination of storm water discharges.

(3) Waste Chemicals and Material Disposal - Wastes shall be recycled or properly disposed of in a manner to eliminate or minimize exposure of pollutants to storm water. All waste contained in bins or dumpsters where there is a potential for drainage of storm water through the waste shall be covered to prevent exposure of storm water to these pollutants. Acceptable covers include, but are not limited to, storage of bins or dumpsters under roofed areas and use of lids or temporary covers such as tarps.

(4) Erosion and Sediment Control - Erosion control methods such as vegetating exposed areas, graveling or paving shall be employed to minimize erosion of soil at the site. Sediment control methods such as detention facilities, sediment control fences, vegetated filter strips, bioswales, or grassy swales shall be employed to minimize sediment loads in storm water discharges. For activities that involve land disturbance, the permittee shall contact the local municipality to determine if there are other applicable requirements.

(5) Debris Control - Screens, booms, settling ponds, or other methods shall be employed to eliminate or minimize debris in storm water discharges.

(6) Storm Water Diversion - Storm water shall be diverted away from fueling, manufacturing, treatment, storage, and disposal areas to prevent exposure of uncontaminated storm water to potential pollutants.

(7) Covering Activities - Fueling, manufacturing, treatment, storage, and disposal areas shall be covered to prevent exposure of storm water to potential pollutants. Acceptable covers include, but are not limited to, permanent structures such as roofs or buildings and temporary covers such as tarps.

(8) Housekeeping - Areas that may contribute pollutants to storm water shall be kept clean. Sweeping, prompt clean up of spills and leaks, and proper maintenance of vehicles shall be employed to eliminate or minimize exposure of storm water to

4. Oregon Administrative Rule 340-41-26(3)(a)(D), Surface Water Temperature Management Plan Individual storm water discharges are not expected to cause a measurable increase in stream temperature. Compliance with this permit meets the requirement of OAR 340-41-26(3)(a)(D) to develop and implement a surface water temperature management plan. If it is determined that storm discharges in a particular basin are impacting a Total Maximum Daily Load for temperature, then permittees in this basin will be required to implement additional management practices to reduce the temperature of the discharges. These practices include, but are not limited to, increased vegetation to provide for shading, underground conveyance systems or detention vaults, and filter treatment systems to reduce detention times.

5. Storm Water Only This permit only regulates the discharge of storm water. It does not authorize the discharge or on-site disposal of process wastewater, wash water, boiler blowdown, cooling water, air conditioning condensate, deicing residues, or any other non-storm discharges associated with the facility.

   Any other wastewater discharge or disposal must be permitted in a separate permit. A separate Department permit may not be required if the wastewater is reused or recycled without discharge or disposal, or discharged to the sanitary sewer with approval from the local sanitary authority.

6. Specific River Basin Requirements The permittee shall comply with any Oregon Administrative Rule requirements for storm water management specific to the applicable river basin.

7. Water Quality Standards The ultimate goal for permittees is to comply with water quality standards in OAR 340-41. In instances where a storm water discharge adversely impacts water quality, the Department may require the facility to implement additional management practices, apply for an individual permit, or take other appropriate action.

CODE OF FEDERAL REGULATION STORM WATER DISCHARGE LIMITATIONS

8. The permittee with the following activities shall be in compliance with the applicable limitations at the time of permit assignment:

CFR Industry Category	Parameter	Limitation	
Cement manufacturing facilities for runoff from material storage piles (40 CFR §411)	pH	6.0 - 9.0 SU	
	Total Suspended Solids (TSS)	50 mg/l	
Steam powered electric power generation facilities with coal handling and storage facilities (40 CFR §423)	TSS	50 mg/l, Daily Maximum	
Manufacturing of asphalt paving and roofing emulsions (40 CFR §443)	Oil & Grease	20 mg/l, Daily Maximum	15 mg/l, 30 Day Average
	pH	6.0 - 9.0 SU	

SCHEDULE B
MONITORING AND REPORTING REQUIREMENTS

1. **Minimum Monitoring Requirements**

a) All permittees shall monitor storm water associated with industrial activity for the following:

GRAB SAMPLES OF STORM WATER	
Parameter	Frequency
Total Copper	Twice per Year
Total Lead	Twice per Year
Total Zinc	Twice per Year
pH	Twice per Year
Total Suspended Solids	Twice per Year
Oil & Grease	Twice per Year
**E. coli	Twice per Year

**The monitoring for E.coli applies only to landfills, if septage and sewage biosolids are disposed at the site, and sewage treatment plants.

VISUAL MONITORING OF STORM WATER	
Parameter	Frequency
Floating Solids (associated with industrial activities)	Once a Month (when discharging)
Oil & Grease Sheen	Once a Month (when discharging)

b) **Grab Samples** Grab samples that are representative of the discharge shall be taken at least 60 days apart. It is preferred, but not required, that one sample be collected in the fall and one in the spring. Compositing of samples from different drainage areas is not allowed.

c) **Multiple Point Source Discharges** The permittee may reduce the number of storm water monitoring points provided the outfalls have substantially identical effluents. Substantially identical effluents are discharges from drainage areas serving similar activities where the discharges are expected to be similar in composition. Outfalls serving areas with no exposure of storm water to industrial activities are not required to be monitored.

d) **Monitoring Location** All samples shall be taken at monitoring points specified in the SWPCP before the storm water joins or is diluted by any other wastestream, body of water or substance.

e) **No Exposure** If there is no exposure of storm water to material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery at the site, monitoring is not required. The permittee shall submit an annual statement certifying as such in lieu of monitoring (refer to Schedule B.3.b). If exposure cannot be prevented, the permittee shall comply with Schedule B.

SCHEDULE C
COMPLIANCE CONDITIONS AND SCHEDULES

1. Existing Permittee (for a facility with an NPDES storm water discharge permit assigned prior to September 30, 1996):

   a) Not later than 90 days after receiving this permit, the existing permittee shall revise and begin implementation of their SWPCP to meet any new permit requirements.

   b) Except for site controls that require capital improvements (see Schedule D.3, Definitions), the SWPCP shall be implemented within 90 days after revision of SWPCP. Site control activities that require capital improvements shall be completed in accordance with the schedule set forth in the SWPCP.

2. New Permittee with Existing Facility (for a facility operating prior to September 30, 1996, without an NPDES storm water discharge permit):

   a) Not later than 90 days after receiving this permit, the new permittee shall prepare and begin implementation of their SWPCP.

   b) Except for site controls that require capital improvements (see Schedule D.3, Definitions), the SWPCP shall be implemented within 90 days after completion of SWPCP. Site control activities that require capital improvements shall be completed in accordance with the schedule set forth in the SWPCP.

3. New Facility (for a facility beginning operation after September 30, 1996):

   a) Prior to starting operations, a new facility shall prepare and begin implementation of their SWPCP.

   b) Except for site controls that require capital improvements (see Schedule D.3, Definitions), the SWPCP shall be implemented within 90 days after beginning operation. Site control activities that require capital improvements shall be completed in accordance with the schedule set forth in the SWPCP.

4. New Permittee Discharging to Clackamas River, McKenzie River above Hayden Bridge (River Mile 15) or North Santiam River. Not later than 180 days after receiving this permit, new permittees discharging to Clackamas River, McKenzie River above Hayden Bridge (river mile 15) or North Santiam River shall submit to the Department a monitoring and water quality evaluation program. This program shall be effective in evaluating the in-stream impacts of the discharge as required by OAR 340-41-470. Within 30 days after Department approval, the permittee shall implement the monitoring and water quality evaluation program. New permittees are defined to include potential or existing dischargers that did not have a permit, and existing dischargers that have a permit but request an increased load limitation.

SCHEDULE F
NPDES GENERAL CONDITIONS

SECTION A. STANDARD CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Oregon Revised Statutes (ORS) 468B.025 and is grounds for enforcement action; for permit termination, suspension, or modification; or for denial of a permit renewal application.

2. Penalties for Water Pollution and Permit Condition Violations

Oregon Law (ORS 468.140) allows the Director to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit.

Under ORS 468.943, unlawful water pollution, if committed by a person with criminal negligence, is punishable by a fine of up to $25,000 or by imprisonment for not more than one year, or by both. Each day on which a violation occurs or continues is a separately punishable offense.

Under ORS 468.946, a person who knowingly discharges, places or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state, is subject to a Class B felony punishable by a fine not to exceed $200,000 and up to 10 years in prison.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of the Department, the permittee shall correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application shall be submitted at least 180 days before the expiration date of this permit.

The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

5. Permit Actions

This permit may be modified, suspended, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute;
b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts; or
c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

The filing of a request by the permittee for a permit modification or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. Toxic Pollutants

The permittee shall comply with any applicable effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.

3. Permit References

Except for effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

For purposes of this permit, A Single Operational Event which leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation. A single operational event is an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational event does not include Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational event is a violation.

6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definitions
   (1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.
   (2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.
   (3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.

b. Prohibition of overflows. Overflows are prohibited unless:
   (1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage;
   (2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and
   (3) The overflows are the result of an upset as defined in General Condition B.4. and meeting all requirements of this condition.

c. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.

d. Reporting required. Unless otherwise specified in writing by the Department, all overflows and uncontrolled overflows must be reported orally to the Department within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D.5.

7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs, upon request by the Department, the permittee shall take such steps as are necessary to alert the public about the extent and nature of the discharge. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

8. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in such a manner as to prevent any pollutant from such materials from entering public waters, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Sampling and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and shall be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Director.

2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

[illegible] of Tampering

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit shall be transferred to a third party without prior written approval from the Director. The permittee shall notify the Department when a transfer of property interest takes place.

4. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

5. Twenty-Four Hour Reporting

The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally (by telephone) within 24 hours, unless otherwise specified in this permit, from the time the permittee becomes aware of the circumstances. During normal business hours, the Department's Regional office shall be called. Outside of normal business hours, the Department shall be contacted at 1-800-452-0311 (Oregon Emergency Response System).

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. If the permittee is establishing an affirmative defense of upset or bypass to any offense under ORS 468.922 to 468.946, and in which case if the original reporting notice was oral, delivered written notice must be made to the Department or other agency with regulatory jurisdiction within 4 (four) calendar days. The written submission shall contain:

a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected;
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
e. Public notification steps taken, pursuant to General Condition B.7.

The following shall be included as information which must be reported within 24 hours under this paragraph:

a. Any unanticipated bypass which exceeds any effluent limitation in this permit.
b. Any upset which exceeds any effluent limitation in this permit.
c. Violation of maximum daily discharge limitation for any of the pollutants listed by the Director in this permit.

The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

6. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under General Condition D.4 or D.5, at the time monitoring reports are submitted. The reports shall contain:

a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected; and
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

7. Duty to Provide Information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Department, it shall promptly submit such facts or information.

8. Signatory Requirements

All applications, reports or information submitted to the Department shall be signed and certified in accordance with 40 CFR 122.22.

9. Falsification of Reports

Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed $100,000 per violation and up to 5 years in prison.

10. Changes to Indirect Dischargers - [Applicable to Publicly Owned Treatment Works (POTW) only]

The permittee must provide adequate notice to the Department of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants and;

APPENDIX D
STORM WATER TRAINING PLAN

Purpose

Reduce the discharge of storm water-borne pollutants into the Willamette River by:

- Improving storm water management and compliance at Portland Steel Works
- Informing OSM employees regarding storm water regulatory requirements and their role in compiling with OSM's SWPCP

Targeted Employees and Training Schedule:

Production, Maintenance, Supervisors and Foreman employee whose daily activities have a potential to have an impact on storm water will be trained annually in the components and goals of OSM's SWPCP. Training will be conducted once a year during regularly scheduled crew meetings. Training will generally be conducted in the Fall of each year (or another time as directed by the yearly plant wide training schedule plan) and consist of components of the training outline below. Use of videos, visual aids, discussions and demonstrations will also be used when appropriate.

TRAINING OUTLINE

Background

- Clean Water Act
- Stormwater Pollution Control Plan

Storm Water Pollution Controls

- Storm Water Management (Best Management Practices)
  - Containment
  - Oil and Grease Separation
  - Debris, Erosion and Sediment Control
  - Storm Water Diversion
  - Covering Activities
  - Good Housekeeping Practices
  - Other Operational Controls
  - Waste Chemical, Storage and Material Disposal
- Spill Prevention
- Training
- Inspections
- Record Keeping and Reporting

Monitoring

Visual (1time per month)

- color
- foam (associated with industrial activities)
- oil sheen

Laboratory (2 times per year)

- pH
- Total Suspended Solids
- Metals (Cu, Pb, Zn)
- Oil and Grease

APPENDIX E

STORM WATER SAMPLING PLAN FOR OSM – RIVERGATE FACILITY

Storm water samples must be collected from each of OSM's storm water outfalls twice a year from the facility as outlined below.

Storm water samples will be collected twice each year as required by the 1200-Z NPDES permit. The samples will be collected from each of the three outfalls (shown on Figure 2). Sampling will be conducted according to the test procedures approved under 40 CFR Part 136. Samples collected at and analyzed for parameters shown as shown in the following table as required by the Permit.

Sampling Outfall	Sampling Location	Sampling Time Frames	Visual Monitoring (Monthly)	Sampling Parameter & Benchmarks
Rivergate Outfall 001	End of pipe on river bank west of Hand Scarfing tables	Fall (Oct – Dec) and Spring (March-June))	• Floating Solids (Associated with industrial activities) • Temperature • Oil & Grease Sheen	Oil & Grease = 10 mg/l pH = 5.5 – 9.0 S. U. TSS = 130 mg/l Metals: Cu, = 0.10 mg/l Pb, = 0.40 mg/l Zn = 0.60 mg/l
Rivergate Outfall 002	Open trench piping in Manhole just west of employee parking exit			
Rivergate Outfall 003	End of pipe on riverbank West of Cut to Length Line and NW of curve in Haul Road			

Visual monitoring for floating solids (associated with industrial activities), temperature, and oil & grease sheen are conducted at the outfall or in the case of Outfall 002, the nearest catchbasin to the outfall. The visual monitoring will be conducted monthly.

Appendix C

Toxic Substance and Hazardous Waste Reduction Policy

OREGON STEEL MILLS

RIVERGATE FACILITY

TOXIC SUBSTANCE AND HAZARDOUS WASTE REDUCTION POLICY

September, 2001 REVISION

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OREGON STEEL MILLS

TOXIC SUBSTANCE AND HAZARDOUS WASTE REDUCTION PLAN (TUHWR) - 2001 REVISION

1.0 TOXIC SUBSTANCE AND HAZARDOUS WASTE REDUCTION POLICY

Oregon Steel Mills (OSM) is committed to efficient and wise use of resources and protection of the environment. We are pledged to eliminate or reduce our use of toxic substances and our generation of hazardous waste, wherever possible. When waste generation cannot be avoided, we are committed to recycling, treatment, and disposal in ways that minimize undesirable effects on humans, air, water, and land.

Toxic substance and hazardous waste reduction is every employees' responsibility. Employees are encouraged to recommend new ways to eliminate or reduce toxic substances and hazardous wastes.

Steel producers are nationally recognized as leaders in recycling. The steel industry consumes twice the recycled material of all other industries combined. Electric arc furnaces use close to 100 percent recycled steel scrap. OSM consumes between 600,000 and 800,000 tons of ferrous scrap each year.

OSM believes the growing significance of environmental issues and the potential impact of the Company's environmental practices requires a commitment to a written environmental policy. To that end, in August 1992, OSM has adopted a Corporate Environmental Policy Statement. A guiding principle of the Corporate Environmental Policy Statement is:

- To prevent or reduce pollution

In addition, OSM has developed an Environmental Management System Manual that has been distributed plant wide. The manual includes waste minimization measures such as purchasing practices and Environmental Departmental input on engineering changes to operating systems.

OSM will continue its commitment to developing techniques and strategies that result in the reduction of wastes, emissions and discharges within technical and market limits. OSM will continue to explore and develop opportunities for waste recycling.

2.0 PLAN SCOPE AND OBJECTIVES

The objective of OSM's Toxic Substance and Hazardous Waste Reduction Plan is to comply with the Oregon Toxic Use Reduction and Hazardous Waste Reduction Act (OAR 340 Division 135). To reach this objective, a reduction assessment has been conducted and a formal plan has been prepared. This plan is intended to guide OSM for the time period of 1997 to 2002.

3.0 RESULTS OF REDUCTION ASSESSMENT

3.1 Identification of Toxic Substances and Hazardous Wastes

Four major process areas were identified at OSM. The reduction assessment identified toxic substances used and hazardous wastes generated. In 1993, an assessment was conducted including a reconnaissance of the four major areas, interviews with OSM personnel, and a review of Material Safety Data Sheets (MSDS). Each year subsequent, the assessment was revised using Hazardous Waste and SARA reports, MSDS information, and interviews with OSM personnel.

3.1.1 Identification of Toxic Substances. The following major toxic substances where more than 10,000 pounds was used annually.

Steel Production
1. Chromium
2. Manganese
3. Nickel
4. Copper

Surface Processing (potential to exceed 10,000 pounds in a year)
1. Methyl Ethyl Ketone

3.1.2 Identification of Hazardous Wastes. The following hazardous waste was identified.

Steel Production
1. Electric Arc Furnace (EAF) Dust-(K061)

Surface Processing
1. Clean-up Solvent (D001, F005, F003, D035)

Maintenance
1. ~~Absorbent Pads (F001)~~ (re-profiled as non-hazardous in 2001)
2. Aerosol Can Puncturing System Liquids (D001, D026, D035, D036, D038, D039, D040)

3.1.3 Identification of Waste Streams

As of spring 1993, the OSM Environmental Staff initiated a program to identify all waste streams (solid or hazardous wastes) generated at the facility and to evaluate the potential for reduction of hazardous materials and reduction of generation of waste. The product of this effort was the "Hazardous Materials and Waste Management Plan" (Plan). The Plan contains Best Management Practices (BMP) for proper handling of hazardous materials and waste streams. The Plan also identifies certain waste streams for further evaluation for toxic use reduction and recycling potential.

3.2 Reduction Opportunities

OSM has evaluated reduction opportunities for toxic substances and hazardous wastes in the following categories:

- Each toxic substance used in quantities of greater than 10,000 pounds per year;
- Each toxic substance used in quantities greater than 1,000 pounds per year and greater than 10 percent of the total toxic substances used; and
- Each hazardous waste representing 10 percent or more by weight of the total waste stream.

More than 10,000 pounds of Chromium, Manganese, Nickel, and Copper are used in a year. The amount of Methyl Ethyl Ketone used will vary from year to year and in the past has been in excess of 10,000 pounds. None of the other toxic substances are used in quantities greater than 1,000 pounds nor comprise greater than 10 percent of the total toxic substances used.

Table 1 provides a summary of the amount of toxic substances used in each of the four major process areas. Table 1 was updated in 2001.

EAF dust comprises 99 percent by weight of the total hazardous waste streams generated at OSM.

Table 2 provides a summary of the amount of hazardous waste generated in each of the four major process areas. Table 2 was updated in 2001.

As part of the "Hazardous Materials and Waste Management Plan," a summary of both solid and hazardous waste streams generated has been developed and is attached as Table 3. Table 3 was updated in 2001.

3.3 Evaluation of Processes

3.3.1 Toxic Substances Used in Steel Production. Four of the metals used as a raw material to manufacture steel are listed as toxic substances. These metals include:

- chromium;
- manganese;
- nickel; and
- copper.

These metals are also found in the scrap metal recycled to produce new steel and steel slabs purchased by OSM. The concentration of these metals in the final product produced by OSM varies depending on the type of the steel. There are no known substitutes for manufacturing steel without these metals.

3.3.2 Toxic Substances Used at Surface Processing. Surface processing includes removing the mill scale (oxidized metal) from the manufactured steel and painting the final product. Toxic substances used at Surface Processing to paint final products include xylene, toluene, and methyl ethyl ketone (MEK). Xylene, toluene, and MEK are components of solvent based paints. Mineral Spirts are used for clean up operations. The client ordering the final product specifies the type of paint used by OSM.

OSM adheres to OAR 340-22-170(5)(j)(B) which states that all coating lines shall not exceed 3.5 pounds per gallon of coating based on a daily weighted average of the coatings used, excluding coatings exempted from this requirement.

Paint is applied by use of a spray gun in a waterfall paint booth. Paint is kept in closed 5 gallon containers and used paint is transferred to drums connected to the spray gun equipment. Paint is not lost during the mixing process prior to spraying.

3.3.4 Toxic Substances Used in the Electrical Distribution System. Electrical transformers owned and used by OSM contain less than 50 parts per million (ppm) PCBs. Transformers with greater than 50 ppm PCBs have been removed from the OSM mill or refilled with non-PCB oil.

3.3.5 Hazardous Wastes Generated in Steel Production. During the smelting process, dust composed of metals is generated and collected in a baghouse. This dust is a listed hazardous waste (K061).

3.3.6 Hazardous Waste Generated From Maintenance Activities.

In 2000, WESCO assumed the contract for service and maintenance of parts washing stations at OSM. Parts washing fluid is now cleaned and reused after it leaves OSM and is not considered a waste.

Liquids generated from aerosol can puncturing systems are considered a hazardous waste

Absorbent pads are used at several locations around the plant to absorb hydraulic fluid from machinery. After several years of analytical data, an exhaustive search of OSM's MSDS database and plant wide inspections, absorbent pads have been profiled as a non-hazardous waste. Purchasing practices are in place to prevent purchases of chlorinated spray degreasers and contractors are prohibited from using them on site.

3.3.7 Hazardous Waste Generated From Surface Processing.

Clean-up solvent used to clean paint guns and lines is collected in a drum and disposed (energy recovery) of through Romic Environmental as a hazardous waste. The waste solvent is placed in 55 gallon drums, stored in a designated accumulation area for shipment.

4.0 ACCOUNTING SYSTEM

4.1 Costs

4.1.1 Separate accounting systems that identify toxics use and waste management costs are no longer required. However, cost is still tracked and provides incentive to minimize generation of these wastes.

5.0 REDUCTION EVALUATIONS

The following section lists the reduction options considered for each toxic substance and reduction options considered for each hazardous waste.

5.1 Toxic Substances

5.1.1 Steel Production. Reduction options were not considered for toxic substances in raw materials used in the production of steel because no feasible substitutes are known.

5.1.2 Surface Processing. The following reduction options were evaluated for implementation in the painting operations conducted at Surface Processing (ongoing in 2001):

- Improved Operating Practices; and
- Raw Product Changes.

5.1.3 Maintenance Activities:

The following reduction option was evaluated for implementation for aerosol cans containing chlorinated solvents:

- Improved Operating Practices; and
- Raw Product Changes.
- Degreasers containing chlorinated solvents have been phased out. Continued efforts are in place to ensure new products do not contain chlorinated solvents that would not generate a hazardous waste from their use.

5.2 Hazardous Wastes

5.2.1 Steel Production. The production of steel by the use of electric arc furnaces produces K061. The reduction option evaluated for this waste streams is:

- Evaluate Economically Feasible Recycling Options.

5.2.2 Maintenance Activities. The reduction options evaluated for the elimination of absorbent pads as a hazardous waste included: Identify and eliminate chlorinated solvents, analytical analysis, search of the MSDS database, plant inspections and training. This was completed in 2001 when the waste profile for absorbent pads was examined. The results indicated that absorbent pad no longer meet the criteria of a hazardous waste.

5.2.3 Surface Processing. The reduction options evaluated for collection of clean-up solvent included:

- Improved Operating Practices; and
- Raw Product Changes.

6.0 IMPLEMENTATION PLAN

6.1 Toxic Use Reduction (TUR) Options and Schedule

6.1.1 Surface Processing. Improved operating practices in the form of leak and spill prevention measures have been instituted at Surface Processing. These measures continued to be refined. Spill kits have been placed in the paint storeroom and near the spray painting equipment in the event of a spill

OSM has limited control over raw product changes at surface processing because the purchaser of the steel designates the type of paint to be used. OSM continues to inform its customers that it's required by the Oregon Department of Environmental Quality (DEQ), and it's own environmental policy to make good faith efforts to reduce its use of toxic substances. OSM continues to request that its clients review the types of paint specified to determine if substitutes, which do not contain toxic substances, are available.

6.1.2 Maintenance Activities. Improved operating practices in the form of routine inspections (once a month) of hydraulic equipment and preventative maintenance have been instituted to reduce the loss of oils and greases. Spill kits have been placed in accessible areas in the event of a release from the hydraulic equipment.

Efforts continue to identify and minimize products that contain no toxic components. Spray degreasers with chlorinated solvents have been eliminated.

6.1.3 Electrical Distribution System. Improved operating practices in the form of routine inspections and repair of leaks of transformers with less than 50 ppm PCBs have been instituted to reduce the loss of PCBs. In 1998, a containment system was installed which would contain any release from a transformer located at the plants main substation. Additionally, spill kits have been placed in accessible areas in the event of a release from a transformer containing less than 50 ppm PCBs.

6.1.4 Best Management Practices (BMP). BMPs for proper handling have been developed for selected hazardous materials and waste streams. These BMPs apply to materials used and wastes generated from all areas of the facility. The following BMPs have been

implemented and are found in the Environmental Management System manual. These BMPs continue to be refined:

- Minimize use of Hazardous Materials;
- Minimize Generation of Waste;
- No Dumping Policy;
- Hydraulic Fluid Management;
- Lubricant Management;
- Continue to not allow the purchase of Spray Degreasers Containing Chlorinated Solvents;
- Manage Petroleum Contaminated Soils; and
- Proper Management of Hazardous Waste.
- Spill prevention and hazardous waste training.
- Additional BMPs are developed as needed.

6.2 Hazardous Waste Reduction Options

6.2.1 Steel Production. Recycling and metals recovery are the current TUR options for EAF Dust. The material is processed into a fertilizer or the metal content is recovered. A cost effective facility that can recycle OSM EAF dust is currently not available. OSM has participated in efforts to develop new options (Waste Management, Inc. proposed "Cashman" process) and will continue to support such efforts.

6.2.2 Maintenance Activities. The elimination of parts washing fluid under Safety Kleen as a hazardous waste was completed in 1999. In 2001, the waste profile for absorbent pads was examined. OSM had several years of analytical data, researched the MSDS database of current products used in the plant and conducted environmental inspections for products that may create hazardous or listed wastes. The results indicated that absorbent pads no longer meet the criteria of a hazardous waste.

6.2.3 Surface Processing. Use of good operating practices in mixing and handling paints will be continued. Additionally, where appropriate, OSM will continue to work with clients to recommend use of paints that are water based or do not contain toxic substances. The rate of waste paint generation is closely tied to the amount of steel plate painted. Painting procedures are in place and the material is used appropriately.

7.0 EMPLOYEE AWARENESS AND TRAINING

Toxic use and hazardous waste reduction training is incorporated into OSM's annual hazardous waste training and Environmental Management System.

Table 1

Identification of Toxic Substances

Process: Steel Production

Toxic Substance	Amount Used	Where Does Toxic Substance Go?
Chromium in Scrap Metal, Steel Slabs, Ore and Alloys	Production Dependent	Steel/EAF Dust/Fugitive Emissions/Slag
Manganese in Scrap Metal, Steel Slabs, Ore and Alloys	Production Dependent	Steel/EAF Dust/Fugitive Emissions/Slag
Nickel in Scrap Metal, Steel Slabs, Ore and Alloys	Production Dependent	Steel/EAF Dust/Fugitive Emissions/Slag
Copper in Scrap Metal, Steel Slabs, Ore and Alloys	Production Dependent	Steel/EAF Dust/Fugitive Emissions/Slag

Surface Processing

Toxic Substances	Amount Used	Where Does Toxic Substance Go?
Paint Coatings	Production Dependent	Consumed product/air/waste paint
Oil Preservative	Production Dependent	Consumed by product/air/waste paint
Methyl Ethyl Ketone	Production Dependent	Consumed by product/air/waste paint

Electrical Distribution System

Toxic Substances	Amount Used	Where Does Toxic Substance Go?
< 50 ppm PCB containing oil	2 Tons	Remains in transformer

Table 2

Identification of Hazardous Wastes Generated

Process: Steel Production

Hazardous Waste	Approximate Amount	Where Recycled/Disposed
Electric Arc Furnace (EAF) Dust	700 tons/month	Stabilization/Landfill US Ecology ID, possible future recycling

Process: Surface Processing

Hazardous Waste	Approximate Amount	Where Recycled/Disposed
Spent Clean-up Solvent	110 gallons/month	Romic Env./Fuel Blending/Incineration

Process: Maintenance Activities

Hazardous Waste	Approximate Amount	Where Recycled/Disposed
Liquids from Aerosol Can Puncturing System	40 gallons/year	Incineration/Fuel Blending – Romic Environmental.

TABLE 3

WASTE STREAMS

Aerosol Cans

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Degreaser (non-chlorinated)	250 cans	Monthly	Most are punctured and the contents are captured.
Electrical Contact Cleaner	60 cans	Monthly	Most are recycled in the furnace as scrap metal.
Spray Painting Activities	100 cans	Monthly	A few are disposed of as solid waste.

Alumina (pouring tubes, refractory lances, ladle tanks)

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Change Safety Ladle	1200 pounds	Every 10 days	Evaluate ways to separate pouring tubes Ladle path
	880 pieces brick	Every 10 days	floor alumina and lances for possible return to
	100 pouring tubes	Every 10 days	vendor. Remove steel for recycle and dispose of
	50 lances	Every 10 days	alumina at a permitted landfill.

Antifreeze (Propylene Glycol)

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Rolling Stock/Shop	55 gallons	Monthly	Oil Recycler

Baghouse Bags

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
ICA Baghouse	16-32 bags	Frequency varies	Metal Recovery in Furnace
Pangborn Baghouse	896 bags	Once every 5 years	Metal Recovery in Furnace

Batteries (Automotive type)

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Cranes	Varies	Maintenance Schedule	Return to Empire Batteries Inc. for Recycle
Rolling Stock	Varies	Maintenance Schedule	Return to Empire Batteries Inc. for Recycle

Shot Blasting Material

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Steel Shot at Wheelebrator Abrasive Blast	1000 pounds	Monthly	Used in the Furnace or disposed at a permitted landfill.

Crane Dust

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Cleaning of Cranes	30-50 cubic yards	Semiannually	Disposed at a permitted landfill

Carbon/Graphite Fines

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Milling System Dust	10-12 cubic yards	Monthly	Used in the furnace as a flux

Dolomite/Refractories

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Change Out Working Lining of Ladle Ladle Path Floor	2000 pounds 580 pieces	Daily	Evaluate ways to separate material, find use as a product/dispose at permitted landfill

Drums (empty - metal)

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Various products used throughout the plant.	30 drums	Daily	Recycled in the Furnace as scrap metal

Electric Arc Furnace Dust (KO61)

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
EAF Operations	30 tons	Daily	Stabilization/Landfill - Recycle

Electrodes

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Spent Electrode/Scrap	115,000 pounds	Quarterly	Sold as Graphite to Schuler Industries

Oil Filters

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Change Oil Filters		Maintenance Schedule	Drain/Crush/Recycle

Furnace Brick (MGO)

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Change Working Lining	400 pieces	Daily	Evaluate ways to separate, use as a product/of Ladle
Reline Furnace	2300 pieces	Every 3 weeks	Dispose at permitted landfill
Change Furnace Patch	20,000 pounds	Every 3 weeks	

Hydraulic Fluid/Lubricants/Oils

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Melt Shop	500-1000 gallons	10 days	Oil Recycler
Heat Treat	10 gallons	Monthly	Oil Recycler
Shop	110 gallons (grease)	Monthly	Oil Recycler
Shop	440 gallons (fluids)	Bimonthly	Oil Recycler

Machine Coolant

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Machine Shop/ Lab	250 gallons	Annually	Oil Recycler

Micro Separator Sludge

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Solids and water from water treatment processes.	100 tons	Month	Find use as a product/dispose at permitted landfill

Mold Coating/Mullite

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Melt Shop Cooling Boxes		Quarterly	Landfill, Slag Fluidizer, Raw Material
Water Treatment process	12 tons	Daily	Landfill, Raw Material in brick/Refractory product
Cooling Pond Dredging		Approx. Every 5 years	Waste Determination for each shipment

Paint

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Overspray with Corn Cob	3-4 drums	Monthly	Non-Hazardous Waste -Fuel Blended

Paint Gun Cleaner

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Surface Processing	110 gallons	Monthly	Hazardous Waste/Fuel Blended

Petroleum Contaminated Grease Sweep

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Cleanup at Shop	3 drums	Weekly	Oil Recycler
Maintenance Activities			Oil Recycler

Petroleum Contaminated Sorbent Pads

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Cleanup at Shop	55 gallons	monthly	Non-Hazardous Waste/Incineration/Fuel Blending
Maintenance Activities			Non-Hazardous Waste/Incineration/Fuel Blending

Petroleum Contaminated Soil

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Cleanup in Various Areas	160 tons	Quarterly	TPS Oregon Hydrocarbon

Pit Scrap

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Furnace Pit	30 yards	Weekly	Scrap / Landfill

Plastic Buckets (empty)

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Shop	6-10 buckets	Monthly	Solid Waste Disposal at permitted landfill
Melt Shop	6-10 buckets	Monthly	Solid Waste Disposal at permitted landfill
Surface Processing (paint)	3 buckets	Monthly	Solid Waste Disposal at permitted landfill
Heat Treat (paint)	2 buckets	Monthly	Solid Waste Disposal at permitted landfill

Roll Grinding Fines with Filter Paper

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Mill Roll Machinging	6 cubic yards	Monthly	Solid Waste Disposal at permitted landfill

Parts Washing Stations Solvent

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Parts Washing Tanks	500 pounds	Monthly	WESCO Reuse Program

Scarfing Fume (Pangborn Baghouse Dust)

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Scarfing Dust Baghouse System	5-10 tons	Monthly	Sold as Product

Vacuum Degassing Sludge

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Melt Shop	2000 gallons	Every 12 Months	Non-Hazardous/Disposal with a permitted disposal facility.

Wood

Generating Process	Quantity Generated	Frequency of Generation	Treatment/Recycling/Disposal Option
Broken Dunnage	2-4 yards	Daily	Recycled
Pallets (good condition)		Daily	Recycled/Recovered by Contractor for use as Pallets
Broken Pallets		Daily	Recycled

Appendix D

Oregon State Fire Marshal Hazardous Substance Information Survey

I COMPANY

RETAIN A COPY OF THIS SURVEY FOR 3 YEARS

ıe Date: NOVEMBER 30, 2001 2001

Facility ID Number 017689

OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

CORRECT THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION A HAZARDOUS SUBSTANCE PRESENCE Check the correct box to the left.

S ☐ NO 1. Were there hazardous substances present at this site in reportable quantities during this survey period?

S ☐ NO 2. Were there Extremely Hazardous Substances (EHS) present at this site that meet the threshold planning quantities during this survey period?

S ☐ NO 3. Is this facility subject to the reporting requirements of Section 112(r) of the Clean Air Act?

ECTION B DEMOGRAPHIC DATA Complete, correct or add information in the [bracketed] areas.

IC CODE 1: 3312 DEFINITION: BLAST FURNACES AND STEEL MILLS-MFG

IC CODE 2: DEFINITION:

USINESS ACTIVITY AT THIS SITE:
CARBON STEEL SLAB PLATE & COIL PRODUCTION

UN & BRADSTREET #: 00-910-6055

ANAGER'S NAME: ANDREW GILPIN

END TO ATTENTION OF: DEBBIE DEETZ SILVA

-MAIL ADDRESS: DEETZD@OSM.COM

USINESS NAME: OREGON STEEL MILLS INC

9. DEPT OR DIV: PORTLAND STEEL WORKS

SITE ADDRESS:
J N RIVERGATE BLVD

ITY: PORTLAND

OUNTY: MULTNOMAH

STATE: OR ZIP CODE: 97203

11. MAILING ADDRESS:
PO BOX 2760

CITY: PORTLAND

COUNTY: MULTNOMAH

STATE: OR ZIP CODE: 97208

BUSINESS PHONE: 503-286-9651

13. NUMBER OF EMPLOYEES AT THIS SITE: 700

EMERGENCY ASSISTANCE CONTACT PERSON FOR THIS SITE:
NDREW GILPIN

15. EMERGENCY CONTACT PHONES:
DAY 503-978-6189 NIGHT (b) (6)

RESPONSIBLE FIRE DEPARTMENT: PORTLAND FIRE BUREAU

CIAL FIRE DEPARTMENT INFORMATION This section is for information the fire service needs to know in case of an emergency.

☐ YES ☐ NO WRITTEN EMERGENCY PLAN. IF YES, WHERE AT SITE: _____

☐ YES ☐ NO AUTOMATIC FIRE SUPPRESSION SYSTEM PRESENT; e.g., sprinklered, halon system, etc.

☐ YES ☐ NO ARE STORAGE BUILDINGS/TANKS/AREAS PLACARDED ACCORDING TO NFPA 704?

☐ YES ☐ NO ARE OTHER TYPES OF PLACARDS USED?

SECTION C PERSON COMPLETING FORM
This person will be contacted to answer any questions needing clarification.

DEBBIE DEETZ SILVA
OREGON STEEL MILLS INC
LAND STEEL WORKS
PO BOX 2760
PORTLAND OR 97208

1. PRINT NAME: _____

2. SIGNATURE (REQUIRED): _____

3. DATE: _____ PHONE NO: _____

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ON NAME/TRADE NAME: ACETYLENE
DOUS INGREDIENT
IEST CONCENTRATION: ACETYLENE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1 - NEW 2 - NO LONGER REPORTABLE	3	3	20	20	20	00	365	L 2 4	2.1 6.3	74-86-2

UN/NA NO. (IF KNOWN): 1001

AGE LOCATIONS AT SITE: INSIDE & OUTSIDE MAINT AREAS
BLDGS #2 #3 #21 #25 #34 #48

EPA PESTICIDE REGISTRATION NO.:

ON NAME/TRADE NAME: ALUMINA REFRACTORIES
DOUS INGREDIENT
IEST CONCENTRATION: ALUMINUM SILICATE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1 - NEW 2 - NO LONGER REPORTABLE	1	1	30	30	40	00	365	E 1 4 R 1 4	6.4	68511-77-3

UN/NA NO. (IF KNOWN):

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.:

ON NAME/TRADE NAME: ALUMINUM
DOUS INGREDIENT
HEST CONCENTRATION: ALUMINUM

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1 - NEW 2 - NO LONGER REPORTABLE	1	1	30	30	50	00	365	J 1 4	9.0	7429-90-5

UN/NA NO. (IF KNOWN): 1383

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.:

ON NAME/TRADE NAME: ANTIFREEZE
DOUS INGREDIENT
HEST CONCENTRATION: ETHYLENE GLYCOL

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1 - NEW 2 - NO LONGER REPORTABLE	2	2	04	04	10	00	365	D 1 4	6.3	107-21-1

UN/NA NO. (IF KNO): 1153

RAGE LOCATIONS AT SITE: INSIDE STORES CENTRAL MAINT
IMS BLDGS #2 #48

EPA PESTICIDE REGISTRATION NO.:

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME/TRADE NAME: ARGON

S INGREDIENT

HEST CONCENTRATION: ARGON

EHS [ ] 112(r)

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
3	2	20	21	21	00	365	A 2 7 S 2 7	2.2	7440-37-1

1 - PURE
2 - MIXTURE
[ ]

1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN): 1006

EPA PESTICIDE REGISTRATION NO.:

AGE LOCATIONS AT SITE: OUTSIDE S SIDE OF MELT LAB B

S #3 #34

ON NAME/TRADE NAME: ARGON

DOUS INGREDIENT

HEST CONCENTRATION: ARGON

EHS [ ] 112(r)

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
3	3	20	20	21	00	365	L 2 4	2.2	7440-37-1

1 - PURE
2 - MIXTURE
[ ]

1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN): 1006

EPA PESTICIDE REGISTRATION NO.:

RAGE LOCATIONS AT SITE: INSIDE & OUTSIDE MAINT. AREAS

F J BLDGS #2 #3 #34

ON NAME/TRADE NAME: CALCINED KYANITE COATING

RDOUS INGREDIENT

HEST CONCENTRATION: CRYSTALLINE SILICA

EHS [ ] 112(r)

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1	1	41	42	53	00	365	H 1 4 O 1 4	6.4	14808-60-7

1 - PURE
2 - MIXTURE
[ ]

1 - NEW
2 - NO LONGER REPORTABLE

UN NA NO. (IF KNOWN):

EPA PESTICIDE REGISTRATION NO.:

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

ION NAME/TRADE NAME: CALCIUM CARBIDE

RDOUS INGREDIENT

HEST CONCENTRATION: CALCIUM CARBIDE

EHS [ ] 112(r)

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1	1	21	21	30	00	365	D 1 4	4.3	75-20-7

1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN): 1402

EPA PESTICIDE REGISTRATION NO.:

ORAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

FORM
IEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

:ROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE {BRACKETED} AREAS

ECTION D

N NAME/TRADE NAME: CALCIUM SILICON
OUS INGREDIENT
EST CONCENTRATION: CALCIUM SILICON

S	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE		1	1	31	31	50	00	365	D 1 4	4.5 4.3	
NEW NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN)
GE LOCATIONS AT SITE		INSIDE MELT SHOP BLDG #3									EPA PESTICIDE REGISTRATION NO.

N NAME/TRADE NAME: CARBON DIOXIDE
OUS INGREDIENT
EST CONCENTRATION: CARBON DIOXIDE

S	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE		3	3	20	21	30	00	365	L 2 4	2.2 6.3	124-38-9
NEW NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN) 1013
GE LOCATIONS AT SITE		INSIDE & OUTSIDE STORES MAIN EAS DJJ BLDGS #2 #3 #25 #34									EPA PESTICIDE REGISTRATION NO.

N NAME/TRADE NAME: CARBON DIOXIDE
OUS INGREDIENT
EST CONCENTRATION: CARBON DIOXIDE

S	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE		3	2	20	21	30	00	365	A 2 7 S 2 7	2.2 6.3	124-38-9
NEW NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN) 1013
GE LOCATIONS AT SITE		INSIDE & OUTSIDE STORES S OF T SHOP MAINT AREAS STORM DRAINS BLDGS #2 # 5 #34 #48									EPA PESTICIDE REGISTRATION NO.

N NAME/TRADE NAME: CARBON PRODUCTS
DOUS INGREDIENT
EST CONCENTRATION: CARBON

S	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE		1	1	40	40	60	00	365	R 1 4	4.5	7440-44-0
NEW NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN) 1361
GE LOCATIONS AT SITE		INSIDE & OUTSIDE MELT SHOP B #3									EPA PESTICIDE REGISTRATION NO.

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECOND

ME/TRADE NAME: CERAM-GUARD

S INGREDIENT
EST CONCENTRATION: AMORPHOUS SILICA

HS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE	2	2	04	04	00	00	365	D 1 4	6.3 6.4	7631-86-9
NEW NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)
AGE LOCATIONS AT SITE	OUTSIDE STORES BLDG #2									EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: CHOPPED COPPER

DOUS INGREDIENT
EST CONCENTRATION: COPPER

HS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
- PURE - MIXTURE	1	1	30	30	40	00	365	K 1 4	9.0	7440-50-8
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)
AGE LOCATIONS AT SITE	INSIDE MELT SHOP BLDG #3									EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: COATINGS-HIGH ZINC

DOUS INGREDIENT
HEST CONCENTRATION: ZINC

HS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
- PURE - MIXTURE	2	2	11	20	21	00	365	D 1 4 F 1 4	3.3 6.3	
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1993
AGE LOCATIONS AT SITE	INSIDE SURFACE PROCESSING BL									EPA PESTICIDE REGISTRATION NO.
#63 #64										

ON NAME/TRADE NAME: COATINGS-WATER BASED

DOUS INGREDIENT
HEST CONCENTRATION: SODIUM POTASSIUM ALUMINUM SILICATE

HS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
- NEW - NO LONGER REPORTABLE	2	2	04	10	21	00	365	E 1 4 D 1 4	9.0	37244-96-5
AGE LOCATIONS AT SITE	INSIDE SURFACE PROCESSING BL									UN/NA NO. (IF KNOWN)
#63 #64										EPA PESTICIDE REGISTRATION NO.

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number 017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ON NAME/TRADE NAME: COOGAR GAS
DOUS INGREDIENT
HEST CONCENTRATION: ARGON

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	3	3	20	21	21	00	365	L 2 4	2.2	7440-37-1
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1956

AGE LOCATIONS AT SITE: INSIDE & OUTSIDE MAINT AREAS
)GS #2 #3 #25 #34 #48

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: DEFOAMER-WATER TREATMENT
DOUS INGREDIENT
HEST CONCENTRATION: SILICONE ANTI-FOAM

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	2	2	04	04	11	00	365	E 1 4	9.0	
1 - NEW 1 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)

RAGE LOCATIONS AT SITE: INSIDE WATER TREATMENT BLDGS
5 #26

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: DIESEL FUEL
RDOUS INGREDIENT
HEST CONCENTRATION: PETROLEUM MID-DISTILLATES

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	2	2	30	30	41	00	365	A 1 4	3.3	68334-30-5
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1993

RAGE LOCATIONS AT SITE: OUTSIDE E END OF PLATE MILL
; BLDGS #34 #47

EPA PESTICIDE REGISTRATION NO.

ION NAME/TRADE NAME: DOLOMITE REFRACTORIES
RDOUS INGREDIENT
GHEST CONCENTRATION: BURNED DOLOMITE

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	1	1	30	30	41	00	365	0 1 4	9.0	37247-91-9
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KN)

ORAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME/TRADE NAME: FERRO CHROME
S INGREDIENT
IEST CONCENTRATION: CHROMIUM

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE		1	1	30	31	50	00	365	R 1 4	6.4	7440-47-3
1 - NEW 2 - NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN)

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: FERRO COLUMBIUM
DOUS INGREDIENT
HEST CONCENTRATION: COLUMBIUM

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE		1	1	21	30	41	00	365	J 1 4	9.0	7440-03-1
1 - NEW 2 - NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN)

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: FERRO MOLYBDENUM
DOUS INGREDIENT
HEST CONCENTRATION: MOLYBDENUM

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE		1	1	30	30	41	00	365	J 1 4	9.0	111121-95-2
1 - NEW 2 - NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN)

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

ION NAME/TRADE NAME: FERRO TITANIUM CORED WIRE
RDOUS INGREDIENT
HEST CONCENTRATION: FERROTITANIUM

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE		1	1	30	30	40	00	365	R 1 4	6.3	7440-32-6
1 - NEW 2 - NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN)

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

FORM
CHEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ON NAME/TRADE NAME: FERROBORON CORED WIRE
DOUS INGREDIENT
HEST CONCENTRATION: BORON

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	1	1	21	21	30	00	365	R 1 4	9.0	11108-67-1
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: FERROSILICON ZIRCONIUM
DOUS INGREDIENT
HEST CONCENTRATION: SILICON

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	1	1	21	21	40	00	365	J 1 4	6.4	
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

ION NAME/TRADE NAME: FERROSILICON 75%
RDOUS INGREDIENT
HEST CONCENTRATION: SILICON

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	1	1	40	40	51	00	365	R 1 4	4.3 6.4	
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1408

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

ION NAME/TRADE NAME: FLUORSPAR
RDOUS INGREDIENT
HEST CONCENTRATION: CALCIUM FLUORIDE

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	1	1	31	31	50	00	365	J 1 4	6.3 6.4	7789-75-5
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KN

ORAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME/TRADE NAME: FREON 22
INGREDIENT
EST CONCENTRATION: CHLORODIFLUOROMETHANE

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	3	2	03	04	04	00	365	L 2 4	2.2 6.3	75-45-6
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1018
STORAGE LOCATIONS AT SITE	INSIDE AIR CONDITIONER REPAI									EPA PESTICIDE REGISTRATION NO.
OP BLDG #14										

ON NAME/TRADE NAME: FURNACE PATCH
DOUS INGREDIENT
HEST CONCENTRATION: MAGNESIUM OXIDE FUME

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
- PURE - MIXTURE	1	1	40	40	51	00	365	0 1 4	6.3	1309-48-4
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)
AGE LOCATIONS AT SITE	INSIDE MELT SHOP BLDG #3									EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: GASOLINE
DOUS INGREDIENT
HEST CONCENTRATION: PETROLEUM DISTILLATES

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	2	2	20	20	30	00	365	A 1 4	3.1 6.4	8006-61-9
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1203
AGE LOCATIONS AT SITE	NE CORNER OUTSIDE OF PLATE M									EPA PESTICIDE REGISTRATION NO.
BLDG IMS OUTSIDE E END OF ROLLING MILL BLD 34 IMS BLDG #47										

ON NAME/TRADE NAME: GREASE
RDOUS INGREDIENT
HEST CONCENTRATION: SEVERELY REFINED PETROLEUM DISTILLATE

EHS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	2	2	30	31	41	00	365	0 1 4 D 1 4	4.5	64742-52-5
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1268
RAGE LOCATIONS AT SITE	INSIDE & OUTSIDE OIL STORAGE									EPA PESTICIDE REGISTRATION NO.
ED MAINT SHOP AREAS THROUGHOUT PLANT MILL B S #2 #3 #31 #34 #38 #47 #48 #50										

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number 017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS.

ECTION D

ON NAME/TRADE NAME: HI-TEMP ALUMINUM PAINT
DOUS INGREDIENT
HEST CONCENTRATION: ALIPHATIC HYDROCARBONS

HS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
- PURE - MIXTURE	2	2	03	04	10	00	365	F 1 4	4.5	64742-88-7
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)

AGE LOCATIONS AT SITE: INSIDE STORES MILL PLATE MIL
DGS #2 #34

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: HYDROGEN PEROXIDE 35%
DOUS INGREDIENT
HEST CONCENTRATION: HYDROGEN PEROXIDE

HS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
- PURE - MIXTURE	2	2	11	11	21	00	365	0 1 4 E 1 4	5.1 8.0	7722-84-1
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 2014

AGE LOCATIONS AT SITE: OUTSIDE WATER TREATMENT BLDG
5 #26

EPA PESTICIDE REGISTRATION NO. 5749-7

ON NAME/TRADE NAME: HYDROGEN SULFIDE
DOUS INGREDIENT
HEST CONCENTRATION: HYDROGEN SULFIDE

HS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
- PURE - MIXTURE	3	3	20	20	20	00	365	L 2 4	2.1 2.3	7783-06-4
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1053

AGE LOCATIONS AT SITE: INSIDE LAB BLDG #34

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: INCO NICKEL PELLETS
DOUS INGREDIENT
HEST CONCENTRATION: NICKEL

HS 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE	1	1	30	30	41	00	365	K 1 4	6.4	7440-02-0
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNO

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number 017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME TRADE NAME: KEROSENE

S INGREDIENT

HEST CONCENTRATION: KEROSENE

EHS [ ] 112(r)

PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
2	2	10	11	11	00	365	A 1 4 D 1 4	3.3 6.5	8008-20-6

- PURE
- MIXTURE

- NEW
- NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN): 1223

AGE LOCATIONS AT SITE: INSIDE & OUTSIDE MAINT AREAS
.T SHOP OIL STORAGE SHED BLDGS #2 #3 #34 #5

EPA PESTICIDE REGISTRATION NO.: 10182-223

ON NAME/TRADE NAME: LOW FOAM GRINDING FLUID

DOUS INGREDIENT

HEST CONCENTRATION: TRIETHANOLAMINE

EHS [ ] 112(r)

PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
2	2	10	10	20	00	365	D 1 4	6.3	102-71-6

- PURE
- MIXTURE

- NEW
- NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN):

AGE LOCATIONS AT SITE: INSIDE ROLL SHOP BLDG #34

EPA PESTICIDE REGISTRATION NO.:

ON NAME/TRADE NAME: MANGANESE COMPOUNDS

DOUS INGREDIENT

HEST CONCENTRATION: MANGANESE

EHS [ ] 112(r)

PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1	1	41	42	53	00	365	R 1 4	9.0	

1 - PURE
2 - MIXTURE

1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN):

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

EPA PESTICIDE REGISTRATION NO.:

ION NAME/TRADE NAME: MEMCIDE 400

RDOUS INGREDIENT

HEST CONCENTRATION: METHYL ISOTHIAZOLIN

EHS [ ] 112(r)

PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
2	2	03	04	04	00	365	E 1 4	8.0 6.3	2682-20-4

1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN): 1760

RAGE LOCATIONS AT SITE: INSIDE & OUTSIDE WATER TREAT
T BLDG #25 #26

EPA PESTICIDE REGISTRATION NO.:

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ON NAME/TRADE NAME: METHYL ETHYL KETONE
DOUS INGREDIENT
HEST CONCENTRATION: METHYL ETHYL KETONE

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE		2	2	10	10	11	00	365	D 1 4	3.2 6.3	78-93-3
1 - NEW 2 - NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN) 1193

AGE LOCATIONS AT SITE: INSIDE SURFACE PROCESSING BL #63 #64

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: NITROGEN
DOUS INGREDIENT
HEST CONCENTRATION: NITROGEN

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE		3	2	03	03	10	00	365	S 2 7	2.2	7727-37-9
1 - NEW 2 - NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN) 1066

AGE LOCATIONS AT SITE: TECHNICAL SERVICE INSIDE & O IDE MELT SHOP MAINT AREAS MILL LAB BLDGS #2 #34

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: NITROGEN
DOUS INGREDIENT
HEST CONCENTRATION: NITROGEN

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE		3	3	21	21	21	00	365	L 2 4	2.2	7727-37-9
1 - NEW 2 - NO LONGER REPORTABLE											UN/NA NO. (IF KNOWN) 1066

AGE LOCATIONS AT SITE: S SIDE OF TECHNICAL SERVICES SIDE & OUTSIDE MAINT AREAS LAB BLDGS #2 #3

EPA PESTICIDE REGISTRATION NO.

ION NAME/TRADE NAME: NITROUS OXIDE
RDOUS INGREDIENT
GHEST CONCENTRATION: NITROUS OXIDE

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE		3	3	20	20	20	00	365	L 2 4	2.2 6.3	10024-97-2
1 - NEW 2 - NO LONGER REPORTABLE											UN/NA NO. (IF KNO) 1070

RAGE LOCATIONS AT SITE: INSIDE LAB BLDG #34

EPA PESTICIDE REGISTRATION NO.

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME TRADE NAME: OIL

S INGREDIENT

HEST CONCENTRATION: PETROLEUM HYDROCARBON

EHS [ ] 112(r)

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
2	2	40	40	40	00	365	D 1 4 0 1 4	4.5	90622-58-5

- PURE
- MIXTURE
[ ]
- NEW
- NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN): 1270

EPA PESTICIDE REGISTRATION NO.:

AGE LOCATIONS AT SITE: INSIDE & OUTSIDE OIL STRGE S
MAINT AREAS MILL MELT SHOP LAB TECH SERV H
SCARFING VARIOUS PLACES THRUOUT PLANT BLDGS #2 3 25 28 31 34 47

ON NAME/TRADE NAME: OIL PRESERVATIVE

DOUS INGREDIENT

HEST CONCENTRATION: ALIPHATIC HYDROCARBON

EHS [ ] 112(r)

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
2	2	10	10	20	00	365	D 1 4	4.5 6.3	

1 - PURE
2 - MIXTURE
[ ]
1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN):

EPA PESTICIDE REGISTRATION NO.:

RAGE LOCATIONS AT SITE: INSIDE SURFACE PROCESSING BL
[redacted] #64

ION NAME/TRADE NAME: OLIVINE SAND

RDOUS INGREDIENT

HEST CONCENTRATION: FERRO MAGNESIUM SILICATES

EHS [ ] 112(r)

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1	1	31	40	52	00	365	J 1 4 0 1 4	6.4 9.0	14808-60-7

1 - PURE
2 - MIXTURE
[ ]
1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN):

EPA PESTICIDE REGISTRATION NO.:

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

ION NAME/TRADE NAME: OXYGEN

RDOUS INGREDIENT

HEST CONCENTRATION: OXYGEN

EHS [ ] 112(r)

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
3	3	30	30	31	00	365	L 2 4	2.2 5.1	7782-44-7

1 - [redacted]
[ ]
1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN): 1072

EPA PESTICIDE REGISTRATION NO.:

ORAGE LOCATIONS AT SITE: INSIDE & OUTSIDE STORES MAIN
AREAS MELT MILL DJJ TECHNICAL SERV BLDGS #2
#25 #31 #32 #34 #47

FORM
IEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

:ROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS.

ECTION D

N NAME/TRADE NAME: OXYGEN
OUS INGREDIENT
EST CONCENTRATION: OXYGEN

112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE	3	2	20	20	30	00	365	S 2 7	2.2 5.1	7782-44-7
NEW NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1072

GE LOCATIONS AT SITE: OUTSIDE MELT MAINT AREAS MIL
J BLDGS #2 #3 #25 #31 #32 #34 #48

EPA PESTICIDE REGISTRATION NO.

N NAME/TRADE NAME: PAINT ENAMEL
)OUS INGREDIENT
IEST CONCENTRATION: MINERAL SPIRITS

112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE	2	2	10	10	20	00	365	F 1 4 F 2 4	3.3 6.4	64742-88-7
NEW NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1263

GE LOCATIONS AT SITE: INSIDE STORES MAINT AREAS MI
ELT SHOP LAB TECHNICAL SERV VARIOUS LOCATI
THROUGHOUT PLANT BLDGS #2 #3 #25 #34 #48 #60

EPA PESTICIDE REGISTRATION NO.

)N NAME/TRADE NAME: PAINT THINNER
)OUS INGREDIENT
IEST CONCENTRATION: MINERAL SPIRITS

112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE	2	2	04	04	04	00	365	F 1 4	3.3 6.3	64742-88-7
NEW NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1263

AGE LOCATIONS AT SITE: INSIDE STORES MAINT AREAS BL
#2 #3 #25 #34

EPA PESTICIDE REGISTRATION NO.

)N NAME/TRADE NAME: PEBBLE QUICKLIME
DOUS INGREDIENT
IEST CONCENTRATION: CALCIUM OXIDE

112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
PURE MIXTURE	1	1	31	31	61	00	365	H 1 4	6.3 6.4	1305-78-8
NEW NO LONGER REPORTABLE										UN/NA NO. (IF KN 1910

AGE LOCATIONS AT SITE: OUTSIDE S SIDE OF MELT SHOP
; SILO BLDG #3

EPA PESTICIDE REGISTRATION NO.

FORM
CHEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME/TRADE NAME: PETROLEUM SOLVENT
S INGREDIENT
HEST CONCENTRATION: SATURATED HYDROCARBONS

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)	UN/NA NO. (IF KNOWN)	EPA PESTICIDE REGISTRATION NO.
[ ]	[ ]	2	2	11	11	21	00	365	D 1 4 F 2 4	4.5	8032-32-4	1255	

1 - PURE
2 - MIXTURE
[ ]
1 - NEW
2 - NO LONGER REPORTABLE

AGE LOCATIONS AT SITE: INSIDE MELT SHOP & MAINT ARE
MILL STORES SURFACE PROCESSING BLDGS #2 #3
#34 #48 #63 #64

ON NAME/TRADE NAME: PH CONTROL ACID
DOUS INGREDIENT
HEST CONCENTRATION: SULFURIC ACID

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)	UN/NA NO. (IF KNOWN)	EPA PESTICIDE REGISTRATION NO.
[ ]	[ ]	2	2	10	10	20	00	365	E 1 4	8.0 6.3	7664-93-9	1830	

1 - PURE
2 - MIXTURE
[ ]
1 - NEW
2 - NO LONGER REPORTABLE

RAGE LOCATIONS AT SITE: INSIDE & OUTSIDE WATER TREAT
T DGS #25 #26

ION NAME/TRADE NAME: PH CONTROL-CAUSTIC SODA
RDOUS INGREDIENT
GHEST CONCENTRATION: SODIUM HYDROXIDE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)	UN/NA NO. (IF KNOWN)	EPA PESTICIDE REGISTRATION NO.
[ ]	[ ]	2	2	11	11	21	00	365	0 1 4	8.0 6.3	1310-73-2		

1 - PURE
2 - MIXTURE
[ ]
1 - NEW
2 - NO LONGER REPORTABLE

ORAGE LOCATIONS AT SITE: INSIDE WATER TREATMENT BLDGS
5 #26

ION NAME/TRADE NAME: PROPANE
RDOUS INGREDIENT
GHEST CONCENTRATION: PROPANE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)	UN/NA NO. (IF KNOWN)	EPA PESTICIDE REGISTRATION NO.
[ ]	[ ]	3	2	11	20	30	00	365	A 2 4 L 2 4	2.1 6.3	74-98-6	1075	

[ ]
1 - NEW
2 - NO LONGER REPORTABLE

ORAGE LOCATIONS AT SITE: OUTSIDE E END OF LAB BLDG #3
OJJ ON MOBILE EQUIP

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ON NAME/TRADE NAME: R-124
DOUS INGREDIENT
HEST CONCENTRATION: 2-CHLORO-1,1,1,2-TETRAFLUOROETHANE

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
		3	2	02	02	03	00	365	L 2 4	2.2 6.3	2837-89-0

1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

AGE LOCATIONS AT SITE: INSIDE AIR CONDITIONER REPAI
IOP BLDG #14

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: R401A
DOUS INGREDIENT
HEST CONCENTRATION: CHLORODIFLUOROMETHANE

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
		3	2	02	02	02	00	365	L 2 4	2.2 6.3	75-45-6

1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

AGE LOCATIONS AT SITE: INSIDE AIR CONDITIONER REPAI
IOP BLDG #14

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: SALT
DOUS INGREDIENT
HEST CONCENTRATION: SODIUM CHLORIDE

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
		1	1	11	20	20	00	365	J 1 4	9.0	7647-14-5

1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

RAGE LOCATIONS AT SITE: INSIDE STORES MELT SHOP MILL
DGS #2 #3 #14 #34

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: SILICON MANGANESE
DOUS INGREDIENT
HEST CONCENTRATION: SILICON MANGANESE

EHS	112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
		USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
		1	1	40	41	60	00	365	R 1 4	9.0	12743-28-1

1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

UN/NA NO. (IF KNO

EPA PESTICIDE REGISTRATION NO.

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME TRADE NAME: SODIUM SILICATE SOLUTION
OUS INGREDIENT
HEST CONCENTRATION: SODIUM SILICATE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1 - NEW 2 - NO LONGER REPORTABLE	2	2	20	20	30	00	365	D 1 4	6.3	1344-09-8

UN/NA NO. (IF KNOWN):
EPA PESTICIDE REGISTRATION NO.:

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

ON NAME/TRADE NAME: STEAM CLEANER SOAP
DOUS INGREDIENT
HEST CONCENTRATION: SODIUM METASILICATE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1 - NEW 2 - NO LONGER REPORTABLE	2	2	04	04	10	00	365	D 1 4	8.0	6834-92-0

UN/NA NO. (IF KNOWN): 1760
EPA PESTICIDE REGISTRATION NO.:

AGE LOCATIONS AT SITE: INSIDE MAINT STEAM CLEANING
LDGS #34 #48 #60

ON NAME/TRADE NAME: STEEL MOLTEN
DOUS INGREDIENT
HEST CONCENTRATION: STEEL

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1 - NEW 2 - NO LONGER REPORTABLE	2	1	42	43	00	00	360	R 1 5	6.3	

UN/NA NO. (IF KNOWN):
EPA PESTICIDE REGISTRATION NO.:

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

ON NAME/TRADE NAME: STEEL SHOT
RDOUS INGREDIENT
HEST CONCENTRATION: IRON

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1 - NEW 2 - NO LONGER REPORTABLE	1	1	21	30	41	00	365	D 1 4	6.4	7439-89-6

UN/NA NO. (IF KNOWN):
EPA PESTICIDE REGISTRATION NO.:

RAGE LOCATIONS AT SITE: INSIDE SURFACE PROCESSING BL
#63

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS.

SECTION D

ON NAME/TRADE NAME: STELOTOL
DOUS INGREDIENT
HEST CONCENTRATION: POLYTETRAFLUOROETHYLENE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
		1	1	30	30	30	00	365	E 1 4	6.3	9002-84-0

1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN):
EPA PESTICIDE REGISTRATION NO.:

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

ON NAME/TRADE NAME: SULFUR CORED WIRE
DOUS INGREDIENT
HEST CONCENTRATION: SULFUR

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
		1	1	21	21	30	00	365	R 1 4	6.3	7704-34-9

1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN):
EPA PESTICIDE REGISTRATION NO.:

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

ON NAME/TRADE NAME: SYNTHETIC SLAG
DOUS INGREDIENT
HEST CONCENTRATION: ALUMINUM OXIDE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
		1	1	31	40	51	00	365	R 1 4	9.0	1344-28-1

1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN):
EPA PESTICIDE REGISTRATION NO.:

RAGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

ION NAME/TRADE NAME: THINNER T-10
RDOUS INGREDIENT
GHEST CONCENTRATION: TOLUENE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
		2	2	10	10	11	00	365	D 1 4	3.2 6.3	108-88-3

1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

UN/NA NO. (IF KN): 1993
EPA PESTICIDE REGISTRATION NO.:

ORAGE LOCATIONS AT SITE: INSIDE SURFACE PROCESSING BL
#63 #64

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME/TRADE NAME: USED OIL

S INGREDIENT
HEST CONCENTRATION: PETROLEUM HYDROCARBONS

EHS 112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	2	2	20	21	00	31	365	D 1 4	4.5 6.4	64742-54-7
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 9189
										EPA PESTICIDE REGISTRATION NO.

AGE LOCATIONS AT SITE: INSIDE & OUTSIDE WASTE TRANS STATION MAINT AREAS MILL MELT SHOP DJJ BLD 12 #3 #19 #31 #34 #48

ON NAME/TRADE NAME: VANADIUM
DOUS INGREDIENT
HEST CONCENTRATION: VANADIUM

EHS 112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1	1	30	30	41	00	365	J 1 4	6.3	7440-62-2
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)
										EPA PESTICIDE REGISTRATION NO.

AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3

ON NAME/TRADE NAME: WASTE ABSORBENT PADS
DOUS INGREDIENT
HEST CONCENTRATION: PETROLEUM

EHS 112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1	1	21	21	00	31	365	D 1 4	4.5	
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)
										EPA PESTICIDE REGISTRATION NO.

RAGE LOCATIONS AT SITE: INSIDE & OUTSIDE WASTE TRANS STATION MAINT AREAS BLDGS #2 #3 #19 #31 #3

ION NAME/TRADE NAME: WASTE FLUE DUST
RDOUS INGREDIENT
HEST CONCENTRATION: FLUE DUST

EHS 112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1 - PURE 2 - MIXTURE	1	1	41	42	00	60	365	Q 1 4 R 1 4	6.3	
1 - NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)
										EPA PESTICIDE REGISTRATION NO.

ORAGE LOCATIONS AT SITE: INSIDE ICA BAGHOUSE S OF CAS IG AREA BLDG #17 RAIL CAR

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS.

SECTION D

ON NAME/TRADE NAME: WASTE PAINT BOOTH SOLIDS
DOUS INGREDIENT
HEST CONCENTRATION: WASTE PAINT

EHS ☐ 112(r)
1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1	1	20	20	00	30	365	D 1 4	4.5	

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

AGE LOCATIONS AT SITE: INSIDE SURFACE PROCESSING BL
163 WASTE TRANSFER STATION BLDG #19

ON NAME/TRADE NAME: WASTE WATER TREATMENT SOLIDS
DOUS INGREDIENT
HEST CONCENTRATION: KYANITE MINERAL

EHS ☐ 112(r)
1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1	1	30	30	00	51	365	R 1 4	9.0	

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

AGE LOCATIONS AT SITE: INSIDE WATER TREATMENT BLDG

ON NAME/TRADE NAME: WATER TREATMENT BIOCIDE
DOUS INGREDIENT
HEST CONCENTRATION: SODIUM HYPOCHLORITE

EHS ☐ 112(r)
1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
2	2	20	20	30	00	365	A 1 4	5.1 6.3	7681-52-9

UN/NA NO. (IF KNOWN): 1791

EPA PESTICIDE REGISTRATION NO.

RAGE LOCATIONS AT SITE: INSIDE & OUTSIDE WATER TREAT
T BLDGS #25 #26 #34

ON NAME/TRADE NAME: WATER TREATMENT BUFFER
RDOUS INGREDIENT
HEST CONCENTRATION: SODIUM BICARBONATE

EHS ☐ 112(r)
1 - PURE
2 - MIXTURE
1 - NEW
2 - NO LONGER REPORTABLE

PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE* (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
1	1	10	11	20	00	365	J 1 4	9.0	144-55-8

UN/NA NO. (IF KNO

EPA PESTICIDE REGISTRATION NO.

RAGE LOCATIONS AT SITE: INSIDE WATER TREATMENT BLDGS
5 #26

FORM
CHEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME/TRADE NAME: WATER TREATMENT COAGULANT
S INGREDIENT
HEST CONCENTRATION: AL CHLOROHYDRATE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
		2	2	20	20	30	00	365	A 1 4	6.3	12042-91-0

- PURE
- MIXTURE
- NEW
- NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

AGE LOCATIONS AT SITE: OUTSIDE WATER TREATMENT BLDG
5 #26

ON NAME/TRADE NAME: WATER TREATMENT COAGULANT
DOUS INGREDIENT
HEST CONCENTRATION: AL CHLOROHYDRATE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
		2	2	11	11	20	00	365	E 1 4	6.3	12042-91-0

- PURE
- MIXTURE
- NEW
- NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

AGE LOCATIONS AT SITE: INSIDE & OUTSIDE WATER TREAT
LT SHOP BLDGS #3 #25 #26

ON NAME/TRADE NAME: WATER TREATMENT CORROSION INHIBITO
DOUS INGREDIENT
HEST CONCENTRATION: SODIUM HYDROXIDE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
		2	2	11	11	20	00	365	E 1 4 0 1 4	8.0	1310-73-2

- PURE
- MIXTURE
- NEW
- NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

AGE LOCATIONS AT SITE: INSIDE & OUTSIDE WATER TREAT
T BLDGS #3 #25 #26 #34

ON NAME/TRADE NAME: WATER TREATMENT POLYMER
DOUS INGREDIENT
HEST CONCENTRATION: PETROLEUM DISTILLATE

EHS	112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
		2	2	11	11	21	00	365	E 1 4	6.3	

- P
- NEW
- NO LONGER REPORTABLE

UN/NA NO. (IF KNOWN)

EPA PESTICIDE REGISTRATION NO.

AGE LOCATIONS AT SITE: INSIDE & OUTSIDE WATER TREAT
T MELT SHOP BLDGS #3 #25 #26 #34

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

N NAME/TRADE NAME: WATER TREATMENT-BWT DP3
OUS INGREDIENT
IEST CONCENTRATION: SODIUM HYDROXIDE

HS 112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
PURE / MIXTURE	2	2	04	04	11	00	365	E 1 4	8.0 6.3	1310-73-2
NEW / NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN) 1760
AGE LOCATIONS AT SITE: INSIDE & OUTSIDE WATER TREAT MELT SHOP BLDGS #3 #25 #26										EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: WATER TREATMENT-BWT OS1
DOUS INGREDIENT
HEST CONCENTRATION: NONE AS PER 29CFR 1910.1200

HS 112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
- PURE - MIXTURE	2	2	04	04	10	00	365	E 1 4	9.0	
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)
AGE LOCATIONS AT SITE: INSIDE & OUTSIDE WATER TREAT MELT SHOP BLDGS #3 #25 #26										EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME: ZIRC WASH
DOUS INGREDIENT
HEST CONCENTRATION: ZIRCONIUM OXIDE

HS 112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
- PURE - MIXTURE	2	2	04	04	10	00	365	E 1 4	9.0	1314-23-4
- NEW - NO LONGER REPORTABLE										UN/NA NO. (IF KNOWN)
AGE LOCATIONS AT SITE: INSIDE MELT SHOP BLDG #3										EPA PESTICIDE REGISTRATION NO.

ON NAME/TRADE NAME:
DOUS INGREDIENT
HEST CONCENTRATION:

HS 112(r)	PHYSICAL STATE (USE TABLE I)	UNIT OF MEASURE (USE TABLE II)	AVG. AMT. CODE (USE TABLE III)	MAX. AMT. CODE (USE TABLE III)	AMT. IN CODE (USE TABLE III)	AMT. OUT CODE (USE TABLE III)	NUMBER OF DAYS ON SITE (3 DIGIT NO.)	STORAGE CODE (USE TABLES IV & V)	HAZARD CLASSES (USE TABLE VI)	CAS NO. (IF KNOWN)
- PURE 2 - MIXTURE										
- NEW 2 - NO LONGER REPORTABLE										UN/NA NO. (IF KNO
RAGE LOCATIONS AT SITE										EPA PESTICIDE REGISTRATION NO.

FORM
HEMICAL

2001 OREGON STATE FIRE MARSHAL
HAZARDOUS SUBSTANCE INFORMATION SURVEY

Facility ID Number
017689

CROSS OFF THE OLD OR INCORRECT INFORMATION AND TYPE OR PRINT CHANGES OR ADDITIONS IN THE [BRACKETED] AREAS

SECTION D

ME/TRADE NAME: [ ]
S INGREDIENT
HEST CONCENTRATION: [ ]

EHS [ ] 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE [ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ] [ ] [ ] [ ] [ ] [ ]	[ ][ ]	[ ] UN/NA NO. (IF KNOWN) [ ] EPA PESTICIDE REGISTRATION NO. [ ]

1 - NEW
2 - NO LONGER REPORTABLE

AGE LOCATIONS AT SITE

[ ]

ON NAME/TRADE NAME: [ ]
DOUS INGREDIENT
HEST CONCENTRATION: [ ]

EHS [ ] 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE [ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ] [ ] [ ] [ ] [ ] [ ]	[ ][ ]	[ ] UN/NA NO. (IF KNOWN) [ ] EPA PESTICIDE REGISTRATION NO. [ ]

1 - NEW
2 - NO LONGER REPORTABLE

RAGE LOCATIONS AT SITE

[ ]

ION NAME/TRADE NAME: [ ]
RDOUS INGREDIENT
GHEST CONCENTRATION: [ ]

EHS [ ] 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
1 - PURE 2 - MIXTURE [ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ] [ ] [ ] [ ] [ ] [ ]	[ ][ ]	[ ] UN/NA NO. (IF KNOWN) [ ] EPA PESTICIDE REGISTRATION NO. [ ]

1 - NEW
2 - NO LONGER REPORTABLE

RAGE LOCATIONS AT SITE

[ ]

ION NAME/TRADE NAME: [ ]
RDOUS INGREDIENT
GHEST CONCENTRATION: [ ]

EHS [ ] 112(r)	PHYSICAL STATE	UNIT OF MEASURE	AVG. AMT. CODE	MAX. AMT. CODE	AMT. IN CODE	AMT. OUT CODE	NUMBER OF DAYS ON SITE	STORAGE CODE	HAZARD CLASSES	CAS NO. (IF KNOWN)
	USE TABLE I	USE TABLE II	USE TABLE III	USE TABLE III	USE TABLE III	USE TABLE III	3 DIGIT NO.	USE TABLES IV & V	USE TABLE VI	
[ ] [ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ] [ ] [ ] [ ] [ ] [ ]	[ ][ ]	[ ] UN/NA NO. (IF KNOWN) [ ] EPA PESTICIDE REGISTRATION NO. [ ]

1 - NEW
2 - NO LONGER REPORTABLE

RAGE LOCATIONS AT SITE

[ ]

Appendix E

Documents Pertaining to Historical Transformer/ Capacitor Cleanup and Removal Activities

OSM (1982a)

REGON STEEL MILL

DATE: February 12, 1982

TO: R. Bird

FROM: T. McCue

SUBJECT: PCB SPILL

At 8:00 a.m., February 11, 1982, John Bowers told me of a PCB spill in the Melt Shop. Upon inspection, I found three high voltage capacitors sitting on a pallet between #2 furnace and the slag pit which were punctured by a pickax and were dripping oil onto the concrete floor. One of the capacitors was labeled PCB containing and the other two had evidence that the labels were removed.

Clean-up operations were begun immediately and supervised by John Bowers. The capacitors were placed in 30-gallon barrels which were then placed in 55-gallon barrels. All spilled oil was absorbed by grease sweep and the spill area was washed with solvent which also was absorbed in the same manner. All clean-up materials were placed into the 30-gallon barrels and sealed. The void around the 30-gallon barrels was filled with grease sweep and the 55-gallon barrel was then sealed. Total volume of capacitors and clean-up materials was contained in two 55-gallon barrels which will need to be labeled, dated and placed inside the temporary storage building at the land fill.

DEQ was notified at 1:00 p.m. No further action is required at this time unless DEQ requests a test of the spill area to ensure that it contains less than 500 ppm PCB.

The cost of ultimate disposal will be from $1,000 to $1,500. The cost of disposal of nonleaking capacitors would have been $50 to $150.

Thomas C McCue

Tom McCue

CC: L. Hollenbeck
J. Longbine
J. Franklin

OSM (1982b)

Tom

OREGON STEEL MILLS
P.O. BOX 2760 • PORTLAND, OREGON 97208
TELEPHONE (503) 286-9651
TWX: 910 464 1549

November 17, 1982

Mr. Thomas R. Bispham
Manager, Northwest Region
DEQ
P. O. Box 1760
Portland, Oregon 97208

Dear Tom:

Last Tuesday, November 9, 1982, I reported a PCB spill of less than one gallon of PCB fluid to the Hazardous Waste Division of the Northwest Region. We had four 7960 volt capacitors burn out. Three had ruptured cases but only two were leaking. Most of the PCB fluid was contained on a concrete pad, but there was evidence of oil on the ground in a spray pattern 5 to 6 feet away from the capacitor bank. Clean up was initiated immediately and was completed within two hours.

All detectable oil was cleaned up by absorbing with grease-sweep, rinsing with solvent and absorbing the solvent with fresh grease-sweep. All clean-up materials including the top one inch of soil in the oil spray area were placed in a single D.O.T. 17 barrel.

The damaged capacitors were not removed from the capacitor bank until Monday, November 15, 1982, since a total power outage was required. The four capacitors were placed in two D.O.T. 17 barrels, labeled and placed along with the clean-up material into the temporary storage building to await disposal.

We have followed the regulations faithfully. If you need further information, please call me at 286-9651, Ext. 329.

Sincerely,

Thomas C. McCue

Thomas C. McCue
Environmental Manager

TCM/rmz

OSM (1985b)

OREGON STEEL MILLS
P.O. BOX 2780 • PORTLAND, OREGON 97208
TELEPHONE (503) 286-9651
TWX: 910 464 1549

October 31, 1985

Ms. Janet A. Gillaspie
Regional Manager
Northwest Region, DEQ
P.O. Box 1760
Portland, OR 97207

Dear Janet:

As you know, we reported a potential PCB spill to you on Friday, October 25. We can now confirm that a PCB spill has occurred based on analysis of oil in the transformer. The transformer is an oil filled 2500 KVA, formerly used to supply power to the oxide plant in the Direct Reduction Division (DRD) of Gilmore Steel Corporation. It was damaged during the demolition of the DRD plant and has leaked oil onto the ground. At your request we have roped off the spill site and placed warning signs identifying the area.

Soil samples were taken in the spill area and analyzed on an expedited basis. All samples were found to contain Arochlor 1242. The oil from the transformer had 530 ppm PCB. Six of the soil samples were below 2 ppm and the remaining six soil samples contained from 2.4 ppm to 7.9 ppm PCB. We will be conducting further soil sampling because we anticipate higher concentrations based on the oil analysis.

We have had an outside company remove the remaining oil from the transformer and place the oil in sealed drums. A contract will be placed within a few days for the flushing and disposal of the transformer carcass.

As new information becomes available, we will be further updating the DEQ by telephone and by letter.

Sincerely,

Tom McCue
Environmental Manager

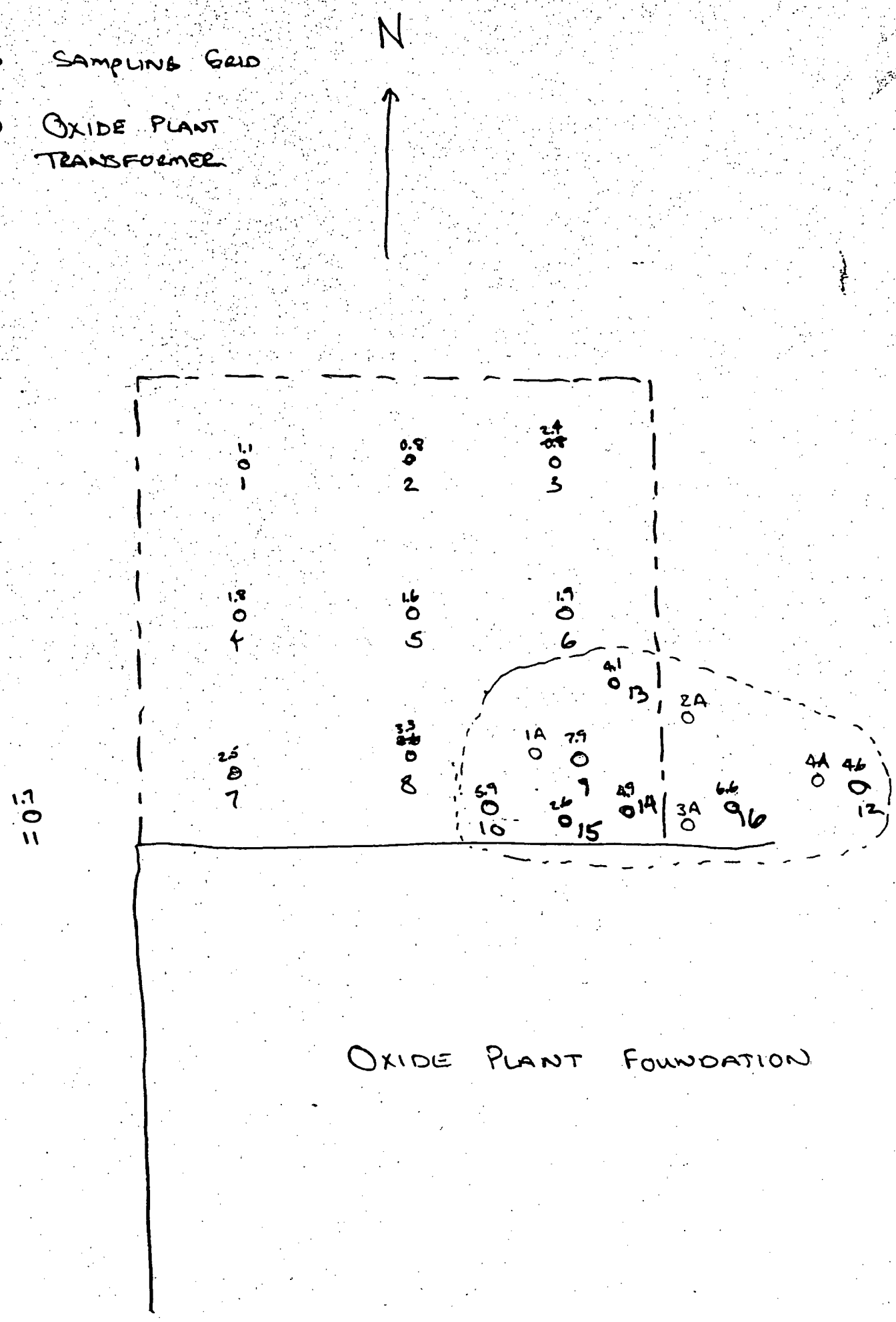
10-25-85
WM Case

An oil filled Transformer, formerly used to supply power to the Oxide Plant in the Direct Reduction Division of Gilmore Steel Corporation, was damaged and has leaked oil onto the ground. It is not believed to be a P.C.B. filled Transformer but is being treated as if it does contain P.C.B. oil. Oil samples are out for analysis.

The location of the oil spill has been indentified. Soil samples have been scheduled to be taken and will be delivered to a Laboratory Saturday. If the oil samples or the soil samples are found to contain P.C.B.'s, a clean-up operation will start immediately. The oil in the Transformer will be removed and disposed of in compliance with 40 CFR 761, if found to contain P.C.B.'s. The Transformer carcasswill be flushed with solvent and landfilled according to 40 CFR 761, if contaminated. If no P.C.B.'s are found or the P.C.B. concentration is below 500 ppm, the Transformer will be repaired and sold.

PCB SAMPLING GRID

DRD OXIDE PLANT TRANSFORMER



COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

October 28, 1985
Log #H851025-G
P.O. # 40300

Oregon Steel Mills
P.O1 Box 2760
Portland, OR 97208
Attention: Tom McCue

Analysis Requested: Polychlorinated Biphenyls

Sample Received: October 25, 1985

Sample ID: Transformer Oil Analysis 10-25-85

Sample Analyzed on a 4-Hour Rush Basis

	RESULTS	AROCLOR
POLYCHLORINATED BIPHENYLS	530 mg/kg	1242

Sincerely,

Susan M. Coffey

Susan M. Coffey,
President

SMC/db

This report is for the sole and exclusive use of the above client. Samples are retained for a maximum of 15 days from the date of this letter.

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

October 30, 1985
Log #A851038-A
PO#: 40300

Oregon Steel Mills
P.O. Box 2760
Portland, Oregon 97208

Attention: Tom McCue

Analysis Requested: Polychlorinated Biphenyls (PCB)

Sample Description: Soil

SAMPLE ID	mg/kg PCB	MAIN ARCHLOR
Sample #1	1.1	1242
Sample #2	0.8	1242
Sample #2 (Duplicate)	0.8	1242
Sample #3	2.4	1242
Sample #4	1.8	1242
Sample #5	1.6	1242
Sample #6	1.9	1242
Sample #7	2.5	1242
Sample #7 (Duplicate)	2.6	1242
Sample #8	3.3	1242
Sample #9	7.9	1242
Sample #10	5.9	1242
Sample #11	1.7	1242
Sample #12	4.6	1242

Sincerely,
Susan M. Coffey
Susan M. Coffey,
President

SMC/gs

This report is for the sole and exclusive use of the above client. Samples are retained a maximum of 15 days from the date of this letter.

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

November 22, 1985
Log #H851120-C

Oregon Steel Mills
P.O. Box 2760
Portland, Oregon 97208

Attention: Tom McCue

Analysis Requested: Polychlorinated Biphenyls

SAMPLE ID	mg/kg PCB	MAIN AROCHLOR
Sample #13	4.1	1242
Sample #14	4.9	1242
Sample #15	2.6	1242
Sample #16	6.6	1242
Sample #16 Duplicate	6.3	1242

Sincerely,

Susan M. Coffey

Susan M. Coffey,
President

SMC/gs

This report is for the sole and exclusive use of the above client.
Samples are retained a maximum of 15 days from the date of this letter.

OSM (1987)

[illegible] FILE [illegible]

FROM: R. C. [illegible]

SUBJECT: - RUPTURE OF PCB FILLED CAPACITOR IN SUBSTATION

Approximately at 9:00 AM This date a capacitor in the West [illegible] allowing some fluid to spill on the concrete foundation of this cap. bank.

I talked to both Ed Woods of DEQ & Willie Olandria of EPA alerting them of the incident.

We used grease sweep to on the concrete to absorb the fluid up & put the bad capacitor in a "D.O.T. 17-C" 55 gal drum with the grease sweep.

We then washed down with solvent & rags all the surfaces that the capacitor fluid got on & wiped these surfaces dry. The solvent & rags were also put into the drum. None of the fluid got on any of the ground in the substation. The surfaces that the fluid got on be cl[illegible] up to [illegible] on [illegible]

We have 30 days that we can store & get rid of this drum. The drum was sealed & marked & then transported to our PCB temporary storage building.

I talked to Joyce Johnson of chem securities & she gave me an approximate price of: from here to Kettleman Hills $130 $1.55/16 + $175.00 to transport to an incinerator. Total cost would be approximately $460.00 for 1 drum weighing 100 lbs. Talked also to G.E. & they will get price tomorrow for me. The price for disposal is $1,128.00 from GE - They handle all paper work & take full responsibility. Requisition was issued to GE to do. See attached. Material was removed 4-14-87 from plant by GE.

OSM (1989)

Item (1).

From 761.125 (c) (5) (i) - (viii)

(i). The original source of contamination to the area came from an accumulation of leaks apparently over 21 years. The last spill, occurring in April 1987, showed no signs of contaminating the soil. See report dated April 1, 1987.

(ii). A capacitor failed in March 1989, but did not leak ~~on the slab~~. The capacitor bank stability was questioned at the time and it was decided to change out two (2) capacitor banks. Soil samples were taken and found to be positive. (See results from Coffey Lab's report dated 4-10-89).

(iii). Clean up of the soil began by removing soil from around the concrete slabs and samples retaken. (See Coffey Lab report dated May 3, 1989). The results indicated that all areas were under 50 PPM in the restricted, outdoors electrical substation.

(iv). The spill location is in the main sub-station of the plant, located between the Engineering offices and the Melt Shop locker room. The area is fenced, locked, graveled, with concrete pads for the electrical equipment to sit on.

(v). The spill that occurred in April 1987 is the last reported in the sub-station area; at which time the concrete pads were wiped . I cannot find any information on the wipe tests that may have been conducted. The preclean up sampling data that was conducted around the concrete pads, at the capacitor banks are attached to the Coffey Lab reports. The spill boundaries were established by taking soil samples at 6" and 12" distances from the slab and surrounding the slab at the points indicated.

(vi). The concrete surfaces had been cleaned earlier, but not at this time. (See Report of Spill in 1987, R.C. Bird to file).

(vii). Soil was removed to a depth of approximately 1-1/2 feet outside the perimeter of the concrete slabs. The amount of soil and rock that was removed was 11 steel drums, 35 gallon and 35 steel Drums 55 gallon.

(viii). See data.

Item (1)

From: R. C. Bird
To: File
Subject: PCB Clean-up - Capacitor Bank Area.

Preceding the change of the capacitors in the ~~Capacitor~~ Main sub-station, soil samples were taken. The results proved PCB contamination. There also was a stain on ~~the~~ one of the concrete slabs. ~~and though~~ The concrete slabs were both bermed with absorbant material and the berms washed ~~numerous~~ and wiped numerous times with (Name supplied later). solvent. After each washing, the area was wiped with "wipe-all" pads.

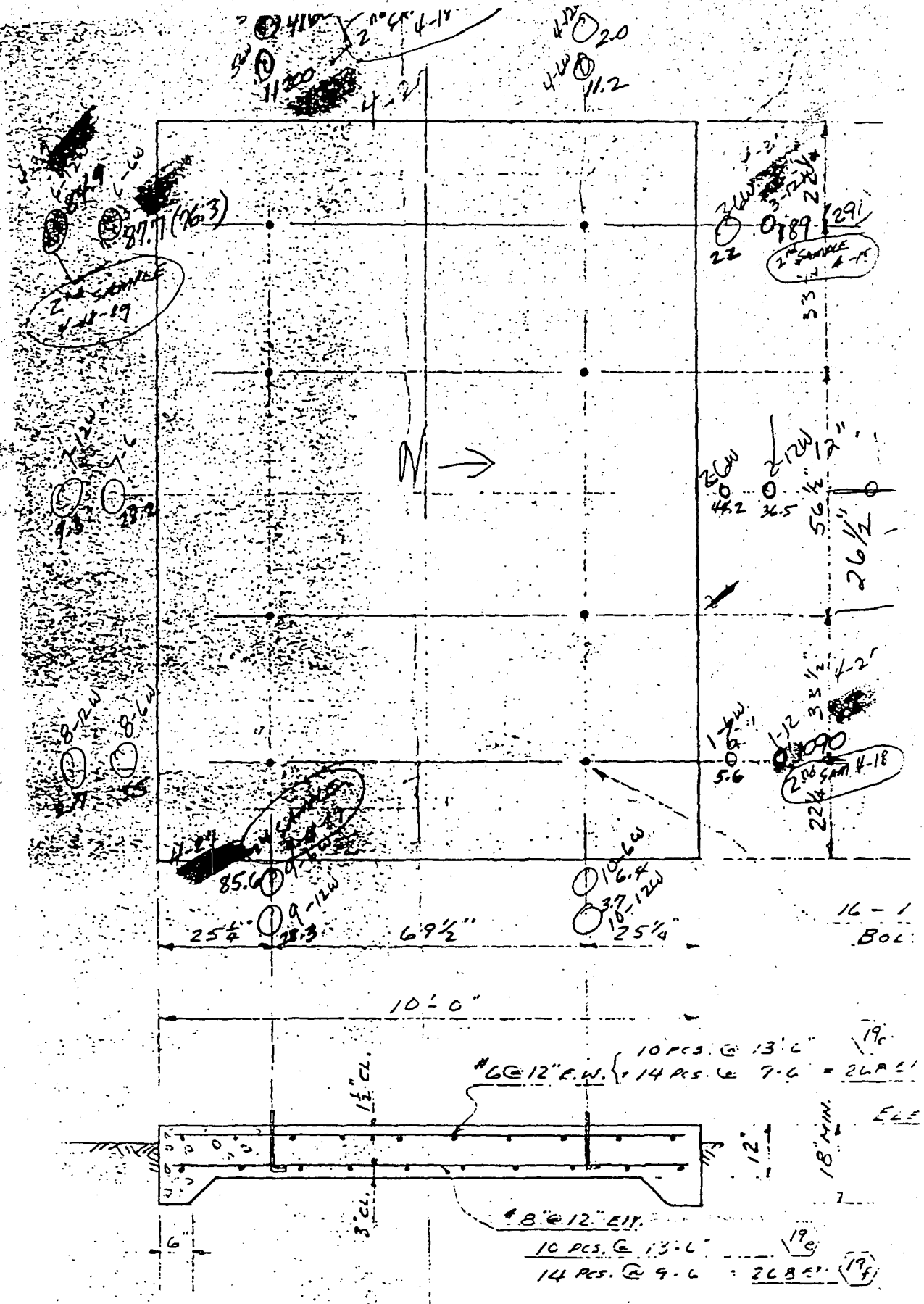
The soil around the pads was removed to approximately 1 foot in depth. Samples were again taken and the areas still high in PCB's had more material Removed, (Approximately another foot). final Samples were taken and found acceptable. New material was then replaced into the excavated area.

All the material was placed in steel drums and removed to secure sight and then disposed of.

In October 1989, the capacitors were uplaced with new capacitors and the old ones removed from the sight in sealed steel drums and taken for disposal by Apotus.

R. C. Bird.

ALL HOLES
THIS DISTANCE
FROM SLAB
4'3"
6"
6"
2'3"
N



SLAB (6") - 3000 psi ± 28 days

APPROX. 6 YDS. - REINF. STL. ASTM A6

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

April 10, 1989
Log #H890328-Y40
PO# 267

egon Steel Mills
.O. Box 2760
ortland, OR 97208
ttention: Richard Bird

Results back 4/27/89
Acceptable to below
50 PPM in enclosed, fenced
Substation.

amples Collected: 03/28/89 0900 hrs.
amples Received: 03/28/89

nalysis Requested: Polychlorinated Biphenyls in Soil

AMPLE ID	PCB (mg/kg)		AROCLOR
1-6E	1.4	4/27	1248/1242/1260
1-6E (DUPLICATE)	1.3		1248/1242/1260
2-6E	264	.9	1242
3-6E	10.9		1248/1242
4-6E	5.9		1248/1242
5-6E	5.1		1248/1242
6-6E	3.9		1248/1242
7-6E	2.6		1248/1242
8-6E	6.4		1248/1242
9-6E	1.0		1248/1242
10-6E	1.1		1248/1242
1-12E	1.5		1248/1242/1260
2-12E	146	2.5	1242
3-12E	11.0		1248/1242
4-12E	4.1		1248/1242
5-12E	5.6		1248/1242
6-12E	1.7		1248/1242
6-12E (DUPLICATE)	1.9		1248/1242
7-12E	0.9		1248/1242
8-12E	16.6		1248/1242
9-12E	2.1		1248/1242
10-12E	2.8		1248/1242
1-6W	5.6		1248/1242
2-6W	44.2		1248/1242
3-6W	22.0		1248/1242
4-6W	11.2		1248/1242
5-6W	11,200	12	1242

Detection Limit: 0.1 mg/kg

ysis Date: 04/05-04/08/89

REMOVE ADDITIONAL MATERIAL
& RETEST - 4/14/89

Results expressed as mg/kg unless otherwise noted.

Analysis by capillary GC/ECD, and comparison with standard solutions

COFFEY LABORATORIES, INC.
4914 N.E. 122nd Ave.
Portland, OR 97230
Phone: (503) 254-1794

Log #H890328-Y40

Oregon Steel Mills
Page 2

Samples Collected: 03/28/89 0900 hrs.
Samples Received: 03/28/89

Analysis Requested: Polychlorinated Biphenyls in Soil

SAMPLE ID	PCB (mg/kg)	4/27	AROCLOR
6-6W	87.7	16	1248
6-6W (DUPLICATE)	76.3		1248
7-6W	26.2		1248
8-6W	3.5		1248
9-6W	85.6	16	1248/1242
10-6W	6.4		1248
1-12W	1,090	.7	1242
2-12W	36.5		1248/1242
3-12W	189	.8	1242
3-12W (DUPLICATE)	291		1242
4-12W	2.0		1242
5-12W	4,160	.9	1242
6-12W	84.9	12	1248
7-12W	9.3		1248
8-12W	2.7		1248
9-12W	28.3		1248
10-12W	3.7		1248/1242

Detection Limit: 0.1 mg/kg

Analysis Date: 04/05-04/08/89

Results expressed as mg/kg unless otherwise noted.

Analysis by capillary GC/ECD, and comparison with standard solutions

Sincerely,

Victor A. Perry,
Quality Assurance

Sincerely,

Susan M. Coffey,
President

C/lws

This report is for the sole and exclusive use of the client. Samples are retained a maximum of 15 days from the report date, or until the maximum holding time expires.

COFFEY LABORATORIES, INC.
12423 N.E. WHITAKER WAY
PORTLAND, OR 97230
PHONE: (503) 254-1794

May 3, 1989
Log #H890418-AP9
P.O. #267

Oregon Steel Mills
PO Box 2760
Portland, OR. 97208
Attention: Richard Bird

Samples Collected: 04/18/89
Samples Received: 04/18/89

Analysis Requested: Polychlorinated Biphenyls

SAMPLE ID	PCB (mg/kg)	AROCLOR
1-12W	0.7	1242
3-12W	0.8	1242
5-6W	12	1242
[illegible]2W	0.9	1242
[illegible]6W	16	1248
6-12W	12	1248
9-6W	16	1248/1260
2-6E	0.9	1242
2-12E	2.5	1248/1260

Results expressed as mg/kg unless otherwise noted.

Analysis Date: 04/27/89

Analyzed by GC/ECD and comparison with standard solutions.

Sincerely,

Victor A. Perry,
Quality Assurance

Sincerely,

Susan M. Coffey,
President

[illegible]C/daj

This report is for the sole and exclusive use of the above client. Samples are retained a maximum of 15 days from report date, or until the maximum holding time expires.

OREGON STEEL MILLS
14400 N. RIVERGATE BLVD.
P. O. BOX 2760
PORTLAND, OREGON 97208

PURCHASE ORDER NUMBER: 72254

OUR ORDER NUMBER: POEQ947

ENGINEERING SERVICES REPORT

PCB CAPACITOR REMOVAL AND REPLACEMENT

PREPARED BY: JOHN KEEL

OCTOBER 25, 1989

WESTINGHOUSE ELECTRIC CORPORATION
ENGINEERING AND INSTRUMENTATION SERVICES DIVISION
4160 SE INTERNATIONAL WAY, SUITE D104
PORTLAND, OREGON 97222

503-659-5900

PURPOSE

PCB capacitor removal and replacement.

PERSON(S) CONTACTED

John Siekas, E.E.

ACTION TAKEN

This report covers our services beginning the week of October 9, 1989 at your main substation. After de-energizing and grounding the existing capacitor banks in cooperation with your personnel, we established a containment area to work in. By establishing a seperate plywood/plastic film floor, we are able to ensure no contamination occurs due to our activities. The existing racks were assembled as six insulated units, to allow two capacitors in series for each element. We removed these six sections per bank individually and placed the capacitor units into "cap-pack" shipping containers. The remaining frame works were wiped down with solvent and left at the mill site.

Adaptor frame works were constructed of galvanized iron I-beams to attach the new banks to the existing structure.

The new capacitors are much more compact and only two banks replace the six removed. After installation of the new banks, bus work was fabricated to connect to existing switchgear.

We replaced the existing current transformers with new potential transformers and extended the existing wiring to the new units. We removed four existing current operated relays and installed four new voltage operated relays.

After installation was complete, we verified that removing one fuse causes an alarm for that bank. Loss of more fuses causes a breaker trip.

We encountered difficulty with Bank Two. The existing wiring was completely disconnected in the top of your control cabinet, rolled up and taped. That bank had been operating with no protection for some time. Also, these were secondary current transformer leads, open circuited.

After your people connected these leads, this bank's relaying also operated normally.

All capacitors and job created PCB materials have been removed from your site and are enroute to the destruction facility. Certificates of destruction will be forwarded to you when created.

OSM (1991)

Item (5) Transformer "N" Sub 8D
761.125 (b) (3) (i) - (vii)

(i) The source of the spill is a 1000 KVA Standard Transformer, serial No. PGD-0859.

(ii). The spill was noted during the inspection of November 7, 1990

(iii). Retesting of the oil was done on March 8, 1991 by Westinghouse and 84 PPM PCB was detected. The concrete pad was double wiped. At the same time the oil was sampled and a standard wipe test taken. The clean-up was completed on March 13, 1991.

(iv). The spill was located in a locked, fenced, covered outdoor substation with concrete pads and gravel. The substation is located at the S.W. corner of the Rolling Mill building.

(v). The precleanup sampling that was conducted, was to test the fluid in the transformer and at the same time the area of the spill was cleaned, (double wiped), and a standard wipe test was taken.

(vi). The solid surface cleaned was concrete and was cleaned by double washing with solvent (mixture of mineral spirits and hexane), wiping with rags and final cleaning with absorbent material between and after washing and wiping. Results of the final wipe test show 1 PPM on the slab. (See attached Westinghouse Report). The materials used to clean up the spill were placed in steel drums, placed in a locked secure area and are waiting for disposal.

(vii). No soil excavation was required.

(viii). I certify that the clean-up of the area was conducted in accordance with Section 761.125 (b)(3)(i) - (vii) and that the information contained in this statement is true to best of my knowledge.

Jerry O. Richartz

Manager, Energy & Environment

Westinghouse
Electric Corporation

Engineering Services

4160 SE International Way
Suite D104
Portland OR 97222
(503) 659 5900
(503) 659 9059 FAX

March 21, 1991

Oregon Steel Mills
14400 N. Rivergate Blvd.
P.O. Box 2760
Portland, OR 97206

Attention: John Siekas

Subject: Recent PCB Sample Testing & Cleanup

Reference: Your Purchase Order #92794 (Westinghouse Job # SEER200)

Dear: John

On Wednesday March 13,1991 Westinghouse completed the work as outlined in our March 8, 1991 letter. Per your direction and inputs from Jerry Richards we have performed the following items:

1. Obtained 2 PCB in oil samples at the small outdoor subs at the East side of the Melt Shop and the West side of the rolling mill i.e. S/N PGD-0859 & 0868. The test results indicate contamination levels of 84 and 80 PPM respectfully. The selling price for the lab work is $80 (24 hour premium turn-around).

2. Obtained 18 PCB in oil samples. There were 17 in the main yard with the highest reading for any of the transformers at 19 PPM. The other sample was obtained from the transformer at the Southwest corner of the rolling mill and the level was 720,000 PPM. The selling price for the lab work is $720 (24 hour premium turn-around).

3. Surface wipe samples from the concrete pads were obtained at locations PGD 0859,PGD 0868 and PGD 0877 as well as a solid sample of the surface debris on the pad at location PGD 0868. The only area of interest would at the pad for transformer S/N PGD 0877 where the surface contamination is 400 uG/100 CM. The selling price for the lab work is $495 (24 hour premium turn-around).

4. Additional oil sample per direction of Jerry Richardz from an out of service pole mount transformer that was located within a 55 gallon drum in the rolling mill. Selling price for the lab work is $40 (24 hour premium turn-around).

5. Finally, on 3-15-91 Jerry Richardz requested that we take a oil sample from the outdoor sub transformer (S/N 290861) adjacent to the current liquid oxygen storage. Also we took a sample from both the tap and transformer (S/N 6534053) for the ladle pre-heat operation. Selling price for this lab work is $120.

6. In addition, you requested that we furnish you with all appropriate PCB labels for all equipment tested the for placement on the specific sub-stations. The selling price for these items is $135.

Lab samples total selling price is = $1,590

In addition to obtaining the PCB samples, you also directed us to do a cleanup on the transformer drain valves, level gauges, tap changers and concrete pads in the area of the drain valves. The actual transformers involved were as follows:

Item	Location	Identification
1	Surface Processing	Sub 8C, 750KVA S/N 3411703
2.	Melt Shop	Sub 8E, 1,000KVA S/N PGD0860
3.	Plate Mill	Sub 8D 1,000KVA S/N PGD0859
4.	Strip Mill	Sub 4E 1,000KVA S/N PGD0877
5.	Plate Mill	Sub 4B 1,000KVA S/N 17050
6.	North Mill	Sub 4D 1,000KVA S/N H-884902

The selling price for all the labor to obtain the sample kits, obtain the oil samples, deliver the oil samples for analysis, clean the transformers and place the various PCB labels is based on 30 hours @ $78/ hours = $2,340

Total selling price will be $3,930
John, we appreciate the opportunity to be of service to you on this project and look forward to working with you on additional projects in the near future.

Respectfully

Bob Thacker
Sales Engineer
Portland Engineering Service
Westinghouse Electric Corp.

c.c. Jerry Richardz/Oregon Steel Mills

Hart Crowser (1991)

PCB Transformers and PCB-Contaminated Transformers

Oregon Steel Mills
14400 N. Rivergate Blvd.
Portland, OR 97203-6612

EPA ID No. ORD009106055

PCB Transformers in Service

Container Number and Type	Transformer Designation	Serial No.	Location	Make/Manufacturer	KVA	Weight (kg)	Weight (lb)	Fluid Vol. (gal.)	PCB Type	Notes
Surface Processing	M	3411703	Surface Processing	Westinghouse	750	2050	4520	348	Inerteen	Leaking
Baghouse MCC	I	17254	Dust Collector	ITE	750	1699	3745	285	Askarel	Leaking
Melt MCC1A	Z	17049	Melt Shop Electric Room	ITE	1000	2086	4600	350	Askarel	
Melt MCC1-B	Y	17052	Melt Shop Electric Room	ITE	1000	2086	4600	350	Askarel	
Strip Mill MCC 4-E	S	PGD-0877	Substation 4E, Strip Mill Motor Room	Standard	1000	1937	4271	325	Askarel	
Plate Mill MCC 4B	Q	17050	Between Plate Mill and Shipping	ITE	1000	2086	4600	350	Askarel	
Plate Mill MCC 4D	R	H884902	Between Shipping & North Mill Bldg.	General Electric	1000	918	2024	154	Askarel	
Plate Mill MCC 4C	O	17053	Plate Mill Motor Room	ITE	3750	5126	11302	860	Askarel	
Plate Mill MCC 4A	P	17051	Plate Mill Motor Room	ITE	1000	2086	4600	350	Askarel	
Water Treat. MCC 7A	H (JJ)	17253		ITE	1500	2563	5651	430	Askarel	Spare

PCB-Contaminated Transformers

West End of Plate Mill	N	PGD-0859	Substation 8D, SW corner of Rolling Mill Bldg	Standard	1000		7430	325		Leaking; PCB contaminated - 84 ppm
	U	PGD-0868	Substation 8E, NW corner of Melt Shop	Standard	1000		7430	325		Leaking; PCB contaminated - 80 ppm
	J	290861	Dust Collector	Westinghouse	5000		30500	1070		

PCB-Contaminated Transformers - Old or Retrofilled

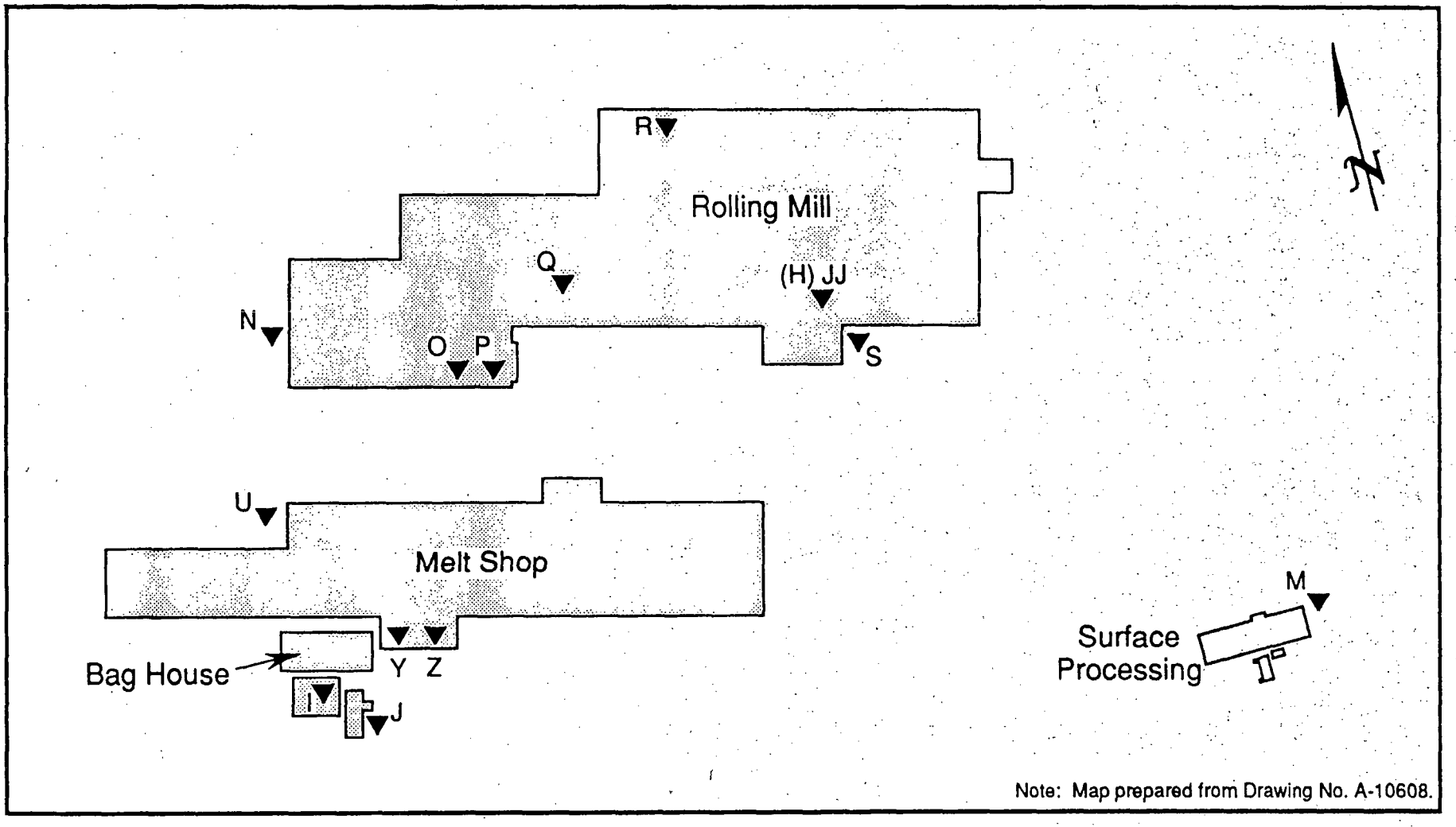
Main Substation	B	RJB-40431		Westinghouse	40000		215100	9288		Gone; decon. by ENSR 8/90; no leaks; 19 ppm in oil
Main Substation	C	20329-1		FPE	30000		127350	4447		Gone
#1 Vault	V	6534053		Lectromelt	33333			4303		Retrofilled; leaking and cleaned up; 80 ppm

Notes: Inerteen 5.89 kg/gal; density = 1.556
Askarel 5.96 kg/gal; density = 1.575

1 Liter = 0.2642 gallon
1 kg = 2.205 lb

PCB Transformer Locations

Oregon Steel Mills



Legend:

P▼ Transformer and Letter Designation

0 100 200

Approximate Scale in Feet

HARTCROWSER

J-5126 *5/91*

Figure 1

Westinghouse (1991)

Westinghouse
Electric Corporation

Engineering Services

4160 SE International Way
Suite D104
Portland OR 97222
503) 659 5900
(503) 659 9059 FAX

April 2, 1991

Oregon Steel Mills
14400 N. Rivergate Blvd.
P.O. Box 2760
Portland, Oregon 97206

Attention: Jerry Richards

Subject: Recent Cleanup Of Two Transformer Locations

Reference: 1. Oregon Steel Mills Purchase Order #92794
2. Westinghouse Job #SEER208
3. Letter To Your Dated 3-28-98 On PCB Procedures

Dear Jerry:

On March 25 & 26 we performed on-site cleanup and PCB sample testing at the following locations at your facility.

1. Outdoor Substation Adjacent To Present Oxygen Storage Facility Transformer S/N 290861

   Performed cleanup of two areas on the mounting pad and attaching cable assemblies and subsequently obtained surface wipe samples all in accordance with the procedure in my 3-28-91 letter to you.

   The test results indicate a PCB level of only 1 uG/100 CM^2 at the two surface locations which were in line with the two transformer valves and approximately 7" from the edge of the transformer pad.

   Also, we obtained a oil sample from the transformer oil tank on the top of the transformer and it matched the oil sample we obtained earlier from the drain valve at the main tank i.e. 150PPM

   In addition we took three (3) soil samples at distances from 8" to 23" out from the transformer pad and in line with the drain valves and at 7" and 9" greater than the width of the pad. These samples were obtained after the top 1-2" of oil saturated soil was removed and put into a hazardous waste container. The three results were 2.6, 6.8 and 15PPM.

2. Inside Transformer At Ladle Preheat Facility
Transformer S/N 6534053

Performed cleanup of the whole floor area surrounding the transformer at this location and subsequently obtained oil samples all in accordance with my 3-28-91 letter to you.

The test results indicate a PCB level of only 1 ug/100CM^2 at the six locations which were obtained from the surface immediately in front of the two valves and the area on the concrete immediately beneath the oil heat exchanger inlet and outlet connections on both sides of the transformer

Jerry, in addition we obtained PCB wipe samples at the outside substation At Plate Processing Facility Transformer S/N 3411703. THe cleaning and samples were all done in accordance with my 3-28-91 letter to you.

The test results indicate a PCB level of less than 1 ug/100CM at the two locations at the edges of the concrete pad approximately 1/2 way between the primary disconnect switch and the transformer and two edges of the pad width.

I appreciate this opportunity to be of service to you and hope to work closely with you on future project.

Our billing to you for this work will consist of:

1. Labor - (b) hour @ (b) (4) /hour	= $	(b) (4)
2. Materials	= $	
3. Oil Samples	= $	
TOTAL	= $	

NOTE: Oil samples consisted of 10 surface wipes, 3 soil and 1 oil sample all with 24 hour turnaround requested.

Respectfully

Bob Thacker
Sales Engineer
Portland Engineering Service
Westinghouse Electric Corp.

OREGON ANALYTICAL LABORATORY
14655 S. W. OLD SCHOLLS FERRY RD
BEAVERTON, OREGON 97007
TELEPHONE: (503) 644-5300

PCB SOIL TEST REPORT

WESTINGHOUSE
4160 SE INTERNATIONAL WAY
SUITE D104
PORTLAND, OR 97222
BOB THACKER (FAX 659-9059) ✓
659-5900

DATE RECEIVED: 91-03-26
REVIEWED BY: DAVE PLATH
PM CHEMIST
REPORT DATE: 91-03-28

OAL SAMPLE NO. 60-0185-	TRANSFORMER NO. OR SAMPLE IDENTIFICATION	AROCLOR TYPE	PCB UG/G
55670	#3 290861	1260/54	2.6
55671	#4 290861	1260	15.
55672	#5 290861	1260	6.8

OREGON ANALYTICAL LABORATORY
14655 S. W. OLD SCHOLLS FERRY RD
BEAVERTON, OREGON 97007
TELEPHONE: (503) 644-5300

PCB SWAB TEST REPORT

WESTINGHOUSE
[illegible] SE INTERNATIONAL WAY
SUITE D104
PORTLAND, OR 97222
BOB THACKER(FAX 659-9059) ✓
659-5900

DATE RECEIVED: 91-03-26
REVIEWED BY: DAVE PLATH
DM
CHEMIST
REPORT DATE: 91-03-26

OAL SAMPLE NO. 60-0185-	TRANSFORMER NO. OR SAMPLE IDENTIFICATION	AROCLOR TYPE	PCB UG/100CM2
55632	290861 #1	1260	1.
55633	290861 #2	1260	1.
55634	3411703 PAD #1	1260	<1.
55635	3411703 PAD #2	1260	<1.

OREGON ANALYTICAL LABORATORY
14655 S. W. OLD SCHOLLS FERRY RD
BEAVERTON, OREGON 97007
TELEPHONE: (503) 644-5300

PCB SWAB TEST REPORT

WESTINGHOUSE
4160 SE INTERNATIONAL WAY
SUITE D104
PORTLAND, OR 97222
BOB THACKER(FAX 659-9059) ✓
659-5900

DATE RECEIVED: 91-03-27
REVIEWED BY: DAVE PLATH
DM CHEMIST
REPORT DATE: 91-03-27

SAMPLE NO. 60-0185-	OR SAMPLE IDENTIFICATION	TYPE	UG/100CM2
55673	6534053 #1	1260/54/42	<1.
55674	6534053 #2	----	ND
55675	6534053 #3	1260/54/42	<1.
55676	6534053 #4	1260/54/42	<1.
55677	6534053 #5	1260/54/42	1.
55678	6534053#6	1260/54/42	1.

ND = NONE DETECTED (<1.0 UG/100CM2)

OREGON ANALYTICAL LABORATORY
14655 S. W. OLD SCHOLLS FERRY RD
BEAVERTON, OREGON 97007
TELEPHONE: (503) 644-5300

PCB OIL TEST REPORT

WESTINGHOUSE
4160 SE INTERNATIONAL WAY
SUITE D104
PORTLAND, OR 97222
BOB THACKER(FAX 659-9059) ✓
659-5900

DATE RECEIVED: 91-03-26
REVIEWED BY: DAVE PLATH
DM CHEMIST
REPORT DATE: 91-03-26

OAL 60-0185-	TRANSFORMER NO. IDENTIFICATION	AROCLOR TYPE	PCB UG/G	EPA CLASSIF.
55636	290861 (CONS)	1260	150.	PCB-CONTAM

Appendix F

Phase I Data Tables and Summary Figures

Table 1. Sediment data

Chemical	Units	RB1 10/10/00 SD0001 0 - 10 cm	RB2 10/10/00 SD0002 0 - 10 cm	RB3 10/10/00 SD0003 0 - 10 cm	RB4a 10/10/00 SD0004 0 - 10 cm	RB4b 10/10/00 SD0014 0 - 30 cm	RB5 10/10/00 SD0005 0 - 10 cm
Metals							
Antimony	mg/kg	10.2 *U*	10.3 *U*	10.4 *U*	10.8 *U*	11.1 *U*	10.3 *U*
Arsenic	mg/kg	2.2	2.2	4.6	2.0	2.8	6.8
Beryllium	mg/kg	1.0 *U*	1.0 *U*	1.0 *U*	1.1 *U*	1.1 *U*	1.0 *U*
Cadmium	mg/kg	1.0 *U*	1.0 *U*	1.0 *U*	1.5	1.1 *U*	1.0 *U*
Chromium	mg/kg	21.7 *J*	26.1 *J*	640 *J*	229 *J*	277 *J*	252 *J*
Copper	mg/kg	12.8	13.4	102	38.5	54.4	36.0
Lead	mg/kg	20.4 *U*	20.5 *U*	20.8 *U*	109	108	67.5
Mercury (total)	mg/kg	0.020 *U*	0.020 *U*	0.020 *U*	0.020	0.030	0.070
Nickel	mg/kg	12.5	12.6	38.7	19.9	34.0	15.7
Selenium	mg/kg	1.0 *U*	1.1 *U*	1.0 *U*	1.1 *U*	1.1 *U*	1.0 *U*
Silver	mg/kg	2.0 *U*	2.0 *U*	2.1 *U*	2.2 *U*	2.2 *U*	2.1 *U*
Thallium	mg/kg	1.0 *U*	1.1 *U*	1.0 *U*	1.1 *U*	1.1 *U*	1.0 *U*
Zinc	mg/kg	68.9	74.3	116	698	479	345
Fuels							
Diesel fuel	mg/kg	--	--	--	--	--	--
Gasoline	mg/kg	--	--	--	--	--	--
Heavy fuel oil	mg/kg	--	--	--	--	--	--
Jet Fuel as Jet A	mg/kg	--	--	--	--	--	--
Jet Fuel as JP-4	mg/kg	--	--	--	--	--	--
Kerosene	mg/kg	--	--	--	--	--	--
Lube Oil	mg/kg	--	--	--	--	--	--
neral Spirits	mg/kg	--	--	--	--	--	--
Naphtha & sp naphthas	mg/kg	--	--	--	--	--	--
PCBs							
Aroclor® 1016	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	1.0 *U*	0.10 *U*
Aroclor® 1221	mg/kg	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*	2.0 *U*	0.20 *U*
Aroclor® 1232	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	1.0 *U*	0.10 *U*
Aroclor® 1242	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	1.0 *U*	0.10 *U*
Aroclor® 1248	mg/kg	**0.14**	**0.18**	**0.66**	**1.6**	**9.3**	**2.5**
Aroclor® 1254	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	1.0 *U*	0.10 *U*
Aroclor® 1260	mg/kg	0.10 *U*	0.10 *U*	**0.15**	**0.17**	1.0 *U*	**0.29**
Grain Size							
Gravel	%	35.4	32.6	62.0	69.9	48.6	84.6
Very coarse sand	%	6.47	6.00	12.3	4.80	9.13	5.16
Coarse sand	%	15.5	13.2	13.3	12.5	13.9	6.04
Medium sand	%	41.9	46.3	10.2	14.5	18.3	4.48
Fine sand	%	1.43	1.61	2.24	0.530	3.44	0.700
Very fine sand	%	0.0500	0.0700	0.450	0.0700	1.44	0.130
Silt	%	7.15	6.55	7.08	7.99	2.67	6.43
Clay	%	0.253	0.00	0.0300	0.0500	0.230	0.0500
Other Analytes							
Total organic carbon	%	0.17	0.11	0.56	0.41	0.32	0.54
Total solids	%	95.0	95.6	95.2	89.2	89.6	95.3

Table 1. (cont.)

Chemical	Units	RB6 10/10/00 SD0006 0 - 10 cm	RB6 (dup) 10/10/00 SD0007 0 - 10 cm	RB7 10/10/00 SD0008 0 - 10 cm	RB8 10/10/00 SD0009 0 - 10 cm	RB9 10/10/00 SD0010 0 - 10 cm	RB10 10/10/00 SD0011 0 - 10 cm
Metals							
Antimony	mg/kg	11.8 *U*	11.5 *U*	10.5 *U*	9.9 *U*	10.4 *U*	12.4 *U*
Arsenic	mg/kg	3.0	2.8	1.8	**132**	6.6	9.3
Beryllium	mg/kg	1.2 *U*	1.1 *U*	1.1 *U*	0.99 *U*	1.1 *U*	1.2 *U*
Cadmium	mg/kg	1.2 *U*	1.1 *U*	1.1 *U*	2.1	1.1 *U*	1.5
Chromium	mg/kg	819 *J*	693 *J*	13.1 *J*	223 *J*	252 *J*	544 *J*
Copper	mg/kg	69.6	41.7	11.1	103	145	75.1
Lead	mg/kg	34.3	75.6	21.0 *U*	103	166	110
Mercury (total)	mg/kg	0.030	0.030	0.020 *U*	0.060	0.060	0.050
Nickel	mg/kg	22.4	16.5	12.4	44.0	60.8	22.0
Selenium	mg/kg	1.2 *U*	1.2 *U*	1.1 *U*	1.0 *U*	1.1 *U*	1.2 *U*
Silver	mg/kg	2.4 *U*	2.3 *U*	2.1 *U*	2.3	2.2	2.5 *U*
Thallium	mg/kg	1.2 *U*	1.2 *U*	1.1 *U*	1.0 *U*	1.1 *U*	1.2 *U*
Zinc	mg/kg	212	338	43.1	**823**	209	341
Fuels							
Diesel fuel	mg/kg	--	--	--	--	--	--
Gasoline	mg/kg	--	--	--	--	--	--
Heavy fuel oil	mg/kg	--	--	--	--	--	--
Jet Fuel as Jet A	mg/kg	--	--	--	--	--	--
Jet Fuel as JP-4	mg/kg	--	--	--	--	--	--
Kerosene	mg/kg	--	--	--	--	--	--
Lube Oil	mg/kg	--	--	--	--	--	--
Mineral Spirits	mg/kg	--	--	--	--	--	--
Naphtha & sp naphthas	mg/kg	--	--	--	--	--	--
PCBs							
Aroclor® 1016	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1221	mg/kg	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*
Aroclor® 1232	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1242	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1248	mg/kg	**0.77**	**0.88**	0.10 *U*	**0.19**	**0.42**	**0.29**
Aroclor® 1254	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1260	mg/kg	**0.39**	**0.14**	0.10 *U*	0.10 *U*	0.13	0.10 *U*
Grain Size							
Gravel	%	49.3	47.6	21.2	79.1	41.5	61.4
Very coarse sand	%	11.6	9.39	13.1	1.94	15.5	9.40
Coarse sand	%	16.0	19.0	16.6	3.29	18.4	14.4
Medium sand	%	20.4	23.7	37.2	8.63	17.9	15.4
Fine sand	%	1.08	1.46	11.5	3.92	4.55	2.53
Very fine sand	%	0.0900	0.120	0.320	2.17	1.41	0.330
Silt	%	7.16	8.51	6.41	4.71	7.60	6.99
Clay	%	0.0400	0.00	0.170	3.07	0.0800	0.00
Other analytes							
Total organic carbon	%	0.18	0.34	0.16	1.91	0.42	0.57
Total solids	%	82.5	82.8	95.2	24.2	93.8	80.0

Table 1. (cont.)

Chemical	Units	RB11 10/10/00 SD0012 0 - 10 cm	RB12 10/10/00 SD0013 0 - 10 cm	RB13 10/10/00 SD0015 0 - 30 cm	RB13 10/10/00 SD0016 30 - 60 cm
Metals					
Antimony	mg/kg	10.4 *U*	9.9 *U*	11.0 *U*	10.5 *U*
Arsenic	mg/kg	2.2	2.2	2.2	2.2
Beryllium	mg/kg	1.0 *U*	0.99 *U*	1.1 *U*	1.1 *U*
Cadmium	mg/kg	1.0 *U*	0.99 *U*	1.1 *U*	1.1 *U*
Chromium	mg/kg	15.2 *J*	14.6 *J*	489 *J*	199 *J*
Copper	mg/kg	12.6	12.9	148	30.2
Lead	mg/kg	20.8 *U*	19.8 *U*	78.0	40.9
Mercury (total)	mg/kg	0.020 *U*	0.020 *U*	0.030	0.040
Nickel	mg/kg	17.1	19.5	58.4	17.2
Selenium	mg/kg	1.0 *UJ*	0.99 *U*	1.1 *U*	1.0 *U*
Silver	mg/kg	2.1 *U*	2.0 *U*	2.2 *U*	2.1 *U*
Thallium	mg/kg	1.0 *U*	0.99 *U*	1.1 *U*	1.0 *U*
Zinc	mg/kg	54.4	66.7	326	234
Fuels					
Diesel fuel	mg/kg	--	--	10 *U*	10 *U*
Gasoline	mg/kg	--	--	10 *U*	10 *U*
Heavy fuel oil	mg/kg	--	--	25 *U*	25 *U*
Jet Fuel as Jet A	mg/kg	--	--	10 *U*	10 *U*
Jet Fuel as JP-4	mg/kg	--	--	10 *U*	10 *U*
Kerosene	mg/kg	--	--	10 *U*	10 *U*
Lube Oil	mg/kg	--	--	81	79
Mineral Spirits	mg/kg	--	--	10 *U*	10 *U*
Naphtha & sp naphthas	mg/kg	--	--	10 *U*	10 *U*
PCBs					
Aroclor® 1016	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1221	mg/kg	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*
Aroclor® 1232	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1242	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1248	mg/kg	0.10 *U*	0.10 *U*	1.1	**1.4**
Aroclor® 1254	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1260	mg/kg	0.10 *U*	0.10 *U*	**0.16**	**0.20**
Grain Size					
Gravel	%	1.59	0.410	--	--
Very coarse sand	%	1.09	0.530	--	--
Coarse sand	%	19.7	24.6	--	--
Medium sand	%	70.0	71.8	--	--
Fine sand	%	7.06	4.50	--	--
Very fine sand	%	0.490	0.0400	--	--
Silt	%	7.77	6.65	--	--
Clay	%	0.00	0.00	--	--
Other analytes					
Total organic carbon	%	0.11	0.050 *U*		
Total solids	%	95.2	97.2	90.0	79.7

Note: -- not analyzed
J - estimated
U - undetected at detection limit shown
Bold values exceed dredged material screening values.

Table 2. Sediment SVOC data

Chemical	Units	RB1 10/10/00 SD0001 0 - 10 cm	RB2 10/10/00 SD0002 0 - 10 cm	RB3 10/10/00 SD0003 0 - 10 cm	RB4a 10/10/00 SD0004 0 - 10 cm	RB4b 10/10/00 SD0014 0 - 30 cm	RB5 10/10/00 SD0005 0 - 10 cm	RB6 10/10/00 SD0006 0 - 10 cm	RB6 (dup) 10/10/00 SD0007 0 - 10 cm	RB7 10/10/00 SD0008 0 - 10 cm
Total Polycyclic Aromatic Hydrocarbons[a]		200 *U*	190 *U*	290 *L*	**55000 *L***	460 *L*	240 *L*	200 *U*	200 *L*	200 *L*
Low Molecular Weight PAH[a,b]		69 *U*	68 *U*	69 *U*	**15000**	100 *L*	62 *U*	70 *U*	67 *U*	69 *U*
2-Methylnaphthalene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	440	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Acenaphthene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	270	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Acenaphthylene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	23	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Anthracene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**1,900**	14	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Fluorene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**1,100**	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Naphthalene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**3,100**	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Phenanthrene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**7,700**	40	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
High Molecular Weight PAH[a,c]		130 *U*	120 *U*	220 *L*	**40000 *L***	360 *L*	180 *L*	130 *U*	130 *L*	130 *L*
Benz[a]anthracene	µg/kg	9.9 *U*	9.7 *U*	15	**4,000**	29	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Benzo[a]pyrene	µg/kg	9.9 *U*	9.7 *U*	28	**4,300**	39	19	10 *U*	9.6 *U*	9.9 *U*
Benzo[b]fluoranthene	µg/kg	9.9 *U*	9.7 *U*	21	**3,500**	31	21	10 *U*	11	9.9 *U*
Benzo[ghi]perylene	µg/kg	20 *U*	19 *U*	26	**2,900**	37	20	20 *U*	19 *U*	20 *U*
Benzo[k]fluoranthene	µg/kg	9.9 *U*	9.7 *U*	19	**3,600**	32	19	10 *U*	9.6 *U*	9.9 *U*
Chrysene	µg/kg	9.9 *U*	9.7 *U*	21	**3,800**	44	22	10 *U*	11	9.9 *U*
Dibenz[a,h]anthracene	µg/kg	20 *U*	19 *U*	20 *U*	970 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
Fluoranthene	µg/kg	9.9 *U*	9.7 *U*	18	**7,600**	42	13	10 *U*	9.6 *U*	12
Indeno[1,2,3-cd]pyrene	µg/kg	20 *U*	19 *U*	26	**3,600**	31	18 *U*	20 *U*	19 *U*	20 *U*
Pyrene	µg/kg	9.9 *U*	9.7 *U*	22	**5,700**	59	18	10 *U*	10	12
Miscellaneous Organic Compounds										
1,2,4-Trichlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
1,2-Dichlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
1,3-Dichlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
1,4-Dichlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
2,4,5-Trichlorophenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
2,4,6-Trichlorophenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
2,4-Dichlorophenol	µg/kg	99 *U*	97 *U*	99 *U*	97 *U*	97 *U*	89 *U*	100 *U*	96 *U*	99 *U*
2,4-Dimethylphenol	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
2,4-Dinitrophenol	µg/kg	300 *U*	290 *U*	300 *U*	290 *U*	290 *U*	270 *U*	300 *U*	290 *U*	300 *U*
2,4-Dinitrotoluene	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*

Table 2. (cont.)

Chemical	Units	RB1 10/10/00 SD0001 0 - 10 cm	RB2 10/10/00 SD0002 0 - 10 cm	RB3 10/10/00 SD0003 0 - 10 cm	RB4a 10/10/00 SD0004 0 - 10 cm	RB4b 10/10/00 SD0014 0 - 30 cm	RB5 10/10/00 SD0005 0 - 10 cm	RB6 10/10/00 SD0006 0 - 10 cm	RB6 (dup) 10/10/00 SD0007 0 - 10 cm	RB7 10/10/00 SD0008 0 - 10 cm
2,6-Dinitrotoluene	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
2-Chloronaphthalene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
2-Chlorophenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
2-Methyl-4,6-dinitrophenol	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
2-Methylphenol	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
2-Nitroaniline	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
2-Nitrophenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
3,3'-Dichlorobenzidine	µg/kg	70 *UJ*	70 *UJ*	70 *UJ*	70 *UJ*	70 *UJ*	70 *UJ*	80 *UJ*	80 *UJ*	70 *UJ*
3- and 4-Methylphenol Coelution	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
3-Nitroaniline	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
4-Bromophenyl-phenyl ether	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
4-Chloro-3-methylphenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
4-Chloroaniline	µg/kg	50 *UJ*	49 *UJ*	49 *UJ*	48 *UJ*	49 *UJ*	44 *UJ*	50 *UJ*	48 *UJ*	49 *UJ*
4-Chlorophenyl-phenyl ether	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
4-Nitroaniline	µg/kg	99 *U*	97 *U*	99 *U*	97 *U*	97 *U*	89 *U*	100 *U*	96 *U*	99 *U*
4-Nitrophenol	µg/kg	99 *U*	97 *U*	99 *U*	97 *U*	97 *U*	89 *U*	100 *U*	96 *U*	99 *U*
Benzoic acid	µg/kg	400 *U*	390 *U*	400 *U*	390 *U*	390 *U*	360 *U*	400 *U*	380 *U*	400 *U*
Benzyl alcohol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
bis[2-Chloroethoxy]methane	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
bis[2-Chloroethyl]ether	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
bis[2-Chloroisopropyl]ether	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
bis[2-Ethylhexyl]phthalate	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
Butylbenzyl phthalate	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
Carbazole	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	1,500	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Dibenzofuran	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**1,000**	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Diethyl phthalate	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Dimethyl phthalate	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Di-*n*-butyl phthalate	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
Di-*n*-octyl phthalate	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
Hexachlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Hexachlorobutadiene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Hexachlorocyclopentadiene	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*

Table 2. (cont.)

Chemical	Units	RB1 10/10/00 SD0001 0 - 10 cm	RB2 10/10/00 SD0002 0 - 10 cm	RB3 10/10/00 SD0003 0 - 10 cm	RB4a 10/10/00 SD0004 0 - 10 cm	RB4b 10/10/00 SD0014 0 - 30 cm	RB5 10/10/00 SD0005 0 - 10 cm	RB6 10/10/00 SD0006 0 - 10 cm	RB6 (dup) 10/10/00 SD0007 0 - 10 cm	RB7 10/10/00 SD0008 0 - 10 cm
Hexachloroethane	µg/kg	40 *U*	39 *U*	40 *U*	39 *U*	39 *U*	36 *U*	40 *U*	38 *U*	40 *U*
Isophorone	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Nitrobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
N-nitroso-di-*n*-propylamine	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
N-nitrosodiphenylamine	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Pentachlorophenol	µg/kg	300 *U*	290 *U*	300 *U*	290 *U*	290 *U*	270 *U*	300 *U*	290 *U*	300 *U*
Phenol	µg/kg	50 *U*	49 *U*	49 *U*	72	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*

Table 2. (cont.)

Chemical	Units	RB8 10/10/00 SD0009 0 - 10 cm	RB9 10/10/00 SD0010 0 - 10 cm	RB10 10/10/00 SD0011 0 - 10 cm	RB11 10/10/00 SD0012 0 - 10 cm	RB12 10/10/00 SD0013 0 - 10 cm	RB13 10/10/00 SD0015 0 - 30 cm	RB13 10/10/00 SD0016 30 - 60 cm
Total Polycyclic Aromatic Hydrocarbons[a]		1600 *L*	250 *L*	320 *L*	200 *U*	200 *U*	220 *L*	270 *L*
Low Molecular Weight PAH[a,b]		120 *L*	68 *U*	69 *U*	69 *U*	69 *U*	67 *U*	68 *U*
2-Methylnaphthalene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Acenaphthene	µg/kg	20 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Acenaphthylene	µg/kg	12	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Anthracene	µg/kg	12	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Fluorene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Naphthalene	µg/kg	10	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Phenanthrene	µg/kg	50	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
High Molecular Weight PAH[a,c]		1500 *L*	180 *L*	250 *L*	130 *U*	130 *U*	150 *L*	200 *L*
Benz[a]anthracene	µg/kg	88	9.7 *U*	16	9.9 *U*	9.9 *U*	9.6 *U*	11
Benzo[a]pyrene	µg/kg	160	25	25	9.9 *U*	9.9 *U*	18	27
Benzo[b]fluoranthene	µg/kg	110	19	22	9.9 *U*	9.9 *U*	17	22
Benzo[ghi]perylene	µg/kg	200 *U*	23	23	20 *U*	20 *U*	19 *U*	25
Benzo[k]fluoranthene	µg/kg	110	17	20	9.9 *U*	9.9 *U*	13	21
Chrysene	µg/kg	130	18	26	9.9 *U*	9.9 *U*	16	26
Dibenz[a,h]anthracene	µg/kg	200 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
Fluoranthene	µg/kg	160	12	34	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Indeno[1,2,3-cd]pyrene	µg/kg	200 *U*	23	20 *U*	20 *U*	20 *U*	19 *U*	22
Pyrene	µg/kg	190	16	43	9.9 *U*	9.9 *U*	14	13
Miscellaneous Organic Compounds								
1,2,4-Trichlorobenzene	µg/kg	20 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
1,2-Dichlorobenzene	µg/kg	20 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
1,3-Dichlorobenzene	µg/kg	20 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
1,4-Dichlorobenzene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
2,4,5-Trichlorophenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
2,4,6-Trichlorophenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
2,4-Dichlorophenol	µg/kg	100 *U*	97 *U*	99 *U*	99 *U*	99 *U*	96 *U*	97 *U*
2,4-Dimethylphenol	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
2,4-Dinitrophenol	µg/kg	300 *U*	290 *U*	300 *U*	300 *U*	300 *U*	290 *U*	290 *U*
2,4-Dinitrotoluene	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*

Table 2. (cont.)

Chemical	Units	RB8 10/10/00 SD0009 0 - 10 cm	RB9 10/10/00 SD0010 0 - 10 cm	RB10 10/10/00 SD0011 0 - 10 cm	RB11 10/10/00 SD0012 0 - 10 cm	RB12 10/10/00 SD0013 0 - 10 cm	RB13 10/10/00 SD0015 0 - 30 cm	RB13 10/10/00 SD0016 30 - 60 cm
2,6-Dinitrotoluene	µg/kg	20 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
2-Chloronaphthalene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
2-Chlorophenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
2-Methyl-4,6-dinitrophenol	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
2-Methylphenol	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
2-Nitroaniline	µg/kg	20 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
2-Nitrophenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
3,3'-Dichlorobenzidine	µg/kg	300 *UJ*	70 *UJ*	80 *UJ*	70 *UJ*	70 *UJ*	70 *UJ*	80 *UJ*
3- and 4-Methylphenol Coelution	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
3-Nitroaniline	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
4-Bromophenyl-phenyl ether	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
4-Chloro-3-methylphenol	µg/kg	90 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
4-Chloroaniline	µg/kg	50 *UJ*	49 *UJ*	50 *UJ*	50 *UJ*	50 *UJ*	48 *UJ*	49 *UJ*
4-Chlorophenyl-phenyl ether	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
4-Nitroaniline	µg/kg	100 *U*	97 *U*	99 *U*	99 *U*	99 *U*	96 *U*	97 *U*
4-Nitrophenol	µg/kg	100 *U*	97 *U*	99 *U*	99 *U*	99 *U*	96 *U*	97 *U*
Benzoic acid	µg/kg	400 *U*	390 *U*	400 *U*	400 *U*	400 *U*	390 *U*	390 *U*
Benzyl alcohol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
bis[2-Chloroethoxy]methane	µg/kg	20 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
bis[2-Chloroethyl]ether	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
bis[2-Chloroisopropyl]ether	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
bis[2-Ethylhexyl]*phthalate*	µg/kg	2,000 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
Butylbenzyl phthalate	µg/kg	34	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
Carbazole	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Dibenzofuran	µg/kg	14	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Diethyl phthalate	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Dimethyl phthalate	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Di-*n*-butyl phthalate	µg/kg	20 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
Di-*n*-octyl phthalate	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
Hexachlorobenzene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Hexachlorobutadiene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Hexachlorocyclopentadiene	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*

Table 2. (cont.)

Chemical	Units	RB8 10/10/00 SD0009 0 - 10 cm	RB9 10/10/00 SD0010 0 - 10 cm	RB10 10/10/00 SD0011 0 - 10 cm	RB11 10/10/00 SD0012 0 - 10 cm	RB12 10/10/00 SD0013 0 - 10 cm	RB13 10/10/00 SD0015 0 - 30 cm	RB13 10/10/00 SD0016 30 - 60 cm
Hexachloroethane	µg/kg	40 *U*	39 *U*	40 *U*	40 *U*	40 *U*	39 *U*	39 *U*
Isophorone	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Nitrobenzene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
N-nitroso-di-*n*-propylamine	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
N-nitrosodiphenylamine	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Pentachlorophenol	µg/kg	300 *U*	290 *U*	300 *U*	300 *U*	300 *U*	290 *U*	290 *U*
Phenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*

Note: -- not analyzed
J - estimated
L - maximum concentration since the full detection limit is included for all undetected compounds.
U - undetected at detection limit shown
Bold values exceed dredged material screening values.

[a] PAH, LPAH, and HPAH results have been rounded to reflect 2 significant figures.

[b] LPAH is the sum of all low molecular weight PAH compounds shown here. If any of these compounds is undetected, the sum is assigned an *L* qualifier; if all are undetected, the sum is assigned a *U* qualifier.

[c] HPAH is the sum of all high molecular weight PAH compounds shown here. If any of these compounds is undetected, the sum is assigned an *L* qualifier; if all are undetected, the sum is assigned a *U* qualifier.

Table 3 data

Chemical	Units	B1 10/18/00 SO0005 8 - 10 ft	B1 10/18/00 SO0017 31 - 32 ft	B2 10/18/00 SO0021 6 - 8 ft	B2 10/18/00 SO0027 18 - 20 ft	B3 10/19/00 SO0080 24 - 26 ft	B4 10/18/00 SO0042 24 - 26 ft	B5 10/19/00 SO0059 22 - 24 ft	B6 10/19/00 SO0097 22 - 24 ft	B7 10/20/00 SO0113 24 - 26 ft	B8 10/20/00 SO0124 22 - 24 ft
Metals											
Antimony	mg/kg	12.5 *UJ*	10.3 *UJ*	11.4 *UJ*	12.4 *UJ*	--	--	--	--	--	--
Arsenic	mg/kg	4.6	3.3	5.4	3.4	--	--	--	--	--	--
Beryllium	mg/kg	1.3 *U*	1.0 *U*	1.1 *U*	1.2 *U*	--	--	--	--	--	--
Cadmium	mg/kg	1.3 *U*	1.0 *U*	1.1 *U*	1.2 *U*	--	--	--	--	--	--
Chromium	mg/kg	17.0	25.0	16.5	18.1	--	--	--	--	--	--
Copper	mg/kg	17.6	25.1	18.2	22.8	--	--	--	--	--	--
Lead	mg/kg	25.0 *U*	20.6 *U*	22.9 *U*	24.8 *U*	--	--	--	--	--	--
Mercury (total)	mg/kg	0.035	0.030	0.050	0.050	--	--	--	--	--	--
Nickel	mg/kg	21.6	23.2	26.1	16.8	--	--	--	--	--	--
Selenium	mg/kg	3.1 *U*	1.0 *U*	2.9 *U*	1.2 *U*	--	--	--	--	--	--
Silver	mg/kg	2.5 *U*	2.1 *U*	2.3 *U*	2.5 *U*	--	--	--	--	--	--
Thallium	mg/kg	1.3 *U*	1.0 *U*	1.1 *U*	1.2 *U*	--	--	--	--	--	--
Zinc	mg/kg	69.3	58.1	61.6	63.0	--	--	--	--	--	--
Fuels											
Diesel fuel	mg/kg	9,100	10 *U*	26,000	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	30	10 *U*
Gasoline	mg/kg	50 *U*	10 *U*	50 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*
Heavy fuel oil	mg/kg	130 *U*	25 *U*	130 *U*	25 *U*	25 *U*	25 *U*	25 *U*	25 *U*	25 *U*	25 *U*
Jet Fuel as Jet A	mg/kg	50 *U*	10 *U*	50 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*
Jet Fuel as JP-4	mg/kg	50 *U*	10 *U*	50 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*
Kerosene	mg/kg	50 *U*	10 *U*	50 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*
Lube Oil	mg/kg	8,200	25 *U*	15,000	25 *U*	25 *U*	25 *U*	25 *U*	25 *U*	140	25 *U*
Mineral Spirits	mg/kg	50 *U*	10 *U*	50 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*
Naphtha & sp naphthas	mg/kg	50 *U*	10 *U*	50 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*	10 *U*
PCBs											
Aroclor® 1016	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	--	--	--	--	--	--
Aroclor® 1221	mg/kg	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*	--	--	--	--	--	--
Aroclor® 1232	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	--	--	--	--	--	--
Aroclor® 1242	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	--	--	--	--	--	--
Aroclor® 1248	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	--	--	--	--	--	--
Aroclor® 1254	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	--	--	--	--	--	--
Aroclor® 1260	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	--	--	--	--	--	--
Other Analytes											
Total solids	%	80.0	69.3	87.5	80.8	90.6	79.2	82.5	87.5	80.5	91.2

Note: -- not analyzed
J - estimated
U - undetected at detection limit shown
No values exceed PRG values for industrial soils.

Table 4. Soil SVOC data

Chemical	Units	B1 10/18/00 SO0005 8 - 10 ft	B1 10/18/00 SO0017 31 - 32 ft	B2 10/18/00 SO0021 6 - 8 ft	B2 10/18/00 SO0027 18 - 20 ft	B3 10/19/00 SO0080 24 - 26 ft	B4 10/18/00 SO0042 24 - 26 ft	B5 10/19/00 SO0059 22 - 24 ft	B6 10/19/00 SO0097 22 - 24 ft	B7 10/20/00 SO0113 24 - 26 ft	B8 10/20/00 SO0124 22 - 24 ft
Total Polycyclic Aromatic Hydrocarbons[a]		160000 *LJ*	200 *UJ*	510000 *LJ*	200 *LJ*	160 *U*	130 *U*	120 *U*	150 *U*	940 *L*	140 *U*
Low Molecular Weight PAH[a,b]		110000 *LJ*	70 *UJ*	330000 *LJ*	69 *UJ*	55 *U*	46 *U*	43 *U*	53 *U*	58 *L*	48 *U*
2-Methylnaphthalene	µg/kg	66,000 *J*	10 *UJ*	190,000 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Acenaphthene	µg/kg	4,100 *J*	10 *UJ*	14,000 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Acenaphthylene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	8.7	6.9 *U*
Anthracene	µg/kg	5,600 *J*	10 *UJ*	20,000 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Fluorene	µg/kg	9,500 *J*	10 *UJ*	25,000 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Naphthalene	µg/kg	140 *U*	10 *UJ*	6,200 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8	6.9 *U*
Phenanthrene	µg/kg	28,000 *J*	10 *UJ*	75,000 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	20	6.9 *U*
High Molecular Weight PAH[a,c]		47000 *LJ*	130 *UJ*	180000 *LJ*	130 *LJ*	100 *U*	85 *U*	79 *U*	98 *U*	880	90 *U*
Benz[a]anthracene	µg/kg	2,700 *J*	10 *UJ*	9,500 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	59	6.9 *U*
Benzo[a]pyrene	µg/kg	2,700 *U*	10 *UJ*	12,000 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	120	6.9 *U*
Benzo[b]fluoranthene	µg/kg	2,700 *U*	10 *UJ*	12,000 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	89	6.9 *U*
Benzo[ghi]perylene	µg/kg	5,500 *U*	20 *UJ*	24,000 *U*	20 *UJ*	16 *U*	13 *U*	12 *U*	15 *U*	110	14 *U*
Benzo[k]fluoranthene	µg/kg	2,700 *U*	10 *UJ*	12,000 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	77	6.9 *U*
Chrysene	µg/kg	4,500 *J*	10 *UJ*	19,000 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	81	6.9 *U*
Dibenz[a,h]anthracene	µg/kg	5,500 *U*	20 *UJ*	24,000 *U*	20 *UJ*	16 *U*	13 *U*	12 *U*	15 *U*	18	14 *U*
Fluoranthene	µg/kg	4,600 *J*	10 *UJ*	15,000 *J*	10 *J*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	97	6.9 *U*
Indeno[1,2,3-cd]pyrene	µg/kg	5,500 *U*	20 *UJ*	24,000 *U*	20 *UJ*	16 *U*	13 *U*	12 *U*	15 *U*	95	14 *U*
Pyrene	µg/kg	11,000 *J*	10 *UJ*	29,000 *J*	12 *J*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	130	6.9 *U*
Miscellaneous Organic Compounds											
1,2,4-Trichlorobenzene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
1,2-Dichlorobenzene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
1,3-Dichlorobenzene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
1,4-Dichlorobenzene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
2,4,5-Trichlorophenol	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	29 *U*	34 *U*
2,4,6-Trichlorophenol	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	29 *U*	34 *U*
2,4-Dichlorophenol	µg/kg	1,400 *U*	100 *UJ*	6,000 *U*	99 *UJ*	78 *U*	65 *U*	61 *U*	75 *U*	58 *U*	69 *U*
2,4-Dimethylphenol	µg/kg	2,700 *U*	200 *UJ*	12,000 *U*	200 *UJ*	160 *U*	130 *U*	120 *U*	150 *U*	120 *U*	140 *U*
2,4-Dinitrophenol	µg/kg	4,100 *U*	300 *UJ*	18,000 *U*	300 *UJ*	230 *U*	200 *U*	180 *U*	220 *U*	170 *U*	210 *U*
2,4-Dinitrotoluene	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	29 *U*	34 *U*

Table 4. (cont.)

Chemical	Units	B1 10/18/00 SO0005 8 - 10 ft	B1 10/18/00 SO0017 31 - 32 ft	B2 10/18/00 SO0021 6 - 8 ft	B2 10/18/00 SO0027 18 - 20 ft	B3 10/19/00 SO0080 24 - 26 ft	B4 10/18/00 SO0042 24 - 26 ft	B5 10/19/00 SO0059 22 - 24 ft	B6 10/19/00 SO0097 22 - 24 ft	B7 10/20/00 SO0113 24 - 26 ft	B8 10/20/00 SO0124 22 - 24 ft
2,6-Dinitrotoluene	µg/kg	270 *U*	20 *UJ*	1,200 *U*	20 *UJ*	16 *U*	13 *U*	12 *U*	15 *U*	12 *U*	14 *U*
2-Chloronaphthalene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
2-Chlorophenol	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	29 *U*	34 *U*
2-Methyl-4,6-dinitrophenol	µg/kg	2,700 *U*	200 *UJ*	12,000 *U*	200 *UJ*	160 *U*	130 *U*	120 *U*	150 *U*	120 *U*	140 *U*
2-Methylphenol	µg/kg	2,700 *U*	200 *UJ*	12,000 *U*	200 *UJ*	160 *U*	130 *U*	120 *U*	150 *U*	120 *U*	140 *U*
2-Nitroaniline	µg/kg	270 *U*	20 *UJ*	1,200 *U*	20 *UJ*	16 *U*	13 *U*	12 *U*	15 *U*	12 *U*	14 *U*
2-Nitrophenol	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	29 *U*	34 *U*
3,3'-Dichlorobenzidine	µg/kg	900 *U*	90 *UJ*	4,000 *U*	80 *UJ*	70 *U*	80 *U*	80 *U*	70 *U*	80 *U*	70 *U*
3- and 4-Methylphenol Coelution	µg/kg	2,700 *U*	200 *UJ*	12,000 *U*	200 *UJ*	160 *U*	130 *U*	120 *U*	150 *U*	120 *U*	140 *U*
3-Nitroaniline	µg/kg	2,700 *U*	200 *UJ*	12,000 *U*	200 *UJ*	160 *U*	130 *U*	120 *U*	150 *U*	120 *U*	140 *U*
4-Bromophenyl-phenyl ether	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
4-Chloro-3-methylphenol	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	30 *U*	34 *U*
4-Chloroaniline	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	29 *U*	34 *U*
4-Chlorophenyl-phenyl ether	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
4-Nitroaniline	µg/kg	1,400 *U*	100 *UJ*	6,000 *U*	99 *UJ*	78 *U*	65 *U*	61 *U*	75 *U*	58 *U*	69 *U*
4-Nitrophenol	µg/kg	1,400 *U*	100 *UJ*	6,000 *U*	99 *UJ*	78 *U*	65 *U*	61 *U*	75 *U*	58 *U*	69 *U*
Benzoic acid	µg/kg	5,500 *U*	400 *UJ*	24,000 *U*	400 *UJ*	310 *U*	260 *U*	240 *U*	300 *U*	230 *U*	270 *U*
Benzyl alcohol	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	29 *U*	34 *U*
bis[2-Chloroethoxy]methane	µg/kg	270 *U*	20 *UJ*	1,200 *U*	20 *UJ*	16 *U*	13 *U*	12 *U*	15 *U*	12 *U*	14 *U*
bis[2-Chloroethyl]ether	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
bis[2-Chloroisopropyl]ether	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
bis[2-Ethylhexyl]phthalate	µg/kg	2,700 *U*	200 *UJ*	12,000 *U*	200 *UJ*	160 *U*	130 *U*	120 *U*	150 *U*	120 *U*	140 *U*
Butylbenzyl phthalate	µg/kg	580 *J*	20 *UJ*	2,100 *J*	20 *UJ*	16 *U*	13 *U*	12 *U*	15 *U*	12 *U*	14 *U*
Carbazole	µg/kg	140 *U*	10 *UJ*	12,000 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Dibenzofuran	µg/kg	2,100 *J*	10 *UJ*	7,600 *J*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Diethyl phthalate	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Dimethyl phthalate	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Di-*n*-butyl phthalate	µg/kg	270 *U*	20 *UJ*	1,200 *U*	20 *UJ*	16 *U*	13 *U*	12 *U*	15 *U*	12 *U*	14 *U*
Di-*n*-octyl phthalate	µg/kg	2,700 *U*	200 *UJ*	12,000 *U*	200 *UJ*	160 *U*	130 *U*	120 *U*	150 *U*	120 *U*	140 *U*
Hexachlorobenzene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Hexachlorobutadiene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Hexachlorocyclopentadiene	µg/kg	2,700 *UJ*	200 *UJ*	12,000 *UJ*	200 *UJ*	160 *UJ*	130 *U*	120 *UJ*	150 *UJ*	120 *UJ*	140 *UJ*

Table 4. (cont.)

Chemical	Units	B1 10/18/00 SO0005 8 - 10 ft	B1 10/18/00 SO0017 31 - 32 ft	B2 10/18/00 SO0021 6 - 8 ft	B2 10/18/00 SO0027 18 - 20 ft	B3 10/19/00 SO0080 24 - 26 ft	B4 10/18/00 SO0042 24 - 26 ft	B5 10/19/00 SO0059 22 - 24 ft	B6 10/19/00 SO0097 22 - 24 ft	B7 10/20/00 SO0113 24 - 26 ft	B8 10/20/00 SO0124 22 - 24 ft
Hexachloroethane	µg/kg	550 *U*	40 *UJ*	2,400 *U*	40 *UJ*	31 *U*	26 *U*	24 *U*	30 *U*	23 *U*	27 *U*
Isophorone	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Nitrobenzene	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
N-nitroso-di-*n*-propylamine	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
N-nitrosodiphenylamine	µg/kg	140 *U*	10 *UJ*	600 *U*	9.9 *UJ*	7.8 *U*	6.5 *U*	6.1 *U*	7.5 *U*	5.8 *U*	6.9 *U*
Pentachlorophenol	µg/kg	4,100 *U*	300 *UJ*	18,000 *U*	300 *UJ*	230 *U*	200 *U*	180 *U*	220 *U*	170 *U*	210 *U*
Phenol	µg/kg	680 *U*	50 *UJ*	3,000 *U*	50 *UJ*	39 *U*	33 *U*	31 *U*	37 *U*	29 *U*	34 *U*

Note: -- not analyzed
J - estimated
L - maximum concentration since the full detection limit is included for all undetected compounds.
U - undetected at detection limit shown
No values exceed PRG values for industrial soils.

[a] PAH, LPAH, and HPAH results have been rounded to reflect 2 significant figures.

[b] LPAH is the sum of all low molecular weight PAH compounds shown here. If any of these compounds is undetected, the sum is assigned an *L* qualifier; if all are undetected, the sum is assigned a *U* qualifier.

[c] HPAH is the sum of all high molecular weight PAH compounds shown here. If any of these compounds is undetected, the sum is assigned an *L* qualifier; if all are undetected, the sum is assigned a *U* qualifier.

Table 5. Groundwater data

Chemical	Units	B1 10/19/00 GW1001 24 - 28 ft	B2 10/20/00 GW1008 14 - 24 ft	B2 (dup) 10/20/00 GW1009 14 - 24 ft	B3 10/19/00 GW1004 26 - 30 ft	B4 10/19/00 GW1003 22 - 32 ft	B5 10/19/00 GW1002 24 - 28 ft	B6 10/19/00 GW1005 36 - 40 ft	B7 10/20/00 GW1006 26 - 30 ft	B8 10/20/00 GW1011 36 - 40 ft
Metals										
Antimony	µg/L	50.0 *U*	50.0 *U*	50.0 *U*	--	--	--	--	--	--
Arsenic	µg/L	10.1	15.9	15.4	--	--	--	--	--	--
Beryllium	µg/L	5.0 *U*	5.0 *U*	5.0 *U*	--	--	--	--	--	--
Cadmium	µg/L	5.0 *U*	5.0 *U*	5.0 *U*	--	--	--	--	--	--
Chromium	µg/L	9.1	5.0 *U*	5.0 *U*	--	--	--	--	--	--
Copper	µg/L	34.5	10 *U*	10 *U*	--	--	--	--	--	--
Lead	µg/L	24.5	2.0 *U*	2.0 *U*	--	--	--	--	--	--
Mercury (total)	µg/L	0.20 *U*	0.20 *U*	0.20 *U*	--	--	--	--	--	--
Nickel	µg/L	20.0 *U*	20.0 *U*	20.0 *U*	--	--	--	--	--	--
Selenium	µg/L	5.0 *U*	5.0 *U*	5.0 *U*	--	--	--	--	--	--
Silver	µg/L	10 *U*	10 *U*	10 *U*	--	--	--	--	--	--
Thallium	µg/L	5.0 *U*	5.0 *U*	5.0 *U*	--	--	--	--	--	--
Zinc	µg/L	56.5	10 *U*	10 *U*	--	--	--	--	--	--
Fuels										
Diesel fuel	µg/L	9,100	1,000	990	6,100	750	4,700	630	1,600	140
Gasoline	µg/L	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	260
Heavy fuel oil	µg/L	250 *U*	250 *U*	250 *U*	250 *U*	250 *U*	250 *U*	250 *U*	250 *U*	250 *U*
Jet Fuel as Jet A	µg/L	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*
Jet Fuel as JP-4	µg/L	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*
Kerosene	µg/L	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*
Lube Oil	µg/L	250 *U*	250 *U*	250 *U*	250 *U*	250 *U*	250 *U*	340	250 *U*	250 *U*
Mineral Spirits	µg/L	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*
Naphtha & sp naphthas	µg/L	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*	100 *U*
PCBs										
Aroclor® 1016	µg/L	0.20 *U*	0.20 *U*	0.20 *U*	--	--	--	--	--	--
Aroclor® 1221	µg/L	0.40 *U*	0.40 *U*	0.40 *U*	--	--	--	--	--	--
Aroclor® 1232	µg/L	0.20 *U*	0.20 *U*	0.20 *U*	--	--	--	--	--	--
Aroclor® 1242	µg/L	0.20 *U*	0.20 *U*	0.20 *U*	--	--	--	--	--	--
Aroclor® 1248	µg/L	0.20 *U*	0.20 *U*	0.20 *U*	--	--	--	--	--	--
Aroclor® 1254	µg/L	0.20 *U*	0.20 *U*	0.20 *U*	--	--	--	--	--	--
Aroclor® 1260	µg/L	0.20 *U*	0.20 *U*	0.20 *U*	--	--	--	--	--	--

Note: -- not analyzed

U - undetected at detection limit shown

Table 6. Groundwater SVOC data

Chemical	Units	B1 10/19/00 GW1001 24 - 28 ft	B2 10/20/00 GW1008 14 - 24 ft	B2 (dup) 10/20/00 GW1009 14 - 24 ft	B3 10/19/00 GW1004 26 - 30 ft	B4 10/19/00 GW1003 22 - 32 ft	B5 10/19/00 GW1002 24 - 28 ft	B6 10/19/00 GW1005 36 - 40 ft	B7 10/20/00 GW1006 26 - 30 ft	B8 10/20/00 GW1011 36 - 40 ft
Total Polycyclic Aromatic Hydrocarbons[a]		70 *L*	15 *L*	10 *L*	6.5 *L*	2.0 *L*	3.3 *L*	1.9 *U*	1.9 *U*	2.0 *U*
Low Molecular Weight PAH[a,b]		68 *L*	14 *L*	9.2 *L*	5.3 *L*	0.79 *L*	2.0 *L*	0.67 *U*	0.67 *U*	0.68 *U*
2-Methylnaphthalene	µg/L	50	7.2	5.1	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Acenaphthene	µg/L	2.6	1.1	0.72	1.2	0.21	0.62	0.096 *U*	0.096 *U*	0.097 *U*
Acenaphthylene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.49 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Anthracene	µg/L	0.64	0.31	0.20	0.20	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Fluorene	µg/L	3.8	1.6	1.0	1.8	0.096 *U*	0.49 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Naphthalene	µg/L	7.1	1.5	0.97	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Phenanthrene	µg/L	3.7	1.9	1.1	1.8	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
High Molecular Weight PAH[a,c]		2.1 *L*	1.3 *L*	1.2 *U*	1.2 *U*	1.2 *U*	1.3 *U*	1.2 *U*	1.2 *U*	1.3 *U*
Benz[a]anthracene	µg/L	0.16	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Benzo[a]pyrene	µg/L	0.10	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Benzo[b]fluoranthene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Benzo[ghi]perylene	µg/L	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*
Benzo[k]fluoranthene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Chrysene	µg/L	0.29	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Dibenz[a,h]anthracene	µg/L	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*
Fluoranthene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Indeno[1,2,3-cd]pyrene	µg/L	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*
Pyrene	µg/L	0.66	0.17	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Miscellaneous Organic Compounds										
1,2,4-Trichlorobenzene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
1,2-Dichlorobenzene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
1,3-Dichlorobenzene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
1,4-Dichlorobenzene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
2,4,5-Trichlorophenol	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	2.4 *U*	0.48 *U*	0.48 *U*	0.49 *U*
2,4,6-Trichlorophenol	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	2.4 *U*	0.48 *U*	0.48 *U*	0.49 *U*
2,4-Dichlorophenol	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
2,4-Dimethylphenol	µg/L	1.7 *J*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
2,4-Dinitrophenol	µg/L	4.9 *U*	4.9 *U*	4.8 *U*	4.8 *U*	4.8 *U*	24 *U*	4.8 *U*	4.8 *U*	4.9 *U*
2,4-Dinitrotoluene	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	2.4 *U*	0.48 *U*	0.48 *U*	0.49 *U*

Table 6. (cont.)

Chemical	Units	B1 10/19/00 GW1001 24 - 28 ft	B2 10/20/00 GW1008 14 - 24 ft	B2 (dup) 10/20/00 GW1009 14 - 24 ft	B3 10/19/00 GW1004 26 - 30 ft	B4 10/19/00 GW1003 22 - 32 ft	B5 10/19/00 GW1002 24 - 28 ft	B6 10/19/00 GW1005 36 - 40 ft	B7 10/20/00 GW1006 26 - 30 ft	B8 10/20/00 GW1011 36 - 40 ft
2,6-Dinitrotoluene	µg/L	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.97 *U*	0.19 *U*	0.19 *U*	0.19 *U*
2-Chloronaphthalene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.49 *U*	0.096 *U*	0.096 *U*	0.097 *U*
2-Chlorophenol	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
2-Methyl-4,6-dinitrophenol	µg/L	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	9.7 *U*	1.9 *U*	1.9 *U*	1.9 *U*
2-Methylphenol	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
2-Nitroaniline	µg/L	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.97 *U*	0.19 *U*	0.19 *U*	0.19 *U*
2-Nitrophenol	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
3,3'-Dichlorobenzidine	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
3- and 4-Methylphenol Coelution	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
3-Nitroaniline	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	2.4 *U*	0.48 *U*	0.48 *U*	0.49 *U*
4-Bromophenyl-phenyl ether	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
4-Chloro-3-methylphenol	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
4-Chloroaniline	µg/L	0.49 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*
4-Chlorophenyl-phenyl ether	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.49 *U*	0.096 *U*	0.096 *U*	0.097 *U*
4-Nitroaniline	µg/L	0.97 *U*	0.97 *U*	0.95 *U*	0.96 *U*	0.96 *U*	4.9 *U*	0.96 *U*	0.96 *U*	0.97 *U*
4-Nitrophenol	µg/L	0.97 *U*	0.97 *U*	0.95 *U*	0.96 *U*	0.96 *U*	4.9 *U*	0.96 *U*	0.96 *U*	0.97 *U*
Benzoic acid	µg/L	4.9 *U*	4.9 *U*	4.8 *U*	4.8 *U*	4.8 *U*	4.9 *U*	4.8 *U*	4.8 *U*	4.9 *U*
Benzyl alcohol	µg/L	0.97 *U*	0.97 *U*	0.95 *U*	0.96 *U*	0.96 *U*	0.97 *U*	0.96 *U*	0.96 *U*	0.97 *U*
bis[2-Chloroethoxy]methane	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
bis[2-Chloroethyl]ether	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
bis[2-Chloroisopropyl]ether	µg/L	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
bis[2-Ethylhexyl]phthalate	µg/L	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*
Butylbenzyl phthalate	µg/L	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.30	0.19 *U*	0.19 *U*
Carbazole	µg/L	0.097 *U*	0.56	0.35	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Dibenzofuran	µg/L	1.4	0.41	0.27	0.37	0.096 *U*	0.49 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Diethyl phthalate	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.49 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Dimethyl phthalate	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.49 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Di-*n*-butyl phthalate	µg/L	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*	0.19 *U*
Di-*n*-octyl phthalate	µg/L	0.97 *U*	0.97 *U*	0.95 *U*	0.96 *U*	0.96 *U*	0.97 *U*	0.96 *U*	0.96 *U*	0.97 *U*
Hexachlorobenzene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Hexachlorobutadiene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Hexachlorocyclopentadiene	µg/L	0.97 *U*	0.97 *U*	0.95 *U*	0.96 *U*	0.96 *U*	4.9 *U*	0.96 *U*	0.96 *U*	0.97 *U*

Table 6. (cont.)

Chemical	Units	B1 10/19/00 GW1001 24 - 28 ft	B2 10/20/00 GW1008 14 - 24 ft	B2 (dup) 10/20/00 GW1009 14 - 24 ft	B3 10/19/00 GW1004 26 - 30 ft	B4 10/19/00 GW1003 22 - 32 ft	B5 10/19/00 GW1002 24 - 28 ft	B6 10/19/00 GW1005 36 - 40 ft	B7 10/20/00 GW1006 26 - 30 ft	B8 10/20/00 GW1011 36 - 40 ft
Hexachloroethane	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Isophorone	µg/L	0.16	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Nitrobenzene	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
N-nitroso-di-*n*-propylamine	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.097 *U*	0.096 *U*	0.096 *U*	0.097 *U*
N-nitrosodiphenylamine	µg/L	0.097 *U*	0.097 *U*	0.095 *U*	0.096 *U*	0.096 *U*	0.49 *U*	0.096 *U*	0.096 *U*	0.097 *U*
Pentachlorophenol	µg/L	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*	1.9 *U*
Phenol	µg/L	0.58 *J*	0.49 *U*	0.48 *U*	0.48 *U*	0.48 *U*	0.49 *U*	0.48 *U*	0.48 *U*	0.49 *U*

Note: -- not analyzed
J - estimated
L - maximum concentration since the full detection limit is included for all undetected compounds.
U - undetected at detection limit shown

[a] PAH, LPAH, and HPAH results have been rounded to reflect 2 significant figures.

[b] LPAH is the sum of all low molecular weight PAH compounds shown here. If any of these compounds is undetected, the sum is assigned an *L* qualifier; if all are undetected, the sum is assigned a *U* qualifier.

[c] HPAH is the sum of all high molecular weight PAH compounds shown here. If any of these compounds is undetected, the sum is assigned an *L* qualifier; if all are undetected, the sum is assigned a *U* qualifier.

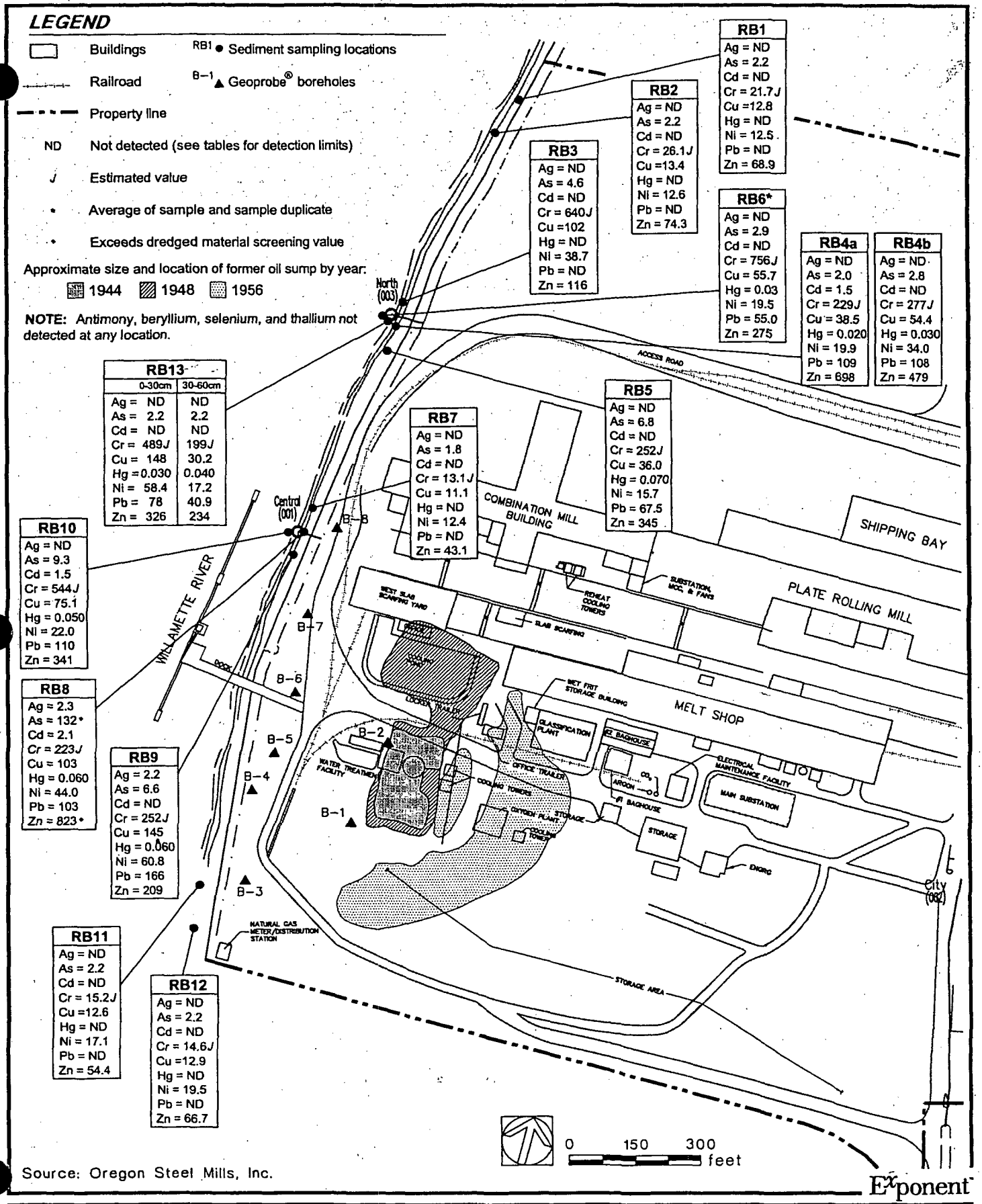
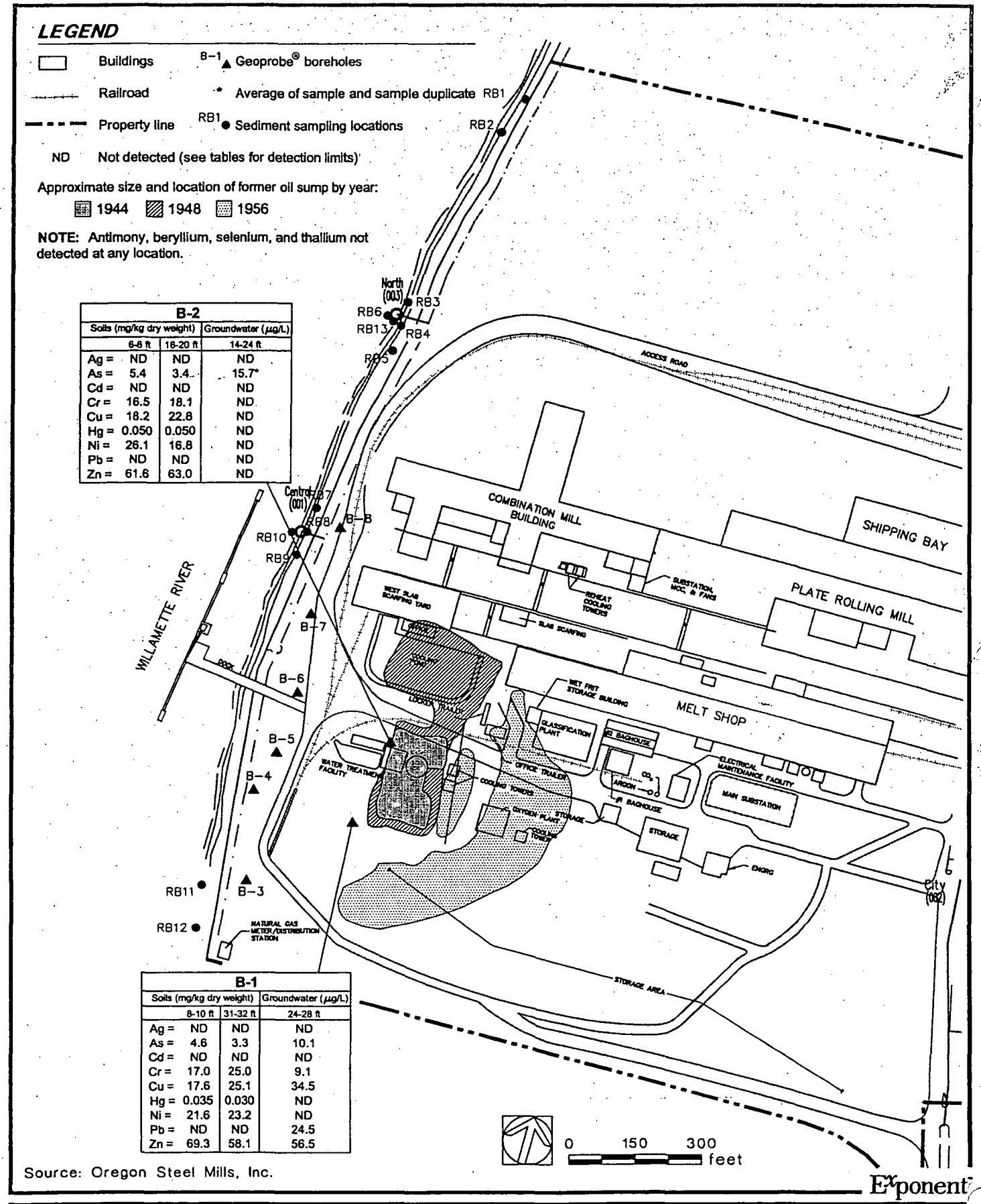


Figure 2. Metals concentrations (mg/kg dry weight) in sediments.

8601526.001.0203 METALsed.dwg 01/31/01 OR

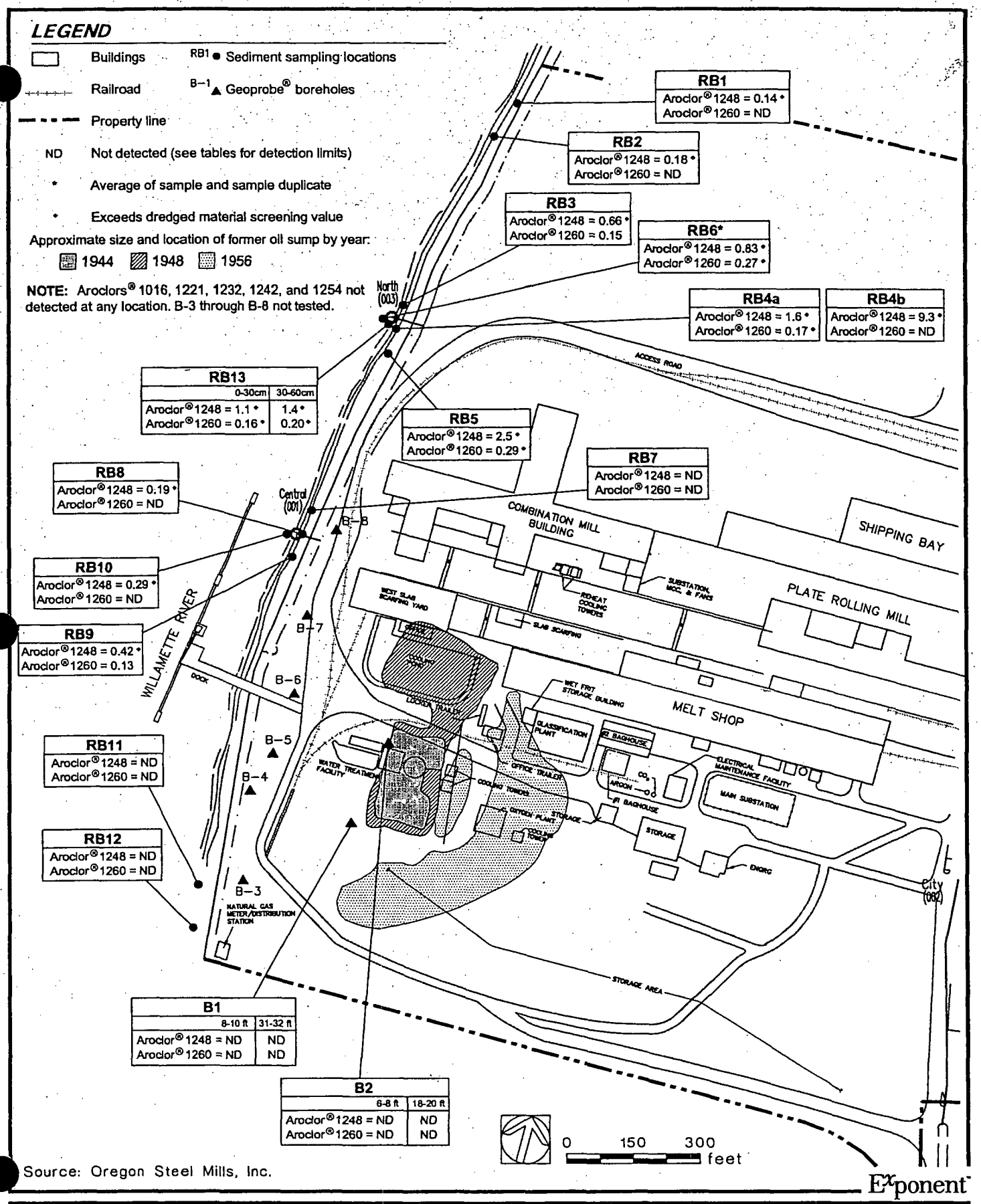


Source: Oregon Steel Mills, Inc.

Exponent

Figure 3. Metals concentrations in soils and groundwater.

8601526.001.0203 MetalsGW.dwg 01/31/01 OR



Source: Oregon Steel Mills, Inc.

Exponent

Figure 4. PCB concentrations (mg/kg dry weight) in soils and sediments.

8601526.001.0203 PCBs.dwg 01/31/01 OR

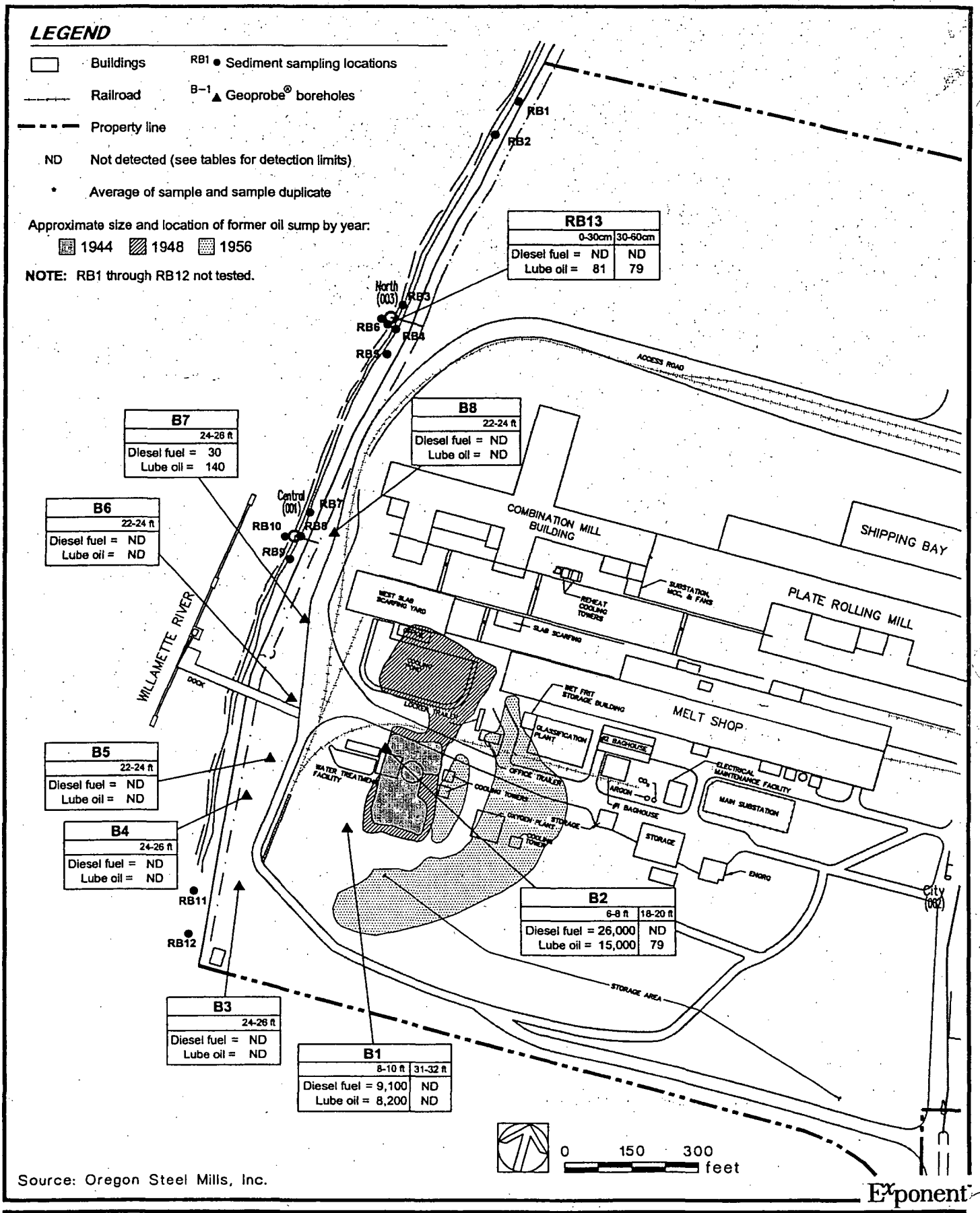


Figure 5. Petroleum hydrocarbon concentrations (mg/kg dry weight) in soils and sediments.

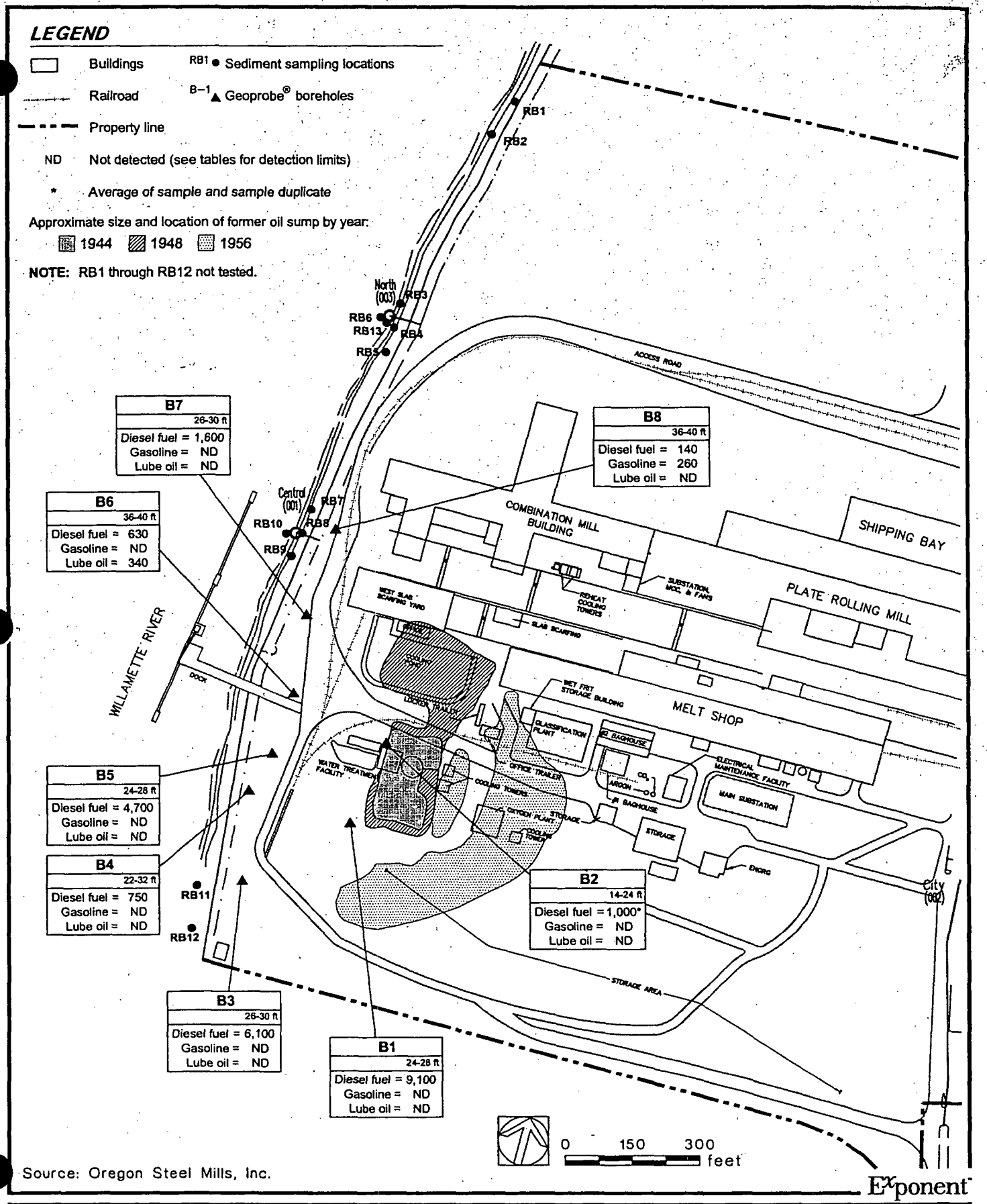


Figure 6. Petroleum hydrocarbon concentrations (μg/L) in groundwater.

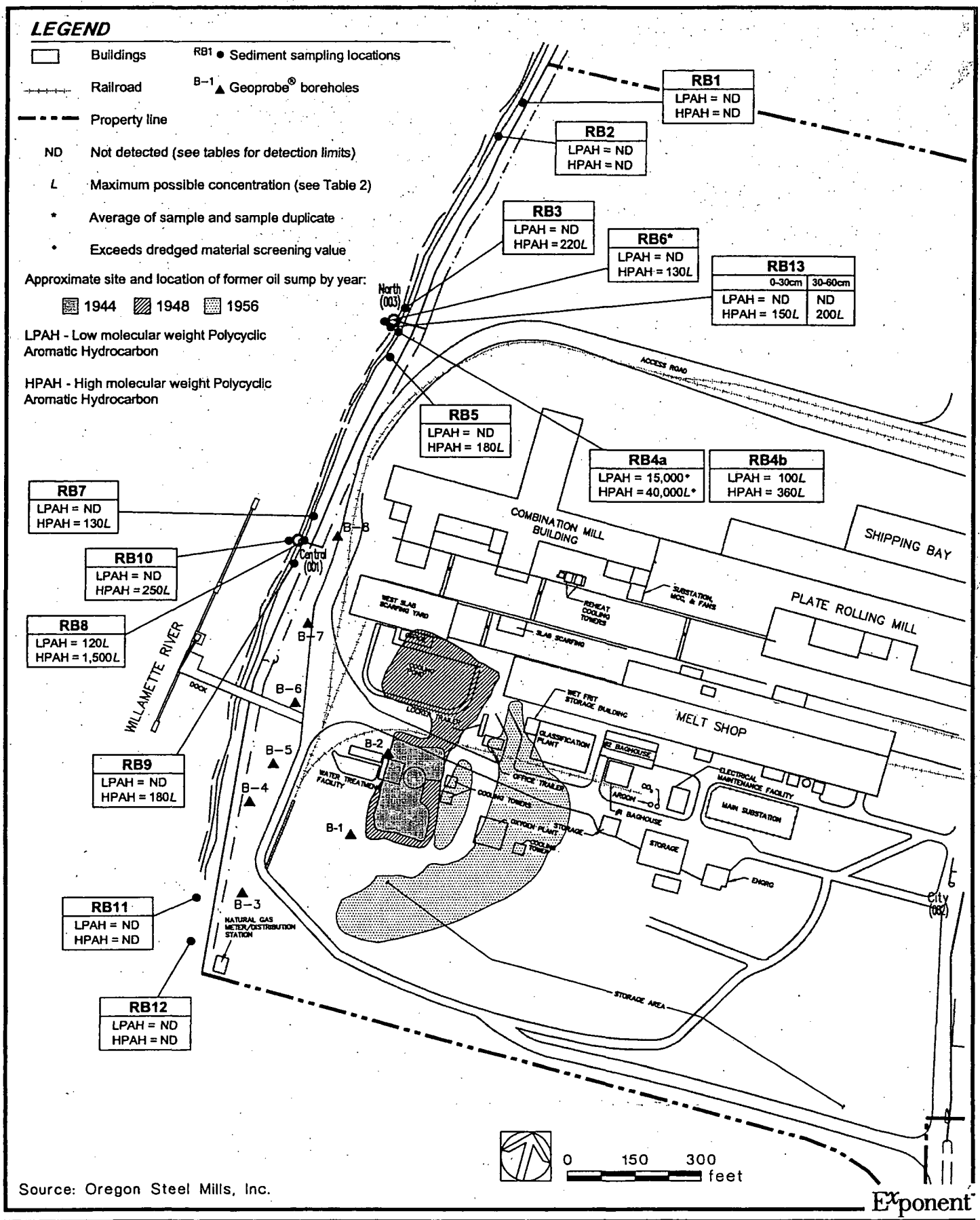


Figure 7. LPAH and HPAH concentrations (μg/kg dry weight) in sediments.

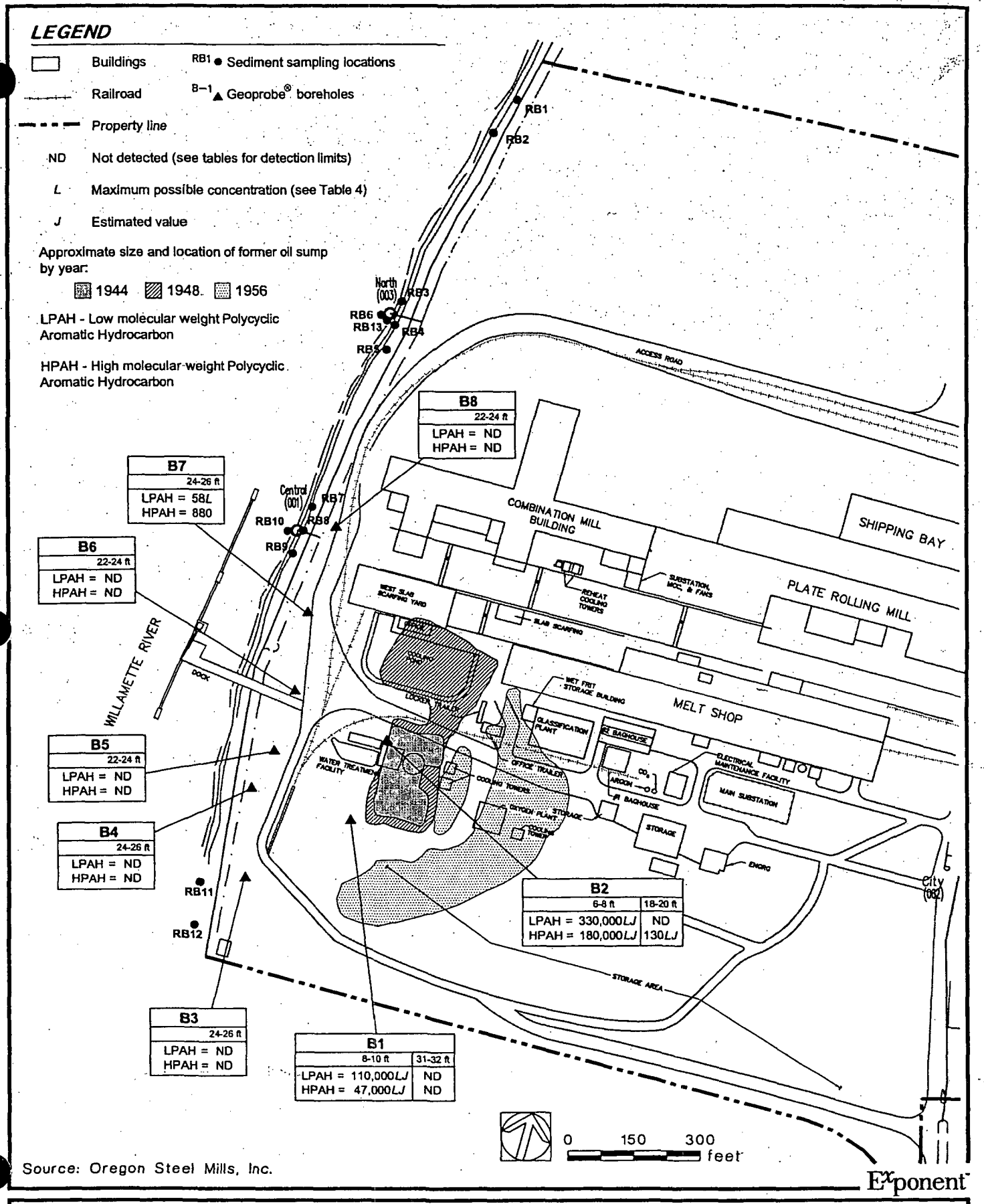


Figure 8. LPAH and HPAH concentrations (μg/kg dry weight) in soils.

8601526.001.0203 PAHs.dwg 01/31/01 OR

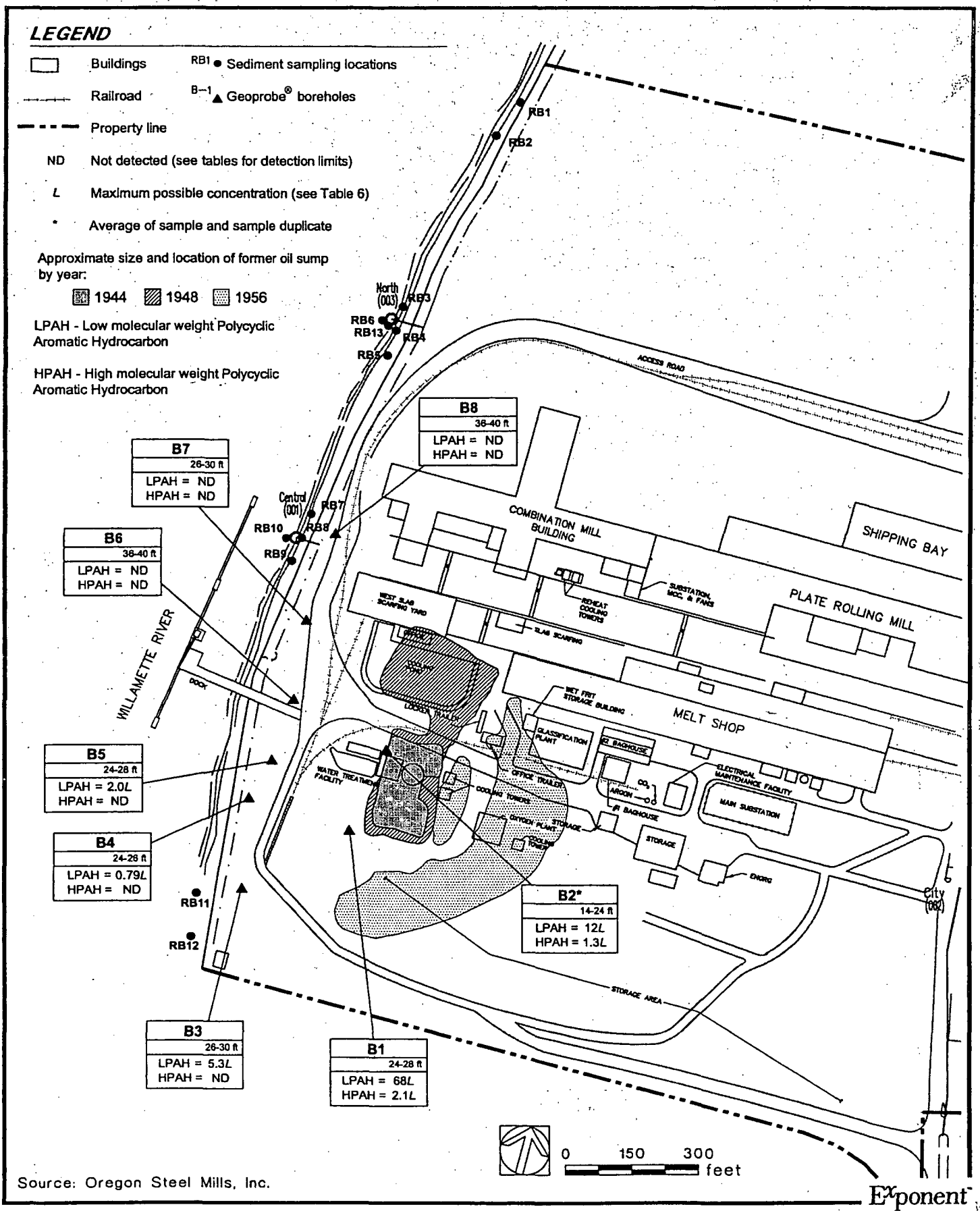


Figure 9. LPAH and HPAH concentrations (μg/L) in groundwater.

8601526.001.0203 PAHgw.dwg 01/26/01 OR

Appendix G

Phase I and Phase II Geoprobe® Borehole and Test Pit Logs

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-1

Ground surface: Gravel

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0								
1	SO0001	0	NS	80%		ML	Gravelly, sandy SILT, very dark grayish brown (10YR 3/2) w/ red brick fragments, moist, no odor. (fill)	
2								
3	SO0002	0	NS	100%				
4							Silt lens (~ 2" thick).	
5	SO0003	0	SS	100%				BACKFILLED w/ BENTONITE GROUT
6								
7	SO0004	0	SS	60%				
8							Transition to silty SAND, very dark grayish brown (10YR 3/2) w/ oily residue, staining, petroleum odor.	
9	SO0005	16.8	HS	100%		SM	Fine SAND, dark gray (7.5YR 3/1) w/ dark, oily staining, moist, petroleum-like odor.	
10							Wood debris (~ 2" thick).	
11	SO0006	0	NS	70%				
12								
13				0%			Water level @ 12.7' BGS.	
14								
15	SO0007	42	HS	100%				
16								
17	SO0008	80	HS	100%				
18						ML	Slightly sandy SILT, very dark gray (10YR 3/1), moist, petroleum-like odor.	
19	SO0009	35	HS	100%				
20						SM	Silty SAND, very dark gray (10YR 3/1), moist, petroleum-like odor.	

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 18 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.87'

Borehole Diameter: 2"

Datum: City of Portland Datum

EX™

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-1

Ground surface: Gravel

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20						SM	Silty SAND, very dark gray (10YR 3/1), moist, petroleum-like odor.	BACKFILLED w/ BENTONITE GROUT
21	SO0010	18	HS	100%		ML	Sandy SILT, very dark gray (10YR 3/1) w/ beads of dark oil on surface, moist, petroleum-like odor.	
22						SM	Silty SAND, very dark gray (10YR 3/1), moist, petroleum-like odor.	
23	SO0011	14	HS	100%		ML	Sandy SILT, very dark gray (10YR 3/1) moist, petroleum-like odor.	
24						SM	Silty SAND, very dark gray (10YR 3/1), moist, petroleum-like odor.	
25	SO0012	46	NS	100%			Collected groundwater grab sample GW1001 from temporary well screen @ 24-28' BGS.	
26								
27	SO0013	0	NS	100%			Very wet, heavy sheen @ 27.0' BGS.	
28								
29	SO0014 SO0015	23	SS	100%				
30	SO0016	0	NS	100%		ML	Sandy SILT, dark brown (10YR 3/3), grading moist, no odor .	
31	SO0017						Reddish mottling @ 31.0' BGS.	
32							Total Depth 32.0' BGS.	
33								
34								
35								
36								
37								
38								
39								
40								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 18 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.87'

Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-2

Ground surface: Gravel

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION
0–1	SO0018	0	NS	80%		SM	Gravelly, silty SAND, very dark grayish brown (10YR 3/2), slightly moist, no odor.
2–3	SO0019	0	NS	100%		ML	SILT, very dark grayish brown (10YR 3/2).
4–5	SO0020	0	NS	60%		SM	Silty SAND, very dark grayish brown (10YR 3/2) w/ oily residue, moist, slight petroleum-like odor.
6–7	SO0021	103	HS	100%			
8–9	SO0022	75	HS	80%		ML	Sandy SILT.
10–11	SO0023	0	NS	100%		SM	Silty SAND, very dark gray (10YR 3/1), wet, organic odor.
						▼	Water level @ 11.57' BGS.
12–13	SO0024	0	HS	20%			
14–15	SO0025	0	NS	100%			Oily residue, water saturated. Collected groundwater grab samples GW1008 and GW1009 (dup) from temporary well screen @ 14-24' BGS.
16–17	SO0026	0	NS	100%			
18–19	SO0027	0	NS	100%			
20						ML	SILT, very dark gray (2.5YR 3/1), moist, no odor.

WELL CONSTRUCTION DETAIL (not applicable)

BACKFILLED w/ BENTONITE GROUT

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 18 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.11'

Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-2

Ground surface: Gravel

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21	SO0028	0	SS	60%		ML	SILT, very dark gray (2.5YR 3/1), slightly moist, no odor.	
						SM	Silty SAND w/ some petroleum-like staining. (possible slough)	
22								
23	SO0029	0	NS	100%		ML	Sandy SILT, moist, no odor.	
24								
25				0%		SM	Silty SAND.	BACKFILLED w/ BENTONITE GROUT
26								
27	SO0030	0	NS	100%		ML	Slightly sandy SILT, very dark grayish brown (10YR 3/2), grading finer with depth, reddish mottling and gray (10YR 5/1), silt intermixed, wet, no odor.	
28								
29	SO0031	0	NS	70%				
30								
31	SO0032	0	NS	100%				
32							Total Depth 32.0' BGS.	
33								
34								
35								
36								
37								
38								
39								
40								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 18 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.11'

Borehole Diameter: 2"

Datum: City of Portland Datum

Sheet: 2 of 2

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-3

Ground surface: Grass

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0								
1	SO0068	0	NS	60%		SM	Gravelly, silty SAND, dark brown (10YR 3/3), moist, no odor. (fill)	
2								
3	SO0069	0	NS	100%			Color change to very dark gray (7.5YR 3/1), moist no odor. gravel, includes slag chunks (orange and brown, to 2" dia.).	
4								
5	SO0070	4.6	NS	80%			Color change to dark yellowish brown (10YR 3/4), moist no odor.	BACKFILLED w/ BENTONITE GROUT
6								
7	SO0071	0	NS	100%				
8								
9	SO0072	0	NS	80%				
10								
11	SO0073	0	NS	100%				
12						ML	Sandy SILT, dark yellowish brown (10YR 3/4) wet, no odor.	
13	SO0074	0	NS	80%		SM	Silty SAND, dark yellowish brown (10YR 3/4), wet, no odor.	
14								
15	SO0075	4.3	NS	100%			Color change to dark brown (10YR 3/3) w/ darker brown mottling.	
16								
17	SO0076	0	NS	70%				
18								
19	SO0077	0	NS	90%				
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 19 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.09'

Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202
Project: Oregon Steel Mills
Client: Oregon Steel Mills
Location: Portland, OR

Borehole : B-3
Ground surface: Grass
Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21	SO0078	0	NS	90%		SM	Silty SAND, dark brown (10YR 3/3), wet.	
22								
23	SO0079	4.6	NS	100%				
24								
25	SO0080	0	NS	100%			Red banding. Water level @ 25.34' BGS.	BACKFILLED w/ BENTONITE GROUT
26								
27	SO0081	0	NS	100%			Color change to very dark gray (7.5YR 3/1), wet, slight organic odor. Collected groundwater grab sample GW1004 from temporary well screen @ 26-30' BGS.	
28								
29	SO0082	0	NS	80%				
30								
31	SO0083	0	NS	100%				
32						ML	Slightly sandy SILT, very dark gray (5YR 3/1), moist, slight organic odor .	
33	SO0084	0	NS	90%		SM	Silty SAND, dark brown (10YR 3/3), wet.	
34								
35	SO0085	0	NS	100%		ML	Sandy SILT, very dark gray (5YR 3/1), moist, slight odor.	
36								
37	SO0086	0	NS	100%		SM	Silty SAND, dark brown (10YR 3/3), wet.	
38								
39	SO0087	0	NS	100%				
40						ML	Sandy SILT, very dark gray (2.5YR 3/1), wet, slight organic odor.	
							Total Depth 40.0' BGS.	

Drilled By: Cascade Drilling, Inc.
Drill Method: Geoprobe
Drill Date: 19 October 2000

Well Casing Elevation: NA
Ground Surface Elevation: 35.09'
Borehole Diameter: 2"

Datum: City of Portland Datum

Sheet: 2 of 2

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-4

Ground surface: Grass

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0								
1	SO0033	0	NS	100%		SM	Silty SAND, very dark yellowish brown (10YR 3/4), moist, no odor.	BACKFILLED w/ BENTONITE GROUT
2							Color change to very dark gray (10YR 3/1).	
3	SO0034	0	SS	100%		ML	*Sandy SILT, black (7.5YR 2/1), moist, slight* organic odor.	
4								
5				0%				
6								
7	SO0035	0	NS	100%		SM	Gravelly, silty SAND, dark brown (7.5YR 3/2), moist, no odor.	
8								
9				0%				
10								
11	SO0036	0	SS	100%			Color change to dark brown (10YR 3/3), moist, no odor.	
12								
13				0%				
14						ML	Sandy SILT lens w/ some dark staining, moist, no odor.	
15	SO0037	0	NS	100%		SM	Slightly silty SAND, dark brown (10YR 3/3), moist, no odor.	
16								
17	SO0038	0	NS	50%				
18								
19				0%				
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 18 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.18'

Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-4

Ground surface: Grass

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20						SM	Slightly silty SAND, dark brown (10YR 3/3), moist, no odor.	
21	SO0040	0	NS	40%				
22								
23	SO0041	0	NS	100%			Reddish-brown banding from 23 - 24' BGS, becoming wetter with depth. Water level @ 24.2' BGS.	
24								
25	SO0042	0	NS	50%			Color change to very dark gray (7.5Y 3/1), wet, slight organic odor. Collected groundwater grab sample GW1003 from temporary well screen @ 22-32' BGS.	
26								
27	SO0043	0	NS	100%		ML	SILT lens.	
						SM	Slightly, silty SAND, dark brown (10YR 3/3), wet, slight odor.	
28								
29	SO0044	0	NS	50%				
30							Wood debris (2" thick) @ 30' BGS.	
31	SO0045	0	NS	100%		ML	Slightly sandy SILT, black (5YR 2.5/1), becoming finer with depth, moist, no odor.	
32								
33				10%			Increasing sand (coarser grained) content, w/ depth.	
34								
35	SO0046	6.5	NS	100%				
36						SM	Silty SAND, black (2.5YR 2.5/1), wet, no odor.	
37	SO0047	0	NS	70%				
38						ML	SILT, black (5YR 2.5/1) wet, no odor.	
39	SO0048	0	NS	100%				
40							Total Depth 40.0' BGS.	

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 18 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.18'

Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-5

Ground surface: Gravel

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0								
1	SO0049	0	NS	100%		SM	Silty SAND, very dark, grayish brown (10YR 3/2) w/ some gravel up to 1" dia. (road base), slightly moist, no odor. (fill)	
2								
3	SO0050	0	NS	100%			Sand/aggregate lens (1" thick).	
4								
5				0%			Grading finer @ ~ 5.0 - 5.5" BGS.	BACKFILLED w/ BENTONITE GROUT
6							Color change to dark yellowish brown (10YR 3/4), slightly silty, moist no odor.	
7	SO0051	0	NS	100%				
8								
9	SO0052	0	NS	10%			Wood debris.	
10								
11	SO0053	0	NS	100%				
12							1/2" band of red discoloration (resembles oxidized iron) @ 11.25' BGS.	
13	SO0054	0	NS	50%				
14							Color change to dark grayish brown (10YR 3/2), uniform SAND.	
15	SO0055	0	NS	100%				
16								
17	SO0056	0	NS	70%				
18								
19	SO0057	0	NS	100%				
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 19 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.05'

Borehole Diameter: 2"

Datum: City of Portland Datum

EX™

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-5

Ground surface: Gravel

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION
20							
21	SO0058	0	NS	90%		SM	Silty SAND, dark grayish brown (10YR 3/2), moist, no odor.
22							Some red mottling and banding.
23	SO0059	0	NS	100%			Water level @ 23.5' BGS.
24							Color change to very dark gray (7.5YR 3/1), wet, slight organic odor. Groundwater saturation observed @ 24' BGS.
25	SO0060	0	NS	50%			Collected groundwater grab sample GW1002 from temporary well screen @ 24-28' BGS.
26						ML	Sandy SILT, very dark gray (7.5YR 3/1), w/ wood debris, wet, slight organic odor.
27	SO0061	0	NS	100%			
28						SM	Silty SAND, dark grayish brown (10YR 3/2), wet no odor.
29	SO0062	0	NS	90%			
30						ML	Sandy SILT, very dark gray (7.5YR 3/1) w/ scattered wood debris, wet.
31	SO0063	0	NS	100%			
32						SM	Grading to silty SAND.
33	SO0064	0	NS	90%		ML	Grading to sandy SILT, scattered wood debris, wet, slight organic odor.
34							
35	SO0065	0	NS	100%			
36							
37	SO0066	0	NS	100%			
38							
39	SO0067	0	NS	100%			
40							Total Depth 40.0' BGS.

WELL CONSTRUCTION DETAIL (not applicable)

BACKFILLED w/ BENTONITE GROUT

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 19 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.05'

Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-6

Ground surface: Gravel

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0						SM	Gravelly, silty SAND, black (10YR 2/1), moist, no odor. (fill)	BACKFILLED w/ BENTONITE GROUT
1	SO0088	0	NS	90%				
2							Color change to very dark, grayish brown (10YR 3/2).	
3	SO0089	0	NS	100%			Color change to dark brown (10YR 3/3), moist, no odor (more uniform sand with less gravel).	
4								
5	SO0090	0	NS	90%				
6							Red mottling and banding.	
7	SO0091	0	NS	100%				
8						ML	SILT lens, very dark gray (10YR 3/1), moist, no odor.	
						SM	Silty SAND, dark brown (10YR 3/3), moist.	
9				0%				
10							Color change to dark brown (10YR 3/3).	
11	SO0092	0	NS	100%				
12								
13				10%				
14								
15	SO0093	0	NS	100%				
16								
17	SO0094	0	NS	100%				
18								
19	SO0095	0	NS	100%				
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 19 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.00'

Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202
Project: Oregon Steel Mills
Client: Oregon Steel Mills
Location: Portland, OR

Borehole : B-6
Ground surface: Gravel
Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21	SO0096	0	NS	80%		SM	Silty SAND, dark brown (10YR 3/3), moist.	
22								
23	SO0097	0	NS	100%			Water level @ 23.25' BGS. Dark red banding and color change to very dark gray (7.5YR 3/1), wet, no odor.	
24								
25	SO0098	0	NS	10%			Wood debris.	BACKFILLED w/ BENTONITE GROUT
26								
27	SO0099	0	NS	100%		ML	Sandy SILT, very dark gray (2.5YR 3/1), moist, slight organic odor.	
28								
29				0%				
30								
31	SO0100	0	NS	100%				
32								
33	SO0101	0	NS	70%		SM	Silty fine SAND, very dark gray (2.5YR 3/1), wet, slight organic odor.	
34								
35	SO0102	0	NS	100%				
36								
37	SO0103	0	NS	100%			Collected groundwater grab sample GW1005 from temporary well screen @ 36-40' BGS.	
38								
39	SO0104	0	NS	100%			Wood debris.	
40							Total Depth 40.0' BGS.	

Drilled By: Cascade Drilling, Inc.
Drill Method: Geoprobe
Drill Date: 19 October 2000

Well Casing Elevation: NA
Ground Surface Elevation: 35.00'
Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202
Project: Oregon Steel Mills
Client: Oregon Steel Mills
Location: Portland, OR

Borehole : B-7

Ground surface: Gravel
Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0								
1	SO0105	0	NS	70%		SP	Gravelly SAND, very dark gray (10YR 3/1), moist, no odor. (fill)	
2								
3	SO0106	0	NS	100%			Color change to dark brown (7.5YR 3/2) increasing gravel fraction.	
4								
5				10%				BACKFILLED w/ BENTONITE GROUT
6								
7	SO0107	0	NS	100%			Concrete layer encountered from 7.0 - 7.5' BGS.	
8								
9				0%				
10						SM	Silty SAND, dark brown (10YR 3/3) with some gravel, moist, no odor. (fill)	
11	SO0108	0	NS	100%				
12							Becoming wetter with depth.	
13				0%				
14								
15	SO0109	0	NS	50%				
16							Wood chips, gravel and gravel fragments.	
17				0%				
18								
19	SO0110	0	NS	40%				
20								

Drilled By: Cascade Drilling, Inc.
Drill Method: Geoprobe
Drill Date: 20 October 2000

Well Casing Elevation: NA
Ground Surface Elevation: 34.79'
Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202
Project: Oregon Steel Mills
Client: Oregon Steel Mills
Location: Portland, OR

Borehole : B-7
Ground surface: Gravel
Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21	SO0111	0	NS	90%		SM	Gravelly, silty SAND, dark brown (10YR 3/3) moist, no odor. (fill)	
22								
23	SO0112	0	NS	100%				
24						SM	Silty SAND, dark brown (10YR 3/3), moist, no odor. Becomes saturated @ 24' BGS.	
25	SO0113	0	NS	80%			Wood debris.	BACKFILLED w/ BENTONITE GROUT
26							Water level @ 26.07' BGS.	
27	SO0114	0	NS	100%			Collected groundwater grab samples GW1006 from temporary well screen @ 26-30' BGS. Color change to very dark gray (2.5YR 3/1).	
28						ML	Sandy SILT, very dark gray (2.5YR 3/1), wet, slight organic odor.	
29	SO0115	0	NS	50%			Wood debris.	
30							Color change to very dark gray (5YR 3/1), becoming finer grained.	
31	SO0116	0	NS	100%				
32								
33				0%				
34								
35				0%				
36						SM	Silty SAND, wet, no odor.	
37	SO0117	0	NS	80%				
38								
39	SO0118	0	NS	100%				
40							Total Depth 40.0' BGS.	

Drilled By: Cascade Drilling, Inc.
Drill Method: Geoprobe
Drill Date: 20 October 2000

Well Casing Elevation: NA
Ground Surface Elevation: 34.79'
Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-8

Ground surface: Grass

Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0								
1				0%		SP	Gravelly SAND, very dark gray (2.5YR 3/1) gravel up to 1" dia., moist, no odor. (fill)	
2								
3	SO0119	0	NS	100%		SM	Grading to silty SAND, dark brown (10YR 3/3), moist, no odor. (fill)	
4								
5				0%				BACKFILLED w/ BENTONITE GROUT
6								
7	SO0120	0	NS	20%				
8							Red mottling and banding.	
9	SO0121	0	NS	100%				
10							Basaltic and concrete fragments from 10 - 11' BGS.	
11	SO0122	0	NS	100%				
12								
13				0%				
14								
15	SO0123	0	NS	100%				
16								
17				0%				
18								
19				0%				
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 20 October 2000

Well Casing Elevation: NA

Ground Surface Elevation: 35.85'

Borehole Diameter: 2"

Datum: City of Portland Datum

Project No: 8601526.001.0202
Project: Oregon Steel Mills
Client: Oregon Steel Mills
Location: Portland, OR

Borehole : B-8
Ground surface: Gravel
Geologist: Adam Bonin

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21				0%		SM	Silty SAND, dark brown (10YR 3/3) moist, no odor. (fill)	
22								
23	SO0124	0	NS	50%			Water level @ 22.92' BGS.	
24								
25	SO0125	0	NS	90%			Gravelly (angular) w/ some gray sand bands.	BACKFILLED w/ BENTONITE GROUT
26						SM	Silty SAND, dark brown (10YR 3/3), wet, no odor.	
27	SO0126	0	NS	100%				
28								
29	SO0127	0	NS	100%				
30							Basaltic gravel fragments.	
31	SO0128	0	NS	100%				
32								
33				0%				
34								
35	SO0129	0	NS	50%		ML	Sandy SILT, dark gray (5YR 4/1) w/ reddish brown mottling, wet, no odor.	
36						SM	Silty SAND, dark brown (10YR 3/3), wet, not odor.	
37	SO0130	0	NS	100%			Collected groundwater grab samples GW1011 from temporary well screen @ 36-40' BGS.	
38						ML	Sandy SILT, dark gray w/ red mottling, wet.	
39	SO0131 SO0132	0	NS	100%			Mottling absent.	
40							Total Depth 40.0' BGS.	

Drilled By: Cascade Drilling, Inc.
Drill Method: Geoprobe
Drill Date: 20 October 2000

Well Casing Elevation: NA
Ground Surface Elevation: 35.85'
Borehole Diameter: 2"

Datum: City of Portland Datum

Ex™

Project No: 8601526.001.0302

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Test Pit : B-9

Ground surface: Gravel / slag

Geologist: E. Dodak / L. McWilliams

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0						GW	Sandy GRAVEL, white (N8 /), slag to 1.5" dia., dry.	BACKFILLED w/ BENTONITE GROUT
1						SM	Gravelly, silty SAND, brown (10YR 4/3), fine to medium sand, gravel to 2" dia., moist. Color change very dark gray (10YR 3/1) at 1.5' BGS, rounded gravel to 3/4" dia.	
2	SO0152						Total depth of excavation 2.0' BGS.	
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Excavated By: International Mill Services

Method: Track hoe

Date: 11 September 2001

Well Casing Elevation: NA

Ground Surface Elevation: 35.32'

Borehole Diameter: N/A

Datum: City of Portland Datum

Sheet: 1 of 1

EX™

Project No: 8601526.001.0302

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Test Pit : B-11

Ground surface: Gravel / slag

Geologist: E. Dodak / L. McWilliams

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0	SO0153					GW	Sandy GRAVEL, white (N8 /), slag to 2.0" dia., dry.	BACKFILLED w/ BENTONITE GROUT
1						SM	Gravelly, silty SAND, very dark gray-brown (10YR 3/2), some metal and wire debris, moist.	
2							Total depth of excavation 1.1' BGS.	
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Excavated By: International Mill Services

Method: Track hoe

Date: 11 September 2001

Well Casing Elevation: NA

Ground Surface Elevation: 34.88'

Borehole Diameter: N/A

Datum: City of Portland Datum

Sheet: 1 of 1

Project No: 8601526.001.0302

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-12

Ground surface: Gravel / slag

Geologist: E. Dodak / L. McWilliams

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0						GW	Sandy GRAVEL (slag), gray (NS/1), dry.	
1							Concrete	
2						SP	Fine to medium SAND, dark gray-brown (10YR 4/2), trace to some silt, moist.	
3		3.9		90%				
4								
5								BACKFILLED w/ BENTONITE GROUT
6		3.9		65%				
7						SM	Silty SAND, very dark gray (7.5YR 3/1), ~20-25% silt, micaceous; wet.	
8						SP	Fine to medium SAND, dark gray (7.5YR 4/1), trace silt, moist.	
9							Color change to dark gray (10YR 4/1), increased SILT content, fine sand only, some organics, very moist to wet.	
10		2.3		60%				
11						SM/ ML	Sandy SILT/silty SAND, dark gray (10YR 4/1) some organics, micaceous, very moist to wet.	
12						SP	Fine to medium SAND, dark gray (10YR 4/1), trace to some silt, wet.	
							Total depth of borehole 12.0' BGS.	
13								
14								
15								
16								
17								
18								
19								
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 12 September 2001

Well Casing Elevation: NA

Ground Surface Elevation: 34.19'

Borehole Diameter: 2"

Datum: City of Portland Datum

Sheet: 1 of 1

Project No: 8601526.001.0302

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-13

Ground surface: Asphalt

Geologist: E. Dodak / L. McWilliams

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							ASPHALT ~ 1'	BACKFILLED w/ BENTONITE GROUT
1						SM	Silty fine SAND, dark green-gray (10Y 4/1) some mica in sand, trace organics, moist.	
2		5.1		100%				
3								
4								
5								
6		3.6		75%		ML	Sandy SILT, dark green-gray (10Y 4/1), very fine sand, moist.	
7						SM	Silty SAND, dark green-gray (10Y 4/1), fine to medium sand, some organics, wet.	
8								
9								
10		3.6		100%		ML	Very fine sandy SILT, dark green-gray (10Y 4/1), trace organics, very moist.	
11						SM/ ML	Interlayered silty SAND/sandy SILT, dark green-gray (10Y 4/1), trace organics (some carbonized), micaceous, moist to wet.	
12							Total depth of borehole 12.0' BGS.	
13								
14								
15								
16								
17								
18								
19								
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 11 September 2001

Well Casing Elevation: NA

Ground Surface Elevation: 32.60'

Borehole Diameter: 2"

Datum: City of Portland Datum

Sheet: 1 of 1

EX™

Project No: 8601526.001.0302

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-14

Ground surface: Gravel/slag

Geologist: E. Dodak / L. McWilliams

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0		5.5				GW	Test pit excavation (0-4' BGS), silty sandy GRAVEL (slag), gray (7.5YR 5/1), dry.	BACKFILLED w/ BENTONITE GROUT
4		5.5		90%		SM	Silty very fine SAND, dark gray-brown (10YR 4/2), micaceous, trace organics, moist.	
6						ML/SM	Interlayered silty SAND/sandy SILT, dark gray-brown (2.5Y 4/2), very fine sand, micaceous, trace organics, moist.	
8		2.3		70%		SM	Silty very fine to fine SAND, dark gray-brown (2.5Y 4/2), ~15% silt, micaceous, wet. As above, with increased silt content (~ 40%) very fine sand only, trace organics (roots), moist to wet.	
12							Total depth of borehole 12.0' BGS.	
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 12 September 2001

Well Casing Elevation: NA

Ground Surface Elevation: 32.93'

Borehole Diameter: 2"

Datum: City of Portland Datum

Sheet: 1 of 1

Project No: 8601526.001.0302

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-15

Ground surface: Gravel / slag

Geologist: E. Dodak / L. McWilliams

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0–1		3.6		100%		GW	Silty, sandy GRAVEL, dark gray-brown (10YR 4/2) fine gravel/slag to 3/4" dia., fine to coarse sand, dry to moist.	BACKFILLED w/ BENTONITE GROUT
2–3	SO0151	3.6		100%			As above w/ trace to some white crystalline material, trace red "brick-like" material, very moist.	
4–5		6.6		50%			As above, no white crystalline material, slag/gravel to 1" dia., wet.	
5–6						SP	Medium SAND, dark gray-green (5G 2.5/2), trace to some fine sand, trace silt, wet.	
6							Total depth of borehole 6.0' BGS.	

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 11 September 2001

Well Casing Elevation: NA

Ground Surface Elevation: 35.45'

Borehole Diameter: 2"

Datum: City of Portland Datum

Sheet: 1 of 1

Project No: 8601526.001.0302

Project: Oregon Steel Mills

Client: Oregon Steel Mills

Location: Portland, OR

Borehole : B-16

Ground surface: Gravel / slag

Geologist: E. Dodak / L. McWilliams

DEPTH (Feet)	SAMPLE NUMBER	OVM (ppm)	SHEEN	% RECOVERY	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0								
1		11.0		100%		GW	Silty, sandy GRAVEL, black (7.5YR 2.5/1) fine gravel/slag to 1" dia., fine to coarse sand, dry to moist.	
2	SO0150	9.5		100%			Color change to dark red-brown (10YR 4/6), some red "brick-like" material, increased moisture.	BACKFILLED w/ BENTONITE GROUT
3						SP	Medium SAND, dark gray-green (5G 2.5/2), trace to some fine and coarse sand, trace silt, wet @ ~3.5' BGS.	
4		6.6		80%				
5								
6							Total depth of borehole 6.0' BGS.	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Drilled By: Cascade Drilling, Inc.

Drill Method: Geoprobe

Drill Date: 11 September 2001

Well Casing Elevation: NA

Ground Surface Elevation: 35.47'

Borehole Diameter: 2"

Datum: City of Portland Datum

Sheet: 1 of 1

Appendix H

Phase II Laboratory Analytical Data

RECEIVED
OCT 12 2001
At Exponent

Columbia Analytical Services INC.
An Employee-Owned Company

October 11, 2001 Service Request No: K2106670

Laura McWilliams
Exponent Environmental Group
4000 Kruse Way Place, Building Two, Suite 285
Lake Oswego, OR 97035

Re: Oregon Steel Mills/8601526.001.0302

Dear Laura:

Enclosed are the results of the sample(s) submitted to our laboratory on September 13, 2001. For your reference, these analyses have been assigned our service request number K2106670.

This is a partial report. Results for Metals and PCBs will follow upon completion.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281.

Respectfully submitted,

Columbia Analytical Services, Inc.

Abbie Spielman
Project Chemist

AS/cb

317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 360/ 577-7222 • Fax 360/636-1068

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

The result is an outlier. See case narrative.

control limit criteria is not applicable. See case narrative.

analyte was found in the associated method blank at a level that is significant relative to the sample result.

The result is an estimate amount because the value exceeded the instrument calibration range.

The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

J The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.

The MRL/MDL has been elevated due to a matrix interference.

See case narrative.

Metals Data Qualifiers

The control limit criteria is not applicable. See case narrative.

B The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

E The reported value is estimated because of the presence of matrix interference.

M The duplicate injection precision was not met.

N The Matrix Spike sample recovery is not within control limits. See case narrative.

S The reported value was determined by the Method of Standard Additions (MSA).

J The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.

W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.

i The MRL/MDL has been elevated due to a matrix interference.

X See case narrative.

* The duplicate analysis not within control limits. See case narrative.

+ The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

* The result is an outlier. See case narrative.

The control limit criteria is not applicable. See case narrative.

A A tentatively identified compound, a suspected aldol-condensation product.

B The analyte was found in the associated method blank at a level that is significant relative to the sample result.

C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.

D The reported result is from a dilution.

E The result is an estimate amount because the value exceeded the instrument calibration range.

J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.

P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).

U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.

i The MRL/MDL has been elevated due to a chromatographic interference.

X See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.

L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

e chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a ater amount of heavier molecular weight constituents than the calibration standard.

O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

Z The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Exponent Environmental Group, Inc.	**Service Request No.:**	K2106670
Project:	Oregon Steel Mills	**Date Received:**	9/13/01
Sample Matrix:	Soil/Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Seventeen samples were received for analysis at Columbia Analytical Services on 9/13/01. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Total Metals

Results will follow upon completion.

Diesel Range Organics by NWTPHDx

Relative Percent Difference (RPD) Exceptions:
The Relative Percent Difference (RPD) control criterion was exceeded for the replicate analysis of Diesel Range Organics and Residual Range Organics in sample GW1200. The variability in the results is attributed to the heterogeneous character of the sample. The sample contained large amounts of sediment, which leads to heterogeneity between duplicate samples. The sample was re-analyzed with similar results. No further corrective action was feasible.

No other anomalies associated with the analysis of these samples were observed.

BTEX by EPA Method 8021

No anomalies associated with the analysis of these samples were observed.

PCB Aroclors by EPA Method 8082

Second Source Verification Exceptions:
Second source verification standards are analyzed following instrument calibration to verify the accuracy of the calibration standards. This check is evaluated using the same criteria as Continuing Calibration Verification (CCV) standards. The control criterion was exceeded for Aroclor 1016 on the RTX-50 column in the Second Source Verification for Initial Calibration (ICAL) ID CAL968. The RTX-5 column was also flagged, however this is due to a difference in calculations between the Target software and Stealth software. In this case Target is the chromatographic software and therefore results generated from Target are determined to be the valid results. Final results show the recovery acceptable in both sets of software with the flag persisting in the Stealth report. The field samples analyzed using this calibration did not contain the analyte in question. No further corrective action was feasible.

Approved by D **Date** 10/11/01

Continuing Calibration Verification (CCV) Exceptions:
The analysis of PCBs by Method 8082 requires the use of dual columns. In the case of an unacceptable CCV for one column in an analysis sequence results for the associated samples will be reported from the column with the acceptable CCV.

The Continuing Calibration Verification criterion was exceeded for Decachlorobiphenyl in some CCVs associated with the analysis batch KWG0106549 and KWG0106590. Results for the associated samples were quantitated from the column with an acceptable CCV. No further corrective action was feasible.

The Continuing Calibration Verification criterion was exceeded for Aroclor 1260 in some CCVs associated with the analysis batch KWG0106549. Results for the associated samples were quantitated from the column with an acceptable CCV. No further corrective action was feasible.

No other anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260B

Initial Calibration (ICAL) Verification Exceptions:
The primary evaluation criterion was exceeded for Methylene Chloride in Initial Calibration (ICAL) ID MS05\CAL1041. In accordance with CAS standard operating procedures and as specified in the analytical method, an alternative evaluation was performed using the average relative standard deviation of all analytes in the calibration. The calibration meets the alternative evaluation criteria.

The primary evaluation criterion was exceeded forv1,2,3-Trichloropropane and Naphthalene in Initial Calibration (ICAL) ID MS13\CAL1016. In accordance with CAS standard operating procedures and as specified in the analytical method, an alternative evaluation was performed using the average relative standard deviation of all analytes in the calibration. The calibration meets the alternative evaluation criteria.

Internal Standard Exceptions:
The Internal Standard recovery of 1,4-Dichlorobenzene-d4 in samples SD0020 and SD0021 was outside control criterion due to suspected matrix interference. Samples were re-analyzed with a similar result for the Internal Standard. Results quantified using this Internal Standard may include a high bias resulting from the matrix effects on the analysis. The data has been flagged to indicate a high degree of uncertainty for results quantified using the Internal Standard in question.

Surrogate Exceptions:
The control criterion was exceeded for the surrogate Dibromofluoromethane in SD00150 and SD00151. Since the problem may indicate a potential bias in the analysis, the samples were re-analyzed. The re-analyses confirms the original results. The initial analyses have been reported.

The control criterion was exceeded for the surrogate Dibromofluoromethane in sample SD0151DMS due to matrix interferences. The chromatogram showed components that prevented accurate quantitation of the surrogate. No further corrective action was taken

The control criteria were exceeded for the surrogates Dibromofluoromethane and Toluene-d8 in sample SD0151MS due to matrix interferences. The chromatogram showed components that prevented accurate quantitation of the surrogate. No further corrective action was taken.

Matrix Spike (MS) Exceptions:
The Matrix Spike recovery of 1,1-Dichloroethene, Trichloroethene (TCE) in sample S00151MS/DMS was outside control criterion due to matrix interference. The chromatogram indicated the presence of matrix components that prevented accurate quantitation of the target analytes. No further corrective action was taken. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicates the analytical batch was in control. The matrix spike outlier does not indicate a significant data quality problem. No further corrective action was feasible.

Approved by _____ **Date** 10/10/01

No other anomalies associated with the analysis of these samples were observed.

Approved by_____ Date 10/11/01

Chain of Custody Documentation

Project: (Name and Nu...) Oregon Steel Mills - 86015.0001 0302

Exponent Contact: Laura McWilliams Office: ___

Ship to: Lake Oswego

Lab Contact/Phone: Abbie Spielman

Samplers: Laura McWilliams

Exponent Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

0007

Analyses Requested

Sample No.	Tag No.	Date	Time	Matrix	VOC's by EPA 8260	NW-TPH-Dx	As, Ba, Cd, Co, Cr, Cu, Pb, Mn, Ni, Ag, V, Zn by ICP/MS	Hg by EPA 747	PCB's by EPA 8082		Extra Container	Archive	Remarks
1 SD0020	45096	9/10/01	1125	Soil	X								
↓	45097	9/10/01	1125	Soil		X	X	X					
2 SD0021	45098	9/10/01	1135	Soil	X								
↓	45099	9/10/01	1135	Soil		X	X	X	X				
3 SD0022	45100	9/10/01	1205	Soil		X	X	X	X				
4 SD0023	45198	9/10/01	1250	Soil		X	X	X					
5 SD0024	45199	9/10/01	1330	Soil					X				
6 SW0002	42401	9/10/01	1400	Water					X				
	42402	9/10/01	1400	Water		X							
	42403	9/10/01	1400	Water							X		
	42404	9/10/01	1400	Water							X		
	42405	9/10/01	1400	Water			X	X					
	42406	9/10/01	1400	Water	X								
	42407	9/10/01	1400	Water							X		
↓	42408	9/10/01	1400	Water							X		

Laura McWilliams

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes ___

Priority: ☒ Normal ☐ Rush Rush time period ___

Shipped via: ☐ FedEx/UPS ☒ Courier Other ___

Condition of Samples Upon Receipt: ___

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: Laura McWilliams (Signature) Date/Time: 9/12/01 6pm Received by: Tracy Black CAS (Signature) Date/Time: 9/13/01 1100

Relinquished by: ___ (Signature) Date/Time: ___ Received by: ___ (Signature) Date/Time: ___

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

3431

Project: (Name and Number) Oregon Steel Mills - 8601526.001 0302

Exponent Contact: _____ Office: _____

Ship to: Laura McWilliams, Lake Oswego

Lab Contact/Phone: Abbie Spielman

Samplers: Laura McWilliams

Exponent Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

00008

	Sample No.	Tag No.	Date	Time	Matrix	VOCs by EPA 8260	Cd, Cr, Cu, Pb, Mn, Zn, by ICP/MS	NWTPH-Dx	BTEX by EPA 8021	PCB's by EPA 8082		Extra Container	Archive	Remarks
7	SO0150	42409	9/11/01	1005	Soil		X							
		42410	9/11/01	1005	Soil	X								
8	SO0151	42411	9/11/01	1100	Soil		X							
		42412	9/11/01	1100	Soil	X								
9	GW1200	42413	9/11/01	1445	Water			X						
		42414	9/11/01	1445	Water							X		
		42415	9/11/01	1445	Water				X					
		42416	9/11/01	1445	Water							X		
		42417	9/11/01	1445	Water							X		
10	SO0152	42418	9/11/01	1615	Soil					X				
11	SO0153	42419	9/11/01	1620	Soil					X				
12	GW1201	42420	9/12/01	1130	Water			X						
		42421	9/12/01	1130	Water							X		
		42422	9/12/01	1130	Water					X				
		42423	9/12/01	1130	Water							X		
		42424	9/12/01	1130	Water							X		

Laura McWilliams

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water

OTHER - Please identify codes _____

Priority: ☐ Normal ☐ Rush Rush time period _____

Shipped via: ☐ FedEx/UPS ☒ Courier Other _____

Condition of Samples Upon Receipt: _____

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: Laura McWilliams (Signature) Date/Time: 9/12/01 6pm Received by: Tracy Black - ARI (Signature) Date/Time: 9/13/01 1700

Relinquished by: _____ (Signature) Date/Time: _____ Received by: _____ (Signature) Date/Time: _____

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

Project: (Name and Nu...) Oregon Steel Mills - 8601526.0302

Exponent Contact: _____ Office: _____

Ship to: Laura McWilliams, Lake Oswego

Lab Contact/Phone: Abbie Spielman

Samplers: Laura McWilliams

Exponent Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

60010

Sample No.	Tag No.	Date	Time	Matrix	VOCs by EPA 8260	Cd, Cr, Cu, Pb, Mn, Zn by ICP/MS	NWTPH-Dx	BTEX by EPA 8021			Extra Container	Archive	Remarks
GW1202	42425	9/12/01	1145	Water			X						
	42426	9/12/01	1145	Water							X		
	42427	9/12/01	1145	Water				X					
	42428	9/12/01	1145	Water							X		
	42429	9/12/01	1145	Water							X		
GW1203	42430	9/12/01	1200	Water		X							
	42431	9/12/01	1200	Water	X								
	42432	9/12/01	1200	Water							X		
	42433	9/12/01	1200	Water							X		
GW1204	42434	9/12/01	1215	Water				X					
	42435	9/12/01	1215	Water							X		
	42436	9/12/01	1215	Water							X		
	42437	9/12/01	1215	Water			X						
	42438	9/12/01	1215	Water							X		
GW1205	42439	9/12/01	1315	Water			X						
	42440	9/12/01	1315	Water							X		
	42441	9/12/01	1315	Water				X					
	42442	9/12/01	1315	Water							X		17 - trips not run.
	42443	9/12/01	1315	Water							X		

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water

OTHER - Please identify codes _____

Priority: ☐ Normal ☐ Rush Rush time period _____

Shipped via: ☐ FedEx/UPS ☒ Courier Other _____

Condition of Samples Upon Receipt: _____

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: Laura McWilliams (Signature) Date/Time: 9/12/01 6pm Received by: Tracy Black - CAS (Signature) Date/Time: 9/13/01 1700

Relinquished by: _____ (Signature) Date/Time: _____ Received by: _____ (Signature) Date/Time: _____

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

3426

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient: Exponent Environmental Group, Inc. **Service Request:** K2106670
roj Oregon Steel Mills/8601526.001.0302
Matrix: Soil

Total Solids

rep Method: NONE **Units:** PERCENT
nalysis Method: 160.3M **Basis:** WET
est Notes:

ample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
D0020	K2106670-001	09/10/2001	09/13/2001	09/14/2001	72.2	
D0021	K2106670-002	09/10/2001	09/13/2001	09/14/2001	66.6	
D0022	K2106670-003	09/10/2001	09/13/2001	09/14/2001	97.5	
D0023	K2106670-004	09/10/2001	09/13/2001	09/14/2001	69.9	
D0024	K2106670-005	09/10/2001	09/13/2001	09/14/2001	19.2	
00150	K2106670-007	09/11/2001	09/13/2001	09/14/2001	83.4	
00151	K2106670-008	09/11/2001	09/13/2001	09/14/2001	89.6	
00152	K2106670-010	09/11/2001	09/13/2001	09/14/2001	89.0	
00153	K2106670-011	09/11/2001	09/13/2001	09/14/2001	87.0	

00010

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ient:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oject:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
mple Matrix:	Soil	**Date Received:**	09/13/2001
		Date Analyzed:	09/14/2001

Duplicate Sample Summary
Total Solids

ep Method:	NONE	**Units:**	PERCENT
alysis Method:	160.3M	**Basis:**	WET
st Notes:			

mple Name	**Lab Code**	**Sample Result**	**Duplicate Sample Result**	**Average**	**Relative Percent Difference**	**Result Notes**
)0020	K2106670-001	72.2	74.2	73.2	3	

00011

Mod. Exponent Level III
data validation
for 10/18/01
James R Weinkauf

BTEX
Method 8021 B

Organic Analysis:
BTEX

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

lient: Exponent Environmental Group, Inc. **Service Request:** K2106670
roject: Oregon Steel Mills/8601526.001.0302

Cover Page - Organic Analysis Data Package
BTEX

Sample Name	Lab Code	Date Collected	Date Received
GW1200	K2106670-009	09/11/2001	09/13/2001
GW1202	K2106670-013	09/12/2001	09/13/2001
GW1204	K2106670-015	09/12/2001	09/13/2001
GW1205	K2106670-016	09/12/2001	09/13/2001

certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the nditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on oppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

re: MS Name: Meena Shah

ate: 9/26/01 Title: Scientist 00017

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

lient:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
roject:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/11/2001
ample Matrix:	Water	**Date Received:**	09/13/2001

BTEX

ample Name:	GW1200	**Units:**	ug/L
ab Code:	K2106670-009	**Basis:**	NA
xtraction Method:	EPA 5030B	**Level:**	Low
nalysis Method:	8021B		

nalyte Name	**Result**	**Q**	**MRL**	**Dilution Factor**	**Date Extracted**	**Date Analyzed**	**Extraction Lot**	**Note**
enzene	ND	U	0.50	1	09/21/01	09/21/01	KWG0106073	
oluene	ND	U	1.0	1	09/21/01	09/21/01	KWG0106073	
thylbenzene	ND	U	1.0	1	09/21/01	09/21/01	KWG0106073	
,p-Xylenes	ND	U	1.0	1	09/21/01	09/21/01	KWG0106073	
-Xylene	ND	U	1.0	1	09/21/01	09/21/01	KWG0106073	

urrogate Name	**%Rec**	**Control Limits**	**Date Analyzed**	**Note**
4-Difluorobenzene	87	70-130	09/21/01	Acceptable

omments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oje	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/12/2001
r [redacted] latrix:	Water	**Date Received:**	09/13/2001

BTEX

mple Name:	GW1202	**Units:**	ug/L
b Code:	K2106670-013	**Basis:**	NA
traction Method:	EPA 5030B	**Level:**	Low
alysis Method:	8021B		

alyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
nzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106073	
luene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
ylbenzene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
p-Xylenes	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
Xylene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	

rrogate Name	%Rec	Control Limits	Date Analyzed	Note
[redacted]orobenzene	87	70-130	09/20/01	Acceptable

omments:

00019

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/12/2001
nple Matrix:	Water	**Date Received:**	09/13/2001

BTEX

nple Name:	GW1204	**Units:**	ug/L
) Code:	K2106670-015	**Basis:**	NA
raction Method:	EPA 5030B	**Level:**	Low
alysis Method:	8021B		

alyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
nzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106073	
uene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
ylbenzene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
-Xylenes	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
ylene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	

rrogate Name	%Rec	Control Limits	Date Analyzed	Note
-Difluorobenzene	87	70-130	09/20/01	Acceptable

mments: 00020

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oject:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/12/2001
Matrix:	Water	**Date Received:**	09/13/2001

BTEX

nple Name:	GW1205	**Units:**	ug/L
b Code:	K2106670-016	**Basis:**	NA
traction Method:	EPA 5030B	**Level:**	Low
alysis Method:	*8021B*		

alyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
nzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106073	
luene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
ıylbenzene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
o-Xylenes	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
Xylene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	

rrogate Name	%Rec	Control Limits	Date Analyzed	Note
-Difluorobenzene	87	70-130	09/20/01	Acceptable

mments:

00021

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	NA
mple Matrix:	Water	**Date Received:**	NA

BTEX

mple Name:	Method Blank	**Units:**	ug/L
Code:	KWG0106073-4	**Basis:**	NA
raction Method:	EPA 5030B	**Level:**	Low
alysis Method:	8021B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
nzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106073	
uene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
ylbenzene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
-Xylenes	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	
ylene	ND	U	1.0	1	09/20/01	09/20/01	KWG0106073	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
-Difluorobenzene	87	70-130	09/20/01	Acceptable

mments:

00022

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

lient: Exponent Environmental Group, Inc. **Service Request:** K2106670
'oj Oregon Steel Mills/8601526.001.0302
Matrix: Water

Surrogate Recovery Summary
BTEX

ıtraction Method: EPA 5030B **Units:** PERCENT
nalysis Method: 8021B **Level:** Low

ımple Name	Lab Code	Sur1
W1200	K2106670-009	87
W1202	K2106670-013	87
W1204	K2106670-015	87
W1205	K2106670-016	87
ethod Blank	KWG0106073-4	87
atch QC	K2106618-002	75
atch QCMS	KWG0106073-1	75
atch QCDMS	KWG0106073-2	75
ab Control Sample	KWG0106073-3	89

urrogate Recovery Control Limits (%)

ur1 = 1,4-Difluorobenzene	70-130

esults flagged with an asterisk (*) indicate values outside control criteria.
esults flagged with a pound (#) indicate the control criteria is not applicable.

00023

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	09/20/2001
		Time Analyzed:	07:32

Internal Standard Area and RT Summary
BTEX

ID:	J:\GC06\DATA\092001B\0920R002.D	**Lab Code:**	KWG0106072-1
rument ID:	GC06	**Analysis Lot:**	KWG0106072
ılysis Method:	8021B	**Column :**	DB-624

		a,a,a-Trifluorotoluene	
		Area	**RT**
	Results ==>	544,986	10.80
	Upper Limit ==>	1,089,972	10.95
	Lower Limit ==>	272,493	10.65
	ICAL Result ==>	720,670	NA
ɔciated Analyses			
ch QCMS	KWG0106073-1	670,094	10.87
ch QCDMS	KWG0106073-2	655,693	10.85
Control Sample	KWG0106073-3	537,070	10.81
thod Blank	KWG0106073-4	509,697	10.83

ults flagged with an asterisk (*) indicate values outside control criteria.

00024

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ient:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oje	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	09/20/2001
		Time Analyzed:	17:11

Internal Standard Area and RT Summary
BTEX

le ID:	J:\GC06\DATA\092001B\0920R017.D	**Lab Code:**	KWG0106072-2
strument ID:	GC06	**Analysis Lot:**	KWG0106072
ıalysis Method:	8021B	**Column :**	DB-624

		a,a,a-Trifluorotoluene	
		Area	**RT**
	Results ==>	526,794	10.87
	Upper Limit ==>	1,053,588	11.02
	Lower Limit ==>	263,397	10.72
	ICAL Result ==>	720,670	NA
sociated Analyses			
ıtch QC	K2106618-002	642,265	10.91
W1204	K2106670-015	556,642	10.93
W1205	K2106670-016	556,070	10.95
W1202	K2106670-013	557,698	10.95
W1200	K2106670-009	561,355	10.96

tesults flagged with an asterisk (*) indicate values outside control criteria.

00025

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/21/2001
Time Analyzed: 01:19

Internal Standard Area and RT Summary
BTEX

e ID: J:\GC06\DATA\092001B\0920R030.D
trument ID: GC06
alysis Method: 8021B

Lab Code: KWG0106072-3
Analysis Lot: KWG0106072
Column : DB-624

	a,a,a-Trifluorotoluene	
	Area	**RT**
Results ==>	576,961	10.96
Upper Limit ==>	1,153,922	11.11
Lower Limit ==>	288,481	10.81
ICAL Result ==>	720,670	NA

ociated Analyses

sults flagged with an asterisk (*) indicate values outside control criteria.

00026

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oje	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
atrix:	Water	**Date Analyzed:**	09/20/2001

Matrix Spike/Duplicate Matrix Spike Summary
BTEX

mple Name:	Batch QC	**Units:**	ug/L
b Code:	K2106618-002	**Basis:**	NA
traction Method:	EPA 5030B	**Level:**	Low
alysis Method:	8021B	**Extraction Lot:**	KWG0106073

		Batch QCMS KWG0106073-1 Matrix Spike			Batch QCDMS KWG0106073-2 Duplicate Matrix Spike					
alyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
nzene	2.6	102	100	100	101	100	98	67-131	1	30
luene	ND	98.9	100	99	98.1	100	98	64-129	1	30
hylbenzene	18	116	100	98	115	100	97	61-126	1	30
p-Xylenes	28	219	200	95	217	200	94	50-150	1	30
Xylene	4.9	100	100	95	99.7	100	95	50-150	1	30

esults flagged with an asterisk (*) indicate values outside control criteria.

esults flagged with a pound (#) indicate the control criteria is not applicable.

rcent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00027

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ient:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
mple Matrix:	Water	**Date Analyzed:**	09/20/2001

Lab Control Spike Summary
BTEX

traction Method:	EPA 5030B	**Units:**	ug/L
ıalysis Method:	8021B	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0106073

	Lab Control Sample KWG0106073-3 Lab Control Spike			
ıalyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
nzene	98.5	100	98	69-118
luene	96.3	100	96	66-124
ıylbenzene	99.2	100	99	63-127
p-Xylenes	196	200	98	50-150
Xylene	95.8	100	96	50-150

sults flagged with an asterisk (*) indicate values outside control criteria.

rcent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00028

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oje	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
latrix:	Water	**Date Analyzed:**	09/20/2001
		Time Analyzed:	13:22

Method Blank Summary
BTEX

mple Name:	Method Blank	**File ID:**	J:\GC06\DATA\092001B\0920R011.D
b Code:	KWG0106073-4	**Instrument ID:**	GC06
traction Method:	EPA 5030B	**Level:**	Low
alysis Method:	8021B	**Extraction Lot:**	*KWG0106073*

is Method Blank applies to the following analyses:

mple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
tch QCMS	KWG0106073-1	J:\GC06\DATA\092001B\0920R005.D	09/20/01	09:38
tch QCDMS	KWG0106073-2	J:\GC06\DATA\092001B\0920R006.D	09/20/01	10:15
b Control Sample	KWG0106073-3	J:\GC06\DATA\092001B\0920R008.D	09/20/01	11:29
tch QC	K2106618-002	J:\GC06\DATA\092001B\0920R020.D	09/20/01	19:05
V1204	K2106670-015	J:\GC06\DATA\092001B\0920R025.D	09/20/01	22:13
V1205	K2106670-016	J:\GC06\DATA\092001B\0920R026.D	09/20/01	22:50
V1202	K2106670-013	J:\GC06\DATA\092001B\0920R027.D	09/20/01	23:27
V1200	K2106670-009	J:\GC06\DATA\092001B\0920R028.D	09/21/01	00:04

00029

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
mple Matrix:	Water	**Date Analyzed:**	09/20/2001
		Time Analyzed:	11:29

Lab Control Sample Summary
BTEX

mple Name:	Lab Control Sample	**File ID:**	J:\GC06\DATA\092001B\0920R008.D
b Code:	KWG0106073-3	**Instrument ID:**	GC06
traction Method:	EPA 5030B	**Level:**	Low
ıalysis Method:	8021B	**Extraction Lot:**	KWG0106073

is Lab Control Sample applies to the following analyses:

mple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
tch QCMS	KWG0106073-1	J:\GC06\DATA\092001B\0920R005.D	09/20/01	09:38
tch QCDMS	KWG0106073-2	J:\GC06\DATA\092001B\0920R006.D	09/20/01	10:15
:thod Blank	KWG0106073-4	J:\GC06\DATA\092001B\0920R011.D	09/20/01	13:22
tch QC	K2106618-002	J:\GC06\DATA\092001B\0920R020.D	09/20/01	19:05
V1204	K2106670-015	J:\GC06\DATA\092001B\0920R025.D	09/20/01	22:13
V1205	K2106670-016	J:\GC06\DATA\092001B\0920R026.D	09/20/01	22:50
V1202	K2106670-013	J:\GC06\DATA\092001B\0920R027.D	09/20/01	23:27
V1200	K2106670-009	J:\GC06\DATA\092001B\0920R028.D	09/21/01	00:04

00030

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
oje[redacted] Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/13/2001

Initial Calibration Summary
BTEX

libration ID: CAL985 **Column:** DB-624
trument ID: GC06

vel ID	File ID	Level ID	File ID
	J:\GC06\DATA\081301B\0813R023.D	E	J:\GC06\DATA\081301B\0813R027.D
	J:\GC06\DATA\081301B\0813R024.D	F	J:\GC06\DATA\081301B\0813R028.D
	J:\GC06\DATA\081301B\0813R025.D	G	J:\GC06\DATA\081301B\0813R029.D
	J:\GC06\DATA\081301B\0813R026.D		

alyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
nzene	A	0.50	2.76	B	1.0	2.77	C	5.0	2.71	D	50	2.71	E	100	2.58
	F	200	2.55	G	500	2.42									
luene	A	0.50	2.75	B	1.0	2.69	C	5.0	2.62	D	50	2.56	E	100	2.48
	F	200	2.41	G	500	2.25									
ylbenzene	A	0.50	2.13	B	1.0	2.14	C	5.0	2.20	D	50	2.19	E	100	2.10
	F	200	2.06	G	500	1.91									
p-Xylenes	A	1.0	2.55	B	2.0	2.49	C	10	2.54	D	100	2.46	E	200	2.32
	F	400	2.22	G	1000	1.95									
Xy[redacted]	A	0.50	2.43	B	1.0	2.34	C	5.0	2.24	D	50	2.21	E	100	2.10
	F	200	2.06	G	500	1.90									
l-Difluorobenzene	A	25	1.01	B	30	0.990	C	40	1.00	D	50	1.02	E	100	1.21
	F	150	0.942												

sults flagged with an asterisk (*) indicate values outside control criteria.

00031

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
oject: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/13/2001

Initial Calibration Summary
BTEX

libration ID: CAL985 **Column:** DB-624
trument ID: GC06

		Calibration Evaluation					RRF Evaluation		
nalyte Name	Compound Type	Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
enzene	MS	AverageRF	% RSD	4.9		≤20	2.64		0.01
oluene	MS	AverageRF	% RSD	6.8		≤20	2.54		0.01
thylbenzene	MS	AverageRF	% RSD	4.7		≤20	2.10		0.01
,p-Xylenes	MS	AverageRF	% RSD	9.3		≤20	2.36		0.01
-Xylene	MS	AverageRF	% RSD	8.2		≤20	2.18		0.01
4-Difluorobenzene	SURR	AverageRF	% RSD	8.9		≤20	1.03		

ults flagged with an asterisk (*) indicate values outside control criteria.

00032

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

lient: Exponent Environmental Group, Inc.
roject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 08/13/2001
Date Analyzed: 08/14/2001

Second Source Calibration Verification
BTEX

alibration Type: Internal Standard
nalysis Method: 8021B

Calibration ID: CAL985
Units: ug/L

ile ID: J:\GC06\DATA\081301B\0813R032.D

Column ID: DB-624

nalyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
enzene	100	100	2.64	2.63	0	NA	± 15 %	AverageRF
oluene	100	100	2.54	2.55	1	NA	± 15 %	AverageRF
thylbenzene	100	110	2.10	2.22	5	NA	± 15 %	AverageRF
,p-Xylenes	200	210	2.36	2.48	5	NA	± 15 %	AverageRF
-Xylene	100	100	2.18	2.26	3	NA	± 15 %	AverageRF

esults flagged with an asterisk (*) indicate values outside control criteria.
SPCC Compound ‡ CCC Compound

00033

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ient: Exponent Environmental Group, Inc.
oject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/20/2001

Continuing Calibration Verification Summary
BTEX

libration Type: Internal Standard
alysis Method: 8021B

Calibration Date: 08/13/2001
Calibration ID: CAL985
Analysis Lot: KWG0106072
Units: ug/L
Column ID: DB-624

e ID: J:\GC06\DATA\092001B\0920R002.D

alyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
nzene	100	96	2.64	2.54	-4	NA	± 15 %	AverageRF
luene	100	95	2.54	2.40	-5	NA	± 15 %	AverageRF
ıylbenzene	100	97	2.10	2.03	-3	NA	± 15 %	AverageRF
p-Xylenes	200	190	2.36	2.25	-5	NA	± 15 %	AverageRF
Xylene	100	92	2.18	2.01	-8	NA	± 15 %	AverageRF
-Difluorobenzene	50	44	1.03	0.912	-11	NA	± 15 %	AverageRF

ults flagged with an asterisk (*) indicate values outside control criteria.

00034

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

lient: Exponent Environmental Group, Inc.
roject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/20/2001

Continuing Calibration Verification Summary
BTEX

alibration Type: Internal Standard
nalysis Method: 8021B

Calibration Date: 08/13/2001
Calibration ID: CAL985
Analysis Lot: KWG0106072
Units: ug/L

ile ID: J:\GC06\DATA\092001B\0920R017.D

Column ID: DB-624

nalyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
enzene	100	99	2.64	2.60	-1	NA	± 15 %	AverageRF
oluene	100	98	2.54	2.49	-2	NA	± 15 %	AverageRF
thylbenzene	100	100	2.10	2.09	-0	NA	± 15 %	AverageRF
ı,p-Xylenes	200	200	2.36	2.34	-1	NA	± 15 %	AverageRF
-Xylene	100	97	2.18	2.11	-3	NA	± 15 %	AverageRF
,4-Difluorobenzene	50	45	1.03	0.917	-11	NA	± 15 %	AverageRF

tesults flagged with an asterisk (*) indicate values outside control criteria.

00035

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/21/2001

Continuing Calibration Verification Summary
BTEX

libration Type: Internal Standard
alysis Method: 8021B

Calibration Date: 08/13/2001
Calibration ID: CAL985
Analysis Lot: KWG0106072
Units: ug/L

e ID: J:\GC06\DATA\092001B\0920R030.D

Column ID: DB-624

alyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
nzene	100	96	2.64	2.53	-4	NA	± 15 %	AverageRF
luene	100	94	2.54	2.38	-6	NA	± 15 %	AverageRF
ıylbenzene	100	96	2.10	2.02	-4	NA	± 15 %	AverageRF
)-Xylenes	200	190	2.36	2.24	-5	NA	± 15 %	AverageRF
Cylene	100	93	2.18	2.03	-7	NA	± 15 %	AverageRF
-Difluorobenzene	50	45	1.03	0.917	-11	NA	± 15 %	AverageRF

sults flagged with an asterisk (*) indicate values outside control criteria.

00036

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ient: *Exponent Environmental Group, Inc.* **Service Request:** K2106670

oject: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
BTEX

alysis Method: 8021B

Analysis Lot: KWG0106072
Instrument ID: GC06
Column: DB-624

le ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
20R002.D	Continuing Calibration Verification	KWG0106072-1	9/20/2001	07:32		9/20/2001	08:01
20R005.D	Batch QCMS	KWG0106073-1	9/20/2001	09:38		9/20/2001	10:07
20R006.D	Batch QCDMS	KWG0106073-2	9/20/2001	10:15		9/20/2001	10:44
20R008.D	Lab Control Sample	KWG0106073-3	9/20/2001	11:29		9/20/2001	11:58
20R011.D	Method Blank	KWG0106073-4	9/20/2001	13:22		9/20/2001	13:51
20R012.D	ZZZZZZ	ZZZZZZ	9/20/2001	14:00		9/20/2001	14:29
20R013.D	ZZZZZZ	ZZZZZZ	9/20/2001	14:38		9/20/2001	15:07
20R014.D	ZZZZZZ	ZZZZZZ	9/20/2001	15:16		9/20/2001	15:45
20R015.D	ZZZZZZ	ZZZZZZ	9/20/2001	15:55		9/20/2001	16:24
20R017.D	Continuing Calibration Verification	KWG0106072-2	9/20/2001	17:11		9/20/2001	17:40
20R019.D	ZZZZZZ	ZZZZZZ	9/20/2001	18:27		9/20/2001	18:56
20R020.D	Batch QC	K2106618-002	9/20/2001	19:05		9/20/2001	19:34
[illegible].D	ZZZZZZ	ZZZZZZ	9/20/2001	19:43		9/20/2001	20:12
20R022.D	ZZZZZZ	ZZZZZZ	9/20/2001	20:20		9/20/2001	20:49
20R023.D	ZZZZZZ	ZZZZZZ	9/20/2001	20:58		9/20/2001	21:27
20R024.D	ZZZZZZ	ZZZZZZ	9/20/2001	21:35		9/20/2001	22:04
20R025.D	GW1204	K2106670-015	9/20/2001	22:13		9/20/2001	22:42
20R026.D	GW1205	K2106670-016	9/20/2001	22:50		9/20/2001	23:19
20R027.D	GW1202	K2106670-013	9/20/2001	23:27		9/20/2001	23:56
20R028.D	GW1200	K2106670-009	9/21/2001	00:04		9/21/2001	00:33
20R030.D	Continuing Calibration Verification	KWG0106072-3	9/21/2001	01:19		9/21/2001	01:48

esults flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00037

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ient:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
oject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/21/2001
mple Matrix:	Water		

Extraction Prep Log
BTEX

:traction Method:	EPA 5030B	**Extraction Lot:**	KWG0106073
ıalysis Method:	8021B	**Level:**	Low

mple Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
W1200	K2106670-009	09/11/01	09/13/01	5ml	5ml	NA	
W1202	K2106670-013	09/12/01	09/13/01	5ml	5ml	NA	
W1204	K2106670-015	09/12/01	09/13/01	5ml	5ml	NA	
W1205	K2106670-016	09/12/01	09/13/01	5ml	5ml	NA	
ethod Blank	KWG0106073-4	NA	NA	5ml	5ml	NA	
tch QC	K2106618-002	NA	NA	5ml	5ml	NA	
tch QCMS	KWG0106073-1	NA	NA	5ml	5ml	NA	
tch QCDMS	KWG0106073-2	NA	NA	5ml	5ml	NA	
b Control Sample	KWG0106073-3	NA	NA	5ml	5ml	NA	

sults flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Organic Analysis:
BTEX

Validation Package

Organic Analysis:
BTEX

Validation Package

QC Reports

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
ject: Oregon Steel Mills/8601526.001.0302
r atrix: Water

Surrogate Recovery Summary
BTEX

traction Method: EPA 5030B **Units:** PERCENT
alysis Method: *8021B* **Level:** Low

nple Name	Lab Code	Sur1
V1200	K2106670-009	87
V1202	K2106670-013	87
V1204	K2106670-015	87
V1205	K2106670-016	87
thod Blank	KWG0106073-4	87
tch QC	K2106618-002	75
tch QCMS	KWG0106073-1	75
tch QCDMS	KWG0106073-2	75
b Control Sample	KWG0106073-3	89

urrogate Recovery Control Limits (%)

ur1 = 1,4-Difluorobenzene 70-130

esults flagged with an asterisk (*) indicate values outside control criteria.
esults flagged with a pound (#) indicate the control criteria is not applicable.

00041

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

it:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	09/20/2001
		Time Analyzed:	07:32

Internal Standard Area and RT Summary
BTEX

ID:	J:\GC06\DATA\092001B\0920R002.D	**Lab Code:**	KWG0106072-1
ument ID:	GC06	**Analysis Lot:**	KWG0106072
lysis Method:	8021B	**Column :**	DB-624

		a,a,a-Trifluorotoluene	
		Area	RT
	Results ==>	544,986	10.80
	Upper Limit ==>	1,089,972	10.95
	Lower Limit ==>	272,493	10.65
	ICAL Result ==>	720,670	NA
ciated Analyses			
h QCMS	KWG0106073-1	670,094	10.87
h QCDMS	KWG0106073-2	655,693	10.85
Control Sample	KWG0106073-3	537,070	10.81
hod Blank	KWG0106073-4	509,697	10.83

ults flagged with an asterisk (*) indicate values outside control criteria.

01042

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/20/2001
Time Analyzed: 17:11

Internal Standard Area and RT Summary
BTEX

ID: J:\GC06\DATA\092001B\0920R017.D
rument ID: GC06
lysis Method: 8021B

Lab Code: KWG0106072-2
Analysis Lot: KWG0106072
Column : DB-624

		a,a,a-Trifluorotoluene	
		Area	RT
	Results ==>	526,794	10.87
	Upper Limit ==>	1,053,588	11.02
	Lower Limit ==>	263,397	10.72
	ICAL Result ==>	720,670	NA
ciated Analyses			
:h QC	K2106618-002	642,265	10.91
1204	K2106670-015	556,642	10.93
1205	K2106670-016	556,070	10.95
1202	K2106670-013	557,698	10.95
1200	K2106670-009	561,355	10.96

ults flagged with an asterisk (*) indicate values outside control criteria.

00043

SuperSet Reference: RR11233

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	Date Analyzed:	09/21/2001
		Time Analyzed:	01:19

Internal Standard Area and RT Summary
BTEX

ID:	J:\GC06\DATA\092001B\0920R030.D	Lab Code:	KWG0106072-3
rument ID:	GC06	Analysis Lot:	KWG0106072
lysis Method:	8021B	Column :	DB-624

	a,a,a-Trifluorotoluene	
	Area	RT
Results ==>	576,961	10.96
Upper Limit ==>	1,153,922	11.11
Lower Limit ==>	288,481	10.81
ICAL Result ==>	720,670	NA

ciated Analyses

ults flagged with an asterisk (*) indicate values outside control criteria.

00044

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
je	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
atrix:	Water	**Date Analyzed:**	09/20/2001

Matrix Spike/Duplicate Matrix Spike Summary
BTEX

ıple Name:	Batch QC	**Units:**	ug/L
Code:	K2106618-002	**Basis:**	NA
raction Method:	EPA 5030B	**Level:**	Low
ılysis Method:	*8021B*	**Extraction Lot:**	KWG0106073

	Sample	Batch QCMS KWG0106073-1 Matrix Spike			Batch QCDMS KWG0106073-2 Duplicate Matrix Spike			%Rec		RPD
ılyte Name	**Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**Limits**	**RPD**	**Limit**
ızene	2.6	102	100	100	101	100	98	67-131	1	30
uene	ND	98.9	100	99	98.1	100	98	64-129	1	30
ylbenzene	18	116	100	98	115	100	97	61-126	1	30
-Xylenes	28	219	200	95	217	200	94	50-150	1	30
ylene	4.9	100	100	95	99.7	100	95	50-150	1	30

ılts flagged with an asterisk (*) indicate values outside control criteria.
ılts flagged with a pound (#) indicate the control criteria is not applicable.
cent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00045

SuperSet Reference: RR11233

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
ple Matrix:	Water	**Date Analyzed:**	09/20/2001

Lab Control Spike Summary
BTEX

raction Method:	EPA 5030B	**Units:**	ug/L
lysis Method:	8021B	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0106073

	Lab Control Sample KWG0106073-3 Lab Control Spike			
lyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
zene	98.5	100	98	69-118
ıene	96.3	100	96	66-124
ylbenzene	99.2	100	99	63-127
-Xylenes	196	200	98	50-150
ylene	95.8	100	96	50-150

ılts flagged with an asterisk (*) indicate values outside control criteria.

cent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
j[redacted]	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
atrix:	Water	**Date Analyzed:**	09/20/2001
		Time Analyzed:	13:22

Method Blank Summary
BTEX

nple Name:	Method Blank	**File ID:**	J:\GC06\DATA\092001B\0920R011.D
Code:	KWG0106073-4	**Instrument ID:**	GC06
raction Method:	EPA 5030B	**Level:**	Low
alysis Method:	8021B	**Extraction Lot:**	KWG0106073

s Method Blank applies to the following analyses:

nple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ch QCMS	KWG0106073-1	J:\GC06\DATA\092001B\0920R005.D	09/20/01	09:38
ch QCDMS	KWG0106073-2	J:\GC06\DATA\092001B\0920R006.D	09/20/01	10:15
Control Sample	KWG0106073-3	J:\GC06\DATA\092001B\0920R008.D	09/20/01	11:29
ch QC	K2106618-002	J:\GC06\DATA\092001B\0920R020.D	09/20/01	19:05
/1204	K2106670-015	J:\GC06\DATA\092001B\0920R025.D	09/20/01	22:13
/1205	K2106670-016	J:\GC06\DATA\092001B\0920R026.D	09/20/01	22:50
/1202	K2106670-013	J:\GC06\DATA\092001B\0920R027.D	09/20/01	23:27
/12[redacted]	K2106670-009	J:\GC06\DATA\092001B\0920R028.D	09/21/01	00:04

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
nple Matrix:	Water	**Date Analyzed:**	09/20/2001
		Time Analyzed:	11:29

Lab Control Sample Summary
BTEX

nple Name:	Lab Control Sample	**File ID:**	J:\GC06\DATA\092001B\0920R008.D
) Code:	KWG0106073-3	**Instrument ID:**	GC06
raction Method:	EPA 5030B	**Level:**	Low
alysis Method:	8021B	**Extraction Lot:**	KWG0106073

s Lab Control Sample applies to the following analyses:

nple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ch QCMS	KWG0106073-1	J:\GC06\DATA\092001B\0920R005.D	09/20/01	09:38
ch QCDMS	KWG0106073-2	J:\GC06\DATA\092001B\0920R006.D	09/20/01	10:15
thod Blank	KWG0106073-4	J:\GC06\DATA\092001B\0920R011.D	09/20/01	13:22
ch QC	K2106618-002	J:\GC06\DATA\092001B\0920R020.D	09/20/01	19:05
'1204	K2106670-015	J:\GC06\DATA\092001B\0920R025.D	09/20/01	22:13
'1205	K2106670-016	J:\GC06\DATA\092001B\0920R026.D	09/20/01	22:50
'1202	K2106670-013	J:\GC06\DATA\092001B\0920R027.D	09/20/01	23:27
'1200	K2106670-009	J:\GC06\DATA\092001B\0920R028.D	09/21/01	00:04

011048

Organic Analysis:
BTEX

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

:nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/11/2001
ıple Matrix:	Water	**Date Received:**	09/13/2001

BTEX

ıple Name:	GW1200	**Units:**	ug/L
) Code:	K2106670-009	**Basis:**	NA
raction Method:	EPA 5030B	**Level:**	Low
ılysis Method:	8021B		

alyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ızene	ND	U	0.50	1	09/21/01	09/21/01	KWG0106073	
uene	ND	U	1.0	1	09/21/01	09/21/01	KWG0106073	
ylbenzene	ND	U	1.0	1	09/21/01	09/21/01	KWG0106073	
-Xylenes	ND	U	1.0	1	09/21/01	09/21/01	KWG0106073	
ylene	ND	U	1.0	1	09/21/01	09/21/01	KWG0106073	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
-Difluorobenzene	87	70-130	09/21/01	Acceptable

nments:

Mod. Exponent Level III
Data Validation
10/17/01
James R. Weinberg

Diesel and Residual Range Organics
Method NWTPH - Dx

Organic Analysis:
Diesel and Residual Range Organics

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

:nt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ject: Oregon Steel Mills/8601526.001.0302

Cover Page - Organic Analysis Data Package
Diesel and Residual Range Organics

Sample Name	Lab Code	Date Collected	Date Received
SD0020	K2106670-001	09/10/2001	09/13/2001
SD0021	K2106670-002	09/10/2001	09/13/2001
SD0022	K2106670-003	09/10/2001	09/13/2001
SD0023	K2106670-004	09/10/2001	09/13/2001
SW0002	K2106670-006	09/10/2001	09/13/2001
GW1200	K2106670-009	09/11/2001	09/13/2001
GW1201	K2106670-012	09/12/2001	09/13/2001
GW1202	K2106670-013	09/12/2001	09/13/2001
GW1204	K2106670-015	09/12/2001	09/13/2001
GW1205	K2106670-016	09/12/2001	09/13/2001

ertify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the nditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on opy ..kette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

...ure: _____ Name: Todd Poyhair

te: 10/9/01 Title: 11152

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ient:	Exponent Environmental Group, Inc.	Service Request:	K2106670
oject:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/10/2001
mple Matrix:	Water	Date Received:	09/13/2001

Diesel and Residual Range Organics

mple Name:	SW0002	Units:	ug/L
b Code:	K2106670-006	Basis:	NA
traction Method:	EPA 3510C	Level:	Low
alysis Method:	NWTPH-Dx		

alyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
sel Range Organics (DRO)	ND	U	250	1	09/14/01	09/23/01	KWG0105906	
sidual Range Organics (RRO)	ND	U	500	1	09/14/01	09/23/01	KWG0105906	

rrogate Name	%Rec	Control Limits	Date Analyzed	Note
Terphenyl	90	50-150	09/23/01	Acceptable
Triacontane	91	50-150	09/23/01	Acceptable

mments:

0153

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
jec	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/11/2001
atrix:	Water	Date Received:	09/13/2001

Diesel and Residual Range Organics

ıple Name:	GW1200	Units:	ug/L
Code:	K2106670-009	Basis:	NA
raction Method:	EPA 3510C	Level:	Low
lysis Method:	NWTPH-Dx		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
el Range Organics (DRO)	4800	F	270	1	09/14/01	09/23/01	KWG0105906	
dual Range Organics (RRO)	6500	O	530	1	09/14/01	09/23/01	KWG0105906	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
rphenyl	78	50-150	09/23/01	Acceptable
iacontane	76	50-150	09/23/01	Acceptable

ments:

00154

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/12/2001
mple Matrix:	Water	Date Received:	09/13/2001

Diesel and Residual Range Organics

mple Name:	GW1201	Units:	ug/L
Code:	K2106670-012	Basis:	NA
raction Method:	EPA 3510C	Level:	Low
alysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
sel Range Organics (DRO)	1200	H	270	1	09/14/01	09/23/01	KWG0105906	
idual Range Organics (RRO)	1700	O	530	1	09/14/01	09/23/01	KWG0105906	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	88	50-150	09/23/01	Acceptable
triacontane	89	50-150	09/23/01	Acceptable

mments:

0W155

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
e:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/12/2001
atrix:	Water	**Date Received:**	09/13/2001

Diesel and Residual Range Organics

ıple Name:	GW1202	**Units:**	ug/L
Code:	K2106670-013	**Basis:**	NA
raction Method:	EPA 3510C	**Level:**	Low
lysis Method:	NWTPH-Dx		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
el Range Organics (DRO)	1300	H	270	1	09/14/01	09/23/01	KWG0105906	
dual Range Organics (RRO)	2100	O	530	1	09/14/01	09/23/01	KWG0105906	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	89	50-150	09/23/01	Acceptable
riacontane	91	50-150	09/23/01	Acceptable

mments: 00156

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/12/2001
ıple Matrix:	Water	**Date Received:**	09/13/2001

Diesel and Residual Range Organics

ıple Name:	GW1204	**Units:**	ug/L
Code:	K2106670-015	**Basis:**	NA
raction Method:	EPA 3510C	**Level:**	Low
ılysis Method:	NWTPH-Dx		

ılyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
el Range Organics (DRO)	ND	U	250	1	09/14/01	09/23/01	KWG0105906	
dual Range Organics (RRO)	ND	U	500	1	09/14/01	09/23/01	KWG0105906	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	87	50-150	09/23/01	Acceptable
riacontane	87	50-150	09/23/01	Acceptable

ıments:

0#157

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt: Exponent Environmental Group, Inc.
e Oregon Steel Mills/8601526.001.0302
atrix: Water

Service Request: K2106670
Date Collected: 09/12/2001
Date Received: 09/13/2001

Diesel and Residual Range Organics

ple Name: GW1205
Code: K2106670-016

raction Method: EPA 3510C
lysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
el Range Organics (DRO)	1100	Y	250	1	09/14/01	09/18/01	KWG0105906	
dual Range Organics (RRO)	ND	U	500	1	09/14/01	09/18/01	KWG0105906	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	83	50-150	09/18/01	Acceptable
riacontane	86	50-150	09/18/01	Acceptable

UU158

mments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	Date Collected:	NA
ıple Matrix:	Water	Date Received:	NA

Diesel and Residual Range Organics

ıple Name:	Method Blank	Units:	ug/L
Code:	KWG0105906-6	Basis:	NA
raction Method:	EPA 3510C	Level:	Low
ılysis Method:	NWTPH-Dx		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
el Range Organics (DRO)	ND	U	250	1	09/14/01	09/23/01	KWG0105906	
dual Range Organics (RRO)	ND	U	500	1	09/14/01	09/23/01	KWG0105906	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	102	50-150	09/23/01	Acceptable
riacontane	99	50-150	09/23/01	Acceptable

00159

ıments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
je	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
atrix:	Soil	**Date Received:**	09/13/2001
		Date Prepared:	09/19/2001

Diesel and Residual Range Organics

aple Name:	SD0020	**Units:**	mg/Kg
Code:	K2106670-001	**Basis:**	Dry
raction Method:	EPA 3550B	**Level:**	Low
alysis Method:	NWTPH-Dx		

alyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
sel Range Organics (DRO)	1000	H	330	1	09/19/01	09/26/01	KWG0106004	
idual Range Organics (RRO)	5900	O	1400	1	09/19/01	09/26/01	KWG0106004	

rrogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	98	50-150	09/26/01	Acceptable
riacontane	121	50-150	09/26/01	Acceptable

mments:

00160

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

:nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/10/2001
ıple Matrix:	Soil	Date Received:	09/13/2001
		Date Prepared:	09/19/2001

Diesel and Residual Range Organics

ıple Name:	SD0021	Units:	mg/Kg
Code:	K2106670-002	Basis:	Dry
raction Method:	EPA 3550B	Level:	Low
ılysis Method:	NWTPH-Dx		

ılyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
el Range Organics (DRO)	1100	H	360	1	09/19/01	09/26/01	KWG0106004	
idual Range Organics (RRO)	6100	O	1500	1	09/19/01	09/26/01	KWG0106004	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	97	50-150	09/26/01	Acceptable
riacontane	100	50-150	09/26/01	Acceptable

aments:

00161

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
Project:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
Matrix:	Soil	**Date Received:**	09/13/2001
		Date Prepared:	09/19/2001

Diesel and Residual Range Organics

Sample Name:	SD0022	**Units:**	mg/Kg
Lab Code:	K2106670-003	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	900	H	130	1	09/19/01	09/27/01	KWG0106004	
Residual Range Organics (RRO)	3000	O	510	1	09/19/01	09/27/01	KWG0106004	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	94	50-150	09/27/01	Acceptable
n-Triacontane	92	50-150	09/27/01	Acceptable

Comments: 00162

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ent:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/10/2001
ple Matrix:	Soil	Date Received:	09/13/2001

Diesel and Residual Range Organics

ple Name:	SD0023	Units:	mg/Kg
Code:	K2106670-004	Basis:	Dry
raction Method:	EPA 3550B	Level:	Low
lysis Method:	NWTPH-Dx		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
el Range Organics (DRO)	400	H	340	1	09/19/01	09/27/01	KWG0106004	
idual Range Organics (RRO)	2900	O	1400	1	09/19/01	09/27/01	KWG0106004	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	105	50-150	09/27/01	Acceptable
riacontane	111	50-150	09/27/01	Acceptable

uments:

00163

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
jer	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	NA
atrix:	Soil	**Date Received:**	NA

Diesel and Residual Range Organics

ıple Name:	Method Blank	**Units:**	mg/Kg
Code:	KWG0106004-10	**Basis:**	Dry
raction Method:	EPA 3550B	**Level:**	Low
lysis Method:	NWTPH-Dx		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
el Range Organics (DRO)	ND	U	25	1	09/19/01	09/25/01	KWG0106004	
dual Range Organics (RRO)	ND	U	100	1	09/19/01	09/25/01	KWG0106004	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
erphenyl	*92*	*50-150*	*09/25/01*	*Acceptable*
riacontane	81	50-150	09/25/01	Acceptable

nments:

U0164

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
oject: Oregon Steel Mills/8601526.001.0302
mple Matrix: Water

Surrogate Recovery Summary
Diesel and Residual Range Organics

traction Method: EPA 3510C **Units:** PERCENT
alysis Method: NWTPH-Dx **Level:** Low

mple Name	Lab Code	Sur1	Sur2
'0002	K2106670-006	90	91
V1200	K2106670-009	78	76
V1201	K2106670-012	88	89
V1202	K2106670-013	89	91
V1204	K2106670-015	87	87
V1205	K2106670-016	83	86
V1200DUP	KWG0105906-3	88	93
thod Blank	KWG0105906-6	102	99
) Control Sample	KWG0105906-4	82	78
plicate Lab Control Sample	KWG0105906-5	87	83

rrogate Recovery Control Limits (%)

r1 = o-Terphenyl	50-150
r2 = n-Triacontane	50-150

ults flagged with an asterisk (*) indicate values outside control criteria.
ults flagged with a pound (#) indicate the control criteria is not applicable.

UU165

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
oject: Oregon Steel Mills/8601526.001.0302
atrix: Soil

Surrogate Recovery Summary
Diesel and Residual Range Organics

traction Method: EPA 3550B **Units:** PERCENT
alysis Method: NWTPH-Dx **Level:** Low

mple Name	Lab Code	Sur1	Sur2
0020	K2106670-001	98	121
0021	K2106670-002	97	100
0022	K2106670-003	94	92
0023	K2106670-004	105	111
0022DUP	KWG0106004-7	95	85
thod Blank	KWG0106004-10	92	81
o Control Sample	KWG0106004-8	81	78
plicate Lab Control Sample	KWG0106004-9	90	88

rrogate Recovery Control Limits (%)

r1 = o-Terphenyl	50-150
r2 = n-Triacontane	50-150

ults flagged with an asterisk (*) indicate values outside control criteria.
ults flagged with a pound (#) indicate the control criteria is not applicable.

0W166

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	Date Extracted:	09/14/2001
ple Matrix:	Water	Date Analyzed:	09/23/2001

Duplicate Sample Summary
Diesel and Residual Range Organics

ple Name:	GW1200	Units:	ug/L
Code:	K2106670-009	Basis:	NA
raction Method:	EPA 3510C	Level:	Low
lysis Method:	NWTPH-Dx	Extraction Lot:	KWG0105906

lyte Name	MRL	Sample Result	GW1200DUP KWG0105906-3 Duplicate Sample Result	Average	Relative Percent Difference	RPD Limit
el Range Organics (DRO)	260	4800	1400	3100	110 *	30
dual Range Organics (RRO)	520	6500	1500	4000	123 *	30

ults flagged with an asterisk (*) indicate values outside control criteria.
ults flagged with a pound (#) indicate the control criteria is not applicable.
ent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

OW167

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
je	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
atrix:	Soil	**Date Analyzed:**	09/27/2001

Duplicate Sample Summary
Diesel and Residual Range Organics

ıple Name:	SD0022	**Units:**	mg/Kg
Code:	K2106670-003	**Basis:**	Dry
raction Method:	EPA 3550B	**Level:**	Low
ılysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0106004

ılyte Name	**MRL**	**Sample Result**	SD0022DUP KWG0106004-7 **Duplicate Sample Result**	**Average**	**Relative Percent Difference**	**RPD Limit**
:el Range Organics (DRO)	130	900	790	850	14	40
idual Range Organics (RRO)	500	3000	2800	2900	7	40

ılts flagged with an asterisk (*) indicate values outside control criteria.
ılts flagged with a pound (#) indicate the control criteria is not applicable.
ınt recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00168

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302
nple Matrix: Water

Service Request: K2106670
Date Extracted: 09/14/2001
Date Analyzed: 09/26/2001

Lab Control Spike/Duplicate Lab Control Spike Summary
Diesel and Residual Range Organics

raction Method: EPA 3510C
alysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0105906

	Lab Control Sample KWG0105906-4 Lab Control Spike			Duplicate Lab Control Sample KWG0105906-5 Duplicate Lab Control Spike					
alyte Name	Result	Expected	%Rec	Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
sel Range Organics (DRO)	1770	1600	111	1830	1600	115	50-150	3	30
idual Range Organics (RRO)	1670	1600	104	1710	1600	107	50-150	2	30

lts flagged with an asterisk (*) indicate values outside control criteria.
nt recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00169

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc.
ıjer Oregon Steel Mills/8601526.001.0302
atrix: Soil

Service Request: K2106670
Date Extracted: 09/19/2001
Date Analyzed: 09/25/2001

Lab Control Spike/Duplicate Lab Control Spike Summary
Diesel and Residual Range Organics

traction Method: EPA 3550B
alysis Method: NWTPH-Dx

Units: mg/Kg
Basis: ~~Dry~~
Level: Low
Extraction Lot: KWG0106004

	Lab Control Sample KWG0106004-8 Lab Control Spike			Duplicate Lab Control Sample KWG0106004-9 Duplicate Lab Control Spike					
alyte Name	Result	Expected	%Rec	Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
sel Range Organics (DRO)	175	160	109	200	160	125	50-150	13	40
idual Range Organics (RRO)	146	160	91	167	160	104	50-150	13	40

esults flagged with an asterisk (*) indicate values outside control criteria.
rcent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00170

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ɔct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/14/2001
ɔle Matrix:	Water	**Date Analyzed:**	09/23/2001
		Time Analyzed:	12:19

Method Blank Summary
Diesel and Residual Range Organics

ɔle Name:	Method Blank	**File ID:**	J:\GC04\DATA\092201\0922F064.D
Code:	KWG0105906-6	**Instrument ID:**	GC04
action Method:	EPA 3510C	**Level:**	Low
ysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0105906

Method Blank applies to the following analyses:

ɔle Name	Lab Code	File ID	Date Analyzed	Time Analyzed
205	K2106670-016	J:\GC04\DATA\091701\0917F038.D	09/18/01	00:14
)02	K2106670-006	J:\GC04\DATA\092201\0922F072.D	09/23/01	13:58
200	K2106670-009	J:\GC04\DATA\092201\0922F074.D	09/23/01	14:23
200DUP	KWG0105906-3	J:\GC04\DATA\092201\0922F076.D	09/23/01	14:47
201	K2106670-012	J:\GC04\DATA\092201\0922F078.D	09/23/01	15:12
202	K2106670-013	J:\GC04\DATA\092201\0922F080.D	09/23/01	15:37
204	K2106670-015	J:\GC04\DATA\092201\0922F082.D	09/23/01	16:02
icate Lab Control Sample	KWG0105906-5	J:\GC04\DATA\092601.SEC\0926F011.D	09/26/01	21:33
Control Sample	KWG0105906-4	J:\GC04\DATA\092601.SEC\0926F013.D	09/26/01	21:57

00171

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
atrix:	Soil	**Date Analyzed:**	09/25/2001
		Time Analyzed:	01:01

Method Blank Summary
Diesel and Residual Range Organics

ple Name:	Method Blank	**File ID:**	J:\GC04\DATA\092401\0924F012.D
Code:	KWG0106004-10	**Instrument ID:**	GC04
raction Method:	EPA 3550B	**Level:**	Low
lysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0106004

; Method Blank applies to the following analyses:

ple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Control Sample	KWG0106004-8	J:\GC04\DATA\092401\0924F014.D	09/25/01	01:25
020	K2106670-001	J:\GC04\DATA\092601\0926F022.D	09/26/01	23:35
021	K2106670-002	J:\GC04\DATA\092601\0926F024.D	09/26/01	23:59
022	K2106670-003	J:\GC04\DATA\092601\0926F026.D	09/27/01	00:24
022DUP	KWG0106004-7	J:\GC04\DATA\092601\0926F028.D	09/27/01	00:48
023	K2106670-004	J:\GC04\DATA\092601\0926F030.D	09/27/01	01:12

00172

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
ject: Oregon Steel Mills/8601526.001.0302
nple Matrix: Water

Lab Control Sample/Duplicate Lab Control Sample Summary
Diesel and Residual Range Organics

nple Name:	Lab Control Sample	**Sample Name:**	Duplicate Lab Control Sample
Code:	KWG0105906-4	**Lab Code:**	KWG0105906-5
ID:	J:\GC04\DATA\092601.SEC\0926F013.D	**File ID:**	J:\GC04\DATA\092601.SEC\0926F011.D
trument ID:	GC04	**Instrument ID:**	GC04
e Extracted:	09/14/2001	**Date Extracted:**	09/14/2001
e Analyzed:	09/26/2001	**Date Analyzed:**	09/26/2001
ie Analyzed:	21:57	**Time Analyzed:**	21:33

raction Method:	EPA 3510C	**Level:**	Low
lysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0105906

se Lab Control Samples apply to the following analyses:

nple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
1205	K2106670-016	J:\GC04\DATA\091701\0917F038.D	09/18/01	00:14
hod Blank	KWG0105906-6	J:\GC04\DATA\092201\0922F064.D	09/23/01	12:19
0002	K2106670-006	J:\GC04\DATA\092201\0922F072.D	09/23/01	13:58
1200	K2106670-009	J:\GC04\DATA\092201\0922F074.D	09/23/01	14:23
1200DUP	KWG0105906-3	J:\GC04\DATA\092201\0922F076.D	09/23/01	14:47
1201	K2106670-012	J:\GC04\DATA\092201\0922F078.D	09/23/01	15:12
1202	K2106670-013	J:\GC04\DATA\092201\0922F080.D	09/23/01	15:37
1204	K2106670-015	J:\GC04\DATA\092201\0922F082.D	09/23/01	16:02

00173

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
atrix:	Soil	**Date Analyzed:**	09/25/2001
		Time Analyzed:	01:25

Lab Control Sample Summary
Diesel and Residual Range Organics

nple Name:	Lab Control Sample	**File ID:**	J:\GC04\DATA\092401\0924F014.D
Code:	KWG0106004-8	**Instrument ID:**	GC04
raction Method:	EPA 3550B	**Level:**	Low
alysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0106004

s Lab Control Sample applies to the following analyses:

nple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
hod Blank	KWG0106004-10	J:\GC04\DATA\092401\0924F012.D	09/25/01	01:01
020	K2106670-001	J:\GC04\DATA\092601\0926F022.D	09/26/01	23:35
021	K2106670-002	J:\GC04\DATA\092601\0926F024.D	09/26/01	23:59
022	K2106670-003	J:\GC04\DATA\092601\0926F026.D	09/27/01	00:24
022DUP	KWG0106004-7	J:\GC04\DATA\092601\0926F028.D	09/27/01	00:48
023	K2106670-004	J:\GC04\DATA\092601\0926F030.D	09/27/01	01:12

00174

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
oject: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 04/14/2001

Initial Calibration Summary
Diesel and Residual Range Organics

ibration ID: CAL896 **Column:** RTX-1
trument ID: GC04

el ID	File ID
	J:\GC04\DATA\041401\0414F008.D
	J:\GC04\DATA\041401\0414F010.D
	J:\GC04\DATA\041401\0414F012.D
	J:\GC04\DATA\041401\0414F014.D
	J:\GC04\DATA\041401\0414F016.D
	J:\GC04\DATA\041401\0414F018.D
	J:\GC04\DATA\041401\0414F020.D
	J:\GC04\DATA\041401\0414F048.D
	J:\GC04\DATA\041401\0414F050.D
	J:\GC04\DATA\041401\0414F052.D
	J:\GC04\DATA\041401\0414F054.D
	J:\GC04\DATA\041401\0414F056.D
	J:\GC04\DATA\041401\0414F058.D

Level ID	File ID
N	J:\GC04\DATA\041401\0414F060.D
O	J:\GC04\DATA\041401\0414F062.D
P	J:\GC04\DATA\041401\0414F064.D
Q	J:\GC04\DATA\041401\0414F066.D
R	J:\GC04\DATA\070101\0628F008.D
S	J:\GC04\DATA\070101\0628F010.D
T	J:\GC04\DATA\070101\0628F012.D
U	J:\GC04\DATA\070101\0628F014.D
V	J:\GC04\DATA\070101\0628F016.D
W	J:\GC04\DATA\070101\0628F018.D
X	J:\GC04\DATA\070101\0628F020.D
Y	J:\GC04\DATA\070101\0628F022.D

ılyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
el Range Organics (DRO)															
													J	20	1390
	K	100	1910	L	500	1950	M	2000	2160	N	4000	2030	O	8000	1960
	P	10000	2000	Q	20000	1830									
dual Range Organics (RRO)															
							R	20	1360	S	50	1140	T	200	1260
	U	1000	1210	V	2500	1170	W	5000	1090				Y	10000	959
rphenyl															
							H	2.0	2790	I	5.0	2480			
							M	50	2390	N	100	2360	O	200	2040
	P	250	2110												
iacontane															
							H	2.0	2240	I	5.0	1870			
							M	50	1800	N	100	1670	O	200	1620
	P	250	1680												

ts flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 04/14/2001

Initial Calibration Summary
Diesel and Residual Range Organics

ibration ID: CAL896
rument ID: GC04

Column: RTX-1

		Calibration Evaluation				
alyte Name	**Compound Type**	**Fit Type**	**Eval.**	**Eval. Result**	**Q**	**Control Criteria**
esel Range Organics (DRO)	MS	AverageRF	% RSD	12.0		≤ 20
sidual Range Organics (RRO)	MS	AverageRF	% RSD	10.9		≤ 20
Terphenyl	SURR	AverageRF	% RSD	11.5		≤ 20
Triacontane	SURR	AverageRF	% RSD	12.6		≤ 20

lts flagged with an asterisk (*) indicate values outside control criteria.

00176

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 04/14/2001
Date Analyzed: 04/15/2001 - 07/01/2001

Second Source Calibration Verification
Diesel and Residual Range Organics

bration Type: External Standard
lysis Method: NWTPH-Dx

Calibration ID: CAL896
Units: ppm

ID: J:\GC04\DATA\041401\0414F076.D
J:\GC04\DATA\041401\0414F078.D
J:\GC04\DATA\070101\0628F026.D
J:\GC04\DATA\070101\0628F028.D

Column ID: RTX-1

lyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
el Range Organics (DRO)	1000	930	1900	1780	-7	NA	± 15 %	AverageRF
idual Range Organics (RRO)	1000	1100	1170	1260	8	NA	± 15 %	AverageRF

lts flagged with an asterisk (*) indicate values outside control criteria.
CC Compound ‡ CCC Compound

00177

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ient: Exponent Environmental Group, Inc. **Service Request:** K2106670
oje: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 05/04/2001

Initial Calibration Summary
Diesel and Residual Range Organics

libration ID: CAL897 **Column:** RTX-1
trument ID: GC04

vel ID	File ID	Level ID	File ID
	J:\GC04\DATA\050301.SEC\0503F031.D	J	J:\GC04\DATA\070101.SEC\0628F009.D
	J:\GC04\DATA\050301.SEC\0503F033.D	K	J:\GC04\DATA\070101.SEC\0628F011.D
	J:\GC04\DATA\050301.SEC\0503F035.D	L	J:\GC04\DATA\070101.SEC\0628F013.D
	J:\GC04\DATA\050301.SEC\0503F037.D	M	J:\GC04\DATA\070101.SEC\0628F015.D
	J:\GC04\DATA\050301.SEC\0503F039.D	N	J:\GC04\DATA\070101.SEC\0628F017.D
	J:\GC04\DATA\050301.SEC\0503F041.D	O	J:\GC04\DATA\070101.SEC\0628F019.D
	J:\GC04\DATA\050301.SEC\0503F043.D	P	J:\GC04\DATA\070101.SEC\0628F021.D
	J:\GC04\DATA\050301.SEC\0503F045.D	Q	J:\GC04\DATA\070101.SEC\0628F023.D
	J:\GC04\DATA\070101.SEC\0628F007.D	R	J:\GC04\DATA\070101.SEC\0628F025.D

alyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
sel Range Organics (DRO)															
	K	20	2910	L	100	2930	M	500	2810	N	2000	3070	O	4000	2920
	P	8000	2690	Q	10000	2610	R	20000	2790						
sid ange Organics (RRO)	A	20	1990	B	50	1770	C	200	1750	D	1000	1640	E	2500	1600
	F	5000	1530				H	10000	1520						
erphenyl															
													J	5.0	4060
										N	50	3180	O	100	2960
	P	200	3020	Q	250	3000									
riacontane															
													J	5.0	3630
										N	50	2640	O	100	2520
	P	200	2620	Q	250	2660									

ults flagged with an asterisk (*) indicate values outside control criteria.

00178

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670

ject: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 05/04/2001

Initial Calibration Summary
Diesel and Residual Range Organics

ibration ID: CAL897 **Column:** RTX-1

trument ID: GC04

		Calibration Evaluation				
alyte Name	**Compound Type**	**Fit Type**	**Eval.**	**Eval. Result**	**Q**	**Control Criteria**
esel Range Organics (DRO)	MS	AverageRF	% RSD	5.2		≤ 20
sidual Range Organics (RRO)	MS	AverageRF	% RSD	9.9		≤ 20
Terphenyl	SURR	AverageRF	% RSD	14.4		≤ 20
Triacontane	SURR	AverageRF	% RSD	16.3		≤ 20

s flagged with an asterisk (*) indicate values outside control criteria.

00179

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

at: Exponent Environmental Group, Inc.
ec' Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 05/04/2001
Date Analyzed: 05/04/2001 - 07/01/2001

Second Source Calibration Verification
Diesel and Residual Range Organics

bration Type: External Standard
lysis Method: NWTPH-Dx

Calibration ID: CAL897
Units: ppm

ID: J:\GC04\DATA\050301.SEC\0503F049.D
J:\GC04\DATA\050301.SEC\0503F051.D
J:\GC04\DATA\070101.SEC\0628F029.D

Column ID: RTX-1

lyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
el Range Organics (DRO)	1000	950	2840	2700	-5	NA	± 15 %	AverageRF
dual Range Organics (RRO)	1000	1000	1680	1680	0	NA	± 15 %	AverageRF

dts flagged with an asterisk (*) indicate values outside control criteria.
'CC Compound ‡ CCC Compound

00180

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	09/17/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

ibration Type:	External Standard	**Calibration Date:**	04/14/2001
lysis Method:	NWTPH-Dx	**Calibration ID:**	CAL896
		Analysis Lot:	KWG0105968
		Units:	ppm
ID:	J:\GC04\DATA\091701\0917F034.D	**Column ID:**	RTX-1
	J:\GC04\DATA\091701\0917F036.D		

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
el Range Organics (DRO)	1000	1000	1900	1960	3	NA	± 15 %	AverageRF
dual Range Organics (RRO)	1000	1000	1170	1200	2	NA	± 15 %	AverageRF
erphenyl	50	51	2360	2430	3	NA	± 15 %	AverageRF
riacontane	50	52	1810	1900	5	NA	± 15 %	AverageRF

lts flagged with an asterisk (*) indicate values outside control criteria.

00181

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc.
oje Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/18/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

libration Type: External Standard
alysis Method: NWTPH-Dx

Calibration Date: 04/14/2001
Calibration ID: CAL896
Analysis Lot: KWG0105968
Units: ppm
Column ID: RTX-1

e ID: J:\GC04\DATA\091701\0917F060.D
J:\GC04\DATA\091701\0917F062.D

alyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
sel Range Organics (DRO)	1000	1000	1900	1970	4	NA	± 15 %	AverageRF
sidual Range Organics (RRO)	1000	1000	1170	1190	2	NA	± 15 %	AverageRF
erphenyl	50	52	2360	2450	4	NA	± 15 %	AverageRF
riacontane	50	52	1810	1890	4	NA	± 15 %	AverageRF

esults flagged with an asterisk (*) indicate values outside control criteria.

00182

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/23/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

bration Type: External Standard
lysis Method: NWTPH-Dx

Calibration Date: 04/14/2001
Calibration ID: CAL896
Analysis Lot: KWG0106117
Units: ppm
Column ID: RTX-1

ID: J:\GC04\DATA\092201\0922F060.D
J:\GC04\DATA\092201\0922F062.D

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
el Range Organics (DRO)	1000	1100	1900	2130	12	NA	± 15 %	AverageRF
lual Range Organics (RRO)	1000	1000	1170	1180	1	NA	± 15 %	AverageRF
rphenyl	50	55	2360	2620	11	NA	± 15 %	AverageRF
iacontane	50	56	1810	2030	12	NA	± 15 %	AverageRF

alts flagged with an asterisk (*) indicate values outside control criteria.

00183

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc.
j Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/23/2001 - 09/24/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

ibration Type: External Standard
alysis Method: NWTPH-Dx

Calibration Date: 04/14/2001
Calibration ID: CAL896
Analysis Lot: KWG0106117
Units: ppm
Column ID: RTX-1

: ID: J:\GC04\DATA\092201\0922F090.D
J:\GC04\DATA\092201\0922F092.D

alyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
sel Range Organics (DRO)	1000	980	1900	1860	-2	NA	± 15 %	AverageRF
idual Range Organics (RRO)	1000	890	1170	1040	-11	NA	± 15 %	AverageRF
erphenyl	50	48	2360	2280	-3	NA	± 15 %	AverageRF
riacontane	50	46	1810	1660	-8	NA	± 15 %	AverageRF

ults flagged with an asterisk (*) indicate values outside control criteria.

00184

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/25/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

bration Type: External Standard
lysis Method: NWTPH-Dx

Calibration Date: 04/14/2001
Calibration ID: CAL896
Analysis Lot: KWG0106185
Units: ppm
Column ID: RTX-1

ID: J:\GC04\DATA\092401\0924F008.D
J:\GC04\DATA\092401\0924F010.D

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
el Range Organics (DRO)	1000	960	1900	1820	-4	NA	± 15 %	AverageRF
dual Range Organics (RRO)	1000	880	1170	1030	-12	NA	± 15 %	AverageRF
rphenyl	50	48	2360	2250	-5	NA	± 15 %	AverageRF
iacontane	50	43	1810	1570	-13	NA	± 15 %	AverageRF

lts flagged with an asterisk (*) indicate values outside control criteria.

00185

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	09/25/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

bration Type:	External Standard	**Calibration Date:**	04/14/2001
lysis Method:	NWTPH-Dx	**Calibration ID:**	CAL896
		Analysis Lot:	KWG0106185
		Units:	ppm
ID:	J:\GC04\DATA\092401\0924F034.D	**Column ID:**	RTX-1
	J:\GC04\DATA\092401\0924F036.D		

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
:l Range Organics (DRO)	1000	990	1900	1890	-1	NA	± 15 %	AverageRF
lual Range Organics (RRO)	1000	920	1170	1080	-8	NA	± 15 %	AverageRF
rphenyl	50	49	2360	2320	-2	NA	± 15 %	AverageRF
iacontane	50	49	1810	1790	-1	NA	± 15 %	AverageRF

ılts flagged with an asterisk (*) indicate values outside control criteria.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/26/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

ibration Type: External Standard
alysis Method: NWTPH-Dx

Calibration Date: 05/04/2001
Calibration ID: CAL897
Analysis Lot: KWG0106267
Units: ppm
Column ID: RTX-1

ID: J:\GC04\DATA\092601.SEC\0926F007.D
J:\GC04\DATA\092601.SEC\0926F009.D

alyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
sel Range Organics (DRO)	1000	960	2840	2730	-4	NA	± 15 %	AverageRF
idual Range Organics (RRO)	1000	920	1680	1550	-8	NA	± 15 %	AverageRF
erphenyl	50	53	3240	3410	5	NA	± 15 %	AverageRF
riacontane	50	48	2810	2710	-4	NA	± 15 %	AverageRF

lts flagged with an asterisk (*) indicate values outside control criteria.

00187

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
j Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/26/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

ibration Type: External Standard
ılysis Method: NWTPH-Dx

Calibration Date: 04/14/2001
Calibration ID: CAL896
Analysis Lot: KWG0106268
Units: ppm
Column ID: RTX-1

: ID: J:\GC04\DATA\092601\0926F008.D
J:\GC04\DATA\092601\0926F010.D

alyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
sel Range Organics (DRO)	1000	1100	1900	2050	8	NA	± 15 %	AverageRF
idual Range Organics (RRO)	1000	1000	1170	1210	3	NA	± 15 %	AverageRF
erphenyl	50	54	2360	2550	8	NA	± 15 %	AverageRF
riacontane	50	57	1810	2070	14	NA	± 15 %	AverageRF

sults flagged with an asterisk (*) indicate values outside control criteria.

00188

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

:nt: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/27/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

ibration Type: External Standard
alysis Method: NWTPH-Dx

Calibration Date: 05/04/2001
Calibration ID: CAL897
Analysis Lot: KWG0106267
Units: ppm
Column ID: RTX-1

: ID: J:\GC04\DATA\092601.SEC\0926F033.D
J:\GC04\DATA\092601.SEC\0926F035.D

alyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
sel Range Organics (DRO)	1000	950	2840	2700	-5	NA	± 15 %	AverageRF
idual Range Organics (RRO)	1000	960	1680	1610	-4	NA	± 15 %	AverageRF
erphenyl	50	52	3240	3340	3	NA	± 15 %	AverageRF
'riacontane	50	48	2810	2710	-4	NA	± 15 %	AverageRF

ults flagged with an asterisk (*) indicate values outside control criteria.

00189

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
jec Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/27/2001

Continuing Calibration Verification Summary
Diesel and Residual Range Organics

ibration Type: External Standard
lysis Method: NWTPH-Dx

Calibration Date: 04/14/2001
Calibration ID: CAL896
Analysis Lot: KWG0106268
Units: ppm
Column ID: RTX-1

ID: J:\GC04\DATA\092601\0926F034.D
J:\GC04\DATA\092601\0926F036.D

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
el Range Organics (DRO)	1000	1000	1900	1990	4	NA	± 15 %	AverageRF
dual Range Organics (RRO)	1000	1000	1170	1170	-0	NA	± 15 %	AverageRF
:rphenyl	50	51	2360	2420	3	NA	± 15 %	AverageRF
iacontane	50	51	1810	1870	3	NA	± 15 %	AverageRF

lts flagged with an asterisk (*) indicate values outside control criteria.

00190

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
ject: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

alysis Method: NWTPH-Dx

Analysis Lot: KWG0105968
Instrument ID: GC04
Column: RTX-1

: ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
7F006.D	Instrument Blank	KWG0105968-3	9/17/01	17:47		9/17/01	18:02
7F008.D	Continuing Calibration Verification	KWG0105968-4	9/17/01	18:11		9/17/01	18:26
7F010.D	Continuing Calibration Verification	KWG0105968-4	9/17/01	18:35		9/17/01	18:50
7F012.D	ZZZZZZ	ZZZZZZ	9/17/01	19:00		9/17/01	19:15
7F018.D	ZZZZZZ	ZZZZZZ	9/17/01	20:12		9/17/01	20:27
7F020.D	ZZZZZZ	ZZZZZZ	9/17/01	20:36		9/17/01	20:51
7F022.D	ZZZZZZ	ZZZZZZ	9/17/01	21:00		9/17/01	21:15
7F024.D	ZZZZZZ	ZZZZZZ	9/17/01	21:24		9/17/01	21:39
7F026.D	ZZZZZZ	ZZZZZZ	9/17/01	21:49		9/17/01	22:04
7F028.D	ZZZZZZ	ZZZZZZ	9/17/01	22:13		9/17/01	22:28
7F030.D	ZZZZZZ	ZZZZZZ	9/17/01	22:38		9/17/01	22:53
7F032.D	Instrument Blank	KWG0105968-5	9/17/01	23:02		9/17/01	23:17
7F034.D	Continuing Calibration Verification	KWG0105968-6	9/17/01	23:26		9/17/01	23:41
7F036.D	Continuing Calibration Verification	KWG0105968-6	9/17/01	23:50		9/18/01	00:05
7F038.D	GW1205	K2106670-016	9/18/01	00:14		9/18/01	00:29
7F040.D	ZZZZZZ	ZZZZZZ	9/18/01	00:38		9/18/01	00:53
7F042.D	ZZZZZZ	ZZZZZZ	9/18/01	01:03		9/18/01	01:18
7F044.D	ZZZZZZ	ZZZZZZ	9/18/01	01:27		9/18/01	01:42
7F046.D	ZZZZZZ	ZZZZZZ	9/18/01	01:51		9/18/01	02:06
7F048.D	ZZZZZZ	ZZZZZZ	9/18/01	02:15		9/18/01	02:30
7F050.D	ZZZZZZ	ZZZZZZ	9/18/01	02:39		9/18/01	02:54
7F052.D	ZZZZZZ	ZZZZZZ	9/18/01	03:04		9/18/01	03:19
7F054.D	ZZZZZZ	ZZZZZZ	9/18/01	03:28		9/18/01	03:43
7F058.D	Instrument Blank	KWG0105968-7	9/18/01	04:16		9/18/01	04:31
7F060.D	Continuing Calibration Verification	KWG0105968-8	9/18/01	04:41		9/18/01	04:56
7F062.D	Continuing Calibration Verification	KWG0105968-8	9/18/01	05:05		9/18/01	05:20
7F066.D	Instrument Blank	KWG0105968-9	9/18/01	05:53		9/18/01	06:08
7F068.D	Instrument Blank	KWG0105968-9	9/18/01	06:17		9/18/01	06:32
7F070.D	Instrument Blank	KWG0105968-9	9/18/01	06:41		9/18/01	06:56
7F072.D	Instrument Blank	KWG0105968-9	9/18/01	07:06		9/18/01	07:21
7F074.D	Instrument Blank	KWG0105968-9	9/18/01	07:29		9/18/01	07:44
7F076.D	Instrument Blank	KWG0105968-9	9/18/01	07:54		9/18/01	08:09
7F078.D	Instrument Blank	KWG0105968-9	9/18/01	08:18		9/18/01	08:33
7F080.D	Instrument Blank	KWG0105968-9	9/18/01	08:43		9/18/01	08:58

lts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00191

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

:nt: Exponent Environmental Group, Inc. **Service Request:** K2106670

jec Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

ılysis Method: NWTPH-Dx

Analysis Lot: KWG0105968
Instrument ID: GC04
Column: RTX-1

: ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
7F082.D	Continuing Calibration Verification	KWG0105968-10	9/18/01	09:07		9/18/01	09:22
7F084.D	Continuing Calibration Verification	KWG0105968-10	9/18/01	09:31		9/18/01	09:46

ılts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00192

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc. Service Request: K2106670

ject: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

lysis Method: NWTPH-Dx

Analysis Lot: KWG0106117
Instrument ID: GC04
Column: RTX-1

ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
2F008.D	Continuing Calibration Verification	KWG0106117-1	9/23/01	00:47		9/23/01	01:02
2F010.D	Continuing Calibration Verification	KWG0106117-1	9/23/01	01:12		9/23/01	01:27
2F026.D	ZZZZZZ	ZZZZZZ	9/23/01	04:29		9/23/01	04:44
2F028.D	ZZZZZZ	ZZZZZZ	9/23/01	04:54		9/23/01	05:09
2F030.D	Instrument Blank	KWG0106117-13	9/23/01	05:18		9/23/01	05:33
2F034.D	Continuing Calibration Verification	KWG0106117-2	9/23/01	06:07		9/23/01	06:22
2F036.D	Continuing Calibration Verification	KWG0106117-2	9/23/01	06:32		9/23/01	06:47
2F038.D	ZZZZZZ	ZZZZZZ	9/23/01	06:57		9/23/01	07:12
2F040.D	ZZZZZZ	ZZZZZZ	9/23/01	07:21		9/23/01	07:36
2F042.D	ZZZZZZ	ZZZZZZ	9/23/01	07:46		9/23/01	08:01
2F048.D	ZZZZZZ	ZZZZZZ	9/23/01	09:00		9/23/01	09:15
2F050.D	ZZZZZZ	ZZZZZZ	9/23/01	09:25		9/23/01	09:40
2F052.D	ZZZZZZ	ZZZZZZ	9/23/01	09:49		9/23/01	10:04
2F054.D	ZZZZZZ	ZZZZZZ	9/23/01	10:14		9/23/01	10:29
2F056.D	ZZZZZZ	ZZZZZZ	9/23/01	10:39		9/23/01	10:54
2F058.D	Instrument Blank	KWG0106117-6	9/23/01	11:04		9/23/01	11:19
2F060.D	Continuing Calibration Verification	KWG0106117-3	9/23/01	11:29		9/23/01	11:44
2F062.D	Continuing Calibration Verification	KWG0106117-3	9/23/01	11:54		9/23/01	12:09
2F064.D	Method Blank	KWG0105906-6	9/23/01	12:19		9/23/01	12:34
2F070.D	ZZZZZZ	ZZZZZZ	9/23/01	13:33		9/23/01	13:48
2F072.D	SW0002	K2106670-006	9/23/01	13:58		9/23/01	14:13
2F074.D	GW1200	K2106670-009	9/23/01	14:23		9/23/01	14:38
2F076.D	GW1200DUP	KWG0105906-3	9/23/01	14:47		9/23/01	15:02
2F078.D	GW1201	K2106670-012	9/23/01	15:12		9/23/01	15:27
2F080.D	GW1202	K2106670-013	9/23/01	15:37		9/23/01	15:52
2F082.D	GW1204	K2106670-015	9/23/01	16:02		9/23/01	16:17
2F084.D	Instrument Blank	KWG0106117-7	9/23/01	16:27		9/23/01	16:42
2F086.D	Continuing Calibration Verification	KWG0106117-4	9/23/01	16:52		9/23/01	17:07
2F088.D	Continuing Calibration Verification	KWG0106117-4	9/23/01	17:17		9/23/01	17:32
2F090.D	Continuing Calibration Verification	KWG0106117-4	9/23/01	23:37		9/23/01	23:52
2F092.D	Continuing Calibration Verification	KWG0106117-4	9/24/01	00:02		9/24/01	00:17

lts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00193

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670

je[redacted] Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

alysis Method: NWTPH-Dx

Analysis Lot: KWG0106185
Instrument ID: GC04
Column: RTX-1

e ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
4F008.D	Continuing Calibration Verification	KWG0106185-1	9/25/01	00:11		9/25/01	00:26
4F010.D	Continuing Calibration Verification	KWG0106185-1	9/25/01	00:36		9/25/01	00:51
4F012.D	Method Blank	KWG0106004-10	9/25/01	01:01		9/25/01	01:16
4F014.D	Lab Control Sample	KWG0106004-8	9/25/01	01:25		9/25/01	01:40
4F018.D	ZZZZZZ	ZZZZZZ	9/25/01	02:15		9/25/01	02:30
4F020.D	ZZZZZZ	ZZZZZZ	9/25/01	02:39		9/25/01	02:54
4F028.D	ZZZZZZ	ZZZZZZ	9/25/01	04:19		9/25/01	04:34
4F030.D	ZZZZZZ	ZZZZZZ	9/25/01	04:43		9/25/01	04:58
4F032.D	Instrument Blank	KWG0106185-13	9/25/01	05:07		9/25/01	05:22
4F034.D	Continuing Calibration Verification	KWG0106185-2	9/25/01	05:32		9/25/01	05:47
4F036.D	Continuing Calibration Verification	KWG0106185-2	9/25/01	05:57		9/25/01	06:12
[redacted]D	ZZZZZZ	ZZZZZZ	9/25/01	06:21		9/25/01	06:36
[redacted]0.D	ZZZZZZ	ZZZZZZ	9/25/01	06:45		9/25/01	07:00
4F042.D	ZZZZZZ	ZZZZZZ	9/25/01	07:10		9/25/01	07:25
4F044.D	ZZZZZZ	ZZZZZZ	9/25/01	07:34		9/25/01	07:49
4F046.D	ZZZZZZ	ZZZZZZ	9/25/01	07:59		9/25/01	08:14
4F048.D	ZZZZZZ	ZZZZZZ	9/25/01	08:23		9/25/01	08:38
4F050.D	ZZZZZZ	ZZZZZZ	9/25/01	08:48		9/25/01	09:03
4F052.D	ZZZZZZ	ZZZZZZ	9/25/01	09:12		9/25/01	09:27
4F054.D	ZZZZZZ	ZZZZZZ	9/25/01	09:37		9/25/01	09:52
4F056.D	ZZZZZZ	ZZZZZZ	9/25/01	10:01		9/25/01	10:16
4F058.D	Instrument Blank	KWG0106185-6	9/25/01	10:25		9/25/01	10:40
4F060.D	Continuing Calibration Verification	KWG0106185-3	9/25/01	10:51		9/25/01	11:06
4F062.D	Continuing Calibration Verification	KWG0106185-3	9/25/01	11:14		9/25/01	11:29
4F064.D	ZZZZZZ	ZZZZZZ	9/25/01	11:39		9/25/01	11:54
4F066.D	ZZZZZZ	ZZZZZZ	9/25/01	12:03		9/25/01	12:18
4F068.D	ZZZZZZ	ZZZZZZ	9/25/01	12:27		9/25/01	12:42
4F070.D	ZZZZZZ	ZZZZZZ	9/25/01	12:52		9/25/01	13:07
4F072.D	ZZZZZZ	ZZZZZZ	9/25/01	13:16		9/25/01	13:31
4F074.D	ZZZZZZ	ZZZZZZ	9/25/01	13:40		9/25/01	13:55
4F076.D	ZZZZZZ	ZZZZZZ	9/25/01	14:04		9/25/01	14:19
4F078.D	ZZZZZZ	ZZZZZZ	9/25/01	14:29		9/25/01	14:44
4F080.D	ZZZZZZ	ZZZZZZ	9/25/01	14:53		9/25/01	15:08
[redacted].D	Instrument Blank	KWG0106185-7	9/25/01	15:18		9/25/01	15:33

ults flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

001194

ent: Exponent Environmental Group, Inc. Service Request: K2106670

ject: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

alysis Method: NWTPH-Dx

Analysis Lot: KWG0106185
Instrument ID: GC04
Column: RTX-1

: ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
4F084.D	Continuing Calibration Verification	KWG0106185-4	9/25/01	15:42		9/25/01	15:57
4F086.D	Continuing Calibration Verification	KWG0106185-4	9/25/01	16:06		9/25/01	16:21

lts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

0195

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc. Service Request: K2106670

je[redacted] Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

lysis Method: NWTPH-Dx

Analysis Lot: KWG0106267
Instrument ID: GC04
Column: RTX-1

ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
6F007.D	Continuing Calibration Verification	KWG0106267-1	9/26/01	20:44		9/26/01	20:59
6F009.D	Continuing Calibration Verification	KWG0106267-1	9/26/01	21:08		9/26/01	21:23
6F011.D	Duplicate Lab Control Sample	KWG0105906-5	9/26/01	21:33		9/26/01	21:48
6F013.D	Lab Control Sample	KWG0105906-4	9/26/01	21:57		9/26/01	22:12
6F015.D	ZZZZZZ	ZZZZZZ	9/26/01	22:22		9/26/01	22:37
6F017.D	ZZZZZZ	ZZZZZZ	9/26/01	22:46		9/26/01	23:01
6F019.D	ZZZZZZ	ZZZZZZ	9/26/01	23:11		9/26/01	23:26
6F021.D	ZZZZZZ	ZZZZZZ	9/26/01	23:35		9/26/01	23:50
6F023.D	ZZZZZZ	ZZZZZZ	9/26/01	23:59		9/27/01	00:14
6F025.D	ZZZZZZ	ZZZZZZ	9/27/01	00:24		9/27/01	00:39
6F027.D	ZZZZZZ	ZZZZZZ	9/27/01	00:48		9/27/01	01:03
6F[redacted].D	ZZZZZZ	ZZZZZZ	9/27/01	01:12		9/27/01	01:27
[redacted].D	Instrument Blank	KWG0106267-13	9/27/01	01:37		9/27/01	01:52
6F033.D	Continuing Calibration Verification	KWG0106267-2	9/27/01	02:01		9/27/01	02:16
6F035.D	Continuing Calibration Verification	KWG0106267-2	9/27/01	02:26		9/27/01	02:41
6F037.D	ZZZZZZ	ZZZZZZ	9/27/01	02:50		9/27/01	03:05
6F039.D	ZZZZZZ	ZZZZZZ	9/27/01	03:14		9/27/01	03:29
6F041.D	ZZZZZZ	ZZZZZZ	9/27/01	03:39		9/27/01	03:54
6F043.D	ZZZZZZ	ZZZZZZ	9/27/01	04:03		9/27/01	04:18
6F045.D	ZZZZZZ	ZZZZZZ	9/27/01	04:27		9/27/01	04:42
6F047.D	ZZZZZZ	ZZZZZZ	9/27/01	04:52		9/27/01	05:07
6F049.D	ZZZZZZ	ZZZZZZ	9/27/01	05:16		9/27/01	05:31
6F051.D	ZZZZZZ	ZZZZZZ	9/27/01	05:41		9/27/01	05:56
6F053.D	ZZZZZZ	ZZZZZZ	9/27/01	06:05		9/27/01	06:20
6F055.D	ZZZZZZ	ZZZZZZ	9/27/01	06:29		9/27/01	06:44
6F057.D	Instrument Blank	KWG0106267-6	9/27/01	06:54		9/27/01	07:09
6F059.D	Continuing Calibration Verification	KWG0106267-3	9/27/01	07:18		9/27/01	07:33
6F061.D	Continuing Calibration Verification	KWG0106267-3	9/27/01	07:42		9/27/01	07:57
6F063.D	ZZZZZZ	ZZZZZZ	9/27/01	08:07		9/27/01	08:22
6F065.D	ZZZZZZ	ZZZZZZ	9/27/01	08:31		9/27/01	08:46
6F067.D	ZZZZZZ	ZZZZZZ	9/27/01	08:56		9/27/01	09:11
6F069.D	ZZZZZZ	ZZZZZZ	9/27/01	09:20		9/27/01	09:35
6F071.D	ZZZZZZ	ZZZZZZ	9/27/01	09:44		9/27/01	09:59
[redacted]D	ZZZZZZ	ZZZZZZ	9/27/01	10:09		9/27/01	10:24

lts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00196

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc. Service Request: K2106670
ect: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

lysis Method: NWTPH-Dx

Analysis Lot: KWG0106267
Instrument ID: GC04
Column: RTX-1

ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
5F075.D	ZZZZZZ	ZZZZZZ	9/27/01	10:33		9/27/01	10:48
5F077.D	ZZZZZZ	ZZZZZZ	9/27/01	10:58		9/27/01	11:13
5F079.D	ZZZZZZ	ZZZZZZ	9/27/01	11:23		9/27/01	11:38
5F081.D	ZZZZZZ	ZZZZZZ	9/27/01	11:47		9/27/01	12:02
5F083.D	Instrument Blank	KWG0106267-7	9/27/01	12:12		9/27/01	12:27
5F085.D	Continuing Calibration Verification	KWG0106267-4	9/27/01	12:36		9/27/01	12:51
5F087.D	Continuing Calibration Verification	KWG0106267-4	9/27/01	13:00		9/27/01	13:15

lts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc. **Service Request:** K2106670

jec[redacted] Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

lysis Method: NWTPH-Dx

Analysis Lot: KWG0106268
Instrument ID: GC04
Column: RTX-1

ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
5F008.D	Continuing Calibration Verification	KWG0106268-1	9/26/01	20:44		9/26/01	20:59
5F010.D	Continuing Calibration Verification	KWG0106268-1	9/26/01	21:08		9/26/01	21:23
5F012.D	ZZZZZZ	ZZZZZZ	9/26/01	21:33		9/26/01	21:48
5F014.D	ZZZZZZ	ZZZZZZ	9/26/01	21:57		9/26/01	22:12
5F016.D	ZZZZZZ	ZZZZZZ	9/26/01	22:22		9/26/01	22:37
6F018.D	ZZZZZZ	ZZZZZZ	9/26/01	22:46		9/26/01	23:01
6F020.D	ZZZZZZ	ZZZZZZ	9/26/01	23:11		9/26/01	23:26
6F022.D	SD0020	K2106670-001	9/26/01	23:35		9/26/01	23:50
6F024.D	SD0021	K2106670-002	9/26/01	23:59		9/27/01	00:14
6F026.D	SD0022	K2106670-003	9/27/01	00:24		9/27/01	00:39
6F028.D	SD0022DUP	KWG0106004-7	9/27/01	00:48		9/27/01	01:03
6F[redacted].D	SD0023	K2106670-004	9/27/01	01:12		9/27/01	01:27
[redacted].D	Instrument Blank	KWG0106268-13	9/27/01	01:37		9/27/01	01:52
6F034.D	Continuing Calibration Verification	KWG0106268-2	9/27/01	02:01		9/27/01	02:16
6F036.D	Continuing Calibration Verification	KWG0106268-2	9/27/01	02:26		9/27/01	02:41
6F038.D	ZZZZZZ	ZZZZZZ	9/27/01	02:50		9/27/01	03:05
6F040.D	ZZZZZZ	ZZZZZZ	9/27/01	03:14		9/27/01	03:29
6F042.D	ZZZZZZ	ZZZZZZ	9/27/01	03:39		9/27/01	03:54
6F044.D	ZZZZZZ	ZZZZZZ	9/27/01	04:03		9/27/01	04:18
6F046.D	ZZZZZZ	ZZZZZZ	9/27/01	04:27		9/27/01	04:42
6F048.D	ZZZZZZ	ZZZZZZ	9/27/01	04:52		9/27/01	05:07
6F050.D	ZZZZZZ	ZZZZZZ	9/27/01	05:16		9/27/01	05:31
6F052.D	ZZZZZZ	ZZZZZZ	9/27/01	05:41		9/27/01	05:56
6F054.D	ZZZZZZ	ZZZZZZ	9/27/01	06:05		9/27/01	06:20
6F056.D	ZZZZZZ	ZZZZZZ	9/27/01	06:29		9/27/01	06:44
6F058.D	Instrument Blank	KWG0106268-6	9/27/01	06:54		9/27/01	07:09
6F060.D	Continuing Calibration Verification	KWG0106268-3	9/27/01	07:18		9/27/01	07:33
6F062.D	Continuing Calibration Verification	KWG0106268-3	9/27/01	07:42		9/27/01	07:57
6F064.D	ZZZZZZ	ZZZZZZ	9/27/01	08:07		9/27/01	08:22
6F066.D	ZZZZZZ	ZZZZZZ	9/27/01	08:31		9/27/01	08:46
6F068.D	ZZZZZZ	ZZZZZZ	9/27/01	08:56		9/27/01	09:11
6F070.D	ZZZZZZ	ZZZZZZ	9/27/01	09:20		9/27/01	09:35
6F072.D	ZZZZZZ	ZZZZZZ	9/27/01	09:44		9/27/01	09:59
6F[redacted].D	ZZZZZZ	ZZZZZZ	9/27/01	10:09		9/27/01	10:24

ılts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

U0198

SuperSet Reference: RR11560

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc. Service Request: K2106670

ject: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Diesel and Residual Range Organics

alysis Method: NWTPH-Dx

Analysis Lot: KWG0106268
Instrument ID: GC04
Column: RTX-1

ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
6F076.D	ZZZZZZ	ZZZZZZ	9/27/01	10:33		9/27/01	10:48
6F078.D	ZZZZZZ	ZZZZZZ	9/27/01	10:58		9/27/01	11:13
6F080.D	ZZZZZZ	ZZZZZZ	9/27/01	11:23		9/27/01	11:38
6F082.D	ZZZZZZ	ZZZZZZ	9/27/01	11:47		9/27/01	12:02
6F084.D	Instrument Blank	KWG0106268-7	9/27/01	12:12		9/27/01	12:27
6F086.D	Continuing Calibration Verification	KWG0106268-4	9/27/01	12:36		9/27/01	12:51
6F088.D	Continuing Calibration Verification	KWG0106268-4	9/27/01	13:00		9/27/01	13:15

lts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00199

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ent: Exponent Environmental Group, Inc.
oje Oregon Steel Mills/8601526.001.0302
Matrix: Water

Service Request: K2106670
Date Extracted: 09/14/2001

Extraction Prep Log
Diesel and Residual Range Organics

traction Method: EPA 3510C
alysis Method: NWTPH-Dx

Extraction Lot: KWG0105906
Level: Low

mple Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
/0002	K2106670-006	09/10/01	09/13/01	500ml	1ml	NA	
V1200	K2106670-009	09/11/01	09/13/01	480ml	1ml	NA	
V1201	K2106670-012	09/12/01	09/13/01	480ml	1ml	NA	
V1202	K2106670-013	09/12/01	09/13/01	480ml	1ml	NA	
V1204	K2106670-015	09/12/01	09/13/01	500ml	1ml	NA	
V1205	K2106670-016	09/12/01	09/13/01	500ml	1ml	NA	
V1200DUP	KWG0105906-3	09/11/01	09/13/01	490ml	1ml	NA	
thod Blank	KWG0105906-6	NA	NA	500ml	1ml	NA	
b Control Sample	KWG0105906-4	NA	NA	500ml	1ml	NA	
plicate Lab Control Sample	KWG0105906-5	NA	NA	500ml	1ml	NA	

ults flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

01200

nted 10/03/2001 16:38:20

SuperSet Reference: RR11560

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302
ple Matrix: Soil

Service Request: K2106670
Date Extracted: 09/19/2001

Extraction Prep Log
Diesel and Residual Range Organics

action Method: EPA 3550B
lysis Method: NWTPH-Dx

Extraction Lot: KWG0106004
Level: Low

ple Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
020	K2106670-001	09/10/01	09/13/01	5.28g	20ml	72.2	
021	K2106670-002	09/10/01	09/13/01	5.36g	20ml	66.6	
022	K2106670-003	09/10/01	09/13/01	10.25g	20ml	97.5	
023	K2106670-004	09/10/01	09/13/01	5.33g	20ml	69.9	
022DUP	KWG0106004-7	09/10/01	09/13/01	10.39g	20ml	97.5	
ıod Blank	KWG0106004-10	NA	NA	10.00g	4ml	NA	
Control Sample	KWG0106004-8	NA	NA	10.00g	4ml	NA	

5-10g

s flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

U0201

Organic Analysis:
Diesel and Residual Range Organics

Validation Package

Organic Analysis:
Diesel and Residual Range Organics

Validation Package

QC Reports

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc. **Service Request:** K2106670
oje Oregon Steel Mills/8601526.001.0302
Matrix: Water

Surrogate Recovery Summary
Diesel and Residual Range Organics

raction Method: EPA 3510C **Units:** PERCENT
alysis Method: NWTPH-Dx **Level:** Low

nple Name	Lab Code	Sur1	Sur2
0002	K2106670-006	90	91
'1200	K2106670-009	78	76
'1201	K2106670-012	88	89
'1202	K2106670-013	89	91
'1204	K2106670-015	87	87
'1205	K2106670-016	83	86
'1200DUP	KWG0105906-3	88	93
hod Blank	KWG0105906-6	102	99
Control Sample	KWG0105906-4	82	78
licate Lab Control Sample	KWG0105906-5	87	83

rogate Recovery Control Limits (%)

1 = o-Terphenyl	50-150
2 = n-Triacontane	50-150

lts flagged with an asterisk (*) indicate values outside control criteria.
lts flagged with a pound (#) indicate the control criteria is not applicable.

01204

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent: Exponent Environmental Group, Inc. Service Request: K2106670
ject: Oregon Steel Mills/8601526.001.0302
nple Matrix: Soil

Surrogate Recovery Summary
Diesel and Residual Range Organics

traction Method: EPA 3550B Units: PERCENT
alysis Method: NWTPH-Dx Level: Low

nple Name	Lab Code	Sur1	Sur2
0020	K2106670-001	98	121
0021	K2106670-002	97	100
0022	K2106670-003	94	92
0023	K2106670-004	105	111
0022DUP	KWG0106004-7	95	85
thod Blank	KWG0106004-10	92	81
) Control Sample	KWG0106004-8	81	78
plicate Lab Control Sample	KWG0106004-9	90	88

rrogate Recovery Control Limits (%)

:1	o-Terphenyl	50-150
:2	n-Triacontane	50-150

ults flagged with an asterisk (*) indicate values outside control criteria.
ults flagged with a pound (#) indicate the control criteria is not applicable.

001205

nted: 10/11/2001 14:10:39 Form 2A - Organic Page 1 of 1

SuperSet Reference: RR11661

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent:	Exponent Environmental Group, Inc.	Service Request:	K2106670
)jec	Oregon Steel Mills/8601526.001.0302	Date Extracted:	09/14/2001
Matrix:	Water	Date Analyzed:	09/23/2001

Duplicate Sample Summary
Diesel and Residual Range Organics

nple Name:	GW1200	Units:	ug/L
b Code:	K2106670-009	Basis:	NA
traction Method:	EPA 3510C	Level:	Low
alysis Method:	NWTPH-Dx	Extraction Lot:	KWG0105906

			GW1200DUP KWG0105906-3			
Analyte Name	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	RPD Limit
sel Range Organics (DRO)	260	4800	1400	3100	110 *	30
idual Range Organics (RRO)	520	6500	1500	4000	123 *	30

ts flagged with an asterisk (*) indicate values outside control criteria.
ults flagged with a pound (#) indicate the control criteria is not applicable.
ent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

U1206

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
ıple Matrix:	Soil	**Date Analyzed:**	09/27/2001

Duplicate Sample Summary
Diesel and Residual Range Organics

ıple Name:	SD0022	**Units:**	mg/Kg
Code:	K2106670-003	**Basis:**	Dry
raction Method:	EPA 3550B	**Level:**	Low
ılysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0106004

			SD0022DUP KWG0106004-7			
ılyte Name	**MRL**	**Sample Result**	**Duplicate Sample Result**	**Average**	**Relative Percent Difference**	**RPD Limit**
:el Range Organics (DRO)	130	900	790	850	14	40
dual Range Organics (RRO)	500	3000	2800	2900	7	40

lts flagged with an asterisk (*) indicate values outside control criteria.
lts flagged with a pound (#) indicate the control criteria is not applicable.
nt recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

U1207

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/14/2001
atrix:	Water	**Date Analyzed:**	09/26/2001

Lab Control Spike/Duplicate Lab Control Spike Summary
Diesel and Residual Range Organics

raction Method:	EPA 3510C	**Units:**	ug/L
lysis Method:	NWTPH-Dx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0105906

	Lab Control Sample KWG0105906-4 Lab Control Spike			Duplicate Lab Control Sample KWG0105906-5 Duplicate Lab Control Spike					
lyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
el Range Organics (DRO)	1770	1600	111	1830	1600	115	50-150	3	30
dual Range Organics (RRO)	1670	1600	104	1710	1600	107	50-150	2	30

lts ...agged with an asterisk (*) indicate values outside control criteria.

nt recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

U1208

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
ıple Matrix:	Soil	**Date Analyzed:**	09/25/2001

Lab Control Spike/Duplicate Lab Control Spike Summary
Diesel and Residual Range Organics

raction Method:	EPA 3550B	**Units:**	mg/Kg
lysis Method:	NWTPH-Dx	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106004

	Lab Control Sample KWG0106004-8 Lab Control Spike			Duplicate Lab Control Sample KWG0106004-9 Duplicate Lab Control Spike					
lyte Name	Result	Expected	%Rec	Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
el Range Organics (DRO)	175	160	109	200	160	125	50-150	13	40
dual Range Organics (RRO)	146	160	91	167	160	104	50-150	13	40

ts flagged with an asterisk (*) indicate values outside control criteria.

it recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00209

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ent:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/14/2001
r atrix:	Water	**Date Analyzed:**	09/23/2001
		Time Analyzed:	12:19

Method Blank Summary
Diesel and Residual Range Organics

nple Name:	Method Blank	**File ID:**	J:\GC04\DATA\092201\0922F064.D
) Code:	KWG0105906-6	**Instrument ID:**	GC04
raction Method:	EPA 3510C	**Level:**	Low
alysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0105906

s Method Blank applies to the following analyses:

nple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
1205	K2106670-016	J:\GC04\DATA\091701\0917F038.D	09/18/01	00:14
)002	K2106670-006	J:\GC04\DATA\092201\0922F072.D	09/23/01	13:58
1200	K2106670-009	J:\GC04\DATA\092201\0922F074.D	09/23/01	14:23
1200DUP	KWG0105906-3	J:\GC04\DATA\092201\0922F076.D	09/23/01	14:47
1201	K2106670-012	J:\GC04\DATA\092201\0922F078.D	09/23/01	15:12
1202	K2106670-013	J:\GC04\DATA\092201\0922F080.D	09/23/01	15:37
1204	K2106670-015	J:\GC04\DATA\092201\0922F082.D	09/23/01	16:02
licate Lab Control Sample	KWG0105906-5	J:\GC04\DATA\092601.SEC\0926F011.D	09/26/01	21:33
C Sample	KWG0105906-4	J:\GC04\DATA\092601.SEC\0926F013.D	09/26/01	21:57

U0210

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
ple Matrix:	Soil	**Date Analyzed:**	09/25/2001
		Time Analyzed:	01:01

Method Blank Summary
Diesel and Residual Range Organics

ple Name:	Method Blank	**File ID:**	J:\GC04\DATA\092401\0924F012.D
Code:	KWG0106004-10	**Instrument ID:**	GC04
action Method:	EPA 3550B	**Level:**	Low
lysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0106004

Method Blank applies to the following analyses:

ple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Control Sample	KWG0106004-8	J:\GC04\DATA\092401\0924F014.D	09/25/01	01:25
)20	K2106670-001	J:\GC04\DATA\092601\0926F022.D	09/26/01	23:35
)21	K2106670-002	J:\GC04\DATA\092601\0926F024.D	09/26/01	23:59
)22	K2106670-003	J:\GC04\DATA\092601\0926F026.D	09/27/01	00:24
)22DUP	KWG0106004-7	J:\GC04\DATA\092601\0926F028.D	09/27/01	00:48
)23	K2106670-004	J:\GC04\DATA\092601\0926F030.D	09/27/01	01:12

00211

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ject Oregon Steel Mills/8601526.001.0302
atrix: Water

Lab Control Sample/Duplicate Lab Control Sample Summary
Diesel and Residual Range Organics

ple Name:	Lab Control Sample	Sample Name:	Duplicate Lab Control Sample
Code:	KWG0105906-4	Lab Code:	KWG0105906-5
ID:	J:\GC04\DATA\092601.SEC\0926F013.D	File ID:	J:\GC04\DATA\092601.SEC\0926F011.D
rument ID:	GC04	Instrument ID:	GC04
Extracted:	09/14/2001	Date Extracted:	09/14/2001
Analyzed:	09/26/2001	Date Analyzed:	09/26/2001
e Analyzed:	21:57	Time Analyzed:	21:33

action Method:	EPA 3510C	Level:	Low
lysis Method:	NWTPH-Dx	Extraction Lot:	KWG0105906

e Lab Control Samples apply to the following analyses:

ple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
1205	K2106670-016	J:\GC04\DATA\091701\0917F038.D	09/18/01	00:14
od Blank	KWG0105906-6	J:\GC04\DATA\092201\0922F064.D	09/23/01	12:19
002	K2106670-006	J:\GC04\DATA\092201\0922F072.D	09/23/01	13:58
1200	K2106670-009	J:\GC04\DATA\092201\0922F074.D	09/23/01	14:23
1200DUP	KWG0105906-3	J:\GC04\DATA\092201\0922F076.D	09/23/01	14:47
	K2106670-012	J:\GC04\DATA\092201\0922F078.D	09/23/01	15:12
	K2106670-013	J:\GC04\DATA\092201\0922F080.D	09/23/01	15:37
1204	K2106670-015	J:\GC04\DATA\092201\0922F082.D	09/23/01	16:02

00212

:nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
ıple Matrix:	Soil	**Date Analyzed:**	09/25/2001
		Time Analyzed:	01:25

Lab Control Sample Summary
Diesel and Residual Range Organics

ıple Name:	Lab Control Sample	**File ID:**	J:\GC04\DATA\092401\0924F014.D
Code:	KWG0106004-8	**Instrument ID:**	GC04
raction Method:	EPA 3550B	**Level:**	Low
ılysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG0106004

; Lab Control Sample applies to the following analyses:

ple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ıod Blank	KWG0106004-10	J:\GC04\DATA\092401\0924F012.D	09/25/01	01:01
020	K2106670-001	J:\GC04\DATA\092601\0926F022.D	09/26/01	23:35
021	K2106670-002	J:\GC04\DATA\092601\0926F024.D	09/26/01	23:59
022	K2106670-003	J:\GC04\DATA\092601\0926F026.D	09/27/01	00:24
022DUP	KWG0106004-7	J:\GC04\DATA\092601\0926F028.D	09/27/01	00:48
023	K2106670-004	J:\GC04\DATA\092601\0926F030.D	09/27/01	01:12

00213

Columbia Analytical Services INC.
An Employee-Owned Company

OCT - 2 2001

October 23, 2001 Service Request No: K2106670

Laura McWilliams
Exponent Environmental Group
4000 Kruse Way Place, Building Two, Suite 285
Lake Oswego, OR 97035

Re: Oregon Steel Mills/8601526.001.0302

Dear Laura:

Enclosed are additional pages for the sample(s) submitted to our laboratory on September 13, 2001. For your reference, these analyses have been assigned our service request number K2106670.

Enclosed are results for the metal analysis.

Please call if you have any questions. My extension is 3281.

Respectfully submitted,

Columbia Analytical Services, Inc.

Jim Smith
Project Chemist

JS/afs

17 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 360/ 577-7222 • Fax 360/636-1068

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

The result is an outlier. See case narrative.

The control limit criteria is not applicable. See case narrative.

analyte was found in the associated method blank at a level that is significant relative to the sample result.

The result is an estimate amount because the value exceeded the instrument calibration range.

The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.

The MRL/MDL has been elevated due to a matrix interference.

See case narrative.

Metals Data Qualifiers

The control limit criteria is not applicable. See case narrative.

The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

The reported value is estimated because of the presence of matrix interference.

The duplicate injection precision was not met.

The Matrix Spike sample recovery is not within control limits. See case narrative.

The reported value was determined by the Method of Standard Additions (MSA).

The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.

The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.

The MRL/MDL has been elevated due to a matrix interference.

See case narrative.

The duplicate analysis not within control limits. See case narrative.

The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

The result is an outlier. See case narrative.

The control limit criteria is not applicable. See case narrative.

A tentatively identified compound, a suspected aldol-condensation product.

The analyte was found in the associated method blank at a level that is significant relative to the sample result.

The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.

The reported result is from a dilution.

The result is an estimate amount because the value exceeded the instrument calibration range.

The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.

The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).

The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.

The MRL/MDL has been elevated due to a chromatographic interference.

See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.

The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a ter amount of heavier molecular weight constituents than the calibration standard.

The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Exponent Environmental Group, Inc.	**Service Request No.:**	K2106670
Project:	Oregon Steel Mills	**Date Received:**	9/13/01
Sample Matrix:	Soil/Water		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier III validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Seventeen samples were received for analysis at Columbia Analytical Services on 9/13/01. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Total Metals

The Matrix Spike (MS) recovery of Chromium, Manganese and Vanadium for sample SO0151 was not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.

No other anomalies associated with the analysis of these samples were observed.

00004

Approved by _____ Date 10/23/01

Chain of Custody Documentation

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

K2106670

Page 1 of 3

Project: (Name and Number) Oregon Steel Mills - 8601526.001 0302

Exponent Contact: Laura McWilliams Office:

Ship to: Lake Oswego

Lab Contact/Phone: Abbie Spielman

Samplers: Laura McWilliams

Exponent Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

	Sample No.	Tag No.	Date	Time	Matrix	VOC's by EPA8260	NW-TPH-Dx	As, Ba, Cd, Co, Cr, Cu, Pb, Mn, Ni, Ag, V, Zn by ICP/MS	Hg by EPA 747	PCB's by EPA8082		Extra Container	Archive	Remarks
1	SD0020	45096	9/10/01	1125	Soil	X								
↓	↓	45097	9/10/01	1125	Soil		X	X	X					
2	SD0021	45098	9/10/01	1135	Soil	X								
↓	↓	45099	9/10/01	1135	Soil		X	X	X	X				
3	SD0022	45100	9/10/01	1205	Soil		X	X	X	X				
4	SD0023	45198	9/10/01	1250	Soil		X	X	X					
5	SD0024	45199	9/10/01	1330	Soil					X				
6	SW0002	42401	9/10/01	1400	Water					X				
		42402	9/10/01	1400	Water		X							
		42403	9/10/01	1400	Water							X		
		42404	9/10/01	1400	Water							X		
		42405	9/10/01	1400	Water			X	X					
		42406	9/10/01	1400	Water	X								
		42407	9/10/01	1400	Water							X		
↓	↓	42408	9/10/01	1400	Water							X		

Laura McWilliams

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water

OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☐ FedEx/UPS ☒ Courier Other

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: Laura McWilliams (Signature) Date/Time: 9/12/01 6pm Received by: Tracy Black CAS (Signature) Date/Time: 9/13/01 1700

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

00005 ~~00007~~

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

K2106670 Page 2 of 3

Project: (Name and Number) Oregon Steel Mills - 860152600I 0302

Exponent Contact: _____ Office: ____

Ship to: Laura McWilliams, Lake Oswego

Lab Contact/Phone: Abbie Spielman

Samplers: Laura McWilliams

Exponent Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Sample No.	Tag No.	Date	Time	Matrix	VOCs by EPA 8260	CdCrCuPbMnZnNi by ICP/MS	NWTPH-Dx	BTEX by EPA 8021	PCBs by EPA 8082		Extra Container	Archive	Remarks
SOØ150	42409	9/11/01	1005	Soil		X							
↓	42410	9/11/01	1005	Soil	X								
SOØ151	42411	9/11/01	1100	Soil		X							
↓	42412	9/11/01	1100	Soil	X								
GWØ200	42413	9/11/01	1445	Water			X						
↓	42414	9/11/01	1445	Water							X		
↓	42415	9/11/01	1445	Water				X					
↓	42416	9/11/01	1445	Water							X		
↓	42417	9/11/01	1445	Water							X		
SOØ152	42418	9/11/01	1615	Soil					X				
SOØ153	42419	9/11/01	1620	Soil					X				
GWØ201	42420	9/12/01	1130	Water			X						
↓	42421	9/12/01	1130	Water							X		
↓	42422	9/12/01	1130	Water					X				
↓	42423	9/12/01	1130	Water							X		
↓	42424	9/12/01	1130	Water							X		

Laura McWilliams

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes _____

Priority: ☐ Normal ☐ Rush Rush time period _____

Shipped via: ☐ FedEx/UPS ☒ Courier Other _____

Condition of Samples Upon Receipt: _____

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: Laura McWilliams (Signature) Date/Time: 9/12/01 6pm Received by: Tracy Black - ARC (Signature) Date/Time: 9/13/01 1700

Relinquished by: _____ (Signature) Date/Time: _____ Received by: _____ (Signature) Date/Time: _____

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

K1106670 Page 3 of 3

Project: (Name and Number) Oregon Steel Mills - 8601526.001 0302

Exponent Contact: _____ Office: ____

Ship to: Laura McWilliams, Lake Oswego

Lab Contact/Phone: Abbie Spielman

Samplers: Laura McWilliams

Exponent Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4336
Washington, D.C. (301) 577-7837

	Sample No.	Tag No.	Date	Time	Matrix	VOCs by EPA 8260	Cd, Cr, Cu, Pb, Mn, Zn by ICP/MS	NWTPH-Dx	BTEX by EPA 8021			Extra Container	Archive	Remarks
13	GW1202	42425	9/12/01	1145	Water			X						
		42426	9/12/01	1145	Water							X		
		42427	9/12/01	1145	Water				X					
		42428	9/12/01	1145	Water							X		
		42429	9/12/01	1145	Water							X		
14	GW1203	42430	9/12/01	1200	Water		X							
		42431	9/12/01	1200	Water	X								
		42432	9/12/01	1200	Water							X		
		42433	9/12/01	1200	Water							X		
15	GW1204	42434	9/12/01	1215	Water				X					
		42435	9/12/01	1215	Water							X		
		42436	9/12/01	1215	Water							X		
		42437	9/12/01	1215	Water			X						
		42438	9/12/01	1215	Water							X		
16	GW1205	42439	9/12/01	1315	Water			X						
		42440	9/12/01	1315	Water							X		
		42441	9/12/01	1315	Water				X					
		42442	9/12/01	1315	Water							X		17 - trips not run
		42443	9/12/01	1315	Water							X		

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water

OTHER - Please identify codes _____

Priority: ☐ Normal ☐ Rush Rush time period _____

Shipped via: ☐ FedEx/UPS ☒ Courier Other _____

Condition of Samples Upon Receipt: _____

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: Laura McWilliams (Signature) Date/Time: 9/12/01 6pm

Received by: Tracy Black - CAS (Signature) Date/Time: 9/13/01 1700

Relinquished by: _____ (Signature) Date/Time: _____

Received by: _____ (Signature) Date/Time: _____

METALS

- Cover Page -
INORGANIC ANALYSIS DATA PACKAGE

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Sample No.	Lab Sample ID.
SW0002	K2106670-006
SW0002D	K2106670-006D
SW0002S	K2106670-006S
GW1203	K2106670-014

re ICP interelement corrections applied? Yes/No YES

re ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

mments: Water Package

certify that this data package is in compliance with the terms and conditions of the ntract, both technically and for completeness, for other than the conditions detailed ove. Release of the data contained in this hardcopy data package and in the mputer-readable data submitted on diskette has been authorized by the Laboratory Manager or e Manager's designee, as verified by the following signature.

gnature: Date: 10/23/01

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Exponent Environmental Group, Inc.
Project No.: 8601526.001.0302
Project Name: Oregon Steel Mills
Matrix: WATER

Service Request: K2106670
Date Collected: 09/10/01
Date Received: 09/13/01
Units: µG/L
Basis: NA

Sample Name: SW0002
Lab Code: K2106670-006

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	200.8	0.5	1	10/19/01	10/18/01	0.5	U	
Barium	200.8	0.2	1	10/19/01	10/18/01	0.3		
Cadmium	200.8	0.05	1	10/19/01	10/18/01	0.05	U	
Chromium	200.8	0.2	1	10/19/01	10/18/01	1.1		
Cobalt	200.8	0.02	1	10/19/01	10/18/01	0.02	U	
Copper	200.8	0.1	1	10/19/01	10/18/01	5.9		
[illegible]ad	200.8	0.02	1	10/19/01	10/18/01	0.40		
[illegible]nganese	200.8	0.05	1	10/19/01	10/18/01	3.32		
Mercury	7470A	0.2	1	9/27/01	9/28/01	0.2	U	
Nickel	200.8	0.2	1	10/19/01	10/18/01	0.3		
Silver	200.8	0.02	1	10/19/01	10/18/01	0.02	U	
Vanadium	200.8	0.2	1	10/19/01	10/18/01	0.2		
Zinc	200.8	0.5	1	10/19/01	10/18/01	10.6		

Analytes requested: all except Hg by ICP

% Solids: 0.0

Comments:

00009

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

lient: Exponent Environmental Group, Inc. Service Request: K2106670

roject No.: 8601526.001.0302 Date Collected: 09/12/01

roject Name: Oregon Steel Mills Date Received: 09/13/01

latrix: WATER Units: µG/L

Basis: NA

Sample Name: GW1203 Lab Code: K2106670-014

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Cadmium	200.8	0.05	1	10/19/01	10/18/01	0.05	U	
Chromium	200.8	0.2	1	10/19/01	10/18/01	0.4		
Copper	200.8	0.1	1	10/19/01	10/18/01	0.2	U	
Lead	200.8	0.02	1	10/19/01	10/18/01	0.02	U	
Manganese	200.8	0.05	1	10/19/01	10/18/01	1.05		
Zinc	200.8	0.5	1	10/19/01	10/18/01	1.5		

Solids: 0.0

Comments:

00010

METALS
-2a-
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: Inorganic Ventures CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					Method
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Arsenic	50.0	49.9	100	25.0	24.2	97	24.1	96	200.8
Barium	200	201	101	25.0	24.1	96	24.9	100	200.8
Cadmium	25.0	24.3	97	25.0	24.2	97	24.7	99	200.8
Chromium	20.0	19.7	99	25.0	24.2	97	25.0	100	200.8
Cobalt	50.0	49.9	100	25.0	24.3	97	24.7	99	200.8
Copper	25.0	24.9	100	25.0	24.3	97	24.8	99	200.8
Lead	50.0	49.2	98	25.0	24.2	97	24.5	98	200.8
Manganese	50.0	50.1	100	25.0	24.6	98	24.9	100	200.8
[illegible]ry	5.0	5.10	102	5.0	5.03	101	5.09	102	7470A
[illegible]	50.0	50.5	101	25.0	24.4	98	25.0	100	200.8
Silver	25.0	24.1	96	25.0	24.1	96	24.9	100	200.8
Vanadium	50.0	49.4	99	25.0	24.1	96	24.9	100	200.8
Zinc	50.0	50.3	101	25.0	24.5	98	24.5	98	200.8

00011

METALS
- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

nalyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	Method
rsenic				25.0	26.3	105	26.0	104	200.8
arium				25.0	26.1	104	25.9	103	200.8
admium				25.0	24.3	97	23.9	95	200.8
hromium				25.0	23.6	94	22.9	92	200.8
obalt				25.0	24.6	98	23.9	96	200.8
opper				25.0	25.8	103	25.2	101	200.8
ead				25.0	26.2	105	25.9	104	200.8
anganese				25.0	24.3	97	23.8	95	200.8
ercury				5.0	5.02	100	5.06	101	7470A
ickel				25.0	24.8	99	24.2	97	200.8
ilver				25.0	23.3	93	22.5	90	200.8
anadium				25.0	24.2	97	23.5	94	200.8
inc				25.0	25.2	101	25.0	100	200.8

00012

METALS
- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

Analyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	Method
Mercury				5.0	5.06	101	5.07	101	7470A

00013

METALS
- 2b -
CRDL STANDARD FOR AA AND ICP

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Arsenic				0.50	0.54	108		
Barium				0.05	0.0	72		
Cadmium				0.05	0.05	101		
Chromium				0.20	0.21	107		
Cobalt				0.02	0.02	120		
Copper				0.10	0.13	132		
Lead				0.02	0.03	161		
Manganese				0.05	0.06	122		
Mercury	0.20	0.2	115					
Nickel				0.20	0.24	117		
Silver				0.02	0.02	108		
Vanadium				0.20	0.19	97		
Zinc				0.50	0.81	163		

METALS
- 3 -
BLANKS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.030

Project Name: Oregon Steel Mills

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C		Preparation Blank	C		Method
Arsenic	0.5	U	0.5	U	0.5	U	0.5	U		0.5	U		200.8
Barium	0.2	U	0.2	U	0.2	U	0.2	U		0.2	U		200.8
Cadmium	0.05	U	0.05	U	0.05	U	0.05	U		0.05	U		200.8
Chromium	0.2	U	0.2	U	0.2	U	0.2	U		0.2	U		200.8
Cobalt	0.02	U	0.02	U	0.02	U	0.02	U		0.02	U		200.8
Copper	0.2	U	0.2	U	0.2	U	0.2	U		0.2	U		200.8
Lead	0.02	U	0.02	U	0.02	U	0.02	U		0.02	U		200.8
anganese	0.05	U	0.05	U	0.05	U	0.16			0.05	U		200.8
Mercury	0.2	U	0.2	U	0.2	U	0.2	U		0.2	U		7470A
Nickel	0.2	U	0.2	U	0.2	U	0.2	U		0.2	U		200.8
Silver	0.02	U	0.02	U	0.02	U	0.05			0.02	U		200.8
Vanadium	0.2	U	0.2	U	0.2	U	0.2	U		0.2	U		200.8
Zinc	0.5	U	0.5	U	0.5	U	0.5	U		0.5	U		200.8

METALS
-3-
BLANKS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.030

Project Name: Oregon Steel Mills

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	Method
Arsenic			0.5	U							200.8
Barium			0.2	U							200.8
Cadmium			0.05	U							200.8
Chromium			-0.2								200.8
Cobalt			0.02	U							200.8
Copper			0.2	U							200.8
Lead			0.02	U							200.8
Manganese			0.10								200.8
Mercury			0.2	U	0.2	U	0.2	U			7470A
Nickel			0.2	U							200.8
Silver			0.04								200.8
Vanadium			0.2	U							200.8
Zinc			0.5	U							200.8

00016

mbia Analytical Services

resubmittal / missing from orig - received 10-26-01 PM

METALS

-4-

ICP INTERFERENCE CHECK SAMPLE

lient: Exponent Environmental Group, Inc. Service Request:K2106670

roject No.: 8601526.001.0302

roject Name: Oregon Steel Mills

CP ID Number: TJA Iris ICP ICS Source: Inorganic Ventures

Concentration Units): ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Chromium		500	4	451	90	5.71	454	91
Manganese		500	9	445	89	9.34	449	90
Vanadium		500	-5	461	92	2.23	460	92

METALS
- 5a -
SPIKE SAMPLE RECOVERY

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302 Units: µG/L

Project Name: Oregon Steel Mills Basis: NA

Matrix: WATER % Solids: 0.0

Sample Name: SW0002S Lab Code: K2106670-006S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	75 - 125	19.0		0.5	U	20.0	95		200.8
Barium	75 - 125	20.0		0.3		20.0	99		200.8
Cadmium	75 - 125	19.4		0.05	U	20.0	97		200.8
Chromium	75 - 125	20.7		1.1		20.0	98		200.8
Cobalt	75 - 125	19.8		0.02	U	20.0	99		200.8
Copper	75 - 125	25.7		5.9		20.0	99		200.8
Lead	75 - 125	19.8		0.40		20.0	97		200.8
Manganese	75 - 125	23.0		3.32		20.0	98		200.8
Mercury	75 - 125	0.9		0.2	U	1.0	91		7470A
Nickel	75 - 125	20.1		0.3		20.0	99		200.8
Silver	75 - 125	19.1		0.02	U	20.0	96		200.8
Vanadium	75 - 125	19.7		0.2		20.0	97		200.8
Zinc	75 - 125	28.7		10.6		20.0	91		200.8

ments: _____

METALS
-6-
DUPLICATES

Client: Exponent Environmental Group, Inc.
Service Request: K2106670
Project No.: 8601526.001.0302
Units: µG/L
Project Name: Oregon Steel Mills
Basis: NA
Matrix: WATER
% Solids: 0.0

Sample Name: SW0002D
Lab Code: K2106670-006D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic		0.5	U	0.5	U			200.8
Barium	0.2	0.3		0.3		19		200.8
Cadmium		0.05	U	0.05	U			200.8
Chromium		1.1		1.1		0		200.8
Cobalt		0.02	U	0.02	U			200.8
Copper		5.9		6.0		2		200.8
Lead		0.40		0.41		2		200.8
Manganese		3.32		3.43		3		200.8
Mercury		0.2	U	0.2	U			7470A
Nickel	0.2	0.3		0.3		5		200.8
Silver		0.02	U	0.02	U			200.8
Vanadium	0.2	0.2		0.3		4		200.8
Zinc		10.6		10.8		2		200.8

METALS

-7-

LABORATORY CONTROL SAMPLE

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Aqueous LCS Source: Inorganic Ventures Solid LCS Source:

Analyte	Aqueous ug/L True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Arsenic	20.0	18.5	93						
Barium	20.0	18.9	95						
Cadmium	20.0	18.9	95						
Chromium	20.0	19.2	96						
Cobalt	20.0	19.3	97						
Copper	20.0	19.4	97						
Lead	20.0	19.0	95						
Manganese	20.0	19.4	97						
Mercury	5.00	4.79	96						
Nickel	20.0	19.5	98						
Silver	20.0	18.9	94						
Vanadium	20.0	19.1	96						
Zinc	20.0	20.0	100						

00019

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resubmittal - missing from original pkg received 10-26-01

METALS
-9-
ICP SERIAL DILUTIONS

lient: Exponent Environmental Group, Inc. Service Request: K2106670

roject No.: 8601526.001.0302 Units: ug/L

roject Name: Oregon Steel Mills

Sample Name: S00151L Lab Code: K2106670-008L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-	Q	Method
Chromium	1980		2130		8		6010B
Manganese	13000		14300		10		6010B
Vanadium	182		189		4		6010B

METALS
-10-
METHOD DETECTION LIMITS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICP/ICP-MS ID #: PQ-S

GFAA ID #: AA ID #:

Analyte	Mass	Back-ground	MRL (ug/L)		Method
Arsenic	75		0.5		200.8
Barium	137		0.2		200.8
Cadmium	114		0.05		200.8
Chromium	52		0.2		200.8
Cobalt	59		0.02		200.8
Copper	65		0.1		200.8
Lead	208		0.02		200.8
Manganese	55		0.05		200.8
Nickel	60		0.2		200.8
Silver	107		0.02		200.8
Vanadium	51		0.2		200.8
Zinc	66		0.5		200.8

ments _____

00020

METALS
-10-
METHOD DETECTION LIMITS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICP/ICP-MS ID #:

GFAA ID #: AA ID #: Varian-3

Analyte	Wave-length	Back-ground	MRL (ug/L)		Method
Mercury	253.70	BD	0.2		7470A

METALS

-12-

ICP LINEAR RANGES (QUARTERLY)

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICP ID Number: PQ-S

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	Method
Arsenic	15.00	1000.0	200.8
Barium	15.00	1000.0	200.8
Cadmium	15.00	1000.0	200.8
Chromium	15.00	1000.0	200.8
Cobalt	15.00	1000.0	200.8
Copper	15.00	1000.0	200.8
Lead	15.00	1000.0	200.8
Manganese	15.00	900.0	200.8
Nickel	15.00	1000.0	200.8
Silver	15.00	100.0	200.8
Vanadium	15.00	800.0	200.8
Zinc	15.00	1000.0	200.8

›mments:

METALS
- 13 -
PREPARATION LOG

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Oregon Steel Mills

Method: CV

Lab Code	Preparation Date	Preparation Method	Initial (mL or grams)	Final Volume (mL)
ICV	9/27/01	METHOD	100	100
LCSW	9/27/01	METHOD	20	20
PBW	9/27/01	METHOD	20	20
S0	9/27/01	METHOD	100	100
S0.2	9/27/01	METHOD	100	100
S0.5	9/27/01	METHOD	100	100
S1	9/27/01	METHOD	100	100
S5	9/27/01	METHOD	100	100
S10	9/27/01	METHOD	100	100
K2106670-006	9/27/01	METHOD	20	20
K2106670-006D	9/27/01	METHOD	20	20
K2106670-006S	9/27/01	METHOD	20	20

METALS
- 13 -
PREPARATION LOG

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Oregon Steel Mills

Method: MS

Lab Code	Preparation Date	Preparation Method	Initial (mL or grams)	Final Volume (mL)
K2106670-014	10/19/01	CLFAA	50	50
LCSW	10/19/01	CLFAA	50	50
PBW	10/19/01	CLFAA	50	50
K2106670-006	10/19/01	CLFAA	50	50
K2106670-006D	10/19/01	CLFAA	50	50
K2106670-006S	10/19/01	CLFAA	50	50

METALS
- 14 -
ANALYSIS RUN LOG

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Instrument ID Number: Varian-3 Method: CV

Start Date: 9/28/01 End Date: 9/28/01

Sample ID.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	11:15																X								
S0.2	1.00	11:16																X								
S0.5	1.00	11:17																X								
S1	1.00	11:18																X								
S5	1.00	11:19																X								
S10	1.00	11:20																X								
ICV	1.00	11:21																X								
[illegible]	1.00	11:22																X								
[illegible]	1.00	11:23																X								
CCB1	1.00	11:24																X								
CRI	1.00	11:25																X								
ZZZZZZ	1.00	11:26																								
ZZZZZZ	1.00	11:27																								
ZZZZZZ	1.00	11:28																								
ZZZZZZ	1.00	11:29																								
ZZZZZZ	1.00	11:30																								
ZZZZZZ	1.00	11:31																								
ZZZZZZ	1.00	11:32																								
ZZZZZZ	1.00	11:33																								
ZZZZZZ	1.00	11:34																								
CCV2	1.00	11:35																X								
CCB2	1.00	11:36																X								
ZZZZZZ	1.00	11:37																								
ZZZZZZ	1.00	11:38																								
ZZZZZZ	1.00	11:39																								
ZZZZZZ	1.00	11:40																								
ZZZZZZ	1.00	11:41																								
[illegible]ZZ	1.00	11:42																								
[illegible]ZZ	1.00	11:43																								
ZZZZZZ	1.00	11:44																								

00025

* - Denotes additional elements (other than the standard elements) are represented on another Form 14

METALS
- 14 -
ANALYSIS RUN LOG

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Instrument ID Number: Varian-3 Method: CV

Start Date: 9/28/01 End Date: 9/28/01

Sample ID.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	11:45																												
PBW	1.00	11:46																X												
CV3	1.00	11:47																X												
CB3	1.00	11:48																X												
LCSW	1.00	11:49																X												
ZZZZZZ	1.00	11:50																												
ZZZZZZ	1.00	11:51																												
ZZZZZZ	1.00	11:52																												
ZZZZZZ	1.00	11:53																												
ZZZZZZ	1.00	11:54																												
ZZZZZZ	1.00	11:55																												
ZZZZZZ	1.00	11:56																												
ZZZZZZ	1.00	11:57																												
ZZZZZZ	1.00	11:58																												
CV4	1.00	11:59																X												
CB4	1.00	12:00																X												
ZZZZZZ	1.00	12:01																												
ZZZZZZ	1.00	12:02																												
ZZZZZZ	1.00	12:03																												
ZZZZZZ	1.00	12:04																												
ZZZZZZ	1.00	12:05																												
ZZZZZZ	1.00	12:06																												
C2106670-006	1.00	12:07																X												
C2106670-006D	1.00	12:08																X												
C2106670-006S	1.00	12:09																X												
ZZZZZZ	1.00	12:10																												
CV5	1.00	12:11																X												
CB5	1.00	12:12																X												
ZZZZZZ	1.00	12:13																												
ZZZZZZ	1.00	12:14																												

00026

- Denotes additional elements (other than the standard elements) are represented on another Form 14

METALS
- 14 -
ANALYSIS RUN LOG

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Instrument ID Number: Varian-3 Method: CV

Start Date: 9/28/01 End Date: 9/28/01

Sample ID.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	12:15																										
ZZZZZZ	1.00	12:16																										
CV6	1.00	12:17																X										
CB6	1.00	12:18																X										

00027

* - Denotes additional elements (other than the standard elements) are represented on another Form 14

METALS
- 14 -
ANALYSIS RUN LOG

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Instrument ID Number: PQ-S Method: MS

Start Date: 10/18/01 End Date: 10/18/01

Sample ID.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CALIBRATION BLANK	1.00	07:35				X	X		X		X	X	X		X		X		X			X			X	X	
CALIBRATION STANDARD	1.00	07:39				X	X		X		X	X	X		X		X		X			X			X	X	
ICV	1.00	07:43				X	X		X		X	X	X		X		X		X			X			X	X	
CCV1	1.00	07:47				X	X		X		X	X	X		X		X		X			X			X	X	
ICB	1.00	07:55				X	X		X		X	X	X		X		X		X			X			X	X	
CCB1	1.00	07:59				X	X		X		X	X	X		X		X		X			X			X	X	
CRA WATER	1.00	08:05				X	X		X		X	X	X		X		X		X			X			X	X	
ZZZZZZ	1.00	08:13																									
PBW	1.00	08:19				X	X		X		X	X	X		X		X		X			X			X	X	
K2106670-006	1.00	08:23				X	X		X		X	X	X		X		X		X			X			X	X	
K2106670-006D	1.00	08:27				X	X		X		X	X	X		X		X		X			X			X	X	
K2106670-014	1.00	08:31							X		X		X		X		X									X	
K2106670-006S	1.00	08:34				X	X		X		X	X	X		X		X		X			X			X	X	
LCSW	1.00	08:38				X	X		X		X	X	X		X		X		X			X			X	X	
ZZZZZZ	1.00	08:43																									
ZZZZZZ	5.00	08:52																									
CCV2	1.00	08:59				X	X		X		X	X	X		X		X		X			X			X	X	
CCB2	1.00	09:06				X	X		X		X	X	X		X		X		X			X			X	X	
ZZZZZZ	5.00	09:10																									
ZZZZZZ	5.00	09:16																									
ZZZZZZ	5.00	09:20																									
ZZZZZZ	5.00	09:23																									
ZZZZZZ	5.00	09:27																									
ZZZZZZ	5.00	09:31																									
ZZZZZZ	5.00	09:35																									
ZZZZZZ	5.00	09:39																									
ZZZZZZ	20.00	09:44																									
ZZZZZZ	1.00	09:48																									
CCV3	1.00	09:54				X	X		X		X	X	X		X		X		X			X			X	X	
CCB3	1.00	09:58				X	X		X		X	X	X		X		X		X			X			X	X	

00028

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METALS
- 14 -
ANALYSIS RUN LOG

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Instrument ID Number: PQ-S Method: MS

Start Date: 10/18/01 End Date: 10/18/01

Sample ID.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN	
ZZZZZZ	100.00	10:03																										
ZZZZZZ	100.00	10:07																										
ZZZZZZ	100.00	10:10																										
ZZZZZZ	100.00	10:13																										
ZZZZZZ	500.00	10:17																										
ZZZZZZ	50.00	10:21																										
ZZZZZZ	50.00	10:26																										
[illegible]	50.00	10:32																										
[illegible]	1.00	10:37				X	X		X		X	X	X		X		X		X			X			X	X		
CCB4	1.00	10:41				X	X		X		X	X	X		X		X		X			X			X	X		

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METALS

- Cover Page -
INORGANIC ANALYSIS DATA PACKAGE

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Sample No.	Lab Sample ID.
SD0020	K2106670-001
SD0021	K2106670-002
SD0022	K2106670-003
SD0022D	K2106670-003D
SD0022S	K2106670-003S
SD0023	K2106670-004
S00150	K2106670-007
S00151	K2106670-008
S00151D	K2106670-008D
S00151S	K2106670-008S

re ICP interelement corrections applied? Yes/No YES

re ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

mments: Soil Package

certify that this data package is in compliance with the terms and conditions of the ntract, both technically and for completeness, for other than the conditions detailed ove. Release of the data contained in this hardcopy data package and in the mputer-readable data submitted on diskette has been authorized by the Laboratory Manager or e Manager's designee, as verified by the following signature.

gnature: _____ Date: 10/23/01

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Exponent Environmental Group, Inc.
Service Request: K2106670

Project No.: 8601526.001.0302
Date Collected: 09/10/01

Project Name: Oregon Steel Mills
Date Received: 09/13/01

Matrix: SOIL
Units MG/KG

Basis Dry

Sample Name: SD0020
Lab Code: K2106670-001

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	200.8	0.6	5	9/24/01	10/18/01	3.6		
Barium	200.8	0.06	5	9/24/01	10/18/01	172		
Cadmium	200.8	0.06	5	9/24/01	10/18/01	1.24		
Chromium	6010B	12	20	10/19/01	10/22/01	1290		
Cobalt	200.8	0.02	5	9/24/01	10/18/01	8.17		
Copper	200.8	0.1	5	9/24/01	10/18/01	124		
Lead	200.8	0.06	5	9/24/01	10/18/01	68.2		
Manganese	6010B	12	20	10/19/01	10/22/01	10700		
Mercury	7471A	0.02	1	9/27/01	9/28/01	0.14		
Nickel	200.8	0.3	5	9/24/01	10/18/01	39.3		
Silver	200.8	0.02	5	10/19/01	10/21/01	0.40		
Vanadium	6010B	2	2	10/19/01	10/22/01	182		
Zinc	200.8	11.5	100	9/24/01	10/18/01	882		

% Solids: 72.2

Comments:

00031

METALS

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INORGANIC ANALYSIS DATA SHEET

Client: Exponent Environmental Group, Inc.
Service Request: K2106670

Project No.: 8601526.001.0302
Date Collected: 09/10/01

Project Name: Oregon Steel Mills
Date Received: 09/13/01

Matrix: SOIL
Units MG/KG

Basis Dry

Sample Name: SD0021
Lab Code: K2106670-002

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	200.8	0.5	5	9/24/01	10/18/01	4.0		
Barium	200.8	0.05	5	9/24/01	10/18/01	215		
Cadmium	200.8	0.05	5	9/24/01	10/18/01	1.49		
Chromium	6010B	11	20	10/19/01	10/22/01	1870		
Cobalt	200.8	0.02	5	9/24/01	10/18/01	8.92		
Copper	200.8	0.1	5	9/24/01	10/18/01	162		
Lead	200.8	0.05	5	9/24/01	10/18/01	97.6		
Manganese	6010B	11	20	10/19/01	10/22/01	15300		
Mercury	7471A	0.02	1	9/27/01	9/28/01	0.17		
Nickel	200.8	0.3	5	9/24/01	10/18/01	53.6		
Silver	200.8	0.02	5	10/19/01	10/21/01	0.62		
Vanadium	6010B	22	20	10/19/01	10/22/01	292		
Zinc	200.8	10.7	100	9/24/01	10/18/01	1750		

% Solids: 66.6

Comments:

00032

METALS

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INORGANIC ANALYSIS DATA SHEET

Client: Exponent Environmental Group, Inc.
Service Request: K2106670

Project No.: 8601526.001.0302
Date Collected: 09/10/01

Project Name: Oregon Steel Mills
Date Received: 09/13/01

Matrix: SOIL
Units MG/KG

Basis Dry

Sample Name: SD0022
Lab Code: K2106670-003

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	200.8	0.5	5	9/24/01	10/18/01	4.2		
Barium	200.8	0.05	5	9/24/01	10/18/01	211		
Cadmium	200.8	0.05	5	9/24/01	10/18/01	1.06		
Chromium	6010B	51	100	10/19/01	10/22/01	4100		
Cobalt	200.8	0.02	5	9/24/01	10/18/01	8.03		
Copper	200.8	0.1	5	9/24/01	10/18/01	178		
Lead	200.8	0.05	5	9/24/01	10/18/01	38.3		
Manganese	6010B	51	100	10/19/01	10/22/01	36400		
Mercury	7471A	0.02	1	9/27/01	9/28/01	0.05		
Nickel	200.8	0.3	5	9/24/01	10/18/01	67.1		
Silver	200.8	0.02	5	10/19/01	10/21/01	0.48		
Vanadium	6010B	21	20	10/19/01	10/22/01	590		
Zinc	200.8	10.3	100	9/24/01	10/18/01	431		

% Solids: 97.5

Comments:

00033

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Exponent Environmental Group, Inc.
Service Request: K2106670

Project No.: 8601526.001.0302
Date Collected: 09/10/01

Project Name: Oregon Steel Mills
Date Received: 09/13/01

Matrix: SOIL
Units MG/KG

Basis Dry

Sample Name: SD0023
Lab Code: K2106670-004

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	200.8	0.5	5	9/24/01	10/18/01	3.8		
Barium	200.8	0.05	5	9/24/01	10/18/01	169		
Cadmium	200.8	0.05	5	9/24/01	10/18/01	1.33		
Chromium	6010B	10	20	10/19/01	10/22/01	1960		
Cobalt	200.8	0.02	5	9/24/01	10/18/01	7.02		
Copper	200.8	0.1	5	9/24/01	10/18/01	125		
Lead	200.8	0.05	5	9/24/01	10/18/01	54.1		
Manganese	6010B	10	20	10/19/01	10/22/01	14800		
Mercury	7471A	0.02	1	9/27/01	9/28/01	0.09		
Nickel	200.8	0.3	5	9/24/01	10/18/01	50.6		
Silver	200.8	0.02	5	10/19/01	10/21/01	0.55		
Vanadium	6010B	2	2	10/19/01	10/22/01	213		
Zinc	200.8	10.2	100	9/24/01	10/18/01	415		

% Solids: 69.9

Comments:

00034

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Exponent Environmental Group, Inc.
Service Request: K2106670
Project No.: 8601526.001.0302
Date Collected: 09/11/01
Project Name: Oregon Steel Mills
Date Received: 09/13/01
Matrix: SOIL
Units MG/KG
Basis Dry

Sample Name: S00150
Lab Code: K2106670-007

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Cadmium	200.8	0.06	5	9/24/01	10/18/01	3.15		
Chromium	6010B	12	20	10/19/01	10/22/01	2760		
Copper	200.8	12.0	500	9/24/01	10/18/01	547		
Lead	200.8	0.06	5	9/24/01	10/18/01	181		
Manganese	6010B	12	20	10/19/01	10/22/01	11400		
Zinc	200.8	60.0	500	9/24/01	10/18/01	26200		

% Solids: 83.4

Comments:

00035

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client: Exponent Environmental Group, Inc.
Project No.: 8601526.001.0302
Project Name: Oregon Steel Mills
Matrix: SOIL

Service Request: K2106670
Date Collected: 09/11/01
Date Received: 09/13/01
Units MG/KG
Basis Dry

Sample Name: S00151
Lab Code: K2106670-008

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	C	Q
Cadmium	200.8	0.06	5	9/24/01	10/18/01	0.60		
Chromium	6010B	11	20	10/19/01	10/22/01	4430		
Copper	200.8	0.1	5	9/24/01	10/18/01	161		
Lead	200.8	0.06	5	9/24/01	10/18/01	11.8		
Manganese	6010B	11	20	10/19/01	10/22/01	29100		
Zinc	200.8	0.6	5	9/24/01	10/18/01	48.1		

% Solids: 89.6

Comments:

METALS
- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: Inorganic Ventures CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					Method
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
rsenic	50.0	49.9	100	25.0	24.2	97	24.1	96	200.8
arium	200	201	101	25.0	24.1	96	24.9	100	200.8
admium	25.0	25.6	102	25.0	24.9	100	25.6	102	200.8
hromium	500	499	100	500	492	98	504	101	6010B
obalt	50.0	49.9	100	25.0	24.3	97	24.7	99	200.8
opper	25.0	24.9	100	25.0	24.3	97	24.8	99	200.8
ead	50.0	49.2	98	25.0	24.2	97	24.5	98	200.8
anganese	1250	1230	98	500	486	97	501	100	6010B
er[illegible]y	5.0	5.15	103	5.0	5.04	101	5.04	101	7471A
[illegible]	50.0	50.5	101	25.0	24.4	98	25.0	100	200.8
ilver	25.0	24.7	98	25.0	24.9	100	25.3	101	200.8
anadium	1250	1260	101	500	497	99	502	100	6010B
inc	50.0	50.3	101	25.0	24.5	98	24.5	98	200.8

00037

METALS
- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					Method
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Arsenic				25.0	26.3	105	26.0	104	200.8
Barium				25.0	26.1	104	25.9	103	200.8
Cadmium				25.0	24.7	99	24.2	97	200.8
Chromium				500	506	101	505	101	6010B
Cobalt				25.0	24.6	98	23.9	96	200.8
Copper				25.0	25.8	103	25.2	101	200.8
Lead				25.0	26.2	105	25.9	104	200.8
Manganese				500	502	100	502	100	6010B
Mercury				5.0	5.06	101	5.04	101	7471A
Nickel				25.0	24.8	99	24.2	97	200.8
Silver				25.0	25.0	100			200.8
Vanadium				500	486	97	494	99	6010B
Zinc				25.0	25.2	101	25.0	100	200.8

00038

METALS
- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

Analyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	Method
Chromium				500	504	101	503	101	6010B
Manganese				500	505	101	504	101	6010B
Mercury				5.0	5.08	102			7471A
Vanadium				500	493	99	485	97	6010B

METALS
- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					Method
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Chromium				500	503	101	508	102	6010B
Manganese				500	504	101	507	101	6010B
Vanadium				500	485	97	474	95	6010B

METALS
- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					Method
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Chromium				500	496	99	508	102	6010B
Manganese				500	499	100	502	100	6010B
Vanadium				500	509	102	505	101	6010B

METALS
- 2a -
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICV Source: CCV Source: CAS Mixed Solutions

Concentration Units: ug/L

nalyte	Initial Calibration			Continuing Calibration					Method
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
hromium				500	505	101			6010B
anganese				500	502	100			6010B
anadium				500	502	100			6010B

00042

METALS
- 2b -
CRDL STANDARD FOR AA AND ICP

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Arsenic				1.0	1.07	107		
Barium				0.10	0.10	104		
Cadmium				0.10	0.15	146		
Chromium				5.0	4.90	98		
Cobalt				0.04	0.04	104		
Copper				0.20	0.21	105		
Lead				0.10	0.04	40		
Manganese				5.0	5.06	101		
Mercury	0.20	0.25	125					
Nickel				0.60	0.41	68		
ilver				0.04	0.04	107		
anadium				5.0	5.50	110		
Zinc				1.0	1.04	104		

METALS
-3-
BLANKS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.030

Project Name: Oregon Steel Mills

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	Method
Arsenic	1.0	U	1.0	U	1.0	U	1.0	U	0.5	U	200.8
Barium	0.10	U	0.10	U	0.10	U	0.10	U	0.05	U	200.8
Cadmium	0.10	U	0.10	U	0.10	U	0.10	U	0.05	U	200.8
Chromium	5	U	5	U	5	U	5	U	1	U	6010B
Cobalt	0.04	U	0.04	U	0.04	U	0.04	U	0.02	U	200.8
Copper	0.2	U	0.2	U	0.2	U	0.2	U	0.1	U	200.8
Lead	0.10	U	0.10	U	0.10	U	0.10	U	0.05	U	200.8
Manganese	5	U	5	U	5	U	5	U	1	U	6010B
Mercury	0.20	U	0.20	U	0.20	U	0.20	U	0.02	U	7471A
Nickel	0.6	U	0.6	U	0.6	U	0.6	U	0.3	U	200.8
Silver	0.04	U	0.04	U	0.04	U	0.04	U	0.02	U	200.8
Vanadium	10	U	10	U	10	U	10	U	2	U	6010B
Zinc	1.0	U	1.0	U	1.0	U	1.0	U	0.5	U	200.8

METALS
- 3 -
BLANKS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: *8601526.001.030*

Project Name: Oregon Steel Mills

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	Method
Arsenic			1.0	U							200.8
Barium			0.10	U							200.8
Cadmium			0.10	U							200.8
Chromium			5	U	5	U	5	U			6010B
Cobalt			0.04	U							200.8
Copper			0.2	U							200.8
Lead			0.10	U							200.8
Manganese			5	U	5	U	5	U			6010B
Mercury			0.20	U	0.20	U					7471A
Nickel			0.6	U							200.8
Vanadium			10	U	10	U	10	U			6010B
Zinc			1.0	U							200.8

00045

METALS
- 3 -
BLANKS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.030

Project Name: Oregon Steel Mills

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C		Preparation Blank	C		Method
Chromium			5	U	5	U	5	U					6010B
Manganese			5	U	5	U	5	U					6010B
Vanadium			10	U	10	U	10	U					6010B

00046

METALS
-3-
BLANKS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.030

Project Name: Oregon Steel Mills

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	Method
Chromium			5	U	5	U					6010B
Manganese			5	U	5	U					6010B
Vanadium			10	U	10	U					6010B

METALS
-4-
ICP INTERFERENCE CHECK SAMPLE

Client: Exponent Environmental Group, Inc. Service Request:K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICP ID Number: TJA Iris ICP ICS Source: Inorganic Ventures

Concentration Units): ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Chromium		500	4	451	90	5.71	454	91
Manganese		500	9	445	89	9.34	449	90
Vanadium		500	-5	461	92	2.23	460	92

00048

METALS
-5a-
SPIKE SAMPLE RECOVERY

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302 Units: MG/KG

Project Name: Oregon Steel Mills Basis: Dry

Matrix: SOIL % Solids: 89.6

Sample Name: S00151S Lab Code: K2106670-008S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	70 - 130	47.5		6.9		44.6	91		200.8
Barium	70 - 130	707		292		446	93		200.8
Cadmium	70 - 130	9.77		0.60		11.2	82		200.8
Chromium		4210		4430		44.6	-493		6010B
Cobalt	70 - 130	91.3		6.49		112	76		200.8
Copper	70 - 130	220		161		55.8	106		200.8
Lead	70 - 130	122		11.8		112	98		200.8
Manganese		30100		29100		112	893		6010B
Nickel	70 - 130	154		54.9		112	88		200.8
Silver	70 - 130	10.6		1.40		11.2	82		200.8
Vanadium		578		406		112	154		6010B
Zinc	70 - 130	144		48.1		112	86		200.8

Comments:

METALS
- 5a -
SPIKE SAMPLE RECOVERY

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302 Units: MG/KG

Project Name: Oregon Steel Mills Basis: Dry

Matrix: SOIL % Solids: 97.5

Sample Name: SD0022S Lab Code: K2106670-003S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Mercury	60 - 130	0.57		0.05		0.50	105		7471A

Comments:

METALS
-6-
DUPLICATES

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302 Units: MG/KG

Project Name: Oregon Steel Mills Basis: Dry

Matrix: SOIL % Solids: 89.6

Sample Name: S00151D Lab Code: K2106670-008D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Arsenic		6.9		6.2		10		200.8
Barium		292		284		3		200.8
Cadmium		0.60		0.67		11		200.8
Chromium		4430		4180		6		6010B
Cobalt		6.49		5.88		10		200.8
Copper		161		167		4		200.8
Lead		11.8		9.92		17		200.8
Manganese		29100		30700		5		6010B
Nickel		54.9		55.6		1		200.8
Silver		1.40		1.24		12		200.8
Vanadium		406		446		9		6010B
Zinc		48.1		58.2		19		200.8

METALS
-6-
DUPLICATES

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302 Units: MG/KG

Project Name: Oregon Steel Mills Basis: Dry

Matrix: SOIL % Solids: 97.5

Sample Name: SD0022D Lab Code: K2106670-003D

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	Method
Mercury	0.0	0.05		0.06		13		7471A

00052

METALS

-7-

LABORATORY CONTROL SAMPLE

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

queous LCS Source: Inorganic Ventures Solid LCS Source: ERA Lot #246

Analyte	Aqueous mg/L			Solid (mg/kg)				
	True	Found	%R	True	Found	C	Limits	%R
Arsenic				187	202		139 235	108
Barium				172	207		132 212	120
Cadmium				67.9	66.7		52.0 83.6	98
Chromium				143	157		114 171	110
Cobalt				221	206		176 266	93
Copper				91.3	95.0		74.8 108	104
Lead				125	129		95.2 155	103
Manganese				388	412		311 465	106
Mercury				1.49	1.40		0.852 2.12	94
[illegible]l				78.0	78.3		61.1 94.9	100
S[illegible]ver				90.0	87.6		67.0 113	97
Vanadium				173	182		118 228	105
Zinc				283	307		219 347	108

00053

METALS
-9-
ICP SERIAL DILUTIONS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302 Units: ug/L

Project Name: Oregon Steel Mills

Sample Name: S00151L Lab Code: K2106670-008L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Differ-	Q	Method
Chromium	1980		2130		8		6010B
Manganese	13000		14300		10		6010B
Vanadium	182		189		4		6010B

00054

METALS
-10-
METHOD DETECTION LIMITS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICP/ICP-MS ID #: PQ-S

GFAA ID #: AA ID #:

Analyte	Mass	Back-ground	MRL (ug/L)		Method
Arsenic	75		1.0		200.8
Barium	137		0.10		200.8
Cadmium	111		0.10		200.8
Cobalt	59		0.04		200.8
Copper	65		0.2		200.8
Lead	208		0.10		200.8
Nickel	60		0.6		200.8
Silver	107		0.04		200.8
Zinc	66		1.0		200.8

Comments: _____

METALS
-10-
METHOD DETECTION LIMITS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICP/ICP-MS ID #: TJA Iris ICP

GFAA ID #: AA ID #:

Analyte	Wave-length	Back-ground	MRL (ug/L)		Method
Chromium	267.72		5		6010B
Manganese	257.61		5		6010B
Vanadium	310.20		10.0		6010B

mments

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METALS
-10-
METHOD DETECTION LIMITS

Client: Exponent Environmental Group, Inc. Service Request: K2106670

Project No.: 8601526.001.0302

Project Name: Oregon Steel Mills

ICP/ICP-MS ID #:

GFAA ID #: AA ID #: Varian-3

Analyte	Wave-length	Back-ground	MRL (ug/L)		Method
Mercury	253.70	BD	0.20		7471A

Polychlorinated Biphenyls (PCBs) Method 8082

COLUMBIA ANALYTICAL SERVICES, INC.

ıt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ect: Oregon Steel Mills/8601526.001.0302

Cover Page - Organic Analysis Data Package
Polychlorinated Biphenyls (PCBs)

Sample Name	Lab Code	Date Collected	Date Received
SD0021	K2106670-002	09/10/2001	09/13/2001
SD0022	K2106670-003	09/10/2001	09/13/2001
SD0024	K2106670-005	09/10/2001	09/13/2001
SW0002	K2106670-006	09/10/2001	09/13/2001
S00152	K2106670-010	09/11/2001	09/13/2001
S00153	K2106670-011	09/11/2001	09/13/2001
GW1201	K2106670-012	09/12/2001	09/13/2001
SW0002MS	KWG0106148-1	09/10/2001	09/13/2001
SW0002DMS	KWG0106148-2	09/10/2001	09/13/2001
SD0022MS	KWG0106264-1	09/10/2001	09/13/2001
SD0022DMS	KWG0106264-2	09/10/2001	09/13/2001

ify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the itions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on y diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Name: Todd Poynton

: 10/10/01

Title: 011568

SuperSet Reference: RR11797

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

it:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
ple Matrix:	Water	**Date Received:**	09/13/2001

Polychlorinated Biphenyls (PCBs)

ple Name:	SW0002	**Units:**	ug/L
Code:	K2106670-006	**Basis:**	NA
action Method:	EPA 3520	**Level:**	Low
ysis Method:	8082		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
lor 1016	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
lor 1221	ND	U	0.39	1	09/17/01	10/02/01	KWG0106148	
lor 1232	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
lor 1242	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
lor 1248	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
lor 1254	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
lor 1260	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	

ogate Name	%Rec	Control Limits	Date Analyzed	Note
chlorobiphenyl	99	0-143	10/02/01	Acceptable

ments:

001569

10-30-01

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/12/2001
atrix:	Water	**Date Received:**	09/13/2001

GW1201 was erroneously analyzed for PCBs. These results were designated as not reportable in the project database

Polychlorinated Biphenyls (PCBs)

ple Name:	GW1201	**Units:**	ug/L
Code:	K2106670-012	**Basis:**	NA
raction Method:	EPA 3520	**Level:**	Low
lysis Method:	8082		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
clor 1016	ND	U	0.43	1	09/17/01	10/02/01	KWG0106148	
clor 1221	ND	U	0.86	1	09/17/01	10/02/01	KWG0106148	
clor 1232	ND	U	0.43	1	09/17/01	10/02/01	KWG0106148	
clor 1242	ND	U	0.43	1	09/17/01	10/02/01	KWG0106148	
clor 1248	ND	U	0.43	1	09/17/01	10/02/01	KWG0106148	
clor 1254	ND	U	0.43	1	09/17/01	10/02/01	KWG0106148	
clor 1260	ND	U	0.43	1	09/17/01	10/02/01	KWG0106148	

r Name	%Rec	Control Limits	Date Analyzed	Note
robiphenyl	35	0-143	10/02/01	Acceptable

uments:

00570

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	Date Collected:	NA
mple Matrix:	Water	Date Received:	NA

Polychlorinated Biphenyls (PCBs)

mple Name:	Method Blank	Units:	ug/L
Code:	KWG0106148-4	Basis:	NA
raction Method:	EPA 3520	Level:	Low
lysis Method:	8082		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
clor 1016	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
clor 1221	ND	U	0.40	1	09/17/01	10/02/01	KWG0106148	
clor 1232	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
clor 1242	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
clor 1248	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
clor 1254	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
clor 1260	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	

rogate Name	%Rec	Control Limits	Date Analyzed	Note
achlorobiphenyl	107	0-143	10/02/01	Acceptable

ments:

00571

ted: 10/10/2001 11:02:00 Form 1A - Organic

ed SuperSet Reference: RR11797

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

it:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
ple trix:	Soil	**Date Received:**	09/13/2001

Polychlorinated Biphenyls (PCBs)

ple Name:	SD0021	**Units:**	mg/Kg
Code:	K2106670-002	**Basis:**	Dry
action Method:	EPA 3540	**Level:**	Low
ysis Method:	8082		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
lor 1016	ND	U	0.16	1	09/24/01	10/03/01	KWG0106264	
lor 1221	ND	U	0.31	1	09/24/01	10/03/01	KWG0106264	
lor 1232	ND	U	0.16	1	09/24/01	10/03/01	KWG0106264	
lor 1242	ND	U	0.16	1	09/24/01	10/03/01	KWG0106264	
lor 1248	**0.57**		0.16	1	09/24/01	10/03/01	KWG0106264	
lor 1254	**0.45**		0.16	1	09/24/01	10/03/01	KWG0106264	
lor 1260	ND	U	0.16	1	09/24/01	10/03/01	KWG0106264	

o Name	%Rec	Control Limits	Date Analyzed	Note
obiphenyl	91	57-136	10/03/01	Acceptable

nents:

01572

ed: 10/10/2001 11:02:04 Form 1A - Organic

d SuperSet Reference: RR11797

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
ple Matrix:	Soil	**Date Received:**	09/13/2001

Polychlorinated Biphenyls (PCBs)

ple Name:	SD0022	**Units:**	mg/Kg
Code:	K2106670-003	**Basis:**	Dry
action Method:	EPA 3540	**Level:**	Low
lysis Method:	8082		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
lor 1016	ND	U	0.11	1	09/24/01	10/03/01	KWG0106264	
lor 1221	ND	U	0.21	1	09/24/01	10/03/01	KWG0106264	
lor 1232	ND	U	0.11	1	09/24/01	10/03/01	KWG0106264	
lor 1242	ND	U	0.11	1	09/24/01	10/03/01	KWG0106264	
lor 1248	**0.17**		0.11	1	09/24/01	10/03/01	KWG0106264	
lor 1254	ND	U	0.11	1	09/24/01	10/03/01	KWG0106264	
lor 1260	ND	U	0.11	1	09/24/01	10/03/01	KWG0106264	

ogate Name	%Rec	Control Limits	Date Analyzed	Note
chlorobiphenyl	94	57-136	10/03/01	Acceptable

ients:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302
p[illegible]trix: Soil

Service Request: K2106670
Date Collected: 09/10/2001
Date Received: 09/13/2001

Polychlorinated Biphenyls (PCBs)

ple Name: SD0024
Code: K2106670-005

Units: mg/Kg
Basis: Dry

action Method: EPA 3540
ysis Method: 8082

Level: Low

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
lor 1016	ND	U	0.52	1	09/24/01	10/03/01	KWG0106264	
lor 1221	ND	U	1.1	1	09/24/01	10/03/01	KWG0106264	
lor 1232	ND	U	0.52	1	09/24/01	10/03/01	KWG0106264	
lor 1242	ND	U	0.52	1	09/24/01	10/03/01	KWG0106264	
lor 1248	1.5		0.52	1	09/24/01	10/03/01	KWG0106264	
lor 1254	0.63		0.52	1	09/24/01	10/03/01	KWG0106264	
lor 1260	ND	U	0.52	1	09/24/01	10/03/01	KWG0106264	

r [illegible]lame	%Rec	Control Limits	Date Analyzed	Note
c[illegible]robiphenyl	88	57-136	10/03/01	Acceptable

ients:

00574

d: 10/10/2001 11:02:13 Form 1A - Organic Page 1 of 1

1 SuperSet Reference: RR11797

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/11/2001
ple Matrix:	Soil	Date Received:	09/13/2001

Polychlorinated Biphenyls (PCBs)

ple Name:	S00152	Units:	mg/Kg
Code:	K2106670-010	Basis:	Dry
action Method:	EPA 3540	Level:	Low
lysis Method:	8082		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
lor 1016	ND	U	0.12	1	09/24/01	10/03/01	KWG0106264	
lor 1221	ND	U	0.23	1	09/24/01	10/03/01	KWG0106264	
lor 1232	ND	U	0.12	1	09/24/01	10/03/01	KWG0106264	
lor 1242	ND	U	0.12	1	09/24/01	10/03/01	KWG0106264	
lor 1248	**1.1**		0.12	1	09/24/01	10/03/01	KWG0106264	
lor 1254	**0.42**		0.12	1	09/24/01	10/03/01	KWG0106264	
lor 1260	ND	U	0.12	1	09/24/01	10/03/01	KWG0106264	

ogate Name	%Rec	Control Limits	Date Analyzed	Note
chlorobiphenyl	86	57-136	10/03/01	Acceptable

nents:

00575

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/11/2001
r[redacted]trix:	Soil	Date Received:	09/13/2001

Polychlorinated Biphenyls (PCBs)

ple Name:	S00153	Units:	mg/Kg
Code:	K2106670-011	Basis:	Dry
action Method:	EPA 3540	Level:	Low
lysis Method:	8082		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
clor 1016	ND	U	5.8	50	09/24/01	10/04/01	KWG0106264	
clor 1221	ND	U	12	50	09/24/01	10/04/01	KWG0106264	
clor 1232	ND	U	5.8	50	09/24/01	10/04/01	KWG0106264	
clor 1242	44	D	5.8	50	09/24/01	10/04/01	KWG0106264	
clor 1248	ND	U	5.8	50	09/24/01	10/04/01	KWG0106264	
clor 1254	ND	U	5.8	50	09/24/01	10/04/01	KWG0106264	
clor 1260	ND	U	5.8	50	09/24/01	10/04/01	KWG0106264	

r[redacted] Name	%Rec	Control Limits	Date Analyzed	Note
achlorobiphenyl	113	57-136	10/04/01	Acceptable

[redacted]

nments: _____

00576

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302
ple Matrix: Soil

Service Request: K2106670
Date Collected: NA
Date Received: NA

Polychlorinated Biphenyls (PCBs)

ple Name: Method Blank
Code: KWG0106264-4

Units: mg/Kg
Basis: Dry

action Method: EPA 3540
lysis Method: 8082

Level: Low

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
lor 1016	ND	U	0.10	1	09/24/01	10/03/01	KWG0106264	
lor 1221	ND	U	0.20	1	09/24/01	10/03/01	KWG0106264	
lor 1232	ND	U	0.10	1	09/24/01	10/03/01	KWG0106264	
lor 1242	ND	U	0.10	1	09/24/01	10/03/01	KWG0106264	
lor 1248	ND	U	0.10	1	09/24/01	10/03/01	KWG0106264	
lor 1254	ND	U	0.10	1	09/24/01	10/03/01	KWG0106264	
lor 1260	ND	U	0.10	1	09/24/01	10/03/01	KWG0106264	

ogate Name	%Rec	Control Limits	Date Analyzed	Note
chlorobiphenyl	100	57-136	10/03/01	Acceptable

nents:

U0577

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ect: Oregon Steel Mills/8601526.001.0302
r' atrix: Water

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)

action Method: EPA 3520 **Units:** PERCENT
lysis Method: 8082 **Level:** Low

ple Name	Lab Code	Sur1
002	K2106670-006	99
1201	K2106670-012	35
iod Blank	KWG0106148-4	107
002MS	KWG0106148-1	93
002DMS	KWG0106148-2	102
Control Sample	KWG0106148-3	102

ogate Recovery Control Limits (%)

= Decachlorobiphenyl	0-143

ts flagged with an asterisk (*) indicate values outside control criteria.
ts flagged with a pound (#) indicate the control criteria is not applicable.

00578

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302		
ple Matrix:	Soil		

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)

action Method:	EPA 3540	**Units:**	PERCENT
ysis Method:	8082	**Level:**	Low

ple Name	Lab Code	Sur1
)21	K2106670-002	91
)22	K2106670-003	94
)24	K2106670-005	88
52	K2106670-010	86
53	K2106670-011	113 D #
od Blank	KWG0106264-4	100
)22MS	KWG0106264-1	89
)22DMS	KWG0106264-2	93
Control Sample	KWG0106264-3	90

ogate Recovery Control Limits (%)

= Decachlorobiphenyl	57-136

s flagged with an asterisk (*) indicate values outside control criteria.
s flagged with a pound (#) indicate the control criteria is not applicable.

U0579

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/17/2001
p[illegible]trix:	Water	**Date Analyzed:**	10/02/2001

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

ple Name:	SW0002	**Units:**	ug/L
Code:	K2106670-006	**Basis:**	NA
action Method:	EPA 3520	**Level:**	Low
lysis Method:	8082	**Extraction Lot:**	KWG0106148

		SW0002MS KWG0106148-1 Matrix Spike			SW0002DMS KWG0106148-2 Duplicate Matrix Spike					
lyte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
lor 1016	ND	3.68	3.85	96	4.05	3.85	105	48-140	10	30
lor 1260	ND	3.93	3.85	102	4.26	3.85	111	58-136	8	30

[illegible]ged with an asterisk (*) indicate values outside control criteria.

s flagged with a pound (#) indicate the control criteria is not applicable.

t recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

U1580

QA/QC Report

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302
ple Matrix: Soil

Service Request: K2106670
Date Extracted: 09/24/2001
Date Analyzed: 10/03/2001

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

ple Name: SD0022
Code: K2106670-003

Units: mg/Kg
Basis: Dry

action Method: EPA 3540
lysis Method: 8082

Level: Low
Extraction Lot: KWG0106264

yte Name	Sample Result	SD0022MS KWG0106264-1 Matrix Spike Result	Expected	%Rec	SD0022DMS KWG0106264-2 Duplicate Matrix Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
lor 1016	ND	0.918	1.02	90	0.965	1.03	94	51-145	5	50
lor 1260	ND	1.11	1.02	109	1.17	1.03	114	58-147	5	50

s flagged with an asterisk (*) indicate values outside control criteria.
s flagged with a pound (#) indicate the control criteria is not applicable.
t recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

U0581

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/17/2001
r' atrix:	Water	**Date Analyzed:**	10/02/2001

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

raction Method:	EPA 3520	**Units:**	ug/L
lysis Method:	8082	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0106148

	Lab Control Sample KWG0106148-3 Lab Control Spike			
lyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
clor 1016	1.69	2.00	85	60-124
clor 1260	2.03	2.00	102	65-131

lts flagged with an asterisk (*) indicate values outside control criteria.

nt recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00582

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/24/2001
ple Matrix:	Soil	**Date Analyzed:**	10/03/2001

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

action Method:	EPA 3540	**Units:**	mg/Kg
lysis Method:	8082	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106264

	Lab Control Sample KWG0106264-3 Lab Control Spike			
lyte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
lor 1016	0.945	1.00	94	63-134
lor 1260	0.957	1.00	96	74-130

s flagged with an asterisk (*) indicate values outside control criteria.

t recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

U0583

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/17/2001
le rix:	Water	**Date Analyzed:**	10/02/2001
		Time Analyzed:	17:19

Method Blank Summary
Polychlorinated Biphenyls (PCBs)

le Name:	Method Blank	**File ID:**	J:\GC09\DATA\100201.B\1002F001.D
Code:	KWG0106148-4	**Instrument ID:**	GC09.i
ction Method:	EPA 3520	**Level:**	Low
sis Method:	8082	**Extraction Lot:**	KWG0106148

Method Blank applies to the following analyses:

e Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ontrol Sample	KWG0106148-3	J:\GC09\DATA\100201.B\1002F002.D	10/02/01	17:47
02	K2106670-006	J:\GC09\DATA\100201.B\1002F003.D	10/02/01	18:15
02MS	KWG0106148-1	J:\GC09\DATA\100201.B\1002F004.D	10/02/01	18:43
02DMS	KWG0106148-2	J:\GC09\DATA\100201.B\1002F005.D	10/02/01	19:11
01	K2106670-012	J:\GC09\DATA\100201.B\1002F006.D	10/02/01	19:39

00584

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/24/2001
ple Matrix:	Soil	**Date Analyzed:**	10/03/2001
		Time Analyzed:	06:21

Method Blank Summary
Polychlorinated Biphenyls (PCBs)

ple Name:	Method Blank	**File ID:**	J:\GC09\DATA\100201.B\1002F029.D
Code:	KWG0106264-4	**Instrument ID:**	GC09.i
action Method:	EPA 3540	**Level:**	Low
ysis Method:	8082	**Extraction Lot:**	KWG0106264

Method Blank applies to the following analyses:

le Name	**Lab Code**	**File ID**	**Date Analyzed**	**Time Analyzed**
:ontrol Sample	KWG0106264-3	J:\GC09\DATA\100201.B\1002F030.D	10/03/01	06:49
21	K2106670-002	J:\GC09\DATA\100201.B\1002F031.D	10/03/01	07:17
22	K2106670-003	J:\GC09\DATA\100201.B\1002F032.D	10/03/01	07:45
22MS	KWG0106264-1	J:\GC09\DATA\100201.B\1002F033.D	10/03/01	08:13
22DMS	KWG0106264-2	J:\GC09\DATA\100201.B\1002F037.D	10/03/01	10:05
24	K2106670-005	J:\GC09\DATA\100201.B\1002F038.D	10/03/01	10:32
52	K2106670-010	J:\GC09\DATA\100201.B\1002F039.D	10/03/01	11:00
53	K2106670-011	J:\GC09\DATA\100301.B\1003F042.D	10/04/01	12:03

00585

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ject:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/17/2001
ıpl atrix:	Water	**Date Analyzed:**	10/02/2001
		Time Analyzed:	17:47

Lab Control Sample Summary
Polychlorinated Biphenyls (PCBs)

ıple Name:	Lab Control Sample	**File ID:**	J:\GC09\DATA\100201.B\1002F002.D
Code:	KWG0106148-3	**Instrument ID:**	GC09.i
raction Method:	EPA 3520	**Level:**	Low
ılysis Method:	8082	**Extraction Lot:**	KWG0106148

Lab Control Sample applies to the following analyses:

ple Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ıod Blank	KWG0106148-4	J:\GC09\DATA\100201.B\1002F001.D	10/02/01	17:19
002	K2106670-006	J:\GC09\DATA\100201.B\1002F003.D	10/02/01	18:15
002MS	KWG0106148-1	J:\GC09\DATA\100201.B\1002F004.D	10/02/01	18:43
002DMS	KWG0106148-2	J:\GC09\DATA\100201.B\1002F005.D	10/02/01	19:11
201	K2106670-012	J:\GC09\DATA\100201.B\1002F006.D	10/02/01	19:39

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/24/2001
ple Matrix:	Soil	**Date Analyzed:**	10/03/2001
		Time Analyzed:	06:49

Lab Control Sample Summary
Polychlorinated Biphenyls (PCBs)

ple Name:	Lab Control Sample	**File ID:**	J:\GC09\DATA\100201.B\1002F030.D
Code:	KWG0106264-3	**Instrument ID:**	GC09.i
action Method:	EPA 3540	**Level:**	Low
lysis Method:	8082	**Extraction Lot:**	KWG0106264

Lab Control Sample applies to the following analyses:

ıle Name	Lab Code	File ID	Date Analyzed	Time Analyzed
od Blank	KWG0106264-4	J:\GC09\DATA\100201.B\1002F029.D	10/03/01	06:21
121	K2106670-002	J:\GC09\DATA\100201.B\1002F031.D	10/03/01	07:17
122	K2106670-003	J:\GC09\DATA\100201.B\1002F032.D	10/03/01	07:45
122MS	KWG0106264-1	J:\GC09\DATA\100201.B\1002F033.D	10/03/01	08:13
122DMS	KWG0106264-2	J:\GC09\DATA\100201.B\1002F037.D	10/03/01	10:05
124	K2106670-005	J:\GC09\DATA\100201.B\1002F038.D	10/03/01	10:32
52	K2106670-010	J:\GC09\DATA\100201.B\1002F039.D	10/03/01	11:00
53	K2106670-011	J:\GC09\DATA\100301.B\1003F042.D	10/04/01	12:03

U0587

ent: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 08/08/2001

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

ibration ID: CAL968
trument ID: GC09.i

Column: Rtx-5

el ID	File ID	Level ID	File ID
	\\kelso3\acqudata\GC09\DATA\080801.B\0808F003.D	H	\\kelso3\acqudata\GC09\DATA\080801.B\0808F010.D
	\\kelso3\acqudata\GC09\DATA\080801.B\0808F004.D	I	\\kelso3\acqudata\GC09\DATA\080801.B\0808F011.D
	\\kelso3\acqudata\GC09\DATA\080801.B\0808F005.D	J	\\kelso3\acqudata\GC09\DATA\080801.B\0808F012.D
	\\kelso3\acqudata\GC09\DATA\080801.B\0808F006.D	K	\\kelso3\acqudata\GC09\DATA\080801.B\0808F013.D
	\\kelso3\acqudata\GC09\DATA\080801.B\0808F007.D	L	\\kelso3\acqudata\GC09\DATA\080801.B\0808F014.D
	\\kelso3\acqudata\GC09\DATA\080801.B\0808F008.D	M	\\kelso3\acqudata\GC09\DATA\080801.B\0808F015.D
	\\kelso3\acqudata\GC09\DATA\080801.B\0808F009.D		

alyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
achlorobiphenyl							H	2.5	1200	I	5.0	1210	J	50	1170
	K	100	1120	L	200	1100	M	500	1010						
clor 1016 (1)							H	25	94.6	I	50	94.4	J	500	83.9
	K	1000	76.2	L	2000	72.3	M	5000	64.0						
clor 1016 (2)							H	25	46.2	I	50	44.8	J	500	40.5
	K	1000	38.0	L	2000	38.1	M	5000	35.3						
clor 1016 (3)							H	25	154	I	50	152	J	500	136
	K	1000	127	L	2000	125	M	5000	116						
clor 1016 (4)							H	25	57.6	I	50	57.5	J	500	53.9
	K	1000	50.1	L	2000	50.0	M	5000	48.5						
clor 1016 (5)							H	25	44.9	I	50	47.3	J	500	41.9
	K	1000	37.9	L	2000	37.1	M	5000	33.5						
clor 1260 (1)							H	25	117	I	50	120	J	500	114
	K	1000	110	L	2000	109	M	5000	103						
clor 1260 (2)							H	25	56.6	I	50	59.3	J	500	57.5
	K	1000	54.5	L	2000	52.8	M	5000	48.8						
clor 1260 (3)							H	25	49.8	I	50	50.0	J	500	49.7
	K	1000	48.2	L	2000	47.8	M	5000	46.5						

lts flagged with an asterisk (*) indicate values outside control criteria.

00588

nt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ject: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/08/2001

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

bration ID: CAL968 **Column:** Rtx-5
rument ID: GC09.i

lyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
lor 1260 (4)															
							H	25	117	I	50	118	J	500	118
	K	1000	115	L	2000	115	M	5000	115						
lor 1260 (5)															
							H	25	56.7	I	50	58.7	J	500	58.7
	K	1000	58.2	L	2000	59.9	M	5000	59.3						

; flagged with an asterisk (*) indicate values outside control criteria.

0:1589

nt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ect: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/08/2001

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

bration ID: CAL968 **Column:** Rtx-5
ument ID: GC09.i

alyte Name	Compound Type	Calibration Evaluation: Fit Type	Eval.	Eval. Result	Q	Control Criteria
achlorobiphenyl	SURR	AverageRF	% RSD	6.7		≤20
clor 1016 {1}	MULTI	AverageRF	% RSD	15.2		≤20
clor 1016 {2}	MULTI	AverageRF	% RSD	10.5		≤20
clor 1016 {3}	MULTI	AverageRF	% RSD	11.5		≤20
clor 1016 {4}	MULTI	AverageRF	% RSD	7.6		≤20
clor 1016 {5}	MULTI	AverageRF	% RSD	12.9		≤20
clor 1260 {1}	MULTI	AverageRF	% RSD	5.4		≤20
clor 1260 {2}	MULTI	AverageRF	% RSD	6.8		≤20
clor 1260 {3}	MULTI	AverageRF	% RSD	2.9		≤20
clor 1260 {4}	MULTI	AverageRF	% RSD	1.1		≤20
clor 1260 {5}	MULTI	AverageRF	% RSD	1.9		≤20

s ..gged with an asterisk (*) indicate values outside control criteria.

00590

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 08/08/2001
Date Analyzed: 08/08/2001

Second Source Calibration Verification
Polychlorinated Biphenyls (PCBs)

ration Type: External Standard
/sis Method: 8082

Calibration ID: CAL968
Units: ng/mL

D: \\kelso3\acqudata\GC09\DATA\080801.B\0808F016.D
\\kelso3\acqudata\GC09\DATA\080801.B\0808F017.D
\\kelso3\acqudata\GC09\DATA\080801.B\0808F018.D
\\kelso3\acqudata\GC09\DATA\080801.B\0808F019.D
\\kelso3\acqudata\GC09\DATA\080801.B\0808F020.D
\\kelso3\acqudata\GC09\DATA\080801.B\0808F021.D
\\kelso3\acqudata\GC09\DATA\080801.B\0808F022.D
\\kelso3\acqudata\GC09\DATA\080801.B\0808F023.D
\\kelso3\acqudata\GC09\DATA\080801.B\0808F024.D

Column ID: Rtx-5

/te Name	Expected	Result	Average RF	SSV RF	%D	%Drift		Criteria	Curve Fit
or 1016	2000	1700	NA	NA	NA	15	*	± 15 %	NA
or 1016 {1}	2000	1700	80.9	68.6	-15	NA		± 30 %	AverageRF
or 1016 {2}	2000	1800	40.5	35.5	-12	NA		± 30 %	AverageRF
or 1016 {3}	2000	1700	135	115	-15	NA		± 30 %	AverageRF
or 1016 {4}	2000	1700	52.9	46.1	-13	NA		± 30 %	AverageRF
or 1016 {5}	2000	1600	40.4	32.5	-20	NA		± 30 %	AverageRF
or 1260	2000	2100	NA	NA	NA	-3		± 15 %	NA
or 1260 {1}	2000	1500	112	86.2	-23	NA		± 30 %	AverageRF
or 1260 {2}	2000	2200	54.9	61.2	11	NA		± 30 %	AverageRF
or 1260 {3}	2000	2200	48.7	54.3	12	NA		± 30 %	AverageRF
or 1260 {4}	2000	2200	116	129	10	NA		± 30 %	AverageRF
or 1260 {5}	2000	2100	58.6	60.5	3	NA		± 30 %	AverageRF

; flagged with an asterisk (*) indicate values outside control criteria.
C Compound **‡ CCC Compound**

0:1591

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 08/08/2001

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

bration ID: CAL968
ument ID: GC09.i

Column: Rtx-50

l ID	File ID	Level ID	File ID
	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R003.D	H	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R010.D
	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R004.D	I	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R011.D
	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R005.D	J	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R012.D
	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R006.D	K	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R013.D
	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R007.D	L	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R014.D
	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R008.D	M	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R015.D
	\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R009.D		

lyte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
ıchlorobiphenyl															
							H	2.5	3580	I	5.0	2820	J	50	2490
	K	100	2320	L	200	2200	M	500	1990						
:lor 1016 (1)															
							H	25	105	I	50	102	J	500	89.5
	K	1000	81.9	L	2000	79.5	M	5000	80.4						
:l 6 (2)															
							H	25	363	I	50	346	J	500	279
	K	1000	254	L	2000	238	M	5000	294						
:lor 1016 (3)															
							H	25	109	I	50	110	J	500	97.3
	K	1000	90.8	L	2000	87.9	M	5000	80.9						
:lor 1016 (4)															
							H	25	89.8	I	50	91.2	J	500	77.8
	K	1000	69.2	L	2000	64.2	M	5000	56.1						
:lor 1016 (5)															
							H	25	131	I	50	132	J	500	117
	K	1000	106	L	2000	103	M	5000	91.7						
:lor 1260 (1)															
							H	25	320	I	50	323	J	500	297
	K	1000	279	L	2000	269	M	5000	262						
:lor 1260 (2)															
							H	25	135	I	50	138	J	500	122
	K	1000	112	L	2000	106	M	5000	97.4						
:lor 1260 (3)															
							H	25	142	I	50	142	J	500	132
	K	1000	124	L	2000	120	M	5000	112						

lts flagged with an asterisk (*) indicate values outside control criteria.

00592

ıt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ect: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/08/2001

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

ɔration ID: CAL968 **Column:** Rtx-50
ument ID: GC09.i

yte Name	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF	Level ID	Amt	RF
lor 1260 {4}															
							H	25	307	I	50	284	J	500	287
	K	1000	272	L	2000	267	M	5000	249						
lor 1260 {5}															
							H	25	211	I	50	203	J	500	191
	K	1000	184	L	2000	184	M	5000	176						

s flagged with an asterisk (*) indicate values outside control criteria.

00593

ınt: Exponent Environmental Group, Inc. **Service Request:** K2106670

ject: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/08/2001

Initial Calibration Summary
Polychlorinated Biphenyls (PCBs)

ibration ID: CAL968 **Column:** Rtx-50

rument ID: GC09.i

		Calibration Evaluation				
alyte Name	Compound Type	Fit Type	Eval.	Eval. Result	Q	Control Criteria
:achlorobiphenyl	SURR	Linear	R2	0.998		≥ 0.99
oclor 1016 {1}	MULTI	AverageRF	% RSD	12.4		≤ 20
oclor 1016 {2}	MULTI	AverageRF	% RSD	16.8		≤ 20
oclor 1016 {3}	MULTI	AverageRF	% RSD	12.0		≤ 20
oclor 1016 {4}	MULTI	AverageRF	% RSD	18.9		≤ 20
oclor 1016 {5}	MULTI	AverageRF	% RSD	14.4		≤ 20
oclor 1260 {1}	MULTI	AverageRF	% RSD	8.9		≤ 20
oclor 1260 {2}	MULTI	AverageRF	% RSD	13.7		≤ 20
oclor 1260 {3}	MULTI	AverageRF	% RSD	9.4		≤ 20
oclor 1260 {4}	MULTI	AverageRF	% RSD	7.1		≤ 20
oclor 1260 {5}	MULTI	AverageRF	% RSD	6.8		≤ 20

lts flagged with an asterisk (*) indicate values outside control criteria.

U0594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 08/08/2001
Date Analyzed: 08/08/2001

Second Source Calibration Verification
Polychlorinated Biphenyls (PCBs)

ıration Type: External Standard
ysis Method: 8082

Calibration ID: CAL968
Units: ng/mL

D: \\kelso3\acqudata\GC09\DATA\080801_r.b\0808R016.D
\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R017.D
\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R018.D
\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R019.D
\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R020.D
\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R021.D
\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R022.D
\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R023.D
\\kelso3\acqudata\GC09\DATA\080801_r.b\0808R024.D

Column ID: Rtx-50

yte Name	Expected	Result	Average RF	SSV RF	%D	%Drift		Criteria	Curve Fit
or 1016	2000	1600	NA	NA	NA	21	*	± 15 %	NA
or 1016 {1}	2000	1600	89.6	72.6	-19	NA		± 30 %	AverageRF
or 1016 {2}	2000	1500	296	218	-26	NA		± 30 %	AverageRF
or 1016 {3}	2000	1700	95.9	80.5	-16	NA		± 30 %	AverageRF
or 1016 {4}	2000	1500	74.7	54.7	-27	NA		± 30 %	AverageRF
or 1016 {5}	2000	1600	113	92.6	-18	NA		± 30 %	AverageRF
or 1260	2000	1900	NA	NA	NA	3		± 15 %	NA
or 1260 {1}	2000	1600	292	227	-22	NA		± 30 %	AverageRF
or 1260 {2}	2000	2100	119	123	4	NA		± 30 %	AverageRF
or 1260 {3}	2000	2000	129	127	-1	NA		± 30 %	AverageRF
or 1260 {4}	2000	2100	278	292	5	NA		± 30 %	AverageRF
or 1260 {5}	2000	2000	191	194	1	NA		± 30 %	AverageRF

ı flagged with an asterisk (*) indicate values outside control criteria.
C Compound **‡ CCC Compound**

00595

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

it:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	10/02/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

ration Type:	External Standard	**Calibration Date:**	08/08/2001
ysis Method:	8082	**Calibration ID:**	CAL968
		Analysis Lot:	KWG0106549
		Units:	ng/mL
D:	\\KELSO3\ACQUDATA\GC09\DATA\100201.B\1001F044.D	**Column ID:**	Rtx-5

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
chlorobiphenyl	100	110	1140	1290	14	NA	± 15 %	AverageRF
lor 1016 {1}	1000	1000	80.9	83.6	3	NA	± 30 %	AverageRF
lor 1016 {2}	1000	1000	40.5	41.9	4	NA	± 30 %	AverageRF
lor 1016 {3}	1000	1000	135	136	1	NA	± 30 %	AverageRF
lor 1016 {4}	1000	1100	52.9	55.7	5	NA	± 30 %	AverageRF
lor 1016 {5}	1000	1000	40.4	40.9	1	NA	± 30 %	AverageRF
lor 1016	1000	1000	NA	NA	NA	3	± 15 %	NA
lor 1260 {1}	1000	990	112	111	-1	NA	± 30 %	AverageRF
lor 1260 {2}	1000	1100	54.9	61.5	12	NA	± 30 %	AverageRF
lor 1260 {3}	1000	1100	48.7	54.6	12	NA	± 30 %	AverageRF
lor 1260 {4}	1000	1100	116	128	10	NA	± 30 %	AverageRF
lor 1260 {5}	1000	1100	58.6	64.7	10	NA	± 30 %	AverageRF
lo[redacted]0	1000	1100	NA	NA	NA	9	± 15 %	NA

s flagged with an asterisk (*) indicate values outside control criteria.

00596

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/02/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

ration Type: External Standard
/sis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106549
Units: ng/mL

D: \\KELSO3\ACQUDATA\GC09\DATA\100201_R.B\1001R044.D

Column ID: Rtx-50

/te Name	Expected	Result	Average RF	CCV RF	%D	%Drift		Criteria	Curve Fit
:hlorobiphenyl	100	120	2570	2660	NA	25	*	± 15 %	Linear
or 1016 {1}	1000	1100	89.6	97.1	8	NA		± 30 %	AverageRF
or 1016 {2}	1000	1000	296	295	-0	NA		± 30 %	AverageRF
or 1016 {3}	1000	1100	95.9	102	7	NA		± 30 %	AverageRF
or 1016 {4}	1000	1100	74.7	79.3	6	NA		± 30 %	AverageRF
or 1016 {5}	1000	1100	113	127	12	NA		± 30 %	AverageRF
or 1016	1000	1100	NA	NA	NA	7		± 15 %	NA
or 1260 {1}	1000	1100	292	309	6	NA		± 30 %	AverageRF
or 1260 {2}	1000	1200	119	138	17	NA		± 30 %	AverageRF
or 1260 {3}	1000	1200	129	149	16	NA		± 30 %	AverageRF
or 1260 {4}	1000	1200	278	325	17	NA		± 30 %	AverageRF
or 1260 {5}	1000	1100	191	213	11	NA		± 30 %	AverageRF
or 1260	1000	1100	NA	NA	NA	13		± 15 %	NA

s flagged with an asterisk (*) indicate values outside control criteria.

U0597

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

it:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	10/02/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

ration Type:	External Standard	**Calibration Date:**	08/08/2001
ysis Method:	8082	**Calibration ID:**	CAL968
		Analysis Lot:	KWG0106549
		Units:	ng/mL
D:	\\KELSO3\ACQUDATA\GC09\DATA\100201.B\1002F012.D	**Column ID:**	Rtx-5

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
chlorobiphenyl	100	110	1140	1260	11	NA	± 15 %	AverageRF
lor 1016 (1)	1000	1000	80.9	81.2	0	NA	± 30 %	AverageRF
lor 1016 (2)	1000	1000	40.5	40.7	1	NA	± 30 %	AverageRF
lor 1016 (3)	1000	980	135	132	-2	NA	± 30 %	AverageRF
lor 1016 (4)	1000	1000	52.9	54.3	3	NA	± 30 %	AverageRF
lor 1016 (5)	1000	1000	40.4	40.5	0	NA	± 30 %	AverageRF
lor 1016	1000	1000	NA	NA	NA	0	± 15 %	NA
lor 1260 (1)	1000	970	112	109	-3	NA	± 30 %	AverageRF
lor 1260 (2)	1000	1100	54.9	60.5	10	NA	± 30 %	AverageRF
lor 1260 (3)	1000	1100	48.7	53.1	9	NA	± 30 %	AverageRF
lor 1260 (4)	1000	1100	116	124	7	NA	± 30 %	AverageRF
lor 1260 (5)	1000	1100	58.6	63.0	7	NA	± 30 %	AverageRF
lo[redacted]0	1000	1100	NA	NA	NA	6	± 15 %	NA

ts flagged with an asterisk (*) indicate values outside control criteria.

00598

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/02/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

ration Type: External Standard
/sis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106549
Units: ng/mL

D: \\KELSO3\ACQUDATA\GC09\DATA\100201_R.B\1002R012.D

Column ID: Rtx-50

te Name	Expected	Result	Average RF	CCV RF	%D	%Drift		Criteria	Curve Fit
hlorobiphenyl	100	120	2570	2640	NA	24	*	± 15 %	Linear
or 1016 {1}	1000	1100	89.6	96.3	7	NA		± 30 %	AverageRF
or 1016 {2}	1000	990	296	292	-1	NA		± 30 %	AverageRF
or 1016 {3}	1000	1100	95.9	103	8	NA		± 30 %	AverageRF
or 1016 {4}	1000	1100	74.7	80.3	7	NA		± 30 %	AverageRF
or 1016 {5}	1000	1100	113	129	14	NA		± 30 %	AverageRF
or 1016	1000	1100	NA	NA	NA	7		± 15 %	NA
or 1260 {1}	1000	1100	292	312	7	NA		± 30 %	AverageRF
or 1260 {2}	1000	1200	119	138	17	NA		± 30 %	AverageRF
or 1260 {3}	1000	1200	129	150	16	NA		± 30 %	AverageRF
or 1260 {4}	1000	1200	278	326	17	NA		± 30 %	AverageRF
or 1260 {5}	1000	1100	191	213	11	NA		± 30 %	AverageRF
or 1260	1000	1100	NA	NA	NA	14		± 15 %	NA

; flagged with an asterisk (*) indicate values outside control criteria.

00599

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

lt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/03/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

ɔration Type: External Standard
ysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106549
Units: ng/mL
Column ID: Rtx-5

ID: \\KELSO3\ACQUDATA\GC09\DATA\100201.B\1002F024.D

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
chlorobiphenyl	100	110	1140	1280	13	NA	± 15 %	AverageRF
lor 1016	1000	1000	NA	NA	NA	2	± 15 %	NA
lor 1016 {1}	1000	1000	80.9	82.4	2	NA	± 30 %	AverageRF
lor 1016 {2}	1000	1000	40.5	41.4	2	NA	± 30 %	AverageRF
lor 1016 {3}	1000	990	135	134	-1	NA	± 30 %	AverageRF
lor 1016 {4}	1000	1000	52.9	55.3	4	NA	± 30 %	AverageRF
lor 1016 {5}	1000	1000	40.4	40.9	1	NA	± 30 %	AverageRF
lor 1260	1000	1100	NA	NA	NA	8	± 15 %	NA
lor 1260 {1}	1000	990	112	111	-1	NA	± 30 %	AverageRF
lor 1260 {2}	1000	1100	54.9	61.5	12	NA	± 30 %	AverageRF
lor 1260 {3}	1000	1100	48.7	54.0	11	NA	± 30 %	AverageRF
lor 1260 {4}	1000	1100	116	127	9	NA	± 30 %	AverageRF
lo[redacted]0 {5}	1000	1100	58.6	64.2	10	NA	± 30 %	AverageRF

ts flagged with an asterisk (*) indicate values outside control criteria.

011600

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/03/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

bration Type: External Standard
lysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106549
Units: ng/mL

ID: \\KELSO3\ACQUDATA\GC09\DATA\100201_R.B\1002R024.D

Column ID: Rtx-50

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift		Criteria	Curve Fit
chlorobiphenyl	100	130	2570	2710	NA	27	*	± 15 %	Linear
lor 1016	1000	1100	NA	NA	NA	12		± 15 %	NA
lor 1016 {1}	1000	1100	89.6	101	13	NA		± 30 %	AverageRF
lor 1016 {2}	1000	1000	296	306	3	NA		± 30 %	AverageRF
lor 1016 {3}	1000	1100	95.9	107	12	NA		± 30 %	AverageRF
lor 1016 {4}	1000	1100	74.7	84.3	13	NA		± 30 %	AverageRF
lor 1016 {5}	1000	1200	113	135	19	NA		± 30 %	AverageRF
lor 1260	1000	1200	NA	NA	NA	15	*	± 15 %	NA
lor 1260 {1}	1000	1100	292	321	10	NA		± 30 %	AverageRF
lor 1260 {2}	1000	1200	119	143	21	NA		± 30 %	AverageRF
lor 1260 {3}	1000	1200	129	155	20	NA		± 30 %	AverageRF
lor 1260 {4}	1000	1100	278	308	11	NA		± 30 %	AverageRF
lor 1260 {5}	1000	1100	191	220	15	NA		± 30 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.

00601

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/03/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

bration Type: External Standard
lysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106549
Units: ng/mL
Column ID: Rtx-5

ID: \\KELSO3\ACQUDATA\GC09\DATA\100201.B\1002F036.D

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
ichlorobiphenyl	100	110	1140	1240	9	NA	± 15 %	AverageRF
lor 1016	1000	1000	NA	NA	NA	-0	± 15 %	NA
lor 1016 {1}	1000	1000	80.9	81.9	1	NA	± 30 %	AverageRF
lor 1016 {2}	1000	1000	40.5	40.8	1	NA	± 30 %	AverageRF
lor 1016 {3}	1000	990	135	133	-1	NA	± 30 %	AverageRF
lor 1016 {4}	1000	1000	52.9	53.8	2	NA	± 30 %	AverageRF
lor 1016 {5}	1000	970	40.4	39.1	-3	NA	± 30 %	AverageRF
lor 1260	1000	1000	NA	NA	NA	4	± 15 %	NA
lor 1260 {1}	1000	940	112	106	-6	NA	± 30 %	AverageRF
lor 1260 {2}	1000	1100	54.9	58.1	6	NA	± 30 %	AverageRF
lor 1260 {3}	1000	1100	48.7	51.8	6	NA	± 30 %	AverageRF
lor 1260 {4}	1000	1100	116	123	6	NA	± 30 %	AverageRF
lo[redacted]0 {5}	1000	1100	58.6	62.0	6	NA	± 30 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.

0v1602

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/03/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

bration Type: External Standard
lysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106549
Units: ng/mL

ID: \\KELSO3\ACQUDATA\GC09\DATA\100201_R.B\1002R036.D

Column ID: Rtx-50

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
chlorobiphenyl	100	110	2570	2380	NA	10	± 15 %	Linear
lor 1016	1000	970	NA	NA	NA	-3	± 15 %	NA
lor 1016 (1)	1000	980	89.6	87.9	-2	NA	± 30 %	AverageRF
lor 1016 (2)	1000	920	296	273	-8	NA	± 30 %	AverageRF
lor 1016 (3)	1000	970	95.9	93.1	-3	NA	± 30 %	AverageRF
lor 1016 (4)	1000	960	74.7	71.5	-4	NA	± 30 %	AverageRF
lor 1016 (5)	1000	1000	113	116	2	NA	± 30 %	AverageRF
lor 1260	1000	970	NA	NA	NA	-3	± 15 %	NA
lor 1260 (1)	1000	930	292	271	-7	NA	± 30 %	AverageRF
lor 1260 (2)	1000	1000	119	119	1	NA	± 30 %	AverageRF
lor 1260 (3)	1000	1000	129	130	1	NA	± 30 %	AverageRF
lor 1260 (4)	1000	950	278	263	-5	NA	± 30 %	AverageRF
lor 1260 (5)	1000	980	191	187	-2	NA	± 30 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.

00603

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ːct:	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	10/03/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

ıration Type:	External Standard	**Calibration Date:**	08/08/2001
ysis Method:	8082	**Calibration ID:**	CAL968
		Analysis Lot:	KWG0106549
		Units:	ng/mL
D:	\\KELSO3\ACQUDATA\GC09\DATA\100201.B\1002F047.D	**Column ID:**	Rtx-5

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
ːhlorobiphenyl	100	110	1140	1220	8	NA	± 15 %	AverageRF
or 1016	1000	1000	NA	NA	NA	2	± 15 %	NA
or 1016 {1}	1000	1000	80.9	83.0	3	NA	± 30 %	AverageRF
or 1016 {2}	1000	1000	40.5	41.7	3	NA	± 30 %	AverageRF
or 1016 {3}	1000	1000	135	136	1	NA	± 30 %	AverageRF
or 1016 {4}	1000	1000	52.9	55.3	4	NA	± 30 %	AverageRF
or 1016 {5}	1000	1000	40.4	41.1	2	NA	± 30 %	AverageRF
or 1260	1000	1100	NA	NA	NA	5	± 15 %	NA
or 1260 {1}	1000	970	112	108	-3	NA	± 30 %	AverageRF
or 1260 {2}	1000	1100	54.9	59.7	9	NA	± 30 %	AverageRF
or 1260 {3}	1000	1100	48.7	52.6	8	NA	± 30 %	AverageRF
or 1260 {4}	1000	1100	116	124	6	NA	± 30 %	AverageRF
or [illegible] {5}	1000	1100	58.6	62.2	6	NA	± 30 %	AverageRF

; flagged with an asterisk (*) indicate values outside control criteria.

01604

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/03/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

ıration Type: External Standard
ysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106549
Units: ng/mL

D: \\KELSO3\ACQUDATA\GC09\DATA\100201_R.B\1002R047.D

Column ID: Rtx-50

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
:hlorobiphenyl	100	110	2570	2370	NA	10	± 15 %	Linear
or 1016	1000	1000	NA	NA	NA	2	± 15 %	NA
or 1016 (1)	1000	1000	89.6	91.5	2	NA	± 30 %	AverageRF
or 1016 (2)	1000	950	296	282	-5	NA	± 30 %	AverageRF
or 1016 (3)	1000	1000	95.9	98.4	3	NA	± 30 %	AverageRF
or 1016 (4)	1000	1000	74.7	76.7	3	NA	± 30 %	AverageRF
or 1016 (5)	1000	1100	113	120	6	NA	± 30 %	AverageRF
or 1260	1000	1000	NA	NA	NA	1	± 15 %	NA
or 1260 (1)	1000	960	292	278	-4	NA	± 30 %	AverageRF
or 1260 (2)	1000	1000	119	122	3	NA	± 30 %	AverageRF
or 1260 (3)	1000	1000	129	131	2	NA	± 30 %	AverageRF
or 1260 (4)	1000	1000	278	288	4	NA	± 30 %	AverageRF
or 1260 (5)	1000	1000	191	192	0	NA	± 30 %	AverageRF

flagged with an asterisk (*) indicate values outside control criteria.

U01605

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/04/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

bration Type: External Standard
lysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106590
Units: ng/mL

ID: \\KELSO3\ACQUDATA\GC09\DATA\100301.B\1003F034.D

Column ID: Rtx-5

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
ıchlorobiphenyl	100	110	1140	1280	13	NA	± 15 %	AverageRF
:lor 1016	1000	1000	NA	NA	NA	2	± 15 %	NA
:lor 1016 {1}	1000	1000	80.9	82.0	1	NA	± 30 %	AverageRF
:lor 1016 {2}	1000	1000	40.5	41.3	2	NA	± 30 %	AverageRF
:lor 1016 {3}	1000	1000	135	135	0	NA	± 30 %	AverageRF
:lor 1016 {4}	1000	1000	52.9	55.5	5	NA	± 30 %	AverageRF
:lor 1016 {5}	1000	1000	40.4	41.5	3	NA	± 30 %	AverageRF
:lor 1260	1000	1100	NA	NA	NA	9	± 15 %	NA
lor 1260 {1}	1000	1000	112	112	-0	NA	± 30 %	AverageRF
lor 1260 {2}	1000	1100	54.9	62.0	13	NA	± 30 %	AverageRF
lor 1260 {3}	1000	1100	48.7	54.7	12	NA	± 30 %	AverageRF
lor 1260 {4}	1000	1100	116	128	10	NA	± 30 %	AverageRF
lor [illegible]0 {5}	1000	1100	58.6	64.7	10	NA	± 30 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.

01606

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/04/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

ɔration Type: External Standard
ysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106590
Units: ng/mL
Column ID: Rtx-50

ID: \\KELSO3\ACQUDATA\GC09\DATA\100301_R.B\1003R034.D

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift		Criteria	Curve Fit
chlorobiphenyl	100	120	2570	2640	NA	24	*	± 15 %	Linear
lor 1016	1000	1100	NA	NA	NA	7		± 15 %	NA
lor 1016 {1}	1000	1100	89.6	96.1	7	NA		± 30 %	AverageRF
lor 1016 {2}	1000	990	296	293	-1	NA		± 30 %	AverageRF
lor 1016 {3}	1000	1100	95.9	103	8	NA		± 30 %	AverageRF
lor 1016 {4}	1000	1100	74.7	80.0	7	NA		± 30 %	AverageRF
lor 1016 {5}	1000	1100	113	129	14	NA		± 30 %	AverageRF
lor 1260	1000	1100	NA	NA	NA	12		± 15 %	NA
lor 1260 {1}	1000	1100	292	312	7	NA		± 30 %	AverageRF
or 1260 {2}	1000	1200	119	138	17	NA		± 30 %	AverageRF
or 1260 {3}	1000	1200	129	150	17	NA		± 30 %	AverageRF
or 1260 {4}	1000	1100	278	297	7	NA		± 30 %	AverageRF
or 1260 {5}	1000	1100	191	213	11	NA		± 30 %	AverageRF

flagged with an asterisk (*) indicate values outside control criteria.

01607

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/04/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

bration Type: External Standard
lysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106590
Units: ng/mL

ID: \\KELSO3\ACQUDATA\GC09\DATA\100301.B\1003F045.D

Column ID: Rtx-5

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
ıchlorobiphenyl	100	110	1140	1290	13	NA	± 15 %	AverageRF
:lor 1016	1000	1000	NA	NA	NA	4	± 15 %	NA
:lor 1016 {1}	1000	1000	80.9	83.8	4	NA	± 30 %	AverageRF
:lor 1016 {2}	1000	1000	40.5	42.2	4	NA	± 30 %	AverageRF
:lor 1016 {3}	1000	1000	135	137	1	NA	± 30 %	AverageRF
:lor 1016 {4}	1000	1100	52.9	56.4	7	NA	± 30 %	AverageRF
:lor 1016 {5}	1000	1100	40.4	42.5	5	NA	± 30 %	AverageRF
:lor 1260	1000	1100	NA	NA	NA	10	± 15 %	NA
:lor 1260 {1}	1000	1000	112	113	1	NA	± 30 %	AverageRF
:lor 1260 {2}	1000	1100	54.9	62.7	14	NA	± 30 %	AverageRF
:lor 1260 {3}	1000	1100	48.7	55.4	14	NA	± 30 %	AverageRF
:lor 1260 {4}	1000	1100	116	129	11	NA	± 30 %	AverageRF
:lor 1260 {5}	1000	1100	58.6	65.2	11	NA	± 30 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.

001608

ed: 10/10/2001 11:03:24

SuperSet Reference: RR11797

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ject: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 10/04/2001

Continuing Calibration Verification Summary
Polychlorinated Biphenyls (PCBs)

bration Type: External Standard
lysis Method: 8082

Calibration Date: 08/08/2001
Calibration ID: CAL968
Analysis Lot: KWG0106590
Units: ng/mL

ID: \\KELSO3\ACQUDATA\GC09\DATA\100301_R.B\1003R045.D

Column ID: Rtx-50

lyte Name	Expected	Result	Average RF	CCV RF	%D	%Drift		Criteria	Curve Fit
ichlorobiphenyl	100	130	2570	2700	NA	27	*	± 15 %	Linear
lor 1016	1000	1100	NA	NA	NA	11		± 15 %	NA
lor 1016 {1}	1000	1100	89.6	99.6	11	NA		± 30 %	AverageRF
lor 1016 {2}	1000	1000	296	302	2	NA		± 30 %	AverageRF
lor 1016 {3}	1000	1100	95.9	106	10	NA		± 30 %	AverageRF
lor 1016 {4}	1000	1100	74.7	83.5	12	NA		± 30 %	AverageRF
lor 1016 {5}	1000	1200	113	133	17	NA		± 30 %	AverageRF
lor 1260	1000	1100	NA	NA	NA	15		± 15 %	NA
lor 1260 {1}	1000	1100	292	321	10	NA		± 30 %	AverageRF
lor 1260 {2}	1000	1200	119	143	20	NA		± 30 %	AverageRF
lor 1260 {3}	1000	1200	129	154	20	NA		± 30 %	AverageRF
lor 1260 {4}	1000	1100	278	305	10	NA		± 30 %	AverageRF
lor 1260 {5}	1000	1100	191	218	14	NA		± 30 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.

001609

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc. **Service Request:** K2106670

ect: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Polychlorinated Biphenyls (PCBs)

lysis Method: 8082 **Analysis Lot:** KWG0106549

Instrument ID: GC09.i

Column: Rtx-5

ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
F043.D	Instrument Blank	KWG0106549-1	10/2/2001	13:50		10/2/2001	13:50
F044.D	Continuing Calibration Verification	KWG0106549-2	10/2/2001	14:18		10/2/2001	14:18
F001.D	Method Blank	KWG0106148-4	10/2/2001	17:19		10/2/2001	17:19
F002.D	Lab Control Sample	KWG0106148-3	10/2/2001	17:47		10/2/2001	17:47
F003.D	SW0002	K2106670-006	10/2/2001	18:15		10/2/2001	18:15
F004.D	SW0002MS	KWG0106148-1	10/2/2001	18:43		10/2/2001	18:43
F005.D	SW0002DMS	KWG0106148-2	10/2/2001	19:11		10/2/2001	19:11
F006.D	GW1201	K2106670-012	10/2/2001	19:39		10/2/2001	19:39
F007.D	ZZZZZZ	ZZZZZZ	10/2/2001	20:06		10/2/2001	20:06
F008.D	ZZZZZZ	ZZZZZZ	10/2/2001	20:34		10/2/2001	20:34
F009.D	ZZZZZZ	ZZZZZZ	10/2/2001	21:02		10/2/2001	21:02
F01[illegible].D	Instrument Blank	KWG0106549-3	10/2/2001	21:58		10/2/2001	21:58
F[illegible]	Continuing Calibration Verification	KWG0106549-4	10/2/2001	22:26		10/2/2001	22:26
F[illegible].D	ZZZZZZ	ZZZZZZ	10/2/2001	22:54		10/2/2001	22:54
F014.D	ZZZZZZ	ZZZZZZ	10/2/2001	23:22		10/2/2001	23:22
F015.D	ZZZZZZ	ZZZZZZ	10/2/2001	23:50		10/2/2001	23:50
F016.D	ZZZZZZ	ZZZZZZ	10/3/2001	00:18		10/3/2001	00:18
F017.D	ZZZZZZ	ZZZZZZ	10/3/2001	00:46		10/3/2001	00:46
F018.D	ZZZZZZ	ZZZZZZ	10/3/2001	01:14		10/3/2001	01:14
F019.D	ZZZZZZ	ZZZZZZ	10/3/2001	01:42		10/3/2001	01:42
F020.D	ZZZZZZ	ZZZZZZ	10/3/2001	02:10		10/3/2001	02:10
F021.D	ZZZZZZ	ZZZZZZ	10/3/2001	02:38		10/3/2001	02:38
F023.D	Instrument Blank	KWG0106549-5	10/3/2001	03:34		10/3/2001	03:34
F024.D	Continuing Calibration Verification	KWG0106549-6	10/3/2001	04:02		10/3/2001	04:02
F025.D	ZZZZZZ	ZZZZZZ	10/3/2001	04:30		10/3/2001	04:30
F026.D	ZZZZZZ	ZZZZZZ	10/3/2001	04:57		10/3/2001	04:57
F027.D	ZZZZZZ	ZZZZZZ	10/3/2001	05:25		10/3/2001	05:25
F028.D	ZZZZZZ	ZZZZZZ	10/3/2001	05:53		10/3/2001	05:53
F029.D	Method Blank	KWG0106264-4	10/3/2001	06:21		10/3/2001	06:21
F030.D	Lab Control Sample	KWG0106264-3	10/3/2001	06:49		10/3/2001	06:49
F031.D	SD0021	K2106670-002	10/3/2001	07:17		10/3/2001	07:17
F032.D	SD0022	K2106670-003	10/3/2001	07:45		10/3/2001	07:45
F033.D	SD0022MS	KWG0106264-1	10/3/2001	08:13		10/3/2001	08:13
F0[illegible]	Instrument Blank	KWG0106549-7	10/3/2001	09:09		10/3/2001	09:09
[illegible]	Continuing Calibration Verification	KWG0106549-8	10/3/2001	09:37		10/3/2001	09:37

s flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00610

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt: Exponent Environmental Group, Inc. Service Request: K2106670

ɔct: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Polychlorinated Biphenyls (PCBs)

ysis Method: 8082 **Analysis Lot:** KWG0106549

Instrument ID: GC09.i

Column: Rtx-5

D	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
F037.D	SD0022DMS	KWG0106264-2	10/3/2001	10:05		10/3/2001	10:05
F038.D	SD0024	K2106670-005	10/3/2001	10:32		10/3/2001	10:32
F039.D	S00152	K2106670-010	10/3/2001	11:00		10/3/2001	11:00
F041.D	ZZZZZZ	ZZZZZZ	10/3/2001	11:56		10/3/2001	11:56
F042.D	ZZZZZZ	ZZZZZZ	10/3/2001	12:24		10/3/2001	12:24
F043.D	ZZZZZZ	ZZZZZZ	10/3/2001	12:52		10/3/2001	12:52
F044.D	ZZZZZZ	ZZZZZZ	10/3/2001	13:20		10/3/2001	13:20
F046.D	Instrument Blank	KWG0106549-9	10/3/2001	14:16		10/3/2001	14:16
F047.D	Continuing Calibration Verification	KWG0106549-10	10/3/2001	14:44		10/3/2001	14:44

; flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00611

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt: Exponent Environmental Group, Inc. **Service Request:** K2106670

ect: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Polychlorinated Biphenyls (PCBs)

ysis Method: 8082 **Analysis Lot:** KWG0106590

Instrument ID: GC09.i

Column: Rtx-5

ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
F046.D	Instrument Blank	KWG0106590-1	10/3/2001	14:16		10/3/2001	14:16
F047.D	Continuing Calibration Verification	KWG0106590-2	10/3/2001	14:44		10/3/2001	14:44
F001.D	ZZZZZZ	ZZZZZZ	10/3/2001	16:57		10/3/2001	16:57
F002.D	ZZZZZZ	ZZZZZZ	10/3/2001	17:25		10/3/2001	17:25
F003.D	ZZZZZZ	ZZZZZZ	10/3/2001	17:53		10/3/2001	17:53
F004.D	ZZZZZZ	ZZZZZZ	10/3/2001	18:21		10/3/2001	18:21
F005.D	ZZZZZZ	ZZZZZZ	10/3/2001	18:49		10/3/2001	18:49
F006.D	ZZZZZZ	ZZZZZZ	10/3/2001	19:17		10/3/2001	19:17
F007.D	ZZZZZZ	ZZZZZZ	10/3/2001	19:45		10/3/2001	19:45
F008.D	ZZZZZZ	ZZZZZZ	10/3/2001	20:13		10/3/2001	20:13
F009.D	ZZZZZZ	ZZZZZZ	10/3/2001	20:41		10/3/2001	20:41
F[redacted]	Instrument Blank	KWG0106590-3	10/3/2001	21:36		10/3/2001	21:36
[redacted]	Continuing Calibration Verification	KWG0106590-4	10/3/2001	22:05		10/3/2001	22:05
F[redacted].D	ZZZZZZ	ZZZZZZ	10/3/2001	23:29		10/3/2001	23:29
F016.D	ZZZZZZ	ZZZZZZ	10/3/2001	23:57		10/3/2001	23:57
F017.D	ZZZZZZ	ZZZZZZ	10/4/2001	00:25		10/4/2001	00:25
F018.D	ZZZZZZ	ZZZZZZ	10/4/2001	00:53		10/4/2001	00:53
F019.D	ZZZZZZ	ZZZZZZ	10/4/2001	01:21		10/4/2001	01:21
F021.D	Instrument Blank	KWG0106590-5	10/4/2001	02:16		10/4/2001	02:16
F022.D	Continuing Calibration Verification	KWG0106590-6	10/4/2001	02:44		10/4/2001	02:44
F023.D	ZZZZZZ	ZZZZZZ	10/4/2001	03:12		10/4/2001	03:12
F024.D	ZZZZZZ	ZZZZZZ	10/4/2001	03:40		10/4/2001	03:40
F025.D	ZZZZZZ	ZZZZZZ	10/4/2001	04:08		10/4/2001	04:08
F026.D	ZZZZZZ	ZZZZZZ	10/4/2001	04:36		10/4/2001	04:36
F027.D	ZZZZZZ	ZZZZZZ	10/4/2001	05:04		10/4/2001	05:04
F028.D	ZZZZZZ	ZZZZZZ	10/4/2001	05:32		10/4/2001	05:32
F029.D	ZZZZZZ	ZZZZZZ	10/4/2001	06:00		10/4/2001	06:00
F030.D	ZZZZZZ	ZZZZZZ	10/4/2001	06:28		10/4/2001	06:28
F031.D	ZZZZZZ	ZZZZZZ	10/4/2001	06:55		10/4/2001	06:55
F033.D	Instrument Blank	KWG0106590-7	10/4/2001	07:51		10/4/2001	07:51
F034.D	Continuing Calibration Verification	KWG0106590-8	10/4/2001	08:19		10/4/2001	08:19
F035.D	ZZZZZZ	ZZZZZZ	10/4/2001	08:47		10/4/2001	08:47
F036.D	ZZZZZZ	ZZZZZZ	10/4/2001	09:15		10/4/2001	09:15
F[redacted]	ZZZZZZ	ZZZZZZ	10/4/2001	09:43		10/4/2001	09:43
[redacted]D	ZZZZZZ	ZZZZZZ	10/4/2001	10:11		10/4/2001	10:11

ıs flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00612

t: Exponent Environmental Group, Inc. **Service Request:** K2106670
ct: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Polychlorinated Biphenyls (PCBs)

sis Method: 8082 **Analysis Lot:** KWG0106590
Instrument ID: GC09.i
Column: Rtx-5

D	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
039.D	ZZZZZZ	ZZZZZZ	10/4/2001	10:39		10/4/2001	10:39
040.D	ZZZZZZ	ZZZZZZ	10/4/2001	11:07		10/4/2001	11:07
041.D	ZZZZZZ	ZZZZZZ	10/4/2001	11:35		10/4/2001	11:35
042.D	S00153	K2106670-011	10/4/2001	12:03		10/4/2001	12:03
044.D	Instrument Blank	KWG0106590-9	10/4/2001	12:59		10/4/2001	12:59
045.D	Continuing Calibration Verification	KWG0106590-10	10/4/2001	13:27		10/4/2001	13:27

ts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00613

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
jec*:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/17/2001
atrix:	Water		

Extraction Prep Log
Polychlorinated Biphenyls (PCBs)

raction Method:	EPA 3520	**Extraction Lot:**	KWG0106148
lysis Method:	8082	**Level:**	Low

ıple Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
0002	K2106670-006	09/10/01	09/13/01	1040ml	2ml	NA	
'1201	K2106670-012	09/12/01	09/13/01	470ml	2ml	NA	
hod Blank	KWG0106148-4	NA	NA	1000ml	2ml	NA	
0002MS	KWG0106148-1	09/10/01	09/13/01	520ml	2ml	NA	
0002DMS	KWG0106148-2	09/10/01	09/13/01	520ml	2ml	NA	
Control Sample	KWG0106148-3	NA	NA	1000ml	2ml	NA	

ults flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00614

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Soil

Service Request: K2106670
Date Extracted: 09/24/2001

Extraction Prep Log
Polychlorinated Biphenyls (PCBs)

ction Method: EPA 3540
ysis Method: 8082

Extraction Lot: KWG0106264
Level: Low

le Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
21	K2106670-002	09/10/01	09/13/01	10.01g	10ml	66.6	
22	K2106670-003	09/10/01	09/13/01	10.04g	10ml	97.5	
24	K2106670-005	09/10/01	09/13/01	10.14g	10ml	19.2	
52	K2106670-010	09/11/01	09/13/01	10.05g	10ml	89.0	
53	K2106670-011	09/11/01	09/13/01	10.02g	10ml	87.0	
od Blank	KWG0106264-4	NA	NA	10.00g	10ml	NA	
22MS	KWG0106264-1	09/10/01	09/13/01	10.02g	10ml	97.5	
22DMS	KWG0106264-2	09/10/01	09/13/01	10.00g	10ml	97.5	
Control Sample	KWG0106264-3	NA	NA	10.00g	10ml	NA	

s flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

00615

COLUMBIA ANALYTICAL SERVICES, INC.

Confirmation Results

t:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/10/2001
rix:	Soil	Date Received:	09/13/2001
		Date Extracted:	09/24/2001
		Date Analyzed:	10/03/2001

Polychlorinated Biphenyls (PCBs)

le Name:	SD0021	Units:	mg/Kg
Code:	K2106670-002	Basis:	Dry
		Level:	Low
ction Method:	EPA 3540		
sis Method:	8082		

te Name	MRL	Primary Result	Confirmation Result	%D	Q
or 1248	0.16	0.57	0.42	30.3	
or 1254	0.16	0.45	0.50	10.5	

COLUMBIA ANALYTICAL SERVICES, INC.

Confirmation Results

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ːct:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
ıle Matrix:	Soil	**Date Received:**	09/13/2001
		Date Extracted:	09/24/2001
		Date Analyzed:	10/03/2001

Polychlorinated Biphenyls (PCBs)

ıle Name:	SD0022	**Units:**	mg/Kg
Code:	K2106670-003	**Basis:**	Dry
		Level:	Low
ıction Method:	EPA 3540		
ysis Method:	8082		

yte Name	MRL	Primary Result	Confirmation Result	%D	Q
or 1248	0.11	0.17	0.13	26.7	

00617

COLUMBIA ANALYTICAL SERVICES, INC.

Confirmation Results

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
r trix:	Soil	**Date Received:**	09/13/2001
		Date Extracted:	09/24/2001
		Date Analyzed:	10/03/2001

Polychlorinated Biphenyls (PCBs)

ple Name:	SD0024	**Units:**	mg/Kg
Code:	K2106670-005	**Basis:**	Dry
		Level:	Low
action Method:	EPA 3540		
ysis Method:	8082		

yte Name	MRL	Primary Result	Confirmation Result	%D	Q
lor 1248	0.52	1.5	1.5	0.0	
lor 1254	0.52	0.63	0.61	3.2	

00618

COLUMBIA ANALYTICAL SERVICES, INC.

Confirmation Results

t:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/11/2001
le Matrix:	Soil	Date Received:	09/13/2001
		Date Extracted:	09/24/2001
		Date Analyzed:	10/03/2001

Polychlorinated Biphenyls (PCBs)

le Name:	S00152	Units:	mg/Kg
Code:	K2106670-010	Basis:	Dry
		Level:	Low
ction Method:	EPA 3540		
sis Method:	8082		

te Name	MRL	Primary Result	Confirmation Result	%D	Q
or 1248	0.12	1.1	1.1	0.0	
or 1254	0.12	0.42	0.48	13.3	

00619

COLUMBIA ANALYTICAL SERVICES, INC.

Confirmation Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/11/2001
trix:	Soil	**Date Received:**	09/13/2001
		Date Extracted:	09/24/2001
		Date Analyzed:	10/04/2001

Polychlorinated Biphenyls (PCBs)

ple Name:	S00153	**Units:**	mg/Kg
Code:	K2106670-011	**Basis:**	Dry
		Level:	Low
action Method:	EPA 3540		
lysis Method:	8082		

lyte Name	MRL	Primary Result	Confirmation Result	%D	Q
:lor 1242	5.8	44	33	28.6	D

00620

Organic Analysis:
Polychlorinated Biphenyls (PCBs)

Validation Package

Organic Analysis:
Polychlorinated Biphenyls (PCBs)

Validation Package

QC Reports

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ect: Oregon Steel Mills/8601526.001.0302
ple Matrix: Water

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)

action Method: EPA 3520 **Units:** PERCENT
ysis Method: 8082 **Level:** Low

ple Name	Lab Code	Sur1
002	K2106670-006	99
201	K2106670-012	35
od Blank	KWG0106148-4	107
002MS	KWG0106148-1	93
002DMS	KWG0106148-2	102
Control Sample	KWG0106148-3	102

ɔgate Recovery Control Limits (%)

= Decachlorobiphenyl	0-143

s flagged with an asterisk (*) indicate values outside control criteria.
s flagged with a pound (#) indicate the control criteria is not applicable.

00623

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc. **Service Request:** K2106670
ct: Oregon Steel Mills/8601526.001.0302
rix: Soil

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)

ction Method: EPA 3540 **Units:** PERCENT
ysis Method: 8082 **Level:** Low

ple Name	Lab Code	Sur1
21	K2106670-002	91
22	K2106670-003	94
24	K2106670-005	88
52	K2106670-010	86
53	K2106670-011	113 D #
od Blank	KWG0106264-4	100
22MS	KWG0106264-1	89
22DMS	KWG0106264-2	93
Control Sample	KWG0106264-3	90

ogate Recovery Control Limits (%)

= Decachlorobiphenyl	57-136	:

ts flagged with an asterisk (*) indicate values outside control criteria.
ts flagged with a pound (#) indicate the control criteria is not applicable.

00624

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Water

Service Request: K2106670
Date Extracted: 09/17/2001
Date Analyzed: 10/02/2001

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

le Name: SW0002
Code: K2106670-006

ction Method: EPA 3520
ysis Method: 8082

Units: ug/L
Basis: NA

Level: Low
Extraction Lot: KWG0106148

te Name	Sample Result	SW0002MS KWG0106148-1 Matrix Spike Result	Expected	%Rec	SW0002DMS KWG0106148-2 Duplicate Matrix Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
or 1016	ND	3.68	3.85	96	4.05	3.85	105	48-140	10	30
or 1260	ND	3.93	3.85	102	4.26	3.85	111	58-136	8	30

flagged with an asterisk (*) indicate values outside control criteria.
flagged with a pound (#) indicate the control criteria is not applicable.
recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00625

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/24/2001
p' trix:	Soil	**Date Analyzed:**	10/03/2001

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)

ɔle Name:	SD0022	**Units:**	mg/Kg
Code:	K2106670-003	**Basis:**	Dry
action Method:	EPA 3540	**Level:**	Low
ysis Method:	8082	**Extraction Lot:**	KWG0106264

		SD0022MS KWG0106264-1 Matrix Spike			SD0022DMS KWG0106264-2 Duplicate Matrix Spike					
yte Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
lor 1016	ND	0.918	1.02	90	0.965	1.03	94	51-145	5	50
lor 1260	ND	1.11	1.02	109	1.17	1.03	114	58-147	5	50

s .. gged with an asterisk (*) indicate values outside control criteria.

s flagged with a pound (#) indicate the control criteria is not applicable.

: recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

U0626

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/17/2001
ıle Matrix:	Water	**Date Analyzed:**	10/02/2001

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

ıction Method:	EPA 3520	**Units:**	ug/L
ysis Method:	8082	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0106148

	Lab Control Sample KWG0106148-3 Lab Control Spike			
yte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
or 1016	1.69	2.00	85	60-124
or 1260	2.03	2.00	102	65-131

ı flagged with an asterisk (*) indicate values outside control criteria.
recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00627

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/24/2001
rix:	Soil	**Date Analyzed:**	10/03/2001

Lab Control Spike Summary
Polychlorinated Biphenyls (PCBs)

ıction Method:	EPA 3540	**Units:**	mg/Kg
ysis Method:	8082	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106264

	Lab Control Sample KWG0106264-3 Lab Control Spike			
yte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
or 1016	0.945	1.00	94	63-134
or 1260	0.957	1.00	96	74-130

s flagged with an asterisk (*) indicate values outside control criteria.
t recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

00628

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ɔct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/17/2001
ɔle Matrix:	Water	**Date Analyzed:**	10/02/2001
		Time Analyzed:	17:19

Method Blank Summary
Polychlorinated Biphenyls (PCBs)

ɔle Name:	Method Blank	**File ID:**	J:\GC09\DATA\100201.B\1002F001.D
Code:	KWG0106148-4	**Instrument ID:**	GC09.i
ıction Method:	EPA 3520	**Level:**	Low
ysis Method:	8082	**Extraction Lot:**	KWG0106148

Method Blank applies to the following analyses:

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ontrol Sample	KWG0106148-3	J:\GC09\DATA\100201.B\1002F002.D	10/02/01	17:47
02	K2106670-006	J:\GC09\DATA\100201.B\1002F003.D	10/02/01	18:15
02MS	KWG0106148-1	J:\GC09\DATA\100201.B\1002F004.D	10/02/01	18:43
02DMS	KWG0106148-2	J:\GC09\DATA\100201.B\1002F005.D	10/02/01	19:11
01	K2106670-012	J:\GC09\DATA\100201.B\1002F006.D	10/02/01	19:39

001629

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/24/2001
ix:	Soil	**Date Analyzed:**	10/03/2001
		Time Analyzed:	06:21

Method Blank Summary
Polychlorinated Biphenyls (PCBs)

le Name:	Method Blank	**File ID:**	J:\GC09\DATA\100201.B\1002F029.D
ode:	KWG0106264-4	**Instrument ID:**	GC09.i
ction Method:	EPA 3540	**Level:**	Low
sis Method:	8082	**Extraction Lot:**	KWG0106264

Method Blank applies to the following analyses:

e Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ontrol Sample	KWG0106264-3	J:\GC09\DATA\100201.B\1002F030.D	10/03/01	06:49
1	K2106670-002	J:\GC09\DATA\100201.B\1002F031.D	10/03/01	07:17
2	K2106670-003	J:\GC09\DATA\100201.B\1002F032.D	10/03/01	07:45
2MS	KWG0106264-1	J:\GC09\DATA\100201.B\1002F033.D	10/03/01	08:13
2DMS	KWG0106264-2	J:\GC09\DATA\100201.B\1002F037.D	10/03/01	10:05
4	K2106670-005	J:\GC09\DATA\100201.B\1002F038.D	10/03/01	10:32
2	K2106670-010	J:\GC09\DATA\100201.B\1002F039.D	10/03/01	11:00
3	K2106670-011	J:\GC09\DATA\100301.B\1003F042.D	10/04/01	12:03

00630

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/17/2001
le Matrix:	Water	**Date Analyzed:**	10/02/2001
		Time Analyzed:	17:47

Lab Control Sample Summary
Polychlorinated Biphenyls (PCBs)

le Name:	Lab Control Sample	**File ID:**	J:\GC09\DATA\100201.B\1002F002.D
Code:	KWG0106148-3	**Instrument ID:**	GC09.i
ction Method:	EPA 3520	**Level:**	Low
sis Method:	8082	**Extraction Lot:**	KWG0106148

ab Control Sample applies to the following analyses:

e Name	Lab Code	File ID	Date Analyzed	Time Analyzed
d Blank	KWG0106148-4	J:\GC09\DATA\100201.B\1002F001.D	10/02/01	17:19
02	K2106670-006	J:\GC09\DATA\100201.B\1002F003.D	10/02/01	18:15
02MS	KWG0106148-1	J:\GC09\DATA\100201.B\1002F004.D	10/02/01	18:43
02DMS	KWG0106148-2	J:\GC09\DATA\100201.B\1002F005.D	10/02/01	19:11
01	K2106670-012	J:\GC09\DATA\100201.B\1002F006.D	10/02/01	19:39

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/24/2001
r trix:	Soil	**Date Analyzed:**	10/03/2001
		Time Analyzed:	06:49

Lab Control Sample Summary
Polychlorinated Biphenyls (PCBs)

ple Name:	Lab Control Sample	**File ID:**	J:\GC09\DATA\100201.B\1002F030.D
Code:	KWG0106264-3	**Instrument ID:**	GC09.i
action Method:	EPA 3540	**Level:**	Low
lysis Method:	8082	**Extraction Lot:**	KWG0106264

Lab Control Sample applies to the following analyses:

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed
od Blank	KWG0106264-4	J:\GC09\DATA\100201.B\1002F029.D	10/03/01	06:21
21	K2106670-002	J:\GC09\DATA\100201.B\1002F031.D	10/03/01	07:17
22	K2106670-003	J:\GC09\DATA\100201.B\1002F032.D	10/03/01	07:45
22MS	KWG0106264-1	J:\GC09\DATA\100201.B\1002F033.D	10/03/01	08:13
22DMS	KWG0106264-2	J:\GC09\DATA\100201.B\1002F037.D	10/03/01	10:05
24	K2106670-005	J:\GC09\DATA\100201.B\1002F038.D	10/03/01	10:32
52	K2106670-010	J:\GC09\DATA\100201.B\1002F039.D	10/03/01	11:00
53	K2106670-011	J:\GC09\DATA\100301.B\1003F042.D	10/04/01	12:03

Organic Analysis:
Polychlorinated Biphenyls (PCBs)

Validation Package

Raw Data

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

::	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
l [redacted]ix:	Water	**Date Received:**	09/13/2001

Polychlorinated Biphenyls (PCBs)

le Name:	SW0002	**Units:**	ug/L
:ode:	K2106670-006	**Basis:**	NA
ction Method:	EPA 3520	**Level:**	Low
sis Method:	8082		

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
or 1016	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
or 1221	ND	U	0.39	1	09/17/01	10/02/01	KWG0106148	
or 1232	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
or 1242	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
or 1248	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
or 1254	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	
or 1260	ND	U	0.20	1	09/17/01	10/02/01	KWG0106148	

r [redacted]ame	%Rec	Control Limits	Date Analyzed	Note
hlorobiphenyl	99	0-143	10/02/01	Acceptable

[redacted]

ients:

00634

Volatile Organic Compounds
Method 8260 B

Organic Analysis:
Volatile Organic Compounds

Summary Package

Sample and QC Results

COLUMBIA ANALYTICAL SERVICES, INC.

t: Exponent Environmental Group, Inc. Service Request: K2106670
ct: Oregon Steel Mills/8601526.001.0302

Cover Page - Organic Analysis Data Package
Volatile Organic Compounds

Sample Name	Lab Code	Date Collected	Date Received
SD0020	K2106670-001	09/10/2001	09/13/2001
SD0021	K2106670-002	09/10/2001	09/13/2001
SW0002	K2106670-006	09/10/2001	09/13/2001
S00150	K2106670-007	09/11/2001	09/13/2001
S00151	K2106670-008	09/11/2001	09/13/2001
GW1203	K2106670-014	09/12/2001	09/13/2001
Trip Blank	K2106670-017		09/13/2001
S00151MS	KWG0106014-1	09/11/2001	09/13/2001
S00151DMS	KWG0106014-2	09/11/2001	09/13/2001

fy that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the ions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on / diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

ture: JMS Name: Meena Shah

10/3/01 Title: Scientist

UN972

SuperSet Reference: RR11510

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
rix:	Water	**Date Received:**	09/13/2001

Volatile Organic Compounds

le Name:	SW0002	**Units:**	ug/L
Code:	K2106670-006	**Basis:**	NA
ction Method:	EPA 5030B	**Level:**	Low
ysis Method:	8260B		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
orodifluoromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
omethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Chloride	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
omethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
oethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
lorofluoromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
ichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
n Disulfide	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ylene Chloride	ND	U	1.0	1	09/20/01	09/20/01	KWG0106108	
1,2-Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
e (MEK)	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
ichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
2-Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
roform	1.9		0.50	1	09/20/01	09/20/01	KWG0106108	
ochloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Trichloroethane (TCA)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
n Tetrachloride	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ichloroethane (EDC)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
loroethene (TCE)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
odichloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
momethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
canone	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
3-Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
1,3-Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Trichloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
hyl-2-pentanone (MIBK)	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
ichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
chloroethene (PCE)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
bromomethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	

ments:

U1973

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
ple Matrix:	Water	**Date Received:**	09/13/2001

Volatile Organic Compounds

ple Name:	SW0002	**Units:**	ug/L
Code:	K2106670-006	**Basis:**	NA
action Method:	EPA 5030B	**Level:**	Low
ysis Method:	8260B		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
)ibromoethane (EDB)	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
robenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
,2-Tetrachloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
benzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Kylenes	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
lene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıoform	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
opylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
,2-Tetrachloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
-Trichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ıpylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
lorotoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
lorotoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
-Trimethylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ıutylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
-Trimethylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ıutylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
)ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
propyltoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
)ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
tylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
)ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ibromo-3-chloropropane	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
-Trichlorobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
-Trichlorobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
thalene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
chlorobutadiene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	

nents:

U0974

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
rix: Water

Service Request: K2106670
Date Collected: 09/10/2001
Date Received: 09/13/2001

Volatile Organic Compounds

le Name: SW0002
Code: K2106670-006

Units: ug/L
Basis: NA

gate Name	%Rec	Control Limits	Date Analyzed	Note
mofluoromethane	99	87-115	09/20/01	Acceptable
ne-d8	101	83-116	09/20/01	Acceptable
mofluorobenzene	93	75-120	09/20/01	Acceptable

ents:

U0975

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

::	Exponent Environmental Group, Inc.	Service Request:	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/12/2001
le Matrix:	Water	Date Received:	09/13/2001

Volatile Organic Compounds

le Name:	GW1203	Units:	ug/L
:ode:	K2106670-014	Basis:	NA
ction Method:	EPA 5030B	Level:	Low
sis Method:	8260B		

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
rodifluoromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
methane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Chloride	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
methane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
orofluoromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
chloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
n Disulfide	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
lene Chloride	ND	U	1.0	1	09/20/01	09/20/01	KWG0106108	
,2-Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
chloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
none (MEK)	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
chloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
-Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
oform	2.1		0.50	1	09/20/01	09/20/01	KWG0106108	
chloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
richloroethane (TCA)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
chloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
n Tetrachloride	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
chloroethane (EDC)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
roethene (TCE)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
chloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
dichloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
nomethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
anone	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
-Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
,3-Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
richloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
yl-2-pentanone (MIBK)	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
chloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
hloroethene (PCE)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
nochloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	

ents:

U1976

::	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/12/2001
l' ix:	Water	**Date Received:**	09/13/2001

Volatile Organic Compounds

le Name:	GW1203	**Units:**	ug/L
:ode:	K2106670-014	**Basis:**	NA
ction Method:	EPA 5030B	**Level:**	Low
sis Method:	8260B		

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
bromoethane (EDB)	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
)benzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
2-Tetrachloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
enzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ylenes	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
e	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
)form	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
pylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
2-Tetrachloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Tri[illegible]ropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
[illegible]e	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
)y[illegible]nzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
)rotoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
)rotoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Trimethylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
utylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Trimethylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
utylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ropyltoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
bromo-3-chloropropane	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Trichlorobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Trichlorobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
halene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
chlorobutadiene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	

ents: 00977

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/12/2001
le Matrix:	Water	**Date Received:**	09/13/2001

Volatile Organic Compounds

le Name:	GW1203	**Units:**	ug/L
Code:	K2106670-014	**Basis:**	NA

ogate Name	%Rec	Control Limits	Date Analyzed	Note
mofluoromethane	100	87-115	09/20/01	Acceptable
ne-d8	100	83-116	09/20/01	Acceptable
mofluorobenzene	95	75-120	09/20/01	Acceptable

ents: 0n973

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
jec	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	
trix:	Water	**Date Received:**	09/13/2001

Volatile Organic Compounds

ıple Name:	Trip Blank	**Units:**	ug/L
Code:	K2106670-017	**Basis:**	NA
:action Method:	EPA 5030B	**Level:**	Low
lysis Method:	8260B		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ılorodifluoromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
/l Chloride	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
nomethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
hlorofluoromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
:one	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıon Disulfide	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıylene Chloride	ND	U	1.0	1	09/20/01	09/20/01	KWG0106108	
s-1,2-Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
oethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
one (MEK)	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
Dichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
,2-Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıroform	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
nochloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
-Trichloroethane (TCA)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıon Tetrachloride	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Dichloroethane (EDC)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
zene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
hloroethene (TCE)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Dichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
nodichloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
omomethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
:xanone	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
,3-Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ıene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
s-1,3-Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
2-Trichloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
thyl-2-pentanone (MIBK)	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
Dichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ach ethene (PCE)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
loromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	

ments: 00979

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ːct:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	
ıle Matrix:	Water	**Date Received:**	09/13/2001

Volatile Organic Compounds

ıle Name:	Trip Blank	**Units:**	ug/L
Code:	K2106670-017	**Basis:**	NA
ıction Method:	EPA 5030B	**Level:**	Low
ysis Method:	8260B		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ibromoethane (EDB)	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
obenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
2-Tetrachloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
benzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Cylenes	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
oform	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ɔpylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
2-Tetrachloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Trichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
obenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
pylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
orotoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
orotoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Trimethylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
utylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Trimethylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
utylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ɔropyltoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
bromo-3-chloropropane	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Trichlorobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Trichlorobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
thalene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
ːhlorobutadiene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	

U1980

ıents:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	
trix:	Water	**Date Received:**	09/13/2001

Volatile Organic Compounds

ple Name:	Trip Blank	**Units:**	ug/L
Code:	K2106670-017	**Basis:**	NA

ogate Name	%Rec	Control Limits	Date Analyzed	Note
omofluoromethane	98	87-115	09/20/01	Acceptable
ene-d8	100	83-116	09/20/01	Acceptable
omofluorobenzene	94	75-120	09/20/01	Acceptable

ments:

00981

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Water

Service Request: K2106670
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

le Name: Method Blank
Code: KWG0106108-4

ction Method: EPA 5030B
sis Method: 8260B

Units: ug/L
Basis: NA
Level: Low

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
orodifluoromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
omethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Chloride	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
omethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
oethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
lorofluoromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
ichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
n Disulfide	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
lene Chloride	ND	U	1.0	1	09/20/01	09/20/01	KWG0106108	
1,2-Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ichloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
anone (MEK)	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
ichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
2-Dichloroethene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
oform	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ochloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Trichloroethane (TCA)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
n Tetrachloride	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ichloroethane (EDC)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
oroethene (TCE)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
odichloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
momethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
anone	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
3-Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
1,3-Dichloropropene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Trichloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
tyl-2-pentanone (MIBK)	ND	U	20	1	09/20/01	09/20/01	KWG0106108	
ichloropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
hloroethene (PCE)	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
mochloromethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	

U1982

ents:

it:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	Date Collected:	NA
trix:	Water	Date Received:	NA

Volatile Organic Compounds

ple Name:	Method Blank	Units:	ug/L
Code:	KWG0106108-4	Basis:	NA
action Method:	EPA 5030B	Level:	Low
ysis Method:	8260B		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
)ibromoethane (EDB)	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
robenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
,2-Tetrachloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
lbenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
Xylenes	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
lene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ne	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
oform	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
opylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
,2-Tetrachloroethane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
-T oropropane	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
ene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
opylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
lorotoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
lorotoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
-Trimethylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Butylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
-Trimethylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Butylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Dichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
propyltoluene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Dichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
tylbenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
Dichlorobenzene	ND	U	0.50	1	09/20/01	09/20/01	KWG0106108	
)ibromo-3-chloropropane	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
-Trichlorobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
-Trichlorobenzene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
thalene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	
achlorobutadiene	ND	U	2.0	1	09/20/01	09/20/01	KWG0106108	

ments: U4983

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	NA
ple Matrix:	Water	**Date Received:**	NA

Volatile Organic Compounds

ple Name:	Method Blank	**Units:**	ug/L
Code:	KWG0106108-4	**Basis:**	NA

ogate Name	%Rec	Control Limits	Date Analyzed	Note
ɔmofluoromethane	99	87-115	09/20/01	Acceptable
ɛne-d8	101	83-116	09/20/01	Acceptable
ɔmofluorobenzene	92	75-120	09/20/01	Acceptable

ıents:

00984

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ıt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ːct:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/10/2001
ɔl[redacted]rix:	Soil	Date Received:	09/13/2001

Volatile Organic Compounds

ɔle Name:	SD0020	Units:	ug/Kg
Code:	K2106670-001	Basis:	Dry
ıction Method:	EPA 5030A	Level:	Low
ysis Method:	8260B		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
orodifluoromethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ɔmethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
Chloride	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ıomethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ɔethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
lorofluoromethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ɔne	ND	U	69	1	09/19/01	09/19/01	KWG0106014	
ichloroethene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ɔn Disulfide	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ylene Chloride	ND	U	14	1	09/19/01	09/19/01	KWG0106014	
1,2-Dichloroethene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ic[redacted]ethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
[redacted]e (MEK)	ND	U	28	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
2-Dichloroethene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
oform	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ochloromethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
Trichloroethane (TCA)	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ichloropropene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ɔn Tetrachloride	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ichloroethane (EDC)	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ɛne	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
loroethene (TCE)	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
odichloromethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
momethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ɛanone	ND	U	28	1	09/19/01	09/19/01	KWG0106014	
3-Dichloropropene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
1,3-Dichloropropene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
Trichloroethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
hyl-2-pentanone (MIBK)	ND	U	28	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ɛhlo[redacted]ethene (PCE)	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
r[redacted]romethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	

ıents: 00985

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Soil

Service Request: K2106670
Date Collected: 09/10/2001
Date Received: 09/13/2001

Volatile Organic Compounds

le Name: SD0020
:ode: K2106670-001

Units: ug/Kg
Basis: Dry

ction Method: EPA 5030A
sis Method: 8260B

Level: Low

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
bromoethane (EDB)	ND	U	28	1	09/19/01	09/19/01	KWG0106014	
)benzene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
!-Tetrachloroethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
enzene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
ylenes	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
:ne	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
e	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
)form	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	
pylbenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	
!-Tetrachloroethane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	*
Trichloropropane	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	*
)benzene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	*
)ylbenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
)rotoluene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
)rotoluene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
Trimethylbenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
ıtylbenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
Trimethylbenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
ıtylbenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
chlorobenzene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	*
ropyltoluene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
chlorobenzene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	*
lbenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
chlorobenzene	ND	U	6.9	1	09/19/01	09/19/01	KWG0106014	*
)romo-3-chloropropane	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
Trichlorobenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
Trichlorobenzene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
ıalene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*
hlorobutadiene	ND	U	28	1	09/19/01	09/19/01	KWG0106014	*

Case Narrative

ents:

00986

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le trix: Soil

Service Request: K2106670
Date Collected: 09/10/2001
Date Received: 09/13/2001

Volatile Organic Compounds

le Name: SD0020
Code: K2106670-001

Units: ug/Kg
Basis: Dry

gate Name	%Rec	Control Limits	Date Analyzed	Note
mofluoromethane	100	75-132	09/19/01	Acceptable
ne-d8	89	85-109	09/19/01	Acceptable
mofluorobenzene	79	49-131	09/19/01	Acceptable

ents:

00987

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Soil

Service Request: K2106670
Date Collected: 09/10/2001
Date Received: 09/13/2001

Volatile Organic Compounds

le Name: SD0021
Code: K2106670-002

ction Method: EPA 5030A
/sis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
orodifluoromethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
omethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
Chloride	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
omethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
oethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
lorofluoromethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	75	1	09/19/01	09/19/01	KWG0106014	
ichloroethene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
n Disulfide	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
lene Chloride	ND	U	15	1	09/19/01	09/19/01	KWG0106014	
1,2-Dichloroethene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ichloroethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
anone (MEK)	ND	U	30	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
2-Dichloroethene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
oform	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ochloromethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
Trichloroethane (TCA)	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ichloropropene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
n Tetrachloride	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ichloroethane (EDC)	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
loroethene (TCE)	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
odichloromethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
momethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
anone	ND	U	30	1	09/19/01	09/19/01	KWG0106014	
3-Dichloropropene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
1,3-Dichloropropene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
Trichloroethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
hyl-2-pentanone (MIBK)	ND	U	30	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
chloroethene (PCE)	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
momochloromethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	

ients:

001988

t:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/10/2001
lr [redacted]ix:	Soil	Date Received:	09/13/2001

Volatile Organic Compounds

le Name:	SD0021	Units:	ug/Kg
ode:	K2106670-002	Basis:	Dry
ction Method:	EPA 5030A	Level:	Low
sis Method:	8260B		

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
bromoethane (EDB)	ND	U	30	1	09/19/01	09/19/01	KWG0106014	
benzene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
2-Tetrachloroethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
enzene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ylenes	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
e	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
form	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	
pylbenzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	
2-Tetrachloroethane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	*
Tri[redacted]ropropane	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	*
[redacted]e	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	*
[redacted]nzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
rotoluene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
rotoluene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
Trimethylbenzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
tylbenzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
Trimethylbenzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
tylbenzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
chlorobenzene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	*
ropyltoluene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
chlorobenzene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	*
lbenzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
chlorobenzene	ND	U	7.5	1	09/19/01	09/19/01	KWG0106014	*
romo-3-chloropropane	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
Trichlorobenzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
Trichlorobenzene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
halene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*
hlorobutadiene	ND	U	30	1	09/19/01	09/19/01	KWG0106014	*

Case Narrative

[redacted]

ents:

011989

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/10/2001
le Matrix:	Soil	**Date Received:**	09/13/2001

Volatile Organic Compounds

le Name:	SD0021	**Units:**	ug/Kg
Code:	K2106670-002	**Basis:**	Dry

gate Name	%Rec	Control Limits	Date Analyzed	Note
mofluoromethane	96	75-132	09/19/01	Acceptable
ne-d8	95	85-109	09/19/01	Acceptable
mofluorobenzene	86	49-131	09/19/01	Acceptable

ents: 00990

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/11/2001
p' trix:	Soil	Date Received:	09/13/2001

Volatile Organic Compounds

ple Name:	S00150	Units:	ug/Kg
Code:	K2106670-007	Basis:	Dry
action Method:	EPA 5030A	Level:	Low
lysis Method:	8260B		

lyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
lorodifluoromethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
romethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
l Chloride	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
iomethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
roethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
ilorofluoromethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
one	ND	U	59	1	09/21/01	09/21/01	KWG0106083	
)ichloroethene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
on Disulfide	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
ylene Chloride	ND	U	12	1	09/21/01	09/21/01	KWG0106083	
-1,2-Dichloroethene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
)i- ethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
t e (MEK)	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
)ichloropropane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
,2-Dichloroethene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
roform	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
iochloromethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
-Trichloroethane (TCA)	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
)ichloropropene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
on Tetrachloride	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
)ichloroethane (EDC)	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
ene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
iloroethene (TCE)	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
)ichloropropane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
iodichloromethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
)momethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
xanone	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
,3-Dichloropropene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
ene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
-1,3-Dichloropropene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
-Trichloroethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
thyl-2-pentanone (MIBK)	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
)ichloropropane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
ichl ethene (PCE)	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
)r romomethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	

00991

nents:

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Soil

Service Request: K2106670
Date Collected: 09/11/2001
Date Received: 09/13/2001

Volatile Organic Compounds

le Name: S00150
Code: K2106670-007

ction Method: EPA 5030A
sis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ibromoethane (EDB)	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
obenzene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
2-Tetrachloroethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
enzene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
ylenes	15		5.9	1	09/21/01	09/21/01	KWG0106083	
ne	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
e	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
oform	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
pylbenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
2-Tetrachloroethane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
Trichloropropane	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
obenzene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
ylbenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
rotoluene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
rotoluene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
Trimethylbenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
tylbenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
Trimethylbenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
tylbenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
chlorobenzene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
ropyltoluene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
chlorobenzene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
lbenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
chlorobenzene	ND	U	5.9	1	09/21/01	09/21/01	KWG0106083	
romo-3-chloropropane	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
Trichlorobenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
Trichlorobenzene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
halene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	
hlorobutadiene	ND	U	24	1	09/21/01	09/21/01	KWG0106083	

ents:

01992

::	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	09/11/2001
le [redacted]rix:	Soil	**Date Received:**	09/13/2001

Volatile Organic Compounds

le Name:	S00150	**Units:**	ug/Kg
ode:	K2106670-007	**Basis:**	Dry

gate Name	%Rec	Control Limits	Date Analyzed	Note
nofluoromethane	71	75-132	09/21/01	Outside Control Limits
ıe-d8	107	85-109	09/21/01	Acceptable
nofluorobenzene	101	49-131	09/21/01	Acceptable

:nts:

0u993

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

t:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/11/2001
le Matrix:	Soil	Date Received:	09/13/2001

Volatile Organic Compounds

le Name:	S00151	Units:	ug/Kg
Code:	K2106670-008	Basis:	Dry
ction Method:	EPA 5030A	Level:	Low
sis Method:	8260B		

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
orodifluoromethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
omethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
Chloride	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
omethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
oethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
orofluoromethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	56	1	09/19/01	09/19/01	KWG0106014	
ichloroethene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
n Disulfide	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
lene Chloride	ND	U	12	1	09/19/01	09/19/01	KWG0106014	
1,2-Dichloroethene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ichloroethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
anone (MEK)	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
2-Dichloroethene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
oform	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ochloromethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
Trichloroethane (TCA)	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ichloropropene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
n Tetrachloride	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ichloroethane (EDC)	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
oroethene (TCE)	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
odichloromethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
momethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
anone	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
3-Dichloropropene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
1,3-Dichloropropene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
Trichloroethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
yl-2-pentanone (MIBK)	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
ichloropropane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
hloroethene (PCE)	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
mochloromethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	

ents:

ıt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	Date Collected:	09/11/2001
ol[redacted]rix:	Soil	Date Received:	09/13/2001

Volatile Organic Compounds

ole Name:	S00151	Units:	ug/Kg
Code:	K2106670-008	Basis:	Dry
action Method:	EPA 5030A	Level:	Low
ysis Method:	8260B		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ibromoethane (EDB)	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
obenzene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
,2-Tetrachloroethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
benzene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
Cylenes	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
lene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
oform	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
opylbenzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
2-Tetrachloroethane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
Trichloropropane	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
[redacted]ne	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
[redacted]nzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
orotoluene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
orotoluene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
Trimethylbenzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
utylbenzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
Trimethylbenzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
utylbenzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
ichlorobenzene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
opropyltoluene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
ichlorobenzene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
ylbenzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
ichlorobenzene	ND	U	5.6	1	09/19/01	09/19/01	KWG0106014	
bromo-3-chloropropane	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
Trichlorobenzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
Trichlorobenzene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
thalene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	
chlorobutadiene	ND	U	23	1	09/19/01	09/19/01	KWG0106014	

[redacted]

ıents:

U1995

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Soil

Service Request: K2106670
Date Collected: 09/11/2001
Date Received: 09/13/2001

Volatile Organic Compounds

le Name: S00151
Code: K2106670-008

Units: ug/Kg
Basis: Dry

gate Name	%Rec	Control Limits	Date Analyzed	Note
mofluoromethane	26	75-132	09/19/01	Outside Control Limits
ne-d8	105	85-109	09/19/01	Acceptable
mofluorobenzene	101	49-131	09/19/01	Acceptable

nts:

0w996

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

nt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	Date Collected:	NA
pl[illegible]trix:	Soil	Date Received:	NA

Volatile Organic Compounds

ple Name:	Method Blank	Units:	ug/Kg
Code:	KWG0106014-4	Basis:	Dry
action Method:	EPA 5030A	Level:	Low
ysis Method:	8260B		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
lorodifluoromethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
romethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
l Chloride	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ıomethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
roethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ılorofluoromethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ɔne	ND	U	50	1	09/19/01	09/19/01	KWG0106014	
)ichloroethene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
on Disulfide	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ylene Chloride	ND	U	10	1	09/19/01	09/19/01	KWG0106014	
-1,2-Dichloroethene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
)ic[illegible]ethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
[illegible] (MEK)	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
)ichloropropane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
,2-Dichloroethene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
roform	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ıochloromethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
Trichloroethane (TCA)	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
)ichloropropene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ɔn Tetrachloride	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
)ichloroethane (EDC)	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
loroethene (TCE)	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
)ichloropropane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ıodichloromethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ɔmomethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
‹anone	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
3-Dichloropropene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
:ne	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
-1,3-Dichloropropene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
-Trichloroethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
hyl-2-pentanone (MIBK)	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
)ichloropropane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
chloroethene (PCE)	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ɔm[illegible]romethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	

nents:

00997

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Soil

Service Request: K2106670
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

le Name: Method Blank
Code: KWG0106014-4

ction Method: EPA 5030A
sis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ibromoethane (EDB)	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
obenzene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
2-Tetrachloroethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
enzene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ylenes	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ne	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
e	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
oform	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
pylbenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
2-Tetrachloroethane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
Trichloropropane	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
obenzene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ylbenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
rotoluene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
rotoluene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
Trimethylbenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
tylbenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
Trimethylbenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
tylbenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
chlorobenzene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
ropyltoluene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
chlorobenzene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
lbenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
chlorobenzene	ND	U	5.0	1	09/19/01	09/19/01	KWG0106014	
romo-3-chloropropane	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
Trichlorobenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
Trichlorobenzene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
alene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	
hlorobutadiene	ND	U	20	1	09/19/01	09/19/01	KWG0106014	

nts:

04998

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	NA
ix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

le Name:	Method Blank	**Units:**	ug/Kg
:ode:	KWG0106014-4	**Basis:**	Dry

gate Name	**%Rec**	**Control Limits**	**Date Analyzed**	**Note**
mofluoromethane	107	75-132	09/19/01	Acceptable
ne-d8	107	85-109	09/19/01	Acceptable
mofluorobenzene	103	49-131	09/19/01	Acceptable

ents:

0u999

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

ıt:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	Date Collected:	NA
ple Matrix:	Soil	Date Received:	NA

Volatile Organic Compounds

ple Name:	Method Blank	Units:	ug/Kg
Code:	KWG0106083-5	Basis:	Dry
action Method:	EPA 5030A	Level:	Low
ysis Method:	8260B		

yte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
orodifluoromethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
omethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
Chloride	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
omethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
oethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
lorofluoromethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ne	ND	U	50	1	09/21/01	09/21/01	KWG0106083	
ichloroethene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
n Disulfide	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ylene Chloride	ND	U	10	1	09/21/01	09/21/01	KWG0106083	
1,2-Dichloroethene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ichloroethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
anone (MEK)	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
ichloropropane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
2-Dichloroethene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
oform	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ochloromethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
Trichloroethane (TCA)	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ichloropropene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
n Tetrachloride	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ichloroethane (EDC)	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ne	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
oroethene (TCE)	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ichloropropane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
odichloromethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
momethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
anone	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
-Dichloropropene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ne	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
,3-Dichloropropene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
Trichloroethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
yl-2-pentanone (MIBK)	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
chloropropane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
hloroethene (PCE)	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
nochloromethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	

ents: 01000

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
rix: Soil

Service Request: K2106670
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

le Name: Method Blank
Code: KWG0106083-5

ction Method: EPA 5030A
sis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low

te Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
ibromoethane (EDB)	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
obenzene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
2-Tetrachloroethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
benzene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ylenes	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ıe	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
oform	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
pylbenzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
2-Tetrachloroethane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
Trichloropropane	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ıe	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
nzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
protoluene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
protoluene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
Trimethylbenzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
utylbenzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
Trimethylbenzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
utylbenzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
ichlorobenzene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ropyltoluene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
ichlorobenzene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
ylbenzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
ichlorobenzene	ND	U	5.0	1	09/21/01	09/21/01	KWG0106083	
bromo-3-chloropropane	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
Trichlorobenzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
Trichlorobenzene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
halene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	
chlorobutadiene	ND	U	20	1	09/21/01	09/21/01	KWG0106083	

ents:

01001

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Collected:**	NA
le Matrix:	Soil	**Date Received:**	NA

Volatile Organic Compounds

le Name:	Method Blank	**Units:**	ug/Kg
Code:	KWG0106083-5	**Basis:**	Dry

ogate Name	%Rec	Control Limits	Date Analyzed	Note
mofluoromethane	104	75-132	09/21/01	Acceptable
ne-d8	105	85-109	09/21/01	Acceptable
mofluorobenzene	108	49-131	09/21/01	Acceptable

ents:

01002

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt: Exponent Environmental Group, Inc. **Service Request:** K2106670

:ct: Oregon Steel Mills/8601526.001.0302

)' rix: Water

Surrogate Recovery Summary
Volatile Organic Compounds

ıction Method: EPA 5030B **Units:** PERCENT

ysis Method: 8260B **Level:** Low

ıle Name	Lab Code	Sur1	Sur2	Sur3
)02	K2106670-006	99	101	93
203	K2106670-014	100	100	95
3lank	K2106670-017	98	100	94
)d Blank	KWG0106108-4	99	101	92
QC	K2106757-012	101	101	92
QCMS	KWG0106108-1	99	103	98
QCDMS	KWG0106108-2	99	102	99
:ontrol Sample	KWG0106108-3	100	103	99

gate Recovery Control Limits (%)

= Dibromofluoromethane	87-115
= Toluene-d8	83-116
= 4-Bromofluorobenzene	75-120

flagged with an asterisk (*) indicate values outside control criteria.
flagged with a pound (#) indicate the control criteria is not applicable.

01003

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ːct: Oregon Steel Mills/8601526.001.0302
ıle Matrix: Soil

Surrogate Recovery Summary
Volatile Organic Compounds

ıction Method: EPA 5030A **Units:** PERCENT
ysis Method: 8260B **Level:** Low

ıle Name	Lab Code	Sur1		Sur2		Sur3
20	K2106670-001	100		89		79
21	K2106670-002	96		95		86
50	K2106670-007	71	*	107		101
51	K2106670-008	26	*	105		101
ɔd Blank	KWG0106014-4	107		107		103
ɔd Blank	KWG0106083-5	104		105		108
51MS	KWG0106014-1	32	*	110	*	105
51DMS	KWG0106014-2	26	*	106		102
ːontrol Sample	KWG0106014-3	100		104		98
ːontrol Sample	KWG0106083-1	98		103		101

ıgate Recovery Control Limits (%)

= Dibromofluoromethane	75-132
= Toluene-d8	85-109
= 4-Bromofluorobenzene	49-131

ı flagged with an asterisk (*) indicate values outside control criteria.
ı flagged with a pound (#) indicate the control criteria is not applicable.

01004

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/19/2001
Time Analyzed: 13:10

Internal Standard Area and RT Summary
Volatile Organic Compounds

D: J:\MS05\DATA\091901\0919F004.D
ıment ID: MS05
sis Method: 8260B

Lab Code: KWG0106015-4
Analysis Lot: KWG0106015

		Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
		Area	RT	Area	RT	Area	RT
	Results ==>	786,596	9.13	597,226	13.03	282,764	16.39
	Upper Limit ==>	1,573,192	9.63	1,194,452	13.53	565,528	16.89
	Lower Limit ==>	393,298	8.63	298,613	12.53	141,382	15.89
	ICAL Result ==>	724,247	NA	579,843	NA	273,320	NA
ated Analyses							
ontrol Sample	KWG0106014-3	748,273	9.13	601,812	13.04	256,826	16.39
ıd Blank	KWG0106014-4	648,540	9.14	539,747	13.04	241,403	16.40
20	K2106670-001	565,863	9.14	325,494	13.04	76,233*	16.40
21	K2106670-002	639,931	9.13	406,346	13.04	104,010*	16.40
1	K2106670-008	741,815	9.14	592,292	13.04	277,753	16.40
1MS	KWG0106014-1	617,083	9.14	503,275	13.04	242,557	16.41
1DMS	KWG0106014-2	712,285	9.14	563,162	13.04	267,997	16.40

: flagged with an asterisk (*) indicate values outside control criteria.

01005

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/20/2001
Time Analyzed: 18:17

Internal Standard Area and RT Summary
Volatile Organic Compounds

D: J:\MS13\DATA\092001\0920F003.D
ıment ID: MS13
ʻsis Method: 8260B

Lab Code: KWG0106107-2
Analysis Lot: KWG0106107

		Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
		Area	RT	Area	RT	Area	RT
	Results ==>	559,232	4.55	224,100	7.60	233,436	10.46
	Upper Limit ==>	1,118,464	5.05	448,200	8.10	466,872	10.96
	Lower Limit ==>	279,616	4.05	112,050	7.10	116,718	9.96
	ICAL Result ==>	575,530	NA	221,881	NA	228,305	NA
ʻated Analyses							
ʻontrol Sample	KWG0106108-3	572,025	4.55	227,274	7.60	237,281	10.46
QCMS	KWG0106108-1	575,778	4.55	229,356	7.60	239,086	10.46
QCDMS	KWG0106108-2	579,662	4.55	228,734	7.61	239,915	10.46
ɔd Blank	KWG0106108-4	557,184	4.55	217,018	7.60	218,415	10.46
)02	K2106670-006	558,223	4.55	219,955	7.60	217,992	10.46
203	K2106670-014	558,034	4.55	217,672	7.60	215,733	10.46
3lank	K2106670-017	558,110	4.55	220,048	7.60	216,832	10.46
QC	K2106757-012	546,027	4.55	218,650	7.60	216,725	10.46

s flagged with an asterisk (*) indicate values outside control criteria.

01006

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/21/2001
Time Analyzed: 12:57

Internal Standard Area and RT Summary
Volatile Organic Compounds

D: J:\MS05\DATA\092101\0921F005.D
ıment ID: MS05
/sis Method: 8260B

Lab Code: KWG0106084-5
Analysis Lot: KWG0106084

		Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
		Area	RT	Area	RT	Area	RT
	Results ==>	678,590	9.14	570,987	13.04	255,607	16.40
	Upper Limit ==>	1,357,180	9.64	1,141,974	13.54	511,214	16.90
	Lower Limit ==>	339,295	8.64	285,494	12.54	127,804	15.90
	ICAL Result ==>	724,247	NA	579,843	NA	273,320	NA
ated Analyses							
ontrol Sample	KWG0106083-1	673,857	9.13	534,863	13.04	240,764	16.40
ɔd Blank	KWG0106083-5	666,895	9.14	506,081	13.04	237,627	16.40
50	K2106670-007	705,788	9.14	609,468	13.04	273,139	16.41

s flagged with an asterisk (*) indicate values outside control criteria.

01007

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

::	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
le Matrix:	Water	**Date Analyzed:**	09/20/2001

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

.e Name:	Batch QC	**Units:**	ug/L
ode:	K2106757-012	**Basis:**	NA
:tion Method:	EPA 5030B	**Level:**	Low
sis Method:	8260B	**Extraction Lot:**	KWG0106108

te Name	Sample Result	Batch QCMS KWG0106108-1 Matrix Spike Result	Matrix Spike Expected	Matrix Spike %Rec	Batch QCDMS KWG0106108-2 Duplicate Matrix Spike Result	Duplicate Matrix Spike Expected	Duplicate Matrix Spike %Rec	%Rec Limits	RPD	RPD Limit
:hloroethene	ND	11.6	10.0	116	11.0	10.0	110	42-178	5	30
ıe	ND	10.6	10.0	106	10.4	10.0	104	65-138	2	30
)roethene (TCE)	ND	10.9	10.0	109	10.8	10.0	108	58-146	1	30
ıe	ND	11.0	10.0	110	10.5	10.0	105	68-135	4	30
benzene	ND	10.3	10.0	103	9.95	10.0	99	71-124	3	30
:hlorobenzene	ND	9.57	10.0	96	9.49	10.0	95	71-121	1	30
ıalene	ND	10.5	10.0	105	10.5	10.0	105	50-145	0	30

lagged with an asterisk (*) indicate values outside control criteria.
lagged with a pound (#) indicate the control criteria is not applicable.
ecoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01008

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
le ix:	Soil	**Date Analyzed:**	09/19/2001

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

le Name:	S00151	**Units:**	ug/Kg
ode:	K2106670-008	**Basis:**	Dry
ction Method:	EPA 5030A	**Level:**	Low
sis Method:	8260B	**Extraction Lot:**	KWG0106014

te Name	Sample Result	S00151MS KWG0106014-1 Matrix Spike Result	Expected	%Rec	S00151DMS KWG0106014-2 Duplicate Matrix Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
chloroethene	ND	231	150	154 *	274	149	183 *	51-127	17	40
ne	ND	140	150	94	164	149	110	57-121	16	40
oroethene (TCE)	ND	248	150	166 *	299	149	200 *	45-127	19	40
ie	ND	135	150	90	157	149	105	34-134	15	40
benzene	ND	128	150	86	149	149	99	37-126	15	40
chlorobenzene	ND	116	150	78	128	149	86	34-131	9	40
halene	ND	99.5	150	66	122	149	82	20-139	20	40

ed with an asterisk (*) indicate values outside control criteria.
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recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01009

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Water

Service Request: K2106670
Date Extracted: 09/20/2001
Date Analyzed: 09/20/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method: EPA 5030B
sis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0106108

	Lab Control Sample KWG0106108-3 Lab Control Spike			
te Name	Result	Expected	%Rec	%Rec Limits
rodifluoromethane	13.0	10.0	130	50-150
omethane	11.0	10.0	109	50-150
Chloride	12.2	10.0	122	50-150
omethane	11.0	10.0	110	50-150
oethane	10.9	10.0	109	50-150
orofluoromethane	10.3	10.0	103	50-150
ne	55.7	50.0	111	50-150
ichloroethene	10.7	10.0	107	62-148
n Disulfide	18.4	20.0	92	50-150
lene Chloride	9.58	10.0	96	50-150
1,2-Dichloroethene	10.7	10.0	107	50-150
ichloroethane	10.5	10.0	105	50-150
anone (MEK)	55.1	50.0	110	50-150
ichloropropane	10.5	10.0	105	50-150
2-Dichloroethene	10.3	10.0	102	50-150
oform	9.57	10.0	96	50-150
ochloromethane	9.57	10.0	96	50-150
richloroethane (TCA)	10.1	10.0	101	50-150
ichloropropene	10.4	10.0	104	50-150
n Tetrachloride	10.4	10.0	104	50-150
ichloroethane (EDC)	9.49	10.0	95	50-150
ne	10.1	10.0	100	77-114
oroethene (TCE)	10.3	10.0	102	69-124
ichloropropane	9.73	10.0	97	50-150
odichloromethane	9.31	10.0	93	50-150
momethane	9.58	10.0	96	50-150
anone	48.7	50.0	97	50-150
3-Dichloropropene	10.4	10.0	104	50-150
ne	10.0	10.0	100	75-118
1,3-Dichloropropene	9.09	10.0	91	50-150
Trichloroethane	9.30	10.0	93	50-150
yl-2-pentanone (MIBK)	50.7	50.0	101	50-150
ichloropropane	9.11	10.0	91	50-150
hloroethene (PCE)	9.97	10.0	100	50-150
mochloromethane	9.18	10.0	92	50-150
ibromoethane (EDB)	9.16	10.0	92	50-150

flagged with an asterisk (*) indicate values outside control criteria.
recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01010

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
)l rix: Water

Service Request: K2106670
Date Extracted: 09/20/2001
Date Analyzed: 09/20/2001

Lab Control Spike Summary
Volatile Organic Compounds

ıction Method: EPA 5030B
ysis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0106108

	Lab Control Sample KWG0106108-3 Lab Control Spike			
te Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
obenzene	9.76	10.0	98	79-110
2-Tetrachloroethane	9.79	10.0	98	50-150
enzene	10.2	10.0	102	50-150
ylenes	21.2	20.0	106	50-150
ene	10.3	10.0	103	50-150
ıe	9.78	10.0	98	50-150
oform	8.89	10.0	89	50-150
pylbenzene	10.2	10.0	102	50-150
2-Tetrachloroethane	8.69	10.0	87	50-150
Tri ropropane	8.53	10.0	85	50-150
ıe	9.49	10.0	95	50-150
y enzene	10.3	10.0	103	50-150
rotoluene	9.44	10.0	94	50-150
rotoluene	9.89	10.0	99	50-150
Trimethylbenzene	10.5	10.0	105	50-150
utylbenzene	10.4	10.0	104	50-150
Trimethylbenzene	10.7	10.0	107	50-150
utylbenzene	10.7	10.0	107	50-150
ichlorobenzene	9.95	10.0	99	50-150
ropyltoluene	10.5	10.0	105	50-150
ichlorobenzene	9.49	10.0	95	50-150
ylbenzene	10.2	10.0	102	50-150
ichlorobenzene	9.29	10.0	93	80-110
bromo-3-chloropropane	8.53	10.0	85	50-150
Trichlorobenzene	9.37	10.0	94	50-150
Trichlorobenzene	9.57	10.0	96	50-150
halene	10.3	10.0	102	64-125
hlorobutadiene	8.98	10.0	90	50-150

flagged with an asterisk (*) indicate values outside control criteria.
recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01011

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
le Matrix:	Soil	**Date Analyzed:**	09/19/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method:	EPA 5030A	**Units:**	ug/Kg
sis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106014

	Lab Control Sample KWG0106014-3 Lab Control Spike			
te Name	Result	Expected	%Rec	%Rec Limits
rodifluoromethane	119	100	119	50-150
omethane	117	100	117	50-150
Chloride	126	100	126	50-150
omethane	117	100	117	50-150
oethane	125	100	125	50-150
orofluoromethane	108	100	108	50-150
ne	445	500	89	50-150
ichloroethene	115	100	115	73-118
n Disulfide	187	200	93	50-150
lene Chloride	96.6	100	97	50-150
1,2-Dichloroethene	115	100	115	50-150
ichloroethane	110	100	110	50-150
anone (MEK)	458	500	92	50-150
ichloropropane	114	100	114	50-150
2-Dichloroethene	102	100	102	50-150
oform	104	100	104	50-150
ochloromethane	101	100	101	50-150
richloroethane (TCA)	112	100	112	50-150
ichloropropene	107	100	107	50-150
n Tetrachloride	115	100	115	50-150
ichloroethane (EDC)	96.9	100	97	50-150
ne	107	100	107	78-116
oroethene (TCE)	112	100	112	79-119
ichloropropane	99.5	100	99	50-150
odichloromethane	99.7	100	100	50-150
momethane	97.3	100	97	50-150
anone	459	500	92	50-150
3-Dichloropropene	101	100	101	50-150
ne	102	100	102	77-118
1,3-Dichloropropene	93.3	100	93	50-150
Trichloroethane	94.0	100	94	50-150
yl-2-pentanone (MIBK)	475	500	95	50-150
ichloropropane	89.6	100	90	50-150
hloroethene (PCE)	106	100	106	50-150
mochloromethane	98.7	100	99	50-150
ibromoethane (EDB)	93.4	100	93	50-150

flagged with an asterisk (*) indicate values outside control criteria.

recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01012

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
l rix: Soil

Service Request: K2106670
Date Extracted: 09/19/2001
Date Analyzed: 09/19/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method: EPA 5030A
sis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0106014

te Name	Lab Control Sample KWG0106014-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
obenzene	101	100	101	80-117
2-Tetrachloroethane	100	100	100	50-150
enzene	104	100	104	50-150
ylenes	194	200	97	50-150
ene	96.6	100	97	50-150
ie	96.5	100	96	50-150
oform	96.6	100	97	50-150
pylbenzene	97.0	100	97	50-150
2-Tetrachloroethane	92.3	100	92	50-150
Tri ropropane	103	100	103	50-150
ne	102	100	102	50-150
y enzene	112	100	112	50-150
rotoluene	103	100	103	50-150
rotoluene	97.3	100	97	50-150
Trimethylbenzene	112	100	112	50-150
utylbenzene	118	100	118	50-150
Trimethylbenzene	114	100	114	50-150
utylbenzene	119	100	119	50-150
ichlorobenzene	103	100	103	50-150
ropyltoluene	110	100	110	50-150
ichlorobenzene	97.6	100	98	50-150
ylbenzene	106	100	106	50-150
ichlorobenzene	97.4	100	97	79-120
bromo-3-chloropropane	95.6	100	96	50-150
Trichlorobenzene	95.5	100	95	50-150
Trichlorobenzene	95.8	100	96	50-150
halene	85.8	100	86	57-135
hlorobutadiene	104	100	104	50-150

; flagged with an asterisk (*) indicate values outside control criteria.
recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01013

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Soil

Service Request: K2106670
Date Extracted: 09/21/2001
Date Analyzed: 09/21/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method: EPA 5030A
sis Method: 8260B

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0106083

te Name	Lab Control Sample KWG0106083-1 Lab Control Spike Result	Expected	%Rec	%Rec Limits
rodifluoromethane	102	100	102	50-150
methane	94.9	100	95	50-150
Chloride	105	100	105	50-150
methane	101	100	101	50-150
ethane	98.7	100	99	50-150
orofluoromethane	97.4	100	97	50-150
ne	436	500	87	50-150
chloroethene	100	100	100	73-118
n Disulfide	162	200	81	50-150
lene Chloride	86.3	100	86	50-150
l,2-Dichloroethene	101	100	101	50-150
chloroethane	92.2	100	92	50-150
none (MEK)	437	500	87	50-150
chloropropane	96.0	100	96	50-150
-Dichloroethene	88.8	100	89	50-150
form	90.2	100	90	50-150
chloromethane	88.3	100	88	50-150
richloroethane (TCA)	97.5	100	97	50-150
chloropropene	93.9	100	94	50-150
n Tetrachloride	102	100	102	50-150
chloroethane (EDC)	84.4	100	84	50-150
ne	93.6	100	94	78-116
oroethene (TCE)	96.4	100	96	79-119
chloropropane	83.5	100	84	50-150
dichloromethane	89.4	100	89	50-150
momethane	88.1	100	88	50-150
anone	461	500	92	50-150
-Dichloropropene	91.1	100	91	50-150
ne	91.1	100	91	77-118
l,3-Dichloropropene	86.4	100	86	50-150
richloroethane	85.6	100	86	50-150
yl-2-pentanone (MIBK)	461	500	92	50-150
chloropropane	82.0	100	82	50-150
hloroethene (PCE)	97.4	100	97	50-150
nochloromethane	87.6	100	88	50-150
bromoethane (EDB)	86.1	100	86	50-150

flagged with an asterisk (*) indicate values outside control criteria.
recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01014

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/21/2001
l- rix:	Soil	**Date Analyzed:**	09/21/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method:	EPA 5030A	**Units:**	ug/Kg
ysis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106083

	Lab Control Sample KWG0106083-1 Lab Control Spike			
yte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
obenzene	90.3	100	90	80-117
2-Tetrachloroethane	91.8	100	92	50-150
benzene	92.0	100	92	50-150
Xylenes	181	200	91	50-150
ene	87.1	100	87	50-150
ne	88.6	100	89	50-150
oform	91.2	100	91	50-150
opylbenzene	91.1	100	91	50-150
2-Tetrachloroethane	89.4	100	89	50-150
Tri loropropane	97.7	100	98	50-150
ne	88.8	100	89	50-150
p enzene	99.1	100	99	50-150
orotoluene	91.4	100	91	50-150
orotoluene	89.4	100	89	50-150
-Trimethylbenzene	99.0	100	99	50-150
utylbenzene	97.8	100	98	50-150
-Trimethylbenzene	97.4	100	97	50-150
utylbenzene	104	100	104	50-150
ichlorobenzene	92.8	100	93	50-150
propyltoluene	97.8	100	98	50-150
ichlorobenzene	89.2	100	89	50-150
ylbenzene	93.3	100	93	50-150
ichlorobenzene	89.8	100	90	79-120
ibromo-3-chloropropane	95.9	100	96	50-150
-Trichlorobenzene	75.7	100	76	50-150
-Trichlorobenzene	75.4	100	75	50-150
thalene	65.9	100	66	57-135
chlorobutadiene	92.8	100	93	50-150

s flagged with an asterisk (*) indicate values outside control criteria.

t recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
ple Matrix:	Water	**Date Analyzed:**	09/20/2001
		Time Analyzed:	20:41

Method Blank Summary
Volatile Organic Compounds

ple Name:	Method Blank	**File ID:**	J:\MS13\DATA\092001\0920F008.D
Code:	KWG0106108-4	**Instrument ID:**	MS13
action Method:	EPA 5030B	**Level:**	Low
ysis Method:	8260B	**Extraction Lot:**	KWG0106108

Method Blank applies to the following analyses:

le Name	**Lab Code**	**File ID**	**Date Analyzed**	**Time Analyzed**
ontrol Sample	KWG0106108-3	J:\MS13\DATA\092001\0920F004.D	09/20/01	18:47
QCMS	KWG0106108-1	J:\MS13\DATA\092001\0920F005.D	09/20/01	19:16
QCDMS	KWG0106108-2	J:\MS13\DATA\092001\0920F006.D	09/20/01	19:44
02	K2106670-006	J:\MS13\DATA\092001\0920F009.D	09/20/01	21:09
03	K2106670-014	J:\MS13\DATA\092001\0920F010.D	09/20/01	21:37
lank	K2106670-017	J:\MS13\DATA\092001\0920F011.D	09/20/01	22:06
QC	K2106757-012	J:\MS13\DATA\092001\0920F024.D	09/21/01	04:15

01016

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

it:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
trix:	Soil	**Date Analyzed:**	09/19/2001
		Time Analyzed:	15:30

Method Blank Summary
Volatile Organic Compounds

ole Name:	Method Blank	**File ID:**	J:\MS05\DATA\091901\0919F009.D
Code:	KWG0106014-4	**Instrument ID:**	MS05
action Method:	EPA 5030A	**Level:**	Low
ysis Method:	8260B	**Extraction Lot:**	KWG0106014

Method Blank applies to the following analyses:

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ontrol Sample	KWG0106014-3	J:\MS05\DATA\091901\0919F005.D	09/19/01	13:40
20	K2106670-001	J:\MS05\DATA\091901\0919F010.D	09/19/01	15:58
21	K2106670-002	J:\MS05\DATA\091901\0919F011.D	09/19/01	16:26
1	K2106670-008	J:\MS05\DATA\091901\0919F013.D	09/19/01	17:21
1MS	KWG0106014-1	J:\MS05\DATA\091901\0919F014.D	09/19/01	17:48
1DMS	KWG0106014-2	J:\MS05\DATA\091901\0919F015.D	09/19/01	18:16

01017

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/21/2001
ıle Matrix:	Soil	**Date Analyzed:**	09/21/2001
		Time Analyzed:	15:15

Method Blank Summary
Volatile Organic Compounds

ıle Name:	Method Blank	**File ID:**	J:\MS05\DATA\092101\0921F010.D
Code:	KWG0106083-5	**Instrument ID:**	MS05
ıction Method:	EPA 5030A	**Level:**	Low
ysis Method:	8260B	**Extraction Lot:**	KWG0106083

Method Blank applies to the following analyses:

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ontrol Sample	KWG0106083-1	J:\MS05\DATA\092101\0921F006.D	09/21/01	13:25
i0	K2106670-007	J:\MS05\DATA\092101\0921F013.D	09/21/01	16:38

01018

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
/ ix:	*Water*	**Date Analyzed:**	09/20/2001
		Time Analyzed:	18:47

Lab Control Sample Summary
Volatile Organic Compounds

le Name:	Lab Control Sample	**File ID:**	J:\MS13\DATA\092001\0920F004.D
'ode:	KWG0106108-3	**Instrument ID:**	MS13
ction Method:	EPA 5030B	**Level:**	Low
sis Method:	8260B	**Extraction Lot:**	KWG0106108

.ab Control Sample applies to the following analyses:

e Name	Lab Code	File ID	Date Analyzed	Time Analyzed
QCMS	KWG0106108-1	J:\MS13\DATA\092001\0920F005.D	09/20/01	19:16
QCDMS	KWG0106108-2	J:\MS13\DATA\092001\0920F006.D	09/20/01	19:44
d Blank	KWG0106108-4	J:\MS13\DATA\092001\0920F008.D	09/20/01	20:41
)2	K2106670-006	J:\MS13\DATA\092001\0920F009.D	09/20/01	21:09
03	K2106670-014	J:\MS13\DATA\092001\0920F010.D	09/20/01	21:37
lank	K2106670-017	J:\MS13\DATA\092001\0920F011.D	09/20/01	22:06
QC	K2106757-012	J:\MS13\DATA\092001\0920F024.D	09/21/01	04:15

01019

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
e Matrix:	Soil	**Date Analyzed:**	09/19/2001
		Time Analyzed:	13:40

Lab Control Sample Summary
Volatile Organic Compounds

e Name:	Lab Control Sample	**File ID:**	J:\MS05\DATA\091901\0919F005.D
ode:	KWG0106014-3	**Instrument ID:**	MS05
:tion Method:	EPA 5030A	**Level:**	Low
sis Method:	8260B	**Extraction Lot:**	KWG0106014

ab Control Sample applies to the following analyses:

: Name	Lab Code	File ID	Date Analyzed	Time Analyzed
l Blank	KWG0106014-4	J:\MS05\DATA\091901\0919F009.D	09/19/01	15:30
)	K2106670-001	J:\MS05\DATA\091901\0919F010.D	09/19/01	15:58
l	K2106670-002	J:\MS05\DATA\091901\0919F011.D	09/19/01	16:26
	K2106670-008	J:\MS05\DATA\091901\0919F013.D	09/19/01	17:21
MS	KWG0106014-1	J:\MS05\DATA\091901\0919F014.D	09/19/01	17:48
DMS	KWG0106014-2	J:\MS05\DATA\091901\0919F015.D	09/19/01	18:16

01020

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	Date Extracted:	09/21/2001
rix:	Soil	Date Analyzed:	09/21/2001
		Time Analyzed:	13:25

Lab Control Sample Summary
Volatile Organic Compounds

le Name:	Lab Control Sample	File ID:	J:\MS05\DATA\092101\0921F006.D
Code:	KWG0106083-1	Instrument ID:	MS05
ction Method:	EPA 5030A	Level:	Low
sis Method:	8260B	Extraction Lot:	KWG0106083

Lab Control Sample applies to the following analyses:

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed
d Blank	KWG0106083-5	J:\MS05\DATA\092101\0921F010.D	09/21/01	15:15
0	K2106670-007	J:\MS05\DATA\092101\0921F013.D	09/21/01	16:38

01021

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

: Exponent Environmental Group, Inc.
t: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/19/2001
Time Analyzed: 12:43

Tune Summary
Volatile Organic Compounds

): J:\MS05\DATA\091901\0919F003.D
ment ID: MS05
ın:

Analysis Method: 8260B
Analysis Lot: KWG0106015

Target Mass	Relative to Mass	Lower Limit %	Upper Limit %	Relative Abundance %	Raw Abundance	Result Pass/Fail
50	95	15	40	21.6	8413	PASS
75	95	30	60	44.5	17288	PASS
95	95	100	100	100.0	38872	PASS
96	95	5	9	6.9	2701	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	81.3	31592	PASS
175	174	5	9	7.4	2332	PASS
176	174	95	101	98.0	30952	PASS
177	176	5	9	6.7	2060	PASS

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
ıuing Calibration Verification	KWG0106015-4	J:\MS05\DATA\091901\0919F004.D	09/19/2001	13:10	
ontrol Sample	KWG0106014-3	J:\MS05\DATA\091901\0919F005.D	09/19/2001	13:40	
ɔd Blank	KWG0106014-4	J:\MS05\DATA\091901\0919F009.D	09/19/2001	15:30	
20	K2106670-001	J:\MS05\DATA\091901\0919F010.D	09/19/2001	15:58	
21	K2106670-002	J:\MS05\DATA\091901\0919F011.D	09/19/2001	16:26	
1	K2106670-008	J:\MS05\DATA\091901\0919F013.D	09/19/2001	17:21	
1MS	KWG0106014-1	J:\MS05\DATA\091901\0919F014.D	09/19/2001	17:48	
1DMS	KWG0106014-2	J:\MS05\DATA\091901\0919F015.D	09/19/2001	18:16	

s flagged with an asterisk (*) indicate the analysis performed outside specified tune window

01022

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

:: Exponent Environmental Group, Inc.
:t: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/20/2001
Time Analyzed: 17:49

Tune Summary
Volatile Organic Compounds

): J:\MS13\DATA\092001\0920F002.D
ıment ID: MS13
nn:

Analysis Method: 8260B
Analysis Lot: KWG0106107

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
50	95	5	40	17.1	9077	PASS
75	95	20	70	48.5	25736	PASS
95	95	50	200	100.0	53112	PASS
96	95	5	9	7.9	4194	PASS
173	174	0	2	0.0	0	PASS
174	95	50	200	78.6	41752	PASS
175	174	5	9	7.3	3058	PASS
176	174	95	101	97.7	40776	PASS
177	176	5	9	6.9	2807	PASS

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
ıu[illegible]alibration Verification	KWG0106107-2	J:\MS13\DATA\092001\0920F003.D	09/20/2001	18:17	
[illegible]Sample	KWG0106108-3	J:\MS13\DATA\092001\0920F004.D	09/20/2001	18:47	
QCMS	KWG0106108-1	J:\MS13\DATA\092001\0920F005.D	09/20/2001	19:16	
QCDMS	KWG0106108-2	J:\MS13\DATA\092001\0920F006.D	09/20/2001	19:44	
)d Blank	KWG0106108-4	J:\MS13\DATA\092001\0920F008.D	09/20/2001	20:41	
)02	K2106670-006	J:\MS13\DATA\092001\0920F009.D	09/20/2001	21:09	
203	K2106670-014	J:\MS13\DATA\092001\0920F010.D	09/20/2001	21:37	
Blank	K2106670-017	J:\MS13\DATA\092001\0920F011.D	09/20/2001	22:06	
QC	K2106757-012	J:\MS13\DATA\092001\0920F024.D	09/21/2001	04:15	

s flagged with an asterisk (*) indicate the analysis performed outside specified tune window

01023

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

:: Exponent Environmental Group, Inc.
:t: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/21/2001
Time Analyzed: 12:02

Tune Summary
Volatile Organic Compounds

): J:\MS05\DATA\092101\0921F003.D
ıment ID: MS05
ın:

Analysis Method: 8260B
Analysis Lot: KWG0106084

Target Mass	Relative to Mass	Lower Limit %	Upper Limit %	Relative Abundance %	Raw Abundance	Result Pass/Fail
50	95	15	40	20.6	6224	PASS
75	95	30	60	41.1	12411	PASS
95	95	100	100	100.0	30208	PASS
96	95	5	9	7.7	2322	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	81.5	24608	PASS
175	174	5	9	7.3	1787	PASS
176	174	95	101	98.6	24256	PASS
177	176	5	9	7.0	1697	PASS

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
ıuing Calibration Verification	KWG0106084-5	J:\MS05\DATA\092101\0921F005.D	09/21/2001	12:57	
ɔntrol Sample	KWG0106083-1	J:\MS05\DATA\092101\0921F006.D	09/21/2001	13:25	
d Blank	KWG0106083-5	J:\MS05\DATA\092101\0921F010.D	09/21/2001	15:15	
0	K2106670-007	J:\MS05\DATA\092101\0921F013.D	09/21/2001	16:38	

flagged with an asterisk (*) indicate the analysis performed outside specified tune window

01024

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

: Exponent Environmental Group, Inc.
:t: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 09/12/2001

Initial Calibration Summary
Volatile Organic Compounds

ration ID: CAL1041
iment ID: MS05

Column: MS

ID	File ID	Level ID	File ID
	J:\MS05\DATA\091201\0912F012.D	E	J:\MS05\DATA\091201\0912F008.D
	J:\MS05\DATA\091201\0912F011.D	F	J:\MS05\DATA\091201\0912F007.D
	J:\MS05\DATA\091201\0912F010.D	G	J:\MS05\DATA\091201\0912F006.D
	J:\MS05\DATA\091201\0912F009.D	H	J:\MS05\DATA\091201\0912F005.D

te Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
rodifluoromethane	A	400	0.305	B	200	0.320	C	100	0.323	D	50	0.391	E	20	0.387
	F	10	0.257	G	5.0	0.332	H	2.0	0.400						
methane	A	400	0.206	B	200	0.245	C	100	0.249	D	50	0.260	E	20	0.250
	F	10	0.205	G	5.0	0.221									
Chloride	A	400	0.177	B	200	0.185	C	100	0.184	D	50	0.206	E	20	0.193
	F	10	0.131	G	5.0	0.175									
methane	A	400	0.183	B	200	0.198	C	100	0.203	D	50	0.214	E	20	0.211
	F	10	0.179	G	5.0	0.198	H	2.0	0.205						
eth	A	400	0.0883	B	200	0.0910	C	100	0.0884	D	50	0.0979	E	20	0.0925
	F	10	0.0695	G	5.0	0.0801	H	2.0	0.0849						
orofluoromethane	A	400	0.384	B	200	0.407	C	100	0.396	D	50	0.487	E	20	0.475
	F	10	0.309	G	5.0	0.405	H	2.0	0.472						
ne	A	800	0.109	B	400	0.122	C	200	0.130	D	100	0.118	E	40	0.126
	F	20	0.136												
chloroethene	A	400	0.213	B	200	0.226	C	100	0.235	D	50	0.278	E	20	0.259
	F	10	0.181	G	5.0	0.227	H	2.0	0.264						
n Disulfide	A	400	0.616	B	200	0.640	C	100	0.666	D	50	0.765	E	20	0.736
	F	10	0.535	G	5.0	0.693	H	2.0	0.829						
lene Chloride	A	400	0.224	B	200	0.254	C	100	0.269	D	50	0.296	E	20	0.330
	F	10	0.375												
l,2-Dichloroethene	A	400	0.228	B	200	0.246	C	100	0.238	D	50	0.285	E	20	0.282
	F	10	0.216	G	5.0	0.256	H	2.0	0.277						
chloroethane	A	400	0.332	B	200	0.339	C	100	0.347	D	50	0.358	E	20	0.363
	F	10	0.315	G	5.0	0.351	H	2.0	0.351						
none (MEK)	A	800	0.126	B	400	0.141	C	200	0.151	D	100	0.141	E	40	0.166
	F	20	0.143	G	10	0.154									
chloropropane	A	400	0.328	B	200	0.342	C	100	0.357	D	50	0.413	E	20	0.443
	F	10	0.284	G	5.0	0.357	H	2.0	0.400						

flagged with an asterisk (*) indicate values outside control criteria.
Compound ‡ CCC Compound

01025

t: Exponent Environmental Group, Inc. **Service Request:** K2106670
ct: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 09/12/2001

Initial Calibration Summary
Volatile Organic Compounds

ration ID: CAL1041 **Column:** MS
ument ID: MS05

rte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
2-Dichloroethene	A	400	0.247	B	200	0.277	C	100	0.293	D	50	0.311	E	20	0.334
	F	10	0.270	G	5.0	0.299	H	2.0	0.308						
oform	A	400	0.450	B	200	0.492	C	100	0.508	D	50	0.535	E	20	0.529
	F	10	0.468	G	5.0	0.496	H	2.0	0.509						
ochloromethane	A	400	0.129	B	200	0.154	C	100	0.159	D	50	0.162	E	20	0.163
	F	10	0.157	G	5.0	0.149	H	2.0	0.126						
Trichloroethane (TCA)	A	400	0.396	B	200	0.426	C	100	0.420	D	50	0.506	E	20	0.478
	F	10	0.333	G	5.0	0.416	H	2.0	0.489						
ichloropropene	A	400	0.245	B	200	0.256	C	100	0.267	D	50	0.317	E	20	0.292
	F	10	0.205	G	5.0	0.248	H	2.0	0.317						
n Tetrachloride	A	400	0.314	B	200	0.332	C	100	0.326	D	50	0.403	E	20	0.373
	F	10	0.247	G	5.0	0.311	H	2.0	0.373						
ichloroethane (EDC)	A	400	0.378	B	200	0.427	C	100	0.421	D	50	0.408	E	20	0.423
	F	10	0.425	G	5.0	0.443	H	2.0	0.471						
ne	A	400	0.579	B	200	0.651	C	100	0.692	D	50	0.783	E	20	0.731
	F	10	0.626	G	5.0	0.717	H	2.0	0.777						
oroethene (TCE)	A	400	0.252	B	200	0.249	C	100	0.276	D	50	0.304	E	20	0.301
	F	10	0.228	G	5.0	0.275	H	2.0	0.277						
ichloropropane	A	400	0.155	B	200	0.174	C	100	0.173	D	50	0.184	E	20	0.178
	F	10	0.158	G	5.0	0.169	H	2.0	0.157						
odichloromethane	A	400	0.361	B	200	0.388	C	100	0.394	D	50	0.397	E	20	0.401
	F	10	0.376	G	5.0	0.373	H	2.0	0.362						
momethane	A	400	0.193	B	200	0.217	C	100	0.220	D	50	0.219	E	20	0.221
	F	10	0.213	G	5.0	0.219	H	2.0	0.193						
anone	A	800	0.282	B	400	0.319	C	200	0.310	D	100	0.284	E	40	0.287
	F	20	0.298	G	10	0.296	H	4.0	0.277						
3-Dichloropropene	A	400	0.333	B	200	0.357	C	100	0.365	D	50	0.370	E	20	0.352
	F	10	0.325	G	5.0	0.326	H	2.0	0.329						
ne	A	400	0.520	B	200	0.562	C	100	0.591	D	50	0.626	E	20	0.628
	F	10	0.501	G	5.0	0.593	H	2.0	0.667						
1,3-Dichloropropene	A	400	0.468	B	200	0.469	C	100	0.471	D	50	0.459	E	20	0.447
	F	10	0.501	G	5.0	0.458	H	2.0	0.428						
Trichloroethane	A	400	0.225	B	200	0.250	C	100	0.233	D	50	0.242	E	20	0.245
	F	10	0.261	G	5.0	0.230	H	2.0	0.227						

flagged with an asterisk (*) indicate values outside control criteria.
C Compound ‡ CCC Compound

01026

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

t: Exponent Environmental Group, Inc. **Service Request:** K2106670
ct: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 09/12/2001

Initial Calibration Summary
Volatile Organic Compounds

ration ID: CAL1041 **Column:** MS
ument ID: MS05

yte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
hyl-2-pentanone (MIBK)	A	800	0.295	B	400	0.322	C	200	0.331	D	100	0.311	E	40	0.291
	F	20	0.300	G	10	0.309	H	4.0	0.282						
ichloropropane	A	400	0.401	B	200	0.438	C	100	0.419	D	50	0.427	E	20	0.428
	F	10	0.451	G	5.0	0.430	H	2.0	0.407						
chloroethene (PCE)	A	400	0.257	B	200	0.260	C	100	0.240	D	50	0.292	E	20	0.277
	F	10	0.188	G	5.0	0.230									
mochloromethane	A	400	0.400	B	200	0.423	C	100	0.404	D	50	0.391	E	20	0.381
	F	10	0.378	G	5.0	0.359	H	2.0	0.335						
ibromoethane (EDB)	A	400	0.392	B	200	0.413	C	100	0.404	D	50	0.404	E	20	0.402
	F	10	0.417	G	5.0	0.420	H	2.0	0.383						
obenzene	A	400	0.867	B	200	0.927	C	100	0.936	D	50	1.01	E	20	0.989
	F	10	0.892	G	5.0	0.949	H	2.0	1.07						
,2-Tetrachloroethane	A	400	0.293	B	200	0.318	C	100	0.309	D	50	0.332	E	20	0.313
	F	10	0.300	G	5.0	0.304	H	2.0	0.299						
e	A	400	0.395	B	200	0.418	C	100	0.418	D	50	0.499	E	20	0.479
	F	10	0.368	G	5.0	0.437	H	2.0	0.504						
Xylenes	A	800	0.471	B	400	0.505	C	200	0.513	D	100	0.605	E	40	0.606
	F	20	0.462	G	10	0.547	H	4.0	0.624						
lene	A	400	0.491	B	200	0.545	C	100	0.532	D	50	0.604	E	20	0.620
	F	10	0.505	G	5.0	0.554	H	2.0	0.598						
ne	A	400	0.859	B	200	0.971	C	100	0.976	D	50	1.02	E	20	1.06
	F	10	0.914	G	5.0	0.932	H	2.0	1.01						
noform	A	400	0.300	B	200	0.333	C	100	0.314	D	50	0.300	E	20	0.288
	F	10	0.287	G	5.0	0.278	H	2.0	0.244						
opylbenzene	A	400	1.33	B	200	1.40	C	100	1.29	D	50	1.57	E	20	1.57
	F	10	1.11	G	5.0	1.30	H	2.0	1.62						
,2-Tetrachloroethane	A	400	0.758	B	200	0.862	C	100	0.818	D	50	0.829	E	20	0.814
	F	10	0.843	G	5.0	0.832									
-Trichloropropane	A	400	0.237	B	200	0.276	C	100	0.276	D	50	0.272	E	20	0.265
	F	10	0.266	G	5.0	0.263	H	2.0	0.232						
nobenzene	A	400	0.769	B	200	0.850	C	100	0.833	D	50	0.871	E	20	0.871
	F	10	0.827	G	5.0	0.866	H	2.0	0.966						
ppylbenzene	A	400	2.98	B	200	3.13	C	100	3.02	D	50	3.64	E	20	3.59
	F	10	2.59	G	5.0	2.91									

ts flagged with an asterisk (*) indicate values outside control criteria.
CC Compound **‡ CCC Compound**

01027

t: Exponent Environmental Group, Inc. **Service Request:** K2106670
ct: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 09/12/2001

Initial Calibration Summary
Volatile Organic Compounds

ration ID: CAL1041 **Column:** MS
ument ID: MS05

te Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
protoluene	A	400	2.27	B	200	2.33	C	100	2.34	D	50	2.62	E	20	2.65
	F	10	2.05	G	5.0	2.22	H	2.0	2.93						
protoluene	A	400	2.18	B	200	2.25	C	100	2.12	D	50	2.35	E	20	2.37
	F	10	1.91	G	5.0	2.12	H	2.0	2.64						
Trimethylbenzene	A	400	2.35	B	200	2.47	C	100	2.31	D	50	2.71	E	20	2.73
	F	10	1.90	G	5.0	2.11	H	2.0	2.98						
utylbenzene	A	400	1.91	B	200	1.98	C	100	1.84	D	50	2.26	E	20	2.24
	F	10	1.48	G	5.0	1.73									
Trimethylbenzene	A	400	2.43	B	200	2.60	C	100	2.39	D	50	2.66	E	20	2.75
	F	10	2.10	G	5.0	2.41	H	2.0	2.79						
utylbenzene	A	400	3.06	B	200	3.12	C	100	2.86	D	50	3.62	E	20	3.48
	F	10	2.26	G	5.0	2.85									
ichlorobenzene	A	400	1.29	B	200	1.39	C	100	1.33	D	50	1.43	E	20	1.46
	F	10	1.24	G	5.0	1.35	H	2.0	1.59						
ropyltoluene	A	400	2.39	B	200	2.44	C	100	2.30	D	50	2.71	E	20	2.67
	F	10	1.82	G	5.0	2.16	H	2.0	2.88						
ichlorobenzene	A	400	1.35	B	200	1.46	C	100	1.41	D	50	1.50	E	20	1.52
	F	10	1.34	G	5.0	1.42	H	2.0	1.63						
ylbenzene	A	400	2.22	B	200	2.28	C	100	2.11	D	50	2.54	E	20	2.59
ichlorobenzene	A	400	1.32	B	200	1.40	C	100	1.37	D	50	1.46	E	20	1.52
	F	10	1.32	G	5.0	1.44	H	2.0	1.56						
bromo-3-chloropropane	A	400	0.190	B	200	0.199	C	100	0.191	D	50	0.181	E	20	0.185
	F	10	0.170	G	5.0	0.183	H	2.0	0.159						
Trichlorobenzene	A	400	0.873	B	200	1.03	C	100	0.998	D	50	1.02	E	20	1.03
	F	10	0.921	G	5.0	0.969	H	2.0	1.22						
Trichlorobenzene	A	400	0.842	B	200	1.01	C	100	0.966	D	50	0.982	E	20	0.996
	F	10	0.961	G	5.0	0.985	H	2.0	1.14						
halene	A	400	1.60	B	200	2.37	C	100	2.29	D	50	2.39	E	20	2.36
	F	10	2.30	G	5.0	2.59	H	2.0	2.72						
chlorobutadiene	A	400	0.486	B	200	0.470	C	100	0.423	D	50	0.490	E	20	0.490
mofluoromethane	A	80	0.291	B	70	0.327	C	60	0.333	D	50	0.337	E	40	0.348
	F	30	0.345												

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C Compound **‡ CCC Compound**

01028

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc.
ect· Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 09/12/2001

Initial Calibration Summary
Volatile Organic Compounds

bration ID: CAL1041
·ument ID: MS05

Column: MS

lyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
ene-d8	A	80	0.894	B	70	0.957	C	60	0.986	D	50	0.925	E	40	0.963
	F	30	0.933												
omofluorobenzene	A	80	0.459	B	70	0.493	C	60	0.490	D	50	0.484	E	40	0.525
	F	30	0.525												

ts flagged with an asterisk (*) indicate values outside control criteria.
CC Compound **‡ CCC Compound**

01029

: Exponent Environmental Group, Inc. **Service Request:** K2106670
t: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 09/12/2001

Initial Calibration Summary
Volatile Organic Compounds

ation ID: CAL1041 **Column:** MS
ment ID: MS05

yte Name	Compound Type	Calibration Evaluation: Fit Type	Eval.	Eval. Result	Q	Control Criteria	RRF Evaluation: Average RRF	Q	Minimum RRF
orodifluoromethane	TRG	AverageRF	% RSD	14.6		≤ 15	0.339		0.01
omethane	TRG	AverageRF	% RSD	9.6		≤ 15	0.234		0.10
Chloride	TRG	AverageRF	% RSD	13.1		≤ 15	0.179		0.01
omethane	TRG	AverageRF	% RSD	6.3		≤ 15	0.199		0.01
oethane	TRG	AverageRF	% RSD	10.0		≤ 15	0.0866		0.01
lorofluoromethane	TRG	AverageRF	% RSD	14.3		≤ 15	0.417		0.01
ne	TRG	AverageRF	% RSD	7.6		≤ 15	0.124		0.01
ichloroethene	MS	AverageRF	% RSD	13.2		≤ 15	0.235		0.01
n Disulfide	TRG	AverageRF	% RSD	13.4		≤ 15	0.685		0.01
ylene Chloride	TRG	AverageRF	% RSD	18.8	*	≤ 15	0.291		0.01
1,2-Dichloroethene	TRG	AverageRF	% RSD	10.2		≤ 15	0.253		0.01
ichloroethane	TRG	AverageRF	% RSD	4.5		≤ 15	0.344		0.10
anone (MEK)	TRG	AverageRF	% RSD	8.5		≤ 15	0.146		0.01
ichloropropane	TRG	AverageRF	% RSD	14.0		≤ 15	0.366		0.01
2-Dichloroethene	TRG	AverageRF	% RSD	9.3		≤ 15	0.292		0.01
oform	TRG	AverageRF	% RSD	5.8		≤ 15	0.498		0.01
ochloromethane	TRG	AverageRF	% RSD	9.8		≤ 15	0.150		0.01
Trichloroethane (TCA)	TRG	AverageRF	% RSD	13.1		≤ 15	0.433		0.01
ichloropropene	TRG	AverageRF	% RSD	14.3		≤ 15	0.268		0.01
n Tetrachloride	TRG	AverageRF	% RSD	14.4		≤ 15	0.335		0.01
ichloroethane (EDC)	TRG	AverageRF	% RSD	6.2		≤ 15	0.425		0.01
ene	MS	AverageRF	% RSD	10.4		≤ 15	0.695		0.01
loroethene (TCE)	MS	AverageRF	% RSD	9.7		≤ 15	0.270		0.01
ichloropropane	TRG	AverageRF	% RSD	6.4		≤ 15	0.169		0.01
odichloromethane	TRG	AverageRF	% RSD	4.1		≤ 15	0.382		0.01
momethane	TRG	AverageRF	% RSD	5.7		≤ 15	0.212		0.01
anone	TRG	AverageRF	% RSD	5.0		≤ 15	0.294		0.01
3-Dichloropropene	TRG	AverageRF	% RSD	5.3		≤ 15	0.344		0.01
ne	MS	AverageRF	% RSD	9.6		≤ 15	0.586		0.01
1,3-Dichloropropene	TRG	AverageRF	% RSD	4.5		≤ 15	0.463		0.01
-Trichloroethane	TRG	AverageRF	% RSD	5.3		≤ 15	0.239		0.01
hyl-2-pentanone (MIBK)	TRG	AverageRF	% RSD	5.4		≤ 15	0.305		0.01
ichloropropane	TRG	AverageRF	% RSD	3.8		≤ 15	0.425		0.01
chloroethene (PCE)	TRG	AverageRF	% RSD	13.6		≤ 15	0.249		0.01
mochloromethane	TRG	AverageRF	% RSD	7.2		≤ 15	0.384		0.01
ibromoethane (EDB)	TRG	AverageRF	% RSD	3.1		≤ 15	0.404		0.01
obenzene	MS	AverageRF	% RSD	6.8		≤ 15	0.955		0.30
,2-Tetrachloroethane	TRG	AverageRF	% RSD	4.1		≤ 15	0.309		0.01
benzene	TRG	AverageRF	% RSD	11.3		≤ 15	0.440		0.01
Cylenes	TRG	AverageRF	% RSD	11.8		≤ 15	0.542		0.01
lene	TRG	AverageRF	% RSD	8.5		≤ 15	0.556		0.01
ne	TRG	AverageRF	% RSD	6.7		≤ 15	0.968		0.01

flagged with an asterisk (*) indicate values outside control criteria.
: Compound ‡ CCC Compound

01030

it: Exponent Environmental Group, Inc. **Service Request:** K2106670
ect: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 09/12/2001

Initial Calibration Summary
Volatile Organic Compounds

ration ID: CAL1041 **Column:** MS
ument ID: MS05

		Calibration Evaluation					RRF Evaluation		
alyte Name	Compound Type	Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
moform	TRG	AverageRF	% RSD	8.9		≤ 15	0.293		0.10
ropylbenzene	TRG	AverageRF	% RSD	12.6		≤ 15	1.40		0.01
2,2-Tetrachloroethane	TRG	AverageRF	% RSD	4.0		≤ 15	0.822		0.30
3-Trichloropropane	TRG	AverageRF	% RSD	6.5		≤ 15	0.261		0.01
mobenzene	TRG	AverageRF	% RSD	6.5		≤ 15	0.857		0.01
opylbenzene	TRG	AverageRF	% RSD	12.0		≤ 15	3.12		0.01
hlorotoluene	TRG	AverageRF	% RSD	11.7		≤ 15	2.43		0.01
hlorotoluene	TRG	AverageRF	% RSD	9.6		≤ 15	2.24		0.01
5-Trimethylbenzene	TRG	AverageRF	% RSD	14.5		≤ 15	2.45		0.01
Butylbenzene	TRG	AverageRF	% RSD	14.5		≤ 15	1.92		0.01
4-Trimethylbenzene	TRG	AverageRF	% RSD	9.0		≤ 15	2.52		0.01
Butylbenzene	TRG	AverageRF	% RSD	14.8		≤ 15	3.03		0.01
Dichlorobenzene	TRG	AverageRF	% RSD	8.1		≤ 15	1.39		0.01
opropyltoluene	TRG	AverageRF	% RSD	13.9		≤ 15	2.42		0.01
Dichlorobenzene	TRG	AverageRF	% RSD	6.4		≤ 15	1.45		0.01
utylbenzene	TRG	AverageRF	% RSD	8.9		≤ 15	2.35		0.01
D[illegible]obenzene	MS	AverageRF	% RSD	6.2		≤ 15	1.42		0.01
[illegible]o-3-chloropropane	TRG	AverageRF	% RSD	6.9		≤ 15	0.182		0.01
4-Trichlorobenzene	TRG	AverageRF	% RSD	10.1		≤ 15	1.01		0.01
3-Trichlorobenzene	TRG	AverageRF	% RSD	8.4		≤ 15	0.986		0.01
hthalene	MS	AverageRF	% RSD	14.2		≤ 15	2.33		0.01
achlorobutadiene	TRG	AverageRF	% RSD	6.1		≤ 15	0.472		0.01
romofluoromethane	SURR	AverageRF	% RSD	6.3		≤ 15	0.330		0.01
uene-d8	SURR	AverageRF	% RSD	3.5		≤ 15	0.943		0.01
romofluorobenzene	SURR	AverageRF	% RSD	5.1		≤ 15	0.496		0.01

s flagged with an asterisk (*) indicate values outside control criteria.
C Compound ‡ CCC Compound

01031

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Exponent Environmental Group, Inc.
Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 09/12/2001
Date Analyzed: 09/12/2001

Second Source Calibration Verification
Volatile Organic Compounds

ıtion Type: Internal Standard
is Method: 8260B

Calibration ID: CAL1041
Units: PPB

: J:\MS05\DATA\091201\0912F015.D

e Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
odifluoromethane	100	110	0.339	0.359	6	NA	± 30 %	AverageRF
nethane	100	100	0.234	0.242	3	NA	± 30 %	AverageRF
:hloride	100	110	0.179	0.197	10	NA	± 20 %	AverageRF
nethane	100	100	0.199	0.206	4	NA	± 30 %	AverageRF
:thane	100	110	0.0866	0.0952	10	NA	± 30 %	AverageRF
rofluoromethane	100	96	0.417	0.400	-4	NA	± 30 %	AverageRF
e	500	400	0.124	0.0993	-20	NA	± 30 %	AverageRF
hloroethene	100	110	0.235	0.250	6	NA	± 20 %	AverageRF
Disulfide	200	170	0.685	0.576	-16	NA	± 30 %	AverageRF
ene Chloride	100	89	0.291	0.258	-11	NA	± 30 %	AverageRF
2-Dichloroethene	100	100	0.253	0.262	4	NA	± 30 %	AverageRF
hloroethane	100	100	0.344	0.356	3	NA	± 30 %	AverageRF
ıone (MEK)	500	420	0.146	0.123	-15	NA	± 30 %	AverageRF
hloropropane	100	98	0.366	0.360	-2	NA	± 30 %	AverageRF
Dichloroethene	100	96	0.292	0.282	-4	NA	± 30 %	AverageRF
form	100	94	0.498	0.470	-6	NA	± 20 %	AverageRF
chloromethane	100	98	0.150	0.146	-2	NA	± 30 %	AverageRF
ichloroethane (TCA)	100	99	0.433	0.427	-1	NA	± 30 %	AverageRF
hloropropene	100	97	0.268	0.261	-3	NA	± 30 %	AverageRF
Tetrachloride	100	100	0.335	0.344	3	NA	± 30 %	AverageRF
hloroethane (EDC)	100	91	0.425	0.385	-9	NA	± 30 %	AverageRF
ıe	100	99	0.695	0.690	-1	NA	± 30 %	AverageRF
roethene (TCE)	100	98	0.270	0.265	-2	NA	± 30 %	AverageRF
hloropropane	100	95	0.169	0.159	-5	NA	± 20 %	AverageRF
dichloromethane	100	95	0.382	0.364	-5	NA	± 30 %	AverageRF
ıomethane	100	92	0.212	0.195	-8	NA	± 30 %	AverageRF
ıone	500	420	0.294	0.248	-16	NA	± 30 %	AverageRF
Dichloropropene	100	97	0.344	0.335	-3	NA	± 30 %	AverageRF
e	100	95	0.586	0.559	-5	NA	± 20 %	AverageRF
,3-Dichloropropene	100	85	0.463	0.395	-15	NA	± 30 %	AverageRF
richloroethane	100	90	0.239	0.215	-10	NA	± 30 %	AverageRF
yl-2-pentanone (MIBK)	500	430	0.305	0.264	-14	NA	± 30 %	AverageRF
chloropropane	100	85	0.425	0.362	-15	NA	± 30 %	AverageRF
ıloroethene (PCE)	100	100	0.249	0.251	1	NA	± 30 %	AverageRF
nochloromethane	100	92	0.384	0.354	-8	NA	± 30 %	AverageRF
bromoethane (EDB)	100	89	0.404	0.361	-11	NA	± 30 %	AverageRF
benzene	100	88	0.955	0.839	-12	NA	± 30 %	AverageRF
-Tetrachloroethane	100	95	0.309	0.293	-5	NA	± 30 %	AverageRF
enzene	100	97	0.440	0.425	-3	NA	± 20 %	AverageRF
ylenes	200	190	0.542	0.510	-6	NA	± 30 %	AverageRF

flagged with an asterisk (*) indicate values outside control criteria.
: Compound **‡ CCC Compound**

01032

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

::	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Calibration Date:**	09/12/2001
		Date Analyzed:	09/12/2001

Second Source Calibration Verification
Volatile Organic Compounds

ration Type:	Internal Standard	**Calibration ID:**	CAL1041
sis Method:	8260B	**Units:**	PPB

te Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
ene	100	94	0.556	0.525	-6	NA	± 30 %	AverageRF
ie	100	94	0.968	0.914	-6	NA	± 30 %	AverageRF
oform	100	94	0.293	0.275	-6	NA	± 30 %	AverageRF
pylbenzene	100	91	1.40	1.28	-9	NA	± 30 %	AverageRF
2-Tetrachloroethane	100	83	0.822	0.685	-17	NA	± 30 %	AverageRF
Trichloropropane	100	89	0.261	0.233	-11	NA	± 30 %	AverageRF
obenzene	100	89	0.857	0.761	-11	NA	± 30 %	AverageRF
ylbenzene	100	97	3.12	3.03	-3	NA	± 30 %	AverageRF
orotoluene	100	92	2.43	2.23	-8	NA	± 30 %	AverageRF
orotoluene	100	88	2.24	1.98	-12	NA	± 30 %	AverageRF
Trimethylbenzene	100	95	2.45	2.33	-5	NA	± 30 %	AverageRF
utylbenzene	100	98	1.92	1.89	-2	NA	± 30 %	AverageRF
Trimethylbenzene	100	96	2.52	2.40	-4	NA	± 30 %	AverageRF
utylbenzene	100	99	3.03	2.99	-1	NA	± 30 %	AverageRF
ichlorobenzene	100	92	1.39	1.27	-8	NA	± 30 %	AverageRF
oro luene	100	94	2.42	2.27	-6	NA	± 30 %	AverageRF
benzene	100	87	1.45	1.26	-13	NA	± 30 %	AverageRF
ylbenzene	100	91	2.35	2.13	-9	NA	± 30 %	AverageRF
ichlorobenzene	100	89	1.42	1.27	-11	NA	± 30 %	AverageRF
bromo-3-chloropropane	100	87	0.182	0.158	-13	NA	± 30 %	AverageRF
Trichlorobenzene	100	85	1.01	0.860	-15	NA	± 30 %	AverageRF
Trichlorobenzene	100	87	0.986	0.858	-13	NA	± 30 %	AverageRF
thalene	100	84	2.33	1.96	-16	NA	± 30 %	AverageRF
chlorobutadiene	100	87	0.472	0.412	-13	NA	± 30 %	AverageRF

ts flagged with an asterisk (*) indicate values outside control criteria.

CC Compound **‡ CCC Compound**

01033

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt: Exponent Environmental Group, Inc. **Service Request:** K2106670

ːct: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/31/2001

Initial Calibration Summary
Volatile Organic Compounds

ıration ID: CAL1016 **Column:** MS

ument ID: MS13

ID	File ID	Level ID	File ID
	J:\MS13\DATA\083101\0831F004.D	E	J:\MS13\DATA\083101\0831F009.D
	J:\MS13\DATA\083101\0831F005.D	F	J:\MS13\DATA\083101\0831F010.D
	J:\MS13\DATA\083101\0831F006.D	G	J:\MS13\DATA\083101\0831F011.D
	J:\MS13\DATA\083101\0831F007.D	H	J:\MS13\DATA\083101\0831F013.D

yte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
orodifluoromethane	A	0.25	0.219	B	0.50	0.199	C	1.0	0.179	D	5.0	0.201	E	20	0.171
	F	40	0.172	G	80	0.179	H	10	0.167						
omethane	A	0.25	0.296	B	0.50	0.293	C	1.0	0.247	D	5.0	0.258	E	20	0.218
	F	40	0.225	G	80	0.234	H	10	0.228						
Chloride	A	0.25	0.246	B	0.50	0.277	C	1.0	0.236	D	5.0	0.240	E	20	0.210
	F	40	0.216	G	80	0.224	H	10	0.205						
omethane				B	0.50	0.193	C	1.0	0.161	D	5.0	0.143	E	20	0.134
	F	40	0.136	G	80	0.142	H	10	0.137						
oethane	A	0.25	0.197	B	0.50	0.201	C	1.0	0.169	D	5.0	0.169	E	20	0.145
	F	40	0.152	G	80	0.151	H	10	0.145						
lorofluoromethane	A	0.25	0.372	B	0.50	0.402	C	1.0	0.365	D	5.0	0.366	E	20	0.311
	F	40	0.322	G	80	0.335	H	10	0.305						
ːne	A	10	0.0318	B	20	0.0311	C	40	0.0304	D	100	0.0270	E	400	0.0291
	F	800	0.0296	G	1600	0.0303	H	200	0.0270						
ichloroethene	A	0.25	0.240	B	0.50	0.235	C	1.0	0.208	D	5.0	0.226	E	20	0.195
	F	40	0.204	G	80	0.210	H	10	0.190						
ːn Disulfide	A	0.25	0.818	B	0.50	0.816	C	1.0	0.760	D	5.0	0.797	E	20	0.710
	F	40	0.740	G	80	0.780	H	10	0.695						
/lene Chloride				B	0.50	0.305	C	1.0	0.263	D	5.0	0.243	E	20	0.224
	F	40	0.221	G	80	0.223	H	10	0.221						
1,2-Dichloroethene	A	0.25	0.263	B	0.50	0.265	C	1.0	0.256	D	5.0	0.253	E	20	0.225
	F	40	0.231	G	80	0.238	H	10	0.223						
ichloroethane	A	0.25	0.447	B	0.50	0.447	C	1.0	0.399	D	5.0	0.423	E	20	0.383
	F	40	0.393	G	80	0.401	H	10	0.372						
anone (MEK)	A	10	0.0109	B	20	0.0119	C	40	0.0115	D	100	0.0109	E	400	0.0124
	F	800	0.0127	G	1600	0.0131	H	200	0.0116						
ichloropropane	A	0.25	0.316	B	0.50	0.298	C	1.0	0.295	D	5.0	0.304	E	20	0.278
	F	40	0.290	G	80	0.305	H	10	0.280						

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C Compound ‡ CCC Compound

01034

ıt: Exponent Environmental Group, Inc.
ect: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 08/31/2001

Initial Calibration Summary
Volatile Organic Compounds

ɔration ID: CAL1016
ument ID: MS13

Column: MS

yte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
2-Dichloroethene	A	0.25	0.277	B	0.50	0.272	C	1.0	0.252	D	5.0	0.272	E	20	0.251
	F	40	0.256	G	80	0.258	H	10	0.248						
oform	A	0.25	0.493	B	0.50	0.442	C	1.0	0.410	D	5.0	0.412	E	20	0.378
	F	40	0.383	G	80	0.390	H	10	0.369						
ochloromethane	A	0.25	0.124	B	0.50	0.129	C	1.0	0.114	D	5.0	0.113	E	20	0.103
	F	40	0.103	G	80	0.103	H	10	0.100						
Trichloroethane (TCA)	A	0.25	0.381	B	0.50	0.370	C	1.0	0.352	D	5.0	0.363	E	20	0.321
	F	40	0.333	G	80	0.351	H	10	0.311						
ichloropropene	A	0.25	0.340	B	0.50	0.352	C	1.0	0.316	D	5.0	0.344	E	20	0.310
	F	40	0.320	G	80	0.335	H	10	0.300						
n Tetrachloride	A	0.25	0.305	B	0.50	0.295	C	1.0	0.265	D	5.0	0.284	E	20	0.257
	F	40	0.269	G	80	0.286	H	10	0.253						
ichloroethane (EDC)	A	0.25	0.330	B	0.50	0.294	C	1.0	0.274	D	5.0	0.266	E	20	0.255
	F	40	0.254	G	80	0.250	H	10	0.252						
:	A	0.25	1.12	B	0.50	1.15	C	1.0	1.09	D	5.0	1.09	E	20	0.989
	F	40	1.01	G	80	1.04	H	10	0.959						
loroethene (TCE)	A	0.25	0.257	B	0.50	0.258	C	1.0	0.259	D	5.0	0.261	E	20	0.235
	F	40	0.245	G	80	0.251	H	10	0.226						
ichloropropane	A	0.25	0.258	B	0.50	0.252	C	1.0	0.239	D	5.0	0.254	E	20	0.239
	F	40	0.245	G	80	0.245	H	10	0.232						
odichloromethane	A	0.25	0.278	B	0.50	0.271	C	1.0	0.241	D	5.0	0.258	E	20	0.249
	F	40	0.257	G	80	0.263	H	10	0.240						
momethane	A	0.25	0.112	B	0.50	0.0955	C	1.0	0.101	D	5.0	0.106	E	20	0.101
	F	40	0.101	G	80	0.101	H	10	0.101						
anone	A	10	0.155	B	20	0.161	C	40	0.170	D	100	0.164	E	400	0.191
	F	800	0.201	G	1600	0.205	H	200	0.177						
)-Dichloropropene	A	0.25	0.296	B	0.50	0.294	C	1.0	0.285	D	5.0	0.304	E	20	0.318
	F	40	0.332	G	80	0.344	H	10	0.305						
ne	A	0.25	0.708	B	0.50	0.705	C	1.0	0.676	D	5.0	0.685	E	20	0.639
	F	40	0.658	G	80	0.675	H	10	0.613						
l,3-Dichloropropene	A	0.25	0.608	B	0.50	0.563	C	1.0	0.593	D	5.0	0.624	E	20	0.640
	F	40	0.677	G	80	0.677	H	10	0.611						
Trichloroethane	A	0.25	0.385	B	0.50	0.340	C	1.0	0.362	D	5.0	0.349	E	20	0.340
	F	40	0.341	G	80	0.329	H	10	0.330						

flagged with an asterisk (*) indicate values outside control criteria.

: Compound ‡ CCC Compound

01035

: Exponent Environmental Group, Inc. **Service Request:** K2106670
:t: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/31/2001

Initial Calibration Summary
Volatile Organic Compounds

ation ID: CAL1016 **Column:** MS
ment ID: MS13

te Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
yl-2-pentanone (MIBK)	A	10	0.0134	B	20	0.0136	C	40	0.0151	D	100	0.0138	E	400	0.0162
	F	800	0.0167	G	1600	0.0173	H	200	0.0149						
chloropropane	A	0.25	0.771	B	0.50	0.794	C	1.0	0.784	D	5.0	0.794	E	20	0.755
	F	40	0.776	G	80	0.753	H	10	0.759						
hloroethene (PCE)	A	0.25	0.648	B	0.50	0.639	C	1.0	0.566	D	5.0	0.586	E	20	0.519
	F	40	0.546	G	80	0.546	H	10	0.516						
nochloromethane	A	0.25	0.423	B	0.50	0.365	C	1.0	0.428	D	5.0	0.411	E	20	0.406
	F	40	0.423	G	80	0.426	H	10	0.396						
bromoethane (EDB)	A	0.25	0.469	B	0.50	0.377	C	1.0	0.353	D	5.0	0.366	E	20	0.369
	F	40	0.379	G	80	0.372	H	10	0.365						
benzene	A	0.25	1.99	B	0.50	1.88	C	1.0	1.85	D	5.0	1.90	E	20	1.76
	F	40	1.82	G	80	1.80	H	10	1.74						
-Tetrachloroethane	A	0.25	0.545	B	0.50	0.481	C	1.0	0.492	D	5.0	0.544	E	20	0.519
	F	40	0.539	G	80	0.544	H	10	0.500						
enzene	A	0.25	0.993	B	0.50	1.02	C	1.0	1.00	D	5.0	1.09	E	20	1.01
	F	40	1.05	G	80	1.05	H	10	0.991						
ylenes	A	0.50	1.08	B	1.0	1.15	C	2.0	1.19	D	10	1.37	E	40	1.28
	F	80	1.33	G	160	1.34	H	20	1.25						
ne	A	0.25	1.10	B	0.50	1.10	C	1.0	1.09	D	5.0	1.25	E	20	1.22
	F	40	1.26	G	80	1.26	H	10	1.18						
e	A	0.25	2.22	B	0.50	1.83	C	1.0	1.81	D	5.0	2.02	E	20	2.04
	F	40	2.12	G	80	2.12	H	10	1.95						
form	A	0.25	0.203	B	0.50	0.210	C	1.0	0.184	D	5.0	0.200	E	20	0.205
	F	40	0.221	G	80	0.226	H	10	0.198						
ylbenzene	A	0.25	2.53	B	0.50	2.71	C	1.0	2.73	D	5.0	3.21	E	20	3.13
	F	40	3.31	G	80	3.39	H	10	3.00						
-Tetrachloroethane	A	0.25	0.480	B	0.50	0.406	C	1.0	0.396	D	5.0	0.407	E	20	0.406
	F	40	0.405	G	80	0.407	H	10	0.397						
richloropropane	A	0.25	0.143	B	0.50	0.176	C	1.0	0.107	D	5.0	0.114	E	20	0.123
	F	40	0.123	G	80	0.121	H	10	0.120						
benzene	A	0.25	0.745	B	0.50	0.742	C	1.0	0.685	D	5.0	0.723	E	20	0.709
	F	40	0.719	G	80	0.715	H	10	0.686						
ylbenzene	A	0.25	3.48	B	0.50	3.51	C	1.0	3.38	D	5.0	3.84	E	20	3.73
	F	40	3.90	G	80	4.04	H	10	3.60						

flagged with an asterisk (*) indicate values outside control criteria.
Compound **‡ CCC Compound**

01036

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Exponent Environmental Group, Inc.
t: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 08/31/2001

Initial Calibration Summary
Volatile Organic Compounds

ation ID: CAL1016
ment ID: MS13

Column: MS

:e Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
rotoluene	A	0.25	2.30	B	0.50	2.19	C	1.0	2.29	D	5.0	2.31	E	20	2.25
	F	40	2.32	G	80	2.32	H	10	2.18						
rotoluene	A	0.25	2.34	B	0.50	2.43	C	1.0	2.43	D	5.0	2.71	E	20	2.58
	F	40	2.64	G	80	2.68	H	10	2.52						
rimethylbenzene	A	0.25	2.06	B	0.50	2.25	C	1.0	2.31	D	5.0	2.71	E	20	2.67
	F	40	2.79	G	80	2.88	H	10	2.57						
tylbenzene	A	0.25	1.92	B	0.50	1.94	C	1.0	2.01	D	5.0	2.22	E	20	2.24
	F	40	2.32	G	80	2.43	H	10	2.14						
rimethylbenzene	A	0.25	2.10	B	0.50	2.15	C	1.0	2.20	D	5.0	2.72	E	20	2.74
	F	40	2.84	G	80	2.92	H	10	2.60						
tylbenzene	A	0.25	2.67	B	0.50	2.92	C	1.0	2.84	D	5.0	3.40	E	20	3.32
	F	40	3.47	G	80	3.66	H	10	3.21						
chlorobenzene	A	0.25	1.54	B	0.50	1.56	C	1.0	1.43	D	5.0	1.50	E	20	1.43
	F	40	1.45	G	80	1.45	H	10	1.40						
luene	A	0.25	2.11	B	0.50	2.39	C	1.0	2.34	D	5.0	2.95	E	20	2.93
	F	40	3.05	G	80	3.21	H	10	2.78						
chlorobenzene	A	0.25	1.72	B	0.50	1.61	C	1.0	1.58	D	5.0	1.60	E	20	1.52
	F	40	1.55	G	80	1.54	H	10	1.51						
lbenzene	A	0.25	2.05	B	0.50	2.15	C	1.0	1.97	D	5.0	2.46	E	20	2.56
	F	40	2.73	G	80	2.91	H	10	2.43						
chlorobenzene	A	0.25	1.43	B	0.50	1.38	C	1.0	1.29	D	5.0	1.35	E	20	1.33
	F	40	1.36	G	80	1.38	H	10	1.31						
romo-3-chloropropane							C	1.0	0.0425	D	5.0	0.0462	E	20	0.0509
	F	40	0.0525	G	80	0.0586	H	10	0.0489						
Trichlorobenzene	A	0.25	0.830	B	0.50	0.912	C	1.0	0.781	D	5.0	0.897	E	20	0.950
	F	40	1.01	G	80	1.07	H	10	0.916						
Trichlorobenzene	A	0.25	0.704	B	0.50	0.736	C	1.0	0.659	D	5.0	0.789	E	20	0.845
	F	40	0.886	G	80	0.918	H	10	0.817						
halene	A	0.25	0.841	B	0.50	0.809	C	1.0	0.848	D	5.0	1.03	E	20	1.35
	F	40	1.52				H	10	1.26						
chlorobutadiene	A	0.25	0.584	B	0.50	0.556	C	1.0	0.481	D	5.0	0.462	E	20	0.464
	F	40	0.490	G	80	0.528	H	10	0.465						
mofluoromethane	A	4.0	0.223	B	5.0	0.207	C	6.0	0.208	D	8.0	0.206	E	20	0.202
	F	40	0.192	G	50	0.199	H	10	0.204						

s flagged with an asterisk (*) indicate values outside control criteria.
C Compound **‡ CCC Compound**

01037

t: Exponent Environmental Group, Inc. **Service Request:** K2106670
ct: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/31/2001

Initial Calibration Summary
Volatile Organic Compounds

ration ID: CAL1016 **Column:** MS
ument ID: MS13

te Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
ne-d8	A	4.0	1.00	B	5.0	0.973	C	6.0	0.985	D	8.0	0.974	E	20	0.956
	F	40	0.900	G	50	0.979	H	10	0.985						
mofluorobenzene	A	4.0	0.888	B	5.0	0.847	C	6.0	0.878	D	8.0	0.910	E	20	0.875
	F	40	0.864	G	50	0.872	H	10	0.902						

flagged with an asterisk (*) indicate values outside control criteria.
: Compound ‡ CCC Compound

01038

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt: Exponent Environmental Group, Inc. **Service Request:** K2106670
ect: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/31/2001

Initial Calibration Summary
Volatile Organic Compounds

ɔration ID: CAL1016 **Column:** MS
ument ID: MS13

		Calibration Evaluation					RRF Evaluation		
alyte Name	**Compound Type**	**Fit Type**	**Eval.**	**Eval. Result**	**Q**	**Control Criteria**	**Average RRF**	**Q**	**Minimum RRF**
hlorodifluoromethane	TRG	AverageRF	% RSD	9.8		≤ 15	0.186		0.01
oromethane	TRG	AverageRF	% RSD	12.1		≤ 15	0.250		0.10
ıyl Chloride	TRG	AverageRF	% RSD	10.1		≤ 15	0.232		0.01
ɔmomethane	TRG	AverageRF	% RSD	14.3		≤ 15	0.149		0.01
oroethane	TRG	AverageRF	% RSD	13.4		≤ 15	0.166		0.01
ɔhlorofluoromethane	TRG	AverageRF	% RSD	9.8		≤ 15	0.347		0.01
ɛtone	TRG	AverageRF	% RSD	6.0		≤ 15	0.0295		0.01
-Dichloroethene	MS	AverageRF	% RSD	8.6		≤ 15	0.213		0.01
ɓon Disulfide	TRG	AverageRF	% RSD	6.1		≤ 15	0.764		0.01
thylene Chloride	TRG	AverageRF	% RSD	13.0		≤ 15	0.243		0.01
ıs-1,2-Dichloroethene	TRG	AverageRF	% RSD	7.0		≤ 15	0.244		0.01
-Dichloroethane	TRG	AverageRF	% RSD	6.9		≤ 15	0.408		0.10
ɨutanone (MEK)	TRG	AverageRF	% RSD	6.8		≤ 15	0.0119		0.01
-Dichloropropane	TRG	AverageRF	% RSD	4.4		≤ 15	0.296		0.01
-1,2-Dichloroethene	TRG	AverageRF	% RSD	4.3		≤ 15	0.261		0.01
oro[redacted]m	TRG	AverageRF	% RSD	10.0		≤ 15	0.410		0.01
[redacted]romethane	TRG	AverageRF	% RSD	9.7		≤ 15	0.111		0.01
[redacted]hloroethane (TCA)	TRG	AverageRF	% RSD	7.0		≤ 15	0.348		0.01
-Dichloropropene	TRG	AverageRF	% RSD	5.5		≤ 15	0.327		0.01
ɓon Tetrachloride	TRG	AverageRF	% RSD	6.7		≤ 15	0.277		0.01
-Dichloroethane (EDC)	TRG	AverageRF	% RSD	10.1		≤ 15	0.272		0.01
ızene	MS	AverageRF	% RSD	6.3		≤ 15	1.06		0.01
chloroethene (TCE)	MS	AverageRF	% RSD	5.1		≤ 15	0.249		0.01
-Dichloropropane	TRG	AverageRF	% RSD	3.7		≤ 15	0.246		0.01
ɔmodichloromethane	TRG	AverageRF	% RSD	5.2		≤ 15	0.257		0.01
ɔromomethane	TRG	AverageRF	% RSD	4.7		≤ 15	0.102		0.01
fexanone	TRG	AverageRF	% RSD	10.7		≤ 15	0.178		0.01
-1,3-Dichloropropene	TRG	AverageRF	% RSD	6.5		≤ 15	0.310		0.01
luene	MS	AverageRF	% RSD	4.8		≤ 15	0.670		0.01
ıs-1,3-Dichloropropene	TRG	AverageRF	% RSD	6.4		≤ 15	0.624		0.01
,2-Trichloroethane	TRG	AverageRF	% RSD	5.4		≤ 15	0.347		0.01
fethyl-2-pentanone (MIBK)	TRG	AverageRF	% RSD	9.8		≤ 15	0.0151		0.01
-Dichloropropane	TRG	AverageRF	% RSD	2.1		≤ 15	0.773		0.01
ɾachloroethene (PCE)	TRG	AverageRF	% RSD	8.8		≤ 15	0.571		0.01
ɔromochloromethane	TRG	AverageRF	% RSD	5.2		≤ 15	0.410		0.01
-Dibromoethane (EDB)	TRG	AverageRF	% RSD	9.5		≤ 15	0.381		0.01
lorobenzene	MS	AverageRF	% RSD	4.3		≤ 15	1.84		0.30
,1,2-Tetrachloroethane	TRG	AverageRF	% RSD	5.1		≤ 15	0.521		0.01
ıylbenzene	TRG	AverageRF	% RSD	3.4		≤ 15	1.03		0.01
ɔ-Xylenes	TRG	AverageRF	% RSD	8.3		≤ 15	1.25		0.01
Xylene	TRG	AverageRF	% RSD	6.3		≤ 15	1.18		0.01
[redacted]	TRG	AverageRF	% RSD	7.2		≤ 15	2.01		0.01

lts flagged with an asterisk (*) indicate values outside control criteria.

CC Compound **‡ CCC Compound**

01039

t: Exponent Environmental Group, Inc. **Service Request:** K2106670
ct: Oregon Steel Mills/8601526.001.0302 **Calibration Date:** 08/31/2001

Initial Calibration Summary
Volatile Organic Compounds

ration ID: CAL1016 **Column:** MS
ıment ID: MS13

lyte Name	Compound Type	Calibration Evaluation					RRF Evaluation		
		Fit Type	Eval.	Eval. Result	Q	Control Criteria	Average RRF	Q	Minimum RRF
noform	TRG	AverageRF	% RSD	6.5		≤ 15	0.206		0.10
ropylbenzene	TRG	AverageRF	% RSD	10.4		≤ 15	3.00		0.01
?,2-Tetrachloroethane	TRG	AverageRF	% RSD	6.6		≤ 15	0.413		0.30
}-Trichloropropane	TRG	AverageRF	% RSD	17.0	*	≤ 15	0.128		0.01
nobenzene	TRG	AverageRF	% RSD	3.1		≤ 15	0.716		0.01
opylbenzene	TRG	AverageRF	% RSD	6.3		≤ 15	3.68		0.01
ılorotoluene	TRG	AverageRF	% RSD	2.6		≤ 15	2.27		0.01
ılorotoluene	TRG	AverageRF	% RSD	5.2		≤ 15	2.54		0.01
}-Trimethylbenzene	TRG	AverageRF	% RSD	11.4		≤ 15	2.53		0.01
Butylbenzene	TRG	AverageRF	% RSD	8.6		≤ 15	2.15		0.01
}-Trimethylbenzene	TRG	AverageRF	% RSD	13.2		≤ 15	2.54		0.01
Butylbenzene	TRG	AverageRF	% RSD	10.8		≤ 15	3.19		0.01
Dichlorobenzene	TRG	AverageRF	% RSD	3.9		≤ 15	1.47		0.01
›propyltoluene	TRG	AverageRF	% RSD	14.4		≤ 15	2.72		0.01
Dichlorobenzene	TRG	AverageRF	% RSD	4.2		≤ 15	1.58		0.01
ıtylbenzene	TRG	AverageRF	% RSD	13.7		≤ 15	2.41		0.01
Dichlorobenzene	MS	AverageRF	% RSD	3.2		≤ 15	1.35		0.01
›ibromo-3-chloropropane	TRG	AverageRF	% RSD	11.1		≤ 15	0.0499		0.01
}-Trichlorobenzene	TRG	AverageRF	% RSD	10.1		≤ 15	0.922		0.01
}-Trichlorobenzene	TRG	AverageRF	% RSD	11.3		≤ 15	0.794		0.01
hthalene	MS	AverageRF	% RSD	25.9	*	≤ 15	1.09		0.01
achlorobutadiene	TRG	AverageRF	% RSD	9.3		≤ 15	0.504		0.01
›omofluoromethane	SURR	AverageRF	% RSD	4.3		≤ 15	0.205		0.01
ıene-d8	SURR	AverageRF	% RSD	3.2		≤ 15	0.970		0.01
›omofluorobenzene	SURR	AverageRF	% RSD	2.3		≤ 15	0.880		0.01

; flagged with an asterisk (*) indicate values outside control criteria.
C Compound ‡ CCC Compound

01040

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ɛct:	Oregon Steel Mills/8601526.001.0302	**Calibration Date:**	08/31/2001
		Date Analyzed:	08/31/2001

Second Source Calibration Verification
Volatile Organic Compounds

ɔration Type:	Internal Standard	**Calibration ID:**	CAL1016
ysis Method:	8260B	**Units:**	PPB
D:	J:\MS13\DATA\083101\0831F015.D		

yte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
orodifluoromethane	10	13	0.186	0.234	26	NA	± 30 %	AverageRF
omethane	10	10	0.250	0.253	1	NA	± 30 %	AverageRF
l Chloride	10	10	0.232	0.236	2	NA	± 20 %	AverageRF
ıomethane	10	10	0.149	0.152	2	NA	± 30 %	AverageRF
oethane	10	9.2	0.166	0.153	-8	NA	± 30 %	AverageRF
lorofluoromethane	10	8.5	0.347	0.294	-15	NA	± 30 %	AverageRF
ɔne	50	48	0.0295	0.0284	-4	NA	± 30 %	AverageRF
)ichloroethene	10	8.8	0.213	0.189	-12	NA	± 20 %	AverageRF
ɔn Disulfide	20	15	0.764	0.563	-26	NA	± 30 %	AverageRF
ylene Chloride	10	8.7	0.243	0.211	-13	NA	± 30 %	AverageRF
-1,2-Dichloroethene	10	9.2	0.244	0.224	-8	NA	± 30 %	AverageRF
)ichloroethane	10	9.3	0.408	0.378	-7	NA	± 30 %	AverageRF
tanone (MEK)	50	50	0.0119	0.0119	1	NA	± 30 %	AverageRF
)ich[redacted]propane	10	9.0	0.296	0.267	-10	NA	± 30 %	AverageRF
[redacted]loroethene	10	9.1	0.261	0.236	-9	NA	± 30 %	AverageRF
[redacted]n	10	8.6	0.410	0.354	-14	NA	± 20 %	AverageRF
ıochloromethane	10	9.0	0.111	0.100	-10	NA	± 30 %	AverageRF
Trichloroethane (TCA)	10	8.3	0.348	0.290	-17	NA	± 30 %	AverageRF
)ichloropropene	10	8.6	0.327	0.281	-14	NA	± 30 %	AverageRF
ɔn Tetrachloride	10	8.5	0.277	0.236	-15	NA	± 30 %	AverageRF
)ichloroethane (EDC)	10	8.8	0.272	0.238	-12	NA	± 30 %	AverageRF
ene	10	8.8	1.06	0.929	-12	NA	± 30 %	AverageRF
loroethene (TCE)	10	8.8	0.249	0.219	-12	NA	± 30 %	AverageRF
)ichloropropane	10	9.0	0.246	0.222	-10	NA	± 20 %	AverageRF
ıodichloromethane	10	8.8	0.257	0.226	-12	NA	± 30 %	AverageRF
ɔmomethane	10	9.2	0.102	0.0943	-8	NA	± 30 %	AverageRF
xanone	50	48	0.178	0.172	-3	NA	± 30 %	AverageRF
,3-Dichloropropene	10	9.4	0.310	0.290	-6	NA	± 30 %	AverageRF
ɜne	10	8.8	0.670	0.590	-12	NA	± 20 %	AverageRF
-1,3-Dichloropropene	10	9.3	0.624	0.581	-7	NA	± 30 %	AverageRF
-Trichloroethane	10	9.3	0.347	0.323	-7	NA	± 30 %	AverageRF
hyl-2-pentanone (MIBK)	50	50	0.0151	0.0152	0	NA	± 30 %	AverageRF
)ichloropropane	10	9.1	0.773	0.700	-10	NA	± 30 %	AverageRF
chloroethene (PCE)	10	8.8	0.571	0.501	-12	NA	± 30 %	AverageRF
ɔmochloromethane	10	8.9	0.410	0.365	-11	NA	± 30 %	AverageRF
)ibromoethane (EDB)	10	9.3	0.381	0.353	-8	NA	± 30 %	AverageRF
ɔbenzene	10	9.1	1.84	1.68	-9	NA	± 30 %	AverageRF
,2-Tetrachloroethane	10	9.5	0.521	0.494	-5	NA	± 30 %	AverageRF
benzene	10	9.1	1.03	0.935	-9	NA	± 20 %	AverageRF
[redacted]	20	19	1.25	1.19	-5	NA	± 30 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.

:C Compound **‡ CCC Compound**

01041

SuperSet Reference: RR11510

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt: Exponent Environmental Group, Inc.
:ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Calibration Date: 08/31/2001
Date Analyzed: 08/31/2001

Second Source Calibration Verification
Volatile Organic Compounds

ration Type: Internal Standard
ysis Method: 8260B

Calibration ID: CAL1016
Units: PPB

yte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
ene	10	9.4	1.18	1.11	-6	NA	± 30 %	AverageRF
ıe	10	9.3	2.01	1.87	-7	NA	± 30 %	AverageRF
oform	10	8.9	0.206	0.184	-11	NA	± 30 %	AverageRF
›pylbenzene	10	9.2	3.00	2.75	-8	NA	± 30 %	AverageRF
2-Tetrachloroethane	10	9.2	0.413	0.379	-8	NA	± 30 %	AverageRF
Trichloropropane	10	8.9	0.128	0.114	-11	NA	± 30 %	AverageRF
obenzene	10	9.0	0.716	0.644	-10	NA	± 30 %	AverageRF
pylbenzene	10	9.2	3.68	3.38	-8	NA	± 30 %	AverageRF
orotoluene	10	8.9	2.27	2.03	-11	NA	± 30 %	AverageRF
orotoluene	10	9.3	2.54	2.36	-7	NA	± 30 %	AverageRF
Trimethylbenzene	10	9.7	2.53	2.46	-3	NA	± 30 %	AverageRF
utylbenzene	10	9.4	2.15	2.02	-6	NA	± 30 %	AverageRF
Trimethylbenzene	10	10	2.54	2.57	1	NA	± 30 %	AverageRF
utylbenzene	10	9.6	3.19	3.05	-4	NA	± 30 %	AverageRF
ichlorobenzene	10	9.6	1.47	1.41	-4	NA	± 30 %	AverageRF
›ropyltoluene	10	9.4	2.72	2.57	-6	NA	± 30 %	AverageRF
ichlorobenzene	10	9.3	1.58	1.47	-7	NA	± 30 %	AverageRF
ylbenzene	10	9.4	2.41	2.26	-6	NA	± 30 %	AverageRF
ichlorobenzene	10	9.2	1.35	1.24	-8	NA	± 30 %	AverageRF
bromo-3-chloropropane	10	8.6	0.0499	0.0427	-14	NA	± 30 %	AverageRF
Trichlorobenzene	10	9.3	0.922	0.857	-7	NA	± 30 %	AverageRF
Trichlorobenzene	10	9.6	0.794	0.762	-4	NA	± 30 %	AverageRF
halene	10	9.9	1.09	1.08	-1	NA	± 30 %	AverageRF
:hlorobutadiene	10	8.3	0.504	0.418	-17	NA	± 30 %	AverageRF

flagged with an asterisk (*) indicate values outside control criteria.
: Compound **‡ CCC Compound**

01042

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/19/2001

Continuing Calibration Verification Summary
Volatile Organic Compounds

ration Type: Internal Standard
sis Method: 8260B

Calibration Date: 09/12/2001
Calibration ID: CAL1041
Analysis Lot: KWG0106015
Units: PPB

D: J:\MS05\DATA\091901\0919F004.D

te Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
orodifluoromethane	50	49	0.339	0.334	-2	NA	± 30 %	AverageRF
omethane	50	53	0.234	0.248	6	NA	± 30 %	AverageRF
Chloride	50	52	0.179	0.186	4	NA	± 20 %	AverageRF
omethane	50	53	0.199	0.211	6	NA	± 30 %	AverageRF
oethane	50	53	0.0866	0.0918	6	NA	± 30 %	AverageRF
lorofluoromethane	50	52	0.417	0.436	5	NA	± 30 %	AverageRF
ne	100	91	0.124	0.112	-9	NA	± 30 %	AverageRF
ichloroethene	50	51	0.235	0.239	1	NA	± 20 %	AverageRF
n Disulfide	50	47	0.685	0.649	-5	NA	± 30 %	AverageRF
ylene Chloride	50	47	0.291	0.273	-6	NA	± 30 %	AverageRF
1,2-Dichloroethene	50	50	0.253	0.253	-0	NA	± 30 %	AverageRF
ichloroethane	50	49	0.344	0.339	-2	NA	± 30 %	AverageRF
a[illegible] (MEK)	100	89	0.146	0.130	-11	NA	± 30 %	AverageRF
[illegible]propane	50	51	0.366	0.375	2	NA	± 30 %	AverageRF
2-Dichloroethene	50	50	0.292	0.292	-0	NA	± 30 %	AverageRF
oform	50	49	0.498	0.488	-2	NA	± 20 %	AverageRF
ochloromethane	50	51	0.150	0.152	2	NA	± 30 %	AverageRF
Trichloroethane (TCA)	50	51	0.433	0.443	2	NA	± 30 %	AverageRF
ichloropropene	50	50	0.268	0.269	0	NA	± 30 %	AverageRF
n Tetrachloride	50	51	0.335	0.341	2	NA	± 30 %	AverageRF
ichloroethane (EDC)	50	47	0.425	0.402	-5	NA	± 30 %	AverageRF
ne	50	53	0.695	0.730	5	NA	± 30 %	AverageRF
loroethene (TCE)	50	52	0.270	0.279	3	NA	± 30 %	AverageRF
ichloropropane	50	50	0.169	0.169	1	NA	± 20 %	AverageRF
odichloromethane	50	48	0.382	0.363	-5	NA	± 30 %	AverageRF
omomethane	50	50	0.212	0.213	1	NA	± 30 %	AverageRF
xanone	100	98	0.294	0.289	-2	NA	± 30 %	AverageRF
3-Dichloropropene	50	52	0.344	0.356	3	NA	± 30 %	AverageRF
ne	50	49	0.586	0.574	-2	NA	± 20 %	AverageRF
-1,3-Dichloropropene	50	52	0.463	0.480	4	NA	± 30 %	AverageRF
-Trichloroethane	50	52	0.239	0.247	3	NA	± 30 %	AverageRF
hyl-2-pentanone (MIBK)	100	94	0.305	0.287	-6	NA	± 30 %	AverageRF
ichloropropane	50	52	0.425	0.443	4	NA	± 30 %	AverageRF
chloroethene (PCE)	50	55	0.249	0.273	10	NA	± 30 %	AverageRF
omochloromethane	50	54	0.384	0.411	7	NA	± 30 %	AverageRF
ibromoethane (EDB)	50	52	0.404	0.419	4	NA	± 30 %	AverageRF
robenzene	50	49	0.955	0.943	-1	NA	± 30 %	AverageRF
2-[illegible]achloroethane	50	53	0.309	0.327	6	NA	± 30 %	AverageRF
[illegible]e	50	53	0.440	0.466	6	NA	± 20 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.
C Compound ‡ CCC Compound

01043

: Exponent Environmental Group, Inc.
:t: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/19/2001

Continuing Calibration Verification Summary
Volatile Organic Compounds

:ation Type: Internal Standard
sis Method: 8260B

Calibration Date: 09/12/2001
Calibration ID: CAL1041
Analysis Lot: KWG0106015
Units: PPB

te Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
ylenes	100	110	0.542	0.574	6	NA	± 30 %	AverageRF
:ne	50	53	0.556	0.586	5	NA	± 30 %	AverageRF
e	50	52	0.968	1.01	5	NA	± 30 %	AverageRF
)form	50	53	0.293	0.309	5	NA	± 30 %	AverageRF
pylbenzene	50	52	1.40	1.46	4	NA	± 30 %	AverageRF
!-Tetrachloroethane	50	48	0.822	0.787	-4	NA	± 30 %	AverageRF
Trichloropropane	50	51	0.261	0.269	3	NA	± 30 %	AverageRF
)benzene	50	49	0.857	0.848	-1	NA	± 30 %	AverageRF
)ylbenzene	50	53	3.12	3.33	7	NA	± 30 %	AverageRF
)rotoluene	50	50	2.43	2.43	0	NA	± 30 %	AverageRF
)rotoluene	50	49	2.24	2.19	-2	NA	± 30 %	AverageRF
Trimethylbenzene	50	50	2.45	2.47	1	NA	± 30 %	AverageRF
ıtylbenzene	50	52	1.92	2.01	5	NA	± 30 %	AverageRF
Trimethylbenzene	50	51	2.52	2.54	1	NA	± 30 %	AverageRF
ıtylbenzene	50	50	3.03	3.06	1	NA	± 30 %	AverageRF
chlorobenzene	50	50	1.39	1.37	-1	NA	± 30 %	AverageRF
ropyltoluene	50	53	2.42	2.58	6	NA	± 30 %	AverageRF
chlorobenzene	50	50	1.45	1.45	-0	NA	± 30 %	AverageRF
'lbenzene	50	49	2.35	2.29	-2	NA	± 30 %	AverageRF
chlorobenzene	50	49	1.42	1.39	-2	NA	± 30 %	AverageRF
)romo-3-chloropropane	50	50	0.182	0.181	-1	NA	± 30 %	AverageRF
Trichlorobenzene	50	47	1.01	0.953	-5	NA	± 30 %	AverageRF
Trichlorobenzene	50	50	0.986	0.979	-1	NA	± 30 %	AverageRF
halene	50	50	2.33	2.34	1	NA	± 30 %	AverageRF
hlorobutadiene	50	45	0.472	0.422	-10	NA	± 30 %	AverageRF
nofluoromethane	50	50	0.330	0.330	0	NA	± 30 %	AverageRF
ıe-d8	50	54	0.943	1.02	8	NA	± 30 %	AverageRF
nofluorobenzene	50	54	0.496	0.538	8	NA	± 30 %	AverageRF

flagged with an asterisk (*) indicate values outside control criteria.
: Compound ‡ CCC Compound

01044

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/20/2001

Continuing Calibration Verification Summary
Volatile Organic Compounds

ration Type: Internal Standard
ysis Method: 8260B

Calibration Date: 08/31/2001
Calibration ID: CAL1016
Analysis Lot: KWG0106107
Units: PPB

D: J:\MS13\DATA\092001\0920F003.D

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
orodifluoromethane	10	12	0.186	0.231	24	NA	± 30 %	AverageRF
omethane	10	10	0.250	0.255	2	NA	± 30 %	AverageRF
Chloride	10	11	0.232	0.248	7	NA	± 20 %	AverageRF
omethane	10	9.5	0.149	0.142	-5	NA	± 30 %	AverageRF
oethane	10	9.8	0.166	0.163	-2	NA	± 30 %	AverageRF
lorofluoromethane	10	9.4	0.347	0.325	-6	NA	± 30 %	AverageRF
ne	200	200	0.0295	0.0299	1	NA	± 30 %	AverageRF
ichloroethene	10	8.9	0.213	0.191	-11	NA	± 20 %	AverageRF
n Disulfide	10	9.0	0.764	0.689	-10	NA	± 30 %	AverageRF
ylene Chloride	10	9.6	0.243	0.233	-4	NA	± 30 %	AverageRF
1,2-Dichloroethene	10	9.4	0.244	0.230	-6	NA	± 30 %	AverageRF
ichloroethane	10	9.5	0.408	0.387	-5	NA	± 30 %	AverageRF
an (MEK)	200	210	0.0119	0.0127	7	NA	± 30 %	AverageRF
propane	10	9.3	0.296	0.276	-7	NA	± 30 %	AverageRF
2-Dichloroethene	10	9.8	0.261	0.256	-2	NA	± 30 %	AverageRF
oform	10	9.3	0.410	0.380	-7	NA	± 20 %	AverageRF
ochloromethane	10	9.8	0.111	0.109	-2	NA	± 30 %	AverageRF
Trichloroethane (TCA)	10	9.1	0.348	0.316	-9	NA	± 30 %	AverageRF
ichloropropene	10	9.3	0.327	0.304	-7	NA	± 30 %	AverageRF
n Tetrachloride	10	9.3	0.277	0.257	-7	NA	± 30 %	AverageRF
ichloroethane (EDC)	10	9.7	0.272	0.263	-3	NA	± 30 %	AverageRF
ne	10	9.5	1.06	0.998	-5	NA	± 30 %	AverageRF
loroethene (TCE)	10	9.3	0.249	0.231	-7	NA	± 30 %	AverageRF
ichloropropane	10	10	0.246	0.246	0	NA	± 20 %	AverageRF
odichloromethane	10	9.9	0.257	0.254	-1	NA	± 30 %	AverageRF
momethane	10	10	0.102	0.104	1	NA	± 30 %	AverageRF
anone	200	210	0.178	0.185	4	NA	± 30 %	AverageRF
3-Dichloropropene	10	10	0.310	0.321	3	NA	± 30 %	AverageRF
ne	10	9.6	0.670	0.646	-4	NA	± 20 %	AverageRF
1,3-Dichloropropene	10	9.8	0.624	0.610	-2	NA	± 30 %	AverageRF
Trichloroethane	10	9.7	0.347	0.337	-3	NA	± 30 %	AverageRF
hyl-2-pentanone (MIBK)	200	220	0.0151	0.0165	9	NA	± 30 %	AverageRF
ichloropropane	10	9.7	0.773	0.750	-3	NA	± 30 %	AverageRF
chloroethene (PCE)	10	8.9	0.571	0.508	-11	NA	± 30 %	AverageRF
mochloromethane	10	9.8	0.410	0.402	-2	NA	± 30 %	AverageRF
ibromoethane (EDB)	10	9.7	0.381	0.368	-3	NA	± 30 %	AverageRF
obenzene	10	9.7	1.84	1.78	-3	NA	± 30 %	AverageRF
2-T achloroethane	10	9.7	0.521	0.505	-3	NA	± 30 %	AverageRF
e	10	9.5	1.03	0.970	-5	NA	± 20 %	AverageRF

s flagged with an asterisk (*) indicate values outside control criteria.
C Compound ‡ CCC Compound

01045

ıt: Exponent Environmental Group, Inc.
:ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/20/2001

Continuing Calibration Verification Summary
Volatile Organic Compounds

ıration Type: Internal Standard
ysis Method: 8260B

Calibration Date: 08/31/2001
Calibration ID: CAL1016
Analysis Lot: KWG0106107
Units: PPB

yte Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Cylenes	20	20	1.25	1.25	-0	NA	± 30 %	AverageRF
.ene	10	9.8	1.18	1.16	-2	NA	± 30 %	AverageRF
ne	10	9.6	2.01	1.94	-4	NA	± 30 %	AverageRF
oform	10	9.7	0.206	0.200	-3	NA	± 30 %	AverageRF
ɔpylbenzene	10	9.8	3.00	2.95	-2	NA	± 30 %	AverageRF
2-Tetrachloroethane	10	9.7	0.413	0.400	-3	NA	± 30 %	AverageRF
Trichloropropane	10	9.8	0.128	0.126	-2	NA	± 30 %	AverageRF
obenzene	10	9.5	0.716	0.681	-5	NA	± 30 %	AverageRF
pylbenzene	10	9.4	3.68	3.45	-6	NA	± 30 %	AverageRF
orotoluene	10	9.4	2.27	2.14	-6	NA	± 30 %	AverageRF
orotoluene	10	9.8	2.54	2.50	-2	NA	± 30 %	AverageRF
Trimethylbenzene	10	9.9	2.53	2.51	-1	NA	± 30 %	AverageRF
utylbenzene	10	9.5	2.15	2.05	-5	NA	± 30 %	AverageRF
Trimethylbenzene	10	10	2.54	2.52	-0	NA	± 30 %	AverageRF
utylbenzene	10	9.6	3.19	3.06	-4	NA	± 30 %	AverageRF
ichlorobenzene	10	9.5	1.47	1.40	-5	NA	± 30 %	AverageRF
ɔropyltoluene	10	10	2.72	2.72	-0	NA	± 30 %	AverageRF
ichlorobenzene	10	9.5	1.58	1.50	-5	NA	± 30 %	AverageRF
ylbenzene	10	9.2	2.41	2.22	-8	NA	± 30 %	AverageRF
ichlorobenzene	10	9.6	1.35	1.30	-4	NA	± 30 %	AverageRF
bromo-3-chloropropane	10	9.6	0.0499	0.0481	-4	NA	± 30 %	AverageRF
Trichlorobenzene	10	9.1	0.922	0.834	-9	NA	± 30 %	AverageRF
Trichlorobenzene	10	9.4	0.794	0.745	-6	NA	± 30 %	AverageRF
thalene	10	10	1.09	1.10	1	NA	± 30 %	AverageRF
:hlorobutadiene	10	8.0	0.504	0.401	-20	NA	± 30 %	AverageRF
mofluoromethane	10	10	0.205	0.209	2	NA	± 30 %	AverageRF
ne-d8	10	11	0.970	1.02	6	NA	± 30 %	AverageRF
mofluorobenzene	10	10	0.880	0.882	0	NA	± 30 %	AverageRF

; flagged with an asterisk (*) indicate values outside control criteria.
C Compound **‡ CCC Compound**

01046

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

:: Exponent Environmental Group, Inc.
:t: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/21/2001

Continuing Calibration Verification Summary
Volatile Organic Compounds

ration Type: Internal Standard
sis Method: 8260B

Calibration Date: 09/12/2001
Calibration ID: CAL1041
Analysis Lot: KWG0106084
Units: PPB

): J:\MS05\DATA\092101\0921F005.D

te Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
ırodifluoromethane	50	56	0.339	0.379	12	NA	± 30 %	AverageRF
›methane	50	53	0.234	0.248	6	NA	± 30 %	AverageRF
Chloride	50	56	0.179	0.199	11	NA	± 20 %	AverageRF
›methane	50	55	0.199	0.220	10	NA	± 30 %	AverageRF
›ethane	50	56	0.0866	0.0977	13	NA	± 30 %	AverageRF
orofluoromethane	50	57	0.417	0.475	14	NA	± 30 %	AverageRF
ıe	100	99	0.124	0.122	-1	NA	± 30 %	AverageRF
chloroethene	50	53	0.235	0.251	7	NA	± 20 %	AverageRF
n Disulfide	50	49	0.685	0.668	-3	NA	± 30 %	AverageRF
lene Chloride	50	53	0.291	0.311	7	NA	± 30 %	AverageRF
l,2-Dichloroethene	50	54	0.253	0.271	7	NA	± 30 %	AverageRF
chloroethane	50	49	0.344	0.335	-3	NA	± 30 %	AverageRF
ıon (MEK)	100	83	0.146	0.121	-17	NA	± 30 %	AverageRF
›propane	50	50	0.366	0.365	-0	NA	± 30 %	AverageRF
-Dichloroethene	50	49	0.292	0.289	-1	NA	± 30 %	AverageRF
›form	50	52	0.498	0.522	5	NA	± 20 %	AverageRF
›chloromethane	50	54	0.150	0.162	8	NA	± 30 %	AverageRF
richloroethane (TCA)	50	52	0.433	0.452	4	NA	± 30 %	AverageRF
chloropropene	50	51	0.268	0.273	2	NA	± 30 %	AverageRF
n Tetrachloride	50	53	0.335	0.357	7	NA	± 30 %	AverageRF
chloroethane (EDC)	50	50	0.425	0.422	-1	NA	± 30 %	AverageRF
ne	50	52	0.695	0.720	4	NA	± 30 %	AverageRF
oroethene (TCE)	50	54	0.270	0.293	8	NA	± 30 %	AverageRF
chloropropane	50	48	0.169	0.161	-4	NA	± 20 %	AverageRF
›dichloromethane	50	53	0.382	0.401	5	NA	± 30 %	AverageRF
nomethane	50	54	0.212	0.227	7	NA	± 30 %	AverageRF
anone	100	87	0.294	0.255	-13	NA	± 30 %	AverageRF
-Dichloropropene	50	51	0.344	0.354	3	NA	± 30 %	AverageRF
ıe	50	52	0.586	0.604	3	NA	± 20 %	AverageRF
l,3-Dichloropropene	50	48	0.463	0.443	-4	NA	± 30 %	AverageRF
richloroethane	50	49	0.239	0.236	-1	NA	± 30 %	AverageRF
yl-2-pentanone (MIBK)	100	92	0.305	0.281	-8	NA	± 30 %	AverageRF
chloropropane	50	48	0.425	0.412	-3	NA	± 30 %	AverageRF
hloroethene (PCE)	50	51	0.249	0.254	2	NA	± 30 %	AverageRF
nochloromethane	50	50	0.384	0.387	1	NA	± 30 %	AverageRF
bromoethane (EDB)	50	49	0.404	0.397	-2	NA	± 30 %	AverageRF
›benzene	50	49	0.955	0.936	-2	NA	± 30 %	AverageRF
-Tetrachloroethane	50	50	0.309	0.308	-0	NA	± 30 %	AverageRF
ıe	50	49	0.440	0.431	-2	NA	± 20 %	AverageRF

ıgged with an asterisk (*) indicate values outside control criteria.
: Compound **‡ CCC Compound**

01047

: Exponent Environmental Group, Inc.
t: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/21/2001

Continuing Calibration Verification Summary
Volatile Organic Compounds

ation Type: Internal Standard
is Method: 8260B

Calibration Date: 09/12/2001
Calibration ID: CAL1041
Analysis Lot: KWG0106084
Units: PPB

e Name	Expected	Result	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
ylenes	100	99	0.542	0.536	-1	NA	± 30 %	AverageRF
ne	50	48	0.556	0.532	-4	NA	± 30 %	AverageRF
:	50	50	0.968	0.964	-0	NA	± 30 %	AverageRF
form	50	50	0.293	0.294	0	NA	± 30 %	AverageRF
ylbenzene	50	48	1.40	1.35	-3	NA	± 30 %	AverageRF
-Tetrachloroethane	50	50	0.822	0.817	-1	NA	± 30 %	AverageRF
richloropropane	50	54	0.261	0.284	9	NA	± 30 %	AverageRF
benzene	50	51	0.857	0.879	3	NA	± 30 %	AverageRF
ylbenzene	50	54	3.12	3.36	7	NA	± 30 %	AverageRF
otoluene	50	50	2.43	2.45	1	NA	± 30 %	AverageRF
otoluene	50	50	2.24	2.22	-1	NA	± 30 %	AverageRF
rimethylbenzene	50	51	2.45	2.50	2	NA	± 30 %	AverageRF
tylbenzene	50	51	1.92	1.96	2	NA	± 30 %	AverageRF
rimethylbenzene	50	52	2.52	2.59	3	NA	± 30 %	AverageRF
ylbenzene	50	52	3.03	3.18	5	NA	± 30 %	AverageRF
hlorobenzene	50	51	1.39	1.41	2	NA	± 30 %	AverageRF
opyltoluene	50	53	2.42	2.58	6	NA	± 30 %	AverageRF
hlorobenzene	50	52	1.45	1.52	5	NA	± 30 %	AverageRF
benzene	50	53	2.35	2.47	5	NA	± 30 %	AverageRF
hlorobenzene	50	50	1.42	1.41	-1	NA	± 30 %	AverageRF
omo-3-chloropropane	50	49	0.182	0.178	-2	NA	± 30 %	AverageRF
richlorobenzene	50	48	1.01	0.973	-3	NA	± 30 %	AverageRF
richlorobenzene	50	47	0.986	0.931	-6	NA	± 30 %	AverageRF
alene	50	43	2.33	2.01	-13	NA	± 30 %	AverageRF
lorobutadiene	50	51	0.472	0.486	3	NA	± 30 %	AverageRF
ofluoromethane	50	52	0.330	0.344	4	NA	± 30 %	AverageRF
e-d8	50	55	0.943	1.03	10	NA	± 30 %	AverageRF
ofluorobenzene	50	53	0.496	0.523	5	NA	± 30 %	AverageRF

lagged with an asterisk (*) indicate values outside control criteria.
Compound ‡ CCC Compound

01048

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

Exponent Environmental Group, Inc.
Oregon Steel Mills/8601526.001.0302

Service Request: K2106670

Analysis Run Log
Volatile Organic Compounds

is Method: 8260B

Analysis Lot: KWG0106015
Instrument ID: MS05

	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
03.D	GC/MS Tuning - Generic	KWG0106015-3	9/19/2001	12:43		9/19/2001	13:02
04.D	Continuing Calibration Verification	KWG0106015-4	9/19/2001	13:10		9/19/2001	13:33
05.D	Lab Control Sample	KWG0106014-3	9/19/2001	13:40		9/19/2001	14:03
06.D	ZZZZZZ	ZZZZZZ	9/19/2001	14:07		9/19/2001	14:30
09.D	Method Blank	KWG0106014-4	9/19/2001	15:30		9/19/2001	15:53
10.D	SD0020	K2106670-001	9/19/2001	15:58		9/19/2001	16:21
11.D	SD0021	K2106670-002	9/19/2001	16:26		9/19/2001	16:49
12.D	ZZZZZZ	ZZZZZZ	9/19/2001	16:53		9/19/2001	17:16
13.D	S00151	K2106670-008	9/19/2001	17:21		9/19/2001	17:44
14.D	S00151MS	KWG0106014-1	9/19/2001	17:48		9/19/2001	18:11
15.D	S00151DMS	KWG0106014-2	9/19/2001	18:16		9/19/2001	18:39
17	ZZZZZZ	ZZZZZZ	9/19/2001	19:11		9/19/2001	19:34
	ZZZZZZ	ZZZZZZ	9/19/2001	19:39		9/19/2001	20:02
19.D	ZZZZZZ	ZZZZZZ	9/19/2001	20:06		9/19/2001	20:29
20.D	ZZZZZZ	ZZZZZZ	9/19/2001	20:34		9/19/2001	20:57
22.D	ZZZZZZ	ZZZZZZ	9/19/2001	21:29		9/19/2001	21:52
023.D	ZZZZZZ	ZZZZZZ	9/19/2001	21:57		9/19/2001	22:20
024.D	ZZZZZZ	ZZZZZZ	9/19/2001	22:24		9/19/2001	22:47

s flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

01049

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

: Exponent Environmental Group, Inc. **Service Request:** K2106670

t: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Volatile Organic Compounds

is Method: 8260B **Analysis Lot:** KWG0106084

Instrument ID: MS05

)	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
)03.D	GC/MS Tuning - Generic	KWG0106084-3	9/21/2001	12:02		9/21/2001	12:25
)03.D	GC/MS Tuning - Generic	KWG0106084-3	9/21/2001	12:02		9/21/2001	12:25
)05.D	Continuing Calibration Verification	KWG0106084-5	9/21/2001	12:57		9/21/2001	13:20
)05.D	Continuing Calibration Verification	KWG0106084-5	9/21/2001	12:57		9/21/2001	13:20
)06.D	Lab Control Sample	KWG0106083-1	9/21/2001	13:25		9/21/2001	13:48
)06.D	ZZZZZZ	ZZZZZZ	9/21/2001	13:25		9/21/2001	13:48
)07.D	ZZZZZZ	ZZZZZZ	9/21/2001	13:52		9/21/2001	14:15
)07.D	ZZZZZZ	ZZZZZZ	9/21/2001	13:52		9/21/2001	14:15
)10.D	Method Blank	KWG0106083-5	9/21/2001	15:15		9/21/2001	15:38
)10.D	ZZZZZZ	ZZZZZZ	9/21/2001	15:15		9/21/2001	15:38
)11.D	ZZZZZZ	ZZZZZZ	9/21/2001	15:43		9/21/2001	16:06
)12.D	ZZZZZZ	ZZZZZZ	9/21/2001	16:11		9/21/2001	16:34
)13.D	S00150	K2106670-007	9/21/2001	16:38		9/21/2001	17:01
)14.D	ZZZZZZ	ZZZZZZ	9/21/2001	17:06		9/21/2001	17:29
)15.D	ZZZZZZ	ZZZZZZ	9/21/2001	17:33		9/21/2001	17:56
)16.D	ZZZZZZ	ZZZZZZ	9/21/2001	18:01		9/21/2001	18:24
)17.D	ZZZZZZ	ZZZZZZ	9/21/2001	18:28		9/21/2001	18:51
)18.D	ZZZZZZ	ZZZZZZ	9/21/2001	18:56		9/21/2001	19:19
)19.D	ZZZZZZ	ZZZZZZ	9/21/2001	19:23		9/21/2001	19:46
)20.D	ZZZZZZ	ZZZZZZ	9/21/2001	19:51		9/21/2001	20:14
)21.D	ZZZZZZ	ZZZZZZ	9/21/2001	20:18		9/21/2001	20:41
)22.D	ZZZZZZ	ZZZZZZ	9/21/2001	20:46		9/21/2001	21:09
)24.D	ZZZZZZ	ZZZZZZ	9/21/2001	21:41		9/21/2001	22:04
)25.D	ZZZZZZ	ZZZZZZ	9/21/2001	22:08		9/21/2001	22:31
)26.D	ZZZZZZ	ZZZZZZ	9/21/2001	22:35		9/21/2001	22:58

flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

01050

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

nt: Exponent Environmental Group, Inc. **Service Request:** K2106670

ect: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Volatile Organic Compounds

ysis Method: 8260B **Analysis Lot:** KWG0106107

Instrument ID: MS13

ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
F002.D	GC/MS Tuning - Generic	KWG0106107-1	9/20/2001	17:49		9/20/2001	18:05
F003.D	Continuing Calibration Verification	KWG0106107-2	9/20/2001	18:17		9/20/2001	18:33
F004.D	Lab Control Sample	KWG0106108-3	9/20/2001	18:47		9/20/2001	19:03
F005.D	Batch QCMS	KWG0106108-1	9/20/2001	19:16		9/20/2001	19:32
F006.D	Batch QCDMS	KWG0106108-2	9/20/2001	19:44		9/20/2001	20:00
F008.D	Method Blank	KWG0106108-4	9/20/2001	20:41		9/20/2001	20:57
F009.D	SW0002	K2106670-006	9/20/2001	21:09		9/20/2001	21:25
F010.D	GW1203	K2106670-014	9/20/2001	21:37		9/20/2001	21:53
F011.D	Trip Blank	K2106670-017	9/20/2001	22:06		9/20/2001	22:22
F012.D	ZZZZZZ	ZZZZZZ	9/20/2001	22:34		9/20/2001	22:50
F013.D	ZZZZZZ	ZZZZZZ	9/20/2001	23:03		9/20/2001	23:19
F0[illegible].D	ZZZZZZ	ZZZZZZ	9/20/2001	23:31		9/20/2001	23:47
[illegible].D	ZZZZZZ	ZZZZZZ	9/20/2001	23:59		9/21/2001	00:15
F016.D	ZZZZZZ	ZZZZZZ	9/21/2001	00:28		9/21/2001	00:44
F017.D	ZZZZZZ	ZZZZZZ	9/21/2001	00:56		9/21/2001	01:12
F018.D	ZZZZZZ	ZZZZZZ	9/21/2001	01:24		9/21/2001	01:40
F019.D	ZZZZZZ	ZZZZZZ	9/21/2001	01:53		9/21/2001	02:09
F020.D	ZZZZZZ	ZZZZZZ	9/21/2001	02:21		9/21/2001	02:37
F021.D	ZZZZZZ	ZZZZZZ	9/21/2001	02:50		9/21/2001	03:06
F022.D	ZZZZZZ	ZZZZZZ	9/21/2001	03:18		9/21/2001	03:34
F023.D	ZZZZZZ	ZZZZZZ	9/21/2001	03:46		9/21/2001	04:02
F024.D	Batch QC	K2106757-012	9/21/2001	04:15		9/21/2001	04:31
F025.D	ZZZZZZ	ZZZZZZ	9/21/2001	04:43		9/21/2001	04:59
F026.D	ZZZZZZ	ZZZZZZ	9/21/2001	05:11		9/21/2001	05:27
F027.D	ZZZZZZ	ZZZZZZ	9/21/2001	05:39		9/21/2001	05:55
F029.D	ZZZZZZ	ZZZZZZ	9/21/2001	06:36		9/21/2001	06:52
F030.D	ZZZZZZ	ZZZZZZ	9/21/2001	07:05		9/21/2001	07:21
F031.D	ZZZZZZ	ZZZZZZ	9/21/2001	07:33		9/21/2001	07:49
F033.D	ZZZZZZ	ZZZZZZ	9/21/2001	08:29		9/21/2001	08:45
F034.D	ZZZZZZ	ZZZZZZ	9/21/2001	08:58		9/21/2001	09:14
F035.D	ZZZZZZ	ZZZZZZ	9/21/2001	09:26		9/21/2001	09:42
F036.D	ZZZZZZ	ZZZZZZ	9/21/2001	09:54		9/21/2001	10:10
F037.D	ZZZZZZ	ZZZZZZ	9/21/2001	10:23		9/21/2001	10:39
F[illegible].D	ZZZZZZ	ZZZZZZ	9/21/2001	10:51		9/21/2001	11:07
[illegible].D	ZZZZZZ	ZZZZZZ	9/21/2001	11:19		9/21/2001	11:35

lts flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

01051

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

: Exponent Environmental Group, Inc. **Service Request:** K2106670

t: Oregon Steel Mills/8601526.001.0302

Analysis Run Log
Volatile Organic Compounds

is Method: 8260B **Analysis Lot:** KWG0106107

Instrument ID: MS13

)	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
)40.D	ZZZZZZ	ZZZZZZ	9/21/2001	11:48		9/21/2001	12:04
)41.D	ZZZZZZ	ZZZZZZ	9/21/2001	12:16		9/21/2001	12:32
)42.D	ZZZZZZ	ZZZZZZ	9/21/2001	12:44		9/21/2001	13:00
)43.D	ZZZZZZ	ZZZZZZ	9/21/2001	13:12		9/21/2001	13:28
)44.D	ZZZZZZ	ZZZZZZ	9/21/2001	13:41		9/21/2001	13:57
)45.D	ZZZZZZ	ZZZZZZ	9/21/2001	14:09		9/21/2001	14:25
)46.D	ZZZZZZ	ZZZZZZ	9/21/2001	14:37		9/21/2001	14:53
)47.D	ZZZZZZ	ZZZZZZ	9/21/2001	15:05		9/21/2001	15:21
)48.D	ZZZZZZ	ZZZZZZ	9/21/2001	15:34		9/21/2001	15:50
)49.D	ZZZZZZ	ZZZZZZ	9/21/2001	16:16		9/21/2001	16:32
)50.D	ZZZZZZ	ZZZZZZ	9/21/2001	16:44		9/21/2001	17:00

flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

01052

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
rix: Water

Service Request: K2106670
Date Extracted: 09/20/2001

Extraction Prep Log
Volatile Organic Compounds

ction Method: EPA 5030B
sis Method: 8260B

Extraction Lot: KWG0106108
Level: Low

le Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
02	K2106670-006	09/10/01	09/13/01	10ml	10ml	NA	
203	K2106670-014	09/12/01	09/13/01	10ml	10ml	NA	
Blank	K2106670-017		09/13/01	10ml	10ml	NA	
d Blank	KWG0106108-4	NA	NA	10ml	10ml	NA	
QC	K2106757-012	NA	NA	10ml	10ml	NA	
QCMS	KWG0106108-1	NA	NA	10ml	10ml	NA	
QCDMS	KWG0106108-2	NA	NA	10ml	10ml	NA	
ontrol Sample	KWG0106108-3	NA	NA	10ml	10ml	NA	

s flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

01053

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ːct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
ıle Matrix:	Soil		

Extraction Prep Log
Volatile Organic Compounds

ıction Method:	EPA 5030A	**Extraction Lot:**	KWG0106014
ysis Method:	8260B	**Level:**	Low

ıle Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
ſ20	K2106670-001	09/10/01	09/13/01	5.08g	5ml	72.2	
ſ21	K2106670-002	09/10/01	09/13/01	5.06g	5ml	66.6	
51	K2106670-008	09/11/01	09/13/01	5.07g	5ml	89.6	
od Blank	KWG0106014-4	NA	NA	5.00g	5ml	NA	
51MS	KWG0106014-1	09/11/01	09/13/01	5.04g	5ml	66.3	
51DMS	KWG0106014-2	09/11/01	09/13/01	5.05g	5ml	66.3	
ːontrol Sample	KWG0106014-3	NA	NA	5.00g	5ml	NA	

s flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

01054

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Results

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/21/2001
le ix:	Soil		

Extraction Prep Log
Volatile Organic Compounds

ction Method:	EPA 5030A	**Extraction Lot:**	KWG0106083
sis Method:	8260B	**Level:**	Low

le Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
0	K2106670-007	09/11/01	09/13/01	5.11g	5.00ml	83.4	
d Blank	KWG0106083-5	NA	NA	5.00g	5.00ml	NA	
ontrol Sample	KWG0106083-1	NA	NA	5.00g	5.00ml	NA	

flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

01055

Organic Analysis:
Volatile Organic Compounds

Validation Package

Organic Analysis:
Volatile Organic Compounds

Validation Package

QC Reports

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302		
e Matrix:	Water		

Surrogate Recovery Summary
Volatile Organic Compounds

:tion Method:	EPA 5030B	**Units:**	PERCENT
sis Method:	8260B	**Level:**	Low

e Name	Lab Code	Sur1	Sur2	Sur3
)2	K2106670-006	99	101	93
03	K2106670-014	100	100	95
lank	K2106670-017	98	100	94
d Blank	KWG0106108-4	99	101	92
QC	K2106757-012	101	101	92
QCMS	KWG0106108-1	99	103	98
QCDMS	KWG0106108-2	99	102	99
)ntrol Sample	KWG0106108-3	100	103	99

gate Recovery Control Limits (%)

= Dibromofluoromethane	87-115
= Toluene-d8	83-116
= 4-Bromofluorobenzene	75-120

flagged with an asterisk (*) indicate values outside control criteria.
flagged with a pound (#) indicate the control criteria is not applicable.

01058

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Exponent Environmental Group, Inc. **Service Request:** K2106670

t: Oregon Steel Mills/8601526.001.0302

ix: Soil

Surrogate Recovery Summary
Volatile Organic Compounds

tion Method: EPA 5030A **Units:** PERCENT

is Method: 8260B **Level:** Low

e Name	Lab Code	Sur1		Sur2		Sur3
0	K2106670-001	100		89		79
1	K2106670-002	96		95		86
)	K2106670-007	71	*	107		101
l	K2106670-008	26	*	105		101
d Blank	KWG0106014-4	107		107		103
d Blank	KWG0106083-5	104		105		108
MS	KWG0106014-1	32	*	110	*	105
DMS	KWG0106014-2	26	*	106		102
ntrol Sample	KWG0106014-3	100		104		98
ntrol Sample	KWG0106083-1	98		103		101

gate Recovery Control Limits (%)

= Dibromofluoromethane	75-132
= Toluene-d8	85-109
= 4-Bromofluorobenzene	49-131

flagged with an asterisk (*) indicate values outside control criteria.

flagged with a pound (#) indicate the control criteria is not applicable.

01059

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302

Service Request: K2106670
Date Analyzed: 09/19/2001
Time Analyzed: 13:10

Internal Standard Area and RT Summary
Volatile Organic Compounds

D: J:\MS05\DATA\091901\0919F004.D
ıment ID: MS05
sis Method: 8260B

Lab Code: KWG0106015-4
Analysis Lot: KWG0106015

		Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
		Area	**RT**	**Area**	**RT**	**Area**	**RT**
	Results ==>	786,596	9.13	597,226	13.03	282,764	16.39
	Upper Limit ==>	1,573,192	9.63	1,194,452	13.53	565,528	16.89
	Lower Limit ==>	393,298	8.63	298,613	12.53	141,382	15.89
	ICAL Result ==>	724,247	NA	579,843	NA	273,320	NA
ated Analyses							
ontrol Sample	KWG0106014-3	748,273	9.13	601,812	13.04	256,826	16.39
xd Blank	KWG0106014-4	648,540	9.14	539,747	13.04	241,403	16.40
20	K2106670-001	565,863	9.14	325,494	13.04	76,233*	16.40
21	K2106670-002	639,931	9.13	406,346	13.04	104,010*	16.40
51	K2106670-008	741,815	9.14	592,292	13.04	277,753	16.40
51MS	KWG0106014-1	617,083	9.14	503,275	13.04	242,557	16.41
51DMS	KWG0106014-2	712,285	9.14	563,162	13.04	267,997	16.40

s flagged with an asterisk (*) indicate values outside control criteria.

01060

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Analyzed:**	09/20/2001
		Time Analyzed:	18:17

Internal Standard Area and RT Summary
Volatile Organic Compounds

):	J:\MS13\DATA\092001\0920F003.D	**Lab Code:**	KWG0106107-2
ıment ID:	MS13	**Analysis Lot:**	KWG0106107
sis Method:	8260B		

		Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
		Area	RT	Area	RT	Area	RT
	Results ==>	559,232	4.55	224,100	7.60	233,436	10.46
	Upper Limit ==>	1,118,464	5.05	448,200	8.10	466,872	10.96
	Lower Limit ==>	279,616	4.05	112,050	7.10	116,718	9.96
	ICAL Result ==>	575,530	NA	221,881	NA	228,305	NA
ated Analyses							
'ontrol Sample	KWG0106108-3	572,025	4.55	227,274	7.60	237,281	10.46
QCMS	KWG0106108-1	575,778	4.55	229,356	7.60	239,086	10.46
QCDMS	KWG0106108-2	579,662	4.55	228,734	7.61	239,915	10.46
ɔd Blank	KWG0106108-4	557,184	4.55	217,018	7.60	218,415	10.46
)02	K2106670-006	558,223	4.55	219,955	7.60	217,992	10.46
203	K2106670-014	558,034	4.55	217,672	7.60	215,733	10.46
3lank	K2106670-017	558,110	4.55	220,048	7.60	216,832	10.46
ı QC	K2106757-012	546,027	4.55	218,650	7.60	216,725	10.46

ılts flagged with an asterisk (*) indicate values outside control criteria.

01061

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	*Oregon Steel Mills/8601526.001.0302*	**Date Analyzed:**	09/21/2001
		Time Analyzed:	12:57

Internal Standard Area and RT Summary
Volatile Organic Compounds

):	J:\MS05\DATA\092101\0921F005.D	**Lab Code:**	KWG0106084-5
ment ID:	MS05	**Analysis Lot:**	KWG0106084
sis Method:	8260B		

		Fluorobenzene		Chlorobenzene-d5		1,4-Dichlorobenzene-d4	
		Area	RT	Area	RT	Area	RT
	Results ==>	678,590	9.14	570,987	13.04	255,607	16.40
	Upper Limit ==>	1,357,180	9.64	1,141,974	13.54	511,214	16.90
	Lower Limit ==>	339,295	8.64	285,494	12.54	127,804	15.90
	ICAL Result ==>	724,247	NA	579,843	NA	273,320	NA
uted Analyses							
ontrol Sample	KWG0106083-1	673,857	9.13	534,863	13.04	240,764	16.40
d Blank	KWG0106083-5	666,895	9.14	506,081	13.04	237,627	16.40
0	K2106670-007	705,788	9.14	609,468	13.04	273,139	16.41

flagged with an asterisk (*) indicate values outside control criteria.

01062

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
rix: Water

Service Request: K2106670
Date Extracted: 09/20/2001
Date Analyzed: 09/20/2001

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

le Name: Batch QC
Code: K2106757-012
ction Method: EPA 5030B
sis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0106108

te Name	Sample Result	Batch QCMS KWG0106108-1 Matrix Spike Result	Expected	%Rec	Batch QCDMS KWG0106108-2 Duplicate Matrix Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
ichloroethene	ND	11.6	10.0	116	11.0	10.0	110	42-178	5	30
ne	ND	10.6	10.0	106	10.4	10.0	104	65-138	2	30
oroethene (TCE)	ND	10.9	10.0	109	10.8	10.0	108	58-146	1	30
ne	ND	11.0	10.0	110	10.5	10.0	105	68-135	4	30
obenzene	ND	10.3	10.0	103	9.95	10.0	99	71-124	3	30
ichlorobenzene	ND	9.57	10.0	96	9.49	10.0	95	71-121	1	30
halene	ND	10.5	10.0	105	10.5	10.0	105	50-145	0	30

s flagged with an asterisk (*) indicate values outside control criteria.
s flagged with a pound (#) indicate the control criteria is not applicable.
t recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01063

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
e Matrix:	Soil	**Date Analyzed:**	09/19/2001

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds

e Name:	S00151	**Units:**	ug/Kg
ode:	K2106670-008	**Basis:**	Dry
:tion Method:	EPA 5030A	**Level:**	Low
sis Method:	8260B	**Extraction Lot:**	KWG0106014

		S00151MS KWG0106014-1 Matrix Spike			S00151DMS KWG0106014-2 Duplicate Matrix Spike					
te Name	**Sample Result**	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
chloroethene	ND	231	150	154 *	274	149	183 *	51-127	17	40
ıe	ND	140	150	94	164	149	110	57-121	16	40
ɔroethene (TCE)	ND	248	150	166 *	299	149	200 *	45-127	19	40
ıe	ND	135	150	90	157	149	105	34-134	15	40
ɔbenzene	ND	128	150	86	149	149	99	37-126	15	40
chlorobenzene	ND	116	150	78	128	149	86	34-131	9	40
ıalene	ND	99.5	150	66	122	149	82	20-139	20	40

flagged with an asterisk (*) indicate values outside control criteria.
flagged with a pound (#) indicate the control criteria is not applicable.
recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01064

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

ıt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ːct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
ıle trix:	Water	**Date Analyzed:**	09/20/2001

Lab Control Spike Summary
Volatile Organic Compounds

ıction Method:	EPA 5030B	**Units:**	ug/L
ysis Method:	8260B	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG0106108

	Lab Control Sample KWG0106108-3 Lab Control Spike			
yte Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
orodifluoromethane	13.0	10.0	130	50-150
omethane	11.0	10.0	109	50-150
Chloride	12.2	10.0	122	50-150
omethane	11.0	10.0	110	50-150
oethane	10.9	10.0	109	50-150
lorofluoromethane	10.3	10.0	103	50-150
ıe	55.7	50.0	111	50-150
ichloroethene	10.7	10.0	107	62-148
ın Disulfide	18.4	20.0	92	50-150
ylen Chloride	9.58	10.0	96	50-150
hloroethene	10.7	10.0	107	50-150
roethane	10.5	10.0	105	50-150
anone (MEK)	55.1	50.0	110	50-150
ichloropropane	10.5	10.0	105	50-150
2-Dichloroethene	10.3	10.0	102	50-150
oform	9.57	10.0	96	50-150
ochloromethane	9.57	10.0	96	50-150
Trichloroethane (TCA)	10.1	10.0	101	50-150
ichloropropene	10.4	10.0	104	50-150
ın Tetrachloride	10.4	10.0	104	50-150
ichloroethane (EDC)	9.49	10.0	95	50-150
ːne	10.1	10.0	100	77-114
oroethene (TCE)	10.3	10.0	102	69-124
ichloropropane	9.73	10.0	97	50-150
ɔdichloromethane	9.31	10.0	93	50-150
momethane	9.58	10.0	96	50-150
anone	48.7	50.0	97	50-150
}-Dichloropropene	10.4	10.0	104	50-150
ne	10.0	10.0	100	75-118
1,3-Dichloropropene	9.09	10.0	91	50-150
Trichloroethane	9.30	10.0	93	50-150
ıyl-2-pentanone (MIBK)	50.7	50.0	101	50-150
ichloropropane	9.11	10.0	91	50-150
ːhloroethene (PCE)	9.97	10.0	100	50-150
mochloromethane	9.18	10.0	92	50-150
ıe thane (EDB)	9.16	10.0	92	50-150

flagged with an asterisk (*) indicate values outside control criteria.

recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01065

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
le Matrix: Water

Service Request: K2106670
Date Extracted: 09/20/2001
Date Analyzed: 09/20/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method: EPA 5030B
sis Method: 8260B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG0106108

te Name	Lab Control Sample KWG0106108-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
)benzene	9.76	10.0	98	79-110
2-Tetrachloroethane	9.79	10.0	98	50-150
enzene	10.2	10.0	102	50-150
ylenes	21.2	20.0	106	50-150
ne	10.3	10.0	103	50-150
e	9.78	10.0	98	50-150
)form	8.89	10.0	89	50-150
pylbenzene	10.2	10.0	102	50-150
2-Tetrachloroethane	8.69	10.0	87	50-150
Trichloropropane	8.53	10.0	85	50-150
)benzene	9.49	10.0	95	50-150
)ylbenzene	10.3	10.0	103	50-150
)rotoluene	9.44	10.0	94	50-150
)rotoluene	9.89	10.0	99	50-150
Trimethylbenzene	10.5	10.0	105	50-150
ıtylbenzene	10.4	10.0	104	50-150
Trimethylbenzene	10.7	10.0	107	50-150
ıtylbenzene	10.7	10.0	107	50-150
chlorobenzene	9.95	10.0	99	50-150
ropyltoluene	10.5	10.0	105	50-150
chlorobenzene	9.49	10.0	95	50-150
/lbenzene	10.2	10.0	102	50-150
chlorobenzene	9.29	10.0	93	80-110
)romo-3-chloropropane	8.53	10.0	85	50-150
Trichlorobenzene	9.37	10.0	94	50-150
Trichlorobenzene	9.57	10.0	96	50-150
halene	10.3	10.0	102	64-125
hlorobutadiene	8.98	10.0	90	50-150

flagged with an asterisk (*) indicate values outside control criteria.
recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

U1066

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
rix:	Soil	**Date Analyzed:**	09/19/2001

Lab Control Spike Summary
Volatile Organic Compounds

ıction Method:	EPA 5030A	**Units:**	ug/Kg
ysis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106014

yte Name	Lab Control Sample KWG0106014-3 Lab Control Spike Result	Expected	%Rec	%Rec Limits
orodifluoromethane	119	100	119	50-150
omethane	117	100	117	50-150
Chloride	126	100	126	50-150
omethane	117	100	117	50-150
oethane	125	100	125	50-150
lorofluoromethane	108	100	108	50-150
ne	445	500	89	50-150
ichloroethene	115	100	115	73-118
n Disulfide	187	200	93	50-150
yl[redacted]hloride	96.6	100	97	50-150
[redacted]chloroethene	115	100	115	50-150
ichloroethane	110	100	110	50-150
tanone (MEK)	458	500	92	50-150
ichloropropane	114	100	114	50-150
,2-Dichloroethene	102	100	102	50-150
roform	104	100	104	50-150
ochloromethane	101	100	101	50-150
Trichloroethane (TCA)	112	100	112	50-150
ichloropropene	107	100	107	50-150
n Tetrachloride	115	100	115	50-150
ichloroethane (EDC)	96.9	100	97	50-150
ene	107	100	107	78-116
loroethene (TCE)	112	100	112	79-119
ichloropropane	99.5	100	99	50-150
odichloromethane	99.7	100	100	50-150
omomethane	97.3	100	97	50-150
xanone	459	500	92	50-150
,3-Dichloropropene	101	100	101	50-150
ene	102	100	102	77-118
-1,3-Dichloropropene	93.3	100	93	50-150
-Trichloroethane	94.0	100	94	50-150
thyl-2-pentanone (MIBK)	475	500	95	50-150
ichloropropane	89.6	100	90	50-150
chloroethene (PCE)	106	100	106	50-150
om[redacted]oromethane	98.7	100	99	50-150
[redacted]ethane (EDB)	93.4	100	93	50-150

ts flagged with an asterisk (*) indicate values outside control criteria.

it recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01067

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
le Matrix:	Soil	**Date Analyzed:**	09/19/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method:	EPA 5030A	**Units:**	ug/Kg
'sis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106014

	Lab Control Sample KWG0106014-3 Lab Control Spike			
'te Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
obenzene	101	100	101	80-117
2-Tetrachloroethane	100	100	100	50-150
ɔenzene	104	100	104	50-150
;ylenes	194	200	97	50-150
ene	96.6	100	97	50-150
ıe	96.5	100	96	50-150
oform	96.6	100	97	50-150
ɔpylbenzene	97.0	100	97	50-150
2-Tetrachloroethane	92.3	100	92	50-150
Trichloropropane	103	100	103	50-150
obenzene	102	100	102	50-150
pylbenzene	112	100	112	50-150
orotoluene	103	100	103	50-150
orotoluene	97.3	100	97	50-150
Trimethylbenzene	112	100	112	50-150
utylbenzene	118	100	118	50-150
Trimethylbenzene	114	100	114	50-150
utylbenzene	119	100	119	50-150
ichlorobenzene	103	100	103	50-150
ɔropyltoluene	110	100	110	50-150
ichlorobenzene	97.6	100	98	50-150
ylbenzene	106	100	106	50-150
ichlorobenzene	97.4	100	97	79-120
ibromo-3-chloropropane	95.6	100	96	50-150
Trichlorobenzene	95.5	100	95	50-150
Trichlorobenzene	95.8	100	96	50-150
thalene	85.8	100	86	57-135
chlorobutadiene	104	100	104	50-150

s flagged with an asterisk (*) indicate values outside control criteria.

.t recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01068

SuperSet Reference: RR11510

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

::	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/21/2001
le [redacted]rix:	Soil	**Date Analyzed:**	09/21/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method:	EPA 5030A	**Units:**	ug/Kg
sis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106083

	Lab Control Sample KWG0106083-1 Lab Control Spike			
te Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
rodifluoromethane	102	100	102	50-150
methane	94.9	100	95	50-150
Chloride	105	100	105	50-150
methane	101	100	101	50-150
ethane	98.7	100	99	50-150
orofluoromethane	97.4	100	97	50-150
ne	436	500	87	50-150
chloroethene	100	100	100	73-118
n Disulfide	162	200	81	50-150
len[redacted]hloride	86.3	100	86	50-150
[redacted]nloroethene	101	100	101	50-150
c...roethane	92.2	100	92	50-150
none (MEK)	437	500	87	50-150
chloropropane	96.0	100	96	50-150
-Dichloroethene	88.8	100	89	50-150
form	90.2	100	90	50-150
chloromethane	88.3	100	88	50-150
richloroethane (TCA)	97.5	100	97	50-150
chloropropene	93.9	100	94	50-150
n Tetrachloride	102	100	102	50-150
chloroethane (EDC)	84.4	100	84	50-150
ne	93.6	100	94	78-116
oroethene (TCE)	96.4	100	96	79-119
chloropropane	83.5	100	84	50-150
dichloromethane	89.4	100	89	50-150
nomethane	88.1	100	88	50-150
anone	461	500	92	50-150
-Dichloropropene	91.1	100	91	50-150
ne	91.1	100	91	77-118
,3-Dichloropropene	86.4	100	86	50-150
Trichloroethane	85.6	100	86	50-150
yl-2-pentanone (MIBK)	461	500	92	50-150
chloropropane	82.0	100	82	50-150
hloroethene (PCE)	97.4	100	97	50-150
no[redacted]romethane	87.6	100	88	50-150
[redacted]thane (EDB)	86.1	100	86	50-150

flagged with an asterisk (*) indicate values outside control criteria.

recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
:t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/21/2001
le Matrix:	Soil	**Date Analyzed:**	09/21/2001

Lab Control Spike Summary
Volatile Organic Compounds

ction Method:	EPA 5030A	**Units:**	ug/Kg
sis Method:	8260B	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0106083

	Lab Control Sample KWG0106083-1 Lab Control Spike			
te Name	**Result**	**Expected**	**%Rec**	**%Rec Limits**
)benzene	90.3	100	90	80-117
!-Tetrachloroethane	91.8	100	92	50-150
enzene	92.0	100	92	50-150
ylenes	181	200	91	50-150
:ne	87.1	100	87	50-150
e	88.6	100	89	50-150
)form	91.2	100	91	50-150
pylbenzene	91.1	100	91	50-150
!-Tetrachloroethane	89.4	100	89	50-150
Trichloropropane	97.7	100	98	50-150
)benzene	88.8	100	89	50-150
)ylbenzene	99.1	100	99	50-150
)rotoluene	91.4	100	91	50-150
)rotoluene	89.4	100	89	50-150
Trimethylbenzene	99.0	100	99	50-150
ıtylbenzene	97.8	100	98	50-150
Trimethylbenzene	97.4	100	97	50-150
ıtylbenzene	104	100	104	50-150
ichlorobenzene	92.8	100	93	50-150
ropyltoluene	97.8	100	98	50-150
ichlorobenzene	89.2	100	89	50-150
ylbenzene	93.3	100	93	50-150
ichlorobenzene	89.8	100	90	79-120
bromo-3-chloropropane	95.9	100	96	50-150
Trichlorobenzene	75.7	100	76	50-150
Trichlorobenzene	75.4	100	75	50-150
halene	65.9	100	66	57-135
hlorobutadiene	92.8	100	93	50-150

flagged with an asterisk (*) indicate values outside control criteria.

recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

01070

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t: Exponent Environmental Group, Inc.
ct: Oregon Steel Mills/8601526.001.0302
l[redacted]rix: Water

Service Request: K2106670
Date Extracted: 09/20/2001
Date Analyzed: 09/20/2001
Time Analyzed: 20:41

Method Blank Summary
Volatile Organic Compounds

le Name: Method Blank
Code: KWG0106108-4
ction Method: EPA 5030B
/sis Method: 8260B

File ID: J:\MS13\DATA\092001\0920F008.D
Instrument ID: MS13
Level: Low
Extraction Lot: KWG0106108

Method Blank applies to the following analyses:

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ontrol Sample	KWG0106108-3	J:\MS13\DATA\092001\0920F004.D	09/20/01	18:47
QCMS	KWG0106108-1	J:\MS13\DATA\092001\0920F005.D	09/20/01	19:16
QCDMS	KWG0106108-2	J:\MS13\DATA\092001\0920F006.D	09/20/01	19:44
02	K2106670-006	J:\MS13\DATA\092001\0920F009.D	09/20/01	21:09
03	K2106670-014	J:\MS13\DATA\092001\0920F010.D	09/20/01	21:37
lank	K2106670-017	J:\MS13\DATA\092001\0920F011.D	09/20/01	22:06
QC	K2106757-012	J:\MS13\DATA\092001\0920F024.D	09/21/01	04:15

01071

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
e Matrix:	Soil	**Date Analyzed:**	09/19/2001
		Time Analyzed:	15:30

Method Blank Summary
Volatile Organic Compounds

e Name:	Method Blank	**File ID:**	J:\MS05\DATA\091901\0919F009.D
ode:	KWG0106014-4	**Instrument ID:**	MS05
:tion Method:	EPA 5030A	**Level:**	Low
is Method:	8260B	**Extraction Lot:**	KWG0106014

lethod Blank applies to the following analyses:

: Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ntrol Sample	KWG0106014-3	J:\MS05\DATA\091901\0919F005.D	09/19/01	13:40
)	K2106670-001	J:\MS05\DATA\091901\0919F010.D	09/19/01	15:58
l	K2106670-002	J:\MS05\DATA\091901\0919F011.D	09/19/01	16:26
	K2106670-008	J:\MS05\DATA\091901\0919F013.D	09/19/01	17:21
MS	KWG0106014-1	J:\MS05\DATA\091901\0919F014.D	09/19/01	17:48
DMS	KWG0106014-2	J:\MS05\DATA\091901\0919F015.D	09/19/01	18:16

01072

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	Service Request:	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	Date Extracted:	09/21/2001
rix:	Soil	Date Analyzed:	09/21/2001
		Time Analyzed:	15:15

Method Blank Summary
Volatile Organic Compounds

le Name:	Method Blank	File ID:	J:\MS05\DATA\092101\0921F010.D
ode:	KWG0106083-5	Instrument ID:	MS05
ction Method:	EPA 5030A	Level:	Low
sis Method:	8260B	Extraction Lot:	KWG0106083

Method Blank applies to the following analyses:

e Name	Lab Code	File ID	Date Analyzed	Time Analyzed
ontrol Sample	KWG0106083-1	J:\MS05\DATA\092101\0921F006.D	09/21/01	13:25
0	K2106670-007	J:\MS05\DATA\092101\0921F013.D	09/21/01	16:38

01073

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
t:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/20/2001
e Matrix:	Water	**Date Analyzed:**	09/20/2001
		Time Analyzed:	18:47

Lab Control Sample Summary
Volatile Organic Compounds

e Name:	Lab Control Sample	**File ID:**	J:\MS13\DATA\092001\0920F004.D
ode:	KWG0106108-3	**Instrument ID:**	MS13
:tion Method:	EPA 5030B	**Level:**	Low
sis Method:	8260B	**Extraction Lot:**	KWG0106108

ab Control Sample applies to the following analyses:

: Name	**Lab Code**	**File ID**	**Date Analyzed**	**Time Analyzed**
)CMS	KWG0106108-1	J:\MS13\DATA\092001\0920F005.D	09/20/01	19:16
)CDMS	KWG0106108-2	J:\MS13\DATA\092001\0920F006.D	09/20/01	19:44
l Blank	KWG0106108-4	J:\MS13\DATA\092001\0920F008.D	09/20/01	20:41
)2	K2106670-006	J:\MS13\DATA\092001\0920F009.D	09/20/01	21:09
)3	K2106670-014	J:\MS13\DATA\092001\0920F010.D	09/20/01	21:37
ank	K2106670-017	J:\MS13\DATA\092001\0920F011.D	09/20/01	22:06
)C	K2106757-012	J:\MS13\DATA\092001\0920F024.D	09/21/01	04:15

01074

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

t:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ct:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/19/2001
rix:	Soil	**Date Analyzed:**	09/19/2001
		Time Analyzed:	13:40

Lab Control Sample Summary
Volatile Organic Compounds

le Name:	Lab Control Sample	**File ID:**	J:\MS05\DATA\091901\0919F005.D
Code:	KWG0106014-3	**Instrument ID:**	MS05
ction Method:	EPA 5030A	**Level:**	Low
sis Method:	8260B	**Extraction Lot:**	KWG0106014

Lab Control Sample applies to the following analyses:

le Name	Lab Code	File ID	Date Analyzed	Time Analyzed
d Blank	KWG0106014-4	J:\MS05\DATA\091901\0919F009.D	09/19/01	15:30
0	K2106670-001	J:\MS05\DATA\091901\0919F010.D	09/19/01	15:58
1	K2106670-002	J:\MS05\DATA\091901\0919F011.D	09/19/01	16:26
1	K2106670-008	J:\MS05\DATA\091901\0919F013.D	09/19/01	17:21
1MS	KWG0106014-1	J:\MS05\DATA\091901\0919F014.D	09/19/01	17:48
1DMS	KWG0106014-2	J:\MS05\DATA\091901\0919F015.D	09/19/01	18:16

01075

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

nt:	Exponent Environmental Group, Inc.	**Service Request:**	K2106670
ect:	Oregon Steel Mills/8601526.001.0302	**Date Extracted:**	09/21/2001
ple Matrix:	Soil	**Date Analyzed:**	09/21/2001
		Time Analyzed:	13:25

Lab Control Sample Summary
Volatile Organic Compounds

ple Name:	Lab Control Sample	**File ID:**	J:\MS05\DATA\092101\0921F006.D
Code:	KWG0106083-1	**Instrument ID:**	MS05
action Method:	EPA 5030A	**Level:**	Low
ysis Method:	8260B	**Extraction Lot:**	KWG0106083

Lab Control Sample applies to the following analyses:

le Name	**Lab Code**	**File ID**	**Date Analyzed**	**Time Analyzed**
od Blank	KWG0106083-5	J:\MS05\DATA\092101\0921F010.D	09/21/01	15:15
50	K2106670-007	J:\MS05\DATA\092101\0921F013.D	09/21/01	16:38

01076

Appendix I

Phase II Quality Assurance Review

Quality Assurance Review

Introduction

A quality assurance review was completed by Exponent for volatile organic compounds (VOCs), diesel-range petroleum hydrocarbons, and oil-range petroleum hydrocarbons in groundwater samples; and VOCs, metals, polychlorinated biphenyls (PCBs), diesel-range petroleum hydrocarbons, and oil-range petroleum hydrocarbons in soil and sediment samples. All samples were collected during the September 2001 Phase II pre-remedial investigation (Pre-RI) activities at Oregon Steel Mills, Portland, Oregon. Three groundwater, four soil, and four sediment samples were collected and submitted for analysis on September 10–12, 2001. A trip blank, two equipment rinsate blanks, and two field duplicates (one groundwater for petroleum hydrocarbons only and one sediment) were also analyzed for this investigation. A modified U.S. Environmental Protection Agency (EPA) Level III data validation was completed.

All analyses were performed by Columbia Analytical Services, Inc. (CAS) of Kelso, Washington. A summary of results reported by the laboratory is presented in Tables 7–9. Table I-1 presents the analytical methods used during laboratory analysis. Table I-2 summarizes the quality control checks performed during data validation.

Completeness

Results reported by the laboratory were 100-percent complete.

Holding Times and Sample Preservation

Holding time constraints were met for all samples.

Analytical Methods

Analyses were completed in accordance with the methods listed in Table I-1, below:

Table I-1. Analytical methods

Constituent	Method
Volatile organic compounds	EPA Method 8021B [a] and 8260B [a]
Polychlorinated biphenyls	EPA Method 8082 [a]
Petroleum hydrocarbons	NWTPH-D, extended [b]
Metals	EPA Method 6000/7000 Series [a]

Note: EPA - U.S. Environmental Protection Agency
NWTPH - Northwest Total Petroleum Hydrocarbon
[a] U.S. EPA 1997
[b] Ecology 1997

Instrument Performance

The performance of the analytical instruments, as documented by the laboratory, was acceptable.

Initial and Continuing Calibration

Initial and continuing calibrations were completed for all applicable target analytes and met the laboratory's criteria for acceptable performance and frequency of analysis, with three exceptions. For the VOC analyses of the trip blank and two equipment rinsate blanks (Samples GW1203 and SW0002), the 25 percent difference control limit for the analysis of continuing calibration verification standards was not met for 1,2-dibromo-3-chloropropane, 2-butanone, and 4-methyl-2-pentanone. The results reported for these three VOCs in the affected samples were qualified as estimated (*J*); these qualified data may indicate a low bias.

Initial and Continuing Calibration Blanks

The initial and continuing calibration blank (ICB and CCB) analyses met the laboratory's criteria for acceptable performance and frequency of analysis. Manganese, silver, and chromium were detected in several CCBs; however, no action was required because these metals were detected in the associated samples at concentrations significantly above the 5-times action limit (U.S. EPA 1994).

Method Blank Analyses

Target analytes were not detected above the method reporting limit (MRL) in any method blank.

Accuracy

The accuracy of the analytical results is evaluated in the following sections in terms of analytical bias (surrogate compound, matrix spike [MS], laboratory control sample [LCS] recoveries, and post-digestion spike recoveries [metals by graphite furnace/atomic absorption]) and precision (matrix spike duplicates [MSDs], LCS duplicates, and duplicate sample analyses).

Surrogate Compound Recoveries

The recoveries reported by the laboratory for surrogate compounds for all applicable analyses, and the frequency of analysis, met the criteria for acceptable performance, with two exceptions. For the analysis of VOCs, the recoveries reported for the surrogate compound dibromofluoromethane for Sample SO0150 (71 percent) and Sample SO0151 (26 percent) were below the lower laboratory control limit of 75 percent. The results reported for the 64 VOCs in each of these samples were qualified as estimated (*J*); these qualified data may indicate a low bias.

Matrix Spike Recoveries

The recoveries reported by the laboratory for MS and MSD analyses for all applicable analyses, and the frequency of analysis, met the laboratory's criteria for acceptable performance, with the following exceptions. Recoveries for 1,1-dichloroethene and trichloroethene were above the upper control limit for the MS and MSD associated with the analysis of the soil samples. No action was taken because sample results reported for organic compound analyses are not qualified based on MS and MSD results alone (U.S. EPA 1999). There was no indication of systematic bias.

Laboratory Control Sample Recoveries

The recoveries reported by the laboratory for all LCS and duplicate LCS analyses, and the frequency of analysis, met the laboratory's criteria for acceptable performance and frequency of analysis.

Internal Standard Performance

The criteria for retention time and area count were met for all of the internal standards that were added to all samples analyzed for VOCs, with two exceptions. The area count for the internal standard 1,4-dichlorobenzene-d_4 was below the –50 percent control limit for Samples SD0020 and SD0021. All results reported for the 20 VOCs associated with this internal standard were qualified as estimated (*J*); these qualified data may indicate a low bias.

Precision

Results for all duplicate and MSD sample analyses, and the frequency of analysis, met the laboratory's criteria for acceptable performance.

For the analysis of diesel-range petroleum hydrocarbons and oil-range petroleum hydrocarbons in groundwater samples, relative percent differences of 110 percent and 123 percent were reported, respectively, for the duplicate sample analysis completed on Sample GW1200. The laboratory case narrative stated large amounts of sediment were present with the groundwater in the sample container. The presence of sediment most likely resulted in a large degree of heterogeneity and, hence, distribution of VOCs in the sample containers. No action was taken during validation based on these duplicate results.

Qualitative Identification

For the analysis of diesel-range petroleum hydrocarbons and oil-range petroleum hydrocarbons in sediment (Samples SD0020, SD0021, SD0022, and SD0023) and groundwater (Samples GW1200, GW1201, GW01202, and GW1205), the laboratory indicated the petroleum constituents that may be present resemble either a diesel- and oil-range product but do not appear to be indicative of the diesel #2 or motor oil standards that were used for quantification

purposes. These results were assigned a *JN* qualifier during validation to indicate the concentration is considered estimated and the identification is tentative.

Field Quality Control Samples

Field quality control samples consisted of a trip blank, two equipment rinsate blanks, and two field duplicate samples (one groundwater sample for petroleum hydrocarbons only and one sediment sample). No target analytes were detected in the trip blank. Chloroform and several metals were detected in the in the equipment rinsate blanks. No action was required because chloroform and the metals were not detected in the associated samples. Results for the field duplicate sample analyses were acceptable.

Overall Data Summary

Table I-2 summarizes the quality control checks for this review.

Table I-2. Summary of quality control checks

Quality Control Check	Status	Comments
Completeness	Acceptable	
Holding Times	Acceptable	
Analytical Methods	Acceptable	
Instrument Performance	Acceptable	
Calibration	Acceptable	Results for 1,2-dibromo-3-chloropropane, 2-butanone, and 4-methyl-2-butanone in the trip blank and equipment rinsate blanks were qualified as estimated due to a CCV percent difference exceedance.
Method Blanks	Acceptable	
Accuracy (bias or recovery)	Acceptable	
Surrogate Compounds	Acceptable	128 soil results for VOCs were qualified as estimated (assigned a *J* qualifier) due to surrogate recovery exceedances.
Matrix Spike Samples	Acceptable	
Laboratory Control Samples	Acceptable	
Internal Standards	Acceptable	20 VOC compounds in Sample SD0020 and Sample SD0021 were qualified as estimated due to low area count for one internal standard
Accuracy (precision)	Acceptable	
Qualitative Identification	Acceptable	Seven diesel-range and seven oil-range petroleum hydrocarbon results were qualified as to indicate the concentration reported is estimated and the identification is tentative.
Field Quality Control Samples	Acceptable	
Overall Assessment	**Acceptable**	**Qualifier codes added to results; see sections indicated above**