RISK-BASED CONCENTRATION REPORT FOR THE EQUIPMENT UNIT GROUP ALCOA-DAVENPORT WORKS RIVERDALE, IOWA

CERCLA CONSENT ORDER VII-95-F-0026

Prepared for:

ALCOA-DAVENPORT WORKS
4879 State Street
Riverdale, Iowa 52722

October 2000

Prepared by:

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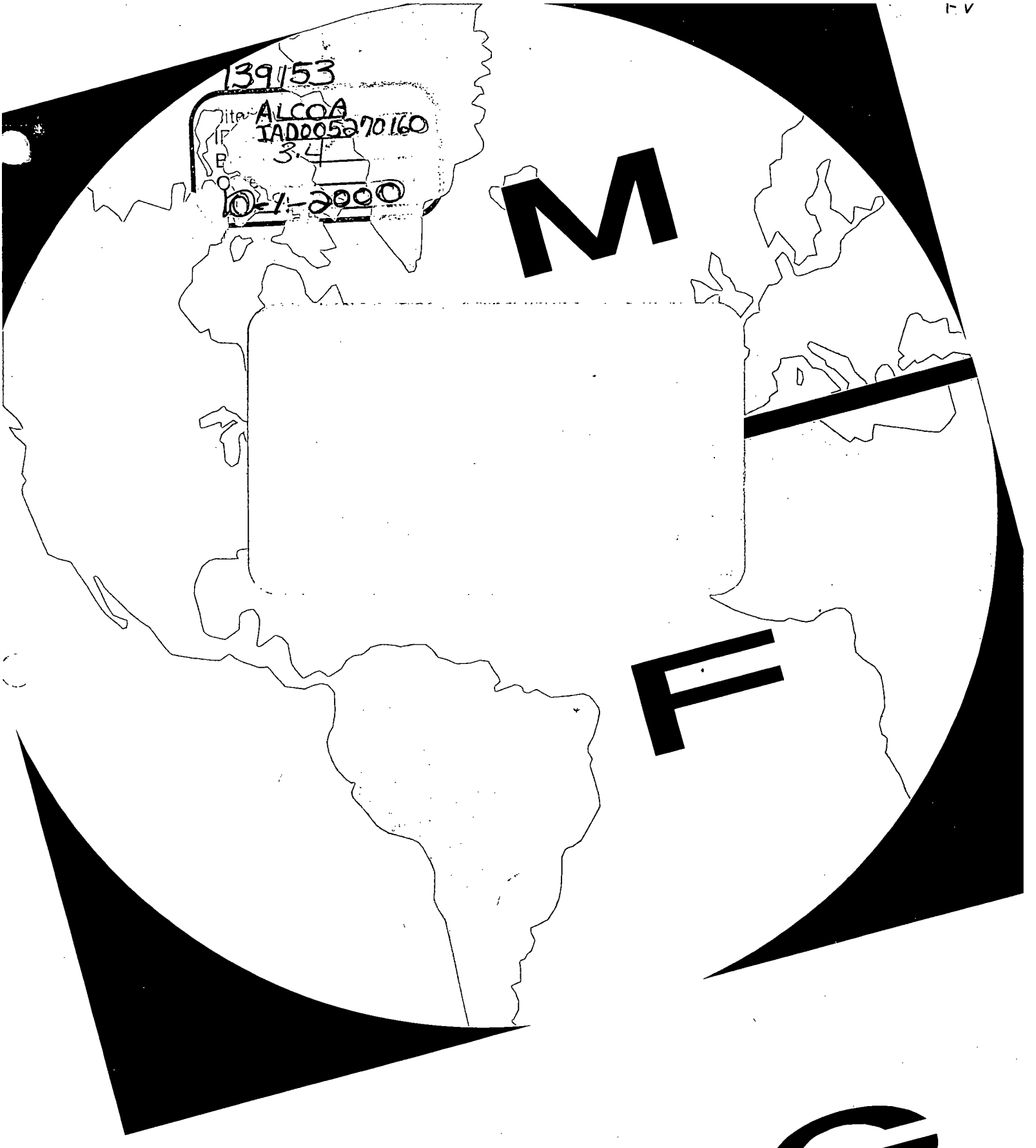

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ALCOA

Mr. Jim Colbert
US Environmental Protection Agency
Region VII
Iowa-Nebraska Remedial Branch
901 N 5th Street
Kansas City, Kansas
66101

October 9, 2000

Subject: **Equipment Group RBC Report, Alcoa-Davenport Works**
CERCLA Consent Order VII-95-F-0026

Dear Jim:

Enclosed for your review are three copies of the Equipment Unit Group RBC Report. The draft report does not contain a Unit Recommendation Memo (URM); however, a URM will be added to the final report after the EPA's review of the draft. If you need additional information or have questions about the enclosed information, do not hesitate to contact me at (319) 459-1628.

Yours Truly

Bud Sturtzer
Davenport Remediation

Cc: George Pratt

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PROFESSIONAL CERTIFICATION

This report was prepared by MFG, Inc. under the professional supervision of Alice J. Waldhauer. The findings, recommendations, specifications, and professional opinions presented in this report were prepared in accordance with generally accepted industry practice, and within the scope of the project. There is no other warranty, either express or implied.

Alice J. Waldhauer
Senior Geologist/Project Manager
MFG, INC.

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LIST OF ACRONYMS

Alcoa	Aluminum Company of America
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirements
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COIs	Constituents of Interest
COPCs	Constituents of Potential Concern
CSM	Conceptual Site Model
CWM	Current Waste Management Unit
EPA	United States Environmental Protection Agency
Exposure Menu	Menu of Facility-Specific Exposure Scenarios
FSA	Facility Site Assessment
G&L	Giddings and Lewis
HU	Historical Unit
IPH	Industrial Process Unit – Hot Lines
IPO	Industrial Process Unit – Other Process Areas
IPP	Industrial Process Unit – Plate Mill
IRIS	Integrated Risk Information System
kg	Kilogram
MADEP	Massachusetts Department of Environmental Protection
mg/kg	Milligrams per Kilogram
mg/m^3	Milligrams per Cubic Meter
MSDS	Material Safety Data Sheet
NIOSH	National Institute of Occupational Safety and Health
NPDES	National Pollution Discharge Elimination System
OSHA	Occupational Safety and Health Administration
Overview Strategy	Overview of Cleanup Strategy
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PRGs	Preliminary Remediation Goals
RBCs	Risk-Based Concentrations

LIST OF ACRONYMS

RfD	Reference Dose
Groundwater RI/FS	Groundwater Remedial Investigation/Feasibility Study
UCM	Unit Conceptual Model
URM	Unit Recommendation Memorandum
UST	Underground Storage Tank

1.0 INTRODUCTION

In August 1995, Aluminum Company of America (Alcoa) and the United States Environmental Protection Agency (EPA) signed an Administrative Order on Consent (AOC), Docket No. VII-95-F-0026, that provides for the evaluation of, and, if necessary, the performance of removal actions for the areas of potential contamination at the Alcoa-Davenport Works in Riverdale, Iowa. Eighty-one areas of potential contamination, or units, were identified in a 1992 Initial Facility Site Assessment Report (FSA [Geraghty & Miller, Inc., 1992]). Included in the list were FSA Units IPH-10 (No. 4 Scalper), IPP-01 (Plate Mill Levelers), IPP-02 (Plate Mill Stretchers), IPP-03 (Giddings & Lewis [G&L] Milling Machine), and IPO-07 (No. 8 Halden Shear). Prior to development of this report, these units were grouped as similar units for evaluation in this Equipment Group Risk-Based Concentration (RBC) Report. Alcoa received EPA approval for this unit group in correspondence dated May 29, 1998. Rationale for grouping these units is presented in Section 1.3.

This RBC Report was prepared in accordance with two documents; the Overview of Cleanup Strategy (Overview Strategy) presented as Appendix B of the 1995 AOC (EPA, 1995); and a supplemental document prepared by EPA and presented in the 1995 AOC titled, "Preliminary Methodology for Tasks 4, 5, and 6 of the Overview of Cleanup Strategy" (Tasks 4, 5, and 6 Document [EPA, 1995]).

The Overview Strategy document outlines a series of six tasks to be completed as part of a comprehensive risk-based strategy for unit characterization and prioritization. These tasks are summarized below. More complete descriptions of each task of the Overview Strategy are provided in the 1995 AOC. It should be noted that Task 1, 2, and 3 have previously been completed. In combination, Tasks 1, 2, and 3 serve as the basis for the development of the RBC Report. In turn, both the CSM and the 1995 AOC are the basis of Tasks 4, 5, and 6. Tasks 4 and 5 were performed as a cumulative effort in preparation of this RBC Report. During completion of Tasks 4 and 5, it was determined that Task 6 was unnecessary and therefore was not completed in the process of implementing the Overview Strategy.

- Task 1 involved preparation of a site-wide Conceptual Site Model (CSM) (Geraghty & Miller, Inc., 1995) to provide a general understanding of the relationship between the units and site characteristics. The CSM identifies site characteristics, potential sources of constituents at FSA units, potential constituents of interest (COIs), primary and secondary constituent release mechanisms, and conditions impacting constituent migration.

- Task 2 consisted of EPA's review and approval of the CSM. EPA approved the CSM on November 22, 1995.
- Task 3 consisted of an Applicable or Relevant and Appropriate Requirements (ARAR) review by EPA and other appropriate agencies. This review is covered in the EPA document "Chemical and Location-Specific ARARs Analysis Report for the Alcoa-Davenport Works Site, Riverdale, Iowa" transmitted December 22, 1995.
- Task 4 is development of a Unit Conceptual Model (UCM) for each FSA unit or group of units.
- Task 5 is completion of an Exposure Assessment for each applicable receptor chosen from the Menu of Facility-Specific Exposure Scenarios (Exposure Menu) for each unit. In this report, a qualitative assessment is presented.
- Task 6 is the calculation of Alcoa-specific RBCs for each identified constituent of potential concern (COPC).

As mentioned above, EPA developed a supplemental document that presented a general framework for completion of Tasks 4, 5, and 6 of the Overview Strategy. This document was provided in the 1995 AOC titled "Preliminary Methodology for Tasks 4, 5, and 6 of the Overview of Cleanup Strategy" (Tasks 4, 5, and 6 Document [EPA, 1995]). Attachment 1 to the Tasks 4, 5, and 6 Document provided an example of the application of Tasks 4, 5, and 6 to specific FSA units. Attachment 1 allowed for the application of the Overview Strategy to units and groups of units to vary according to the characteristics of the unit, and the extent to which the unit has been previously investigated.

This RBC Report presents the results of Tasks 4, 5, and 6: a UCM; a qualitative Exposure Assessment; and an evaluation of potential COIs identified at the Unit Group, respectively. Each of these elements was completed in accordance with the Overview Strategy and the Tasks 4, 5, and 6 Document. Upon EPA approval of the RBC Report, Alcoa will prepare the Unit Recommendation Memorandum (URM) indicating whether further evaluation, a removal action or no further action should be conducted at the Unit Group or individual units within the Unit Group. A draft URM will be included in this report in Appendix C after review of the draft report by EPA.

The objectives of each task necessary to complete the RBC Report are discussed in the following sections.

1.1 Objectives

Completion of Tasks 4, 5 and 6 of the Overview Strategy is necessary for initial evaluation of the Unit Group. In this RBC Report, unit information and process knowledge are used in screening to determine whether the unit requires additional action under the 1995 Consent Order. Additional action may consist of continued evaluation (i.e., application of unit-specific exposure parameter values to calculate unit RBCs for COPCs, field investigation, or other investigation), or a removal action. Major objectives of Tasks 4, 5, and 6 in this overall site strategy are outlined below.

Task 4, development of the UCM, was prepared based on the 1992 FSA and the 1995 site-wide CSM. The major objective of the UCM is to identify unit characteristics and conditions impacting constituent migration, exposure pathways and receptors (human and ecological). A summary of potential unit COIs is provided based on a review of the 1995 CSM and process knowledge.

Task 5, development of the Exposure Assessment, was prepared to assess potential for exposure of human receptors to environmental media at the unit. Alcoa-specific site-wide human exposure scenarios for soil, surface water, sediment and groundwater were developed into the Exposure Menu and which was submitted to EPA for approval. This document was approved by the EPA and included in the 1995 AOC. Human exposure scenarios applicable to the Unit Group were selected from the Exposure Menu and used in evaluation of the Unit Group. Scenarios provided in the Exposure Menu acknowledge current and anticipated future industrial use of Alcoa-Davenport Works. The scenarios also acknowledge limited access to Alcoa-Davenport Works by the public. The potential for direct exposure of ecological receptors to environmental media at the Unit Group was also evaluated. However, because the Unit Group consists of machinery that is entirely within plant buildings, no ecological habitat was identified at this Unit Group and a detailed ecological assessment is not necessary.

The objective of Task 6 was to develop RBCs for media-specific COPCs. RBCs are generally calculated based on exposure scenarios specific to the Alcoa-Davenport Works selected from the Exposure Menu. Because the qualitative exposure assessment shows no unacceptable risk from the Equipment Unit Group due to a lack of complete exposure pathways, calculation of RBCs was not performed. This is discussed further in Sections 2:0 and 3.0.

1.2 Organization

This RBC Report was developed in a manner consistent with the general format provided in Attachment 1 of the Tasks 4, 5 and 6 Document and includes the following components:

- Unit Conceptual Model
- Qualitative Exposure Assessment
- Recommendation

Section 2.0 provides a description of the Unit Group in terms of proximity to property boundary and surrounding units, summary of previous investigations, quantity and quality of available analytical data (Appendix A) and identification of COIs. The UCM also discusses the general physical and chemical properties of the COIs, identifies potential primary and secondary constituent release mechanisms and migration pathways and discusses potential exposure pathways for human receptors. Appendix B presents equations used in development of this qualitative analysis.

Section 3.0 provides a discussion of exposure pathways and information used to complete a qualitative assessment of the Unit Group. Section 3.0 also includes a discussion of uncertainties associated with the qualitative evaluation. This discussion will serve as the basis for recommendations provided in the URM. The draft URM will be included as Appendix C of this report. Section 4.0 provides references for materials used in the preparation of this RBC Report.

1.3 Unit Grouping

The Equipment Group was formed because each unit in the group is located in the north central to eastern area of the main plant, and each unit is a piece of machinery that is part of the industrial process. The units are in buildings where there is no routine access to subsurface soil. These areas of the plant are fully developed, and have low potential for future construction projects. Each unit in the Equipment Group uses petroleum hydrocarbons in machinery as hydraulic fluid. In addition, petroleum hydrocarbons are used as lubricant or coolant at some units, so the potential COIs identified in the 1995 CSM are similar.

2.0 UNIT GROUP CONCEPTUAL MODEL

The Alcoa-Davenport Works plant is located in Scott County in east-central Iowa. The site is in Riverdale, Iowa, adjacent to Bettendorf, Iowa, one of the Iowa-Illinois Quad Cities (Figure 2-1). The site is bounded to the south by the Mississippi River, to the north by State Route 67, to the east by the Riverside Power Plant and to the west by residential, industrial and undeveloped property. A detailed site description is presented in the 1995 CSM (Geraghty & Miller, 1995).

2.1 Unit Group Description

FSA Units that comprise the Equipment Unit Group include the No. 4 Scalper (IPH-10), Plate Mill Levelers (IPP-01), Plate Mill Stretchers (IPP-02), the Giddings & Lewis Milling Machine (IPP-03), and the No. 8 Halden Shear (IPO-07). Each unit is located within main plant buildings in the north central to eastern part of the plant site. Figure 2-2 identifies the locations of units within this Unit Group. Detailed descriptions of the units and elements relative to their potential environmental impact are presented in the following sections.

Petroleum hydrocarbons are constituents of interest (COIs) with these units because each unit within the group is a piece of machinery that uses an oil mixture as hydraulic fluid. Also, other petroleum hydrocarbons are used at the Unit Group. These include: lubricating oil which is used at the Giddings & Lewis Milling Machine; an oil/water mixture (coolant) which is used at the No. 4 Scalper; and kerosene which is used at the No 8 Halden Shear. PCBs were also evaluated as COIs at these units. This evaluation was predicated on knowledge of their past use, and their presence in other areas and/or equipment at the plant. The presence of PCBs in other areas was the result of cross-contamination, or where heat-treating of metals posed a threat of combustion. Reportedly, no PCB-containing oils were ever used in these units. This is supported by laboratory analysis of fluid samples collected from the machinery of the Equipment Unit Group, which show no indication of PCBs. The data from these analyses are summarized in Section 2.2.

Historically, there are no known releases of petroleum hydrocarbons from these units. Given the site setting and nature of these oils, old releases of the oil which could have contaminated soils would not be an important issue regarding risk to human health or the environment – direct exposure to oils in an industrial setting (through repair of equipment) would far exceed incidental exposure through contact

with soil. Additionally, the principal concern from oils is whether they are contaminated with PCBs. This has been shown not to be a problem at these units.

This Unit Group is entirely within buildings, and ground surface is concrete. Therefore, environmental media beneath the units could only be contacted if the floor were removed during a construction project or during excavation for repairs or maintenance. Lithologic data collected during construction projects in the eastern end of the plant suggest that only 3-4 feet of unconsolidated material are present over bedrock in the area of the Equipment Group. This unconsolidated material is not saturated with groundwater. The following sections provide unit information, process knowledge, and analytical data for each FSA Unit included in this Unit Group.

2.1.1 No. 4 Scalper (IPH-10)

The No. 4 Scalper is located in Building 833 in the eastern end of the plant site. The work performed at the No. 4 Scalper is the first step in milling aluminum using the hot rolling process. The No. 4 Scalper was installed in the early 1970's at the same time as the 220-Inch Mill (IPH-01; to be evaluated in Hot Lines Unit Group RBC Report) and is still in operation. The size of the No. 4 Scalper is about 60 feet by 180 feet, located approximately 300 feet from the eastern property boundary. The No. 4 Scalper was identified as a perimeter unit in the Groundwater RI/FS Work Plan (Geraghty & Miller, Inc., 1996) because it is located within 500 feet of the property boundary.

The No. 4 Scalper is used to mill the top and bottom surfaces of aluminum ingots, creating a smooth surface prior to hot rolling. As the ingot is being milled, a coolant mixture of oil and water is applied to the ingot surface and scalper blades. Aluminum chips generated during scalping are collected and recycled into new ingots by melting and casting processes. Excess chips and drips of coolant collect in a concrete pit beneath the scalper. These are periodically removed for recycling or disposal. Some of the coolant is vaporized or atomized to a mist during the operation, and these are managed with a fume exhaust system on the roof. Condensation upon discharge to the atmosphere leaves an oil residue on the roof, small portions of which may be carried to the Storm Sewer System (FSA Unit CWM-07) with storm water runoff. Water from the Storm Sewer System flows to lift stations where it is pumped to the Water Reclamation Facility for treatment. During significant storm events, the lift station pumps may occasionally be overcome, and water can be released to National Pollution Discharge Elimination System (NPDES) Outfalls.

In early July 2000, an oil sheen was observed in Outfall 006 where a storm sewer entered the outfall. Booms were immediately placed around the oil in the outfall and no oil was released from the outfall. Davenport maintenance personnel inspected manholes along the storm sewer to pinpoint the source of the oil. The suspected source of the oil was the No. 4 Scalper, and on July 13, 2000 Terracon Environmental mobilized to collect soil samples and install two shallow monitor wells. Monitoring well MW-1 was installed south of the Scalper in the courtyard adjacent to the south end of Building 833. Soil from the MW-1 borehole appeared to be clean, with no evidence of oil in soil. Monitor well MW-2 was installed inside Building 833, immediately adjacent to the north side of the No. 4 Scalper. During installation of the borehole, odors were detected beginning at an approximate depth of 3.0 feet. Oil and water were observed in the borehole at approximately 6.5 feet, which is within the range of depths of the storm sewer (5.5 to 7.4-feet).

Soil samples were collected from each soil boring, and analyzed by TestAmerica for PCBs (Method 8082), benzene, toluene, ethylbenzene, and xylenes [BTEX (Method OA-1)], and Total Extractable Hydrocarbons [TEH (Method OA-2)]. PCBs and TEH were below detection in the soil sample from MW-1. Total xylenes and toluene were detected in sample MW-1 at concentrations of 1.4 and 0.79 milligrams per kilogram (mg/kg), respectively. In MW-2, BTEX were below detection limits, but TEH was detected at a concentration of 4,270 mg/kg, all reported in the range of motor oil. PCBs were also detected in soil from MW-2; Aroclor 1248 was reported detected at an estimated concentration of 1.36 mg/kg. In addition to the analyses performed by TestAmerica, samples of oil were submitted to the Alcoa Davenport Chem Lab. The oil samples submitted to the lab were from oil skimmed from the outfall within the boomed area, oil squeezed from absorbent pads, soil, and five samples of virgin oil products used in equipment in the area of the No. 4 Scalper (identified as ML-669, ML-672, ML680, ML-803, and ML-805). The oil samples were analyzed using gas chromatography and mass spectrophotometer (GS/MS) and the resulting chromatograms and mass spectra were compared. The laboratory concluded that the oil in samples collected from the pads, soil, and the outfall matched the characteristics of ML-805. ML-805 is used at the No. 4 Scalper to lubricate moving parts. A memo from the Alcoa Chem Lab is presented in Appendix A.

The 1995 CSM identified petroleum hydrocarbons (coolant) as the only potential COI at the No. 4 Scalper. A Material Safety Data Sheet (MSDS) for oil used at the No. 4 Scalper is presented in Appendix A.

2.1.2 Plate Mill Levelers (IPP-01)

This Unit includes two leveling machines identified as the No. 1 Mesta Leveler and the Continental Leveler. The levelers are located in central part of the plant site in Buildings 900 and 902. Both levelers were installed in the early 1960s and remain in operation today. The levelers range in size from 50 to 70 feet wide by 100 to 160 feet long.

Both levelers function in the same manner to remove wrinkles and distortions from heat-treated sheet by passing the sheet through a series of hydraulic rollers. Hydraulic pumps and piping for the levelers are located beside the equipment or in pits beneath the equipment. Curbing surrounds the levelers to collect drips of used hydraulic oil and convey it to pits. Each pit has a sump where the oil is pumped into a portable 500-gallon steel tank for transport to the Industrial Waste Treatment Facility (CWM-10) for disposal or reclamation. Historically, the oil was sent to the Former Industrial Waste Treatment Facility (HU-05).

The 1995 CSM identified petroleum hydrocarbons (hydraulic fluid) and PCBs as the only potential COIs at the Plate Mill Levelers; however, PCBs have never been detected in fluids tested from machinery at the unit. This is discussed further in Section 2.2.

2.1.3 Plate Mill Stretchers (IPP-02)

The Plate Mill Stretchers that comprise FSA Unit IPP-02 consist of four separate stretchers: 1) No. 7 Stretcher located in Building 902, 2) No. 8 Stretcher in Building 925, 3) No. 9 Stretcher in Building 926, and 4) No. 5 Stretcher in Building 902, also known as the 1.9 Million Pound Stretcher. The Stretchers were installed between the early 1950s and 1980 and are all still in operation. They range in size from eight to 20 feet wide by 40 to 100 feet long. Each stretcher operates in essentially the same manner. They grasp the aluminum sheets at either end and pull in opposite directions to reduce internal stress within the sheet. The Stretchers are positioned at floor level, or they are in pits that are 10-12 feet below floor level. Each Stretcher uses hydraulic systems with fluid piping located in shallow trenches or pits surrounding the Stretchers that collect any drips of hydraulic fluid. Sumps collect the hydraulic fluid from trenches and pits, and pump the oil to portable 500-gallon steel tanks. Trenches at the No. 5 Stretcher lack a sump, but the oil is periodically removed for disposal or reclamation at the Industrial Waste Treatment Facility (CWM-10) or historically, at the Former Industrial Waste Treatment Facility (HU-05).

The 1995 CSM identified petroleum hydrocarbons (hydraulic fluid) as the only potential COI at the Plate Mill Stretchers.

2.1.4 Giddings and Lewis Milling Machine (IPP-03)

The Giddings and Lewis (G&L) Milling Machine was installed in 1955 and is still in operation. It is located in the northeast corner of Building 900 in the north-central part of the plant. The machine is approximately 50 feet long by 20 feet wide and is positioned over a 2-foot deep pit. The milling machine is used to mill aluminum sheet to a specific gauge. Aluminum sheets are placed horizontally on the milling machine table, and vertical milling heads remove excess metal. Metal fines are conveyed pneumatically to a cyclone chip collector for remelting and reuse. Drips of hydraulic and lubricating oils generated during milling are collected in shallow trenches that surround the machine. The trenches gravity drain to a pit, where fluids are periodically pumped out for disposal or reclamation at the Industrial Waste Treatment Facility (CWM-10) or historically, at the Former Industrial Waste Treatment Facility (HU-05).

The 1995 CSM identified petroleum hydrocarbons (hydraulic fluid) as the only potential COI at the G&L Milling Machine.

2.1.5 No. 8 Halden Shear (IPO-07)

The No. 8 Halden Shear was installed in the north end of Building 904 in the north-central part of the plant in 1985 and is still in operation. The entire No. 8 Halden Shear is approximately 100 feet long. This shear is used to remove excess aluminum from the edges of aluminum coil. Kerosene is sprayed on the aluminum for lubrication as it passes through steel rollers near the entry to the shear. The area where kerosene is used is approximately 20 feet by 30 feet. The kerosene is stored in a 260-gallon tank located in a concrete pit below floor level. Drips of used kerosene drain to a pit beneath the eastern portion of the shear, which is approximately 5-feet wide, 15-feet long, and 8.5 feet deep. Fluids that collect within the pit are pumped out periodically for disposal or reclamation at the Industrial Waste Treatment Facility (CWM-10) or historically, at the Former Industrial Waste Treatment Facility (HU-05). A hydraulic system for this unit is located at floor level to the north of the shear. Hydraulic lines from the pumps to the shear run through a trench that drains to the same pit as the kerosene. Fluid from any leaks of hydraulic fluid is removed periodically with the kerosene. Airborne kerosene exposure has been assessed by the Davenport Industrial Hygiene Department.

The 1995 CSM identified petroleum hydrocarbons (hydraulic fluid and kerosene) as the only potential COIs at the No. 8 Halden Shear.

2.2 Equipment Group Analytical Data

In July 2000, two soil samples were collected from the area near the No. 4 Scalper and analyzed for PCBs, BTEX, and TEH as discussed in Section 2.1.1. Total xylenes and toluene were detected in sample MW-1 at concentrations of 1.4 mg/kg and 0.79 mg/kg, respectively. TEH was detected in soil sample MW-2 at a concentration of 4,270 mg/kg, all of it reported in the range of motor oil. Aroclor 1248 was also detected at an estimated concentration of 1.36 mg/kg in sample MW-2. Because no additional soil data are available, these data were used to support the qualitative analysis of the Unit Group. Other data used in the evaluation are discussed below.

Alcoa Davenport Works no longer uses any PCB-containing oils in equipment, but some systems may still contain low concentrations of residual PCBs. Oils, although commonly replaced in equipment, may become contaminated with PCBs because machinery may still have residual PCBs on interior surfaces or within piping. Davenport maintains a comprehensive program to identify and eliminate sources of residual PCBs in equipment and machinery. Fluids from over 4000 hydraulic systems and gearboxes have been tested to determine if residual PCBs are present. Where PCBs are detected, specific actions are initiated based on guidelines in the *Davenport Works PCB Management Plan* (Alcoa, 1998). If PCBs are detected at concentrations greater than 50 parts per million (ppm), the equipment is drained and refilled within 1 week, and retested after 3 months. For equipment where PCBs are detected at concentrations between 30 ppm and 49 ppm, the equipment is drained within 3 months, refilled, and retested after 3 months. Any fluids removed from equipment with PCB concentrations greater than or equal to 30 ppm is disposed off-site by incineration. For equipment with concentrations below 29 ppm, fluids are drained and refilled as part of normal maintenance activities. Fluids recovered from maintenance activities are transferred to the Industrial Waste Treatment Facility for testing and recycling or disposal.

At the Equipment Group, gearboxes, hydraulic systems, and lubrication systems were tested for PCBs in oil samples collected between 1986 and 1995. Results of this testing program for the area near Unit Group are presented in Appendix A, and results from every sample were below detection. These

data suggest that PCBs were never introduced into fluids used in machinery at the Unit Group. A summary of the number of samples collected at each unit within the group is presented below:

Number of Oil Samples from Gearbox and Hydraulic System Testing at the Equipment Unit Group, Alcoa-Davenport Works

Equipment Group Unit	Gearboxes	Hydraulic Systems	Lubrication Systems	Other
No. 4 Scalper	33	2	2	
Plate Mill Levelers	50	3		
Plate Mill Stretchers	19	15		2
G & L Milling Machine	9		1	1
No. 8 Halden Shear	20	2		
Not associated with a unit but collected in the area	33	7	1	6

As indicated in the data summary table presented in Appendix A, PCBs were not detected in any oil samples from gearboxes or hydraulic systems at the Equipment Group. Therefore, this Unit Group is not a source of residual PCBs.

2.3 Proximity and Relationship to Surrounding Units

The Equipment Group (shown on Figure 2-2) is located inside plant buildings in the north-central part of the facility. The closest adjacent units are the Former Caustic Etch Area (HU-16), the 220-Inch Mill (IPH-01), and the No. 8 & 9 Vertical Heat Treatment Furnaces (IPH-09). The Caustic Etch Area was evaluated in the pH Group RBC Report (IT, 2000a), and the No. 8 & 9 Vertical Heat Treat Furnaces were evaluated in the Furnace Group RBC Report (ICF Kaiser, 1999a). The 220-Inch Mill will be addressed in the Hot Lines Unit Group RBC Report.

The Storm Sewer System (FSA Unit CWM-07) services each of the units in the Equipment Group and passes beneath or near each piece of equipment. The portions of the Storm Sewer System that service Equipment Group Units flow to the lift stations above NPDES Outfalls 003, 004, and 006. Historically, constituents entering the Storm Sewer System (with storm water, or through infiltration) could have reached the outfalls and impacted surface water or sediments. Currently, storm water is pumped from lift stations on each outfall to the Water Reclamation Plant for treatment; however, during storm events the lift stations may be overcome, and some storm water may flow through NPDES outfall ditches toward the Mississippi River. The No. 4 Scalper appears to be located above the historical course of Outfall 006. Outfall 006 was relocated to its current location in the late 1960's. At that time, the old channel was filled in prior to construction of the eastern end of the plant.

There are no known or expected impacts to environmental media beneath this Unit Group from surrounding FSA units. Constituents associated with the Storm Sewer were addressed in the Sewer Group RBC Report, and constituents associated with Outfalls 003, 004, and 006 will be addressed in the Outfall Group RBC Report. Groundwater issues are being addressed by the Groundwater RI/FS, and are discussed further in Section 2.6.

2.4 Physical and Chemical Properties of COIs (Constituent Characterization)

Petroleum hydrocarbons were identified as potential COIs in the FSA and CSM because these comprise the coolant (used only at the No. 4 Scalper), hydraulic fluids, and lubricants (including kerosene) used at the units. Determining the exact chemical properties of kerosene and hydraulic fluid is difficult because each substance is a mixture of petroleum hydrocarbons, and many different proprietary formulations hydraulic fluid are on the market. MSDSs are available for each formulation sold by manufacturers; however, these tend to be non-specific because of the proprietary nature of the fluid composition. A brief description of these oils, their general constituent composition, and toxicological information are provided below.

Hydraulic and lubricating oils, which were used at all of the units of the Equipment Group, are heavy end petroleum distillates comprised principally of n-alkanes and cycloalkanes, with a typical carbon range of C_{18} to C_{34}+, and with very low concentrations (>0.1%) of aromatics [Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG), 1998]. Because hydraulic and lubricating oils are not exposed to combustion sources (as with used motor oil), even used oils contain very low levels of polynuclear aromatic hydrocarbons (PAHs). An MSDS (see Appendix A) for a fire resistant hydraulic fluid (Monsanto, 1997) indicates the hydraulic fluid is not carcinogenic, but acute noncarcinogenic effects from direct contact included irritation to the eyes and respiratory system. The TPHCWG (1997a) recommended an oral reference dose (RfD) of 2.0 mg/Kg/day for the >C_{16} to C_{35} alkane fraction, overwhelmingly the predominant component of these oils. The Massachusetts Department of Environmental Protection [MADEP (1994)] recommended a proposed oral RfD of 6.0 mg/Kg/day for the C_{19} to C_{32} alkane/cycloalkane fraction, with eicosane as a reference compound.

Standard hot rolling coolants are used at the No. 4 Scalper, and are 5 to 10 percent emulsions of a formulated soluble oil. The remaining 90 to 95% of the coolant is deionized water. The oil phase is typically a base oil, a fatty ester and a fatty acid. Amine soaps are added as an emulsifier, and blooming agents (hexylene glycol or diethylene glycol) are added at low concentrations to assist in emulsification.

Usually an oxidation inhibitor, a corrosion inhibitor, and other additives are used. For additional information on Hot Mill Coolants, see the correspondence presented in Appendix A from Thomas J. Kasun (Surface Technology Division, Alcoa Technical Center) to Anthony Sturtzer (Alcoa-Davenport Works). The toxicity of this mixture for risk assessment purposes is not known but the mixture adheres to FDA regulations for surface lubricants used in manufacture of metallic articles (subsection 21 CFR 178.3910), carcinogenicity, and California's Proposition 65 (Alcoa, 1997). The MSDS for oil used at the No. 4 Scalper indicates that prolonged or frequent exposure may be mildly irritating to the skin and eyes, and possible irritation to the respiratory system may occur with prolonged or frequent exposure. The MSDS describes the soluble oil (coolant) used at the No. 4 Scalper as a clear amber liquid with a specific gravity of 8.3.

Kerosene is sprayed on aluminum sheet at the Halden Shear to lubricate the shear blade. Kerosene is a middle distillate petroleum fraction comprised principally of aliphatics, including cycloalkanes and n-alkanes with lower concentrations of monoaromatics and branched alkanes (TPHCWG, 1998). The carbon fraction range for kerosene is from approximately C_8 to C_{16}. The kerosene fraction contains very low concentrations of the more hazardous aromatic hydrocarbon constituents such as benzene, toluene, ethyl benzene and xylenes (BTEX) and PAHs, and therefore is generally considered to be of relatively low toxicity (TPHCWG, 1997b). An MSDS for kerosene (Marathon Petroleum, 1992) lists a specific gravity of 0.8, and describes kerosene as a clear or amber-colored liquid, with an odor of fuel oil. The MSDS (presented in Appendix A) indicates that kerosene is not carcinogenic, but direct contact may cause irritation of the skin or dermatitis. An Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) of 2000 mg/m^3 was provided to OSHA by the manufacturer. However, the National Institute of Occupational Safety and Health (NIOSH) has a recommended exposure limit of 100 mg/m^3 for a 10-hour time-weighted average.

Although EPA's Integrated Risk Information Service (IRIS, 2000) does not have a verified RfD for kerosene, both MADEP (1994) and the TPHCWG (1997a) developed recommended toxicity information on the middle range distillate carbon chain length. TPHCWG (1997a) recommended an oral RfD of 0.1 mg/Kg/day and an inhalation RfD of 1 mg/Kg/day for the C_8 to C_{16} alkane fraction, and a recommended oral RfD of 0.04 for the C_8 to C_{16} aromatic fraction. MADEP (1994) recommended a proposed RfD of 0.6 mg/Kg/day, for the C_9 to C_{18} alkane/cycloalkane fraction with n-Nonane as a reference compound. For the small aromatic fraction (C_9 to C_{32}) present in kerosene, MADEP (1994) recommends a proposed RfD of 0.03 mg/Kg/day with pyrene as a reference compound.

2.5 Selection of COIs and COPCs

There has been only one subsurface investigation conducted at units that comprise the Equipment Group. Because few analytical data are available for subsurface soil below Equipment Group units, COIs were primarily evaluated based on process knowledge of the oil and oil mixtures used at this unit and toxicology of the primary constituents of the oils. The available data points were used to support the qualitative evaluation of the Unit Group.

Potential COIs listed in the 1992 FSA and 1995 CSM include petroleum hydrocarbons identified for each unit within the group, PCBs identified for the Plate Mill Levelers (FSA Unit IPP-01), and kerosene identified for the No. 8 Halden Shear (FSA Unit IPO-07). PCBs have been identified as contaminants in some hydraulic system fluids at the plant; however, analytical results from oil samples collected from hydraulic systems and gearboxes indicate that residual PCBs are not present in machinery within the Equipment Group. This suggests that machinery at the Equipment Group never contained fluids that were contaminated with PCBs. However, Aroclor 1248 was detected in one subsurface soil sample collected near the No. 4 Scalper at an estimated concentration of 1.36 mg/kg, which is slightly above the Region IX PRG for industrial soil (1.0 mg/kg). Therefore, Aroclor 1248 was selected as a COPC for the Equipment Group.

Total xylenes were detected in one soil sample collected at the No. 4 Scalper, but the detected concentration (1.4 mg/kg) was well below the Region IX PRG for industrial soil (210 mg/kg). A low level of toluene was also detected in one soil sample collected near the No. 4 Scalper, but the detected concentration (0.79 mg/kg) is well below the Region IX PRG for industrial soil (520 mg/kg). Therefore, total xylenes and toluene were not retained as COPCs for further evaluation in the risk evaluation.

Although petroleum hydrocarbons and kerosene were identified as potential COIs in the 1992 FSA and 1995 CSM, these are not identified as COPCs for risk assessment primarily because there is very low potential for contacting them in environmental media. If an excavation project were to occur, contact would be minimized and controlled through the established Digging Permit procedures at the Alcoa-Davenport plant. However, even in the unlikely event that uncontrolled contact with subsurface soil potentially containing hydraulic fluids and heavy oils were to occur, the constituents that comprise the oils pose low risk from human exposure. EPA Region IX does not have a PRG for heavy-end lubricating and hydraulic oil-derived contaminated soils. However, using the toxicity information presented above for the various petroleum fractions present, and using the EPA Region IX risk-based methodologies (the equations and assumptions used by Region IX to derive PRGs – see Appendix B),

equivalent industrial soil PRGs for the heavy oils used at all of these units could be calculated. These oils are made up of large molecular weight (>200 MW) hydrocarbons of low volatility. Using the MADEP and TPHCWG derived RfDs for the predominant carbon fractions making up heavy lubricating and hydraulic oils, the following equivalent industrial soil PRGs would be calculated:

Derived Soil PRGs for Lubricants and Hydraulic Fluids Used at the Equipment Group Alcoa-DavenportWorks			
Constituent Type	**Carbon Fraction Range**	**Derived RfD**	**Equivalent Region IX Industrial Soil PRG**
MADEP (1994)			
Alkanes/cycloalkanes	C_{19} to C_{32}	6.0	> 1,000,000 mg/Kg[(a)]
TPHCWG (1997a)			
Alkanes/cycloalkanes	C_{19} to C_{32}	2.0	>1,000,000 mg/Kg[(a)]

(a) Dermal absorbance for SVOCs (0.1) per EPA Region IX (1999); VF for eicosane (C20) of 2.54E+09 kg/m^3 (TPHCWG, 1997b).

↳ default value used by Region 9 for organics

These industrial soil PRGs suggest that daily exposure to free oils would be required before there would be an unacceptable risk for contact by an industrial worker. Potential risks would be substantially lower for infrequent contact as would occur for subsurface soils under the concrete. Therefore, assuming a historical release of lubricating oils from the Equipment Unit Group units has occurred, the heavy hydraulic and lubricating oils associated with the units under the Equipment Group, absent any other contaminants (i.e., PCBs), would pose very little risk for direct contact under industrial land use.

For kerosene at the No. 8 Halden Shear, equivalent industrial soil PRGs can be calculated for the middle-range distillate alkane hydrocarbon fraction that comprises much of kerosene's composition. Industrial soil PRGs were calculated for the C_9 to C_{18} alkane fraction using both MADEP (1994) and TPHCWG (1997a) recommended RfDs and applying assumptions of n-nonane volatility to the entire fraction. In order to account for the small proportion of aromatic hydrocarbon fraction that may be associated with kerosene, the PRGs for fluorene (C_8 to C_{16}) and pyrene (C_{16} to C_{35}) are included in the table below.

Derived Soil PRGs for Middle Distillate Hydrocarbons Used at the Equipment Group Alcoa-Davenport Works			
Constituent Type	**Carbon Fraction Range**	**Derived RfD**	**Equivalent Region IX Industrial Soil PRG**
MADEP (1994)			
Alkanes/cycloalkanes	C_9 to C_{18}	0.6	11,000 mg/Kg[(a)]
Aromatics	C_9 to C_{32}	0.03	54,000 mg/Kg[(b)]

Derived Soil PRGs for Middle Distillate Hydrocarbons Used at the Equipment Group Alcoa-Davenport Works (continued)			
TPHCWG (1997a)			
Alkanes/cycloalkanes	C_9 to C_{18}	0.1 (oral) 1.0 (inhalation)	16,000 mg/Kg[(a)]
Aromatics	C_8 to C_{16}	0.04	33,000 mg/Kg[(c)]
	C_{16} to C_{35}	0.03	54,000 mg/Kg[(b)]

(a) Conservative VF for n-nonane (2.87E-04 m^3/Kg; TPHCWG, 1997b).
(b) PRG for pyrene (EPA Region IX, 1999).
(c) PRG for fluorene (EPA Region IX, 1999).

EPA Region IX PRGs incorporate a conservative component for inhalation of volatiles, and the greater potential volatility of these constituents (in comparison to the heavy-end hydraulic and lubricating oils) results in industrial soil PRGs that range from approximately 11,000 to 16,000 mg/Kg. However, there is low potential for contacting subsurface soils at the No. 8 Halden Shear. If a future repair or construction project were carried out in this area, the Digging Permit program would require sampling and analysis of subsurface soils to determine the level of protection required to handle this medium. There is the potential for kerosene, if present below the concrete floor, to be released to air, and the Davenport Industrial Hygiene Department has performed periodic assessments of airborne kerosene.

2.6 Release Mechanisms, Migration Pathways and Exposure Pathways

Sources of petroleum hydrocarbons at the Equipment Group are similar for each unit. Hydraulic fluid, coolant (used only at the No. 4 Scalper), and kerosene (used only at the No. 8 Halden Shear) are used in machinery and collected in pits, trenches, and sumps below the equipment. Due to the nature of their use, hydraulic fluids are contained in closed systems to provide the necessary pressure to perform work. Because the fluids are in a pressurized system, hydraulic lines can leak if a line is ruptured. The machinery at Davenport makes extensive use of hydraulic systems to manipulate heavy objects such as aluminum sheet and plate. The design of equipment and machinery generally anticipate that hydraulic fluid leaks can occur.

As these fluids are integral to the processes performed in these units, management systems are in place to contain, treat, recycle, or dispose of the used fluids. The used fluids drain to sumps, which are periodically pumped out, and transported to the Industrial Waste Treatment Facility for testing and recycling or disposal. There is little direct evidence of a release of hydraulic fluids or lubricants to subsurface soil, but there is a potential for isolated pockets of oil to be present in subsurface soil below equipment sumps. However, if a release did occur, there are no complete exposure pathways with subsurface soil because the ground surface is covered by concrete. Therefore, the potential presence of

these fluids in subsurface soil would not pose a risk to human health or the environment under current conditions. Figure 2-3 illustrates the conceptual model for potential oil migration at the Equipment Group.

Oil used in the process could potentially leak through cracks in the concrete pits and trenches, or from subsurface piping. Oil released in this manner would enter the subsurface soil beneath the floor of the building. Middle distillates and heavy oils are more viscous than water, and migration through subsurface soil is relatively slow (EPA, 1996b). Once in subsurface soil, oil would likely sorb onto subsurface soil and remain immobile beneath the floor of the plant. Over time, the oil would be expected to degrade. Remaining free oil, if mobile, could potentially migrate into the Storm Sewer lines or into groundwater. Oil entering the Storm Sewer System would flow to lift stations, where water is pumped to the Water Reclamation Facility for treatment. Insoluble oil entering the groundwater system could migrate downgradient as a separate phase, or soluble oils within groundwater in the dissolved phase. No oil has been observed on the groundwater surface in wells and piezometers along the eastern facility boundary (IT, 2000b).

There is no routine exposure to groundwater beneath the Unit Group because groundwater is not used or encountered during normal operations at this Unit Group. If insoluble oil was present in the subsurface and came in contact with groundwater, it would be expected to be present as separate phase. It is believed that the unconsolidated zone is not saturated with groundwater in this area of the plant, so the shallow bedrock zone is the uppermost groundwater horizon. Results of the Groundwater RI indicate that a groundwater divide exists in shallow bedrock groundwater under the eastern end of the plant. West of the divide groundwater flows west with a downward vertical gradient, and east of the divide groundwater flows east toward NPDES Outfall 006 and the eastern facility boundary. The only Equipment Group unit believed to be located east of the groundwater divide is the No. 4 Scalper. A conservative off-site groundwater exposure pathway is being evaluated for the eastern end of the plant as part of the Baseline Risk Assessment (IT, 2000b).

Some of the petroleum hydrocarbons used at the Equipment Group are vaporized or atomized to mists during use in the aluminum milling process. These vapors and mists are managed using fume exhaust systems located on the roof. Condensation upon discharge to atmosphere leaves an oil residue on the roof, some of which may be carried to the Storm Sewer System (FSA Unit CWM-07) with storm water runoff. Water from the Storm Sewer System flows to lift stations where it is pumped to the Water Reclamation Facility for treatment. During storm events, the lift station pumps occasionally are

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overcome, and water can be released to NPDES Outfalls. This potential pathway was addressed in the Sewer Group RBC Report (ICF Kaiser, 1998), or will be addressed in the Outfall Group RBC Report.

This entire Unit Group is within buildings where ground surface is concrete. The trenches, pits and sumps where petroleum hydrocarbons are managed are also constructed of concrete. Environmental media beneath the Unit Group could only be contacted if the floor were removed during a construction project or excavation for repairs or maintenance. However, review of Digging Permit records indicate that the only intrusive excavation that has occurred in the area of the Unit Group since the inception of the program is the soil sampling and well installation at the No. 4 Scalper in July 2000. This suggests that contact with environmental media below the Unit Group is occurring only rarely.

3.0 QUALITATIVE EXPOSURE ASSESSMENT

Each unit within the group is a piece of machinery used in producing aluminum plate and sheet. Based on unit information and process knowledge, no direct evidence of subsurface contamination has been identified, but the potential exists for petroleum hydrocarbons (primarily as heavy oils) to have migrated beneath the plant floor. Potential primary sources of leaks or spills from materials stored or activities conducted at this Unit Group may have included: 1) leaks of lubricating and hydraulic oils from supply lines through cracks in concrete to soil beneath the floor of the plant, 2) leaks of lubricating and hydraulic oils from concrete pits, sumps, or trenches beneath equipment to underlying soil, and 3) vaporized oil, which is managed by a fume exhaust system located on the roof.

Based on analytical data from the gearbox and hydraulic system testing program, there are no PCBs in petroleum hydrocarbons used in machinery at the Unit Group, so there is no known source of residual PCBs that could have migrated to subsurface soils. Based on the results of soil sampling at the No. 4 Scalper, PCBs may be present in subsurface soil at low concentrations. The No. 8 Halden Shear uses kerosene for lubrication as part of routine activities, and each unit within the group uses petroleum hydrocarbons (as lubricating oils or hydraulic oils) in industrial equipment. No other potential sources of contamination have been identified at the Unit Group.

Because the ground surface at the Unit Group is within buildings with concrete floors, no routine exposure to soil is possible. Episodic exposure to subsurface soil may occur if the floors are removed and soils are excavated to repair utility lines or for construction work. However, based on records from the Digging Permit Program, intrusive repair or construction work has been conducted at units within the group only once since the inception of the program, so the potential for even occasional exposure to soil beneath the floor is very low. Even if excavation did occur in these areas, due to the nature of the constituents present in these oils, there would be no unacceptable risk from human contact with contaminated soils.

3.1 Qualitative Risk Evaluation

Unit information, soil data, and process knowledge were used to identify the nature and type of constituents present and their hazards if an environmental release of oils from these units did occur. Results from soil sampling and the Alcoa gearbox-oil sampling database suggests that the oils used in this equipment did not contain PCBs, nor was it cross-contaminated from other equipment. Thus, if a release

were to occur, the release would be associated only with the constituents commonly found in process oils (lubricating oils, cutting oils and/or hydraulic oils) used at each unit of this Unit Group. In addition to lubricating and hydraulic oils, hot-rolling oil coolants are used at the No. 4 Scalper, and kerosene is used for lubrication at the No. 8 Halden Shear.

3.1.1 Lubricating and Hydraulic Oils – All Units

The lubricating and hydraulic oils used in all of the units of the Equipment Group are principally derived from high range petroleum distillates. These oils contain complex mixtures of various compounds that have been organized into carbon fractions where various ranges are grouped based on similarity in toxicity and fate and transport properties (MADEP, 1994; TPHCWG, 1997a, 1997b, 1998). The constituents that are typically found in lubricating and hydraulic oils are the alkanes and cycloalkanes with a carbon range of C_{18} to C_{34}. There are also very low levels of aromatic compounds (generally less than 1%). Although only a few analytical data points are available for soils, and EPA Region IX tables do not have published values for petroleum distillates, industrial PRGs for soil can be derived for the heavy-end oils that are used at all of these units using EPA Region IX methodologies (1999). The soil PRGs for the larger chain carbon fraction alkanes and cycloalkane compounds are estimated to be greater than 1,000,000 mg/kg. These derived soil PRGs suggest that even full-time worker exposure to free oil would not pose unacceptable risk. Site-specific RBCs for an excavation-repair worker scenario would even be substantially higher for the hydraulic and lubricating oils used at units within the Equipment Group.

3.1.2 Hot-Rolling Oil Coolant – No. 4 Scalper

Standard hot rolling coolants are used at the No. 4 Scalper, and are 5 to 10 percent emulsions of a formulated soluble oil of a base oil, fatty ester, and a fatty acid. The remaining 90 to 95% of the coolant is deionized water. Amine soaps are added as an emulsifier, and blooming agents (hexylene glycol or diethylene glycol) are added at low concentrations to assist in emulsification. Although the specific toxicity of this mixture is not known, it adheres to FDA regulations for surface lubricants used in manufacture of metallic articles (subsection 21 CFR 178.3910), carcinogenicity, and California's Proposition 65 (Alcoa, 1997). From an industrial hygiene perspective, worker exposure to this type of oil is unlikely to be associated with adverse health effects except possibly for dermatitis from frequent, chronic contact. Infrequent, hypothetical contact by an excavation worker to hot-rolling oil released to subsurface soil is likely to be acceptable.

3.1.3 Kerosene – No. 8 Halden Shear

The constituents that are typically found in kerosene are the alkanes and cycloalkanes with a carbon range of C_8 to C_{16}. There are also trace levels of aromatics also found in kerosene but very low levels of the more hazardous aromatic compounds (BTEX and PAHs). Estimated industrial soil PRGs for kerosene based on MADEP (1994) and TPHCWG (1997a) and using EPA Region IX methodologies range from 11,000 to 16,000 mg/kg. There are no complete exposure pathways with subsurface soil, and kerosene may not have been released to this medium at the Halden Shear. However, under a digging scenario such as the repair or construction worker, site-specific RBCs for kerosene would be substantially higher. The Digging Permit program would ensure that analytical data for subsurface soils would be collected prior to implementation of any excavation.

No unacceptable risk has been identified for the Equipment Group based on the qualitative analysis primarily because there are no complete exposure pathways, and potential risks due to future excavation activities would be managed using the Alcoa-Davenport Digging Permit Program. The Digging Permit Program would require that samples be collected to aid in selection of protective equipment for excavation activities and appropriate soil disposal options.

3.1.4 PCBs – No. 4 Scalper

Results of gearbox and hydraulic system testing indicate that PCBs are not present in machinery used at the Equipment Group, but Aroclor 1248 was detected in one subsurface soil sample collected adjacent to the No. 4 Scalper. The maximum detected value (an estimated concentration of 1.36 mg/kg) is slightly above the Region IX PRG for industrial soil (1.0 mg/kg), so Aroclor 1248 was retained for further qualitative evaluation. RBCs for Aroclor 1248 under the excavation-repair worker scenario were developed for previous risk evaluations at the site, including the Master RBC Analysis (ICF Kaiser, 1999b), which re-evaluated past FSA units for various exposure scenarios from the 1995 AOC.

Repair worker RBCs for carcinogenic endpoints with target cancer risks of 10^{-4} and 10^{-6} were calculated at 47 mg/kg and 4700 mg/kg, respectively. The repair worker RBC for Aroclor 1248 for non-carcinogenic endpoints was 673 mg/kg. Comparing the maximum detected value for Aroclor 1248 from the No. 4 Scalper (1.36 mg/kg) with the RBCs for Aroclor 1248, the concentrations in soil are well below all of the calculated RBCs. This suggests that concentrations of Aroclor 1248 in soil at the No. 4 Scalper do not pose an unacceptable risk under the excavation repair worker scenario.

3.2 Uncertainty Analysis

Uncertainties are an inherent part of evaluating risk. Alcoa acknowledges that uncertainties associated with this qualitative unit evaluation are high given the amount of environmental data available for the Unit Group. However, Alcoa also believes that these uncertainties are not significant given the nature of the units, the types of oils present, and the analytical data from the testing program used to identify PCBs in equipment fluids.

Results from hydraulic system and gearbox testing suggest that no sources of residual PCBs are present at the Unit Group. Soil data from the No. 4 Scalper helps to establish that PCBs are not present at levels of concern in subsurface soil; however, it is suspected that isolated pockets of petroleum hydrocarbons may be present in subsurface soil beneath the Equipment Group. The lack of additional subsurface soil data represents a data gap for evaluation of the Equipment Group, but not a significant gap. Currently, there are no complete exposure pathways with subsurface soil, and the Digging Permit Program would control exposure if future excavation activities were carried out in this area. Furthermore, the nature of the contaminants (petroleum-derived lubricating, cutting, and hydraulic oils) suggests that incidental direct contact with oils through an excavation scenario would not pose an unacceptable risk.

3.3 Conclusion

No unacceptable risks were identified for the Equipment Unit Group, primarily because no complete exposure pathways were identified. This conclusion is discussed further in the Unit Recommendation Memo to be presented in Appendix C.

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FIGURES

J:\PROJECTS\ALCOA\DAVENPORT\FIG2-1.apr

Approximate Boundary of the Alcoa Property

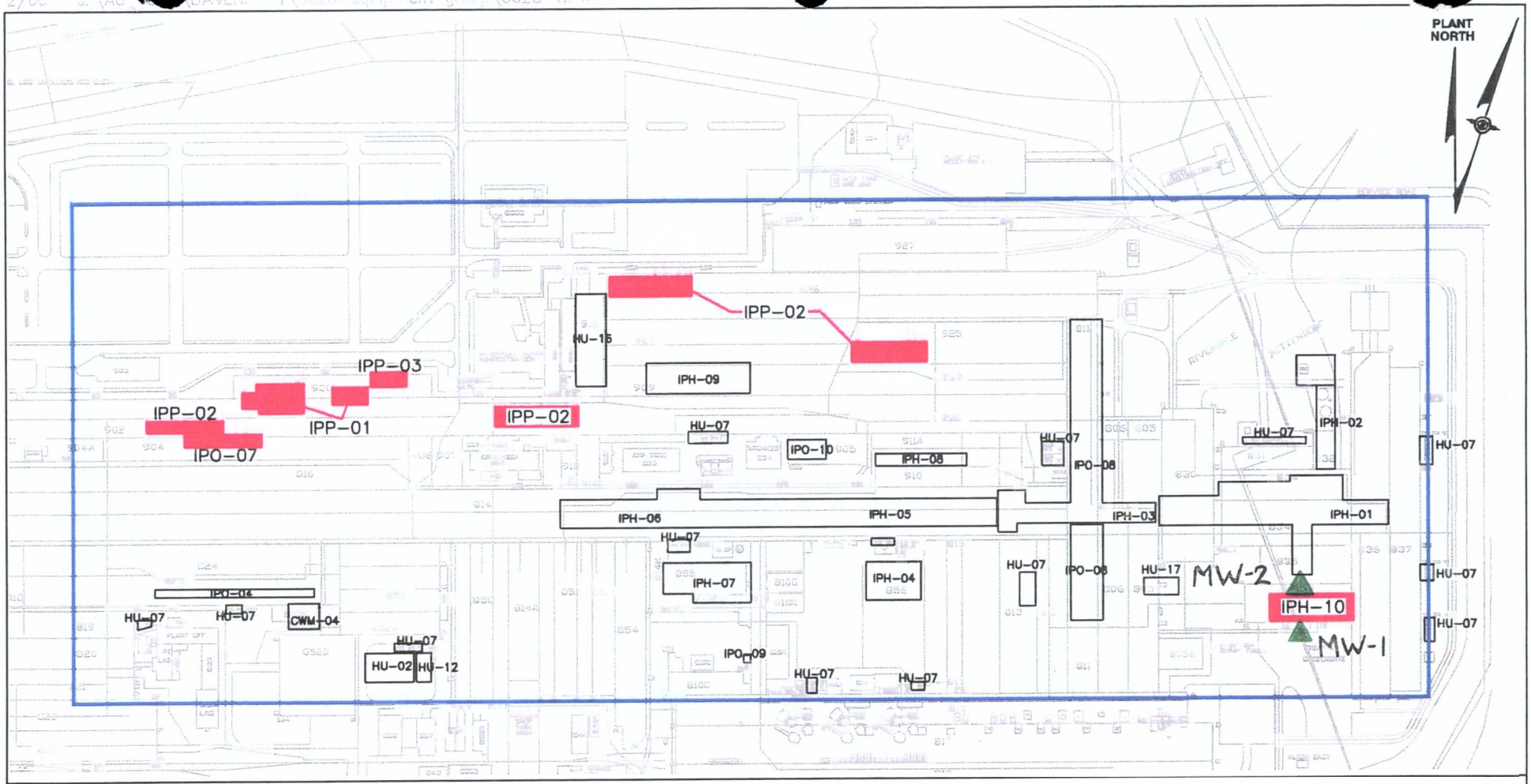
500 0 500 Feet

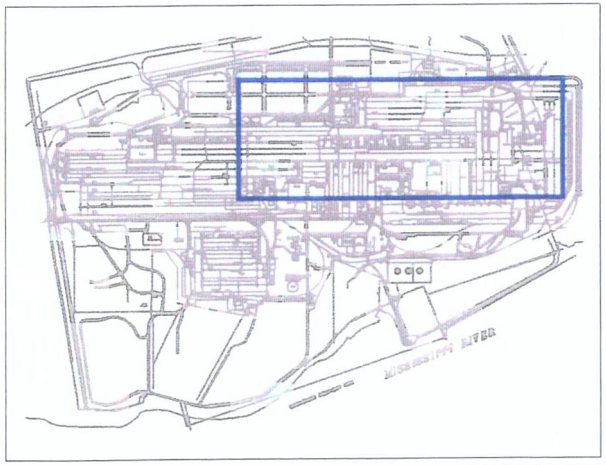
Location and Physical Setting of Alcoa - Davenport Works

Alcoa, Davenport Works
Riverdale, Iowa

Project: 120028	By: JMA	Figure 2-1
Date: 6/21/00	Checked: AJW	

MFG, Inc.
consulting scientists and engineers





LEGEND:

IPH-10	#4 Scalper (Bldg. 833)
IPP-01	Plate Mill Levellers
IPP-02	Plate Mill Stretchers
IPP-03	Giddings & Lewis Milling Machine
IPO-07	#8 Halden Shear

Industrial Process Unit included in Equipment Unit Group

Soil Sample Location

SCALE

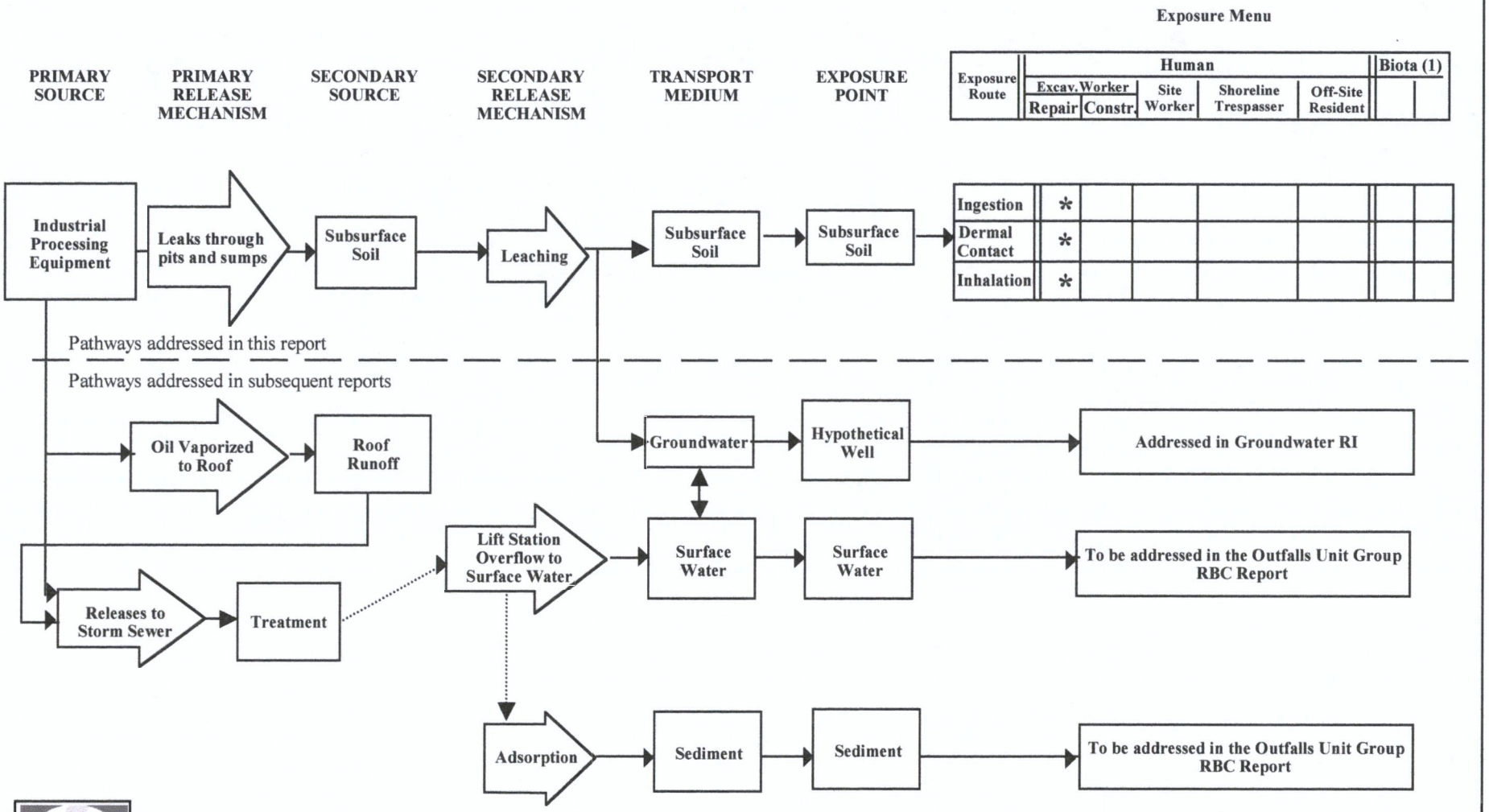
400 0 400 FEET

LOCATION OF EQUIPMENT UNIT GROUP

Alcoa-Davenport Works
Riverdale, Iowa

Project No. 120028	By: M.W.	**Figure 2-2**
Date: 2/9/00	Checked:	

MFG, Inc.
environmental consulting and engineering services



1. No ecological habitat was identified. No further ecological evaluation will be performed.

Fluids used at the Equipment Group do not contain PCBs.

M F G consulting scientists and engineers

ALCOA

Figure 2-3. Unit Conceptual Model for Potential Oil Migration at the Equipment Unit Group, Alcoa-Davenport Works, Riverdale, Iowa

Appendix A
Summary of Unit Information for the Equipment Unit Group
Alcoa-Davenport Works
Riverdale, Iowa

Summary of Gearbox and Hydraulic System Testing
Equipment Group RBC Report
Alcoa-Davenport Works
Riverdale, Iowa

Table A-1. Summary of Gearbox and Hydraulic System Testing
Equipment Group RBC Report
Alcoa-Davenport Works

Sample ID	Description	Location	FSA Unit #	Test Date	PCB Result
HL-4SCP-GB01		#4 SCALPER	IPH-10	03/23/93	ND
HL-4SCP-GB02	4 SCALPER GB02	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB03	4 SCALPER GB03	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB04	4 SCALPER GB04	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB05	4 SCALPER GB05	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB06	4 SCALPER GB06	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB07	4 SCALPER GB07	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB08	4 SCALPER GB08	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB09	4 SCALPER GB09	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB10	4 SCALPER GB10	#4 SCALPER	IPH-10	03/23/93	ND
HL-4SCP-GB11	4 SCALPER GB11	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB12	4 SCALPER GB12	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB13	4 SCALPER GB13	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB14	4 SCALPER GB14	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB15	4 SCALPER GB15	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB16	4 SCALPER GB16	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB17	4 SCALPER GB17	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB18	4 SCALPER GB18	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB19	4 SCALPER GB19	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB20	4 SCALPER GB20	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB21	4 SCALPER GB21	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB22	4 SCALPER GB22	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB23	4 SCALPER GB23	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB24	4 SCALPER GB24	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB25	4 SCALPER GB25	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB26	4 SCALPER GB26	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB27	4 SCALPER GB27	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB28	4 SCALPER GB28	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB29	4 SCALPER GB29	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB30	4 SCALPER GB30	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB31	4 SCALPER GB31	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB32	4 SCALPER GB32	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-GB33	4 SCALPER GB33	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-HY01	4 SCALPER HY01	#4 SCALPER	IPH-10	06/25/92	ND

Table A-1. Summary of Gearbox and Hydraulic System Testing
Equipment Group RBC Report
Alcoa-Davenport Works

Sample ID	Description	Location	FSA Unit #	Test Date	PCB Result
HL-4SCP-HY02	4 SCALPER HY02	#4 SCALPER	IPH-10	06/25/92	ND
HL-4SCP-LU01	4 SCALPER SPINDLE LUBE	#4 SCALPER	IPH-10	01/23/92	ND
HL-4SCP-LU02	4 SCALPER WAY LUBE SYSTEM	#4 SCALPER	IPH-10	01/23/92	ND
IP-3SCA-GB01	3 SCALPER GEARBOX 01	#3 SCALPER	NA	06/03/92	ND
IP-3SCA-GB02	3 SCALPER GEARBOX 02	#3 SCALPER	NA	06/03/92	ND
IP-3SCA-GB03	3 SCALPER GEARBOX 03	#3 SCALPER	NA	06/03/92	ND
IP-3SCA-HY01	3 SCALPER HYDRAULIC 01	#3 SCALPER	NA	06/03/92	ND
IP-3SCA-HY02	3 SCALPER HYDRAULIC 02	#3 SCALPER	NA	06/03/92	ND
PM-1MES-GB01	1 MESTA LEVELER GB LUBE	#1 MESTA LEVELER	IPP-01	11/18/86	ND
PM-1MES-GB01	1 MESTA LEVELER GB LUBE	#1 MESTA LEVELER	IPP-01	03/04/92	ND
PM-1MES-GB02	1 MESTA MAIN T-ROLL GB EAST	#1 MESTA LEVELER	IPP-01	04/03/92	ND
PM-1MES-GB03	1 MESTA T-ROLL REDUC. GB EAST	#1 MESTA LEVELER	IPP-01	04/03/92	ND
PM-1MES-GB04	1 MESTA MAIN T-ROLL GB WEST	#1 MESTA LEVELER	IPP-01	04/03/92	ND
PM-1MES-GB05	1 MESTA REDUCTION GB WEST	#1 MESTA LEVELER	IPP-01	04/03/92	ND
PM-1MES-GB06	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB07	1 MESTER LEVELER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB08	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB09	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB10	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB11	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB12	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB13	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB14	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB15	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB16	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB17	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB18	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB19	1 MESAT LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB20	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB21	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB22	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB23	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB24	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB25	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND

Table A-1. Summary of Gearbox and Hydraulic System Testing
Equipment Group RBC Report
Alcoa-Davenport Works

Sample ID	Description	Location	FSA Unit #	Test Date	PCB Result
PM-1MES-GB26	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/16/92	ND
PM-1MES-GB27	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB28	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB29	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB30	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB31	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB32	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB33	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB34	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB35	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB36	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB37	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-GB38	1 MESTA LEVELLER	#1 MESTA LEVELER	IPP-01	09/17/92	ND
PM-1MES-HY01	1 MESTA LEVELER MAIN HYD	#1 MESTA LEVELER	IPP-01	04/03/92	ND
PM-2MES-GB01	2 MESTA LEVELER	#2 MESTA LEVELER	IPP-01	04/06/92	ND
PM-2MES-GB02	2 MESTA ENTRY T-ROLL GB	#2 MESTA LEVELER	IPP-01	04/06/92	ND
PM-2MES-GB03	2 MESTA ENTRY T-ROLL MAIN	#2 MESTA LEVELER	IPP-01	04/03/92	ND
PM-2MES-GB04	2 MESTA ENTRY REDUCTION GB	#2 MESTA LEVELER	IPP-01	04/06/92	ND
PM-2MES-GB05	2 MESTA EXIT T-ROLL GB	#2 MESTA LEVELER	IPP-01	04/06/92	ND
PM-2MES-GB06	2 MESTA EXIT MAIN T-ROLL	#2 MESTA LEVELER	IPP-01	04/06/92	ND
PM-2MES-GB07	2 MESTA EXIT REDUCTION	#2 MESTA LEVELER	IPP-01	04/06/92	ND
PM-2MES-HY01	2 MESTA LEVELER	#2 MESTA LEVELER	IPP-01	04/06/92	ND
PM-CONT1-GB01	CONTINENTAL LEVELER PINION	CONTINENTAL LEVELER	IPP-01	04/28/92	ND
PM-CONT2-GB01	CONTINENTAL LEVELER PINION	CONTINENTAL LEVELER	IPP-01	04/28/92	ND
PM-CONT-GB01	CONTINENTAL LEVELER PINION	CONTINENTAL LEVELER	IPP-01	04/03/92	ND
PM-CONT-GB01	PINION STAND	CONTINENTAL LEVELER	IPP-01	04/29/92	ND
PM-CONT-GB02	CONTINENTAL-ENTRY BELT DRIVE	CONTINENTAL LEVELER	IPP-01	04/03/92	ND
PM-CONT-GB03	CONTINENTAL-EXIT BELT DRIVE	CONTINENTAL LEVELER	IPP-01	04/03/92	ND
PM-CONT-HY01	CONTINENTAL LEVELER	CONTINENTAL LEVELER	IPP-01	04/03/92	ND
PM-3MIL-BR01	SPINDLE LUBE SYSTEM	#3 INGERSOL MILLING	NA	04/03/92	ND
PM-3MIL-LU01	WAY LUBE N.	#3 INGERSOL MILLING	NA	06/25/92	ND
PM-5STR-GB01	HYD PUMP GEARBOX EAST	#5 STRETCHER	IPP-02	04/03/92	ND
PM-5STR-GB02	HYD PUMP GEARBOX WEST	#5 STRETCHER	IPP-02	04/03/92	ND
PM-5STR-HY01	5 STRETCHER RETURN HYD	#5 STRETCHER	IPP-02	04/03/92	ND
PM-5STR-HY02	5 STRETCHER MAIN HYD	#5 STRETCHER	IPP-02	04/03/92	ND

Table A-1. Summary of Gearbox and Hydraulic System Testing
Equipment Group RBC Report
Alcoa-Davenport Works

Sample ID	Description	Location	FSA Unit #	Test Date	PCB Result
PM-7STR-BR01	EAST MOTOR BEARING	#7 STRETCHER	IPP-02	05/07/92	ND
PM-7STR-BR02	WEST MOTOR BEARING	#7 STRETCHER	IPP-02	05/07/92	ND
PM-7STR-GB01	7 STR EAST HYD PUMP GB	#7 STRETCHER	IPP-02	05/07/92	ND
PM-7STR-GB02	7 STR WEST HYD PUMP GB	#7 STRETCHER	IPP-02	05/07/92	ND
PM-7STR-HY01	AUX. HYD. TAILSTOCK	#7 STRETCHER	IPP-02	04/03/92	ND
PM-7STR-HY03	DECOMPRESSION HYD.	#7 STRETCHER	IPP-02	04/03/92	ND
PM-8STR-GB01	8 STRETCHER	#8 STRETCHER	IPP-02	09/15/92	ND
PM-8STR-GB02	8 STRETCHER	#8 STRETCHER	IPP-02	09/15/92	ND
PM-8STR-GB03	8 STRETCHER	#8 STRETCHER	IPP-02	09/15/92	ND
PM-8STR-GB04	8 STRETCHER	#8 STRETCHER	IPP-02	09/15/92	ND
PM-8STR-GB10	8 STRETCHER	#8 STRETCHER	IPP-02	09/15/92	ND
PM-8STR-HY01	HEAD - EAST (17/14)	#8 STRETCHER	IPP-02	04/03/92	ND
PM-8STR-HY02	HEAD - WEST (17/14)	#8 STRETCHER	IPP-02	04/03/92	ND
PM-8STR-HY03	MAIN RAM NORTH-EAST	#8 STRETCHER	IPP-02	04/03/92	ND
PM-8STR-HY04	MAIN RAM NORTH-WEST	#8 STRETCHER	IPP-02	04/03/92	ND
PM-8STR-HY05	MAIN RAM SOUTH-EAST	#8 STRETCHER	IPP-02	04/03/92	ND
PM-8STR-HY06	MAIN RAM SOUTH-WEST	#8 STRETCHER	IPP-02	04/03/92	ND
PM-9STR-GB01	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB02	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB03	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB04	9 STRETCHER BOARD	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB05	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB06	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB07	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB08	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB09	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-GB10	9 STRETCHER BOARDS	#9 STRETCHER	IPP-02	09/15/92	ND
PM-9STR-HY01	WEST AUX. HYD.	#9 STRETCHER	IPP-02	12/03/91	ND
PM-9STR-HY02	EAST AUX. HYD.	#9 STRETCHER	IPP-02	12/03/91	ND
PM-9STR-HY03	MAIN HYD.	#9 STRETCHER	IPP-02	12/03/91	ND
PM-9STR-HY04	SERVO SYS.	#9 STRETCHER	IPP-02	12/03/91	ND
PM-9STR-HY05	COMPRESSION BAR RETURN	#9 STRETCHER	IPP-02	12/03/91	ND

Table A-1. Summary of Gearbox and Hydraulic System Testing
Equipment Group RBC Report
Alcoa-Davenport Works

Sample ID	Description	Location	FSA Unit #	Test Date	PCB Result
PM-902T-BR01	902 WEST MG TABLE DRIVE	#15 SIDE SHEAR	NA	04/03/92	ND
PM-902T-BR02	902 WEST MG TABLE DRIVE	#15 SIDE SHEAR	NA	04/03/92	ND
PM-902T-GB01	MG REDUCTION GEARBOX	#15 SIDE SHEAR	NA	04/03/92	ND
PM-DOWN-HY01	DOWNENDER	PLATE MILL DOWNENDER	NA	08/24/92	ND
PM-ENDS-HY01	END SHEAR ENTRY TABLE	#14 PLATE END SHEAR	NA	04/03/92	ND
PM-ENDS-HY02	END SHEAR EXIT TABLE	#14 PLATE END SHEAR	NA	04/03/92	ND
PM-ENDS-HY03	END SHEAR MAIN HYD	#14 PLATE END SHEAR	NA	04/03/92	ND
PM-ESHR-GB01	END SHEAR NORTH GEARBOX	#14 PLATE END SHEAR	NA	04/03/92	ND
PM-ESHR-GB02	END SHEAR SOUTH GEARBOX	#14 PLATE END SHEAR	NA	04/03/92	ND
PM-G&LM-GB01	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-GB02	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-GB03	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-GB04	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-GB05	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-GB05	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	08/08/95	ND
PM-G&LM-GB06	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-GB07	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-GB08	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-GB09	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/07/92	ND
PM-G&LM-LU01	G & L MILLING MACH WAY LUBE	G & L MILLING MACHINE	IPP-03	04/03/92	ND
PM-G&LM-MS03	G & L MILLING MACHINE	G & L MILLING MACHINE	IPP-03	10/06/92	ND
PM-8HAL-GB01	8 HALDEN SHEAR GB LUBE	#8 HALDEN SHEAR	IPO-07	04/03/92	ND
PM-8HAL-GB02	8 HALDEN UPCOILER GB	#8 HALDEN SHEAR	IPO-07	04/03/92	ND
PM-8HAL-GB03	8 HALDEN UPCOILER REDUCTION	#8 HALDEN SHEAR	IPO-07	04/03/92	ND
PM-8HAL-GB04	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB05	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB06	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB07	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB08	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB09	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB10	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB11	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB12	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB13	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB14	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND

Table A-1. Summary of Gearbox and Hydraulic System Testing
Equipment Group RBC Report
Alcoa-Davenport Works

Sample ID	Description	Location	FSA Unit #	Test Date	PCB Result
PM-8HAL-GB15	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB16	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB17	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB18	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB19	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-GB21	8 HALDEN SHEAR	#8 HALDEN SHEAR	IPO-07	10/06/92	ND
PM-8HAL-HY01	8 HALDEN SHEAR MAIN HYD.	#8 HALDEN SHEAR	IPO-07	04/03/92	ND
PM-8HAL-HY01	MAIN HYDRAULICS	#8 HALDEN SHEAR	IPO-07	08/18/86	ND
PM-GR07-GB01		GRAB 07	NA	05/03/93	ND
PM-GR07-GB02		GRAB 07	NA	05/03/93	ND
PM-GR09-GB01		GRAB 09	NA	05/03/93	ND
PM-GR09-GB02		GRAB 09	NA	05/03/93	ND
PM-GR09-GB03		GRAB 09	NA	05/03/93	ND
PM-GR10-GB01		GRAB 10	NA	05/03/93	ND
PM-GR21-GB01		GRAB 21	NA	05/03/93	ND
PM-GR35-GB01		GRAB 35	NA	05/03/93	ND
PM-GR35-GB02		GRAB 35	NA	05/03/93	ND
PM-GR73-GB01		GRAB 73	NA	05/03/93	ND
PM-GR75-GB01		GRAB 75	NA	05/03/93	ND
PM-GR75-GB02		GRAB 75	NA	05/03/93	ND
PM-GR76-GB01		GRAB 76	NA	05/03/93	ND
PM-GR76-GB02		GRAB 76	NA	05/03/93	ND
PM-GR78-3567		GRAB 78	NA	05/03/93	ND
PM-GR78-GB02		GRAB 78	NA	05/03/93	ND
PM-GR78-GB03		GRAB 78	NA	05/03/93	ND
PM-GR79-GB01		GRAB 79	NA	05/03/93	ND
PM-GR79-GB02		GRAB 79	NA	05/03/93	ND
PM-NSHR-GB01	NORTH SHEAR EAST GB	PM ROLL TABLES	NA	04/03/92	ND
PM-NSHR-GB02	NORTH SHEAR GB WEST	PM ROLL TABLES	NA	04/03/92	ND
PM-NSHR-HY01	NORTH SHEAR	PM ROLL TABLES	NA	04/03/92	ND
PM-PKLN-GB01	PACK LINE	COIL PACK LINE UPENDERS	NA	08/24/92	ND
PM-PKLN-GB02	PACK LINE	COIL PACK LINE UPENDERS	NA	08/24/92	ND
PM-PKLN-GB03	PACK LINE	COIL PACK LINE UPENDERS	NA	08/24/92	ND
PM-PKLN-GB04	PACK LINE	COIL PACK LINE UPENDERS	NA	08/24/92	ND

Table A-1. Summary of Gearbox and Hydraulic System Testing
Equipment Group RBC Report
Alcoa-Davenport Works

Sample ID	Description	Location	FSA Unit #	Test Date	PCB Result
PM-ROLT-BR01	ROLL TABLE MG EAST BEARING	PM ROLL TABLES	NA	04/03/92	ND
PM-ROLT-BR02	ROLL TABLE MG BEARING WEST	PM ROLL TABLES	NA	04/03/92	ND
PM-ROLT-GB01	MG REDUCTION GEARBOX	PM ROLL TABLES	NA	04/03/92	ND
PM-SSHR-GB01	SOUTH SHEAR GB EAST	PLATE MILL SOUTH SHEAR	NA	04/03/92	ND
PM-SSHR-GB02	SOUTH SHEAR GB WEST	PLATE MILL SOUTH SHEAR	NA	04/03/92	ND

Notes:

IPH-10 = #4 Scalper

IPP-01 = Plate Mill Levellers

IPP-02 = Plate Mill Stretchers

IPP-03 = Giddings & Lewis Milling Machine

IPO-07 = #8 Halden Shear

NA = Not Applicable to a specific unit; however, the sample was collected in the vicinity of the Unit Group.

ND = Not Detected. No sample quantitation limit is available.

GB = Gearbox

HY = Hydraulic System

PM = Plate Mill

HL = Hot Line

Samples of gearbox oil and hydraulic fluid do not represent environmental media; however, the results provide information about potential sources of PCB Contamination.

Summary of Analytical Results for Soil
Equipment Group RBC Report
Alcoa-Davenport Works
Riverdale, Iowa

Table A-2. Soil Samples Collected Under the Digging Permit Program at the No. 4 Scalper Equipment Unit Group, Alcoa-Davenport Works, Riverdale, Iowa

Sample ID	MW-1 - 6-8'	MW-2 - 12-14'
Sample Date	7/13/00	7/13/00
Sample Location	South of Bldg. 833	North of No. 4 Scalper
PCBs		
PCB-1016/1242	<0.25	<0.8
PCB-1221	<0.25	<0.8
PCB-1232	<0.25	<0.8
PCB-1248*	<0.25	**1.36**
PCB-1254	<0.25	<0.8
PCB-1260	<0.25	<0.8
PCB-1268	<0.25	<0.8
BTEX		
Benzene	<0.25	<0.25
Toluene	**0.79**	<0.5
Ethylbenzene	<0.5	<0.5
Xylenes, Total	**1.4**	<0.5
TEH	<10	**4,270**
as Diesel	<10	<10
as Gasoline	<10	<10
as Motor Oil	<10	**4,270**

* Matrix spike and/or matrix spike duplicate are outside control limits.
PCBs = Polychlorinated biphenyls
BTEX = Benzene, toluene, ethylbenzene, and xylenes (total)
TEH = Total extractable hydrocarbons
Units = mg/kg
Analyzed by NET Midwest using Methods OA-1 (BTEX), OA-2 (TEH), and 8082 (PCBs).

Formulation of Hot Mill Coolants
Internal Correspondence
July 1997

THOMAS J. KASUN
SURFACE TECHNOLOGY DIVISION
ALCOA TECHNICAL CENTER - C

ANTHONY STURTZER, DAVENPORT
KIRK GRIBBEN, ATC-C-ER
CHRIS DIXON-ERNST, PITTSBURGH

1997 July 10

RE: HISTORY OF THE CHEMICALS USED IN DAVENPORT HOT MILL LUBES

Standard hot rolling coolants are 5 to 10% emulsions of a formulated oil phase. The oil phase is typically made up of a base oil, a fatty ester, and a fatty acid. Additionally, amine soaps (e.g. TEA oleate) are added as the emulsifier. Blooming agents (hexylene glycol or diethylene glycol are added to assist in emulsification. Usually, an antioxidant a corrosion inhibitor, and EP additives are added. To enable proper traction to engage the head of a slab in the hot continuous mill, kerosene is sprayed on to the work roll at the start of every slab. Most of the kerosene evaporates, although some can become emulsified and remain with the coolant package. Hot mill lubricants **are not** required to be F&DA approved (adheres to subsection 21 CFR 178.3910.) We currently comply with CONEG, carcinogenicity, and Prop 65 with all of these coolants.

Our systems are typically designed to contain any ML (mechanical lubricant) leakage. Therefore, there is, at times, some level of contaminants from these fluids. These fluids often negatively affect the performance of our lubricants, which causes us to minimize leakage's, and actively manage their levels through reclamation of the coolant. For this reason, I am not considering these chemicals as issues in this effort.

A historical look at the kinds of materials that we have used at Davenport are as follows:

< 80% Base Oils	100 & 500 SSU base oils*, 100 & 500 SSU severely hydrotreated base oils (switch in ~1990)
< 20% Esters	unsaturated methylated C18 ester
< 10% Acids	unsaturated C18 fatty acid
<10% emulsifier	TEA Oleate
<10% blooming	glycols
<10% additives	corrosion inhibitors, oxidation inhibitors, EP additives

* chemicals no longer in use

Please note that due to proprietary reasons, I have not included actual compositions or chemical names. The Hot Reversing mill formulations have been purchased commercially designated as PL142 supplied by Mobil until ~1994, and since then by Houghton International. The Hot Continuous Mill has been using PL310 supplied by Nalco Chemical.

Special Hot Mill Considerations

The base oils used prior to ~1990, were middle distillate cuts of crude oil. They were typically unsaturated napthenic based. They did contain measurable levels of PAHs (polynuclear aromatic hydrocarbons). The switch to more highly refined based oils (I'm assuming that this occurred since these products are not labeled as a carcinogen, and the MSDS does not call out the hazards of this major ingredient) eliminated PAHs in these formulations and drove the base oil to be more fully saturated (less potential for reaction). From a boiling point perspective, depletion of the PAHs would be at a similar rate to C20, C30, C40 paraffinic species, neither of which tend to concentrate with time. At the temperatures and pressures of our hot rolling process, in-situ formation of PAHs is not possible (reactants, catalyst and temperatures required to form PAHs are all missing), although other reactions are known to occur.

The most recognized reaction in hot rolling is the formation of mono-, di-, and poly-aluminum soaps of the fatty acid. These materials do not tend to be harmful, and are kept to a controlled level to minimize the adverse viscosity effect they carry in hot rolling. Distillation of light ends through evaporation is well know. Oxidative polymerization is kept in line through additive control. Cracking of heavier species into lighter species is possible. The light end evaporate off; the residual materials tend to be benign. Biological reactions are common and are maintained with the proper addition of biocides. MLs unique to hot rolling are the fire resistant hydraulic fluids (phosphate esters and water glycols).

Although the hot mill present an interesting opportunity for reactions, the products that are formed typically negatively impact rolling performance leading to active coolant management to minimize the level of reaction products.

Please let me know what other information that you may need.

Thomas J. Kasun

THOMAS J. KASUN

c: ID - D - LIB

Memorandum from the Alcoa Chemistry Lab on Fingerprinting of Lubricating Oil
Equipment Unit Group
Alcoa-Davenport Works
Riverdale, Iowa

From: Denise Mikkelsen
Granville Jordan

To: Anthony Sturtzer

8/16/00

RE: GC/MS Analysis for Determination of Oil Source at Outfall #6

Introduction:
Various samples were submitted to the Chem Lab to determine the source of oil at Outfall #6 that occurred on and around 07/05/00. These included a skim sample from the outfall, absorbent pad samples, soil samples and ML samples of potential candidates.

Sample Prep:
The skim sample was centrifuged to obtain a clean oil layer and dissolved in methylene chloride.

Portions of the pad and soil samples were sonicated with methylene chloride. A clean pad sample was also prepared and ran as a baseline.

Neat oil samples of ML-669, ML-672, ML-680, ML-803, and ML-805 were prepared in methylene chloride.

All samples were prepared qualitatively; no attempt was made to quantify oil levels.

Results:
All samples were acquired on the GC/MS using identical methods and collection parameters. The chromatograms and mass spectrums from each were compared. ML-669, ML-672, and ML680 were immediately ruled out based on retention times on the TIC.

The unknown oil from the pads, soil, and outfall all match ML-805. ML-803 is similar, but has a prominent butyl stearate peak that is missing from the other samples.

Conclusion:
ML-805 is used as a way lubricant at #4 Scalper to lubricate moving parts. Since it is an ML that is not contained within a gear box, but is applied directly to these parts, there is great potential for it to contaminate the area around the scalper and possibly seep into the outfall waters.

Attachments:

cc:
Chris Retarides, ATC

Material Safety Data Sheets
Equipment Group RBC Report
Alcoa-Davenport Works
Riverdale, Iowa

Material Safety Data Sheet for Oil Used in Coolant at the Number 4 Scalper
Equipment Unit Group
Alcoa-Davenport Works
Riverdale, Iowa

Alice #4 Scalper oil MSDS

111194

D. A. STUART COMPANY
MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHEMICAL PRODUCT IDENTIFICATION:
- PRODUCT NAME. . . . . : XL-386
- PRODUCT ID NUMBER . . . . . : 08856.00
- PRODUCT CLASS . . . . . : POST LUBRICANT

MANUFACTURER IDENTIFICATION:
- NAME . . . . . : D. A. STUART COMPANY
- ADDRESS . . . . . : 4580 WEAVER PARKWAY
  WARRENVILLE IL
  60555
- TELEPHONE . . . . . : 630-393-0833

FOR CHEMICAL EMERGENCY
Spill, leak, fire, exposure, or accident
- EMERGENCY CONTACT . . . . . : CHEMTREC
- EMERGENCY TELEPHONE . . . . . : (800) 424-9300

SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS

1
CAS# MIXTURE
PETROLEUM OILS
PCT BY WT: < 10
EXPOSURE LIMIT:

ACGIH TLV/TWA:	5 MG/M3 (OIL MIST)
ACGIH TLV/STEL:	10 MG/M3 (OIL MIST)
OSHA PEL/TWA:	5 MG/M3 (OIL MIST)
OTHER:	THIS CONSTITUENT MAY CONTAIN ONE OR MORE OF THE
(cont.)	FOLLOWING CASRN'S: 64741-96-4, 64742-52-5, 64742-
(cont.)	53-6.

2
CAS# MIXTURE
POLYALKYLENE GLYCOL
PCT BY WT: < 10
EXPOSURE LIMIT:

OTHER:	THIS CONSTITUENT MAY CONTAIN ONE OR BOTH OF THE
(cont.)	FOLLOWING CAS NUMBERS: 9038-95-3, 9003-13-8.

3
CAS# 102-71-6
TRIETHANOLAMINE
PCT BY WT: < 2
EXPOSURE LIMIT:

ACGIH TLV/TWA:	5 MG/M3
OSHA PEL/TWA:	5 MG/M3

****

This product contains no components, present in excess of 0.1% by weight, which are listed as carcinogens by IARC, NTP, or OSHA.

D. A. STUART COMPANY
MATERIAL SAFETY DATA SHEET

08856.00
XL-386

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SECTION 3 - HAZARDS IDENTIFICATION

HEALTH HAZARDS (Acute and Chronic):

Acute:

Eyes: May be mildly irritating with prolonged or frequent exposure
Skin: May be mildly irritating with prolonged or frequent exposure
Respiratory System: Possible irritation with prolonged or frequent exposure.

Chronic effects have not been determined for the product as a whole.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY OVEREXPOSURE:

None Determined

ROUTE(S) OF ENTRY:

Inhalation?	Skin?	Ingestion?
Possible	Yes	Not Likely

SIGNS AND SYMPTOMS OF OVEREXPOSURE:

Possible red and/or itching skin due to overexposure.

SECTION 4 - FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: Flush with water at once for at least 15 minutes, lifting upper and lower lids to ensure even flushing. Seek medical attention.

SKIN CONTACT: Remove contaminated clothing immediately, and wash affected area thoroughly with soap and water. If irritation persists, seek medical attention.

INHALATION: If a person breathes in large amounts of this product, move the exposed person to fresh air at once. If breathing becomes difficult, administer oxygen and seek immediate medical attention.

INGESTION: Rinse mouth immediately. Never give anything to an unconscious person. Do not induce vomiting unless advised by a physician. Seek immediate medical attention.

SECTION 5 - FIRE FIGHTING MEASURES

FIRE AND EXPLOSIVE PROPERTIES:

Flashpoint	200.0 F
Auto-ignition temperature.	-N/A
Lower Explosion Limit. . .	-N/A
Upper Explosion Limit. . .	-N/A

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EXTINGUISHING MEDIA:
Dry Chemical, Foam, CO2, Water Fog

UNUSUAL FIRE AND EXPLOSION HAZARDS:
None

SPECIAL FIRE FIGHTING PROCEDURES:
Clear fire area of unprotected personnel. Do not enter a confined space without a helmet, face-shield, bunker coat, gloves, rubber boots, and a positive pressure NIOSH approved self-contained breathing apparatus.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Evacuate all unprotected personnel. Extinguish all flames in the vicinity. Dike spill and soak up on inert absorbent material. Place in appropriate containers and affix proper labels.

OTHER PRECAUTIONS:
Use good personal hygiene. For industrial use only. Always wear appropriate personal protection to minimize direct contact and exposure.

SECTION 7 - HANDLING AND STORAGE

HANDLING PRECAUTIONS:
Avoid contact with eyes, skin, and clothing. Do not get into eyes, on skin, or clothing. Wash thoroughly after handling. Avoid breathing mist or vapor. Use only with adequate ventilation.

STORAGE REQUIREMENT:
Store in well-ventilated, cool, dry area. Keep containers closed when not in immediate use. Store with compatible materials and equipment.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

EYE PROTECTION: Safety Glasses
PROTECTIVE GLOVES: Rubber, Impervious

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:
An eyewash fountain and safety shower should be located nearby work area at all times for emergency use.

RESPIRATORY PROTECTION (Specify Type):
None required with normal use.

VENTILATION:

D. A. STUART COMPANY
MATERIAL SAFETY DATA SHEET

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Local Exhaust: Recommended
Mechanical: None Special
Special: None Special
Other: None Special

WORK/HYGENIC PRACTICES:
Use good personal hygiene at all times. Launder soiled clothing before reuse. Wash hands thoroughly before eating or smoking.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical Appearance	CLEAR AMBER
Odor	PETROLEUM OIL
Physical State	LIQUID
pH	-N/A
Vapor Pressure	-N/A
Vapor Density	-N/A
Boiling Range	Lower - N/A °F Higher - N/A °F
Water Solubility	SOLUBLE IN WATER
Specific Gravity	8.300
Evaporation Rate	-N/A

SECTION 10 - STABILITY AND REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: Keep away from heat and flames
INCOMPATIBILITY (Materials to Avoid): Strong oxidizing agents
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Carbon monoxide and carbon dioxide
HAZARDOUS POLYMERIZATION: Will Not Occur

SECTION 11 - TOXICOLOGICAL INFORMATION

Not determined for this product. Please refer to Section 3 for information on potential health effects.

SECTION 12 - ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product.

SECTION 13 - DISPOSAL CONSIDERATIONS

Follow all Federal, State, Local and Corporate Regulations for disposal. The disposal method and manner practices should be acceptable to good waste management practices and follow applicable codes and regulations.

D. A. STUART COMPANY
MATERIAL SAFETY DATA SHEET

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XL-386

SECTION 14 - TRANSPORT INFORMATION

DOT SHIPPING DESCRIPTION:

NOT DOT REGULATED

SECTION 15 - REGULATORY INFORMATION

SARA 311 AND 312 INFORMATION:
This product contains the following substances defined as Hazardous by OSHA Hazard Communication Standard 29 CFR 1910.1200 (d).

CAS#	Chemical Name	% By Weight
See Section 2		

SARA 313 INFORMATION:
This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

SECTION 16 - OTHER INFORMATION

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM (HMIS) INFORMATION:
Health- 1 Flammability- 0
Reactivity- 0 Personal Protective Equipment- B

Prepared by . . . . . .: EHS Department
MSDS Last Revision Date . . . . . .: 04/29/1999
MSDS Print Date . . . . . .: 06/10/1999

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE BY THE D.A. STUART COMPANY. HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, IS GIVEN REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF.

Material Safety Data Sheets for Lubricating Oil
Equipment Unit Group
Alcoa-Davenport Works
Riverdale, Iowa

117729

600494-00 MOBIL VACTRA OIL NO. 2

1. PRODUCT AND COMPANY IDENTIFICATION

APPROVAL DATE: 06/29/98

PRODUCT NAME: MOBIL VACTRA OIL NO. 2
SUPPLIER: MOBIL OIL CORP.
NORTH AMERICA MARKETING AND REFINING
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Emergency (call collect):	609-737-4411	
Product and MSDS Information:	800-662-4525	609-224-4644
CHEMTREC:	800-424-9300	202-483-7616

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: PET. HYDROCARBONS AND ADDITIVES

INGREDIENTS CONSIDERED HAZARDOUS TO HEALTH:

This product is not formulated to contain ingredients which have exposure limits established by U.S. agencies. It is not hazardous to health as defined by the European Union Dangerous Substances/Preparations Directives. See Section 15 for a regulatory analysis of the ingredients.

See Section 15 for European Label Information.

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

US OSHA HAZARD COMMUNICATION STANDARD: Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined not to be hazardous.
EFFECTS OF OVEREXPOSURE: No significant effects expected.
EMERGENCY RESPONSE DATA: Brown Liquid. DOT ERG No. - NA

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Wash contact areas with soap and water.
INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, use mouth to mouth resuscitation.
INGESTION: Not expected to be a problem when ingested. If uncomfortable seek medical assistance.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None. Flash Point C(F): > 204(399) (ASTM D-92). Flammable limits - LEL: NA, UEL: NA.
NFPA HAZARD ID: Health: 1, Flammability: 1, Reactivity: 0
HAZARDOUS DECOMPOSITION PRODUCTS: Phosphorus oxides. Sulfur oxides. Carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills as required to appropriate authorities. U. S. Coast Guard regulations require immediate reporting of spills that could reach any waterway including intermittent dry creeks. Report spill to Coast Guard toll free number (800) 424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: Adsorb on fire retardant treated sawdust, diatomaceous earth, etc. Shovel up and dispose of at an appropriate waste disposal facility in accordance with current applicable laws and regulations, and product characteristics at time of disposal.
ENVIRONMENTAL PRECAUTIONS: Prevent spills from entering storm sewers or drains and contact with soil.
PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.
STORAGE: Do not store in open or unlabelled containers. Store away from strong oxidizing agents or combustible material.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION: Use in well ventilated area.
RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.
EYE PROTECTION: Normal industrial eye protection practices should be employed.
SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed.
EXPOSURE LIMITS: This product does not contain any components which have recognized exposure limits. However, a exposure limit of 5.00 mg/m3 is suggested for oil mist.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Brown
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
MELTING POINT C(F): NA
FLASH POINT C(F): > 204(399) (ASTM D-92)
FLAMMABILITY: NE
AUTO FLAMMABILITY: NE
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.879
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: NE
VISCOSITY AT 40 C, cSt: > 61.2
VISCOSITY AT 100 C, cSt: 8.6
POUR POINT C(F): < -6(21)

(Section continued next page)

FREEZING POINT C(F): NE
VOC: < 4.00 (Wt. %); 0.293 lbs/gal
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Phosphorus oxides. Sulfur oxides. Carbon monoxide.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

INHALATION TOXICITY (RATS): Not established

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: 0 or greater but 6 or less). ---Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

Severely solvent refined and severely hydrotreated mineral base oils have been tested at Mobil Environmental and Health Sciences Laboratory by dermal application to rats 5 days/week for 90 days at doses significantly higher than those expected during normal industrial exposure. Extensive evaluations including microscopic examination of internal organs and clinical chemistry of body fluids, showed no adverse effects.

---CHRONIC TOXICOLOGY (SUMMARY)---

The base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS: Not established.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value or disposal by supervised incineration. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

15. REGULATORY INFORMATION

Governmental Inventory Status: All components comply with TSCA and DSL.

EU Labeling: EU labeling not required.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

(Section continued next page)

This product contains no chemicals reportable under SARA (313) toxic release program.

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
*** NO REPORTABLE INGREDIENTS ***		

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: WAY OIL

NOTE: MOBIL PRODUCTS ARE NOT FORMULATED TO CONTAIN PCBS.

Please call the Customer Response Center on 800-662-4525 for formulation disclosure.

****

For Internal Use Only: MHC: 0* 0* NE 0* 1*, MPPEC: A, TRN: 600494-00, GLIS: 400389, CMCS97: 970716, REQ: US - MARKETING, SAFE USE: L

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(Section continued next page)

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CITGO SlideRite® 68 Oil

Material Safety Data Sheet

CITGO Petroleum Corporation
P.O. Box 3758
Tulsa, OK 74102

MSDS No. 637210001

Revision Date 07/27/1999

Hazard Rankings	HMIS	NFPA
Health Hazard	0	0
Fire Hazard	1	1
Reactivity	0	0

* = Chronic Health Hazard

Protective Equipment

Minimum Requirements
See Section 8 for Details

IMPORTANT: Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

Emergency Overview

Physical State Liquid.
Color Amber. **Odor** Mild Petroleum Odor

This product can cause mild eye and skin irritation.
Protect eyes from misting or spraying material.
Protect exposed skin from repeated or prolonged exposure.
This product can burn when preheated but will not ignite readily.
Do not store material in open or unmarked containers.
Spills can cause slipping hazard.

SECTION 1: IDENTIFICATION

Trade Name	CITGO SlideRite® 68 Oil	**Technical Contact**	(918) 495-5933
Product Number	637210001	**Medical Emergency**	(918) 495-4700
CAS Number	Mixture	**CHEMTREC Emergency**	(800) 424-9300
Product Family	Machine Tool Slideway Oil		
Synonyms	Lubricating Oil; Former ILS Code: 37210; CITGO SAP Product Code No.: 637210001		

SECTION 2: COMPOSITION

Component Name(s)	CAS Registry No.	Concentration (%)
1) Highly-Refined Petroleum Lubricant Oils	Mixture	95 - 100
2) Proprietary Additives	Mixture	1 - 4
3) Phosphonic acid, di-9-octadecenyl ester	64051-29-2	0 - 1

SECTION 3: HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact.

Signs and Symptoms of Acute Exposure

Inhalation At elevated temperatures or in enclosed spaces, product mist or vapors may irritate the mucous membranes of the nose, the throat, bronchi, and lungs.

Eye Contact This product can cause transient mild eye irritation with short-term contact with liquid sprays or mists.

Skin Contact	This material can cause mild skin irritation from prolonged or repeated skin contact. Injection under the skin, in muscle, or into the blood stream can cause irritation, inflammation, swelling, fever, and systemic effects and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention.
Ingestion	If swallowed, no significant adverse health effects are anticipated. Ingestion can cause a laxative effect. If aspirated into the lungs, liquid can cause severe lung damage or death.
Chronic Health *Effects Summary*	Contains a petroleum-based mineral oil. Prolonged or repeated skin contact can cause mild irritation and *inflammation characterized* by drying, cracking, (dermatitis) or oil acne. Inhalation of petroleum-based mineral oils can cause respiratory irritation or other pulmonary effects after repeated or prolonged inhalation of oil mists at concentrations above applicable workplace exposure levels.
Conditions Aggravated by Exposure	Personnel with pre-existing skin disorders should avoid repeated or prolonged contact with this product.
Target Organs	Skin.
Carcinogenic Potential	This product does not contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC, or NTP.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification				OSHA Physical Hazard Classification					
Irritant	☐	Toxic	☐	Combustible	☐	Explosive	☐	Pyrophoric	☐
Sensitizer	☐	Highly Toxic	☐	Flammable	☐	Oxidizer	☐	Water-reactive	☐
Corrosive	☐	Carcinogenic	☐	Compressed Gas	☐	Organic Peroxide	☐	Unstable	☐

SECTION 4: FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

Inhalation	Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.
Eye Contact	Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.
Skin Contact	Remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with soap and water. Seek medical attention if tissue appears damaged or if irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. If material is injected under the skin, into muscle, or into the bloodstream, seek medical attention immediately.
Ingestion	Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. If large amounts are swallowed or irritation or discomfort occurs, seek medical attention immediately.
Notes to Physician	The viscosity range of the product(s) represented by this MSDS is 100 to 400 SUS at 100° F. Accordingly, upon ingestion there is a low to moderate risk of aspiration. Careful gastric lavage may be considered to evacuate large quantities of material. Subcutaneous or intramuscular injection requires prompt surgical debridement.

SECTION 5: FIRE FIGHTING MEASURES

NFPA Flammability Classification	OSHA/NFPA Class-IIIB combustible liquid. Slightly combustible!
Flash Point/Method	CLOSED CUP: 195°C (383°F). (Pensky-Martens (ASTM D-93).). OPEN CUP: 218°C (424°F). (Cleveland.).
Lower Flammable Limit	AP 1 % **Upper Flammable Limit** AP 7 %
Auto-Ignition Temp.	Not available.
Hazardous Combustion Products	Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons, aldehydes and other products of incomplete combustion. Also, depending upon the conditions of use, low concentrations of hydrogen sulfide can be released.
Special Properties	When heated above its flash point temperature, this material will release vapors which, if exposed to an ignition source, can ignite. In enclosed spaces vapors can ignite with explosive force. Mists or sprays may burn at temperatures below the flash point.
Extinguishing Media	Use dry chemical, foam, Carbon Dioxide or water fog.
Fire Fighting Protective Clothing	Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

SECTION 7: HANDLING AND STORAGE

Handling	Avoid water contamination and extreme temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product.
Storage	Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120° F or in direct sunlight for extended periods of time. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of mists and/or vapors below the recommended exposure limits (see below). An eye wash station and safety shower should be located near the work-station.
Personal Protective Equipment	Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.

Eye Protection	Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is likely, especially if material is heated above 125°F (or 51°C). Have suitable eye wash water available.
Hand Protection	Avoid skin contact. Use gloves constructed of chemical resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. Use good personal hygiene practices. Use extreme caution when wearing gloves around rotating or moving equipment.
Body Protection	Use clean and impervious protective clothing (e.g., neoprene or Tyvek®) if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures.
Respiratory Protection	Vaporization or misting is not expected at ambient temperatures. Therefore, the need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).
General Comments	Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents, or harsh abrasive skin cleaners. Since specific exposure standards/control limits have not been established for this product, the "Oil Mist, Mineral" exposure limits shown below are suggested as minimum control guidelines.

Occupational Exposure Guidelines

Substance	Applicable Workplace Exposure Levels
1) Highly-Refined Petroleum Lubricant Oils	TWA: 5 STEL: 10 (mg/M^3) from ACGIH (TLV) TWA: 5 (mg/M^3) from OSHA (PEL) TWA: 5 STEL: 10 (mg/M^3) from NIOSH

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid.	**Color**	Amber.	**Odor**	Mild Petroleum Odor
Specific Gravity	0.88 (Water = 1)	**pH**	Not applicable.	**Vapor Density**	>1 (Air = 1)
Boiling Point/Range	Not available.			**Melting/Freezing Point**	Not available.
Vapor Pressure	Not available.			**Viscosity (cSt @ 40°C)**	66
Solubility in Water	Insoluble in cold water.			**Volatile Characteristics**	Negligible volatility
Additional Properties	No additional information.				

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability	Stable.	**Hazardous Polymerization**	Not expected to occur.
Conditions to Avoid	Keep away from extreme heat, sparks, open flame and strongly oxidizing conditions.		
Materials Incompatibility	Strong oxidizers.		
Hazardous Decomposition Products	No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS.		

SECTION 11: TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 and the Hazards Identification in Section 3 of this MSDS.

Toxicity Data

Highly-Refined Petroleum Lubricant Oils:

ORAL (LD50): Acute: GT 5000 mg/kg [Rat].
DERMAL (LD50): Acute: GT 2000 mg/kg [Rabbit].

Highly-Refined Petroleum Lubricant Oils: *Mineral oil mists derived from highly refined oils are* reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Ecological effects testing has not been conducted on this product. A biocide has been added for protection against microbial growth. Product released to the environment can be hazardous to plants, animals or aquatic life.

Environmental Fate

Ecological effects testing has not been conducted on this product. However, plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway might be enough to cause a fish kill or create an anaerobic environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Conditions of use may cause this material to become a "hazardous waste", as defined by federal or state regulations. It is the responsibility of the user to determine if the material is a "hazardous waste" *at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be* conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional US EPA office for guidance concerning case specfic disposal issues. Empty drums and pails retain residue. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose this product's empty container to heat, flame, or other ignition sources. DO NOT attempt to clean it. Empty drums and pails should be drained completely, properly bunged or sealed, and promptly sent to a reconditioner.

SECTION 14: TRANSPORT INFORMATION

DOT Status Not a U.S. Department of Transportation regulated material.

Proper Shipping Name Petroleum Oil, N.O.I.B.N.

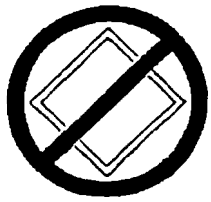
Hazard Class Not a DOT controlled material (United States).

Packing Group(s) Not applicable.

UN/NA ID Not applicable.

Reportable Quantity A Reportable Quantity (RQ) has not been established for this product.

Placards



Emergency Response Guide No.	Not applicable.
HAZMAT STCC No.	Not applicable.
MARPOL III Status	Not a DOT "Marine Pollutant" per 49 CFR 171.8.

SECTION 15: REGULATORY INFORMATION

TSCA Inventory	This product and/or its components are listed on the Toxic Substance Control Act (TSCA) inventory.
SARA 302/304	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified.
SARA 311/312	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: No SARA 311/312 hazard categories identified.
SARA 313	This product contains the following components in concentrations above de minimis levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: No components were identified.
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. This product or refinery stream is not known to contain chemical substances subject to this statute. However, it is recommended that you contact state and local authorities to determine if there are any other reporting requirements in the event of a spill.
CWA	This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.
California Proposition 65	This product is not known to contain the any components for which the State of California has found to cause cancer, birth defects or other reproductive harm.
New Jersey Right-to-Know Label	For New Jersey labeling refer to components listed in Section 2.
Additional Regulatory Remarks	No additional regulatory remarks

SECTION 16: OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

REVISION INFORMATION

Version Number	1.0
Revision Date	07/27/1999
Print Date	Printed on 07/27/1999.

ABBREVIATIONS

AP = Approximately EQ = Equal GT = Greater Than LT = Less Than NA = Not Applicable ND = No Data
NE = Not Established

ACGIH = American Conference of Governmental Industrial Hygienists AIHA = American Industrial Hygiene Association

IARC = International Agency for Research on Cancer
NIOSH = National Institute of Occupational Safety and Health
NPCA = National Paint and Coating Manufacturers Association
NFPA = National Fire Protection Association
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration
HMIS = Hazardous Materials Information System
EPA = Environmental Protection Agency

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***** END OF MSDS *****

conoco®

MSDS MATERIAL SAFETY DATA SHEET

LUBC0220 Revised 6-DEC-1997 Printed 17-JUL-1998

HD WAY LUBRICANT 68, 220

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Product Use
Metalworking Fluid

Tradenames and Synonyms
7572, 7573 - Conoco Base Codes

Company Identification
MANUFACTURER/DISTRIBUTOR
Conoco, Inc.
P.O. Box 2197
Houston, TX 77252

PHONE NUMBERS

Product Information	1-281-293-5550
Transport Emergency	CHEMTREC I-800-424-9300
Medical Emergency	1-800-441-3637

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
Highly-Refined Base Oils		>90
Proprietary Additives		<10

If oil mist is generated, exposure limits apply.

HAZARDS IDENTIFICATION

Potential Health Effects

Primary Routes of Entry: Skin, inhalation

Extreme overexposure or aspiration into the lungs may cause lung

(Continued)

damage or death. The product may cause irritation to the eyes, nose, throat, lungs, and skin after prolonged or repeated exposure.

A 1992 epidemiology report of male automobile workers suggests that machining fluids used in automobile plants may have contributed to an elevation of several types of cancer and respiratory problems (difficult breathing and respiratory illnesses). However, a definite cause-and-effect relationship could not be concluded from the study. Further studies are planned by the automobile industry to better define these results.

If an oil mist is generated, overexposure can cause minor and reversible irritation to the eyes, skin, and especially the lungs. Proper personal protective equipment and sufficient ventilation can provide adequate protection.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

Wash skin thoroughly with soap and water. If irritation develops and persists, consult a physician.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

Material poses an aspiration hazard. If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration.

Notes to Physicians

Activated charcoal mixture may be administered. To prepare activated charcoal mixture, suspend 50 grams activated charcoal in 400 mL water and mix thoroughly. Administer 5 mL/kg, or 350 mL for an average adult.

(Continued)

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point	**460 F (238 C) (Typical; Grade 68)** **495 F (257 C) (Typical; Grade 220)**
Method	**Cleveland Open Cup - COC.**
Autoignition	**Undetermined**
NFPA Classification	**Class IIIB Combustible Liquid.**

Extinguishing Media

Water **Spray, Foam, Dry Chemical, C02.**

Fire Fighting Instructions

Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water may be used to flush spills away from exposures.

Products of combustion may contain carbon monoxide, carbon dioxide, and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: **Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.**

Remove **source of heat, sparks, and flame.**

Initial Containment

Dike spill. Prevent material from entering sewers, waterways, or low areas.

Spill Clean Up

Recover free liquid for reuse or reclamation. Soak up with sawdust, sand. oil drv or other absorbent material.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing mist. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Wash contaminated clothing prior to reuse.

Handling (Physical Aspects)

Close **container after each use. Do not pressurize, cut, weld, braze, solder, grind, or drill on or near full or empty container. Empty container retains residue (liquid and/or vapor) and may explode in heat of a fire.**

Storage

Store in accordance with National Fire Protection Association recorlmendations. Store in a cool, dry place. Store in a well ventilated place. Store away from oxidizers, heat, sparks and flames.

(Continued)

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

VENTILATION
General mechanical ventilation normally adequate but use local exhaust where necessary to maintain exposures below acceptable limits.

Personal Protective Equipment

RESPIRATORY PROTECTION
None normally required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Select appropriate NIOSH-approved respiratory protective equipment when exposed to sprays or mists. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure, and published respirator protection factors.

PROTECTIVE GLOVES
Should be worn when the potential exists for prolonged or repeated skin contact. NBR or neoprene recommended.

EYE PROTECTION
Safety glasses with side shields.

OTHER PROTECTIVE EQUIPMENT
Coveralls with long sleeves if splashing is probable.

Exposure Guidelines

Applicable Exposure Limits
If oil mist is generated, exposure limits apply.

PEL	(OSHA)	5 mg/m3, 8 Hr. TWA
TLV	(ACGIH)	5 mg/m3, 8 Hr. TWA, STEL 10 mg/m3 Notice of Intended Changes (1997) 5 mg/m3, 8 Hr. TWA, (As sampled by method that does not collect vapors)
AEL *	(DuPont)	5 mg/m3, 8 Hr. TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	Not Available
Vapor Pressure	Nil
Vapor Density	>1 (Air = 1)
% Volatiles	Nil
Evaporation Rate	Nil
Solubility in Water	Insoluble
Odor	Petroleum Hydrocarbon (mild)
Form	Liquid
Color	Clear Yellow, Amber, or Brown
Specific Gravity	0.88-0.89 @ 60 F (16 C)
Density	7.42-7.47 lb/gal @ 60 F (16 C)

(Continued)

STABILITY AND REACTIVITY

Chemical Stability
Stable at normal temperatures and storage conditions.

Conditions to Avoid
Avoid heat, sparks, and flame.

Incompatibility with Other Materials
Incompatible with strong oxidizing materials.

Decomposition
Hazardous gases or vapors can be released, including oxides of carbon, nitrogen, sulfur.

Polymerization
Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data
Mouse skin painting studies have shown that highly solvent-refined petroleum distillates similar to ingredients in this product have not caused skin tumors.

ECOLOGICAL INFORMATION

Ecotoxicological Information
No specific aquatic data available for this product.

DISPOSAL CONSIDERATIONS

Waste Disposal
Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

Container Disposal
Empty drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All other containers should be disposed of in an environmentally safe manner.

TRANSPORTATION INFOFWATION

Shipping Information
DOT
Not regulated.

ICAO/IMO
Not restricted.

(Continued)

REGULATORY INFORMATION

U.S. Federal Regulations

OSHA HAZARD DETERMINATION
This material is hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

CERCLA/SUPERFUND
Not applicable; this material is covered by the CERCLA petroleum exclusion.

SARA, TITLE III, 302/304
This material is not known to contain extremely hazardous substances.

TITLE III **HAZARD** CLASSIFICATIONS **SECTIONS 311, 312**

Acute	**: Yes**
Chronic	**: No**
Fire	**: No**
Reactivity	**: No**
Pressure	**: No**

SARA,, TITLE III, 313
This material is not known to contain any chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and subject to release reporting requirements.

TSCA
Material and/or components are listed in the TSCA Inventory of Chemical Substances (40 CFR 710).

RCRA
This material has been evaluated for RCRA characteristics and does not meet hazardous waste criteria if discarded in its purchased form. Because of product use, transformation, mixing, processing, etc., which may render the resulting material hazardous, it is the product user's responsibility to determine at the time of disposal whether the material meets RCRA hazardous waste criteria.

CLEAN **WATER ACT**
The material contains the following ingredient(s) which is considered hazardous if spilled into navigable waters and therefore reportable to the National Response Center (1-800-424-8802).

Ingredient(s)	**Petroleum Hydrocarbons**
Reportable Quantity	**Film or sheen upon or discoloration of any water surface**

State Regulations (U.S.)

CALIFORNIA "PROP 65"
Ingredients subject to Act - None

PENNSYLVANIA WORKER & COMMUNITY RIGHT TO KNOW ACT
This material may contain the following ingredient(s) subject to

(Continued)

REGULATORY INFORMATION (Continued)

the Pennsylvania Worker and Community Right to Know Hazardous Substances List.

Ingredient	Mineral oil mist
CAS Number	SEQ-60-1
Category	Hazardous Substance.

Canadian Regulations

CLASS D Division 2 Subdivision B - Toxic Material. Skin or Eye Irritant.

Trarsport/Medical Emergency Phone Number: 1-613-348-3616

OTHER INFORMATION

NFPA, NPCA-HMIS

NFPP Rating	
Health	0
Flammability	1
Reactivity	0

NPCP-HMIS Rating	
Health	1
Flammability	1
Reactivity	0

Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS	: MSDS Coordinator
Address	: Conoco Inc.
>	: PO Box 2197
>	: Houston, TX 77252
Telephone	: 1-281 -293-5550

# Indicates updated section.

End of MSDS

MATERIAL SAFETY DATA SHEET

MSDS Number: 137607 Status: PENDING Revision Date: 7-NOV-1997
PRODUCT NAME: ALTRA WAYLUBE 68

Part Number: NOT GIVEN Formula: SEE TEXT
Specification: NOT GIVEN Keyword: NOT GIVEN
Stock Item Numbers: NOT GIVEN
NOT GIVEN
NOT GIVEN
Synonyms: NOT GIVEN NOT GIVEN

Manufacturer:
ALLEGHENY PETROLEUM PRODUCTS CO.
999 AIRBRAKE AVENUE Phone: (412) 829-1990
WILMERDING, PA 15148 Emergency Phone: (412) 829-1990

Supplier:
ALLEGHENY PETROLEUM PRODUCTS CO.
999 AIRBRAKE AVENUE Phone: (412) 829-1990
WILMERDING, PA 15148 Emergency Phone: (412) 829-1990

PHYSICAL/CHEMICAL CHARACTERISTICS:

Boiling Point:	NG		NG
Melting Point:	NG		NG
Freezing Point:	NG		NG
Pour Point:	NG		NG
Softening Point:	NG		NG
Specific Gravity:	EQ	0.88 (Water = 1)	@ 15.6/15.6'C.
Vapor Pressure:	LT	0.1 mmHg @ 68 deg. F	MMHG @ 20'C.
pH:	NG		NG
Vapor Density:	NG		NG
Evaporation Rate:	NI		NIL.
% of Volatiles:	NG		NG
Molecular Weight:	NG		NG
Viscosity:	NG		NG
Solubility in water:	NIL.		

Odor/Appearance/Other Characteristics:
BROWN LIQUID / VOC: <4.00 WT%; 0.293 LBS/GAL

FIRE AND EXPLOSION HAZARD DATA:

Closed Cup Flash:	NG		NG
Open Cup Flash:	EQ	399 deg. F	204'C, ASTM D-92.
Fire Point:	NG		NG
Auto Ignition:	ND		NO DATA.
Lower Explosion Limit:	NE		NOT ESTABLISHED.
Upper Explosion Limit:	NE		NOT ESTABLISHED.

SHIPPING REGULATIONS:
UN/NA Number: NG
DOT Hazard Class: NG
DOT Label: NOT GIVEN
Proper Shipping Name: NOT GIVEN

PREPARER/CONTACT INFORMATION: NOT GIVEN
Date Prepared/Revised: 25-AUG-1997

COMPONENTS:

SEVERELY SOLVENT REFINED LIGHT PARAFFINIC DISTILLATE
OSHA PEL: 5 MG/M3 ACGIH TLV: 5 MG/M3 Other Limits: 10 MG/M3
EQ 94 0 % of product. CASRN: 64741-89-5

* PEL, TLV & ACGIH STEL: OIL MIST, IF GENERATED
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
% of product NOT GIVEN. CASRN: NOT GIVEN

SEVERELY SOLVENT REFINED HEAVY PARAFFINIC DISTILLATE
OSHA PEL: 5 MG/M3 ACGIH TLV: 5 MG/M3 Other Limits: 10 MG/M3
% of product NOT GIVEN. CASRN: 64741-88-4

* PEL, TLV & ACGIH STEL: OIL MIST, IF GENERATED
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
% of product NOT GIVEN. CASRN: NOT GIVEN

PROPRIETARY ADDITIVES
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
LT ____6 ____0 % of product. CASRN: NOT GIVEN

* CAS#: MIXTURE
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
% of product NOT GIVEN. CASRN: NOT GIVEN

==========

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

----------Last change: 24-OCT-1997

PRODUCT NAME: ALTRA WAYLUBE 68

ML805

PRODUCT DESCRIPTION: Petroleum lubricating oil

REVISION DATE: 8/25/97

EMERGENCY TELEPHONE NUMBERS:

TRANSPORTATION: 412-829-1990 8am-6pm EST M-F
CHEMTREC: 800-424-9300 24 hrs Everyday

MANUFACTURER'S NAME AND ADDRESS:

ALLEGHENY PETROLEUM PRODUCTS CO.
999 AIRBRAKE AVE.

WILMERDING, PA 15148
412-829-1990
FAX: 412-829-1956

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2. COMPOSITION/INFORMATION ON INGREDIENTS

----------Last change: 24-OCT-1997

SEE COMPONENT PAGE(S) FOR ADDITIONAL INFORMATION.

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3. HAZARD IDENTIFICATION

----------Last change: 24-OCT-1997

EMERGENCY OVERVIEW: Oil mist, if generated.

US OSHA HAZARD COMMUNICATIONS STANDARD: Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined not to be hazardous.

HMIS HAZARD RATING:

HEALTH: 1
FLAMMABILITY: 1
REACTIVITY: 0

KEY:

4: Severe
3: Serious
2: Moderate
1: Slight
0: Minimal

POTENTIAL HEALTH EFFECTS:

INHALATION: Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem.

Inhalation of oil mist or vapors at elevated temperature may cause respiratory irritation.

EYE CONTACT: Expected to be minor eye irritant.

SKIN CONTACT: Repeated or prolonged skin contact may cause dermatitis and defatting.

INGESTION: Not expected to be acutely toxic.

CHRONIC: None known.

==========

4. FIRST AID MEASURES

----------Last change: 24-OCT-1997

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

EYE CONTACT: Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT: Flush with large amounts of water. Use soap if possible. Remove severely contaminated clothing and wash before reuse. If irritation persists seek medical attention.

INGESTION: If swallowed, DO NOT induce vomiting.

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5. FIRE FIGHTING MEASURES

----------Last change: 24-OCT-1997

FLASHPOINT (METHOD): 399'F (204'C) ASTM D-92

FLAMMABLE LIMITS: NE

AUTOIGNITION TEMP.: ND

EXTINGUISHING MEDIA: Water spray, dry chemical, carbon dioxide (CO2), foam.

FIRE FIGHTING INSTRUCTIONS: Avoid breathing smoke and vapor.

FIRE FIGHTING EQUIPMENT: Wear self-contained breathing apparatus and protective clothing. Use water spray to keep fire-exposed containers cool.

HAZARDOUS COMBUSTION PRODUCTS: Includes oxides of carbon, phosphorus, sulfur.

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6. ACCIDENTAL RELEASE MEASURES

----------Last change: 24-OCT-1997

SPILLS OR LEAKS: Remove sources of ignition. Contain any spills with dikes or

absorbents to prevent migration and entry into sewers or streams. Take up small spills with absorbent pads. Large spills may be taken up with pump or vacuum.

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7. HANDLING AND STORAGE

----------Last change: 24-OCT-1997

STORAGE TEMPERATURE: Ambient

STORAGE PRESSURE: Atmospheric

GENERAL: Keep container closed. Store in a cool, well ventilated place. Keep away from heat, sparks and flame. Empty containers may contain residues.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

----------Last change: 24-OCT-1997

EXPOSURE LIMITS:

OIL MIST IF GENERATED: TLV (ACGIH) 5 mg/m3 - 8 hr TWA, STEL 10 mg/m3, PEL (OSHA) 5 mg/m3 - 8 hr TWA

VENTILATION: Good general ventilation at source of vapor.

PERSONAL PROTECTION: For open systems where contact is likely, wear safety glasses with side shields, long sleeves and chemical resistant gloves.

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9. PHYSICAL AND CHEMICAL PROPERTIES

----------Last change: 24-OCT-1997

SEE DATA PAGES FOR ADDITIONAL INFORMATION.

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10. STABILITY AND REACTIVITY

----------Last change: 24-OCT-1997

STABILITY: Stable

CONDITIONS TO AVOID: Extreme heat

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS POLYMERIZATION: Will not occur

HAZARDOUS DECOMPOSITION: Includes oxides of carbon, phosphorus, sulfur.

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11. TOXICOLOGICAL INFORMATION

----------Last change: 24-OCT-1997

ACUTE TOXICOLOGY:

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). Based on testing of similar products and/or the components.

DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). Based on testing of similar products and/or the components.

INHALATION TOXICITY (RATS): Not established

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: 0 or greater but 6 or less). Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3.) Based on testing of similar

products and/or the components.

CHRONIC TOXICOLOGY (SUMMARY): The base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects.

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12. ECOLOGICAL INFORMATION

----------Last change: 24-OCT-1997

ENVIRONMENTAL FATE AND EFFECTS: This material is not expected to present any environmental problems other than those associated with oil spills.

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13. DISPOSAL CONSIDERATIONS

----------Last change: 24-OCT-1997

The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

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14. TRANSPORTATION INFORMATION

----------Last change: 24-OCT-1997

DOT:

DESCRIPTION/PROPER SHIPPING NAME: Not regulated
HAZARD CLASS: Not regulated
ID NUMBER: Not regulated
PACKING GROUP: N/A
SPECIAL INFORMATION: None

IMO:

PROPER SHIPPING NAME: Not regulated
HAZARD CLASS: Not regulated
PACKING GROUP: N/A
SPECIAL INFORMATION: None
IMO LABEL: None
SHIPPING CONTAINERS: N/A

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15. REGULATORY INFORMATION

----------Last change: 24-OCT-1997

TSCA: This material is in compliance with the TOXIC SUBSTANCES CONTROL ACT (15 USC 2601-2629) and is listed in the TSCA Inventory.

HAZARD CATEGORIES FOR SARA 311/312 REPORTING:

Health	Immediate (Acute)	No
Health	Delayed (Chronic)	No
Physical	Fire	No
Physical	Sudden Release of Pressure	No
Physical	Reactive	No
Physical	Nuisance Mist/Dust Only	No

01=SARA 313	11=NJ RTK	21=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	22=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	23=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	24=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	25=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	26=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	27=Canadian WHMIS

08=IARC Group 2B
09=SARA 302/304
10=PA RTK
18=DOT Marine Pollutant
20=EPA Carcinogen
28=OSHA CEILING

The following components of this material are found on the regulatory lists indicated.

DISTILLATES, HYDROTREATED LIGHT PARAFFINIC is found on lists: 14, 15, 17

DISTILLATES, HYDROTREATED HEAVY PARAFFINIC is found on lists: 14, 15, 17

NEW JERSEY RTK CLASSIFICATION: Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL

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16. OTHER INFORMATION

----------Last change: 24-OCT-1997

ND

NA=Not Applicable
ND=No Data
NE=Not Established

ALLEGHENY PETROLEUM PRODUCTS CO.
999 AIRBRAKE AVE.
WILMERDING, PA 15148
412-829-1990

The information on this form is furnished solely for the purpose of compliance with the OSHA Act, and shall not be used for any other purpose. The information herein is given in good faith and is based on data considered accurate. However, no warranty, expressed or implied, is made regarding the accuracy of these data or the results to be obtained from the use thereof.

End of Report

MATERIAL SAFETY DATA SHEET

MSDS Number: 112069 Status: PENDING Revision Date: 15-JUL-1992
PRODUCT NAME: TONNA T OIL 68

Part Number: NOT GIVEN Formula: NOT GIVEN
Specification: NOT GIVEN Keyword: NOT GIVEN
Stock Item Numbers: NOT GIVEN
NOT GIVEN
NOT GIVEN
Synonyms: NOT GIVEN NOT GIVEN

Manufacturer:
SHELL OIL CO.
P. O. BOX 4320 Phone: (713) 241-4819
HOUSTON, TX 77210 Emergency Phone: (713) 473-9461

Supplier:
SHELL OIL CO.
P. O. BOX 4320 Phone: (713) 241-4819
HOUSTON, TX 77210 Emergency Phone: (713) 473-9461

PHYSICAL/CHEMICAL CHARACTERISTICS:

Boiling Point:	NA		NOT AVAILABLE.
Melting Point:	NG		NG
Freezing Point:	NG		NG
Pour Point:	EQ	10 deg. F	NG
Softening Point:	NG		NG
Specific Gravity:	EQ	0.9100 (Water = 1)	NG
Vapor Pressure:	NA		NOT AVAILABLE.
pH:	NG		NG
Vapor Density:	NA		NOT AVAILABLE.
Evaporation Rate:	NA		NOT AVAILABLE.
% of Volatiles:	NG		NG
Molecular Weight:	NG		NG
Viscosity:	EQ	63 cST	CS, 40'C.

Solubility in water: NEGLIGIBLE.
Odor/Appearance/Other Characteristics: HYDROCARBON ODOR / AMBER OIL.

FIRE AND EXPLOSION HAZARD DATA:

Closed Cup Flash:	EQ	365 deg. F	PMCC.
Open Cup Flash:	NG		NG
Fire Point:	NG		NG
Auto Ignition:	NG		NG
Lower Explosion Limit:	NA		NG
Upper Explosion Limit:	NA		NG

SHIPPING REGULATIONS:
UN/NA Number: NG
DOT Hazard Class: NOT HAZARDOUS
DOT Label: NOT GIVEN
Proper Shipping Name: NOT GIVEN

PREPARER/CONTACT INFORMATION: J. C. WILLETT

Date Prepared/Revised: 21-AUG-1990

COMPONENTS:

SHELL TONNA OIL T 68
OSHA PEL: 5 MG/M3 ACGIH TLV: 5 MG/M3 Other Limits: 10 MG/M3
EQ 100 0 % of product. CASRN: NOT GIVEN

* PEL,TLV, & STEL: OIL MIST, MINERAL / PEL-CEILING: NONE.
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
% of product NOT GIVEN. CASRN: NOT GIVEN

SOL. REF., HYDROTREATED ACID TREATED HEAVY NAPHTHENIC DISTILLAT
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
BT __0.0 ___70 % of product. CASRN: 64742-18-3

SEVERELY HYDROTREATED HEAVY NAPHTHENIC DISTILLATE
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
BT __0.0 ___90 % of product. CASRN: 64742-52-5

SOL. REF., HYDROTREATED MIDDLE DISTILLATE
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
BT __0.0 ___30 % of product. CASRN: 64742-46-7

SOL. REF., HYDROTREATED RESIDUAL OIL
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
BT ____5 ___10 % of product. CASRN: 64742-57-0

MINOR ADDITIVES
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
LT ____3 ____0 % of product. CASRN: NOT GIVEN

* CAS#: MIXTURE.
OSHA PEL: NOT GIVEN ACGIH TLV: NOT GIVEN Other Limits: NOT GIVEN
% of product NOT GIVEN. CASRN: NOT GIVEN

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NAME

----------Last change: 21-AUG-1990

PRODUCT: SHELL TONNA(R) T OIL 68.

CHEMICAL NAME: MIXTURE (SEE PRODUCT/INGREDIENT SECTION).

CHEMICAL FAMILY: PETROLEUM HYDROCARBON; INDUSTRIAL OIL.

SHELL CODE: 66535.

MSDS NUMBER: 65,002-5.

24 HOUR EMERGENCY ASSISTANCE:

SHELL: 713-473-9461.

CHEMTREC: 800-424-9300.

GENERAL MSDS ASSISTANCE:

SHELL: 713-241-4819.

ACUTE HEALTH* = 1; FIRE = 1; REACTIVITY = 0.

HAZARD RATING:

LEAST = 0; SLIGHT = 1; MODERATE = 2; HIGH = 3; EXTREME = 4.

* For acute and chronic health effects refer to the discussion in HEALTH INFORMATION Section.

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PRODUCT/INGREDIENT

----------Last change: 21-AUG-1990

SEE COMPONENT PAGE(S) FOR ADDITIONAL INFORMATION.

COMPOSITION:	CAS NUMBER	PERCENT
SHELL TONNA T OIL 68	MIXTURE	100.

NO.	COMPOSITION:
P	SHELL TONNA T OIL 68.
1	SOL. REF., HYDROTREATED HEAVY NAPHTHENIC DISTILLATE.
2	SEVERELY HYDROTRETED HEAVY NAPHTHENIC DISTILLATE.
3	SOL. REF., HYDROTREATED MIDDLE DISTILLATE.
4	SOL. REF., HYDROTREATED RESIDUAL OIL.
5	MINOR ADDITIVES.

ACUTE TOXICITY DATA:

P: NOT AVAILABLE.

BASED UPON DATA AVAILABLE TO SHELL. COMPONENT 5 IN THIS PRODUCT IS NOT HAZARDOUS UNDER OSHA HAZARD COMMUNICATION (29 CFR 1910.1200).

HEALTH INFORMATION

Last change: 21-AUG-1990

THE HEALTH EFFECTS BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER OSHA HAZARD COMMUNICATIONS (29 CFR 1910.1200).

EYE CONTACT: LUBRICATING OILS ARE GENERALLY CONSIDERED NO MORE THAN MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT: LUBRICATING OILS ARE GENERALLY CONSIDERED NO MORE THAN MILDLY IRRITATING TO THE SKIN. PROLONGED AND REPEATED CONTACT MAY LEAD TO VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, OIL ACNE, OR FOLLICULITIS.

INHALATION: INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES) OR MIST MAY CAUSE MILD IRRITATION OF THE UPPER RESPIRATORY TRACT.

INGESTION: LUBRICATING OILS ARE GENERALLY CONSIDERED NO MORE THAN SLIGHTLY TOXIC IF SWALLOWED.

SIGNS AND SYMPTOMS: IRRITATION AS NOTED ABOVE.

AGGRAVATED MEDICAL CONDITIONS: PRE-EXISTING SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OCCUPATIONAL EXPOSURE LIMITS

Last change: 21-AUG-1990

	OSHA		ACGIH		
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	OTHER
P	5 MG/M3*	NONE	5 MG/M3*	10 MG/M3*	NOT GIVEN.

*OIL MIST, MINERAL.

EMERGENCY AND FIRST AID PROCEDURES

Last change: 21-AUG-1990

EYE CONTACT: FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING

EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING/SHOES AND WIPE EXCESS FROM SKIN. FLUSH WITH WATER. FOLLOW WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION: REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. IN GENERAL, NO TREATMENT IS NECESSARY UNLESS LARGE QUANTITIES OF PRODUCT ARE INGESTED. HOWEVER, GET MEDICAL ADVICE.

NOTE TO PHYSICIAN: IN GENERAL, EMESIS INDUCTION IS UNNECESSARY IN HIGH VISCOSITY, LOW VOLATILITY PRODUCTS, I.E. MOST OILS AND GREASES.

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SUPPLEMENTAL HEALTH INFORMATION

----------Last change: 21-AUG-1990

AMOCO HAS REPORTED TO THE U.S. EPA PURSUANT TO SECTION 8(3) OF TSCA THAT A SAMPLE OF HYDROTREATED MIDDLE DILTILLATE (CAS REGISTRY NUMBER 64742-46-7) APPLIED REPEATEDLY TO THE SKIN OF EXPERIMENTAL ANIMALS OVER THEIR LIFETIME PRODUCED A WEAK TUMORIGNEIC RESPONSE IN THE SKIN. THE FULL REFINING/PROCESS IN THIS SAMPLE WAS NOT PROVIDED IN AMOCO'S SUBMISSION.

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PHYSICAL DATA

----------Last change: 21-AUG-1990

SEE DATA PAGES FOR ADDITIONAL INFORMATION.

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FIRE AND EXPLOSION HAZARDS

----------Last change: 21-AUG-1990

SEE DATA PAGES FOR ADDITIONAL INFORMATION.

EXTINGUISHING MEDIA: USE WATER FOG, FOAM, DRY CHEMICAL OR CO2. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS: MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

==========

REACTIVITY

----------Last change: 21-AUG-1990

STABILITY: STABLE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS AND MATERIALS TO AVOID: AVOID HEAT, OPEN FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS: THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED UPON COMBUSTION.

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EMPLOYEE PROTECTION

----------Last change: 21-AUG-1990

RESPIRATORY PROTECTION: IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (OCCUPATIONAL EXPOSURE LIMITS SECTION) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS AND PARTICULATES.

PROTECTIVE CLOTHING: AVOID CONTACT WITH EYES. WEAR SAFETY GOGGLES. WEAR CHEMICAL-RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT. TEST DATA FROM PUBL. LIT. AND/OR GLOVE & CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE GLOVES.

==========

ENVIRONMENTAL PROTECTION

----------Last change: 21-AUG-1990

SPILL OR LEAK PROCEDURES: MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS.

LARGE SPILLS: WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE.

SMALL SPILLS: TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

==========

SPECIAL PRECAUTIONS

----------Last change: 21-AUG-1990

STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES.

WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

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TRANSPORTATION REQUIREMENTS

----------Last change: 21-AUG-1990

SEE DATA PAGES FOR ADDITIONAL INFORMATION.

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OTHER REGULATORY CONTROLS

----------Last change: 21-AUG-1990

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE EDS SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

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SPECIAL NOTES

----------Last change: 21-AUG-1990

SUPPLEMENTAL HEALTH INFORMATION SECTION HAS BEEN REVISED.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO USE AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

BE SAFE.

READ OUR PRODUCT SAFETY INFORMATION...AND PASS IT ON.

(PRODUCT LIABILITY LAW REQUIRES IT).

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210.

==========

ENVIRONMENTAL DATA SHEET

----------Last change: 21-AUG-1990

EDS NUMBER: 65,002-1.

PRODUCT: SHELL TONNA(R) T OIL 68.

PRODUCT CODE: 66535.

PRODUCT/COMPOSITION:

NO.	COMPONENT	CAS NUMBER	PERCENT
P	SHELL TONNA T OIL 68	MIXTURE	100
1	SOL. REF., HYDROTREATED ACID TREATED HEAVY NAPHTHENIC DIST	64742-18-3	0-70
2	SEVERELY HYDROTREATED HEAVY NAPHTHENIC DISTILLATE	64742-52-5	0-90
3	SOL. REF., HYDROTREATED MIDDLE DISTILLATE	64742-46-7	0-30
4	SOL. REF., HYDROTREATED RESIDUAL OIL	64742-57-0	5-10
5	MINOR ADDITIVES	MIXTURE	<3

SARA TITLE III INFORMATION:

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)

BASED ON THE DATA AVAILABLE TO SHELL THIS PRODUCT IS NOT REGULATED BY SARA, TITLE III.

FOOTNOTES:

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC. 302.

*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302.

*3 = TOXIC CHEMICAL, SEC 313.

*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM.

*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING:

HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD.
H-2 = DELAYED (CHRONIC) HEALTH HAZARD.

PHYSICAL P-3 = FIRE HAZARD.
P-4 = SUDDEN RELEASE OF PRESSURE HAZARD.
P-5 = REACTIVE HAZARD.

ENVIRONMENTAL RELEASE INFORMATION: UNDER EPA-CWA, THIS PRODUCT IS CLASSIFIED AS AN OIL UNDER SECTION 311. SPILLS INTO OR LEADING TO SURFACE WATERS THAT

CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

RCRA INFORMATION: PLACE IN AN APPROPRIATE FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

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ENVIRONMENTAL DATA SHEET CONT'D

----------Last change: 21-AUG-1990

DATE PREPARED: AUGUST 07, 1989.

SHELL OIL COMPANY
ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210.

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL:
(713) 241-2252.

FOR EMERGENCY ASSISTANCE PLEASE CALL:

SHELL: (713) 473-9461.
CHEMTREC: (800) 424-9300.

End of Report

Material Safety Data Sheet for Fire Resistant Hydraulic Oil
Equipment Unit Group
Alcoa-Davenport Works
Riverdale, Iowa

MONSANTO -- 57 SKYDROL LD-4 FIRE RESISTANT HYDRAULIC FLUID - HYDRAULIC FLUID, FIRE
MATERIAL SAFETY DATA SHEET
NSN: 9150010564883
Manufacturer's CAGE: 76541
Part No. Indicator: B
Part Number/Trade Name: 57 SKYDROL LD-4 FIRE RESISTANT HYDRAULIC FLUID

General Information

Item Name: HYDRAULIC FLUID, FIRE RESISTANT
Company's Name: MONSANTO CO
Company's Street: 800 N. LINDBERGH BOULEVARD
Company's City: ST LOUIS
Company's State: MO
Company's Country: US
Company's Zip Code: 63167
Company's Emerg Ph #: 314-694-6661, CHEMTREC 800-424-9300
Company's Info Ph #: 314-694-6661
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 002
Status: FE
Date MSDS Prepared: 18JUL95
Safety Data Review Date: 06JAN97
Supply Item Manager: CX
MSDS Preparer's Name: MSDS COORDINATOR
MSDS Serial Number: CCCDT
Specification Number: NONE
Spec Type, Grade, Class: NONE
Hazard Characteristic Code: N1
Unit Of Issue: QT
Net Unit Weight: 2.1 LBS
NRC/State License Number: NONE
Net Propellant Weight-Ammo: NONE

Ingredients/Identity Information

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 01

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 02

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 03

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 04

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 05

Physical/Chemical Characteristics

Appearance And Odor: CLEAR, PURPLE, OILY LIQUID, NO ODOR - POUR POINT <-
80F.
Boiling Point: NOT GIVEN
Melting Point: NOT GIVEN

Vapor Pressure (MM Hg/70 F): NOT GIVEN
Vapor Density (Air=1): NOT GIVEN
Specific Gravity: 1.004-1.014
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: NOT GIVEN
Solubility In Water: NOT GIVEN
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: 320F,160C
Flash Point Method: COC
Lower Explosive Limit: NOT GIVEN
Upper Explosive Limit: NOT GIVEN
Extinguishing Media: IN CASE OF FIRE USE WATER SPRAY (FOG), FOAM, DRY CHEMICAL, OR CARBON DIOXIDE.
Special Fire Fighting Proc: FIRE FIGHTERS & OTHERS EXPOSED TO PRODUCTS OF COMBUSTION SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS. THOROUGHLY DECONTAMINATE EQUIPMENT AFTER USE.
Unusual Fire And Expl Hazrds: PRODUCTS OF DECOMPOSITION INCLUDE HAZARDOUS CARBON MONOXIDE, CARBON DIOXIDE AND OXIDES OF PHOSPHORUS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): USE ABOVE 275F
Materials To Avoid: EXPOSURE TO STRONG OXIDIZING AGENTS MAY RESULT IN GENERATION OF HEAT AND COMBUSTION PRODUCTS.
Hazardous Decomp Products: OXIDES OF PHOSPHORUS MAY FORM. IF BURNED, ORGANIC MATERIAL, CARBON MONOXIDE GAS AND SOOT MAY BE PRODUCED.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): WILL NOT OCCUR.

Health Hazard Data

LD50-LC50 Mixture: LD50 ORAL RAT = 2200 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ACUTE EFFECTS:MAY CAUSE IRRITATION TO EYES AND RESPIRATORY SYSTEM. CHRONIC EFFECTS:MAY CAUSE URINARY BLADDER DAMAGE. ANIMAL STUDIES FOUND IRRITATION, LIVER CHANGES, BLOOD CHANGES & DECREASED WEIGHT GAIN. NO ADVERSE GENETIC CHANGES WERE FOUND.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: MANUFACTURER GAVE NO COMMENTS OTHER THAN THE ABOVE REFERENCES TO THE THREE LISTINGS.
NONE SPECIFIED BY MANUFACTURER.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: IF IRRITATION PERSISTS OR IS SEVERE, SEE A DOCTOR. EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN. SKIN:WASH WITH SOAP & REMOVE TO FRESH AIR. AID/RESTORE BREATHING IF NECESSARY. INGESTED:NO INFORMATION GIVEN BY MFR ON MSDS.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: CONTAIN SPILLS W/DIKES & TRANSFER THE MATERIAL TO APPROPRIATE CONTAINERS FOR RECLAIMATION OR DISPOSAL. ABSORB REMAINING MATERIAL OR SMALL SPIILLS W/INERT MATERIAL & PLACE IN CHEMICAL WASTE CONTAINER.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: IF UNCONTAMINATED PRODUCT IS NOT HAZARDOUS WASTE

UNDER 40CFR261. USED PRODUCT QUALIFIES AS USED OIL UNDER 40CFR279 & MUST BE TESTED PER TCLP TO DETERMINE PROPER CLASSIFICATION. INCINERATE I/A/W FEDERAL, STATE & LOCAL REGULATIONS. KEEP OUT OF WATERWAY
Precautions-Handling/Storing: KEEP CONTAINER CLOSED. WASH THOROUGHLY AFTER HANDLING. PRODUCT IS STABLE UNDER ORDINARY CONDITIONS OF USE, STORAGE OR HANDLING UP TO 250-275F.
Other Precautions: AVOID BREATHING VAPORS OR MIST. AVOID CONTACT W/EYES, SKIN & CLOTHING. USE W/ADEQUATE VENTILATION. EMPTY CONTAINERS CONTAIN RESIDUE & VAPORS. OBSERVE ALL LABEL SAFEGUARDS UNTIL CONTAINER IS DESTROYED. DO NOT REUSE CONTAINERS.

Control Measures

Respiratory Protection: NOT A HAZARD IF AT ROOM TEMPERATURE. IF HEATED OR AEROSOLIZED AVOID BREATHING VAPOR OR MIST. USE NIOSH/MSHA FULL FACEPIECE RESPIRATORY PROTECTION IF EXPOSURE IS EXCESSIVE. CONSULT RESPIRATOR MFR & COMPLY W/29CFR1910.134.
Ventilation: PROVIDE NATURAL OR MECHANICAL VENTILATION TO CONTROL EXPOSURE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS.
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL SPLASH GOGGLES.
Other Protective Equipment: APPROPRIATE PROTECTIVE CLOTHING INCLUDING FACE SHIELD TO PREVENT SKIN CONTACT IF SPLASHING LIKELY.
Work Hygienic Practices: AVOID CONTACT WITH EYES & SKIN. DO NOT BREATHE VAPORS. WASH THOROUGHLY AFTER HANDLING. LAUNDER CONTAMINATED CLOTHING.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

Transportation Data

Trans Data Review Date: 96304
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI PSN Code: ZZZ
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 30OCT96
MFR Label Number: NONE
Label Status: F
Common Name: 57 SKYDROL LD-4 FIRE RESISTANT HYDRAULIC FLUID
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Slight: X
Reactivity Hazard-None: X
Special Hazard Precautions: KEEP CONTAINER CLOSED. WASH THOROUGHLY AFTER HANDLING. PRODUCT IS STABLE UNDER ORDINARY CONDITIONS OF USE, STORAGE OR HANDLING UP TO 250-275F. FIRST AID: IF IRRITATION PERSISTS OR IS SEVERE, SEE A DOCTOR. EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN. SKIN:WASH WITH SOAP REMOVE TO FRESH AIR. AID/RESTORE BREATHING IF NECESSARY. INGESTED:NO INFORMATION GIVEN BY MFR ON MSDS.
Protect Eye: Y
Protect Skin: Y

Label Name: MONSANTO CO
Label Street: 800 N. LINDBERGH BOULEVARD
Label City: ST LOUIS
Label State: MO
Label Zip Code: 63167
Label Country: US
Label Emergency Number: 314-694-6661, CHEMTREC 800-424-9300

Material Safety Data Sheet for Kerosene
Equipment Unit Group
Alcoa-Davenport Works
Riverdale, Iowa

MARATHON PETROLEUM -- 1-K KEROSENE - KEROSENE
MATERIAL SAFETY DATA SHEET
NSN: 9140002426749
Manufacturer's CAGE: 16106
Part No. Indicator: A
Part Number/Trade Name: 1-K KEROSENE

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General Information

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Item Name: KEROSENE
Company's Name: MARATHON PETROLEUM CO
Company's Street: 539 S MAIN ST
Company's City: FINDLAY
Company's State: OH
Company's Country: US
Company's Zip Code: 45840-3229
Company's Emerg Ph #: 419-422-2121/800-424-9300(CHEMTREC)
Company's Info Ph #: 419-422-2121
Distributor/Vendor # 1: AMERICAN SOCIETY FOR TESTING AND MATERIA
Distributor/Vendor # 1 Cage: 81346
Record No. For Safety Entry: 007
Tot Safety Entries This Stk#: 018
Status: SE
Date MSDS Prepared: 16MAY90
Safety Data Review Date: 10JUL92
Supply Item Manager: KY
MSDS Serial Number: BNBZQ
Spec Type, Grade, Class: GRADE 1-K
Hazard Characteristic Code: F4

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: KEROSENE
Ingredient Sequence Number: 01
Percent: MIXTURE
NIOSH (RTECS) Number: OA5500000
CAS Number: 8008-20-6
OSHA PEL: 100 PPM
ACGIH TLV: 100 PPM 9091
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: PARAFFINS & CYCLOPARAFFINS
Ingredient Sequence Number: 02
Percent: 70-80%
NIOSH (RTECS) Number: 1002590PA
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: OLEFINS
Ingredient Sequence Number: 03
Percent: 3-6%
NIOSH (RTECS) Number: 10007950L
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: AROMATIC HYDROCARBONS

Ingredient Sequence Number: 04
Percent: 17-25%
NIOSH (RTECS) Number: 1000081AS
OSHA PEL: 2000 MG/M3 (PER MFR)
ACGIH TLV: UNKNOWN
Other Recommended Limit: NONE SPECIFIED

Physical/Chemical Characteristics

Appearance And Odor: CLEAR OR AMBER LIQUID. FUEL OIL ODOR.
Boiling Point: 350F,177C
Vapor Pressure (MM Hg/70 F): 1-10 MMHG
Vapor Density (Air=1): 4-5 AIR=1
Specific Gravity: 0.8
Decomposition Temperature: UNKNOWN
Solubility In Water: NEGLIGIBLE
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: 120F,49C
Lower Explosive Limit: 0.7%
Upper Explosive Limit: 5.0%
Extinguishing Media: CLASS B FIRE EXTINGUISHING MEDIA SUCH AS FOAM, CARBON DIOXIDE OR DRY CHEMICAL.
Special Fire Fighting Proc: FIRE FIGHTING SHOULD BE ATTEMPTED ONLY BY THOSE WHO ARE ADEQUATELY TRAINED. WATER CAN BE USED TO COOL EXPOSED SURFACES.
Unusual Fire And Expl Hazrds: AVOID USE OF SOLID WATER STREAMS. AVOID EXCESSIVE WATER SPRAY APPLICATION.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): THIS MATERIAL IS STABLE AT 70F. 760 MM PRESSURE.
Materials To Avoid: STRONG OXIDIZERS.
Hazardous Decomp Products: CARBON MONOXIDE, ALDEHYDES, AROMATICS, OTHER HYDROCARBONS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: LD50 (ORAL RAT) IS UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYE-LITTLE OR NO IRRITATION ON DIRECT CONTACT. SKIN-MAY PRODUCE SEVERE IRRITATION OR DERMATITIS. INGESTION-ASPIRATION OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES IN THE LUNGS CAN PRODUCE CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRAGE.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: THIS COMPOUND CONTAINS NO INGREDIENTS AT CONCENTRATIONS OF 0.1% OR GREATER THAT ARE CARCINOGENS OR SUSPECT CARCINOGENS.
Signs/Symptoms Of Overexp: SKIN-PROLONGED OR REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN. INHALATION-HIGH VAPOR CONCENTRATIONS MAY PRODUCE HEADACHE, GIDDINESS, VERTIGO AND ANESTHETIC STUPOR.

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: FLUSH WITH RUNNING WATER FOR 15 MINUTES. IF IRRITATION OCCUR, CALL A PHYSICIAN. SKIN: WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. CALL A PHYSICIAN. INHALATION: MOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION, IF NOT BREATHING. CALL A PHYSICIAN. INGESTION: DO NOT INDUCE VOMITING. DO NOT GIVE LIQUIDS. IMMEDIATELY CALL A PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: KEEP PUBLIC AWAY. SHUT OFF SOURCE. ELIMINATE IGNITION SOURCES. ADVISE NRC (800-424-8802) FOR WATER SPILL. CONTAIN LIQUID WITH SAND OR SOIL. RECOVER & RETURN FREE LIQUID TO SOURCE. USE SUITABLE SORBENT TO CLEAN UP RESIDUAL LIQUIDS.
Waste Disposal Method: DISPOSE OF CLEANUP MATERIAL IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
Precautions-Handling/Storing: PRODUCT SHOULD BE HANDLED & STORED IN ACCORDANCE WITH INDUSTRY ACCEPTED PRACTICES. IN THE ABSENCE OF LOCAL CODES REQUIREMENTS, USE NFPA OR OSHA CODES.
Other Precautions: USE APPROPIATE GROUNDING AND BONDING PRACTICES. STORE IN PROPERLY CLOSED CONTAINERS THAT ARE PROPERLY LABELED. DO NOT EXPOSE TO HEAT, OPEN FLAME, STRONG OXIDIZERS OR OTHER IGNITION SORCES. AVOID SKIN CONTACT.

Control Measures

Respiratory Protection: APPROVED ORGANIC CHEMICAL CARTRIDGE OR SUPPLIED AIR RESPIRATOR SHOULD BE WORN WHEN EXCESSIVE VAPORS OR MISTS ARE GENERATED. OBSERVE RESPIRATOR PROTECTION FACTOR CRITERIA CITED IN ANSI Z88.2 1980. SCBA SHOULD BE USED FOR FIRE FIGHTING.
Ventilation: LOCAL OR GENERAL EXHAUST REQUIRED WHEN SPRAYING OR USING AT ELEVATED TEMPERATURES.
Protective Gloves: NEOPRENE, NITRILE OR PVC GLOVES
Eye Protection: SAFETY GLASSES - CHEMICAL SPLASH GOGGLES
Other Protective Equipment: USE MECHANICAL VENTILATION EQUIPMENT THAT IS EXPLOSION-PROOF.
Work Hygienic Practices: EXERCISE GOOD PERSONAL HYGIENE INCLUDING REMOVAL OF SOILED CLOTHING AND PROMPT WASHING WITH SOAP AND WATER.
Suppl. Safety & Health Data: WARNING! COMBUSTIBLE LIQUID. HARMFUL OR FATAL IF SWALLOWED. PRODUCES SKIN IRRITATION UPON PROLONGED OR REPEATED CONTACT.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 10JUL92
MFR Label Number: UNKNOWN
Label Status: F
Common Name: 1-K KEROSENE
Chronic Hazard: YES
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Slight: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: IN CASE OF SPILL: KEEP PUBLIC AWAY. SHUT OFF SOURCE. ELIMINATE IGNITION SOURCES. ADVISE NRC (800-424-8802) FOR WATER SPILL. CONTAIN LIQUID WITH SAND OR SOIL. RECOVER & RETURN FREE LIQUID TO

FLUSH WITH RUNNING WATER FOR 15 MINUTES. IF IRRITATION OCCUR, CALL A PHYSICIAN. SKIN: WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. CALL A PHYSICIAN. INHALATION: MOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION, IF NOT BREATHING. CALL A PHYSICIAN. INGESTION: DO NOT INDUCE VOMITING. DO NOT GIVE LIQUIDS. IMMEDIATELY CALL A PHYSICIAN.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: MARATHON PETROLEUM CO
Label Street: 539 S MAIN ST
Label City: FINDLAY
Label State: OH
Label Zip Code: 45840-3229
Label Country: US
Label Emergency Number: 419-422-2121/800-424-9300(CHEMTREC)

APPENDIX B

Appendix B
EPA Region IX PRG Algorithm
Combined Exposures to Noncarcinogenic Contaminants in Industrial Soil
Equipment Unit Group
Alcoa-Davenport Works
Riverdale, Iowa

Table B-1
EPA Region IX PRG Algorithm

$$C(mg/kg) = \frac{THQ \times BW_a \times AT_n}{EF_o \times ED_o[(\frac{1}{RfD_o} \times \frac{IRS_o}{10^6\ mg/kg}) + (\frac{1}{RfD_o} \times \frac{SA_a \times AF \times ABS}{10^6\ mg/kg}) + (\frac{1}{RfD_i} \times \frac{IRA_a}{VF_s^a})]}$$

Combined Exposures to Noncarcinogenic Contaminants in Industrial Soil

Where:

THQ	=	target hazard quotient	1
Bw_a	=	body weight	70 kg
At_n	=	averaging time (noncarc)	365*ED
EF	=	exposure frequency	250 days/yr
ED	=	exposure duration	25 yr
RfD_o	=	oral reference dose	chemical specific
IRS_o	=	ingestion rate (soil)	50 mg/day
SA_a	=	skin surface area (adult)	3300 cm^2/day
AF	=	adherence factor	0.2
ABS	=	dermal absorbance	chemical specific
RfDi	=	inhalation RfD	chemical specific
IRAa	=	inhalation rate (adult)	20 m^3/day
VF	=	volatilitzation factor	chemical specific

If a chemical is considered to be a VOC[(1)], the dermal pathway is not included with ingestion and inhalation pathways in PRG calculation. This is because the latest EPA dermal guidance does not provide a default dermal absorbance factor for VOCs.

If a chemical is considered to be a SVOC, all pathways (ingestion, dermal, and inhalation) are included in PRG calculation.

(1) VOCs are generally considered to be constituents with MW>200 and Henry's Law Constant >10^{-5}. However, pyrene (MW 202, Henry's Law constant 1.1 x 10^{-5}) is an exception that is evaluated as a volatile chemical by Region IX in its PRG Table.

Alcoa Mill Products

4879 State Street
Bettendorf, IA 52722 USA
Tel: 1 319 359 2000
1 800 562 2640

Mr. Jim Colbert
US Environmental Protection Agency
Region VII
Iowa-Nebraska Remedial Branch
901 N 5th Street
Kansas City, Kansas
66101

February 20, 2001

Subject: **Equipment Group RBC Report, Alcoa-Davenport Works**
CERCLA Consent Order VII-95-F-0026

Dear Jim:

Enclosed for your review are three copies of the Equipment Group Unit Recommendation Memorandum (URM). The URM should be inserted as appendix C of the Equipment Group RBC Report. In order to accommodate EPA's comments that were included in the Equipment Group RBC report approval letter dated January 03, 2001 also enclosed are the RBC report replacement pages capturing the minor revisions that were requested.

Please call me at 319-459-1628 if you need additional information or have questions about the enclosed information.

Yours Truly

Bud Sturtzer
Davenport Remediation

Cc: George Pratt

870361-170-AB

APPENDIX C

APPENDIX C

UNIT RECOMMENDATION MEMO
EQUIPMENT UNIT GROUP
FSA UNITS IPH-10, IPP-01, IPP-02, IPP-03, AND IPO-07
FEBRUARY 2001

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1.0 RECOMMENDATION

Alcoa recommends no further action for the Equipment Group under the 1995 Administrative Order of Consent (AOC) Docket No. VII-95-F-0026. Details of the evaluation that led to the recommendation are summarized in Table C-1. The table includes all environmental media outlined in the 1995 AOC and summarizes the recommendation for each applicable scenario considered in the evaluation of the unit.

The Equipment Group was formed because each unit in the group is located within the main plant structure and each unit is a piece of heavy machinery used in the industrial process. Also, each unit is located in buildings with concrete floors where there is no routine access to soil beneath the concrete floor and foundations. Therefore, similar exposure scenarios are applicable at each unit. The receptors selected for evaluation at this Unit Group are the excavation repair worker and the excavation construction worker. This RBC Report evaluates the potential risks associated with exposure to COPCs in soil. Potential risks to ecological receptors were not evaluated in this risk assessment because there is no ecological habitat at this Unit Group.

Constituents that were included in this qualitative evaluation are lubricating and hydraulic oils used at each of the units, hot rolling oil coolant used at the No. 4 Scalper, kerosene used at the No. 8 Halden Shear, and residual PCBs that were detected at low levels in soil beneath the No. 4 Scalper. Aroclor 1248 was identified as a COPC in soil beneath the No. 4 Scalper because the detected concentration was slightly above the Region IX PRG for industrial soil. RBCs were calculated for other units at the site, and exposure point concentrations (EPCs) at the Equipment Group were well below comprehensive RBCs for the excavation repair worker and the excavation construction worker, reflecting an HI of 1 or a TCR of 10^{-6}. Therefore, no further action is warranted for soil to protect human health.

2.0 DISCUSSION

2.1 Unit History and Data Review

The FSA units that comprise the Equipment Group were combined because each unit is located in the north central to eastern area of the main plant, and each unit is a piece of heavy machinery that is part of the industrial process. The units are in buildings with concrete floors where there is no routine access to subsurface soil. These areas of the plant are fully developed, and have low potential for future construction projects. Each unit in the Equipment Group uses petroleum hydrocarbons in machinery as hydraulic fluid. In addition, petroleum hydrocarbons are used as lubricant or coolant at some units, so the potential COIs identified in the 1995 CSM are similar. FSA Units that comprise the Equipment Unit Group include the No. 4 Scalper (IPH-10), Plate Mill Levelers (IPP-01), Plate Mill Stretchers (IPP-02), the Giddings & Lewis Milling Machine (IPP-03), and the No. 8 Halden Shear (IPO-07). There is no ecological habitat at this Unit Group because it entirely within plant buildings; therefore, ecological risk was not evaluated.

Petroleum hydrocarbons were identified as constituents of interest (COIs) for these units because each unit within the group is a piece of machinery that uses an oil mixture as hydraulic fluid. Other petroleum hydrocarbons are used at the Unit Group including lubricating oil, which is used at the Giddings & Lewis Milling Machine, an oil/water mixture (coolant) that is used at the No. 4 Scalper, and kerosene, which is used at the No 8 Halden Shear. PCBs were also evaluated as COIs at these units based on knowledge of their past use at the plant. The presence of PCBs in other plant locations is attributed to processes where heat-treating of metals posed a threat of combustion, or as the result of cross-contamination from the mobile equipment that was used to change lubricants contained in production machinery. Reportedly, no PCB-containing oils were ever used in the Equipment Group units. This is supported by laboratory analysis of fluid samples collected from the machinery of the Equipment Unit Group, which show no detections of PCBs.

In July 2000, two soil samples were collected from the area near the No. 4 Scalper and analyzed for PCBs, BTEX, and total extractable hydrocarbons (TEH). Total xylenes and toluene were detected in sample MW-1 at concentrations of 1.4 mg/kg and 0.79 mg/kg, respectively. TEH was detected in soil sample MW-2 at a concentration of 4,270 mg/kg, all of it reported in the range of motor oil. Aroclor 1248 was also detected at an estimated concentration of 1.36 mg/kg in sample MW-2. Because

no additional soil data are available, these data were used to support the qualitative analysis of the Unit Group.

At the Equipment Group, fluids from gearboxes, hydraulic systems, and lubrication systems were tested for PCBs in oil samples collected between 1986 and 1995. Results of this testing program for the area near Unit Group were presented in Appendix A, and results from every sample were below detection. These data suggest that PCBs were never introduced into fluids used in machinery at the Unit Group.

2.2 Potential Migration and Exposure Pathways

Sources of petroleum hydrocarbons at the Equipment Group are similar for each unit. Hydraulic fluid, coolant (used only at the No. 4 Scalper), and kerosene (used only at the No. 8 Halden Shear) are used in machinery and collected in pits, trenches, and sumps below the equipment. Due to the nature of their use, hydraulic fluids are contained in closed systems to provide the necessary pressure to perform work. Because the fluids are in a pressurized system, hydraulic lines can leak if a line is ruptured. Hydraulic machinery is used extensively at Davenport to manipulate heavy objects such as aluminum sheet and plate. The design of these equipment and machinery generally anticipates that hydraulic fluid leaks can occur.

As these fluids are integral to the processes performed in these units, management systems are in place to contain, treat, recycle, or dispose of the used fluids. The used fluids drain to sumps, which are periodically pumped out, and transported to the Industrial Waste Treatment Facility for testing and recycling or disposal. There is little direct evidence of a release of hydraulic fluids or lubricants to subsurface soil, but there is a potential for isolated pockets of oil to be present in subsurface soil below equipment sumps. However, if a release did occur, there are no complete exposure pathways with subsurface soil because the ground surface is covered by concrete. Therefore, the potential presence of these fluids in subsurface soil would not pose a risk to human health or the environment under current conditions.

Oil that collects in sumps could potentially leak through cracks in the concrete pits and trenches, or from subsurface piping. Oil released in this manner would enter the subsurface soil beneath the floor of the building. Middle distillates and heavy oils are more viscous than water, and migration through subsurface soil would be relatively slow. Once in subsurface soil, oil would likely sorb onto subsurface soil and remain immobile beneath the floor of the plant. Over time, the oil would be expected to degrade

(EPA, 1996b). Remaining free oil, if mobile, could potentially migrate into the Storm Sewer lines or into groundwater. If oil entered the Storm Sewer System, it would flow to lift stations, where water is pumped to the Water Reclamation Facility for treatment. If insoluble oil migrated to groundwater, then it could move downgradient as a separate phase, and soluble oils would migrate within groundwater in the dissolved phase. However, no oil has been observed on the groundwater surface in wells and piezometers along the eastern facility boundary (IT, 2000b).

There is no routine exposure to groundwater beneath the Unit Group because groundwater is not used or encountered during normal operations. It is believed that the unconsolidated zone is not saturated with groundwater in this area of the plant, so the shallow bedrock zone is the uppermost groundwater horizon. Results of the Groundwater RI indicate that a groundwater divide exists in shallow bedrock groundwater under the eastern end of the plant. West of the divide groundwater flows west with a downward vertical gradient, and east of the divide groundwater flows east toward NPDES Outfall 006 and the eastern facility boundary. The only equipment within Equipment Group located east of the groundwater divide is the No. 4 Scalper. A conservative off-site groundwater exposure pathway is being evaluated for the eastern end of the plant as part of the Baseline Risk Assessment (IT, 2000b).

Some of the petroleum hydrocarbons used at the Equipment Group are vaporized or atomized to mists during use in the aluminum milling process. These vapors and mists are managed using fume exhaust systems located on the roof. Condensation upon discharge to atmosphere leaves an oil residue on the roof, some of which may be carried to the Storm Sewer System (FSA Unit CWM-07) with storm water runoff. Water from the Storm Sewer System flows to lift stations where it is pumped to the Water Reclamation Facility for treatment. During storm events, the lift station pumps occasionally are overcome, and water can be released to NPDES Outfalls. This potential pathway was addressed in the Sewer Group RBC Report (ICF Kaiser, 1998), or will be addressed in the Outfall Group RBC Report.

This entire Unit Group is within buildings where ground surface is concrete. The trenches, pits and sumps where petroleum hydrocarbons are managed are also constructed of concrete. Environmental media beneath the Unit Group could only be contacted if the floor were removed during a construction project or excavation for repairs or maintenance. However, review of Digging Permit records indicates that the only intrusive excavation that has occurred in the area since the inception of the program is the soil sampling and well installation at the No. 4 Scalper in July 2000. This suggests that contact with environmental media below the Unit Group is occurring only rarely.

2.3 Qualitative Risk Analysis

Unit information, soil data, and process knowledge were used to identify the nature and type of constituents present and their potential hazards if an environmental release of oils from these units did occur. Results from soil sampling and the Alcoa gearbox-oil sampling database suggests that the oils used in this equipment did not contain PCBs, nor was it cross-contaminated from other equipment. Thus, if a release were to occur, the release would be associated only with the constituents commonly found in process oils (lubricating oils, cutting oils and/or hydraulic oils) used at each unit of this Unit Group. In addition to lubricating and hydraulic oils, hot-rolling oil coolants are used at the No. 4 Scalper, and kerosene is used for lubrication at the No. 8 Halden Shear.

The lubricating and hydraulic oils used in all of the units of the Equipment Group are primarily derived from high range petroleum distillates. These oils contain complex mixtures of various compounds that can be characterized by their carbon fractions whose various ranges can be grouped based on similarity in toxicity and fate and transport properties (MADEP, 1994; TPHCWG, 1997a, 1997b, 1998). The constituents that are typically found in lubricating and hydraulic oils are the alkanes and cycloalkanes with a carbon range of C_{18} to C_{34}. There are also very low levels of aromatic compounds (generally less than 1%). Although the EPA Region IX tables do not have published values for petroleum distillates, industrial PRGs for soil can be derived for the heavy-end oils using EPA Region IX methodologies (EPA, 1999). Soil PRGs for the larger chain carbon fraction alkanes and cycloalkane compounds are calculated and presented in Section 2.5 of the Equipment Group RBC Report. The estimated industrial soil PRG for this range of hydrocarbon is greater than 1,000,000 mg/kg. These derived soil PRGs suggest that even full-time worker exposure to free oil would not pose unacceptable risk. Site-specific RBCs for an excavation-repair worker scenario would even be substantially higher for the hydraulic and lubricating oils used at units within the Equipment Group.

Standard hot rolling coolants are used at the No. 4 Scalper, and are 5 to 10 percent emulsions of a formulated soluble oil of a base oil, fatty ester, and a fatty acid. The remaining 90 to 95% of the coolant is deionized water. Amine soaps are added as an emulsifier, and blooming agents (hexylene glycol or diethylene glycol) are added at low concentrations to assist in emulsification. Although the specific toxicity of this mixture is not known, it adheres to FDA regulations for surface lubricants used in manufacture of metallic articles (21 CFR 178.3910), carcinogenicity, and California's Proposition 65 (Alcoa, 1997). From an industrial hygiene perspective, worker exposure to this type of oil is unlikely to be associated with adverse health effects except possibly for dermatitis from frequent, chronic contact.

Infrequent, hypothetical contact by an excavation worker to hot-rolling oil released to subsurface soil is likely to be acceptable.

The constituents that are typically found in kerosene are the alkanes and cycloalkanes with a carbon range of C_8 to C_{16}. There are trace levels of aromatics also found in kerosene, such as very low levels of the more hazardous aromatic compounds (BTEX and PAHs). Estimated industrial soil PRGs for kerosene based on MADEP (1994) and TPHCWG (1997a) and using EPA Region IX methodologies range from 11,000 to 16,000 mg/kg. There are no complete exposure pathways with subsurface soil, and kerosene may not have been released to this medium at the Halden Shear. However, under a digging scenario such as the repair or construction worker, site-specific RBCs for kerosene would be substantially higher than those calculated for a full-time industrial scenario. For example, although pyrene is not a COPC for this Unit Group, a comparison can be made between pyrene's Region IX industrial PRG and repair worker RBC developed for the Master RBC Analysis (ICF Kaiser, 1999b) to illustrate the relative conservatism of the industrial PRG assumptions. The Region IX industrial soil PRG for pyrene is 54,000 mg/kg (EPA, 1999), and the site-specific RBC for noncarcinogenic pyrene under the repair worker scenario is 995,000 mg/kg (ICF Kaiser, 1999b). The site-specific RBC is nearly 20 times greater than the generic Region IX PRG for industrial soil. Furthermore, the Digging Permit program would ensure that analytical data for subsurface soils would be collected and appropriate health and safety measures would be used.

Results of gearbox and hydraulic system testing indicate that PCBs are not present in machinery used at the Equipment Group, but Aroclor 1248 was detected in one subsurface soil sample collected adjacent to the No. 4 Scalper. The maximum detected value (an estimated concentration of 1.36 mg/kg) is slightly above the Region IX PRG for industrial soil (1.0 mg/kg), so Aroclor 1248 was retained for further qualitative evaluation. RBCs for Aroclor 1248 under the excavation-repair worker scenario were developed for previous risk evaluations at the site, including the Master RBC Analysis (ICF Kaiser, 1999b), which re-evaluated past FSA units for various exposure scenarios from the 1995 AOC.

Repair worker RBCs for carcinogenic endpoints for Aroclor 1248 with target cancer risks of 10^{-6} and 10^{-4} were calculated at 47 mg/kg and 4700 mg/kg, respectively. The repair worker RBC for Aroclor 1248 for non-carcinogenic endpoints was 673 mg/kg. Comparing the maximum detected value for Aroclor 1248 from the No. 4 Scalper (1.36 mg/kg) with the RBCs for Aroclor 1248, the concentrations in soil are well below all of the calculated RBCs. This suggests that concentrations of Aroclor 1248 in soil at the No. 4 Scalper do not pose an unacceptable risk under the excavation repair worker scenario.

2.4 Uncertainty Analysis

Uncertainties are an inherent part of evaluating risk. Alcoa acknowledges that uncertainties associated with this qualitative unit evaluation are potentially high given the amount of environmental data available for the Unit Group. However, Alcoa believes that these uncertainties are not significant given the nature of the units, the types of oils present, and the analytical data from soil and the testing program used to identify PCBs in equipment fluids.

Results from hydraulic system and gearbox testing suggest that no PCB cross-contamination of these equipment occurred. Soil data from the No. 4 Scalper helps to establish that PCBs are not present at levels of concern in subsurface soil. It is possible that isolated pockets of petroleum hydrocarbons may be present in subsurface soil beneath the Equipment Group. The lack of additional subsurface soil data represents a data gap for evaluation of the Equipment Group, but not a significant gap. Currently, there are no complete exposure pathways with subsurface soil, and the Digging Permit Program would control exposure if future excavation activities were carried out in this area. Furthermore, the nature of the contaminants (petroleum-derived lubricating, cutting, and hydraulic oils) suggests that incidental direct contact with oils through an excavation scenario would not pose an unacceptable risk.

No unacceptable risk has been identified for the Equipment Group based on the qualitative analysis primarily because there are no complete exposure pathways, and potential risks due to future excavation activities would be managed using the Alcoa-Davenport Digging Permit Program. The Digging Permit Program requires that samples be collected to aid in selection of protective equipment for excavation activities and appropriate soil disposal options. This is discussed in more detail below.

2.5 Existing Alcoa Control Measures

The facility is surrounded by a security fence with manned access gates, which controls public access to the site. In addition to these physical barriers, the plant Security Department makes routine security rounds to monitor for unauthorized personnel on site. Although the fences and security procedures may not necessarily eliminate unauthorized access to the site, they do essentially eliminate the potential for routine, uncontrolled exposure to environmental media. Unauthorized access to areas within plant buildings is even more unlikely. Before entering the site, visitors must participate in a safety briefing, wear appropriate safety equipment, and sign in at manned access gates.

More applicable to this Unit Group is the Alcoa Drilling or Digging Permit required prior to any excavation or drilling into floors, walls, ceilings, courtyards or other areas outside of buildings (Davenport Works Contractor Safety Practices Manual, January 1996). A copy of this internal Alcoa permit is included as Figure C-1. With this process, a Digging or Drilling Permit requisition form (Figure C-2) is completed that details the project. This form and the drilling permit are routed to appropriate electrical and mechanical design engineers, area maintenance planner, electrical and mechanical maintenance personnel, a telephone company representative, and a Plant environmental control representative if soil removal is proposed. Information on the permit includes the date, permit number, location, building number, column number, detailed sketch, start date, completion date, and the name of the requester. The permit specifically indicates whether or not soil will be removed and if it is, environmental control must approve the permit. As part of the environmental approval of the permit, it is determined if excavation will be done in an area of known or suspected contamination as identified by the Facility Site Assessment. If it is and data are available, those data are used to manage the health and safety aspects of the excavation work as well as applicable disposal requirements. If data are not available but the area is suspect, the project engineer is required to collect the appropriate data before the job can proceed. In this case, the digging permit is approved for soil sampling only and the final digging permit must be reviewed and approved by the environmental control department after the data are received. Environmental approval for excavation is only given if the area is clean or if a plan has been prepared to address contamination issues.

Another program in place assures that major projects are not planned for areas of known or suspected soil or groundwater contamination without a plan being in place to address the potential problem. When funds for a project are requested, a Pre-Project Environmental Checklist is required by the plant environmental manager. The purpose of the checklist is to assure that environmental aspects of a project are considered in funding. The checklist has been in place for several years and includes questions specifically related to the 1995 AOC. A copy of this checklist is attached as Figure C-3.

As part of the plant-wide general safety program, projects that have the potential for accident, injury, or exposure to potentially unsafe conditions require the preparation of a Job Safety Analysis (JSA) before the job can proceed. The JSA forms the basis of daily job-site safety review meetings to discuss potential safety hazards associated with the particular job. For example, a JSA for working with PCB-contaminated materials was developed in 1987 and is used whenever a job may involve potential exposure to PCBs.

Use of the above Drilling and Digging Permit, Pre-Project Environmental Checklist and JSA has proven effective in minimizing physical and electrical safety hazards as well as uncontrolled exposure to contaminated media when working on a project.

2.6 Additional Scenarios and Management Controls

In addition to the potentially applicable exposure scenario discussed above, Alcoa evaluated other site-specific scenarios to address potential future concerns with a change in Alcoa's land use at the unit. The objective of this evaluation is to evaluate whether a change in land use could change the conclusion[s] regarding potential risk to human health or the environment and assess the need for short-term management controls to manage these risks at the Unit Group. The qualitative analysis indicated that no unacceptable risks were associated with potential exposure to soil under the excavation scenarios.

The only potential future exposures at this unit group are COPCs in subsurface soil through an excavation scenario. Relevant excavation scenarios include exposures that occur as a result of excavation for repair or construction. A screening level assessment using risk-based PRGs for oils used at the Unit Group, derived using EPA Region IX methodologies, suggest that exposure to the oils would be acceptable under any excavation scenarios. The derived PRGs for petroleum hydrocarbons used at the Unit Group range from 11,000 mg/kg for kerosene to >1,000,000 mg/kg for lubricants and hydraulic fluids. For Aroclor 1248, the detected concentration at the Unit Group is 1.36 mg/kg, and the range of excavation construction worker RBCs developed for the Master RBC Analysis (ICF Kaiser, 1999b) for Aroclor 1248 is 96 to 9,600 mg/kg for carcinogenic endpoints, and 141 mg/kg for non-carcinogenic endpoints. The concentrations detected at the Unit Group are well below the RBCs developed for the excavation construction worker scenario.

Considering the current and potential future exposures at this unit, Alcoa sees no need for a Short-Term Management Plan. Because the Unit Group is within the main plant, this unit will be covered by a long-term management plan that would protect human health and the environment associated with any change in land use that results from a change in ownership of the property.

3.0 CONCLUSIONS

Alcoa has identified no unacceptable risks associated with current and potential future Alcoa land use with the Equipment Unit Group. This conclusion is based primarily on the fact that the chemicals used at this unit pose low hazards regardless of the level of environmental exposure. Therefore, Alcoa recommends an unconditional no further action for this unit, which implies no need for a Short-Term Management Plan since concentrations at the Unit Group do not pose an unacceptable risk under any scenario.

TABLE C-1

Unit Recommendation, Equipment Group RBC Report
(FSA Units IPH-10, IPP-01, IPP-02, IPP-03, and IPO-07),
Alcoa-Davenport Works, Riverdale, Iowa.

MEDIA	RECEPTOR	RECOMMENDATIONS	JUSTIFICATION
Surface Soil	NA	NA	No surface soil is present.
Subsurface Soil			
Potential Future Alcoa Land Use	***Excavation Construction Worker***	***No further action***	***PCB concentrations were below RBCs, and oil PRGs were greater than 1,000,000 mg/kg.***
Current and Potential Future Alcoa Land Use	***Excavation Repair Worker***	***No further action***	***PCB concentrations were below RBCs, and oil PRGs were greater than 1,000,000 mg/kg.***
Surface Water/Sediment	NA	NA	No surface water and sediment are present.
Groundwater	NA	NA	No complete exposure pathway.

NA - Not Applicable.
Bold and italicized text is applicable at this FSA Unit Group.

FIGURE C-1

DIGGING OR DRILLING PERMIT

DATE _____ PERMIT NO. Nº 5774

BLDG NO._____

COLUMN NO._____

S.O. or W.T. No._____

SKETCH ATTACHED? YES_____ NO _____

START DATE_____

EST. COMPLETION DATE\TIME_____

REQUESTED BY_____

OF_____DEPARTMENT

WILL SOIL REMOVAL BE REQUIRED FOR THIS PROJECT?

YES_____ Route to Environmental Control for completion of the lower Environmental Considerations section.

NO_____ Discard Pink Copy - Completion of the Environmental Section and Environmental Control Dept. approval not required.

CONDUITS AND OTHER HAZARDS IN THE AREA

	C	D	A			
13.8 KV 2.3 KV 440 V 230 V LOCAL				MILL WATER SANITARY WATER WELL WATER SANITARY SEWER STORM SEWERS STEAM NATURAL GAS	LIQUID CAUSTIC IND WASTE CHLORINE ACID FUEL OIL SCRAP OIL	OIL TELEPHONE PROPANE LIQUID ALUM CONDENSATE COMPRESSED AIR

* C-CLEAR * D-DEAD * A-ALIVE (CHECK)

WARNING TAGS ON BREAKERS, SWITCHES, VALVES?

YES_____ NO_____

EQUIPMENT TAGGED OUT_____

_____

REMARKS_____

_____

_____

_____

_____

NECESSARY PRECAUTIONS HAVE BEEN TAKEN

_____ _____ _____ _____

MILL MAINT. UTILITY SUPERVISOR DATE ELECTRIC UTILITY SUPERVISOR DATE

_____ _____

TELEPHONE COMPANY SUPERVISOR DATE

ENVIRONMENTAL CONSIDERATIONS

SOIL SAMPLES REQUIRED? YES_____ NO_____

SAMPLING PLAN DEVELOPED? YES_____ NO_____

CLEARED FOR SOIL SAMPLING ONLY_____

ENVIRONMENTAL CONTROL ENGINEER

SOIL ANALYSIS OBTAINED? YES_____ NO_____

SOIL DISPOSAL PLAN DEVELOPED? YES_____ NO_____

CLEARED FOR PROJECT EXCAVATION_____

ENVIRONMENTAL CONTROL ENGINEER

EMERGENCY TELEPHONE NUMBERS:

...LS - EXT. 2200 FIRE OR AMBULANCE - EXT. 2200

...ECURITY - EXT .2201 UTILITY SUPERVISOR - EXT. 2210

WHEN ANY DIGGING OR DRILLING IS PLANNED IN THE FLOORS, WALLS, OR CEILINGS OF BUILDINGS, IN COURTYARDS, OR IN OTHER AREAS OUTSIDE BUILDINGS, A DIGGING OR DRILLING PERMIT MUST BE OBTAINED BEFORE OPERATIONS START.

OBTAINING DIGGING OR DRILLING PERMITS

A. The designated Alcoa Engineer shall obtain the Digging or Drilling Permit for projects originated by engineering.

B. The appropriate Maintenance Planner shall obtain the Digging or Drilling Permit for projects originated by maintenance.

C. The permit request is initiated by completing and routing a Digging or Drilling Permit Request form to identify any potential interference problems or environmental concerns.

D. The Mill Maintenance Utility Supervisor, Electrical Maintenance Supervisor and Telephone Company Representative will determine the location of any underground cables, piping, or electric lines in the area. The permit requires the signatures of these people to verify that the location of underground lines have been determined.

E. For projects that require soil removal, the Environmental Considerations section of the Digging Permit shall be signed following procedure A - C above. If soil samples are required 2-4 weeks may be needed before the permit can be cleared for project excavation.

F. If the project is cleared for soil sampling only, the pink copy of the Digging or Drilling Permit is to be posted at the job site. The green copy will be retained by Environmental Control until test results are obtained. At that time, the green copy will be signed and returned to the requestor for posting during excavation.

DIGGING OR DRILLING SAFETY RULES

1. The Electrical Unit Supervisor and Mill Maintenance Utility Supervisor shall take the ... steps to see that work can be done safely and sign the Digging Permit. Whe... ver practial, circuits involved shall be de-energized and valves shut off. Normal tag-out procedures shall be followed where required.

2. Prior to any digging or drilling, the designeated Alcoa Engineer or Maintenance Planner shall advise the Alcoa Supervisor or Contractor in charge of excavation of any pote...ial under ground interferences.

3. For projects that require soil removal, the designated Alcoa Engineer or Maintenance Planner shall advise the Alcoa Supervisor or Contractor in charge of excavation of the potential for encountering contaminated material. The Alcoa Supervisor or Contractor is responsible for protecting the health and safety of employees through monitoring and/or the use of appropriate personal protectice equipment. For assistance regarding monitoring or personal protective equipment requirements, contact the Alcoa Industrial Hygienist.

4. The Unit Supervisor or Requestor shall post the Permit in the work area and proceed with work. If the Permit is cleared only for Soil Sampling, the pink copy of the permit is to be posted. If no soil removal is involved and/or the entire project is cleared by Environmental Control, the green copy of the permit shall be posted. Digging or Drilling is not proceed unless a property signed permit is posted at the job site.

5. For projects involving excavation deeper than 4 feet, compliance with OSHA Standard 1926, Subpart-P "Excavation" is mandatory.

6. Evidence of past contamination discovered during excavation, or the release of oils or chemicals into the soil, sewer systems or outfalls caused by an accident during excavation may have to be reported to Environmental Regulatory Agencies within 4 hours of the occurrence. If excavation causes a release or uncovers evidence of past contamination, report it immediately to Ext. 2200 to initate the proper reporting procedure.

FIGURE C-2

DIGGING OR DRILLING PERMIT REQUISITION

PERMIT NUMBER: (Requestor supplies permit number and attaches permit.)	EQUIP / BLDG:	ROUTING
PROJECT TITLE:		Elec Design: A.G.Booth J.L.Dubay
REQUEST DATE: / REQUIRED DATE: / REQUESTED BY:		Mech Design: J. J. Radloff
IS SOIL REMOVAL REQUIRED? YES NO	ACCOUNT NO: (Req. for soil removal - #202924. Authorized Projects charge directly to RFA.)	Area Maint Planner:
		Telephone Company Rep: Larry Avercamp
		• Environmental Control M. K. Sorensen
		Requestor
		• Req'd Only For Soil Removal

EXCAVATION DESCRIPTION (INCLUDE LOCATION - SEE BACK)

REFERENCE DRAWINGS (POTENTIAL INTERFERENCES)

EMBEDDED CONDUIT:	UTILITY PIPING:
PROCESS PIPING:	EQUIPMENT GENERAL ARRANGEMENT:

THIS SECTION TO BE COMPLETED BY ALCOA ENVIRONMENTAL CONTROL

Have samples been collected in this area before? _____

If yes, are they adequate for a decision on this excavation? _____ (Attach copy of analytical results)

If yes, recommendation for disposition of excavated soils: _____

If no, what additional analytical tests are recommended? _____

Description of sample location and collection procedure: _____

_____

If appropriate, provide sketch on reverse side and note here. _____

Estimated cost for sample collection and analytical work: $ _____ (Contact requestor if cost will exceed this amount)

General Comments: _____

_____

Results required as letter report or raw data only? _____

Required date for receipt of data and/or report? _____

General Comments: _____

_____

Approval to proceed with sample collection given by: _____ (signature)

FIGURE C-3

DAVENPORT WORKS PROJECT APPROVAL REQUEST
FOR ≤$250,000 PROJECTS

APPROVAL ROUTING	INITIAL	DATE
BUDGET SEC.	I. D. PALMER	
CHIEF / SUPV.		
MECH CHIEF/SUPV.	J. P. CLARK	
I. E. SPECIALIST:		
SUPERINTENDENT:		
MANAGER:		
WORKS MANAGER: (Always Req'd for Manager's Contingency Fund)		
PROPERTY ACCT:	R. V. McQUEEN	

SHOP ORDER NO:	DATE:
ACCOUNT NUMBER:	AUTH NUMBER:
FORECAST NUMBER:	DATE:
EXPENDITURE TOTAL (000's)	Target Completion Date

1996 1997

CAPITAL:
EXPENSE:

If Not In The Budget, What Project(s) Will Be Replaced?

REASON FOR EXPENDITURE

REASON 100%

FOCAL POINT:

PROJECT TITLE:

PROJECT SCOPE: (brief, one paragraph)

PROJECT BENEFITS: (Economic, ROR (if available), non-financial indicator, reduced set up time, etc.)

SAFETY IMPACT: (if applicable)

ENVIRONMENTAL IMPACT: An environmental pre-project checklist has been completed and a) ☐ there are no environmental impact issues, or b) ☐ all environmental impact issues have been resolved with the environmental department, account for in this request, and in summary result in the following actions:

PREPARED BY:	NAME	SIGNATURE	DATE
PROJ ENGR:			
MFG/IND ENGR:			
OTHER:			

INFO COPIES: G. O. PRATT, J. P. CLARK, J. N. WOOD, I. D. PALMER, J. G. FUNK, C. M. OSBORNE, J. V. VELEZ, A. WHITTY, C. A. BUEL, R. J. MEYER

PRE-PROJECT - ENVIRONMENTAL CHECKLIST

Instructions: Please complete this checklist prior to all requests for project funds. If you answered yes or don't know to any of the questions, please contact the listed individual in the environmental department for assistance. When all issues have been resolved, complete the environmental section of the PAR and attach the completed checklist to the copy of the PAR that goes to the environmental manager.

Project Title: _____

Budget Forecast No: _____

AIR

	Y	?	N
Will there be any exhausts to the outside through a new stack or vent?	☐	☐	☐
Will there be any changes to the exhaust characteristics through an existing stack or vent (i.e., flow rate, temperature, stack configuration [size, discharge direction, or height])?	☐	☐	☐
Will there be a change in the chemical makeup or quantity of air stream exhausted? (When answering this consider the effect of temperature on evaporation, chemical reactions, and the amount of emissions captured at the source after the change.)	☐	☐	☐

If the answer to any of the above is Yes or you don't know (?), contact Wayne Jochmann.

WATER

Will there be any change in water usage?	☐	☐	☐
Will there be any change in chemicals that have the potential to reach any plant waste water stream (storm sewer, industrial waste sewer, sanitary sewer)?	☐	☐	☐
Will any plant wastewater drain be relocated?	☐	☐	☐
Will the construction/installation of this project interrupt the operation of any lift station?	☐	☐	☐
Will there be any impact on storm water runoff during construction or operation (i.e., outside storage of equipment or excavation material)?	☐	☐	☐
Will there be any change in the number of aluminum pass-lbs. through a piece of equipment/process?	☐	☐	☐

If the answer to any of the above is Yes or you don't know (?), contact Anita Berry.

SPILL PREVENTION

Will there be any change in the number of storage tanks, vaults, or containers?	☐	☐	☐
Will any material (except clean water), be transferred via piping or other means, (i.e., ditch or sewer)?	☐	☐	☐

If the answer to any of the above is Yes or you don't know (?), contact Anita Berry.

	Y	?	N
SOLID WASTE			
Will there be any building demolition or the removal of any obsolete equipment/piping?	☐	☐	☐
Will there be a need to handle or dispose of asbestos?	☐	☐	☐
Will this project result in a change in the routine generation of solid waste requiring off-site disposal?	☐	☐	☐
Will the project disturb >5 acres of ground?	☐	☐	☐
Does this project require any excavations?	☐	☐	☐

If the answer to any of the above is Yes or you don't know (?), contact Linda Hoehn.

CHEMICALS

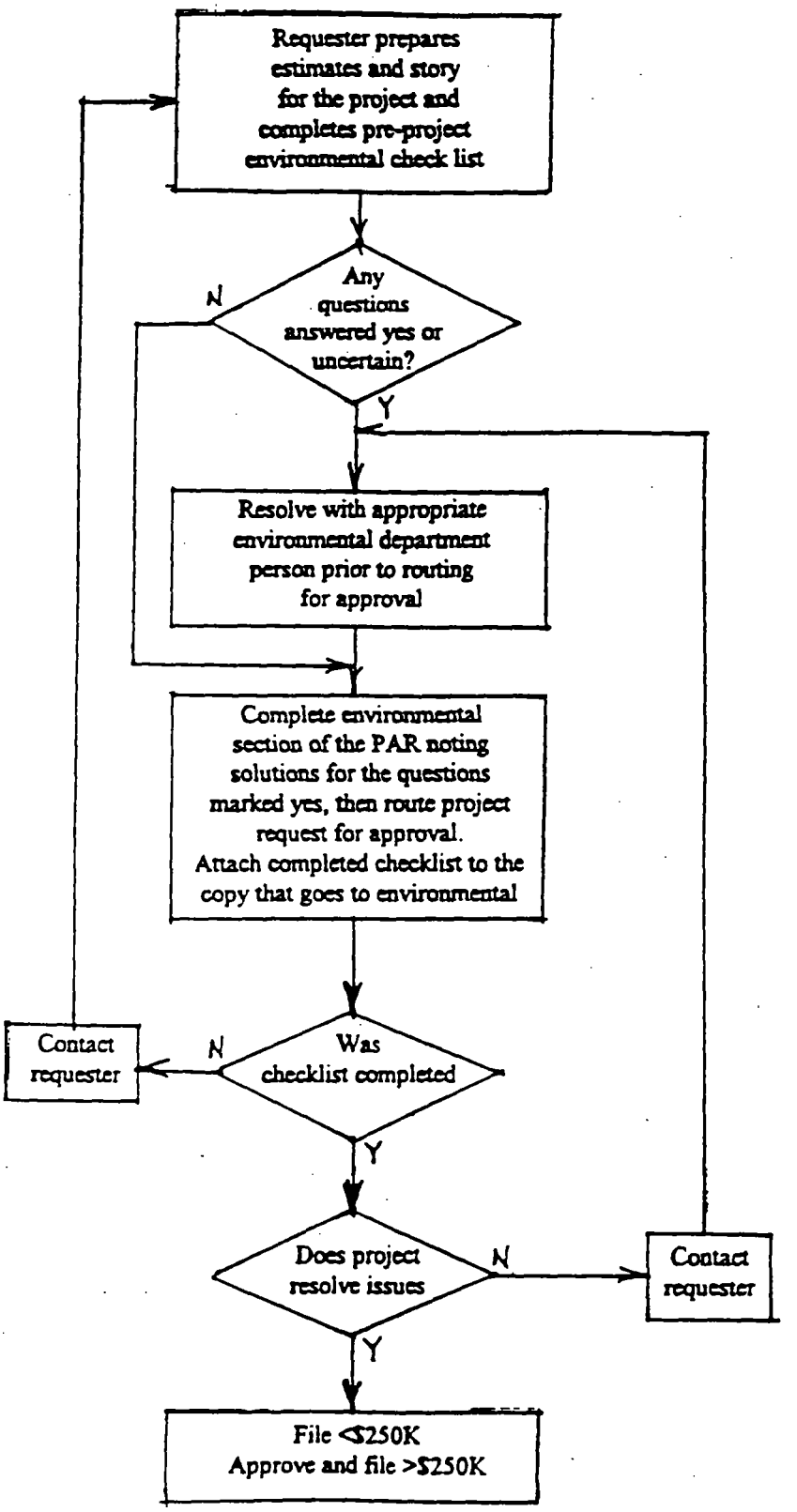
Is there a change in quantity or type of chemical used in the process?	☐	☐	☐
Will the process/equipment generate any chemical wastes?	☐	☐	☐

If the answer to the above is Yes or you don't know, contact Steve Rodine

GENERAL

If this project requires a digging permit, it is in an area covered by the Remediation Consent Order. *If yes or you don't know (?), contact Marshall Sonksen or Bud Sturtzer..*	☐	☐	☐
Will this project create or abate noise? *If yes, complete Noise Control Sheet SF-4887 and contact Dan Bedell.*	☐	☐	☐
Will this project involve any radioactive source? *If yes, contact Susan Leuthauser..*	☐	☐	☐
Will this project involve any river dredging, or river or outfall embankment changes? *If so contact Linda Hoehn.*	☐	☐	☐
Is there any used equipment from a non-Davenport source being used in this project? *If yes contact Linda Hoehn.*	☐	☐	☐
Is there any lighting being replaced or added? *If so, contact Jim Wood.*	☐	☐	☐

PROJECT APPROVAL REQUEST
Environmental Pre-Project Checklist Procedures



Requester pulls up PAR and checklist from SAROS form file

Requester

Requester

Requester

Environmental Department

Environmental Department

Environmental Department