Indoor Air Quality and Subsurface Soil
Investigation
Snohomish County Airport Offices
Snohomish County, Washington

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INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION SNOHOMISH COUNTY AIRPORT OFFICES SNOHOMISH COUNTY, WASHINGTON

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# **Executive Summary**

Camp Dresser & McKee Inc. (CDM) has completed an investigation of indoor air quality and potential soil contamination at the Snohomish County Airport (SCA) offices in Snohomish County, Washington. This investigation was conducted in response to complaints of air quality in the offices after employees noted chemical odors and frequent signs of illness.

The SCA offices occupy 3,880 square feet of a 28,725-square-foot building called C-1 at the north end of SCA. The remainder of the building, most of which is utilized as shop space, is occupied by Precision Engines Corporation (Precision). This investigation focused on the potential source area within the building, based on reports of strong odors.

CDM conducted a subsurface investigation of soils underlying Precision's Equipment Room, the Fire Riser Room, the SCA hallway, and construction office. Ambient air inside SCA offices and Precision's Equipment Room was sampled, as was the air at two boreholes. CDM reviewed engineering drawings for Building C-1 and material safety data sheets of chemicals used in the subject area. Chemical testing was performed on soil and air samples, chemicals used in the subject area, and liquid from an underground pipe. Analytical results were compared in order to evaluate matches between products used and contaminants found in soil and air samples.

Results of the soils investigation found petroleum hydrocarbons in soils underlying Precision's Equipment Room at concentrations that exceed current and proposed MTCA Method A cleanup levels. Hydrocarbons have migrated past the footings of the building into soils underlying the SCA offices. Chromatograms show clear matches between soil contamination and Soltrol®170, a product previously used at the facility by Precision Airmotive, a "sister" company of Precision.

Volatile hydrocarbons are present in ambient air of Precision's Equipment Room and SCA offices, but concentrations are below regulatory levels. Chromatograms show that air contaminants in SCA offices are correlative with the calibrating fluid historically used by both Precision Engines and Precision Airmotive. In addition, a clear correlation with Soltrol®170 was noted for air contaminants inside Precision's space and in subsurface air samples. The fact that calibrating fluid is indicated in air samples, but not in soil suggests there may be an undiscovered area of soil contaminated with calibrating fluid.

Contaminants in soil and air appear to have been affected very little by weathering, indicating this may be a recent release. Further, building drawings dated 1991 and interviews with site personnel indicate that Soltrol®170 would not have been used in the Equipment Room and Flow Room prior to 1991.

CDM recommends additional investigation and evaluation of subsurface soils underlying Precision to determine source area(s), the extent of contamination, migration pathways, and remedial options. Additional investigation of subsurface soil underlying the SCA offices is not recommended at this time because contaminant migration appears to be minimal and concentrations are below proposed cleanup levels.

Available information indicates there would likely be no adverse health effects from long-term exposure to the types of hydrocarbons present at the concentrations detected. However, we recommend that an air ventilation system be installed and that recommendations from our concurrent investigation of molds in the office are followed. In addition, the door between the SCA office hallway and the Fire Riser Room should be sealed to reduce migration of volatile hydrocarbons into the SCA office space. The lack of an air circulation system in the office, combined with these contaminants and other potential air pollution sources, may have caused symptoms of illness reported by office personnel. Theoretically, some personnel could also have become sensitized after long-term continuous exposure. CDM recommends evaluation by a medical professional if personnel believe they may be adversely affected by indoor air quality.

# Section 1 Introduction

This report presents the results of Camp Dresser & McKee Inc.'s (CDM) investigation of indoor air quality and potential soil contamination at the Snohomish County Airport (SCA) offices in Snohomish County, Washington. The Snohomish County Public Works Department retained CDM to perform this investigation in accordance with our September 15, 2000 proposal, under Master Agreement OC10-97, Work Authorization No. 48, and our January 10, 2001 proposal, under Master Agreement OC02-00, Work Authorization No. 3.

# 1.1 Background

SCA employees have complained of a condition referred to as "sick building syndrome" associated with air quality in their offices. Employees noted frequent sinus infections, colds, and allergy-like symptoms, including nausea, headaches, tiredness, sore throat, stuffy nose, and watery eyes they believed were attributable to poor indoor air quality.

Employees specifically complained of chemical odors, noting potential volatile organic compounds (VOCs) associated with industrial activities. SCA offices and Precision Engines Corporation (Precision) occupy Building C-1, separated only by a wall.

SCA requested that CDM investigate and identify potential contaminants and conditions that may be contributing to air quality problems in the offices. In October 2000, CDM completed a preliminary review and assessment of conditions in the SCA offices (CDM, 2000a). Preliminary assessment findings noted that, because of the lack of a ventilation system, the building has poor air circulation. Potential air contamination sources identified at that time included jet fuel fumes from aircraft refueling, exhaust fumes from vehicle parking areas, VOC emissions migrating from Precision's work areas located adjacent to the office, molds, and carbon dioxide from respiration. At the time of the preliminary assessment, field screening did not identify significant concentrations of VOCs in the air.

# 1.2 Purpose and Scope

The purpose of this investigation was to evaluate indoor air quality and potential subsurface contamination, which, if present, could be contributing to indoor air quality problems in the SCA offices. The scope of this investigation included the following:

Collecting a sample of liquid in an exposed pipe and submitting it for forensic analysis in an effort to ascertain potential contaminants of concern prior to a subsurface investigation. The pipe is located within Precision's area next to SCA's offices.

- Reviewing engineering drawings for Building C-1.
- Reviewing material safety data sheets (MSDS) of chemicals used in the portion of the building being investigated.
- Coring the concrete slab inside of Precision and the SCA office at 10 locations and using hand implements to extend test holes to depths of 2 to 3½ feet below ground surface (bgs).
- Screening soils in test holes for VOCs using an organic vapor meter equipped with a photoionization detector (OVM-PID) and physically examining soils to check for evident contamination and assist in sample selection.
- Submitting selected soil samples from each hole for chemical analysis.
- Collecting four ambient air samples from the SCA offices and Precision and submitting them for VOC analysis.
- Collecting air samples within two sealed boreholes (one inside Precision and one inside the SCA office area) where previous soil sampling identified hydrocarbons, and submitting them for VOC analysis.
- Submitting samples of two of the chemical products used by Precision for fingerprinting analysis for comparison to chemicals identified in soil and air samples.
- Preparing this report outlining our findings.

# Section 2 Site Description and Setting

## 2.1 Setting

The site is located within Snohomish County Airport, which is about 6 miles southwest of downtown Everett, Washington (Figure 1). The area of this investigation is located within Building C-1, which contains the SCA offices (Figure 2). Land use in the surrounding area is primarily industrial in nature.

## 2.2 Site Description

Building C-1 is 28,725 square feet and constructed in 1956. It is of wood frame and concrete block construction with a concrete slab floor and flat tar roof. A 3,880–square-foot rectangular strip along the building's northwest side is office space utilized by SCA personnel. The remainder of the building, most of which is utilized as a shop space, is occupied by Precision. A floor plan of Building C-1 is shown on **Figure 3**.

The strongest odors had been detected within the Fire Riser Room and SCA's hallway (see **Figure 3**). Therefore, the investigation focused on this area. The Fire Riser Room is adjacent to and accessed from the hallway. However, structurally it is located within Precision's Equipment Room, separated from Precision by a sheetrock-covered 2 x 4 stud wall.

Precision's Equipment Room and the adjacent Flow Room, which also borders the hallway (Figure 3), were used for storage at the time of our site work. However, we understand that the Equipment and Flow Rooms were used by one of Precision's "sister" companies, Precision Airmotive, between early 1991 and May 2000 (West, 2001). Precision Airmotive specialized in carburetor systems, and fluid test benches had been set up in the Flow Room for testing carburetor parts. Drawings dated 1991 show a series of above-ground piping extended between the two rooms. The drawings further show that the sump in the Equipment Room was installed in 1991 (Gary Parkinson Architects, 1991).

Two 8-inch storm drain lines that extend diagonally through the building were noted on a 1956 drawing of Building C-1. These lines could not be physically located under the building, so drawing measurements were used to mark approximate locations in the field. Underground power lines that extend parallel with the hallway were identified during utility locates. Underground lines are considered important from the aspect of their potential to act as migratory conduits for contamination. Subsurface explorations attempted to focus on these potential contamination migration pathways. Figure 4 shows approximate locations of underground lines.

## 2.3 History of Precision's Occupancy

Precision has a long history at Building C-1 and throughout its history has specialized in rebuilding radial engines, with expansions into the manufacture of fuel injection

systems, carburetors, and electrical components at this facility. The following is a brief history of Precision relative to this facility based on written and oral information provided by Mr. Bill West, Supervisor at Precision Engines.

Precision was founded in the 1940s, originally serving as the maintenance provider for Alaska Airlines' DC-3 and DC-6 radial engine aircraft. Alaska's aircraft maintenance activities began at the south end of the airport, and were moved to Hangar 2 and Building C-1 in about 1956. In 1963, Alaska Airlines moved its facility to SeaTac when the airline advanced to jets, but the radial aircraft repair business continued at SCA under the name of Pierce Precision.

Over the years, Precision changed its name several times and grew, adding various related specialty companies, some of which occupied facilities at other locations. The parent corporation is currently called Precision Aerospace Corporation. Building C-1 has always been used by that portion of the company that specializes in overhauling radial engines, currently under the name of Precision Engines Corporation. In 1990, Precision purchased Facet Aerospace Company and moved Facet's float carburetor fuel systems to the SCA facility under the name of Precision Airmotive. In 1993, Precision purchased Lamar Electronic Products and moved it to the Precision Airmotive facility at SCA.

Precision Airmotive occupied the western portion of Building C-1, including the Equipment Room and Flow Room, which were the subject of this investigation. Precision Airmotive moved from Building C-1 in May 2000 and the building is currently occupied only by Precision Engines.

## 2.4 Environmental Setting

Geologic maps and previous investigations conducted throughout SCA by CDM indicate that native soils underlying the site are Vashon till. Vashon till comprises a very dense, non-sorted mixture of clay, silt, sand, pebbles, cobbles, and boulders. Recent investigations conducted by CDM at the south end of the airport indicate the till is at least 75 feet thick. Logs of other borings in the area indicate the till can be as much as 200 feet thick in the Paine Field area (CDM, 2000b).

Because of its dense nature, till rarely yields water in useable quantity, although groundwater may be found in isolated sand lenses and perched in the upper weathered zone. Previous subsurface investigations conducted by CDM in the immediate site vicinity have found perched, discontinuous zones of groundwater within the upper 15 feet, which occur only sporadically. The regional aquifer occurs within the advance outwash sand and gravel underlying the till. Information on wells north of SCA and at the south end of SCA indicates the depth to groundwater could be as shallow as 130 feet (ft) bgs and as deep as 250 ft bgs (CDM, 2000b).

# Section 3 Investigation Methods

## 3.1 Liquid Sampling

On October 24, 2000, CDM visited the site to observe conditions and to collect a sample of liquid in an exposed pipe located inside Precision's Equipment Room, next to the shared wall between Precision and SCA offices (see Figure 4). The 1½-inch metal pipe is sawed off at the floor surface and extends about 18 inches vertically, then turns west, under the SCA hallway, running parallel to the ground surface. The pipe was partially filled with a clear, slightly oily liquid. CDM collected a sample of this liquid using tygon tubing and transferred it directly into a 4-ounce laboratory-supplied glass jar with a Teflon® cap liner. The sample jar was sealed, labeled, and placed in a chilled ice chest for submittal to the laboratory for analysis.

# 3.2 Soil Sampling

The subsurface was explored at 10 locations over the course of this investigation. Exploration locations are shown on **Figure 4**. Soil conditions at each location were investigated by coring through the concrete slab, then using a posthole digger, pry bar, and stainless steel hand auger to advance the boring. Each boring was initially advanced using the posthole digger and pry bar. Soil samples were collected using the stainless steel hand auger. Soil samples to be submitted for laboratory analysis were placed directly into laboratory-supplied glass jars, packed without headspace, sealed, labeled, and placed in a chilled ice chest.

During exploration, soils were field screened for VOCs using an OVM-PID to assist in determining sample locations. Field screening was performed by placing a soil sample into a plastic resealable bag, desegregating the sample, and after approximately 5 minutes, inserting the OVM-PID probe through the bag into the space (headspace) above the soil. This screening technique is not a compound-specific analysis and is affected by, among other influences, climate (e.g., temperature and humidity), soil type and condition, and instrument calibration and operation. The intent of this analysis is to qualitatively compare samples and assist in selecting samples for chemical analysis. Soils were also field screened for hydrocarbons by immersing a small sample in water and checking for sheen.

Between each borehole location, field equipment was decontaminated by scrubbing it with a solution of Alconox and potable water, rinsing it with potable tap water, and rinsing it again with deionized water.

CDM conducted the subsurface investigation in four stages. The purpose of the first stage was to check for the existence of soil contamination within the suspect area, and if present, to determine the type of contamination. The purpose of the second stage was to evaluate the depth of contamination. The purpose of the third and fourth stages was to evaluate whether contamination had migrated beyond the footings and under the SCA offices.

CDM conducted Stage 1 on November 2, 2000. Shallow subsurface soil samples were collected from three locations (shown as B1 through B3 on Figure 4) inside Precision's Equipment Room and two locations (B4 and B5) from inside the Fire Riser Room. B1 and B2 were located on either side of the stubbed pipe from which the liquid sample was collected and next to an underground line. B3 was located adjacent to the existing sump. All samples were collected at 8 inches bgs except the sample from B3 by the sump, which was collected at 22 inches bgs.

CDM conducted Stage 2 on December 1, 2000. Borings B1 through B3 were deepened by hand until encountering till and refusal. Soil samples collected at the base of B1 through B3 at 32, 36, and 42 inches bgs, respectively, were submitted for analysis.

CDM conducted Stage 3 on December 7, 2000. Two new borings, B6 and B7, were extended in the SCA office hallway. B6 was located in the SCA hallway just outside the Fire Riser Room door and B7 was located in the hallway opposite of the wall from the 1½-inch stubbed pipe. These borings were also extended to the maximum depth until refusal (24 inches). Two soil samples were collected from each boring (18 and 24 inches bgs) and submitted for analysis.

CDM conducted Stage 4 on December 27, 2000. Three new borings, B8 through B10, were extended. B8 and B9 were located approximately over storm drain lines that extend through the footings. B10 was located west of B7, just inside one of the offices; it was thought that the  $1\frac{1}{2}$ -inch pipe might extend in this direction. Two soil samples were collected from each boring (18 and 30 inches bgs) and submitted for analysis.

## 3.3 VOC Air Sampling

CDM conducted ambient air sampling for VOC analyses on November 13, 2000. Sample locations are shown on Figure 5. One ambient air sample was collected inside Precision's Equipment Room (#1) and three ambient air samples were collected inside the airport offices (#2 through #4). A fifth sample (#5) was collected inside borehole B2 in Precision's Equipment Room to check VOC concentrations in the air space of the unsaturated soils (vadose). The borehole had been covered with visqueen and sealed with duct tape immediately after the soil investigation. Soil samples collected from this borehole contained some of the highest concentrations of petroleum hydrocarbons.

Ambient air samples #1 through #4 were collected over 8 hours using air sampling pumps equipped with charcoal tubes set at a flow rate of 1 to 1.5 liters per minute. Total air volume sampled ranged from 475 to 720 liters. Sample pumps were set at a height of approximately 4 feet above ground and left undisturbed, but periodically checked throughout the day. Sample #5 was collected through a small hole in the visqueen after all of the ambient air samples had been collected. The sample was collected over 1 hour at a pumping rate of 2 liters per minute. The total air volume sampled was 120 liters.

On January 5, 2001, CDM collected an air sample (#6) from Borehole B6 in the SCA office hallway. The purpose of this sample was to evaluate migration of VOCs through the soil vadose zone underlying the SCA offices. The sample was collected in the same manner as #5 except that it was run at a pumping rate of 2 liters per minute for 2 hours, for a total volume of 240 liters.

# 3.4 Laboratory Analysis

### 3.4.1 Liquid

The liquid sample was submitted to Fayette Environmental Services, Inc. (Fayette) in Fayette, Missouri under chain-of-custody protocol. Volatile and semivolatile gas chromatography and mass spectophotometry (GC/MS) scans were performed on the sample. Fayette specializes in forensic chemical analytical services. The scans were checked against the MS library of chemical compounds and interpreted by laboratory personnel.

#### 3.4.2 Soil

Soil samples were submitted to CCI Analytical Laboratories in Everett, Washington under chain-of-custody protocol. The soil samples from Stage 1 were analyzed for VOCs by EPA method 8260, semivolatile organic compounds by EPA method 8270, and for hydrocarbon screening by Northwest method NWTPH-HCID. Following the results of the hydrocarbon screening, the soil samples were also analyzed for diesel-range hydrocarbons by Northwest method NWTPH-Dx. All subsequent soil samples were analyzed only for diesel-range hydrocarbons by NWTPH-Dx.

#### 3.4.3 Air

The charcoal tubes from the air sampling were submitted under chain-of-custody to Prezant Associates (Prezant) in Seattle, Washington for analysis by GC/MS. This is a broad-spectrum analysis that will detect a wide range of VOCs, including halogenated compounds (i.e., chlorinated solvents), aromatic hydrocarbons (i.e., benzene, toluene), and volatile/semivolatile aliphatic hydrocarbons through  $C_{15}$  (i.e., petroleum products such as gasoline, stoddard solvent, and diesel).

#### 3.4.4 Product

Two products historically used by Precision, Soltrol®170 (manufactured by Phillips Chemical Company) and calibrating fluid (MIL-PRF-7024E Type II, manufactured by Ashland Chemical Co.), were submitted to CCI and Prezant for analysis by the same methods used for the soil and air samples. The purpose of these analyses was to obtain chromatograms for comparison. MSDSs for these two products are provided in **Appendix A**.

Both Soltrol®170 and the calibrating fluid are used for testing carburetors. These products are used instead of fuel for safety purposes. The products are used in a closed loop system that cycles the fluid through the carburetor in order to test it.

Calibrating fluid has been used longer than the Soltrol®170. Each is used in different types of carburetors (West, 2001).

Precision's records contain an MSDS for another calibrating fluid (MIL-C-7024C). A representative of Ashland Chemical Co. informed CDM that this calibrating fluid was the predecessor to the calibrating fluid currently used by Precision (Morgan, 2000). It was discontinued in October 2000. MIL-C-7024C was manufactured to slightly different specifications. We were further informed that chromatograms of the two calibrating fluids would be indistinguishable from each other (Morgan, 2000).

We understand that only Precision Airmotive used Soltrol®170. The calibrating fluid has been used on the west side of the building by Precision Engines, Precision Airmotive and others throughout Precision's history at this site.

# Section 4 Findings

#### 4.1 Field Observations

Subsurface sediments encountered during hand augering consisted of 6 inches of light brown sandy gravel (fill) that turned dark brown to gray below 6 inches and graded into a silty sand. Gray, very dense, unweathered native till was encountered at 2 to 2.5 feet below the floor slab, except next to the sump, where it was encountered at 3.5 feet below the slab. Perched groundwater was not encountered in any of the test holes. Soils in B1 through B3 had solvent-like odors, and VOC and sheen screening tests were positive. Soils in B4 and B5 were not obviously contaminated, but VOC screening results were positive. Field screening did not indicate significant contamination in B6 through B10.

## 4.2 Chemical Analytical Results

Chemical analytical results are included in the **Appendix B**. Soil chemical results were reviewed by a CDM chemist for completeness and data quality, and the data were found to be of known quality and acceptable for use. A Quality Assurance Report is also included with the laboratory reports in the **Appendix B**.

#### 4.2.1 Product

The MSDS for Soltrol®170 indicates this product is an aliphatic hydrocarbon mix (i.e., carbon atoms linked in open chains of varying length) consisting of  $C_{10}$  to  $C_{15}$  isoalkanes (saturated hydrocarbons). A representative for the manufacturer stated a slightly different makeup, indicating the carbon chain lengths of this product range from  $C_{12}$  to  $C_{15}$  (Ortiz, 2000) and specifically stated percentages ( $C_{12}$  - 11%,  $C_{13}$  - 53%,  $C_{14}$  - 30%, and  $C_{15}$  - 6%). The chromatographic profile of Soltrol®170 confirms that the product elutes in the  $C_{12}$  to  $C_{15}$  range (late gasoline, early diesel).

The MSDS for the calibrating fluid indicates this product is an aliphatic hydrocarbon mix, similar to stoddard solvent/mineral spirits. The chromatographic profile of the calibrating fluid shows that it elutes in the range of  $C_9$  to  $C_{11}$ , before that of the Soltrol®170.

### 4.2.2 Liquid

Screening analyses on the liquid sample identified some volatile and semivolatile organic compounds. In the volatile range the lab indicated the major components were saturated, mostly branched, hydrocarbons with 10 to 15 carbons. There were also a few alkenes, alcohols, and ketones, along with some limonene (lemon scent). No aromatic hydrocarbons were detected. Three groups of semivolatile compounds were identified: glycols, saturated hydrocarbons, and surfactants. The saturated hydrocarbons ranged from 12 to 18 carbons. The  $C_{12}$  to  $C_{15}$  hydrocarbons were branched. Bis(ethylhyxyl)phalate was a dominant peak; however, this could be cross contamination from the tubing used to collect the sample.

In summary, the compounds detected in this sample appear to be a mixture of the Soltrol®170, a cleaner (e.g., Murphy's oil soap), and possibly some other unidentified petroleum hydrocarbons.

#### 4.2.3 Soil

Stage 1 hydrocarbon screening analyses that were conducted on the shallow samples collected from B1 through B5 identified diesel-range hydrocarbons. No other VOCs or SVOCs were identified in the stage 1 analyses. Therefore, semivolatile total petroleum hydrocarbons (TPH) were quantified in these and subsequent soil samples collected from the site.

TPH quantification analytical results are summarized in **Table 1** and on **Figure 4**. Petroleum hydrocarbons ranging from 680 to 23,000 milligrams per kilogram (mg/kg) were detected in all soil samples collected from under Precision's Equipment Room and the Fire Riser Room.

Conversely, soils underlying the SCA offices are mostly free of hydrocarbon contamination. Hydrocarbons were detected in only two samples: B6 at 22 inches bgs (400 mg/kg) and B9 at 30 inches bgs (160 mg/kg). The B6 sample was collected within the trench backfill of the 1½-inch pipe that extends from Precision's Equipment Room. The B9 sample was collected approximately next to a storm drain line that extends under the building.

#### 4.2.4 Air

VOC analytical results from air sampling are summarized in **Table 2**. For the purposes of this investigation, Sample # 5, which was obtained from B2, is considered a reference sample in order to evaluate whether detected VOCs in the air samples are related to subsurface contamination. Stoddard solvent ( $C_9$ - $C_{11}$ )- and diesel ( $C_{12}$ - $C_{15}$ )-range hydrocarbons were detected in Sample #5 at concentrations of 210 and 220 milligrams per cubic meter ( $mg/m^3$ ), respectively. No other compounds were detected in this sample.

Stoddard solvent-range hydrocarbons were detected in all of the ambient air samples. The ambient air sample with the highest concentration (7.9 mg/m³) was collected in Precision's Equipment Room. Concentrations in the SCA offices ranged from 1.0 to 1.5 mg/m³. The less volatile diesel-range ( $C_{12}$ - $C_{15}$ ) hydrocarbons were detected in the air sample from Precision's Equipment Room (5.1 mg/m³), but not in the SCA office samples. Low concentrations of  $C_3$  alkyl benzenes (i.e., less than 0.2 mg/m³) were detected in the four ambient air samples. Low concentrations of toluene, m,p-xylene, and ethylbenzene were also detected in Precision's Equipment Room.

The air sample collected from B6, located inside the SCA hallway, contained 9.6 mg/m $^3$  hydrocarbons, of which 94 percent was determined to be within the  $C_{12}$ - $C_{15}$  range and only 6 percent in the  $C_{10}$ - $C_{11}$  range.

# Section 5 Discussion

#### 5.1 Soil

## 5.1.1 Chemical Profiling

The chromatographic profile for the calibrating fluid is substantially different from that of Soltrol®170. **Figure 6** compares the chromatographic profiles for calibrating fluid and Soltrol®170. As would be expected by the carbon ranges for these two compounds, the calibrating fluid elutes before the Soltrol®170.

The chromatograms show distinct relationships between hydrocarbons in soil and Soltrol®170, but not with the calibrating fluid. Figure 7 compares Soltrol®170 with the 42-inch sample from B2. The hydrocarbon profile of this sample is essentially the same as that of the Soltrol®170; slight differences are expected due to different concentrations (which changes the vertical scale) and effects of weathering. However, very little weathering is apparent in the sample.

### 5.1.2. Regulatory Limits

The Model Toxics Control Act (MTCA) administered by the Washington State Department of Ecology (Ecology) provides numerical standards for cleanup of petroleum hydrocarbons using three methods referred to as Method A, Method B, and Method C. Method A provides cleanup levels in tabular form for a limited number of contaminants and is used on uncomplicated sites with only a few contaminants of concern. Risk-based cleanups are conducted under Methods B (unrestricted land use) and C (restricted land use).

Under the current version of MTCA, cleanup levels for petroleum hydrocarbons are established only under Method A. The current Method A cleanup level for diesel-range petroleum hydrocarbons is 200 mg/kg. In 1997 Ecology published an interim TPH policy that outlines a method to develop Method B cleanup levels. The method outlined in this policy is complex and requires a substantial amount of analytical work. The method develops cleanup levels based on the additive effects of the petroleum fractions and the VOCs present in the petroleum mixture. Method B cleanup levels developed for petroleum products with low volatility and few aromatic hydrocarbons (i.e., weathered gasoline, diesel, lube oil) are often substantially higher than under Method A.

Proposed revisions to MTCA that are expected to be implemented in mid-2001 will increase the Method A cleanup level for diesel-range hydrocarbons to 2,000 mg/kg. The 1997 TPH interim policy under Method B will also be incorporated. Development of site-specific cleanup levels must consider migration pathways (i.e., volatilization).

Six of the ten soil samples collected under Precision's Equipment Room and the Fire Riser Room exceeded current and proposed Method A cleanup levels. Without further analysis, we cannot determine whether Method B cleanup levels will be exceeded. All of the soil samples collected under the SCA offices were below proposed Method A cleanup levels.

#### 5.2 Air

### 5.2.1 Chemical Profiling

Chromatograms of the air samples from B2 and Precision's Equipment Room have two distinct humps. The first hump contains  $C_9$  to  $C_{11}$  hydrocarbons and the second hump contains  $C_{12}$  to  $C_{15}$  hydrocarbons. In the air samples from the SCA offices, only the more volatile  $C_9$  to  $C_{11}$  hydrocarbons were detected.

Figure 8 compares the chromatogram of Soltrol®170 with the air sample from Precision's Equipment Room. Figure 9 compares the calibrating fluid with the air sample from Precision's Equipment Room. The Soltrol®170 and the calibrating fluid closely match their respective humps in the air samples. There is some evidence of weathering whereby the lighter end of the hydrocarbons in the air samples is reduced in abundance relative to the later eluting compounds.

Probably because it is more volatile, only the stoddard solvent-range hydrocarbons were detected in ambient air collected in the SCA offices. However, it is interesting to note that hydrocarbons detected in the air sample from B6 were mostly comprised of Soltrol®170.

The presence of the aromatic hydrocarbons (toluene, xylenes, and ethylbenzene) in the air sample from Precision's Equipment Room, but not in the other samples, suggests there is another contaminant source unrelated to the calibrating fluid and Soltrol®170. It is likely that adjacent shop activities are the source of these contaminants.

### 5.2.2 Regulatory Limits

**Table 2** compares contaminant concentrations with allowable limits established by the American Conference of Governmental Industrial Hygienists (ACGIH) and the Occupational Safety and Health Administration (OSHA). Contaminant concentrations in all samples were well below any of these limits. Theoretically, there should be no adverse health effects from exposure to the low levels of contaminants present in the workplace air, both at the SCA offices and at Precision.

It should be noted that these allowable limits do not necessarily take into consideration that there may be additional indoor air pollution sources. It is currently generally recognized that, while pollutant levels from individual sources may not pose a significant health risk by themselves, most buildings have more than one source that contributes to indoor air pollution and that there can be a serious risk from cumulative effects of these sources. For this site, the additive effects of these

VOCs and other potential air pollution sources (i.e., aircraft fueling and exhaust, cleaning products, building materials such as carpets, air fresheners, dusts, and molds), combined with inadequate ventilation in the building may be causing the symptoms described by SCA personnel.

The Environmental Protection Agency's (EPA) *The Inside Story, A Guide to Indoor Air Quality* (1995) notes that the symptoms building occupants experience "do not fit the pattern of any particular illness and are difficult to trace to any specific source." Symptoms are varied and numerous and may include stuffy or runny nose, headache, nausea, irritability, fatigue, or lethargy. The EPA's guide further notes that there is no single manner in which these health problems appear. In some cases, the problems begin as workers enter their office and diminish later in the day; other times the symptoms continue. Sometimes there are outbreaks of illness among workers in a single building; in other cases health symptoms show up only in individual workers.

In addition, some VOCs can be sensitizers. This occurs when continuous exposure to low levels of a chemical over a long period causes some individuals to suddenly, and from then forward, have strong adverse reactions to any exposure to the particular contaminant. Stoddard solvent is not a known sensitizer. CDM and Prezant conducted a limited search of research that may provide information on the potential for stoddard solvent to be a sensitizer and found none. Part of the reason for this lack of information is the variable effects that any individual chemical may have on different individuals. An overwhelming amount of research would have to be conducted on any particular chemical to establish such a link.

# Section 6 Conclusions and Recommendations

The following sections outline our conclusions and recommendations based on our investigation and research. Our recommendations assume that an air ventilation system will be installed and that recommendations from our concurrent investigation of molds in the building are followed as outlined in the report from that investigation.

#### 6.1 Conclusions

- Petroleum hydrocarbons are present in soils underlying Precision's Equipment Room at concentrations that exceed current and proposed MTCA Method A cleanup levels. There has been minor migration of hydrocarbons past the footings of the building into soils underlying the SCA offices.
- Chromatograms show clear matches of the soil contamination with Soltrol®170.
- The Soltrol®170 that is present in soils appears to have been affected very little by weathering, which may be indicative that this is a recent release. Further, building drawings dated 1991 and interviews with site personnel indicate that Soltrol®170 would not have been used in the Equipment Room and Flow Room prior to Precision Airmotive's occupancy in 1991. In addition, since strong odors were present in soil next to the sump during our field investigation, if the same was true at the time of sump installation, it should have been reported by personnel installing it.
- Volatile hydrocarbons are present in ambient air of Precision's Equipment Room and SCA offices, but concentrations are below regulatory levels. Available information indicates there would be no probable adverse health effects from long-term exposure to the types of hydrocarbons present at the concentrations detected. However, the lack of an air circulation system, combined with these contaminants and potentially other air pollution sources, may have resulted in the symptoms of illness reported by office personnel.
- Air contaminants in the SCA offices match the calibrating fluid used by Precision.
   Soltrol®170 also clearly matches air contaminants inside Precision's space and in subsurface air samples.
- The fact that calibrating fluid is indicated in air samples but not in soil suggests there may be an undiscovered area of soil contaminated with calibrating fluid.

### 6.2 Recommendations

Additional investigation and evaluation of subsurface soils underlying Precision should be conducted to determine source area(s), the extent of contamination, migration pathways, and remedial options.

- No additional investigation of subsurface soil underlying the SCA offices is recommended at this time because contaminant migration appears to be minimal.
- While VOC contaminants identified in air are present at levels that are not known to have an adverse effect, theoretically, some personnel could become sensitized after long-term continuous exposure. Personnel who believe they may be adversely affected by such exposure would have to be further evaluated by a medical professional.
- The door between the SCA office hallway and the Fire Riser Room should be sealed as it may reduce VOC migration into the SCA office space.

# Section 7 Use of This Report

This report was prepared for exclusive use by Snohomish County Public Works Department and Snohomish County Airport for this project only. Our scope of services was developed in conjunction with your involvement to achieve specific project objectives, with the intent of establishing an appropriate balance between level of effort and uncertainty. Providing this report to others not party to this mutual scope determination, or using it for other projects or purposes, can result in misunderstanding or incorrect assumptions. CDM cannot be responsible for interpretation by others of the data contained herein, except as stated in our conclusions and recommendations.

We must presume the conditions encountered are representative of the site. However, subsurface conditions may vary between exploration locations and with time, and unanticipated conditions can and often do occur.

Our work has been performed in a manner consistent with that level and care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty, express or implied, is made.

# Section 8 References

CDM. 2000a. Summary of Findings, Indoor Environmental Air Quality Review, Snohomish County Airport Office Space, Paine Field, Washington. October 18.

CDM. 2000b. Hydrogeologic Setting, Paine Field Area, Everett, Washington. Prepared for Snohomish County Public Works Department. Project Number 19947-29702-15512334. December 29.

EPA. 1995. The Inside Story; A Guide to Indoor Air Quality. EPA Document #402-K-93-007. April.

Gary Parkinson Architects. 1991. Drawings for Tenant Improvements for Precision Airmotive Corporation. Electrical, Mechanical, Venting, Ducted Air & Fluids Plan, and Sheet 2 of 6 of the drawings. Drawn January 31, 1991.

Morgan. 2000. Telephone conversation between Ashland Chemical and Pamela Morrill of CDM on December 27. (888) 424-8356.

Ortiz, Sixto. 2000. Telephone conversation between Chevron Philips Chemical Company and Pamela Morrill of CDM on November 11, 2000. (425) 353-2110.

West, Bill, Supervisor at Precision Engines. 2001. Telephone conversation with Pamela Morrill of CDM on February 28, March 1, and May 21, 2001. (425) 347-2800.

# Distribution

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Bellevue, Washington 98008

Attention: Ms. Judith Aitken

Quality Assurance / Technical Review by:

Susan J. Penoyar, P.E.

Principal

# **Tables**

Table 1
Petroleum Hydrocarbon Analytical Summary - Soil
Snohomish County Airport/Building C-1 Air Investigation
Everett, Washington

Borehole	Sample I.D.	Sample Depth (inches bgs) <sup>a</sup>	TPH Semivolatile Range (mg/kg)
B1	B-1	8	1,800
	B-1 38"	32	5,700
B2	B-2	8	23,000
	B-2 42"	36	14,000
B3	B-3	22	680
	B-3 48"	42	19,000
B4	B-4	8	16,000
B5	B-5	8	17,000
B6	B-6 2'	18	<25
	B-6 2'6"	24	400
B7	B-7 2'	18	<25
	B-7 2'6"	24	<25
B8	B-8 2'	18	<25
	B-8 3'	30	<25
B9	B-9 2'	18	<25
	B-9 3'	30	160
B10	B-10 2'	18	<25
	B-10 3'	30	<25
Current Cl	200		
Proposed	2,000		

#### Notes:

Boxed values exceed current Method A cleanup levels. Shaded values exceed proposed Method A cleanup levels.

- a) Sample depths measured from the top of the soil surface. (Excludes thickness of the concrete floor.)
- b) Model Toxics Control Act (MTCA) Cleanup Regulations, Chapter 173-340 WAC, Method A soil cleanup levels per January 1996 amendments.
- c) MTCA Method A soil cleanup levels per February 2001 adopted amendments.

bgs - below ground surface.

mg/kg - milligram per kilogram.

Table 2
Volatile Organic Compound Analytical Summary - Air
Snohomish County Airport/Building C-1 Air Investigation
Everett, Washington

Sample No.: Location:	#5 Borehole B2	#6 Borehole B6	#1 Precision Equipment Room	#2 SCA Hall	#3 SCA Reception	#4 SCA Office		
Sample Type:	Vadose				Air		ACGIH	OSHA
Compound	mg/m³					TWA a	PEL	
C <sub>9</sub> -C <sub>11</sub> (stoddard range)	210	0.6	7.9	1.0	1.4	1.5	100 ppm 524 mg/m <sup>3</sup>	500 ppm 2,900 mg/m <sup>3</sup>
C <sub>12</sub> -C <sub>15</sub> (diesel range)	220	9.0	5.1	ND	ND	ND	N/A	N/A
Toluene	ND	ND	0.95	ND	ND	ND	50 ppm 188 mg/m <sup>3</sup>	200 ppm 753 mg/m <sup>3</sup>
m,p-Xylene	ND	ND	0.04	ND	ND	ND	100 ppm 435 mg/m <sup>3</sup>	100 ppm 435 mg/m <sup>3</sup>
Ethylbenzene	ND	ND	0.02	ND	ND	ND	100 ppm 435 mg/m <sup>3</sup>	100 ppm 435 mg/m <sup>3</sup>
C <sub>3</sub> Alkyl Benzenes	ND	ND	0.19	0.095	0.069	0.082	N/A	N/A
Hydrocarbons as % of #5 $C_{9}\text{-}C_{11}$ $C_{12}\text{-}C_{15}$	100 100	0.29	3.8 2.4	0.48	0.67	0.71	N/A	N/A
Air Volume Sampled (liters)	120	240	475	480	480	720		

#### Notes:

Boxed value exceeds ACGIH TWA recommended levels.

a) 1999 TWA (time-weighted average) adopted by the American Conference of Governmental Industrial Hygienists (ACGIH).

SCA - Snohomish County Airport.

TWA - Time-weighted average concentration for a conventional 8-hour work day.

OSHA PEL - Occupational Safety and Health Administration Permissible Exposure Limit - TWA concentrations not to be exceeded during average 8-hour work shift of a 40-hour work week.

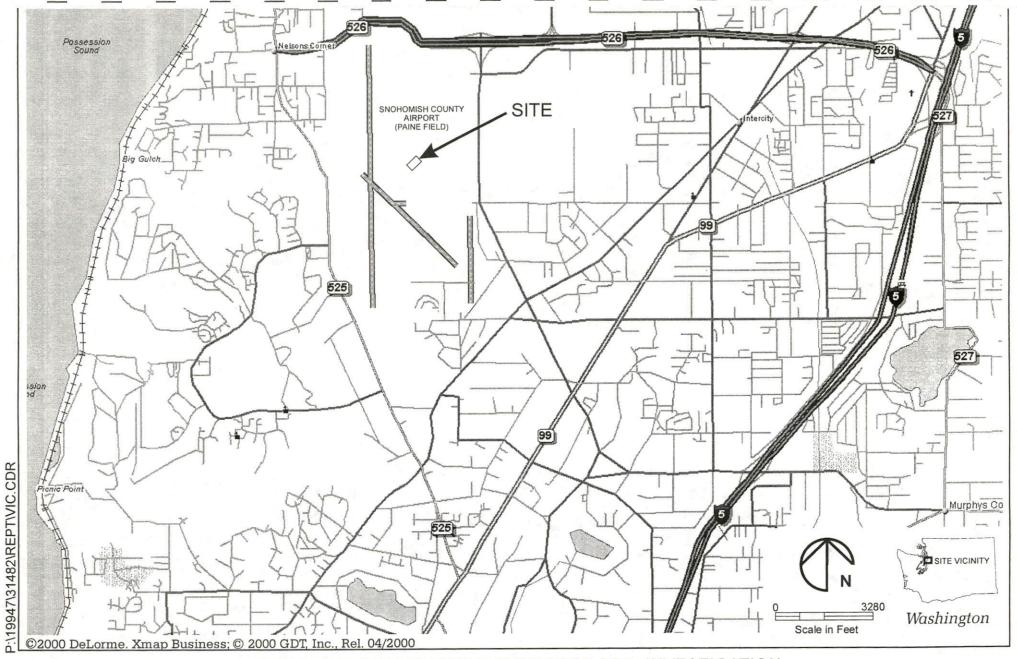
mg/m<sup>3</sup> - milligram per cubic meter.

N/A - not applicable.

ppm - parts per million.

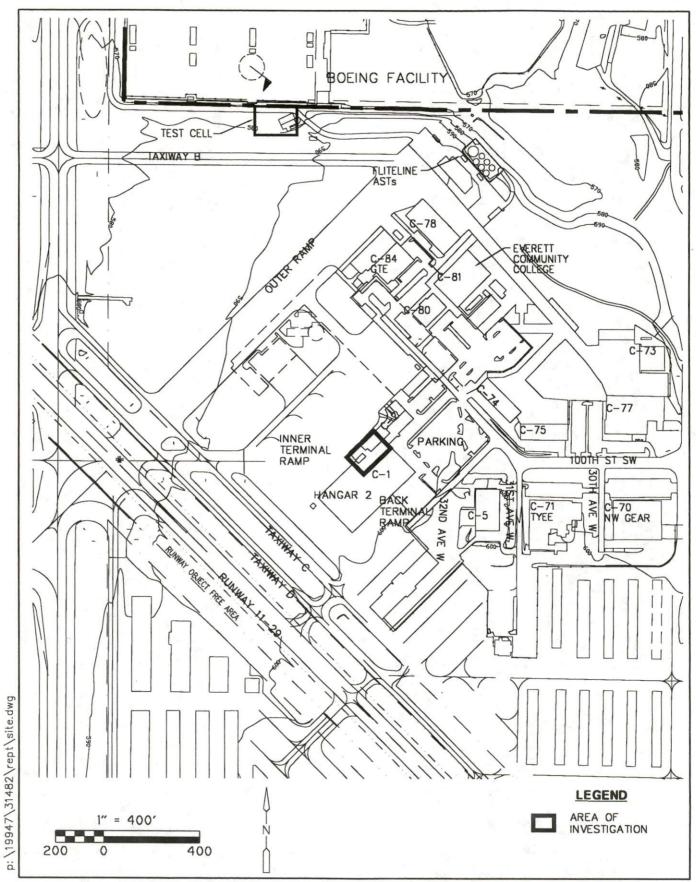
ND - not detected.

# **Figures**

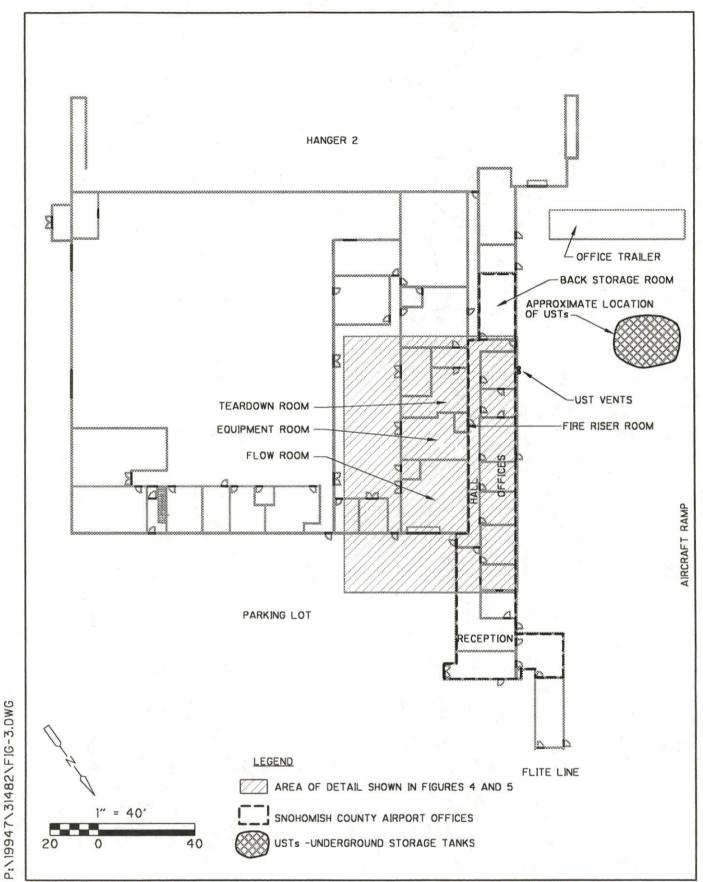


INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION SNOHOMISH COUNTY AIRPORT SNOHOMISH COUNTY, WASHINGTON

Figure No. 1 VICINITY MAP



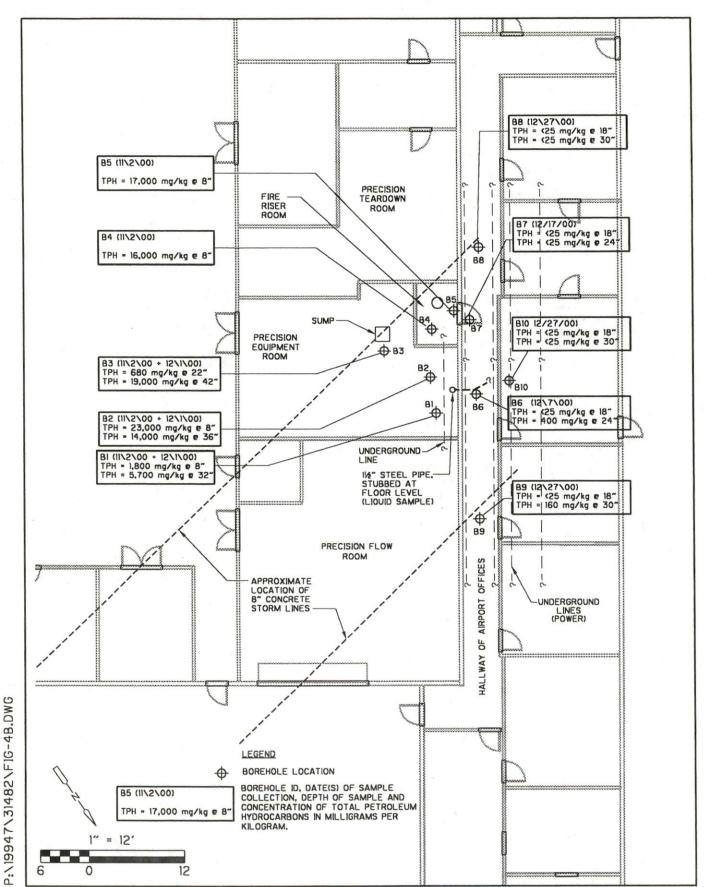
INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION SNOHOMISH COUNTY AIRPORT SNOHOMISH COUNTY, WASHINGTON



INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION

SNOHOMISH COUNTY AIRPORT SNOHOMISH COUNTY, WASHINGTON

FIGURE No. 3 FLOOR PLAN OF BUILDING C-1



INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION

SNOHOMISH COUNTY AIRPORT SNOHOMISH COUNTY, WASHINGTON

Figure No. 4
SUBSURFACE
EXPLORATION
LOCATION MAP

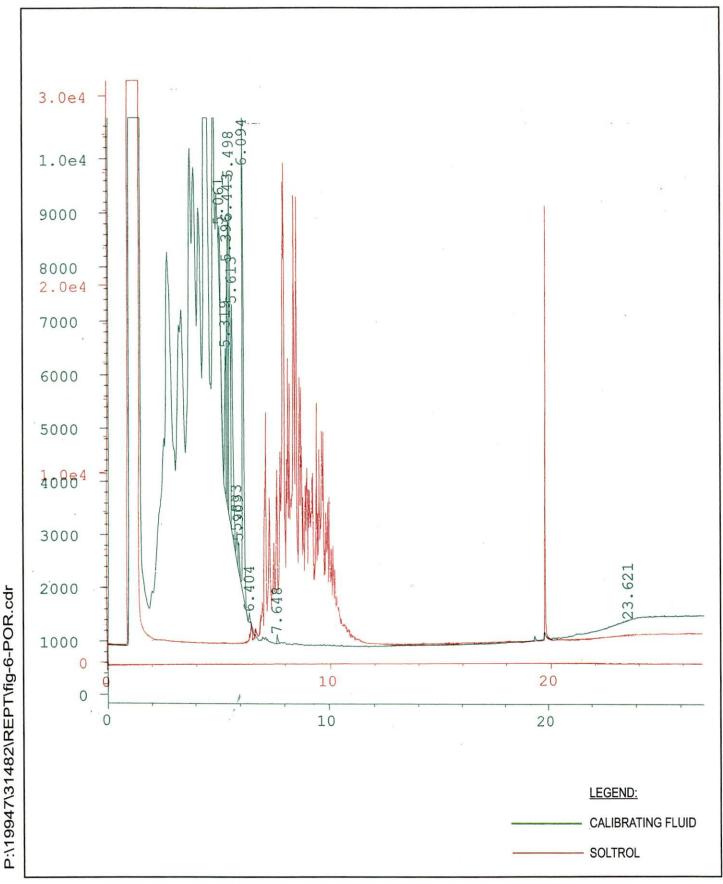
CDM Camp Dresser & McKee

INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION

SNOHOMISH COUNTY AIRPORT SNOHOMISH COUNTY, WASHINGTON

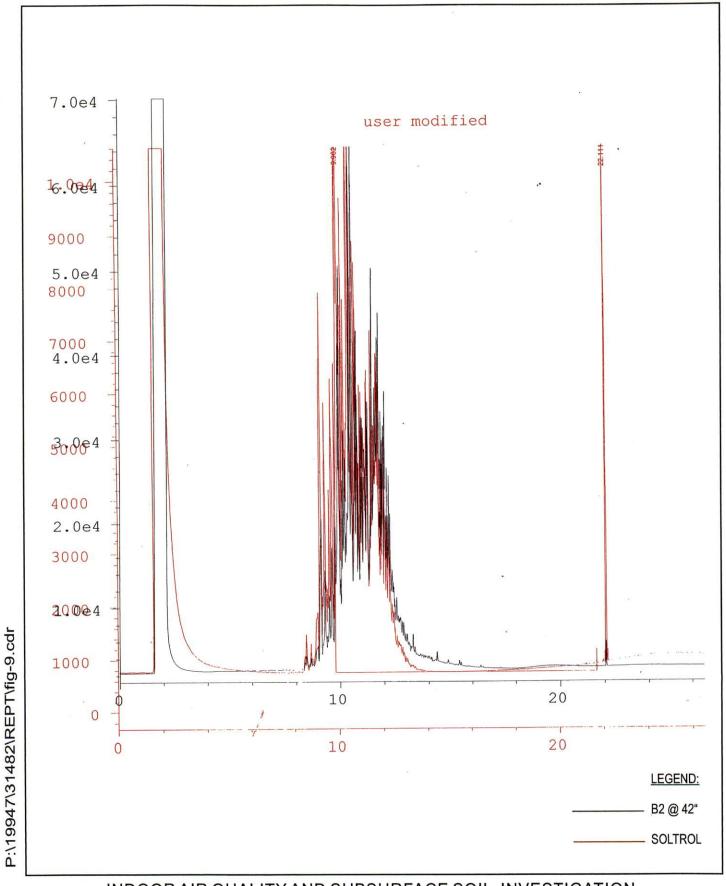
Figure No. 5 AIR SAMPLE LOCATION MAP

CDM Camp Dresser & McKee



INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION SNOHOMISH COUNTY AIRPORT EVERETT, WASHINGTON

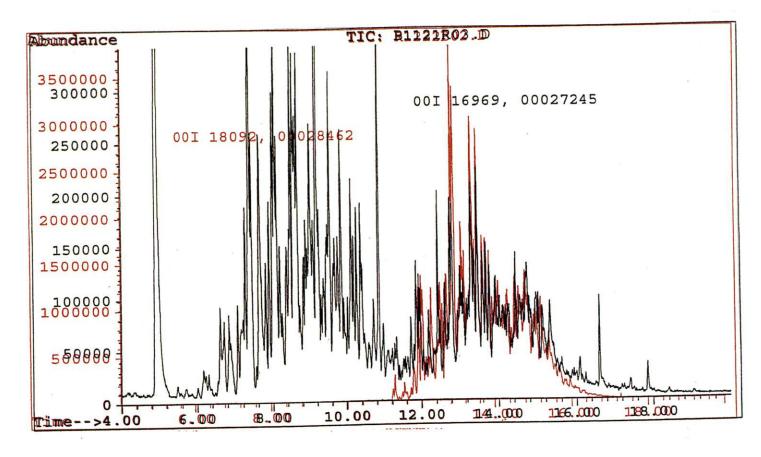
Figure No. 6
COMPARISON OF CALIBRATING FLUID
AND SOLTROL® 170
CHROMATOGRAMS



INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION SNOHOMISH COUNTY AIRPORT EVERETT, WASHINGTON

ON Figure No. 7
COMPARISON OF SOLTROL® 170

AND B2 @ 42" CHROMATOGRAMS



LEGEND:

AIR SAMPLE

SOLTROL® 170

INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION SNOHOMISH COUNTY AIRPORT EVERETT, WASHINGTON

Figure No. 8
COMPARISON OF SOLTROL ® 170
AND PRECISION EQUIPMENT ROOM
AMBIENT AIR CHROMATOGRAMS

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INDOOR AIR QUALITY AND SUBSURFACE SOIL INVESTIGATION SNOHOMISH COUNTY AIRPORT EVERETT, WASHINGTON

Figure No. 9
COMPARISON OF CALIBRATING FLUID
AND PRECISION EQUIPMENT ROOM
AMBIENT AIR CHROMATOGRAMS

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# Appendix A

Material Safety Data Sheets for Soltrol®170 and Calibrating Fluid

MSDS: CALIBRATING FLUID MIL-PRF-7024E TYPE II



## Material Safety Data Sheet

Ashland Chemical Co.

Date Prepared: 01/26/98
Date Printed: 06/23/99

MSDS No: 999.0267239-002.0051

CALIBRATING FLUID MIL-PRF-7024E TYPE II

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: CALIBRATING FULL MIL PRE-1021E TYPE TI
General or Generic ID: AMERICAN HADROCARBON

Company
Ashland Chemical Co.
P.O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number: 1-800-ASHLAND (1-800-274-5263) 24 hours everyday

Regulatory Information Number: 1-800-325-3751

COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s) CAS Number % (by weight)

ALIPHATIC HYDROCARBON (STODDARD TYPE) 8052-41-3 100.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye

May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

Skin

May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, drying and cracking of skin, and skin burns.

Swallowing
Swallowing small amounts of this material during normal handling
is not likely to cause harmful effects. Swallowing large amounts
may be harmful. This material can get into the lungs during
swallowing or vomiting. This results in lung inflammation and
other lung injury.

Inhalation

Breathing of vapor or mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful.

Page 2 of 7

## W2D2: CALIBRATING FLUID MIL-PRF-7024E TYPE II

headache, unconsciousness), and death. depression (dizziness, drowsiness, weakness, fatigue, nausea, irritation (nose, throat, airways), central nervous system include: stomach or intestinal upset (nausea, vomiting, diarrhea) swallowing, and/or passage of the material through the skin may Signs and symptoms of exposure to this material through breathing, Symptoms of Exposure

No data Target Organ Effects

No data Developmental Information

No data Cancer Information

No data Other Health Effects

Inhalation, Skin contact. Primary Route(s) of Entry

FIRST AID MEASURES

oxlden.

apart. If symptoms persist or there is any visual difficulty, tresh air. Flush eyes gently with water while holding eyelids If symptoms develop, move individual away from exposure and into

seek medical attention.

clothing before reuse. water. If symptoms persist, seek medical attention. Launder Remove contaminated clothing. Wash exposed area with soap and

If possible, do not leave individual unattended. poison control center for advice about whether to induce vomiting. with the head down. Contact a physician, medical facility, or do not give anything by mouth; place individual on the left side Seek medical attention. If individual is drowsy or unconscious, BUTMOTTEMS

artificial respiration. If breathing is difficult, administer exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin If symptoms develop, immediately move individual away from Inhalation

cxample, asthma-like conditions). may be aggravated by exposure to this material: skin, lung (for Preexisting disorders of the following organs (or organ systems) Section 3 - Swallowing) when deciding whether to induce vomiting. aspiration must be weighed against possible oral toxicity (See This material is an asplration hazard. Potential danger from Note to Physicians

...\ShowMSDS.asp?M=0267239&C=003&D=999&L=EN&F:::ANSI&N=CALIBRATING% 10/18/2000

FIRE FIGHTING MEASURES

Flash Point F (40.5 C) 105.0

Explosive Limit (for product) Lower 1.0 Upper 6.0 %

Autoignition Temperature 575.0 F (301.6

Hazardous Products of Combustion May form: carbon dioxide and carbon monoxide, various hydrocarbons.

Fire and Explosion Hazards Vapors are heavier than air and may travel along the ground or be moved by ventilation and ignited by heat, pilot lights, other flames and ignition sources at locations distant from material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

Extinguishing Media regular foam, carbon dioxide, dry chemical.

Fire Fighting Instructions Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating Health - 1, Flammability - 2, Reactivity - 0

### ACCIDENTAL RELEASE MEASURES

Small Spill Absorb liquid on vermiculite, floor absorbent, or other absorbent material and transfer to hood.

Large Spill Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

#### HANDLING AND STORAGE 7.

Handling Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be

10/18/2000 WED 09:06 FAX 425 355 9883

observed. All five-gallon pails and larger metal containers, including tank cars and tank trucks, should be grounded and/or Sudden release of bonded when material is transferred. Warning. hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

Eye Protection Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin Protection Wear resistant gloves (consult your safety equipment supplier)., To prevent repeated or prolonged skin contact, wear impervious clothing and boots ...

Respiratory Protections If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

Engineering Controls Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Exposure Guidelines Component

ALIPHATIC HYDROCARBON (STODDARD TYPE) (8052-41-3) OSHA VPEL 100.000 ppm - TWA ACGIH TLV 100.000 ppm - TWA

Boiling Point (for product) 315.0 f (157.2 C) @ 760 mmHg

Vapor Pressure (for product) 3.000 mmHg @ 68.00 F

Specific Vapor Density 4,700 @ AIR=1

Specific Gravity .770 @ 60.00 F

EXPOSURE CONTROLS/PERSONAL PROTECTION

PHYSICAL AND CHEMICAL PROPERTIES

Liquid Density 6.420 lbs/gal @ 60.00 F .770 kg/l @ 16.00 C

Percent Volatiles 100.0 %

Evaporation Rate
.20 (BUTYL ACETATE)

Appearance No data

State

TITQUID

Physical Form HOMOGENEOUS SOLUTION

Color

COLORLESS

Odor

No data

pH

Not applicable

#### 10. STABILITY AND REACTIVITY

Hazardous Polymerization
Product will not undergo hazardous polymerization.

Hazardous Decomposition

May form: carbon dioxide and carbon monoxide, various hydrocarbons.

Chemical Stability Stable.

Incompatibility

Avoid contact with: strong oxidizing agents.

#### 11. TOXICOLOGICAL INFORMATION

No data

### 12. ECOLOGICAL INFORMATION

No data

### 13. DISPOSAL CONSIDERATION

Waste Management Information

## MSDS: CALIBRATING FLUID MIL-PRF-7024E TYPE II

Dispose of in accordance with all applicable local, state and federal regulations.

### 14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101

DOT Description:
PETROLEUM DISTILLATES, N.O.S., COMBUSTIBLE LIQUID, UN1268, III

Container/Mode: 55 GAT, DRUM/TRUCK PACKAGE

NOS Component: NAPHTHA

RQ (Reportable Quantity) - 49 CFR 172.101 Not applicable

### 15. REGULATORY INFORMATION

US Federal Regulations
TSCA (Toxic Substances Control Act) Status
TSCA (UNITED STATES) The intentional ingredients of this
product are listed.

CERCLA RQ - 40 CFR 302.4(a) None listed

SARA 302 Components - 40 CFR 355 Appendix A

Section 311/312 Hazard Class - 40 CFR 370.2 Immediate() Delayed() Fire(X) Reactive() Sudden Release of Pressure()

SARA 313 Components - 40 CFR 372.65 None

International Regulations Inventory Status Not determined

State and Local Regulations California Proposition 65 None

New Jersey RTK Label Information STODDARD SOLVENT

8052-41-3

Pennsylvania RTK Label Information STODDARD SOLVENT

8052-41-3

### 16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the

, MSDS: CALIBRATING FLUID MIL-PRF-7024E TYPE II

information is current, applicable, and suitable to their circumstances.

Last page





Subsidiary Of Ashland Oil, Inc P.O. BOX 2219 COLUMBUS, OHIO 43216 (614) 889-3333

Emergency Telephone 1(800) 274-5263 c 1(800) ASHLAND

002307

### CALIBRATING FLUID MIL-C-7024C

Page:

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

Product Name: CALIBRATING FLUID MIL-C-7024C 8052-41-3

PRECISION AIRMOTIVE 3220 100TH STREET S.W. EVERETT W

. #E WA 98204

05 50 108 7167950-

PRODUCT: 3002140 INVOICE: 056092 INVOICE DATE: 11/26/93 TO: PRECISION AIRMOTIVE 3220 100TH STREET S.W.

EVERETT

ATTN: PLANT MGR./SAFETY DIR.

Supersedes:

WA 98204

SECTION I-PRODUCT IDENTIFICATION

General or Generic ID: ALIPHATIC HYDROCARBON

DOT Hazard Classification: COMBUSTIBLE

NTP AND OSHA CARCINOGENS AND CHEMICALS SUBJECT TO THE REPORT-DF SARA TITLE III SECTION 313 ARE IDENTIFIED IN THIS SECTION. SEE DEFINITION PAGE FOR CLARIFICATION IF PRESENT, IARC, N'ING REQUIREMENTS OF

INGREDIENT

Mineral Spirits (granded solveny)

% (by WT)

TLV

Note

ALIPHATIC HYDROCARBONS (STODDARD TYPE) CAS #: 8052-41-3

>95 100 PPM 100 PPM

Data Sheet No: 0013947-005.001 Prepared: 09/23/93

07/05/90

(1)

Notes:

( 1) NIOSH RECOMMENDS A LIMIT OF 350 MG/CUM - 8 HOUR TIME WEIGHTED AVERAGE, 1800 MG/CUM AS DETERMINED BY A 15 MINUTE SAMPLE.

ALCOHOLD TO THE REAL PROPERTY.	SECTION III	- PHYSICAL DATA		
Bailing Paint	for PRODUCT		(	315.00 Deg F 157.22 Deg C) 760.00 mm Hg
Vapor Pressure	for PRODUCT		@(	3.00 mm Hg 68.00 Deg F 20.00 Deg C)
Specific Vapor Density	AIR = 1			4.70
Specific Gravity		96 Ne .	.770 -	.788 60.00 Deg F 15.55 Deg C)
Percent Volatiles			l.	100.00%
Evaporation Rate	(BUTYL ACETATE = 1)			.20

#### SECTION IV-FIRE AND EXPLOSION INFORMATION

(

FLASH POINT

105.0 Deg F

40.6 Deg C)

EXPLOSIVE LIMIT

(PRODUCT)

LOWER -

EXTINGUISHING MEDIA: REGULAR FOAM OR WATER FOG OR CARBON DIOXIDE OR DRY CHEMICAL

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS:, CARBON DIOXIDE AND CARBON MONOXIDE, VARIOUS HYDROCARBONS, ETC.

FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND MODE WHEN FIGHTING FIRES.

AL FIRE & EXPLOSION HAZARDS: VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL ALONG THE GROUND OR BE MOVED BY VENTILATION AND IGNITED BY HEAT, PILOT LIGHTS, OTHER FLAMES AND IGNITION SOURCES AT LOCATIONS DISTANT FROM MATERIAL HANDLING POINT.

NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

NFPA CODES:

HEALTH- 0

FLAMMABILITY- 2

REACTIVITY- 0

PERMISSIBLE EXPOSURE LEVEL 100

THRESHOLD LIMIT VALUE

100 PPM

EFFECTS OF ACUTE OVEREXPOSURE:

EYES - CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION.
SKIN - PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, DERMATITIS.
BREATHING - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, CENTRAL NERVOUS SYSTEM
EFFECTS INCLUDING DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE AND POSSIBLE UNCONSCIOUSNESS, AND EVEN DEATH.

OWING - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL. SWALLOWING



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### SECTION V-HEALTH HAZARD DATA (Continued)

FIRST AID:

- IF ON SKIN: THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE.
- IF IN EYES: FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY, GET MEDICAL ATTENTION.
- IF SWALLOWED: DO NOT INDUCE VOMITING, KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.
- IF BREATHED: IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION.

EFFECTS OF CHRONIC OVEREXPOSURE:

OVEREXPOSURE TO THIS MATERIAL (OR ITS COMPONENTS) HAS BEEN SUGGESTED AS A CAUSE OF THE FOLLOWING EFFECTS IN HUMANS:, CENTRAL NERVOUS SYSTEM EFFECTS

#### SECTION VI-REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CANNOT OCCUR

STABILITY: STABLE

INCOMPATIBILITY: AVOID CONTACT WITH: STRONG OXIDIZING AGENTS

#### SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: ABSORB LIQUID ON VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.

LARGE SPILL: ELIMINATE ALL IGNITION SOURCES (FLARES, FLAMES INCLUDING PILOT LIGHTS, ELECTRICAL SPARKS). PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE. PREVENT FROM ENTERING DRAINS, SEWERS, STREAMS OR OTHER BODIES OF WATER.PREVENT FROM SPREADING. IF RUNOFF OCCURS, NOTIFY AUTHORITIES AS REQUIRED. PUMP OR VACUUM TRANSFER SPILLED PRODUCT TO CLEAN CONTAINERS FOR RECOVERY. ABSORB UNRECOVERABLE PRODUCT.TRANSFER CONTAMINATED ABSORBENT, SOIL AND OTHER MATERIALS TO CONTAINERS FOR DISPOSAL.

PREVENT RUN-OFF TO SEWERS, STREAMS OR OTHER BODIES OF WATER. IF RUN-OFF OCCURS, NOTIFY PROPER AUTHORITIES AS REQUIRED, THAT A SPILL HAS OCCURED.

WASTE DISPOSAL METHOD:

SMALL SPILL: ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPORS TO COMPLETELY CLEAR HOOD DUCT WORK. DISPOSE OF REMAINING MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS.

LARGE SPILL: DESTROY BY LIQUID INCINERATION.

CONTAMINATED ABSORBENT MAY BE DEPOSITED IN A LANDFILL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

#### SECTION VIII-PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT OR ANY COMPONENT IS EXCEEDED (SEE SECTION II), A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE) UNDER SPECIFIED CONDITIONS (SEE YOUR INDUSTRIAL HYGIENIST). ENGINEERING OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS:, NITRILE RUBBER

EYE PROTECTION: CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. CONSULT YOUR SAFETY REPRESENTATIVE.

OTHER PROTECTIVE EQUIPMENT: TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

#### SECTION IX-SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THE DATA SHEET MUST BE OBSERVED.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

#### SECTION X-LABEL INFORMATION

#### CAUTION!

MAY CAUSE EYE, SKIN AND RESPIRATORY IRRITATION

MAY BE HARMFUL IF INHALED OR SWALLOWED.

MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION

HANDLING & STORAGE:

MATERIAL SAFETY DATA SHEET



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### SECTION X-LABEL INFORMATION (Continued)

KEEP AWAY FROM HEAT AND OPEN FLAME. CONTAINER SHOULD BE GROUNDED AND BONDED WHEN TRANSFERRING LIQUID CONTENTS. AVOID BREATHING VAPOR OR MIST. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. WEAR CHEMICAL SPLASH GOGGLES, IMPERVIOUS GLOVES AND OTHER NECESSARY PROTECTIVE EQUIPMENT. WASH THOROUGHLY AFTER HANDLING. USE OR STORE ONLY WITH ADEQUATE VENTILATION. REFER TO APPLICABLE OSHA REGULATIONS. KEEP WORKPLACE AIRBORNE CONCENTRATIONS BELOW LEGAL AND RECOMMENDED LIMITS. CIRCUMSTANCES COULD REQUIFE USE OF RESPIRATORY PROTECTION. DO NOT TRANSFER TO UNLABELED CONTAINER. KEEP CONTAINER CLOSED WHEN NOT IN USE. NEVER USE PRESSURE TO EMPTY. EMPTY CONTAINERS MAY CONTAIN HAZARDOUS PRODUCT RESIDUES. KEEP CLOSURE END UP. LOOSEN CLOSURE CAREFULLY. BEFORE USE, REVIEW MATERIAL SAFETY DATA SHEET FOR MORE DETAILED INFORMATION, INCLUDING CHRONIC HEALTH EFFECTS. DO NOT USE CUTTING OR WELDING TORCH ON THIS CONTAINER (EVEN EMPTY). 24-HOUR EMERGENCY NUMBER 1-800-274-5263

FIRST AID

EYES: IMMEDIATELY FLUSH WITH WATER FOR AT LEAST 15 MINUTES WHILE LIFTING UPPER AND LOWER EYELIDS. DO NOT USE CHEMICAL ANTIDOTE. IF REDNESS OR IRRITATION PERSISTS, GET MEDICAL ATTENTION.

SKIN: THOROUGHLY FLUSH WITH WATER. IF REDNESS OR IRRITATION PERSISTS, GET MEDICAL ATTENTION. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE. DISCARD CONTAMINATED SHOES.

INHALATION: IF AFFECTED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION AND GET MEDICAL ATTENTION IMMEDIATELY. IF BREATHING IS DIFFICULT, GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. GIVE TWO GLASSES OF WATER AND GET MEDICAL ATTENTION IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

CHRONIC INFORMATION:

NOTICE: OVEREXPOSURE TO SOLVENT VAPORS CAN IRRITATE THE RESPIRATORY TRACT AND CAUSE HEADACHE, DIZZINESS, DROWSINESS OR OTHER NERVOUS SYSTEM EFFECTS.

\*\*\* COMPONENTS APPEAR IN SECTION II \*\*\*

#### MATERIAL SAFETY DATA SHEET



### ASIILAND CHEMICAL, INC.

Subsidiary of Ashalmd Oil, Inc. P.O. BOX 2219 COLUMBUS, OHIO 43216 (614) 889-3333 Emergency Telephone 1(800) 274-5263 or 1(800) ASHLAND

#### **DEFINITIONS**

This definition page is intended for use with Material Safety Data Sheets supplied by the Ashland Chemical Company. Recipients of these data sheets should consult the OSHA Safety and Health Standards (29 CFR 1910), particularly subpart G - Occupational Health and Environmental Control, and subpart I - Personal Protective Equipment, for general guidance on control of potential Occupational Health and Safety Hazards.

### SECTION I PRODUCT IDENTIFICATION

GENERAL OR GENERIC ID: Chemical family or product description.

DOT HAZARD CLASSIFICATION: Product meets DOT criteria for hazards listed.

# SECTION II COMPONENTS

Components are listed in this section if they present a physical or health hazard and are present at or above 1% in the mixture. If a component is identified as a CARCINOGEN by NTP, IARC, or OSHA as of the date on the MSDS, it will be listed and footnoted in this section when present at or above 0.1% in the product. Negative conclusions concerning carcinogenicity are not reported. Additional health information may be found in Section V. Components subject to the reporting requirements of Section 313 of SARA Title III are identified in the footnotes in this section, along with typical percentages. Other components may be listed if deemed appropriate.

Exposure recommendations are for components. OSHA Permissible Exposure Limits (PELS) and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) appear on the line with the component identification. Other recommendations appear as footnotes.

# SECTION III PHYSICAL DATA

BOILING POINT: Of product if known. The lowest value of the components is listed for mixtures.

VAPOR PRESSURE: Of product if known. The highest value of the components is listed for mixtures.

SPECIFIC VAPOR DENSITY: Compared to AIR = 1. If the Specific Vapor Density of a product is not known, the value is expressed as lighter or greater than air.

SPECIFIC GRAVITY: Compared to WATER = 1. If Specific Gravity of product is not known, the value is expressed as less than or greater than water.

pH: If applicable.

PERCENT VOLATILES: Percentage of material with initial boiling point below 425 degrees Fahrenheit and vapor pressure above 0.1mm Hg at 68 F.

EVAPORATION RATE: Indicated as faster or slower than ETHYL ETHER, unless otherwise stated.

# SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT: Method identified.

**EXPLOSION LIMITS:** For product if known. The lowset value of the components is listed for mixtures.

HAZARDOUS DECOMPOSITION PRODUCTS: Known or expected hazardous products resulting from heating, burning or other reactions.

### SECTION IV (cont.)

**EXTINGUISHING MEDIA:** Following National Fire Protection Association criteria.

FIREFIGHTING PROCEDURES: Minimum equipment to protect firefighters from toxic products of vaporization, combustion or decomposition in fire situations. Other firefighting hazards may also be indicated.

SPECIAL FIRE AND EXPLOSION HAZARDS: States hazards not covered by other sections.

NFPA CODES: Hazard ratings assigned by the National Fire Protection Association.

### SECTION V HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMIT: For product.

THRESHOLD LIMIT VALUE: For product.

EFFECTS OF ACUTE OVEREXPOSURE: Potential local and systemic effects due to single or short term overexposure to the eyes and skin or through inhalation or ingestion.

EFFECTS OF CHRONIC OVEREXPOSURE: Potential local and systemic effects due to repeated or long term overexposure to the eyes and skin or through inhalation or ingestion.

FIRST AID: Procedures to be followed when dealing with accidental overexposure.

PRIMARY ROUTE OF ENTRY: Based on properties and expected use.

### SECTION VI

#### REACTIVITY DATA

HAZARDOUS POLYMERIZATION: Conditions to avoid to prevent hazardous polymerization resulting in a large release of energy.

STABILITY: Conditions to avoid to prevent hazardous or violent decomposition.

INCOMPATIBILITY: Materials and conditions to avoid to prevent hazardous reactions.

# SPILL OR LEAK PROCEDURES

Reasonable precautions to be taken and methods of containment, clean-up and disposal. Consult federal, state and local regulations for accepted procedures and any reporting or notification requirements.

# SECTION VIII PROTECTIVE EQUIPMENT TO BE USED

Protective equipment which may be needed when handling the product.

### SECTION IX

### SPECIAL PRECAUTIONS OR OTHER COMMENTS

Covers any relevant points not previously mentioned.

### ADDITIONAL COMMENTS

Containers should be either reconditioned by CERTIFIED firms or properly disposed of by APPROVED firms. Disposal of containers should be in accordance with applicable laws and regulations. "EMPTY" drums should not be given to individuals. Serious accidents have resulted from the misuse of "EMPTIED" containers (drums, pails, etc.). Refer to Sections

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# 11035

Material Safety Data Sheet

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Co./Dept. C.D.M	Со
Phone #	Phone #
Fax *	hax #

SOLTROL® 170

PHILLIPS CHEMICAL COMPANY A Division of Phillips Petroleum Company Bartlesville, Oklahoma 74004

PHONE NUMBERS (918) 661-8118 Emergency: Technical Services: (918) 661-9091 For Additional MSDSs: (918) 661-7297

# A. Product Identification

Synonyms: Not Established Chemical Name: C10-C15 Isoalkanes Chemical Family: Aliphatic hydrocarbon

Chomical Formula: Mixture CAS Reg. No .: 68551-19-9 Product No .: AP1700

Product and/or Components Entered on EPA's TSCA Inventory: YES

This product is in U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals; hence, it may be subject to applicable TSCA provisions and restrictions.

B. Components

В.	Components	CAS	2	OSHA PEL	ACGIH TLV
	Ingredients	Number	By Wt.	15	NE
C10-C15 Isnalkanes		68551-19-9	100	NE	

See Spotion F. Recommended Exposure Limits.

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## C. Personal Protection Information

Ventilation: Use adequate ventilation to control concentration below recommended exposure limits.

Respiratory Protection: Not generally required. For concentrations exceeding the recommended exposure limit, use NIOSH/MSHA

approved air purifying respirator.

For aplash Eye Protection: Use safety glasses with side shields. protection, use chemical goggles and face shield

Skin Protection: Avoid unnecessary akin contamination with material Use gloves resistant to the material being used. (eg. neopreme or Vitan).

NOTE: Personal protection information shown in Section C is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

## D. Handling and Storage Precautions

Avoid contact with eyes, skin or clothing Avoid breathing vapors. Avoid contact with eyes, thin or clothing would not clumps. Weat mist, fune or durt. Do not swallow. May be aspirated into lungs. Weat protective equipment and/or garments described in Section C if exposure conditions warrant. Wash thoroughly after handling. Launder contaminated clothing before rouse. Use with adequate ventilation Wear

Keep away from heat, sparks and flame. Store in well-ventilated area Store in tightly closed container. Bond and ground during transfer

### E. Reactivity Data

Stability: Stable Conditions to Avoid: Not Applicable Incompatibility (Materials to Avoid): Oxygen and strong exidizing agents

Hazardous Polymerization: Will Not Occur Conditions to Avoid: Not Applicable Hazardous Decomposition Products: Carbon oxides formed when burned.

## F. Health Hazard Data

Recommended Exposure Limits:

The Company recommended exposure is 400 ppm.

Sattrol 170 (LSU47809)

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Eye: May be mildly irritating.

Skin: May be mildly irritating.

Inhalation: May cause headache, dizziness, nauses, unconsciousness.

Ingestion: May irritate the stomach and intestines. If swallowed, may be aspirated resulting in inflammation and possible fluid

accumulation in the lungs.

### Subchronic and Chronic Effects of Overexposure:

Some isoparaffins have produced kidney damage in male rate only. No comparable kidney disease is known to occur in humans.

### Other Health Effects:

No known applicable information.

### Health Hazard Categories:

	Animal	Human				Animal	Human
Lnown Carcinogen			Toxic				_
Suspect Carcinogen			Corrosive				
tutagen		-	Irritant	. ,		×	X
Teratogen,			Target Organ	Iakin		. Harard	
Allergic Sanzitiza	· · ·		Specify -	Laud.	Aspiration	Marara	
lighly Toxic		-					

### First Aid and Emergency Procedures:

Eye: Flush eyes with running water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Skin: Wash skin with scap and water for at loast fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Inhalation: Remove from exposure. If breathing is difficult, give exygen.
If breathing ceases, administer artificial respiration followed by exygen. Seek immediate medical attention.

Ingestion: Do not induce vomiting. Seck immediate medical attention.

Note to Physician: Gastric lavage using a cuffed endotracheal tubo may be performed at your discretion.

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Mealth : 0 : Least - 0 : Slight - 1
Flammability: 1 : Modarato - 1
Reactivity: 0 : High - 3
Special Nax : - Extreme - 4

NFR 704 Hazard Codes - - - - Signals

As of the preparation date, this product did not contain a chemical or chemicals 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.

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V. Additional Comments

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### G. Physical Data

Colorless liquid Appearance:

Mild Odor . 434-472F (223-244C) Bailing Point:

0.012 paia 2 77F (25C) Vapor Pressure:

Vapor Density (Air = 1):

Negligible

0.78 2 60/60F (15.6/15.6C)

Solubility in Water: Specific Gravity (H2O = 1): Percent Volatile by Volume: 100

Evaporation Rate (Butyl Acetate = 1): < 1 2.45 cSt 3 100F (38C) Viscosity:

## H. Fire and Explosion Data

Flash Point (Mothod Used): Flammable Limits (X by Volume in Air):

> 192F (> 89C) (TCC. ASTM D56)

LEL - Not Established UEL - Not Established

Dry chemical, foam or carbon Fire Extinguishing Media:

dioxide (CO2)

Special fire Fighting Procedures:

Evacuate area of all unnecessary personnel. Use NIOSH/HSMA approved self-contained breathing apparatus and other protective equipment and/or garments described in Section C if exposure conditions warrant. Shut off source if possible. Water fog or spray may be used to cool exposed containers and equipment. Do spray water directly on fire Do not product will float and could be reignited on surface of water.

Fire and Explosion Mazards: Carbon oxides formed when burned. Highly flammable vapors which are heavier than air may accumulate in low areas and/or spread along ground away from handling site. Flash back along vapor trail is possible.

## I. Spill, Leak and Disposal Procedures

Precautions Required if Material is Released or Spilled: Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Shut off source, if possible and contain spill. Protect from ignition.
Keep out of water sources and sewers. Absorb in a dry, inert material
(sand, clay, etc). Transfer to disposal drums using non-sparking equipment.

Waste Disposal (Insure Conformity with all Applicable Disposal Regulations): Incinorate or place in permitted waste management facility.

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## **Toxicity Study Summary**

### **SOLTROL 130**

### Acute Oral Toxicity (1964)

Soltrol 130 was administered, undiluted, by gavage to albino rats of both sexes after 16-24 hours of fasting. Each group was made up of two males and two females. Reactions during the fourteen day observation period consisted of sedation, dyspnea and muscular weakness. These reactions persisted for three hours after intubation. Lethargy persisted through 48 hours after intubation. Fur and skin of the test animals appeared to be oil soaked approximately three to four hours after intubation (dermal excretion of the test material). Necropsy of the animals which died at the 34.6 g/kg dose level revealed slight inflammation of the stomach.

The acute oral LD<sub>50</sub> for Soltrol 130 is considered to be greater than 34.6 g/kg of body weight in albino rats.

### Acute Percutaneous Toxicity (1964)

Soltrol 130 was administered undiluted to the shaved backs of albino rabbits of both sexes. The application sites of three dose groups (6.8 g/kg, 10.2 g/kg, and 15.4 g/kg) each consisting of two males and two females were covered with an impervious plastic wrap. The test material remained in contact with the unabraded skin for 24 hours. After the test material was sponged off, the animals were observed for an additional 13 days.

Since the highest dose tested (15.4 mg/kg) produced only 50% mortality, the acute percutaneous LD<sub>50</sub> for Soltrol 130 is considered to be approximately 15.4 g/kg of body weight in albino rabbits. Gross observations consisted of loss of body weight and muscular weakness. These observations persisted through ten days of the fourteen day observation period. All deaths occurred 24 to 36 hours after dosing. At necropsy, no gross pathologic alterations were noted.

## Eye Irritancy (Unwashed) (1986)

Six young adult albino rabbits of the New Zealand White/Dutchland strain were selected as the experimental animals. At least 24 hours prior to the start of the test, the left aye of each animal was stained with fluorescein dye and examined for corneal damage. Any animal with corneal damage was rejected and replaced with a healthy animal. One-tenth ml of liquid test material was instilled into the conjunctival sac of the left eye of each animal. The eye was then gently held closed for 1 second and released. The untreated right eye of each rabbit served as a control. The eyes were scored according to the Draize\* system at 24, 48 and 72 hours postinstillation. In this study, the following results were noted. No corneal opacity, iritis, or conjunctival chemosis were observed in any of the eyes during the study. Conjunctival redness (Grade 1) was noted in one eye at 24 hours only. Conjunctival discharge (Grade 1) was present in this same eye

at 24 hours and in another eye at 48 hours only. All initial and 24 hour fluorescein examinations were negative. The overall Eye Irritation Index for Soltrol 130 was 0.67 at 24 hours, 0.34 at 48 hours, and 0.0 at 72 hours.

### Primary Dermal Irritation (1986)

Three male and three female young adult rabbits of the New Zealand White/Dutchland strain were selected as the experimental animals. The animals were clipped free of hair and 0.5 ml of liquid test material was applied to one abraded and to one non-abraded site. The sites were rotated over various areas of clipped skin. Abrasions were minor incisions through the stratum corneum but not deep enough to disturb the dermis or to produce bleeding. Test material was introduced to each application site under a 1 square-inch gauze patch. The patches were secured in place and the entire trunk of each animal was wrapped with impervious plastic sheeting. The animals were then immobilized with collars for 24 hours. After the 24 hour exposure period, the sheeting and patches were removed and the skin wiped to remove any test material still remaining. Thirty to sixty minutes after patch removal, the degree of erythema and edema was read according to the Draize technique\*. Subsequent examinations were made at 24, 48, 72, and 96 hours and on days 7 and 14 after patch removal.

In this study, the following results were noted. All animals survived to termination. Very slight to severe erythema was noted at all abraded sites through 72 hours and at all intact sites through 24 hours, persisting in one intact site to 48 hours, in one intact site to 72 hours, in two abraded sites to 96 hours, and in two abraded and three intact sites to Day 7. All erythema cleared by Day 14. Very slight to moderate edema was noted at four abraded and five intact sites 30-60 minutes after patch removal and persisted in one abraded site to 24 hours, in one abraded site to 48 hours, and in one abraded and one intact site to 96 hours with reoccurrence of very slight edema in one intact site at 72 and 96 hours. All edema cleared by Day 7. Other dermal effects noted among abraded and/or intact sites consisted of epidermal scaling and fissuring. The Primary Skin Irritation Index for Soltrol 130 was calculated to be 2.71.

### Skin Irritation (1964)

Soltrol 130 was applied to the shaved backs of six albino rabbits on both intact and abraded skin sites. A volume of 0.5 ml was applied to each of four sites, two intact and two abraded, on each rabbit and covered with an impervious plastic sheet for 24 hours. After the product was sponged off, the application sites were scored according to the method of Draize, et. al.\* The Primary Irritation Index for Soltrol 130 was determined to be 5.7 in albino rabbits and considered to be a primary irritant to the skin.

## Aspiration Hazard (1964)

Soltrol 130 was evaluated according to the procedure of H. W. Gerarde\*\* for pulmonary aspiration hazard in five albino rats. All animals appeared sedated, anoxic and cyanotic immediately after aspiration of the test material. They appeared normal 4 hours later. The average lung weight of the test animals 24 hours after aspiration of the material was 2.8 grams (2.0-3.6 grams). Control rats showed comparable lung weights of 1.5 grams (1.2-1.9 grams). Gross observations of the lungs of the test animals revealed marked hemorrhaging, edema, and congestion with a "liver like" appearance.

## Acute Inhalation, Rats (1969)

Soltrol 130 saturated vapor was fed into an all glass exposure chamber (volume-9.5 gallons) at a rate of 6.0 liters per minute for approximately 15 minutes prior to introduction of the test animals. Ten albino rats (five males and five females) weighing 200-300 grams were placed in the exposure chamber and left for six hours. The concentration of Soltrol 130 was determined to be 8.2 mg/L (1277 ppm). Gross observations revealed no untoward behavioral signs during or after the exposure period at the dose level of exposure. All rats survived and necropsy revealed no finding which could be attributed to inhalation of Soltrol 130.

### Acute Inhalation, Mongrel Dogs (1969)

Soltrol 130 saturated vapor was fed into a stainless steel and glass exposure chamber (volume-85 cubic feet) at a rate of 8.5 cubic feet per minute for approximately 15 minutes prior to introduction of the test animals. Exposure to the test material vapors at a calculated concentration of 8.4 mg/L (1308 ppm) lasted for four hours. All dogs survived the exposure. Two and one-half hours after the start of exposure, all animals displayed general weakness, ataxia, rapid respiration, tremors and mixed tonic-clonic convulsions. Salivation was noted in two dogs. All reactions subsided within two hours of the termination of exposure.

### Acute Inhalation, Mongrel Dogs (1969)

Soltrol 130 saturated vapor was fed into a stainless steel and glass exposure chamber (volume-85 cubic feet) at a rate of 8.5 cubic feet per minute for approximately 15 minutes prior to introduction of the test animals. Four mongrel dogs (two males and two females) served as the test animals. Exposure to the test material vapors at a calculated concentration of 14.2 mg/L (2211 ppm) lasted for six hours. Three dogs died during the exposure period at 3 3/4, 4 1/2, and 5 hours after the start of the exposure. Severe signs of general weakness, salivation, tremors, and mixed tonic-clonic convulsions were noted during the exposure period. The single surviving dog recovered completely from these reactions within 24 hours after the start of exposures. Necropsy of the dogs which died revealed severely hyperemic livers and extremely ischemic spleens. The surviving dog appeared normal at necropsy.

## Acute Inhalation, Guinea Pigs (1969)

Soltrol 130 saturated vapor was fed into an all glass exposure chamber (volume-9.5 gallons) at a rate of 6.0 liters per minute for approximately 15 minutes prior to introduction of the test animals. Ten albino guinea pigs (five males and five females), weighing 300-400 grams, were placed in the exposure chamber and left for four hours. The concentration of Soltrol 130 was determined to be 9.9 mg/L (1541 ppm). Gross observations revealed that minimal to severe lethargy began one to one and one-half hours after the start of exposure and persisted 7 to 23 hours following the exposure. At necropsy, no untoward gross pathological signs were noted.

## Acute Inhalation, Rhesus Monkeys (1969)

Soltrol 130 saturated vapor was fed into a stainless steel and glass exposure chamber (volume-85 cubic feet) at a rate of 8.5 cubic feet per minute for approximately 15 minutes prior to introduction of the test animals. Exposure to the test material vapors at a calculated concentration of 11.6 mg/L (1806.5 ppm) lasted for six hours. All four monkeys survived the

exposure. During the exposure period, all monkeys showed signs of retching and two monkeys vomited. All animals rubbed their eyes and held their heads during the exposure period. All four monkeys were certified healthy by a veterinarian at the end of 14 days of observation.

### One Month Subacute Inhalation, Rhesus Monkeys (1969)

Soltrol 130 vapor was introduced into a stainless steel and glass exposure chamber (volume-85. cubic feet) at a rate of 4.25 cubic feet per minute. The final concentration of Soltrol 130 in the chamber was calculated to be 4.2 mg/L (654 ppm). An equilibrium period of 15 minutes was allowed prior to introduction of the test animals into the chamber. The exposure lasted for six hours per day, three days per week (Monday, Wednesday, and Friday), for a total of 13 exposures. Observations throughout the one month exposure period were conducted for behavioral patterns, body weight, food consumption, hematology, clinical chemistry, urine analysis, gross pathology, and microscopic pathology. All four rhesus monkeys survived the study. Observations for behavioral patterns, body weight, food consumption, clinical chemistry, urine analysis, gross pathology, and microscopic pathology were unremarkable. A slight lymphocytopenia and a slight neutrophilia were noted in the differential leucocyte count at the mid point of the study and after the last exposure.

### Ames Test (1980)

Five Salmonella typhimurium tester strains, TA1535, TA1537, TA1538, TA98, and TA100, were utilized as the experimental organisms. Each strain was exposed to a minimum of five test compound doses both with and without metabolic activation by an Aroclor-induced rat liver microsomal fraction. The test compound dose levels were determined by a preliminary multidose-ranging study with the optimal concentration allowing survival of about 50% of the cells. Soltrol 130, with constant mixing, achieved a homogeneous suspension at approximately 100 mg/ml in dimethylsulfoxide. The maximum dose selected for the mutagenicity test was approximately 10,000 µg/plate because it represents the limits of solubility of the test material. The mutagenicity assay was done directly by the plate incorporation method.

Exposure to six graded doses of the test material in the presence of and in the absence of metabolic activation did not increase the reversion to histidine prototrophy of S. typhimurium strains TA1535, TA1537, TA1538, TA98, or TA100. Therefore Soltrol 130 is not considered to be mutagenic in this test system.

## Mouse Lymphoma Forward Mutational Assay (1982)

This assay was performed with the TK+/- phenotype of L5178Y mouse lymphoma cells from subline 3.7.2C using a minimum of eight test compound doses with and without metabolic activation by an Aroclor-induced rat liver microsomal fraction. Appropriate negative, solvent, and positive controls were included with each assay. The test compound dose levels were determined by a preliminary multidose-ranging study with the highest dose targeted to give approximately fifty to ninety percent inhibition of suspension cell growth depending on the solubility of the compound. Soltrol 130 achieved a homogeneous mixture at approximately 100 mg/ml in dimethylsulfoxide. The maximum dose selected for the mutagenicity test was 1000 ug/ml because it represents the limits of solubility of the test material.

Exposure to eight graded doses of the test material in the presence of and in the absence of metabolic activation did not increase the induction of forward mutations in L5178Y mouse lymphoma cells at the T/K locus. Therefore Soltrol 130 is not considered to be mutagenic in this test system.

### In Vitro Sister Chromatid Exchange (1982)

This assay was performed using Chinese Hamster Ovary Cells and a minimum of five test compound doses with and without metabolic activation by an Aroclor-induced rat liver microsomal fraction. Appropriate negative solvent and positive controls were included with each assay. The test compound dose levels were determined by a preliminary multidose-ranging study with the highest concentration of the chemical tested depending upon its solubility. Soltrol 130 required constant mixing to achieve a homogeneous suspension at approximately 100 mg/L in dimethylsulfoxide. The maximum dose selected for the mutagenicity test was approximately 50 ug/ml because it exhibited growth inhibition.

Cells were exposed to five graded doses of the test material in the presence of and in the absence of metabolic activation. No growth occurred at the two highest dose levels (50 µg/ml and 17 µg/ml) without activation due to the toxicity of the test compound. In the remaining dose levels, Soltrol 130 did not show statistically significant increases in the number of SCE s per chromosome. Therefore Soltrol 130 is not considered to be mutagenic in this test system.

- \* Draize, J. H., "Appraisal of the Safety of Chemicals in Foods, Drugs, and Cosmetics", Assoc. Food and Drug Officials of the U.S., Texas State Department of Health, Austin, Texas, pp. 46, 1959.
- \*\* Gerarde, H.W. "Aspiration Hazard and Toxicity of Hydrocarbons and Hydrocarbon Mixtures", Arch. Environ. Health

February 1990



## **Toxicity Study Summary**

### SOLTROL 10

### ACUTE INHALATION

Soltrol 10 was evaluated by passing clean, dry air over the liquid in a gas -washing bottle. The air flow through this vapor generator plus the make -up air flowing into the exposure chamber characterized the total air flow in the exposure chamber. Nominal concentrations of the vapor were calculated on this total air flow rate. Five male and five female, Charles River rats constituted each of six test groups. A single exposure, lasting four hours, took place in an 80 liter exposure chamber.

The nominal concentrations were calculated to be 28.61, 35.55, 56.73, 67.87, 94.61 and 131.73 mg/liter of air. The acute inhalation LC 50 was calculated to be 66.43 mg/liter of air. Gross toxic signs consisted of hypoactivity, ptosis, ruffed fur, enophthalmus, and dyspnea. Tremors were noted in the high dose group only. Posterior paralysis, marked distention of the urinary bladder and bilateral hydronephrosis were noted in single surviving males of the 67.87 and 94.61 mg/liter dose groups.

A second evaluation was conducted as described above. The nominal concentrations for the exposure groups were calculated to be 45.82, 68.70, 89.96, 106.39 and 135.97 mg/liter of air. The acute inhalation LC 50 was calculated to be 86.46 mg/liter of air. Gross toxic signs consisted of hypoactivity, ptosis, ruffed fur, enophthalmus and dyspnea. Tremors were noted in the high dose group only. One male in the 89.96 mg/liter dose group was sacrificed one day after the exposure while moribund. He exhibited posterior paralysis, marked distention of the urinary bladder and hydronephrosis of the right kidney. One female in this group which died exhibited distention of the urinary bladder and bilateral hydronephrosis.

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# **Toxicology Update** Isoparaffinic Hydrocarbons: A Summary of Physical Properties, Toxicity Studies and Human **Exposure Data**

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The Isoparaffins covered in this manuscript are branched aliphatic hydrocarbons with a carbon skeleton length ranging from approximately C10 to C15. They are used in the manufacture of liquid imaging toners, paint formulations, charcoal lighter fluid, furniture polishes and floor cleaners. Potential exposure exists in the petroleum, printing and paint industries.

Isoparaffins have a very low order of acute toxicity, being practically non-toxic by oral, dermal and inhalation routes. However, aspiration of liquid isoparaffins into the lungs during oral ingestion could result

in severe pulmonary injury.

Dermally, isoparaffins have produced slight to moderate irritation in animals and humans under occluded patch conditions where evaporation cannot freely occur. However, they are not irritating in non-occluded tests, which are a more realistic simulation of human exposure. They have not been found to be sensitizers in guinea pig or human patch testing. However, occasional rare idiosyncratic sensitization reactions in humans have been reported. Instillation of isoparaffins into rabbit eyes produces only slight irritation.

Several studies have evaluated sensory irritation in laboratory animals or odor or sensory response in humans. When evaluated by a standard procedure to assess upper airway irritation, isoparaffins did not produce sensory irritation in mice exposed to up to 400 ppm isoparaffin in air. Human volunteers were exposed for six hours to 100 ppm isoparaffin. The subjects were given a self-administered questionnaire to evaluate symptoms, which included dryness of the mucous membranes, loss of appetite, nausea, vomiting, diarrhea, fatigue, headache, dizziness, feeling of inebriation, visual disturbances, tremor, muscular weakness, impairment of coordination or paresthesia. No symptoms associated with solvent exposure were observed. With a human expert panel, odor from liquid imaging copier emissions became weakly discernible at approximately 50 ppm.

Numerous long-term exposures have been conducted in animals with only one major finding observed. Renaltubular damage has been found in kidneys of male rats upon repeated exposures to isoparaffins. It does not occur in mice or in female rats. This male rat nephropathy has been observed with a number of hydrocarbons, including wholly vaporized unleaded gasoline. The phenomenon has been attributed to reversible binding of hydrocarbon to α2μ-globulin. Since humans do not synthesize α2μ-globulin or a similar protein, the finding is not considered to be of biological significance to man. No clinically significant renal abnormalities have been found in refinery workers exposed to hydrocarbons.

When evaluated for developmental toxicity in rats, isoparaffins were neither embryotoxic nor teratogenic. Isoparaffins were consistently negative on standard bacterial genotoxicity assays. They were also non-genotoxic in in vivo mammalian testing for somatic or germ cell mutations (mouse micronucleus test and rat dominant lethal assay, respectively).

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### MATERIAL IDENTIFICATION

Chemical family:

Petroleum solvents.

Material:

Branched aliphatic hydrocarbons, predominantly C10-C15 isoparaffinic

hydrocarbons. Exxon and Texaco report benzene impurity as <0.1 ppm for all their isoparaffinic products and data from Ricoh' established that benzene contamination was <0.2 ppm for Isopar® G. See Table 1 for a more

complete sample identification.

### General properties

Form:

Liquid.

Color:

Colorless to water-white. Faint petroleum odor.

Vapor pressure:

<10 mmHg at 25°C. Combustible (U.S. DOT).

Flammability: Stability:

Stable.

Incompatibility:

Incompatible with strong oxidants

(e.g. liquid chlorine, sodium hypochlorite, concentrated O<sub>2</sub>).

Polymerization:

Will not occur.

Decomposition:

Incomplete combustion may prod-

uce CO and aldehydes.

### **Exposure limits**

TLV®: PEL: None established. None established.

Occupational standards:

Vary with manufacturer. Several countries have occupational standards for specific aliphatic hydrocarbons. However, Romania is the only country to have an additional generic standard for 'aliphatic hydrocarbons'. The standard 1000 mg m<sup>-3</sup> average and 1300 mg m<sup>-3</sup> maximum,<sup>2</sup> which equates to ca. 165 and 215 ppm, respectively, for isoparaffinic hydrocarbons with an average molecular weight of 150.

#### Inventories

TSCA<sup>7</sup>: EINECS<sup>8</sup>: AICS<sup>9</sup>: Listed. Listed.

DSL35:

Soltrol products from Philips Petroleum not currently listed.

SARA title!!!

Not listed.

California proposition 65: Isoparaffinic hydrocarbons are not listed in 'chemicals known to the State to cause cancer or repro-

ductive effects'.

## Typical permitted FDA food additive uses

21CFR 172.882:

Food additives permitted for direct

addition to food for human con-

sumption.

21CFR 172.884:

Direct additives approved for coating on egg shells, defoamer in processing beet sugar, float/fermentation fluid in processing wine and vinegar, froth flotation cleaning of vegetables, component in insecti-

sides.

21CFR

178.3530:

21CFR 178.3650: Indirect food additive use as plasticizer, lubricant of fibers for food

Indirect food additives.

Table 1.	Identification	of	isoparaffinic	hydrocarbons.

Producer	Material	Predominant carbon length	CAS no.	Average mol. wt.	Boiling range (°C)	Specific gravity (g m(r-1)	Flash point (°C)	Ref.
Exxon	Isopar® G Isopar® H Isopar® K Isopar® L Isopar® M	C10-11 C11-12 C11-14 C11-13 C12-15	64742-48-9 64742-48-9 64742-48-9 64742-48-9 64742-47-8	149 160 164 171 191	155–176 169–193 174–197 185–206 205–254	0.748 0.759 0.761 0.767 0.783	40 49 49 60 71	3
Phillips Petroleum	Soltrol® 50 Soltrol® 100 Soltrol® 130 Soltrol® 145 Soltrol® 170 Soltrol® 220	C 8-10 C 9-11 C10-13 C 5-16 C10-14 C13-17	68551-15-5 68551-16-6 68551-17-7 68551-18-8 68551-19-9 64741-73-7	116 142 158 157 185 206	118-148 157-173 176-208 171-299 218-238 232-288	0.72 0.74 0.75 0.77 0.778 0.809	10 41 56 53 85 106	4
Shell	Shell Sol 71	C 9-12	64741-65-7	158	179–202	0.76	52	5
Техасо	75733 Texsolve® S-2 75731 Texsolve® S 75732 Texsolve® S-66 75740 Texsolve® S/LO	C 9-10 C 8-11 C 8-11 C 8-11	64742-88-7 64742-88-7 64742-88-7 64742-88-7	135 141 142 143	156–157 157–196 160–187 161–190	0.778 0.783 0.778 0.7781	39 40.5 40.5 40.5	6

contact, component of adhesives, defoamer in coating and paperboard manufacture.

#### Uses

USA and Japan—liquid imaging toners; Europe and Japan—cosmetics.

### TOXICITY AND HUMAN STUDIES

### Acute animal toxicity

(i) Oral

(a) Gavage—practically non-toxic Isopar® G—rat LD<sub>50</sub> > 10 g kg<sup>-1</sup> to Isopar® L—rat LD<sub>50</sub> > 10 g kg<sup>-1</sup> to Soltrol® 100—rat LD<sub>50</sub> > 34.6 g kg<sup>-1</sup> to Soltrol® 130—rat LD<sub>50</sub> > 34.6 g kg<sup>-1</sup> to Shell Sol 71—rat LD<sub>50</sub> > 25 g kg<sup>-1</sup> 5

(b) Aspiration of isoparaffins into the lungs during ingestion may result in severe pulmonary injury and possibly death Aspiration of Soltrol<sup>®</sup> 130 into the lungs of rats resulted in pulmonary hemorrhaging, edema, congestion and increased lung weight 24 h after treatment.<sup>12</sup>

(ii) Skin

(a) Absorption—practically non-toxic Isopar® G—rabbit LD<sub>50</sub> >3.2 g kg<sup>-1</sup>. <sup>10</sup> Isopar® L—rabbit LD<sub>50</sub> >3.2 g kg<sup>-1</sup>. <sup>10</sup> Soltrol® 100—rabbit LD<sub>50</sub> ~15.4 g kg<sup>-1</sup>. <sup>11</sup> Soltrol® 130—rabbit LD<sub>50</sub> ~15.4 g kg<sup>-1</sup>. <sup>12</sup> Shell Sol 71—rabbit LD<sub>50</sub> >5.0 g kg<sup>-1</sup>. <sup>5</sup> A systemic intoxication by percutaneous absorption is unlikely. <sup>13</sup>

(b) Irritation
Isopar® G produced a slight dosc-related irritation in rabbits after a 24-h contact period. Hence, frequent or prolonged skin contact may irritate and cause dermatitis. Undiluted Isopar® G was found to be a primary irritant in rabbits and gave a grade 5 reaction under occlusive patch conditions. In a modified non-occluded test (a more realistic simulation of human exposure), no irritation was noted. It Isopar® L produced slight dermal irritation in rabbits. Soltrol® 100 produced mild dermal irritation when applied to intact or abraded skin of rabbits. It

rabbits.11
Soltrol® 130 was considered to be a primary irritant to rabbit skin by the Draize test with

a score of 5.7.<sup>12</sup>
In another study, Soltrol® 130 produced very slight to severe erythema when applied to intact or abraded rabbit skin. All irritation cleared by Day 7 in intact skin and Day 14 in abraded skin.<sup>12</sup>

Shell Sol 71 was moderately irritating, defat-

(c) Sensitization Isopar<sup>®</sup> L was non-sensitizing in guinea pigs. 10

(iii) Eye Isopar® G produced slight conjunctival irritation when 0.1 ml was instilled into the eyes of rabbits. No corneal lesions occurred. Draize score out of a possible 110 was 2.0 at 1 and 4 h and 0.0 for remainder of test period." Isopar® L produced slight conjunctival irritation when 0.1 ml was instilled into the eyes of rabbits. No corneal lesions were produced. Draize score out of a possible 110 was 6.0 at 1 h, 1.0 at 4 h and 0.0 for remainder of test period.10 Soltrol® 100 produced minimal, transient conjunctival irritation when 0.1 ml was instilled into rabbit eyes.11 Soltrol<sup>®</sup> 130 produced conjunctival redness and discharge (grade 1) but no corneal opacity, iritis or conjunctival chemosis when instilled into rabbit eyes. Irritation cleared within 72 h.12 Shell Sol 71 is expected to be practically nonirritating to eyes.5

(iv) Inhalation

(a) Rat Lethal Concentration greater than the highest concentrations generated.

Isopar® G—rat 4-h LC<sub>50</sub> >2000 ppm (12.2 mg ℓ<sup>-1</sup>). <sup>10</sup>

Isopar® L—rat 4-h LC<sub>50</sub> >715 ppm (5.01 mg ℓ<sup>-1</sup>). <sup>10</sup>

Soltrol® 100—rat 4-h LC<sub>50</sub> >21.4 mg ℓ<sup>-1</sup>

(3684 ppm). <sup>11</sup>

Soltrol® 130—rat 6-h LC<sub>50</sub> >8.2 mg ℓ<sup>-1</sup>

(1227 ppm). <sup>12</sup>

Shell Sol 71—rat 4-h LC<sub>50</sub> >592 ppm (3.83 mg ℓ<sup>-1</sup>). <sup>5</sup>

(b) Acute exposure to other species Dogs exposed to 8.4 mg  $\ell^{-1}$  (1308 ppm) Soltrol® 130 for 4 h displayed general weakness, ataxia, rapid respiration and tremors during exposure. All dogs survived and all reactions subsided within 2 h.12 Three of four dogs died during a 6-h exposure to 14.2 mg ℓ-1 (2211 ppm) Soltrol® 130. The single surviving dog recovered completely within 24 h. 13 Ten guinea pigs exposed to 9.9 mg ℓ-1 (1541 ppm) Soltrol® 130 for 4 h showed severe lethargy during exposure, which persisted for 7-23 h post-exposure. At necroscopy, no unusual findings were noted.12 Four monkeys were exposed to 11.6 mg e-1 (1806 ppm) Soltrol® 130 for 6 h. During exposure, monkeys showed signs of retching and eye rubbing. All animals were certified healthy by a veterinarian at the end of a 14day observation period.12

(c) Mouse sensory irritation
Groups of mice were exposed to either 1834 mg m<sup>-3</sup> (~300 ppm) or 2621 mg m<sup>-3</sup> (~420 ppm) Isopar® G for 30 min. <sup>10</sup> Respiration rate was measured using the method of Alarie. <sup>15</sup> Neither concentration produced any significant effects on respiratory rate. Thus, sensory irritation was not produced in mice at or slightly above current industrial workplace

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Also, using the method of Alarie, 15 isooctane failed to elicit respiratory irritation in SPF mice exposed to ~3000 ppm. 16

### Repeated exposure studies

(i) Subacute inhalation in monkeys<sup>12</sup>
Four rhesus monkeys were exposed to Soltrol<sup>10</sup>
130 for 6 h per day, 3 days per week for a total of 13 exposures. The mean exposure concentration of Soltrol<sup>10</sup> 130 was 654 ppm (4.2 mg ℓ<sup>-1</sup>). All four monkeys survived the exposures. Observations for changes in behavioural patterns, body weight, food consumption, clinical chemistry and urine analysis during exposure and gross or microscopic pathology after exposure were unremarkable. Slight lymphocytopenia and neutrophilia were noted in the differential leukocyte count at the mid-point and end of the study.

(ii) Subchronic inhalation study in rats<sup>17</sup>
Groups of 35 male and 35 female Sprague-Dawley rats were exposed to 0, 300 (1.91 g m<sup>-1</sup>) or 900 ppm (5.62 g m<sup>-1</sup>) Isopar<sup>19</sup> G for 6 h per day, 5 days per week for 12 weeks. Clinical chemistry, hematology and autopsy evaluations were performed on selected rats from each group at the end of the fourth, eighth and twelfth week of exposure. Selected organs were weighed and tissues collected for gross histopathological examination. The following findings were considered to be treatment related:

—decreased body weight in male rats at 300 and 900 ppm;

—a dose-related increase in absolute and/or relative kidney weight in male rats at 300 and 9(0) ppm and in female rats at 900 ppm;

—mild kidney tubular damage in male rats, which showed a dose- and duration-related increase in degree and severity. The damage was essentially comparable after 8 and 12 weeks. Changes in the kidney included regenerative tubular cpithelium in focal areas of the cortex and dilated tubules with proteinaceous material in the cortico-medullary junction;

—an increase in absolute and relative liver weight in male and female rats at 900 ppm without histopathological evidence of liver damage. This change is considered to be representative of a non-specific metabolic and/or physiological response to the uptake of hydrocarbon.

In summary, subchronic exposure of rats to Isopar® G at levels up to 900 ppm for 12 weeks did not produce significant toxic effects other than mild structural changes in the kidneys of male rats.

male rats.

8-week study of kidney function in rats<sup>18,19</sup>
In order to evaluate further the kidney effects found in the 90-day study, groups of 50 male and 50 female Fischer 344 rats were exposed to 0, 300 (1.83 g m<sup>-3</sup>) or 900 ppm (5.48 g m<sup>-3</sup>) C<sub>10</sub>-C<sub>11</sub> isoparaffin for 6 h per day, 5 days per week for 8 weeks. Urine and blood were collected after 1, 4 and 8 weeks of exposure and 4 weeks of recovery. The ability of males to concentrate

urine was reduced after 4 and 8 weeks of exposure, but showed evidence of recovery 4 weeks after exposure ended. Following 4 and 8 weeks of exposure, glucose, protein and epithelial cell exerction was greater in the urine of exposed males than in controls. Creatinine clearance decreased after 8 weeks. After 4 weeks of recovery, urine glucose, protein, epithelial cell exfoliation and creatinine clearance returned to control levels. Overall, the effect on kidney function was mild with evidence of nearly complete recovery. Histological changes observed in exposed male rats were similar to the previous study. Structural recovery was not complete at the end of the 4-week post-exposure period, No functional or histological changes were observed in female rats.

(iv) Subchronic inhalation study in rats<sup>20</sup>
Male and female rats were exposed to 0, 359, 737
or 1444 ppm (0, 2.53, 5.20 or 10.19 g m<sup>-1</sup>) Shell
Sol TD for 6 h per day, 5 days per week for 13
weeks. No deaths or clinical signs of toxicity
occurred in the low and intermediate groups.
Rats exposed to the high level were slightly
lethargic during exposure. Body weight gain was
slightly reduced in all female groups and in highexposure males. Water intake was increased in
the high-exposure males only.

Aspartate aminotransferase and alanine aminotransferase were decreased in all female isoparaffin-exposed groups. In males, alkaline phosphatase, potassium, chloride and albumin were increased in the high exposure level. The toxicological significance of these minor changes is not known. A low-grade anemia occurred in all solvent-exposed males, as evidenced by slight reductions in hemoglobin, packed cell volume and total crythrocyte counts.

Spleen weights were increased in the highconcentration males and liver weights were increased in the low-concentration males and in the intermediate- and high-concentration males and females. However, in the absence of histological changes, weight changes are regarded as adaptation rather than a toxic effect. Male kidney weights were increased in all solvent-exposed these weight changes groups and intracytoplasmic accompanied by hyaline inclusions, increased incidence of tubular degeneration and/or dilatation in the cortical tubules. Kidney weights were also increased in the highexposure females, but no exposure-related kidney lesions were seen. The low-grade anemia and mild renal degenerative changes were considered to be compound-related and biologically signifi-

(v) Subchronic and chronic inhalation studies in rats<sup>21</sup> A series of experiments was performed by Viau et al. to elucidate further the mechanisms of male rat nephrotoxicity related to isoparaffinic hydrocarbon exposure.

Chronic: Groups of 24 male Sprague-Dawley rats were exposed to either 0 or 6.5 mg  $\ell^{-1}$  Shell Sol TD ( $C_{10}$ – $C_{12}$  isoparaffins) for 8 h per day, 5

days per week for up to 16 months. Urine was collected periodically throughout the exposure. Half of the animals were killed at 46 weeks, the rest at 68 weeks. Enzymuria, as measured by urinary exerction of lactic dehydrogenase, showed marked increases early in exposure to 6.5 mg  $\ell^{-1}$ , but this effect declined with time. Albuminuria was also observed in rats exposed to 6.5 mg  $\ell^{-1}$ , as well as decreased ability to produce concentrated urine. The presence of numerous hyaline droplets was evident in the proximal tubules of the kidneys of rats exposed for 46 or 68 weeks.

Reversibility: Two groups of 12 male and 12 female Sprague-Dawley rats were exposed to either 0 or 6.5 mg  $\ell^{-1}$  Shell Sol TD for 8 h per day, 5 days per week for 13 weeks, and the reversibility of the effects was evaluated 6 weeks after the final exposure. Female rats were unaffected. Male rats showed enzymuria and decreased capacity to produce concentrated urine during exposure, but a complete recovery occurred after removal from exposure.

Effect of low-level exposure: Twelve Sprague-Dawley male rats were exposed to either 0 or 0.58 mg  $\ell^{-1}$  Shell Sol TD for 8 h per day, 5 days per week for 16 weeks. Enzymuria was increased, but no effect was seen on urinary clearance or

relative kidney weights.

Hormonal effects: Six normal and five castrated Sprague-Dawley male rats were exposed to 6.5 mg 1<sup>-1</sup> Shell Sol TD for 8 h per day, 5 days per week for 5.5 weeks. These were matched to six normal and six castrated control rats. Castrated rats showed neither enzymuria nor albuminuria. Both castrated and normal rats exposed to 6.5 mg  $\ell^{-1}$  showed increased levels of  $\alpha_{2\mu}$ -globulin in the kidney and increased relative kidney weights. Histologically, hyaline droplets were observed in the exposed, normal male rats.

In summary, prolonged inhalation exposure to 6.5 mg  $\ell^{-1}$  of  $C_{10}$ – $C_{12}$  isoparaffins resulted in both functional and morphological renal changes in male rats. Such renal effects were not observed

in females or in castrated males.

(vi) Relevance of male rat hydrocarbon nephropathy

In the preceding studies, effects were observed on the kidneys of male rats upon repeated exposures. Similar male rat nephrotoxicity has been reported for a diverse group of hydrocarbons, including unleaded gasoline, and has been attributed to reversible binding of hydrocarbon to a24-globulin.22 Humans do not synthesize α2μ-globulin. Therefore, a direct extrapolation of rat data cannot be made. Swenberg et al.22 noted that even if there was another protein in humans that would bind hydrocarbons, it would have to be synthesized in an adequate amount, be freely filtered by the glomerulus, binding would have to reduce the digestibility of the protein and, finally, exposures causing renal overload would have to occur repeatedly since the cytotoxic effect due to protein overload is reversible. Therefore, it is highly unlikely that the hydrocarbon-associated nephrotoxic effects observed in male rats have any implications for humans.

Summarized below are the findings from a variety of studies in humans on hydrocarbon-induced

kidney effects:

—A case-control study of 148 cases of biopsyproved chronic glomerulonephritis (CGN) drawn from thirteen Paris-area kidney centers showed essentially no association between hydrocarbon exposure and CGN.<sup>23</sup>

—There has been a retraction of four positive case control studies by one Scandinavian investigator, which purported to find an association between hydrocarbon exposure and glomeru-

lonephritis.24

The results of a survey of 30 000 French workers reported that those with a 'significant history of solvent exposure' had a significantly greater prevalence of dipstick positive proteinuria. However, solvent exposure incorporated a broad range of exposures, including halogenated hydrocarbons, oxygenated solvents, engine fuels, paints and paint thinners, removers and strippers, glues, hair sprays, pesticides and molding compounds. Therefore, it is impossible to determine whether or not this was related to isoparaffin exposure. 25

—In a cross-sectional study of refinery workers exposed to low levels of hydrocarbons, sensitive biochemical and immunological markers of kidney function were evaluated. Mean albuminuria was slightly higher in the exposed group and these workers also showed an increased excretion of renal antigen and slightly higher titers of anti-laminin antibodies. However, the authors concluded that chronic low-level hydrocarbon exposure in these refinery workers did not lead to clinically significant renal abnormalities.<sup>26</sup>

The University of Oklahoma was commissioned by API to conduct a study designed to evaluate kidney changes in tissues surrounding renal cell carcinomas. No correlation of historical hydrocarbon exposure and kidney abnormalities was found. Job titles of patients included oil field roughneck, petrochemical engineers.

refinery workers and dry cleaners.27

# Inhalation developmental toxicity study with isoparaffin in rats<sup>10</sup>

Mated Sprague-Dawley CD® rats were exposed to 0, 300 or 900 ppm Isopar® G for 6 h per day on Days 6-15 of gestation. All dams were sacrificed on Day 21 of gestation. Live and dead fetuses, early and late resorptions, implantation sites and number of corpora lutea were counted. All fetuses were identified, weighed, measured (crown-rump length), sexed and examined for external, visceral and skeletal malformations. There were no changes in any of these parameters, including resorptions, fetal size, sex distribution and fetal alterations. Thus, isoparaffin was

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neither fetotoxic nor teratogenic to rats at concentrations up to 900 ppm in air.

### Genetic toxicity studies

Isoparaffins have been negative on every mutagenicity assay in which they have been tested.

- (i) Ames Salmonella reverse mutation assay Isopar<sup>60</sup> L was not mutagenic when tested in five S. typhimurium strains (TA98, TA100, TA1535, TA1537 and TA1538) with and without S9 metabolic activation. <sup>28</sup> Isopar<sup>60</sup> G was also negative on the Ames assay in the same strains with and without S9 activation. The highest dose tested was undiluted. <sup>14,28</sup> Soltrol<sup>60</sup> 130 was negative in the same five Ames tester strains listed above, both with and without metabolic activation. It was tested as a 100 mg ml<sup>-1</sup> suspension in DMSO, with a maximum concentration of 10 000 μg per plate. <sup>12</sup>
- (ii) Pol A' A'
  The Pol A' A' assay is a test of DNA repair in
  Escherichia coli bacteria. The Pol A' strain is
  normal for DNA polymerase enzyme and is
  capable of repairing DNA damage. Since Pol A'
  is deficient in this enzyme, any DNA damage will
  result in growth inhibition. Treatment of Pol A'
  E. coli with Isopar® G did not result in growth
  inhibition. Thus, Isopar® G was not mutagenic
  in this assay. 14,28
- (iii) WP2
  WP2 is a reverse mutation assay in E. coli. The strain WP2 is deficient in the ability to synthesize tryptophane. Consequently, tryptophane must be supplied to the media for growth. A tryptophane-independent revertant will be able to grow in the absence of added tryptophane. Isopar® G did not increase the number of revertants with or without S9 activation. Therefore, Isopar® G was not mutagenic in the WP2 assay. 14,28
- (iv) Mouse lymphoma forward mutation assay Soltrol® 130 was tested at eight graded concentrations with and without metabolic activation for the induction of forward mutations in L5178Y mouse lymphoma cells at the T/K locus. The maximum dose tested was 1000 μg ml<sup>-1</sup> based on the solubility of the material. Soltrol® 130 did not increase the induction of forward mutations and thus is not considered to be mutagenic by the mouse lymphoma assay.<sup>12</sup>
- (v) In vitro sister chromatid exchange Soltrol® 130 was evaluated for the production of sister chromatid exchanges (SCEs) in Chinese hamster ovary cells with and without metabolic activation at dose levels up to those that inhibited cell growth due to the toxicity of the compound. Soltrol® 130 did not increase the number of SCEs per chromosome and thus is not considered to be mutagenic in this assay. 12
- (vi) Mouse micronucleus

  The in vivo mutagenicity of Isopar® G was evaluated by the mouse micronucleus assay.

  Groups of four male and four female mice per time period were dosed intraperitoneally with 25 ml kg-1 Isopar® G given as a 10% solution in

eorn oil. Mice were killed at 48 and 72 h after dosing. The numbers of micronuclei per 1000 erythrocytes were counted. Isopar® G did not produce any clastogenic activity at either time period. 14,28

(vii) Dominant lethal study The in vivo mutagenicity of Isopar® G to germ cells was evaluated by the dominant lethal test. Groups of 10 each, proved fertile male Sprague-Dawley CD<sup>00</sup> rats were exposed to 0, 300 or 900 ppm Isopar® G for 6 h per day for five consecutive days. Starting on the last treatment day (at least 2 h after exposure), males were cohoused with untreated virgin Sprague-Dawley CD60 rats (1 male: 2 females) for 7 days. The mating procedure continued for six consecutive weeks. Females were removed from the male rats and sacrificed 18 days after cohousing (Days II-18 of gestation). Females were examined for implantation sites, early and late resorptions and viable fetuses. At the end of the study, males were sacrificed and the seminal vesicles, epididymides, prostate and testes were preserved. There were no differences from controls that were considered to be treatment-related in the pregnancy rate, number of implantations or numbers of early or late fetal deaths. Thus, under the conditions of this study. Isopar<sup>op</sup> G was not considered to be mutagenic by the dominant lethal test.10

### Human exposures

- (i) Dermal
  - (a) Patch tests
    Isopar® G. Isopar® L and Isopar® M have each been tested in human patch tests. When applied as a 50% preparation in petrolatum under semi-occluded patches, none of these materials produced evidence of sensitization, phototoxicity or photosensitization in panels of over 100 subjects. 10.14

Under closed or semi-occluded conditions where evaporation cannot freely occur, these isoparaffins can produce defatting of the skin and irritation. 10,14

(b) Workplace experience Occasional rare idiosyncratic dermal sensitization reactions have been reported in humans. 'In very few cases a hypersensitization has been recorded which was ascribed to the use of solvent mixtures containing isoparaffins'. 13 A NIOSH survey was conducted in the Services Department of Graphic R. L. Polk company of Cincinnati.29 Four organic solvents were found in the work area. One employee who experienced hive-like lesions of the lips and tongue was determined by skin testing to be hypersensitive to isodecane. 'Reactions of this severity to isodecane are considered rare'. On the basis of this investigation, NIOSH determined that a health hazard due to exposure to chemicals did not exist except for the one hypersensitive

Cir-Cir and Cir-Cis isoparaffins have been

used by Versatec (a Xerox company) for over 16 years and by Xerox Medical Systems for over 10 years. In over 2000 employees, there have been only two cases of health-related incidents. In both cases, the employees were found to be sensitized, breaking out in a skin rash and hives when in contact with isoparaffin. 30

(ii) Inhalation studies

Pedersen and co-workers have published a series of papers31-34 primarily focusing on the biochemical effects of isoparaffin exposure, with observations on sensory parameters from a single exposure to isoparaffin hydrocarbons. Only their initial paper reported data related to sensory perception of isoparaffinic hydrocarbon exposure. The effect of a single exposure to Shell Sol TS (identified as a white spirit that contained >99% C<sub>8</sub>-C<sub>12</sub> isoparaffin) was evaluated. Twelve human volunteers were given a single 6 h exposure to 100 ppm. Urine was collected prior to exposure and after 3 and 6 h of exposure. Venous blood was collected prior to exposure and 6 and 48 h after start of exposure. According to a selfadministered questionnaire, there was no difference during or after exposure in any of the following symptoms: dryness of the mucous membranes, loss of appetite, nausea, vomiting, diarrhea or fatigue. No symptoms associated with solvent exposure were observed, including headache, dizziness, feeling of inebriation, visual disturbances, tremor, muscular weakness, impairment or coordination or paresthesia. Exposure to 100 ppm resulted in a mean blood concentration of 2.3 mg  $\ell^{-1}$  (14 nmol  $\ell^{-1}$ ) after 6 h of exposure. No changes in blood chemistry were found following isoparaffin exposure, including measurements of serum amylase, cholesterol, triglyceride, sodium, potassium, creatine kinase, orosomucoid, urate or glucose. Urine samples were analyzed for albumin and β<sub>2µ</sub>-globulin. These two urine variables were not affected.31

In subsequent human exposure experiments by Pedersen, emphasis was placed on biochemical parameters. Seven subjects were exposed to 103 ppm (0.61 g m<sup>-3</sup>) Shell Sol TS for 6 h per day for 5 days, while five subjects served as unexposed controls. The concentrations of plasma immunoglobulins and orosomucoid and serum creatine kinase and follicle stimulating hormone were measured. There were some significant

differences from controls in creatine kinase and follicle stimulating hormone. However, there was marked intra-individual and inter-individual variability in the serum concentration of these parameters. There were no changes in plasma immunoglobulins or orosomucoid. 12

A third experiment had seven volunteers exposed to 100 ppm. Shell Sol TD (99% C<sub>R</sub>-C<sub>12</sub> isoparaffins) for 6 h per day for 5 days. The mean concentration in the fat was 41.1 mg kg<sup>-1</sup> (Friday afternoon). The following Monday the concentration was 31.7 mg kg<sup>-1</sup>. The estimated mean half-life in fat was 7 days. Based on this experiment, the isoparaffin concentration in the brain was estimated. At steady state the maximum brain isoparaffin concentration was estimated to be 11 mg kg<sup>-1</sup>, with an estimated maximum half-life of 18-19 h.<sup>13</sup>

In a more recent study, the same investigators exposed eight volunteers to 100 ppm (0.6 g m<sup>-3</sup>) Shell Sol TD for 3 h. Using mathematical modeling, they estimated the maximum steady-state concentration during repeated exposure to be 55 mg kg<sup>-1</sup> for fat and 5 mg kg<sup>-1</sup> for brain. <sup>34</sup>

(iii) Inhalation of liquid imaging copier emissions
A human expert panel (2 males, 4 females) was
exposed to isoparaffinic-hydrocarbon emissions
from Ricoh machines. They were asked to rank
odor on a 6-point scale ranging from no odor
to unbearably strong odor. They also ranked
'discomfort' ranging from -4 (utmost discomfort)
to +4 (completely comfortable), with 0 neutral
(neither comfortable nor uncomfortable). Odor
was almost imperceptible at an average isoparaffin
concentration of 22 ppm, weak at 48 ppm and
clearly discernible at 108 ppm. This same panel
noted slight discomfort when concentration
reached 54 ppm and felt uncomfortable at
143 ppm.

The Xerox Corporation notes that customer complaints do not arise when machine emissions are <50 ppm.<sup>30</sup>

#### Acknowledgements

The authors wish to thank Lawrence N. Curcio of Exxon Corporation, John Delpup of Texaco Chemical Company, John Murphy of Shell Oil Company, Caroll J. Kirwin of Phillips Petroleum Company and Malcolm Hemming of Rank Xerox for supplying much of the data and for their helpful input into the preparation of this manuscript. This manuscript was prepared by the Toxicology subcommittee of the Liquid Imaging Materials Association.

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# Appendix B

**Quality Assurance and Laboratory Reports** 

### QUALITY ASSURANCE REPORT

### PROJECT AND SAMPLE INFORMATION

Project Name:

Snohomish County Airport/Paine Field

Project No.:

19947-31919-RT

Lab Name:

CCI Analytical Laboratories Inc.

Table Sample Ke	,	D . C 1. 1
Lab Numbers	Samples	Date Sampled
011014	B-1, B-2, B-3, B-4,B-5	11/02/01
012002	B-1 38", B-2 42", B-3 48"	12/01/01
012037	B-6 2', B-6 2.6', B-7 2', B-7 2'6"	12/07/01
012115	B-8 2', B-8 3', B-9 2', B-9 3', B-10 2', B-10 3'	12/27/01

### **QUALITY ASSURANCE SUMMARY**

All data were of known quality and acceptable for use.

Review of data was performed using OnSite Environmental control limit criteria, the *National Functional Guidelines for Organic Data Review-USEPA* (2/94), and the WA State Department of Ecology Analytical Methods for Petroleum Hydrocarbons (ECY 97-602, June 1997).

### ANALYTICAL METHODS

Parameter	<u>Technique</u>	Method
Total Petroleum Hydrocarbons (TPH)	GC/FID	NWTPH-Dx
Volatile Organic Compounds (VOCs)	GC/MS	EPA 8260
Semivolatile Organic Compounds (SVOCs)	GC/MS	EPA 8270

#### **TIMELINESS**

All samples were extracted and analyzed within recommended holding times.

				Time	Time
	Date	Date	Date	Until	Until
<u>Parameter</u>	Sampled	<b>Extracted</b>	<b>Analyzed</b>	Extraction	<u>Analysis</u>
SVOCs	11/02/00	NR	11/5 &6/00	NA	4&5(14)
VOCs	11/02/00	NR	11/06/00	NA	5(14)
TPH-Dx	11/02/00	NR	11/07/00	NA	6(14)
TPH-Dx	12/01/00	NR	12/07/00	NA	7(14)
TPH-Dx	12/07/00	NR	12/13/00	NA	7(14)
TPH-Dx	12/27/00	NR	12/29/00	NA	3(14)

### QUALITY ASSURANCE REPORT

### PROJECT AND SAMPLE INFORMATION

Project Name:

Snohomish County Airport/Paine Field

Project No.:

19947-31919-RT

Lab Name:

CCI Analytical Laboratories Inc.

NR - not reported. NA - not applicable.

() - numbers in parenthesis indicate recommended holding time in days.

### FIELD QUALITY CONTROL SAMPLES

Field Duplicates:

None.

Rinsate:

None.

Trip Blank:

None.

### LAB QUALITY CONTROL SAMPLES

Method Blanks:

No analytes were detected at or above CCI reporting limits.

Matrix Spike:

Matrix Spike/Matrix Spike duplicates were within USEPA control limit

criteria.

SVOCs: The matrix spike recovery for 1,4 Dichlorobenzene (27%) was below the USEPA control limit of 28%, This recovery is only slightly below the

control limit: therefore no action is necessary.

Matrix Duplicates:

Duplicate relative percent differences were within USEPA control limit

criteria.

Sample and

Sample Duplicates:

Duplicate relative percent differences were within the Analytical Methods

control limit criteria.

Surrogates:

Surrogate recoveries were within USEPA and the Analytical Methods control

limit criteria, with the following exceptions.

Low BCB surrogate recoveries were observed for samples B-2 (64%), B-3 (65%), B-4 (62%), which were below the Analytical Methods control limit of

70%. No action is necessary.

#### QUALITY ASSURANCE REPORT

#### PROJECT AND SAMPLE INFORMATION

Project Name:

Snohomish County Airport/Paine Field

Project No.:

19947-31919-RT

Lab Name:

CCI Analytical Laboratories Inc.

Low C25 surrogate recoveries were observed for samples B-62' (62%) and B-72'6" (68%), which were below the Analytical Methods control limit of 70%.

No action is necessary.

**Laboratory Control** 

Sample:

None.

**Total Petroleum** 

Hydrocarbon

Identification:

Various samples had detection of early range diesel products, including

Diesel #1/Jet Fuel, Lube oil, and Soltrol 170.

**SIGNATURES** 

Prepared by \_

Date 3/2/01

Checked by

Date 3/2/0/



February 21, 2001

Pam Morrill Camp Dresser & McKee 11811 N.E. 1<sup>st</sup> Street, Suite 201 Bellevue, Washington 998005-3033

RE: Analytical Results for Air Samples and "Calibration Fluid" for Paine Air Study -01-0078

Dear Pam,

The samples you submitted to our laboratory on January 5, 2001 were analyzed by GC/MS to determine the constituents present and to compare them each other and to previous samples submitted for analysis. A charcoal tube air sample (01000561) and a blank charcoal tube (01000563) were submitted for analysis. The charcoal tubes were desorbed in 2.5 ml of CS<sub>2</sub> containing 2ul of 2-chlorobenzotrifluoride per 100 ml of CS<sub>2</sub> as an internal standard. A liquid "calibration fluid" sample was submitted (01000562) and was diluted in CS<sub>2</sub> for analysis. A 5 ul aliquot of the sample was diluted in 1.0 ml of CS<sub>2</sub> and injected using a splitless injection technique into the GC/MS under instrumental conditions that were identical to the conditions under which the previous air samples and bulk samples had been analyzed.

#### Results:

The analysis of the blank sample (01000563) showed no detectable compounds present. The air sample (01000561) showed that the chromatographic profile for this sample did not resemble the profile for the bulk sample (01000562) but closely resembled the profile of the last bulk sample submitted for analysis, the Soltrol 170. The attached chromatograms show the total ion current profile for this sample (Figure 1) and the total ion current profile for the bulk "calibration fluid" (Figure 2). The elution range, both in minutes (11.5 to 16 minutes) and in component profile (C12 - C15), show that the later eluting peaks from the air sample match the Soltrol 170. The bulk sample consisted of C9 – C11 hydrocarbons and appeared to be a Stoddard type solvent. The majority of the hydrocarbons present in the sample were exclusively branched aliphatics with no aromatics or straight chain hydrocarbons. A smaller cluster of hydrocarbons consisting of about C10 to C11 and were primarily branched aliphatics. These represented about 6% of the total hydrocarbons present in the sample.

The density of the calibration fluid was measures at about 0.762 grams per ml. The concentration of total hydrocarbons in air sample 01000561 when measured against the internal standard was 2.2 mg/sample. The concentration of hydrocarbons when measured against the Calibration Liquid was about 2.4 mg/sample. This represents an



air concentration of about 9.6 mg/cubic meter on average. In conclusion, the original air samples taken in November, 2000 indicate the presence of both Soltrol 170 and the "calibration liquid" in several of the samples. The primary constituient in the samples appears to be the "calibration liquid" and not the Soltrol 170. Two samples contained both hydrocarbon fractions but the neat liquid samples show that the samples vary from location to location. This newest air sample has very trace levels of the "calibrating fluid" hydrocarbon peaks present. Isolation of the sources of the contaminants may take additional air monitoring to identify where the contaminants are present.

This report relates only to the sample tested. Results reported above are based upon the generally accepted practices of Industrial Hygiene Laboratory analysis at the time of sample analysis.

Respectfully submitted,

George G. McCaslin Laboratory Director



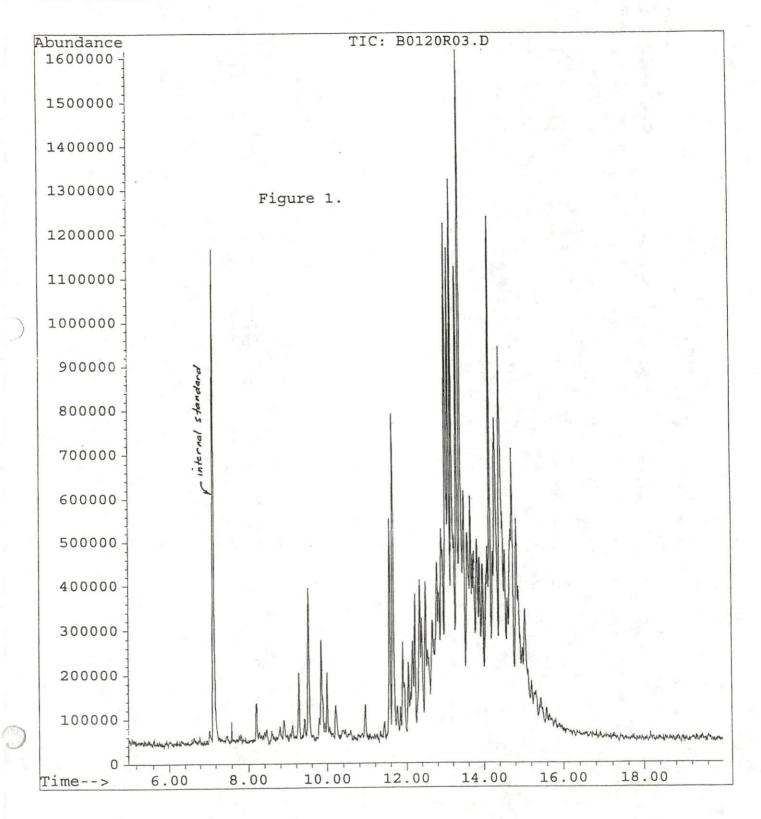
File : C:\HPCHEM\1\DATA\PREZANT\B0120R03.D

Operator : jmr

Acquired : 01/20/2001 01:48 using AcqMethod 45-100FF

Instrument: 5972 -U

Sample Name: 01i00195,01000561 Misc Info : PREZANT, 45-10off



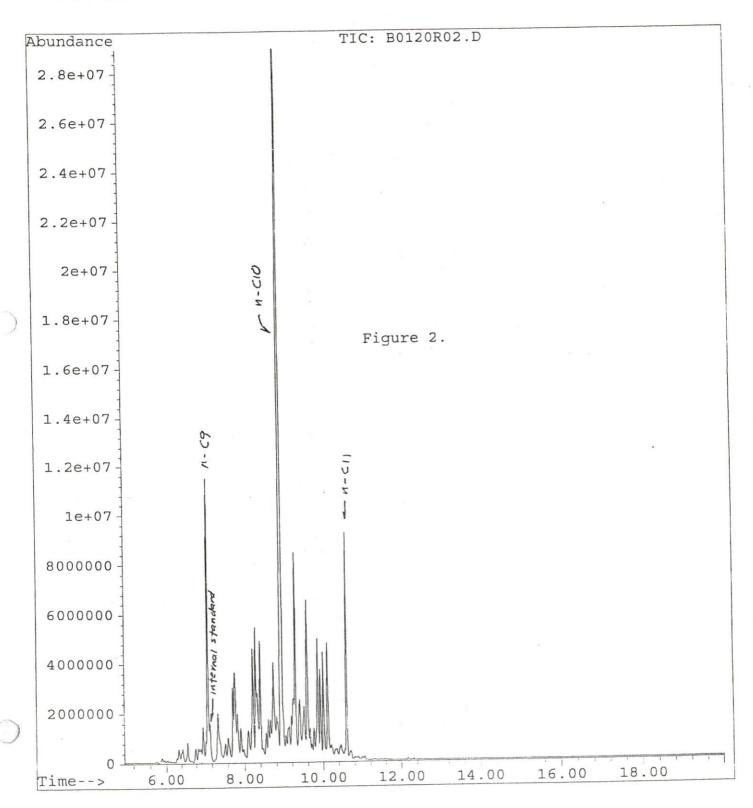
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Operator

: 01/20/2001 00:56 using AcqMethod 45-100FF Acquired

5972 -U Instrument :

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December 01, 2000

Pam Morrill
Camp Dresser & McKee
11811 N.E. 1<sup>st</sup> Street, Suite 201
Bellevue, Washington 998005-3033

RE: Analytical Results for Charcoal Tube Samples for Paine Air Study -00-5238

Dear Pam,

The samples you submitted to our laboratory on November 14, 2000 were analyzed by GC/MS to determine the constituents present and to compare them to a reference charcoal tube sample taken from a potential source at the site. The samples were desorbed in 2 ml of Carbon Disulfide and spiked with 2 ul of 2-chlorobenzotrifluoride per 100 ml of CS<sub>2</sub>. The "reference tube sample", #5 (00027249) contained about 0.5 ml of water in the sample after desorption, indicating a high relative humidity in the area samples with a significant amount of water collected on the charcoal. The analysis showed the following results:

#### Sample #1 (00027245)

Precision Shop - sampled 4' above ground

### Components Identified in sample:

Stoddard Solvent Hydrocarbon Range (C9-11)	_	$7.9 \text{ mg/m}^3$
Diesel Range Hydrocarbons (C12-15)	-	$5.1 \text{ mg/m}^3$
Toluene	- 1	$0.95 \text{ mg/m}^3$
m/p-Xylene	-	$0.04 \text{ mg/m}^3$
Ethyl Benzene	_	$0.02 \text{ mg/m}^3$
C <sub>3</sub> Alkyl Benzenes	- 4	$0.19 \text{ mg/m}^3$

#### Hydrocarbons as a % of Reference Sample #5 (00027249)

C9-11	-	3.7%
C12-15	<u>.</u>	2.4%

Same hydrocarbon humps present in both samples.

Air Volume sampled - 475 liters



Sample #2 (00027246)

Hall - sampled 4' above ground

Components Identified in sample:

Stoddard Solvent Hydrocarbon Range (C9-11) - 1.0 mg/m<sup>3</sup>
Diesel Range Hydrocarbons (C12-15) - Not Detected

C<sub>3</sub> Alkyl Benzenes - 0.095 mg/m<sup>3</sup>

Hydrocarbons as a % of Reference Sample #5 (00027249)

C9-11 - 0.47%

C12-15 - Not Detected

Air Volume sampled - 480 liters

Sample #3 (00027247)

Reception Area - sampled 4' above ground

Components Identified in sample:

Stoddard Solvent Hydrocarbon Range (C9-11) - 1.4 mg/m<sup>3</sup>
Diesel Range Hydrocarbons (C12-15) - Not Detected
C<sub>3</sub> Alkyl Benzenes - 0.069 mg/m<sup>3</sup>

WE (2000 TO 10)

Hydrocarbons as a % of Reference Sample #5 (00027249)

C9-11 - 0.67%

C12-15 - Not Detected

Air Volume sampled - 480 liters

Sample #4 (00027248)

Office - sampled 4' above ground

Components Identified in sample:

Stoddard Solvent Hydrocarbon Range (C9-11) - 1.5 mg/m<sup>3</sup>
Diesel Range Hydrocarbons (C12-15) - Not Detected
C<sub>3</sub> Alkyl Benzenes - 0.082 mg/m<sup>3</sup>

Hydrocarbons as a % of Reference Sample #5 (00027249)

C9-11 - 0.71%

C12-15 - Not Detected

Air Volume sampled - 720 liters



## Sample #5 (00027249)

Reference Sample - sampled 6" inside borehole

## Components Identified in sample:

Stoddard Solvent Hydrocarbon Range (C9-11)	- 3	210 mg/m <sup>3</sup>
Diesel Range Hydrocarbons (C12-15)	-	220 mg/m <sup>3</sup>

## Hydrocarbons as a % of Reference Sample #5 (00027249)

C9-11	- 100%
C12-15	- 100%

Air Volume sampled - 120 liters

## Sample #6 (00027250)

Blank Charcoal Tube

## Components Identified in sample:

Stoddard Solvent Hydrocarbon Range (C9-11)	-1	Not Detected
Diesel Range Hydrocarbons (C12-15)	-0	Not Detected

# Hydrocarbons as a % of Reference Sample #5 (00027249)

11 Juno Curo Cris as	,		00/
C9-11		-	0%
C12-15		_	0%

## Air Volume sampled - Blank

The analysis of sample #1 (00027245) showed the presence of aromatic hydrocarbons that were not present in the reference sample from the borehole suggesting that there may be an additional source for the aromatic solvents present in the air sample. Toluene, Ethyl Benzene and Xylenes are relatively common solvents and could be generated from many different sources. I also believe that it would be advantageous to have the solvent in question analyzed under the same conditions as the air samples to verify whether the two distinct humps in the air samples are derived from this one solvent or if they are derived from different solvents that may be present. As I compared the chromatograms for the air samples to the chromatograms of the Stoddard solvent and the other solvent that were analyzed by FES and CCI, it appears that the two hydrocarbon humps present in the air sample may be derived from just the solvent of concern. These distinct groups of chromatographic peaks may be resolved to a greater degree than they were in the analysis done by FES and CCI and that would explain the elution patterns I observed and the relation to carbon range and elution temperature. Analysis of this solvent under these conditions is recommended.



Long-term exposures to Stoddard type solvents at low concentrations may have adverse health effects on individuals that have become particularly sensitized to these solvents. There is literature available through the Centers for Disease Control, OSHA, NIOSH and other agencies dealing with the short term and long term exposure symptoms for these types of solvents. Prezant Associates, Inc. also has Industrial Hygiene consulting services available if you might need these services to further characterize the air quality issues you are dealing with.

This report relates only to the sample tested. If Prezant Associates, Inc. personnel do not collect the sample, the accuracy of the results is limited by the methodology to the expertise of the sample collector. Results reported above are based upon the generally accepted practices of Industrial Hygiene Laboratory analysis at the time of sample analysis. If I may be of further service in this matter, please contact me at your convenience.

Respectfully submitted,

George G. McCaslin Laboratory Director



: C:\HPCHEM\1\DATA\JMR\B1121R03.D File

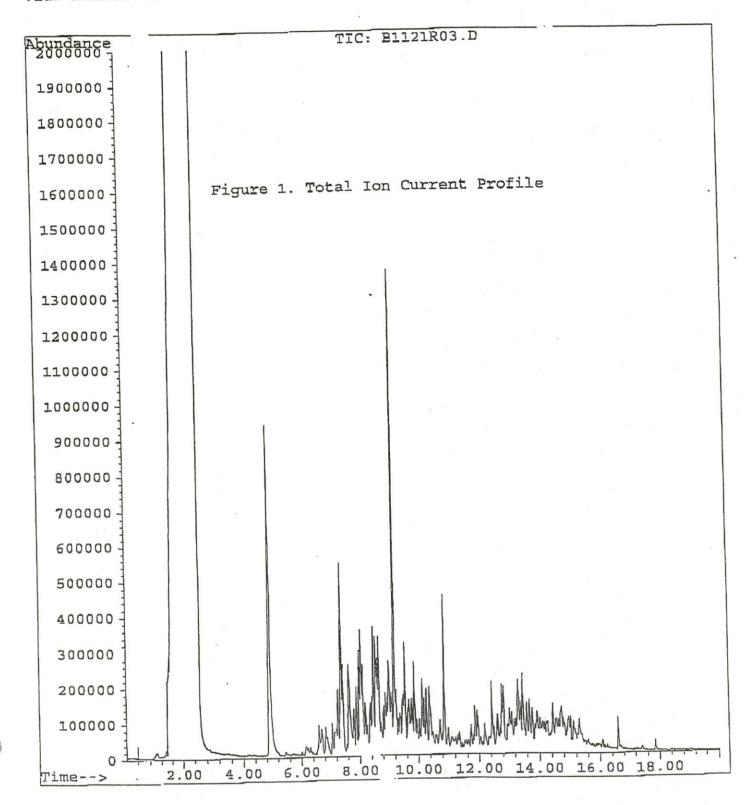
: jmr Operator

Acquired : 11/21/2000 14:07 using AcqMethod 45-100FF

5972 -Ù Instrument :

Sample Name: 00i16969, 00027245

Misc Info : PREZANT



File : C:\HPCHEM\1\DATA\JMR\B1121R04.D

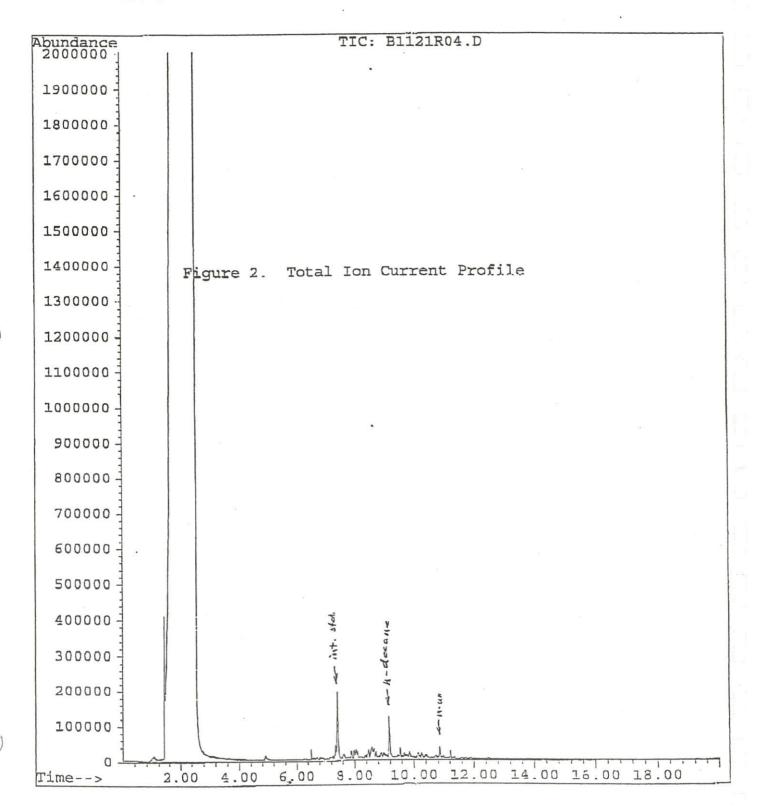
Operator : jmr

Acquired : 11/21/2000 14:57 using AcqMethod 45-100FF

Instrument: 5972 -U

Sample Name: 00il6970, 00027246

Misc Info : PREZANT



File : C:\HPCHEM\1\DATA\JMR\B1121R05.D

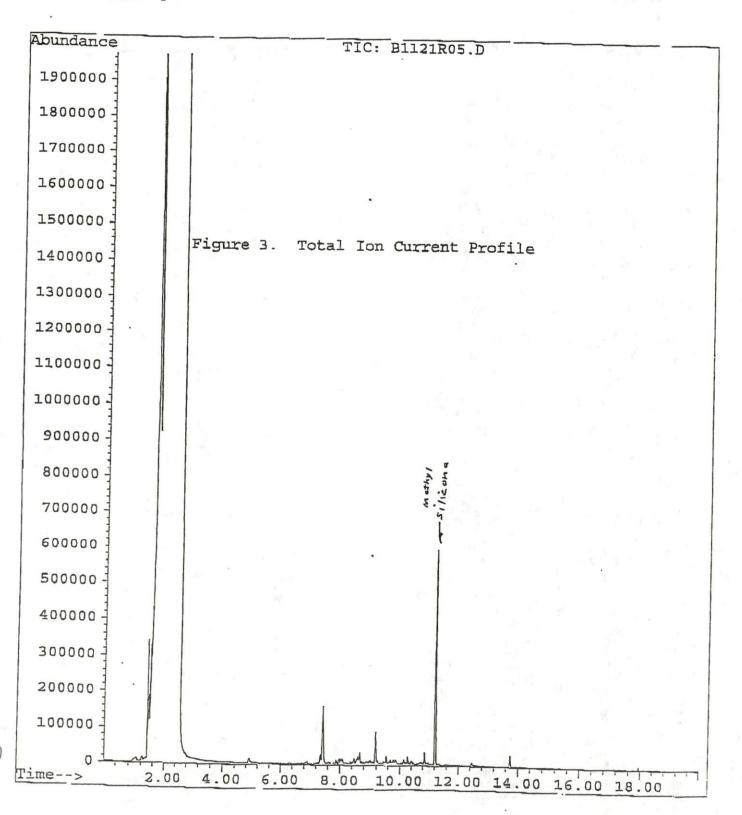
Operator : jmr

Acquired : 11/21/2000 15:47 using AcqMethod 45-100FF

Instrument : 5972 -U

Sample Name: 00i16971, 00027247

Misc Info : PREZANT



File

: C:\HPCHEM\1\DATA\JMR\B1121R06.D

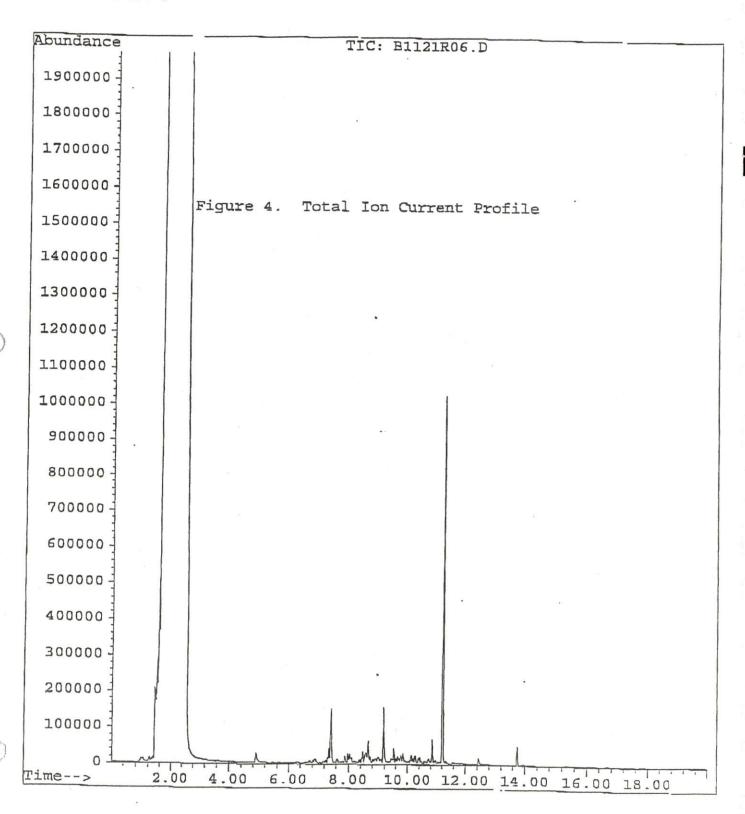
Operator : jmr Acquired : 11/21/2000 16:36 using AcqMethod 45-100FF

Instrument :

5972 -U

Sample Name: 00i16972, 00027248

Misc Info : PREZANT



: C:\HPCHEM\1\DATA\JMR\B1121R07.D File

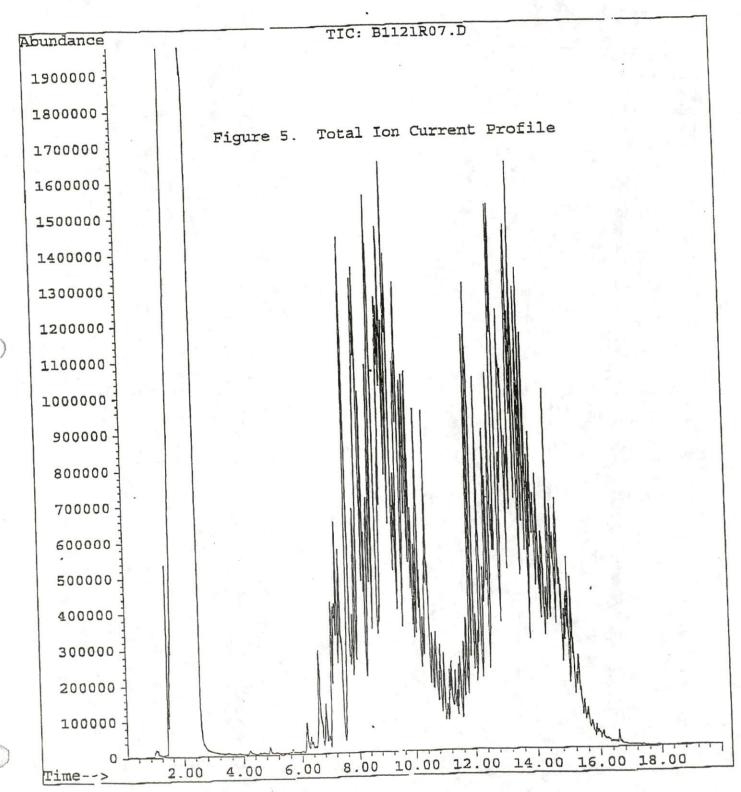
Operator

: 11/21/2000 17:26 using AcqMethod 45-100FF Acquired

Instrument : 5972 -U

Sample Name: 00116973, 00027249

Misc Info : PREZANT



: C:\HPCHEM\1\DATA\JMR\B1121R08.D File

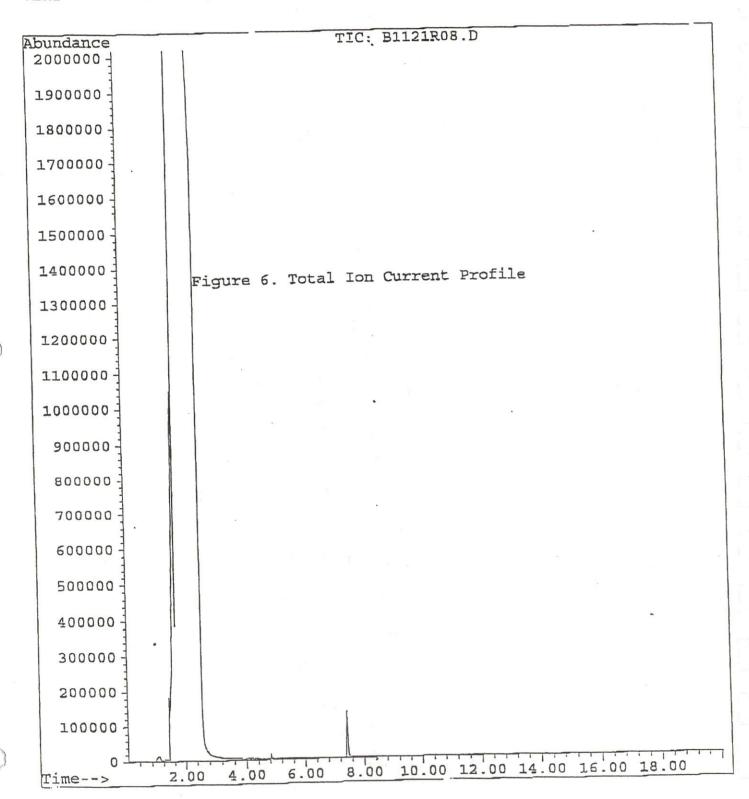
Operator : jmr

Acquired : 11/21/2000 18:16 using AcqMethod 45-100FF

Instrument: 5972 -U

Sample Name: 00i16974, 00027250 (blank CT)

Misc Info : PREZANT





Page /	of	5
i age		-

Batch #: 00 -5238
PAI Project #:\_\_\_\_\_

ampled by:	JAMBRO	Laboratory PRODUT	Method: MIK	SAMP.
ontaminant:(	OU			
ample ID:	#/	Worker Name:	SS#	
ump ID: P	24	Worker Name: Sample Type: TWA or STEL		
		on shoppe		
		NeA.		
	1 / 1 / 1 <u>1</u>		10	
Engineering Co	ontrols:		0	
Start Time:	805	Start Flow Rate /		
End Time:	1600	End Flow Rate: /. O		475
	480 415			
ý		Summary of Daily Activities		
Start Time	End Time	Activitie		
0805	1600	SHUPPE WONK &	WORKOW	
				or a
	- Y			
		11 80		
			964	-4 T
	1 4 2			
	Nico			
01				



Page	2 of	5
-		

Client: CDM Client Contact: P, MORRICL Date: 1/1/12/00 Location: 4' RBOUE LROUND PAI Project Manager: Sampled by: J. Am BrosE Laboratory: PKERANT Method: AIK SAMP. Contaminant: OU Sample ID: # Worker Name: SS#\_\_\_\_\_ Pump ID: \_\_\_\_\_ Sample Type: TWA or STEL Location: KIACC Personal Protective Equipment: NACE MASK RESP. Engineering Controls: Start Time 0870 Start Flow Rate / O End Flow Rate: /O End Time: 9820 /620 Avg Flow Rate: // Total Volume: 480 Total Time: 4/80 **Summary of Daily Activities** Activities **End Time** Start Time 1620 0820

Prezant Representative Signature: \_\_\_\_\_\_ Date: \_\_\_\_\_



	7		/
Page_	5	_of_	2

Client:	) w	Client Contact: P. More	RUL Date: 11/12/0
Location:	I' ABOV	E Cloure PAI Project	Manager: All Source.
Sampled by:		SE Laboratory PR.S Zuw	Method: Ald Shurt,
Sample ID:	#3	Worker Name:	SS#
		Sample Type: TWA or STEL	
		N.A.	
Engineering Co	ontrols:		
147	810 810 480	Start Flow Rate	
		Summary of Daily Activities	
Start Time	End Time	OFFICE WORKE	9
Prezant Repre	esentative Signatu	ıre:	Date:



Page	4	of	5
	1		

Batch #: 00-523 %
PAI Project #:

Client: CPM	Client Contact:	P. MOROLL	Date:	11/12/00
Location: 4' ABOUT 6"				
Sampled by: June 1058  Contaminant: OU		PRELANT	Method: #1R	SAM!
Sample ID: #4	Worker Name:		SS#	
Pump ID:		A or STEL		
Personal Protective Equipment:	DS SO			
Engineering Controls:				
Start Time: <u>0815</u>		1.5		
End Time: 1615  Total Time: 480	End Flow Rate:	1.5 1.5	Total Volume:	720
	Summary of Daily	Activities		
Start Time End Time		Activities		
0815 1615	OFFICE	WORKER		15 
737				
		0 =		
	-			



-	
Page 2	_of_S

Batch #: 00.5738
PAI Project #:\_\_\_\_\_

Client: C	).m-	Client Contact:_P.M	GRRILL	Date: 11/12/00
Location: I	N BOKIN	G HOLE PAI	Project Manager:	
Sampled by: Contaminant:		EE Laboratory: PRE	ZANT Method:	Win Suyl.
Sample ID: 7	<i>†5</i>	Worker Name:	MBKS FUR	S#
	45			
Location:	" B.65.	IN BORING		
Personal Prote	ctive Equipment:_	NA.		
Engineering Co	ontrols:		3	
1	600 700 60	Start Flow Rate 2.0  End Flow Rate: 2.0  Avg Flow Rate: 2.0		ume: <u>/2</u> 0
		Summary of Daily Activ		7
Start Time	End Time		Activities	
1600	1700	SHOPPE	Morel	* .
				4 - 1 - 1
				3.2
			10 73	
Donat Bank	esentative Signatu	ro:	Date:	



February 21, 2001

Pam Morrill Camp Dresser & McKee 11811 N.E. 1<sup>st</sup> Street, Suite 201 Bellevue, Washington 998005-3033

RE: Analytical Results for Soltrol 170 for Paine Air Study -00-5515

Dear Pam,

The sample you submitted to our laboratory on December 5, 2000 was analyzed by GC/MS to determine the constituents present and to compare them to a reference charcoal tube sample taken from a previous sampling round. A 0.5 ul aliquot of the sample was injected using a split injection technique into the GC/MS under instrumental conditions that were identical to the conditions under which the previous air samples had been analyzed.

#### Results:

The analysis of the bulk sample (00028462) showed that the chromatographic profile for this bulk sample is nearly identical to the second large cluster of chromatographic peaks in the reference air sample taken in November, 2000. The attached chromatograms show the total ion current profile for this sample (Figure 1) and the total ion current profile for the charcoal tube air sample desorbate for 00027245, (Figure 2). The elution range, both in minutes (11.5 to 16 minutes) and in component profile (C12 - C15), show that the later eluting peaks from the air sample match the Soltrol 170. The lighter end of the profile for the air sample (00027245) was reduced in abundance relative to the later eluting compounds commpared to the same profile for the liquid sample (00028462). This is evidence for weathering of the sample in 00027245 prior to sampling on the charcoal tube. The absence of the components in the air sample eluting from 6 minutes to 11.5 minutes suggests that these peaks came from a source other than the Soltrol 170 fluid.

This report relates only to the sample tested. Results reported above are based upon the generally accepted practices of Industrial Hygiene Laboratory analysis at the time of sample analysis.

Respectfully submitted,

George G. McCaslin Laboratory Director

zel.ali

File : C:\HPCHEM\1\DATA\R1222B02.D

Operator : jmr

Acquired : 12/15/2000 16:57 using AcqMethod 45-100FF

Instrument: 5972 -U

Sample Name: 00i 18092, 00028462

Misc Info : 50/2>320@10, 0.5 uL split, 29-429

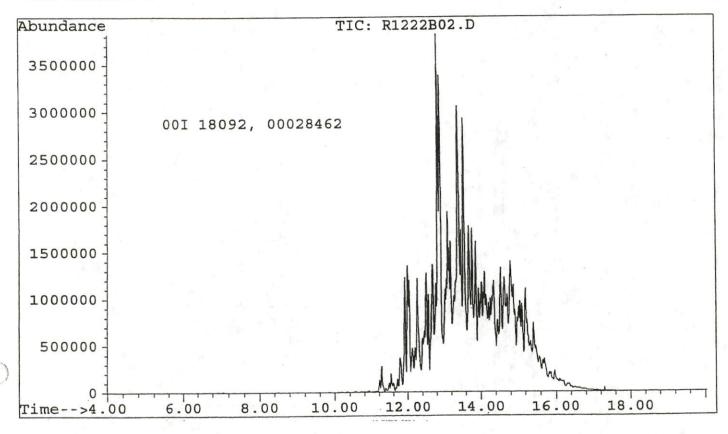


FIGURE 1. Total ion current profile of hydrocarbon liquid analyzed under the same conditions chromatographically as the charcoal tube sample in Figure 2.

: C:\HPCHEM\1\DATA\PREZANT\B1121R03.D File

Operator : jmr

: 11/21/2000 14:07 using AcqMethod 45-100FF Acquired

5972 -U Instrument :

Sample Name: 00i16969, 00027245

Misc Info : PREZANT

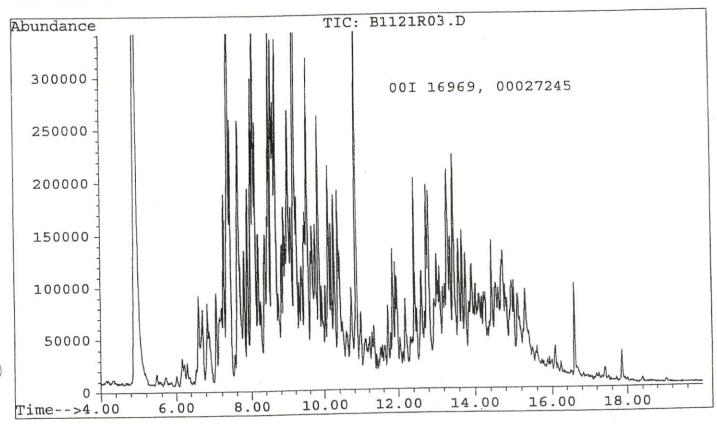


FIGURE 2. Total ion current profile of charcoal tube sample 00027245.



# Laboratory Analysis Request



(425) 259-6289 Fax Page \_\_\_\_\_ Of \_\_\_\_ REPORT TO OTHER (Specify) ANALYSIS REQUESTED PROJECT MANAGER RECEIVED IN GOOD CONDITION? Semi-Vol 8015 MODIFIED INVOICE TO COMPANY: CLP Metals ☐ VOA ☐ ATTENTION: 624 601 625 ADDRESS: OF EPA 8010 | 6 EPA 8080 WTPH-D PO. NUMBER: DATE LAB# SAMPLE I.D. TIME 1. Soltrol 170 Circa to sample in prop 011014 SPECIAL INSTRUCTIONS COMPOR TURNAROUND REQUESTED in Business Days\* SIGNATURES (Name, Company, Date, and Time): OTHER: Organic, Metals & Inorganic Analysis 1. Relinquished By: \_ Specify: 2 Received By: LUCY HOELSCHEV 11-15-00, 10:00am

2. Relinquished By: Lix Bagan CCIAL 12/4/20 12:00

Received By: Janehan Cash 12/4/20 10:30 Fuels & Hydrocarbon Analysis \* Turnaround Requests less than standard may incur Rush Charges.



120 East Davis Street P.O. Box 21 Fayette, MO 65248-0021 Phone: (660) 248-1911 Fax: (660) 248-1921 www.feslab.com

NOV 13 2000

ANALYSIS REPORT

CAMP DRESSER & MCKEE INC.

Client Information: Camp Dresser & McKee Inc. 11811 NE 1st St. Suite 201 Bellevue, WA 98005 Chain of Custody #: 00-691

Project Name: P.F. Office Air Study

Sample Number: PF office Lab Number: 6791 Sample Matrix: Water

Date/Time Received: 10/25/00 - 1000

Volatile and semivolatile GC/MS scans were performed. In the volatile range, the major components were saturated hydrocarbons with 10 to 15 carbons. Most were branched. In addition, there were a few alkenes, alcohols, and ketones, along with limonene (lemon scent). No aromatic compounds were found. In the semivolatile range, the compounds could be arranged in three groups: glycols, saturated hydrocarbons, and surfactants. Tripropylene glycol (two isomers) and ethylhexanol were each well represented. The saturated hydrocarbons ranged from 12 to 18 carbons. The hydrocarbons between 12 and 15 carbons were branched. Above that, the dominant peaks were for the straight-chain isomers. Bis(ethylhexyl)phthalate (DEHP) was the dominant peak. The sample arrived here in glass containers. However, if the sample had been held in a plastic container before shipment, this could be from that plastic container.

Rhys N. Thomas, Ph.D.

Laboratory Director

Date

11/02/00

File: : C:\HPCHEM\1\DATA\SVC-6791.D

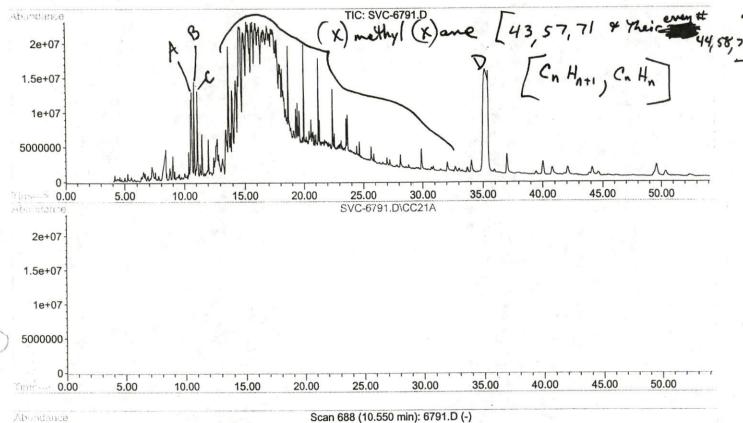
Operator : KI

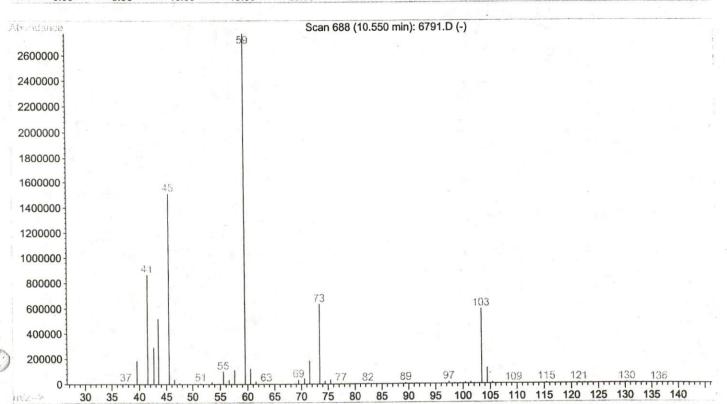
Acquired : 27 Oct 2000 15:20 using AcqMethod DLSTSEMI

Instrument : GC/MS Ins

Sample Name:

Misc Info : 2 mmL





Peak#	Ret Time	Type	Width	Area	Start Time	End Time
( )1	10.605	BV	0.140	840867767	10.458	10.745
2	10.848	VV	0.069	513661304	10.745	10.948
3	11.126	PV	0.071	475674027	10.948	11.253
4	13.685	VV	0.092	860192838	13.576	13.891
5	13.989	PV	0.103	478276618	13.891	14.102
6	14.278	VV	0.155	761178614	14.102	14.375
7	14.613	VV	0.229	2172592189	14.375	14.768
8	14.927	VV	0.236	1708504770	14.768	15.091
9	15.313	VV	0.285	2264270384	15.091	15.510
10	15.691	VV	0.231	1272439226	15.510	15.796
11	15.968	VV	0.256	1127555802	15.796	16.082
12	16.216	VV	0.223	770307851	16.082	16.359
13	16.636	PV	0.329	551392753	16.359	16.774
14	18.664	PV	0.060	363719957	18.565	19.004
15	19.992	PV	0.136	476912689	19.797	20.336
16	21.246	VB	0.075	447510045	21.170	21.476
17	22.436	BV	0.066	306531182	21.866	22.741
18	35.218	BB	0.437	4128676146	34.727	35.833

Information from Data File:

File: C:\HPCHEM\1\DATA\SVC-6791.D

Operator: KI

Date Acquired: 27 Oct 2000 15:20

Method File: DLSTSEMI

Sample Name:

Misc Info: 2 mmL

Vial Number: 1

Search Libraries: C:\PROGRA~1\WILEY\WILEY6N.L Minimum Quality: C

Unknown Spectrum: Apex

Integration Events: Chemstation Integrator - 8260.E

Pk#	RT Z	Area%	Library/ID	Ref#	CAS# Qua	al
1	10.61		C:\PROGRA~1\WILEY\WILEY6N.L			- 4
		-	TRIPROPYLENE GLYCOL 1		000000-00-0	
			Ethane, 1-ethoxy-1-methoxy- (CAS)		010471-14-4	
			2-Butanol, 2-methyl- (CAS) \$\$ 2-Me	4087	000075-85-4	59
2	10.84	2.63	C:\PROGRA~1\WILEY\WILEY6N.L			
			TRIPROPYLENE GLYCOL 2	75039	000000-00-0	64
			TRIPROPYLENE GLYCOL 1	75038	000000-00-0	64
			1-Propanol, 2-(2-hydroxypropoxy)-	22623	000106-62-7	64
) 3	11 12	2 11	C:\PROGRA~1\WILEY\WILEY6N.L			
3	11.13		2 ETHYL HEXANOL	21026	000104-76-7	90
			1-Hexanol, 2-ethyl- (CAS) \$\$ 2-Eth		000104-76-7	
			1-Hexanol, 2-ethyl- (CAS) \$\$ 2-Eth		000104-76-7	
4	13.68	4 47	C:\PROGRA~1\WILEY\WILEY6N.L			
4	13.00	4.41	Decane, 2,2,6-trimethyl- (CAS)	68905	062237-97-2	64
			Hexane, 2,2,5,5-tetramethyl- (CAS)		001071-81-4	
		_/	Hexane, 2,2,5,5-tetramethyl- (CAS)		001071-81-4	
			nexalle, 2,2,3,5-cectametry: (cab)	2,001	001071 01 1	
5	13.99	2.45	C:\PROGRA~1\WILEY\WILEY6N.L			
			Nonane, 3,7-dimethyl- (CAS) \$\$ 3,7	42356	017302-32-8	49
			Hexane, 2,4,4-trimethyl- (CAS) \$\$		016747-30-1	47
			Dodecane (CAS) \$\$ n-Dodecane \$\$ Ba	55410	000112-40-3	47
6	14.28	3 90	C:\PROGRA~1\WILEY\WILEY6N.L			
0	11.20	3.50	Heptadecane (CAS) \$\$ n-Heptadecane	125522	000629-78-7	80
			Heptadecane (CAS) \$\$ n-Heptadecane	125520	000629-78-7	80
			Eicosane (CAS) \$\$ n-Eicosane	162794	000112-95-8	72
7	14.61	11.13	C:\PROGRA~1\WILEY\WILEY6N.L			
			Octane, 2,2,6-trimethyl- (CAS)		062016-28-8	
(-)			Undecane, 2,2-dimethyl- (CAS)		017312-64-0	
			Pentane, 2,2,3,4-tetramethyl- (CAS	19707	001186-53-4	59

Pk#	RT	Area%	Library/ID	Ref#	CAS# Qua	al
8	14.92	8.75	C:\PROGRA~1\WILEY\WILEY6N.L  Dodecane, 2,7,10-trimethyl- (CAS)  Undecane, 4-methyl- (CAS) \$\$ 4-Met  3-Buten-2-ol, 2-methyl- (CAS) \$\$ 2	55429	074645-98-0 002980-69-0 000115-18-4	50
9	15.31	11.60	C:\PROGRA~1\WILEY\WILEY6N.L Heptadecane, 2,6,10,15-tetramethyl Hexadecane (CAS) \$\$ n-Hexadecane \$ Heptadecane (CAS) \$\$ n-Heptadecane	111949	000544-76-3	72
10	15.69	6.52	C:\PROGRA~1\WILEY\WILEY6N.L Ether, hexyl pentyl (CAS) \$\$ Hexan Pentadecane (CAS) \$\$ n-Pentadecane Undecane, 6-ethyl- (CAS)	97496	032357-83-8 000629-62-9 017312-60-6	68
11	15.97	5.78	C:\PROGRA~1\WILEY\WILEY6N.L  Dodecane, 3-methyl- (CAS) \$\$ 3-Met  Dodecane, 3-methyl- (CAS) \$\$ 3-Met  Hexadecane (CAS) \$\$ n-Hexadecane \$	68854	017312-57-1 017312-57-1 000544-76-3	72
12	16.22	3.95	C:\PROGRA~1\WILEY\WILEY6N.L Tridecane, 6-methyl- (CAS) \$\$ 6-Me Undecane, 2,6-dimethyl- (CAS) \$\$ 2 Eicosane (CAS) \$\$ n-Eicosane	68873	013287-21-3 017301-23-4 000112-95-8	58
13	16.63	2.82	C:\PROGRA~1\WILEY\WILEY6N.L  Hexadecane (CAS) \$\$ n-Hexadecane \$  Nonadecane (CAS) \$\$ n-Nonadecane  Dodecane, 2,6,11-trimethyl- (CAS)	150956	000544-76-3 000629-92-5 031295-56-4	80
14	18.66		C:\PROGRA~1\WILEY\WILEY6N.L Pentadecane (CAS) \$\$ n-Pentadecane pentadecane Pentadecane (CAS) \$\$ n-Pentadecane	97526	000629-62-9	96
15	19.99		C:\PROGRA~1\WILEY\WILEY6N.L  Hexadecane (CAS) \$\$ n-Hexadecane \$ Pentadecane (CAS) \$\$ n-Pentadecane  Heptadecane (CAS) \$\$ n-Heptadecane	97496	000629-62-9	91
16	21.2		C:\PROGRA~1\WILEY\WILEY6N.L  Heptadecane (CAS) \$\$ n-Heptadecane Heptadecane (CAS) \$\$ n-Heptadecane Heptadecane (CAS) \$\$ n-Heptadecane	e 125519	000629-78-7	95
		4	- a / ppoaps - 1/ titt pr// titt pre/			

Octadecane (CAS) \$\$ n-Octadecane

Pentadecane (CAS) \$\$ n-Pentadecane

Heptacosane (CAS) \$\$ n-Heptacosane 225363 000593-49-7 91

1.57 C:\PROGRA~1\WILEY\WILEY6N.L

17

22.44

138447 000593-45-3 96 97500 000629-62-9 95

Qual

35.22 21.15 C:\PROGRA~1\WILEY\WILEY6N.L 18

Library/ID

-7 1,2-Benzenedicarboxylic acid, bis( 229646 000117-81-7 90

1,2-Benzenedicarboxylic acid, dioc 229636 000117-84-0 80

1,2-Benzenedicarboxylic acid, bis( 229648 000117-81-7 72

: C:\HPCHEM\1\DATA\VOC-6791.D

Operator

KI

Acquired

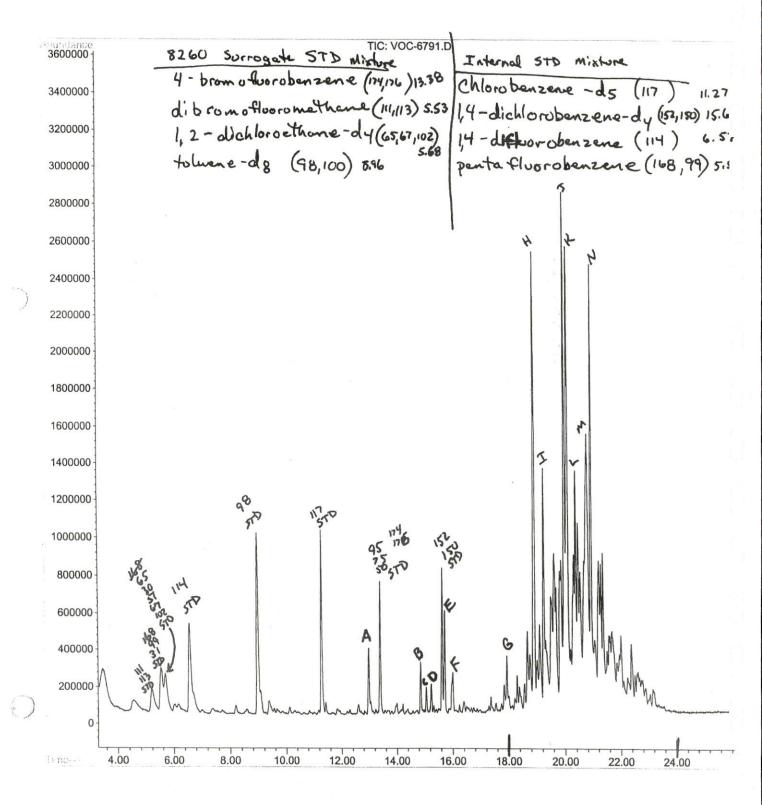
27 Oct 2000

11:07 GC/MS Ins

using AcqMethod VOC-MEK

Instrument : Sample Name:

Misc Info : voc 5 mL - foamy



Information from Data File:

File:

C:\HPCHEM\1\DATA\VOC-6791.D Murphy's oil SOAP

Operator:

KI

Date Acquired: 27 Oct 2000 11:07

Method File: VOC-MEK

Sample Name:

Misc Info:

voc 5 mL - foamy

Vial Number: 1

Search Libraries: C:\PROGRA~1\WILEY\WILEY6N.L

Minimum Quality:

Unknown Spectrum: Apex

Integration Events: Chemstation Integrator - 8260.E

Pk#	RT	Area%	Library/ID	Ref#	CAS# Qu	al
1	1.89	70	C:\PROGRA~1\WILEY\WILEY6N.L			
		/	Carbon dioxide (CAS) \$\$ Dry ice \$\$		000124-38-9	4
			Carbon dioxide (CAS) \$\$ Dry ice \$\$		000124-38-9	4
			Carbon dioxide (CAS) \$\$ Dry ice \$\$	178	000124-38-9	4
2	2.19	68/36	C:\PROGRA~1\WILEY\WILEY6N.L 1-Propanol, 2-amino-, (.+)- (CAS			
		/	1-Propanol, 2-amino-, (.+)- (CAS		006168-72-5	4
			Hydrazine (CAS) \$\$ Levoxine \$\$ N2H		000302-01-2	4
			Methanol (CAS) \$\$ Carbinol \$\$ Meth	100	000067-56-1	4
) 3	2.74	12/99	<pre>C:\PROGRA~1\WILEY\WILEY6N.L Methanol (CAS) \$\$ Carbinol \$\$ Meth</pre>			
			Methanol (CAS) \$\$ Carbinol \$\$ Meth		000067-56-1	4
			1-Propanol, 2-amino-, (.+)- (CAS		006168-72-5	4
			Hydrazine (CAS) \$\$ Levoxine \$\$ N2H	105	000302-01-2	4
4	5.53	0/0/8	C:\PROGRA~1\WILEY\WILEY6N.L Benzene, pentafluoro- (CAS) \$\$ Pen			
		X	Benzene, pentafluoro- (CAS) \$\$ Pen	51877	000363-72-4	95
			Benzene, pentafluoro- (CAS) \$\$ Pen	51879	000363-72-4	70
			Benzene, pentafluoro- (CAS) \$\$ Pen	51878	000363-72-4	70
5	6.56	0.181	C:\PROGRA~1\WILEY\WILEY6N.L Benzene, 1,3-difluoro- (CAS) \$\$ 1,			
		1	Benzene, 1,3-difluoro- (CAS) \$\$ 1,	11581	000372-18-9	96
			Benzene, 1,4-difluoro- (CAS) \$\$ 1,	11584	000540-36-3	95
			Benzene, 1,2-difluoro- (CAS) \$\$ 1,		000367-11-3	95
6	8.95	0.40	C:\PROGRA~1\WILEY\WILEY6N.L C6D5CD3 \$\$ Benzene-d5-, methyl-d3-			
	0,70		C6D5CD3 \$\$ Benzene-d5-, methyl-d3-	4594	002037-26-5	91
		/	TOLUOL, PERDEUTERO-	4562	000000-00-0	49
			3-Isoxazolamine, 5-methyl- (CAS) \$	5457	001072-67-9	47
7	11 2	7 0 %	C.\PROGRA~1\WILEY\WILEY6N.L			
,	11.2		C:\PROGRA~1\WILEY\WILEY6N.L Chlorobenzene-D5 \$\$ Benzene-d5-, c	10351	003114-55-4	94
( )			Chlorobenzene-D5 \$\$ Benzene-d5-, c	10352	003114-55-4	94
( )			1H-Pyrazole, 3-methyl- (CAS) \$\$ 3-		001453-58-3	

Pk#	RŢ.	Area%	Library/ID	Ref#	CAS# Qual
8	12.97	0.11		6673	002371-19-9 32 000565-61-7 28 000565-61-7 23
9	13.38	e <b>X</b> . 0	<pre>C:\PROGRA~1\WILEY\WILEY6N.L Benzene, 1-bromo-3-fluoro- (CAS) \$ Benzene, 1-bromo-4-fluoro- (CAS) \$ 4 bromo-fluoro benzene</pre>	57798	001073-06-9 97 000460-00-4 91 000000-00-0 90
10	14.86	<del></del>	C:\PROGRA~1\WILEY\WILEY6N.L  1-Decene (CAS) \$\$ Dec-1-ene \$\$ n-1 1-Decene (CAS) \$\$ Dec-1-ene \$\$ n-1 Cyclopropane, 1-heptyl-2-methyl- (	27976	000872-05-9 94 000872-05-9 93 074663-91-5 80
11	15.61	also 0.21	C:\PROGRA~1\WILEY\WILEY6N.L  1,2-Dichlorobenzene-d4 \$\$ Benzene-  1,4-Dichlorobenzene-d4  1,4-Dichlorobenzene-d4	31775 31777 31776	002199-69-1 97 003855-82-1 95 003855-82-1 93
12	15.71		C:\PROGRA~1\WILEY\WILEY6N.L 2 ETHYL HEXANOL 1-Hexanol, 2-ethyl- (CAS) \$\$ 2-Eth 1-Hexanol, 2-ethyl- (CAS) \$\$ 2-Eth	20948	000104-76-7 90 000104-76-7 86 000104-76-7 83
13	15.99	9 0.09	C:\PROGRA~1\WILEY\WILEY6N.L l-Limonene \$\$ Cyclohexene, 1-methy dl-Limonene \$\$ Cyclohexene, 1-meth dl-Limonene \$\$ Cyclohexene, 1-meth	24829	005989-54-8 98 000138-86-3 97 000138-86-3 97
14	17.9	3 0.09	C:\PROGRA~1\WILEY\WILEY6N.L  Hexane, 2,2,5-trimethyl- (CAS) \$\$ Hexane, 2,2,4-trimethyl- (CAS) \$\$ Hexane, 2,2,5-trimethyl- (CAS) \$\$	19674	0 003522-94-9 59 0 016747-26-5 59 0 003522-94-9 59
15	18.6	6 0.1	3 C:\PROGRA~1\WILEY\WILEY6N.L • Undecane, 2,4-dimethyl- (CAS) \$\$ 2 1-Hexanol, 2-ethyl-2-propyl- (CAS) Undecane, 5,7-dimethyl- (CAS)	5713	3 017312-80-0 78 7 054461-00-6 59 5 017312-83-3 50
16		2,2,7	0 C:\PROGRA~1\WILEY\WILEY6N.L  HEXANOL-4-D2  Octane, 2,2-dimethyl- \$\$ 2,2-Dimet  2,2,7,7-Tetramethyloctane	2980° 5547	3 053778-67-9 59 7 015869-87-1 53 0 001071-31-4 53 37-99-√
	7 18.9	0.8	O C:\PROGRA~1\WILEY\WILEY6N.L Hexane, 2,2,5,5-tetramethyl- (CAS) Hexane, 2,2,5,5-tetramethyl- (CAS) Decane, 2,2,4-trimethyl- (CAS)	2980	3 001071-81-4 64 1 001071-81-4 64 3 062237-98-3 59

18	19.11	0.17 C:\PROGRA~1\WILEY\WILEY6N.L			
1		Eicosane (CAS) \$\$ n-Eicosane		000112-95-8	
1		2 2 mather (CAC) cc 2 Mot	68854	017312-57-1	53
		Octane (CAS) \$\$ n-Octane \$\$ Octane	12343	000111-65-9	50
		Octane (CAS) \$\$ n-Octane \$\$ Octane  3 methyl undleane	1002 -	43-3	
19	19.25	0.51 C:\PROGRA~1\WILEY\WILEY6N.L			
		Undecane, 2,8-dimethyl- (CAS)	The second secon	017301-25-6	
		Dodecane, 2,7,10-trimethyl- (CAS)		074645-98-0	
		Hexane, 2,4,4-trimethyl- (CAS) \$\$	19691	016747-30-1	59
20	19.51	0.28 C:\PROGRA~1\WILEY\WILEY6N.L	E7144	022257-83-8	61
		Ether, hexyl pentyl (CAS) \$\$ Hexan	02044	006419-41-3	50
		Tridecane, 3-methyl- (CAS) \$\$ 3-Me	162700	000418-41-3	59
		Eicosane (CAS) \$\$ n-Eicosane	162/96	000112-95-6	33
		2,7,7 + rimently decor 42338-15-2			
21	19.63	0.34 C:\PROGRA~1\WILEY\WILEY6N.L	12266	062016-37-9	80
		Octane, 2,4,6-trimethyl- (CAS)	60070	017301-26-7	72
		Undecane, 2,9-dimethyl- (CAS)			
		Heptadecane (CAS) \$\$ n-Heptadecane	125522	000629-78-7	30
22	19.70	0			
22	17.70	Undecane, 2,6-dimethyl- (CAS) \$\$ 2	68875	017301-23-4	64
		Nonane, 3.7-dimethyl- (CAS) \$\$ 3,7	42356	017302-32-8	64
		Dodecane, 1-iodo- (CAS) \$\$ n-Dodec	173346	004292-19-7	59
)					
23	19.88	0.42 C:\PROGRA~1\WILEY\WILEY6N.L			
		Octane (CAS) \$\$ n-Octane \$\$ Octane	12343	000111-65-9	59
			82859	007225-67-4	1 59
		Dodecane, 3-methyl- (CAS) \$\$ 3-Met	68854	017312-57-1	L 53
24	19.99		==	010000 00 :	
		Decane, 2,2-dimethyl- (CAS) \$\$ 2,2		017302-37-3	
		Hexane, 2,2,5,5-tetramethyl- (CAS)		001071-81-4	
		Heptane, 2,2,4-trimethyl- (CAS) \$	\$ 29782	014720-74-2	2 59
25	5 20.10	0.93 C:\PROGRA~1\WILEY\WILEY6N.L			
25	20.10	Butane, 2-iodo-2-methyl- (CAS) \$\$	81341	000594-38-	7 83
		Undecane, 3,6-dimethyl- (CAS)		017301-28-	
		Dodecane, 2,6,11-trimethyl- (CAS)		031295-56-	
		Dodecare, 2,0,11 crimon, 1	9		
26	5 20.33	0.33 C:\PROGRA~1\WILEY\WILEY6N.L			
2	20.55	Hexane, 3,3,4,4-tetramethyl- (CAS	) 29804	1 005171-84-	6 53
		Pentane, 3,3-dimethyl- (CAS) \$\$ 3		5 000562-49-	2 53
		Undecane, 2-methyl- (CAS) \$\$ 2-Me	t 55420	0 007045-71-	8 53
			, a		
2	7 20.39	9 0.33 C:\PROGRA~1\WILEY\WILEY6N.L	N22022	(-	
( )		Decane, 3,3,5-trimethyl- (CAS)		2 062338-13-	
		Undecane, 3,3-dimethyl- (CAS)		0 017312-65-	
		Decane, 3,3,8-trimethyl- (CAS)	6892	5 062338-16-	3 78

Pk#	RŢ	Area%	Library/ID	Ref#	CAS# Qu	ıal
28	20.48	0.32	C:\PROGRA~1\WILEY\WILEY6N.L Tridecane, 3-methyl- (CAS) \$\$ 3-Me Undecane, 2,9-dimethyl- (CAS) Dodecane (CAS) \$\$ n-Dodecane \$\$ Ba	68878	006418-41-3 017301-26-7 000112-40-3	64
29	20.55	0.25	C:\PROGRA~1\WILEY\WILEY6N.L  Decane (CAS) \$\$ n-Decane \$\$ Isodec  Dodecane, 3-methyl- (CAS) \$\$ 3-Met  Decane, 2,4,6-trimethyl- (CAS)	68855	000124-18-5 017312-57-1 062108-27-4	59
30	20.80	1.16	C:\PROGRA~1\WILEY\WILEY6N.L Nonane, 3,7-dimethyl- (CAS) \$\$ 3,7 Tetradecane (CAS) \$\$ n-Tetradecane Heptadecane (CAS) \$\$ n-Heptadecane	82823	000629-59-4	80
31	20.95	0.69	C:\PROGRA-1\WILEY\WILEY6N.L Undecane, 3,9-dimethyl- (CAS) Undecane, 3-methyl- (CAS) \$\$ 3-Met Decane, 2,5,6-trimethyl- (CAS)	55423	017301-31-4 001002-43-3 062108-23-0	64
32	21.23	0.33	C:\PROGRA~1\WILEY\WILEY6N.L  Dodecane, 2,7,10-trimethyl- (CAS)  Dodecane, 2,6,11-trimethyl- (CAS)  Octane, 6-ethyl-2-methyl- (CAS)	97522	074645-98-0 031295-56-4 062016-19-7	64
33	21.30	0.19	C:\PROGRA~1\WILEY\WILEY6N.L  Dodecane, 2,7,10-trimethyl- (CAS)  Dodecane, 2,6,11-trimethyl- (CAS)  Hexadecane, 7-methyl- (CAS)	97522	074645-98-0 031295-56-4 026730-20-1	72
34	21.38	0.23	C:\PROGRA~1\WILEY\WILEY6N.L Tridecane, 4-methyl- (CAS) \$\$ 4-Me Decane, 3,3,5-trimethyl- (CAS) Iron, tricarbonyl[N-(phenyl-2-pyri	68922	062338-13-0	64
35	22.02	0.22	C:\PROGRA~1\WILEY\WILEY6N.L Hentriacontane (CAS) \$\$ Untriacont Nonadecane (CAS) \$\$ n-Nonadecane Tetracosane (CAS) \$\$ n-Tetracosane	150957	000629-92-5	49
36	22.39	0.09	C:\PROGRA~1\WILEY\WILEY6N.L Nonane, 3-methyl-5-propyl- (CAS) Pentadecane, 2,6,10,14-tetramethyl Hexadecane, 2,6,10,14-tetramethyl-	150964		59

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Peak#	Ret Time	Type	Width	Area		Start Time	End Time
1	1.889	BV	0.184	912366149		1.595	1.997
2	2.195	VV	0.450	7895729807		1.997	2.703
3	2.744	VB	0.114	1500202583		2.703	3.290
4	5.524	BV	0.094	8846085		5.415	5.612
5	6.563	BB	0.109	35238530		6.464	6.877
6	8.955	BB	0.072	45896672		8.849	9.186
7	11.265	BV	0.052	33086724		11.091	11.377
8	12.969	BB	0.054	12466867		12.902	13.100
9	13.378	BB	0.048	22124292		13.176	13.508
10	14.853	BB	0.045	7968119		14.781	15.001
11	15.615	VV	0.048	23726959		15.284	15.662
12	15.703	VV	0.043	15182818		15.662	15.817
13	15.991	PB	0.066	10362414		15.817	16.144
14	17.932	VB	0.054	10736637		17.874	18.049
15	18.667	VV	0.056	15291069	9	18.601	18.722
16	18.755	VV	0.067	11748063		18.722	18.820
17	18.910	VV	0.058	91893882		18.820	18.968
18	19.108	VV	0.063	19454438		19.055	19.192
19	19.248	VV	0.066	59390616		19.192	19.435
20	19.516	VV	0.087	32637315		19.435	19.574
21	19.628	VV	0.076	39711423		19.574	19.677
22	19.697	VV	0.050	18827392		19.677	19.767
23	19.874	VV	0.084	48405948		19.767	19.924
)4	19.991	VV	0.051	93421002		19.924	20.038
25	20.098	VV	0.066	107078862		20.038	20.180
26	20.333	VV	0.064	37574722		20.240	20.357
27	20.392	VV	0.045	37820385		20.357	20.432
28	20.476	VV	0.059	37516880		20.432	20.520
29	20.553	VV	0.064	28825150		20.520	20.614
30	20.799	VV	0.126	134409164		20.614	20.889
31	20.946	VV	0.051	79520637		20.889	21.030
32	21.228	VV	0.081	38471993		21.138	21.270
33	21.299	VV	0.044	21588650		21.270	21.337
34	21.375	VV	0.051	26869162		21.337	21.446
35	22.018	VV	0.101	25003643		21.899	22.196
36	22.389	VV	0.056	10228571		22.340	22.466

CDM Camp Dresser & McKee Inc.

# **CHAIN-OF-CUSTODY**

Date 10/34/00 Page \_\_\_\_\_ of \_\_\_\_ Laboratory Number: PROJECT INFORMATION Project Manager: Pam Morrill **ANALYSIS REQUEST** Project Name: P.F. Office air Study LEACHING OTHER **TESTS HYDROCARBONS** Project Number: MH. Sno Co. Paine Air Study NUMBER OF CONTAINERS Organic Lead (Ca) Priority Poll. Metals (13) 8080 OC Pest/PCBs 8140 OP Pesticides 8150 OC Herbicides Selected Metals: list 8015M Fuel Hydrocarbon 8010 Halogenated VOCs 8020M - BETX only DWS - Volatiles and Semivolatiles 8020 Aromatic VOCs 8240 GC/MS Volatiles 8270 GC/MS Semivolatiles 8310 PAHs 8040 Phenois Sampled By: HM Site Location: Paine Field **DISPOSAL INFORMATION** Lab Disposal (return if not indicated) Disposal Method: Disposed by: \_\_\_\_\_ Disposal Date:\_ QC INFORMATION (check one) □SW-846 □CLP □Screening □CDM Std. □Special MATRIX LABID SAMPLE ID DATE TIME 6791 DF-office **RELINQUISHED BY: 2. RELINQUISHED BY: 3.** RELINQUISHED BY: 1. LAB INFORMATION SAMPLE RECEIPT Signature: Lab Name: Fayette Env, Services Total Number of Containers: Chain-of-Custody Seals: Y/N/NA Printed Name: Intact?: Y/N/NA Received in Good Condition/Cold: 3. RECEIVED BY: RECEIVED BY: Turn Around Time: ☐ Standard ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 1 wk. Signature: Time: PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA Printed Name: Special Instructions: Farensic Analysis Company:

CDM OFF CES: Bellevue: (206) 453-8383 rev.9/00 Portland: (503) 232-1800 Gig Harbor: (206) 851-5562

DISTRIBUTION: White, Canary to Analytical Laboratory; Pink to CDM Project Files; Gold

CDM Disposal Files



#### RECEIVED

# DEC 07 2000

# CAMP DRESSER & MCKEE INC.

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

11/22/00

CCIL JOB #:

011074

CCIL SAMPLE #: DATE RECEIVED:

11/15/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY SOLTROL 170 11/15/00

DATA RESULTS

**ACTION** 

ANALYSIS

ANALYSIS

ANALYTE

METHOD

**RESULTS\*** 

LEVEL\*\*\*

BY

GC-FINGERPRINT

NWTPH-DX MOD

SEE BELOW

11/21/00

KAS

NOTE:

CHROMATOGRAM SHOWS PRODUCT ELUTING IN LATE GASOLINE AND EARLY DIESEL RANGE. CHROMATOGRAM PATTERN IS A CLOSE MATCH WITH PAINE FIELD SAMPLES B-2 AND B-4 AND A FAIR

MATCH WITH SAMPLES B-1, B-3, AND B-5

<sup>\* &</sup>quot;ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT.

<sup>\*\*</sup> UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

<sup>\*\*\*</sup> ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

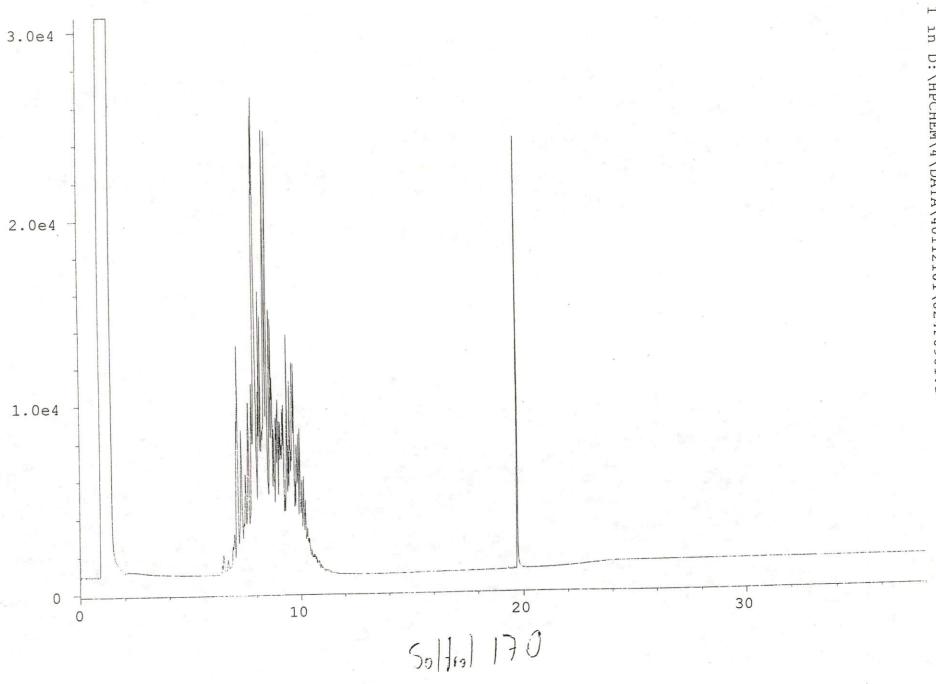
External Standard Report Data File Name : D:\HPCHEM\4\DATA\40112101\024F0901.D Page Number ( rator : KAS Vial Number : 24 : DIESEL #2 Instrument Sample Name : 011074-1 X2000 Injection Number: 1 Sequence Line : 9 Run Time Bar Code: Instrument Method: 4DXT0800.MTH Acquired on : 21 Nov 00 02:18 PM Report Created on: 21 Nov 00 05:52 PM Analysis Method : 4DSL0600.MTH Sample Amount : 0 Last Recalib on : 15 JUN 00 01:45 PM ISTD Amount : 1 Multiplier Sig. 1 in D:\HPCHEM\4\DATA\40112101\024F0901.D Ret Time Area Type Width Ref# ug/ml |----|----|-----|-----|-----|-----| 9.412 \* not found \* 1 9.730 42963 MM 0.030 1 TPH-Dsl envelope 7.580 nC-25 surrogate 19.730 Not all calibrated peaks were found

User Modified

Prichaet not calculated used find beinger printing purposes.

Solfis 170

11-77-00 KAS





# Chain Of Custody / Laboratory Analysis Request

CCI Job#	(Laboratory Use Only)

(206) 292 (425) 259	2-9059 Seattle 9-6289 Fax	9															Dat	e _	_		Page	9		_ 0	ıf		
PROJECT ID: Tank Fight 11	In tucky		17	4	L	7 :-											-										$\neg$
PROJECT POWN MOYYIII					AN	VALY	SIS	REQ	UES	STED								HEH	(Spe	city)	T		T	T			1 1 1
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PHONE:	FAX:					[ CAN								□ Pest	RCRA ☐ TAL ☐		l □ Pe									S	RECEIVED IN GOOD CONDITION?
INVOICE TO COMPANY:	JAn.					8015 MODIFIED						20 08		PCB only 🗌	☐ RC		Semi-Vol									CONTAINERS	CON
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	7 1			11-	5-	П О-НАТМ	WTPH-418.1		WTPH-HCID	EPA 8020	EPA 8010 🗌	EPA 8240 🗌	EPA 8270 🗌	EPA 8080   608	Metals Priority Pollutant	Metals Other (Specify)	TCLP Metals ☐ VOA ☐			-						NUMBER OF	CEIVE
P.O. NUMBER: SAMPLE I.D.	DATE	TIME	TYPE	LAB#	WTPH-G	WTP	WTP	втех	WTP	EPA (	EPA	EPA	EPA	EPA	Meta	Meta	TCLF			_	_	_	_	_	_	N.	H.
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SPECIAL INSTRUCTIONS SIGNATURES (Name, Compa			13 )41	The state of the s	0"	1		4./-		N									STE	) in I	Busir		Days				
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2. Relinquished By:										F		5	ydrod 3	carbo	_	nalys	sis		_					7	)		_
Received								-			Stan	dard		0.00								!	thee ctar	od a see	av incur	Rush C	harges.





CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00

011014

CCIL JOB #: CCIL SAMPLE #:

DATE RECEIVED: 11/2/00

WDOE ACCREDITATION #: C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID: B-1 11/2/00 1215

ANALYTE	METHOD						
		RESULTS*	UNITS**	LEVEL***	DATE	ву	
HCID-GAS RANGE	NWTPH-HCID	ND(<20)	MG/KG GAS		11/4/00	KAS	
HCID-DIESEL RANGE	NWTPH-HCID	>50	MG/KG DSL		11/4/00	KAS	
HCID-OIL RANGE	NWTPH-HCID	>100	MG/KG OIL		11/4/00	KAS	
TPH-SEMIVOLATILE RANGE	NWTPH-DX	1800	MG/KG		11/7/00	LAH	
PYRIDINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
N-NITROSODIMETHYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
PHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
ANILINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
BIS(2-CHLOROETHYL)ETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
2-CHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
1,3-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
1,4-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
BENZYL ALCOHOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
1,2-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
2-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
BIS(2-CHLOROISOPROPYL)ETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
4-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
N-NITROSO-DI-N-PROPYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
HEXACHLOROETHANE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
NITROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
ISOPHORONE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
2-NITROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL	
2,4-DIMETHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
BENZOIC ACID	EPA-8270	ND(<1000)	UG/KG		11/5/00	RAL	
BIS(2-CHLOROETHOXY)METHANE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
2,4-DICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
1,2,4-TRICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
NAPHTHALENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
4-CHLOROANILINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
2,6-DICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL	
HEXACHLOROBUTADIENE	EPA-8270	ND(<100)			11/5/00	RAL	
4-CHLORO-3-METHYLPHENOL	EPA-8270	ND(<100)			11/5/00	RAL	
2-METHYLNAPHTHALENE	EPA-8270	ND(<100)			11/5/00	RAL	
HEXACHLOROCYCLOPENTADIENE		ND(<500)			11/5/00	RAL	



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00

CCIL JOB #:

011014

CCIL SAMPLE #:

1

DATE RECEIVED: 11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-1 11/2/00 1215

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
2,4,6-TRICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,4,5-TRICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-CHLORONAPHTHANLENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
ACENAPHTHYLENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
DIMETHYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,6-DINITROTOLUENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
ACENAPHATHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
3-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,4-DINITROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
4-NITROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
DIBENZOFURAN	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,4-DINITROTOLUENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,3,4,6-TETRACHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
DIETHYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
FLUORENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-CHLOROPHENYL-PHENYLETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
4,6-DINITRO-2-METHYLPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
N-NITROSODIPHENYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
AZOBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-BROMOPHENYL-PHENYLETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
HEXACHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
PENTACHLOROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
PHENANTHRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
CARBAZOLE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
DI-N-BUTYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
PYRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BUTYLBENZYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
3,3'-DICHLOROBENZIDINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[A]ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
CHRYSENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BIS(2-ETHYLHEXYL)PHTHALATE	EPA-8270	380****	UG/KG		11/5/00	RAL
DI-N-OCTYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
DI II OCTILITINALATE	2171 0270	()	/			



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00

CCIL JOB #: 011014

CCIL SAMPLE #:

1

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-1 11/2/00 1215

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
	ED 1 0270	ND( <100)	UG/KG		11/5/00	RAL
BENZO[B]FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[K]FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[A]PYRENE	EPA-8270	ND(<100)	NOT BUILDING		11/5/00	RAL
INDENO[1,2,3-CD]PYRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
DIBENZ[A,H]ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[G,H,I]PERYLENE	EPA-8270	ND(<100)	UG/KG		11/3/00	IOAL
					11/5/00	CAC
DICHLORODIFLUOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
VINYL CHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TRICHLOROFLUOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
METHYLENE CHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TRANS-1,2-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1.1-DICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CIS-1,2-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
2,2-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOCHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROFORM	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,1-TRICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CARBON TETRACHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TRICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
DIBROMOMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMODICHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TRANS-1,3-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CIS-1,3-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,2-TRICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,3-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TETRACHLOROETHYLENE	EPA-8260	MD(~300)	JUJAG		22/0/00	





CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

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WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-1 11/2/00 1215

DATA RESULTS

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
DIBROMOCHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DIBROMOETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,1,2-TETRACHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
ETHYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
M+P XYLENE	EPA-8260	ND(<1000)	UG/KG		11/6/00	SAS
STYRENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
D-XYLENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOFORM	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
ISOPROPYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,2,2-TETRACHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,3-TRICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
N-PROPYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
2-CHLOROTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,3,5-TRIMETHYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
4-CHLOROTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
T-BUTYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,4-TRIMETHYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
S-BUTYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
P-ISOPROPYLTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,3 DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,4-DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
N-BUTYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,4-TRICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
HEXACHLORO1,3-BUTADIENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
NAPHTHALENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,3-TRICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE PREDOMINANTELY DIESEL #1/JET FUEL RANGE PRODUCT AND SMALLER AMOUNT OF LUBE OIL







CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

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WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-1 11/2/00 1215

#### DATA RESULTS

ACTION

ANALYSIS

ANALYSIS

ANALYTE

METHOD

RESULTS\* UNITS\*\*

LEVEL\*\*\*

DATE

BY

\* "ND" INDICATES ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 250 MG/KG

LUBE OIL RANGE REPORTING LIMIT IS 500 MG/KG

" UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

\*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

\*\*\*\* RESULT DUE TO LABORATORY CONTAMINATION

APPROVED BY



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

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PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-2 11/2/00 1240

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
HCID-GAS RANGE	NWTPH-HCID	ND(<20)	MG/KG GAS		11/4/00	KAS
HCID-DIESEL RANGE	NWTPH-HCID	>50	MG/KG DSL		11/4/00	KAS
HCID-OIL RANGE	NWTPH-HCID	>100	MG/KG OIL		11/4/00	KAS
TPH-SEMIVOLATILE RANGE	NWTPH-DX	23000	MG/KG		11/7/00	LAH
PYRIDINE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
N-NITROSODIMETHYLAMINE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
PHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
ANILINE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
BIS(2-CHLOROETHYL)ETHER	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
2-CHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
1,3-DICHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
1,4-DICHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
BENZYL ALCOHOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
1,2-DICHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
2-METHYLPHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
BIS(2-CHLOROISOPROPYL)ETHER	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
4-METHYLPHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
N-NITROSO-DI-N-PROPYLAMINE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
HEXACHLOROETHANE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
NITROBENZENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
ISOPHORONE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
2-NITROPHENOL	EPA-8270	ND(<400)	UG/KG		11/6/00	RAL
2.4-DIMETHYLPHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
BENZOIC ACID	EPA-8270	ND(<2000)	UG/KG		11/6/00	RAL
BIS(2-CHLOROETHOXY)METHANE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
2,4-DICHLOROPHENOL	EPA-8270	ND(<200)	UG/KG	,	11/6/00	RAL
1,2,4-TRICHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
NAPHTHALENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
4-CHLOROANILINE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
2,6-DICHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
HEXACHLOROBUTADIENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
4-CHLORO-3-METHYLPHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
2-METHYLNAPHTHALENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL
HEXACHLOROCYCLOPENTADIENE	EPA-8270	ND(<1000)			11/6/00	RAL



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

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CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-2 11/2/00 1240

					ACTION	ANALYSIS	ANALYSIS	
	ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY	
	2,4,6-TRICHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	2,4,5-TRICHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	2-CHLORONAPHTHANLENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	2-NITROANILINE	EPA-8270	ND(<400)	UG/KG		11/6/00	RAL	
	ACENAPHTHYLENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
***	DIMETHYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	2,6-DINITROTOLUENE	EPA-8270	ND(<400)	UG/KG		11/6/00	RAL	
	ACENAPHATHENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	3-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	2,4-DINITROPHENOL	EPA-8270	ND(<1000)	UG/KG		11/6/00	RAL	
	4-NITROPHENOL	EPA-8270	ND(<1000)	UG/KG		11/6/00	RAL	
	DIBENZOFURAN	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	2,4-DINITROTOLUENE	EPA-8270	ND(<400)	UG/KG		11/6/00	RAL	
	2,3,4,6-TETRACHLOROPHENOL	EPA-8270	ND(<400)	UG/KG		11/6/00	RAL	
	DIETHYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	FLUORENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	4-CHLOROPHENYL-PHENYLETHER	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	4-NITROANILINE	EPA-8270	ND(<400)	UG/KG		11/6/00	RAL	
	4,6-DINITRO-2-METHYLPHENOL	EPA-8270	ND(<1000)	UG/KG		11/6/00	RAL	
	N-NITROSODIPHENYLAMINE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	AZOBENZENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	4-BROMOPHENYL-PHENYLETHER	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	HEXACHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	PENTACHLOROPHENOL	EPA-8270	ND(<1000)	UG/KG		11/6/00	RAL	
	PHENANTHRENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	ANTHRACENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	CARBAZOLE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	DI-N-BUTYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	FLUORANTHENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	PYRENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	BUTYLBENZYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	3,3'-DICHLOROBENZIDINE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	BENZO[A]ANTHRACENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	CHRYSENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	BIS(2-ETHYLHEXYL)PHTHALATE	EPA-8270	325****	UG/KG		11/6/00	RAL	
	DI-N-OCTYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00

CCIL JOB #: 011014

CCIL SAMPLE #:

DATE RECEIVED: 11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-2 11/2/00 1240

					ACTION	ANALYSIS	ANALYSIS	
	ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	ВУ	
	BENZO[B]FLUORANTHENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	BENZO[K]FLUORANTHENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	BENZO[A]PYRENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	INDENO[1,2,3-CD]PYRENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	DIBENZ[A,H]ANTHRACENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
27	BENZO[G,H,I]PERYLENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
	)							
	DICHLORODIFLUOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	CHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	VINYL CHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	BROMOMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	CHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	TRICHLOROFLUOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	1,1-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	METHYLENE CHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	TRANS-1,2-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	1,1-DICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	CIS-1,2-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	2,2-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	BROMOCHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	CHLOROFORM	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	1,1,1-TRICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	1,1-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	CARBON TETRACHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	1,2-DICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	TRICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	1,2-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	DIBROMOMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	BROMODICHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	TRANS-1,3-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	TOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	CIS-1,3-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
	1,1,2-TRICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
100 m	1,3-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
B	TETRACHLOROETHYLENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	



CAMP DRESSER & MCKEE INC. CLIENT:

DATE:

11/8/00

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #:

011014

BELLEVUE, WA 98005

CCIL SAMPLE #:

DATE RECEIVED:

WDOE ACCREDITATION #:

11/2/00 C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-2 11/2/00 1240

#### **DATA RESULTS**

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
DIBROMOCHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DIBROMOETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,1,2-TETRACHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
ETHYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
M+P XYLENE	EPA-8260	ND(<1000)	UG/KG		11/6/00	SAS
STYRENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
O-XYLENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOFORM	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
ISOPROPYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,2,2-TETRACHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,3-TRICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
N-PROPYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
2-CHLOROTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,3,5-TRIMETHYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
4-CHLOROTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
T-BUTYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,4-TRIMETHYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
S-BUTYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
P-ISOPROPYLTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,3 DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,4-DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
N-BUTYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,4-TRICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
HEXACHLORO1,3-BUTADIENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
NAPHTHALENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,3-TRICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE PREDOMINANTELY

UNIDENTIFIED EARLY DIESEL RANGE PRODUCT AND SMALLER AMOUNT OF LUBE OIL



CLIENT: CAMP DRESSER & MCKEE INC.

11/8/00 DATE:

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #: 011014

BELLEVUE, WA 98005

CCIL SAMPLE #:

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-2 11/2/00 1240

#### **DATA RESULTS**

**ACTION** 

**ANALYSIS** 

**ANALYSIS** 

ANALYTE

RESULTS\*

UNITS\*\*

LEVEL\*\*\*

DATE

BY

\* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 5000 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 10000 MG/KG

- \*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA
- \*\*\*\* RESULT DUE TO LABORATORY CONTAMINATION

APPROVED BY:



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00

CCIL JOB #: 011014

1014

CCIL SAMPLE #:

11/2/00

DATE RECEIVED: WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-3 11/2/00 1315

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
HCID-GAS RANGE	NWTPH-HCID	ND(<20)	MG/KG GAS		11/4/00	KAS
HCID-DIESEL RANGE	NWTPH-HCID	>50	MG/KG DSL		11/4/00	KAS
HCID-OIL RANGE	NWTPH-HCID	ND(<100)	MG/KG OIL		11/4/00	KAS
TPH-SEMIVOLATILE RANGE	NWTPH-DX	680	MG/KG		11/7/00	LAH
DVDIDINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
PYRIDINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
N-NITROSODIMETHYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
PHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
ANILINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BIS(2-CHLOROETHYL)ETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-CHLOROPHENOL			UG/KG		11/5/00	RAL
1,3-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
1,4-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZYL ALCOHOL	EPA-8270	ND(<100)			11/5/00	RAL
1,2-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG UG/KG		11/5/00	RAL
BIS(2-CHLOROISOPROPYL)ETHER	EPA-8270	ND(<100)			11/5/00	RAL
4-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
N-NITROSO-DI-N-PROPYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
HEXACHLOROETHANE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
NITROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
ISOPHORONE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-NITROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,4-DIMETHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZOIC ACID	EPA-8270	ND(<1000)			11/5/00	RAL
BIS(2-CHLOROETHOXY)METHANE	EPA-8270	ND(<100)	UG/KG			RAL
2,4-DICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
1,2,4-TRICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	
NAPHTHALENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-CHLOROANILINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,6-DICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
HEXACHLOROBUTADIENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-CHLORO-3-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-METHYLNAPHTHALENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
HEXACHLOROCYCLOPENTADIENE	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL





CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

11/8/00

CCIL JOB #:

011014

CCIL SAMPLE #:

3

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID: B-3 11/2/00 1315

					ACTION	ANALYSIS	ANALYSIS
	ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
	2,4,6-TRICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	2,4,5-TRICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	2-CHLORONAPHTHANLENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	2-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
"One	ACENAPHTHYLENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	DIMETHYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
, in the	2,6-DINITROTOLUENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
	ACENAPHATHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	3-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
	2,4-DINITROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
	4-NITROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
	DIBENZOFURAN	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	2,4-DINITROTOLUENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
	2,3,4,6-TETRACHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
	DIETHYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	FLUORENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	4-CHLOROPHENYL-PHENYLETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	4-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
	4,6-DINITRO-2-METHYLPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
	N-NITROSODIPHENYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	AZOBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	4-BROMOPHENYL-PHENYLETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	HEXACHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	PENTACHLOROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
	PHENANTHRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	CARBAZOLE	-EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	DI-N-BUTYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	PYRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	BUTYLBENZYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	3,3'-DICHLOROBENZIDINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	BENZO[A]ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
720	CHRYSENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
	BIS(2-ETHYLHEXYL)PHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
, il	DI-N-OCTYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
			,				



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

11/8/00 DATE:

CCIL JOB #: 011014

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WDOE ACCREDITATION #:

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-3 11/2/00 1315

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	ВУ
BENZO[B]FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[K]FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[A]PYRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
INDENO[1,2,3-CD]PYRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
DIBENZ[A,H]ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[G,H,I]PERYLENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
)		2.72				
DICHLORODIFLUOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
VINYL CHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TRICHLOROFLUOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
METHYLENE CHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TRANS-1,2-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1-DICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CIS-1,2-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
2,2-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOCHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROFORM	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,1-TRICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CARBON TETRACHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TRICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
DIBROMOMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMODICHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TRANS-1,3-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
TOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CIS-1,3-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,2-TRICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,3-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
ETRACHLOROETHYLENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS



CLIENT: CAMP DRESSER & MCKEE INC.

DATE:

11/8/00

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #:

011014

BELLEVUE, WA 98005

CCIL SAMPLE #:

DATE RECEIVED:

WDOE ACCREDITATION #:

11/2/00 C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-3 11/2/00 1315

#### DATA RESULTS

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
ANALTIE						
DIBROMOCHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DIBROMOETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
CHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,1,2-TETRACHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
ETHYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
M+P XYLENE	EPA-8260	ND(<1000)	UG/KG		11/6/00	SAS
STYRENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
O-XYLENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOFORM	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
ISOPROPYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,1,2,2-TETRACHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,3-TRICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
BROMOBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
N-PROPYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
2-CHLOROTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,3,5-TRIMETHYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
4-CHLOROTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
T-BUTYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,4-TRIMETHYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
S-BUTYL BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
P-ISOPROPYLTOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,3 DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,4-DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
N-BUTYLBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,4-TRICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
HEXACHLORO1,3-BUTADIENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
NAPHTHALENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS
1,2,3-TRICHLOROBENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS DIESEL #1/JET FUEL RANGE PRODUCT



CLIENT: CAMP DRESSER & MCKEE INC.

DATE:

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11/2/00 C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-3 11/2/00 1315

**DATA RESULTS** 

ACTION

ANALYSIS

NALVETS

ANALYTE

METHOD

RESULTS\*

UNITS\*\*

LEVEL\*\*\*

DATE

BY

\* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG

LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

\*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

\*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY:



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

11/8/00 DATE:

CCIL JOB #: 011014

CCIL SAMPLE #:

DATE RECEIVED: 11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-4 11/2/00 1330

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
LICID CAC DANCE	NWTPH-HCID	ND(<20)	MG/KG GAS		11/4/00	KAS
HCID-GAS RANGE	NWTPH-HCID	>50	MG/KG DSL		11/4/00	KAS
HCID-DIESEL RANGE	NWTPH-HCID	>100	MG/KG OIL		11/4/00	KAS
HCID-OIL RANGE	NW IPH-HCID	>100	MG/ KG OIL		12/ 1/00	
TPH-SEMIVOLATILE RANGE	NWTPH-DX	16000	MG/KG	91	11/7/00	LAH
DURTOWE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
PYRIDINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
N-NITROSODIMETHYLAMINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
PHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
ANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
BIS(2-CHLOROETHYL)ETHER	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2-CHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
1,3-DICHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
1,4-DICHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
BENZYL ALCOHOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
1,2-DICHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2-METHYLPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
BIS(2-CHLOROISOPROPYL)ETHER	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
4-METHYLPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
N-NITROSO-DI-N-PROPYLAMINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
HEXACHLOROETHANE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
NITROBENZENE ISOPHORONE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2-NITROPHENOL	EPA-8270	ND(<400)	UG/KG		11/5/00	RAL
2,4-DIMETHYLPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
BENZOIC ACID	EPA-8270	ND(<2000)			11/5/00	RAL
	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
BIS(2-CHLOROETHOXY)METHANE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,4-DICHLOROPHENOL	EPA-8270	ND(<200)			11/5/00	RAL
1,2,4-TRICHLOROBENZENE	EPA-8270	ND(<200)			11/5/00	RAL
NAPHTHALENE	EPA-8270	ND(<200)			11/5/00	RAL
4-CHLOROANILINE	EPA-8270	ND(<200)			11/5/00	RAL
2,6-DICHLOROPHENOL	EPA-8270	ND(<200)			11/5/00	RAL
HEXACHLOROBUTADIENE	EPA-8270	ND(<200)			11/5/00	RAL
4-CHLORO-3-METHYLPHENOL	EPA-8270	ND(<200)			11/5/00	RAL
2-METHYLNAPHTHALENE HEXACHLOROCYCLOPENTADIENE	EPA-8270	ND(<200)			11/5/00	RAL



CLIENT: CAMP DRESSER & MCKEE INC.

DATE: 11/8/00

11811 N.E. FIRST ST., SUITE 201

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DATE RECEIVED: WDOE ACCREDITATION #:

11/2/00 C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-4 11/2/00 1330

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
2,4,6-TRICHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,4,5-TRICHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2-CHLORONAPHTHANLENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2-NITROANILINE	EPA-8270	ND(<400)	UG/KG		11/5/00	RAL
ACENAPHTHYLENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
DIMETHYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,6-DINITROTOLUENE	EPA-8270	ND(<400)	UG/KG		11/5/00	RAL
ACENAPHATHENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
3-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,4-DINITROPHENOL	EPA-8270	ND(<1000)	UG/KG		11/5/00	RAL
4-NITROPHENOL	EPA-8270	ND(<1000)	UG/KG		11/5/00	RAL
DIBENZOFURAN	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,4-DINITROTOLUENE	EPA-8270	ND(<400)	UG/KG		11/5/00	RAL
2,3,4,6-TETRACHLOROPHENOL	EPA-8270	ND(<400)	UG/KG		11/5/00	RAL
DIETHYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
FLUORENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
4-CHLOROPHENYL-PHENYLETHER	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
4-NITROANILINE	EPA-8270	ND(<400)	UG/KG		11/5/00	RAL
4,6-DINITRO-2-METHYLPHENOL	EPA-8270	ND(<1000)	UG/KG		11/5/00	RAL
N-NITROSODIPHENYLAMINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
AZOBENZENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
4-BROMOPHENYL-PHENYLETHER	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
HEXACHLOROBENZENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
PENTACHLOROPHENOL	EPA-8270	ND(<1000)	UG/KG		11/5/00	RAL
PHENANTHRENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
ANTHRACENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
CARBAZOLE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
DI-N-BUTYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
FLUORANTHENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
PYRENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
BUTYLBENZYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
3,3'-DICHLOROBENZIDINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
BENZO[A]ANTHRACENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
CHRYSENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
BIS(2-ETHYLHEXYL)PHTHALATE	EPA-8270	400****	UG/KG		11/5/00	RAL
DI-N-OCTYLPHTHALATE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

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CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-4 11/2/00 1330

				ACTION	ANALYSIS	ANALYSIS	
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY	
BENZO[B]FLUORANTHENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL	
BENZO[K]FLUORANTHENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL	
BENZO[A]PYRENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL	
INDENO[1,2,3-CD]PYRENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL	
DIBENZ[A,H]ANTHRACENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL	
BENZO[G,H,I]PERYLENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL	
		()			,-,		
DICHLORODIFLUOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
CHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
VINYL CHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
BROMOMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
CHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
TRICHLOROFLUOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
1,1-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
METHYLENE CHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
TRANS-1,2-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
1,1-DICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
CIS-1,2-DICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
2,2-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
BROMOCHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
CHLOROFORM	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
1,1,1-TRICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
1,1-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
CARBON TETRACHLORIDE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
1,2-DICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
BENZENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
TRICHLOROETHENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
1,2-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
DIBROMOMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
BROMODICHLOROMETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
TRANS-1,3-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
TOLUENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
CIS-1,3-DICHLOROPROPENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
1,1,2-TRICHLOROETHANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
1,3-DICHLOROPROPANE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	
TETRACHLOROETHYLENE	EPA-8260	ND(<500)	UG/KG		11/6/00	SAS	



CAMP DRESSER & MCKEE INC. CLIENT:

BELLEVUE, WA 98005

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PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-4 11/2/00 1330

DATA RESULTS

#### ANALYSIS ACTION ANALYSIS LEVEL\*\*\* DATE BY METHOD **RESULTS\*** UNITS\*\* ANALYTE SAS 11/6/00 **DIBROMOCHLOROMETHANE** EPA-8260 ND(<500) UG/KG SAS 11/6/00 1,2-DIBROMOETHANE EPA-8260 ND(<500)UG/KG 11/6/00 SAS ND(<500) UG/KG **CHLOROBENZENE** EPA-8260 11/6/00 SAS ND(<500)UG/KG 1,1,1,2-TETRACHLOROETHANE EPA-8260 11/6/00 SAS ND(<500)UG/KG EPA-8260 **ETHYLBENZENE** 11/6/00 SAS ND(<1000) UG/KG M+P XYLENE EPA-8260 11/6/00 SAS UG/KG STYRENE EPA-8260 ND(<500) SAS 11/6/00 UG/KG ND(<500) O-XYLENE EPA-8260 11/6/00 SAS UG/KG ND(<500) **BROMOFORM** EPA-8260 SAS 11/6/00 ND(<500) UG/KG **ISOPROPYLBENZENE** EPA-8260 SAS 11/6/00 ND(<500) UG/KG 1,1,2,2-TETRACHLOROETHANE EPA-8260 SAS 11/6/00 UG/KG ND(<500)1,2,3-TRICHLOROPROPANE EPA-8260 SAS ND(<500) 11/6/00 UG/KG **BROMOBENZENE** EPA-8260 SAS 11/6/00 ND(<500) UG/KG EPA-8260 N-PROPYL BENZENE SAS ND(<500) UG/KG 11/6/00 EPA-8260 2-CHLOROTOLUENE SAS 11/6/00 1,3,5-TRIMETHYLBENZENE EPA-8260 ND(<500)UG/KG 11/6/00 SAS ND(<500)UG/KG 4-CHI OROTOI UENE EPA-8260 SAS 11/6/00 EPA-8260 ND(<500)UG/KG T-BUTYL BENZENE SAS 11/6/00 UG/KG EPA-8260 ND(<500)1,2,4-TRIMETHYL BENZENE 11/6/00 SAS EPA-8260 ND(<500)UG/KG S-BUTYL BENZENE SAS 11/6/00 UG/KG P-ISOPROPYLTOLUENE EPA-8260 ND(<500)11/6/00 SAS ND(<500) UG/KG EPA-8260 1,3 DICHLOROBENZENE 11/6/00 SAS EPA-8260 ND(<500)UG/KG 1,4-DICHLOROBENZENE SAS 11/6/00 UG/KG N-BUTYLBENZENE EPA-8260 ND(<500)SAS 11/6/00 UG/KG EPA-8260 ND(<500)1,2-DICHLOROBENZENE SAS 11/6/00 1,2-DIBROMO 3-CHLOROPROPANE EPA-8260 ND(<500)UG/KG SAS 11/6/00 EPA-8260 ND(<500)UG/KG 1,2,4-TRICHLOROBENZENE SAS 11/6/00 EPA-8260 ND(<500)UG/KG HEXACHLORO1,3-BUTADIENE SAS 11/6/00 UG/KG EPA-8260 ND(<500)NAPHTHALENE SAS 11/6/00 EPA-8260 ND(<500)UG/KG 1,2,3-TRICHLOROBENZENE

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE PREDOMINANTELY

UNIDENTIFIED EARLY DIESEL RANGE PRODUCT AND SMALLER AMOUNT OF LUBE OIL



CLIENT: CAMP DRESSER & MCKEE INC.

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CLIENT CONTACT: PAN

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID: PAINE FIELD/AIRSTUDY

B-4 11/2/00 1330

**DATA RESULTS** 

ACTION

ANALYSIS

ANALYSIS

ANALYTE

METHOD

RESULTS\*

IINTTC\*\*

LEVEL\*\*\*

BY

\* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 2500 MG/KG

LUBE OIL RANGE REPORTING LIMIT IS 5000 MG/KG

- UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

\*\*\*\* RESULT DUE TO LABORATORY CONTAMINATION

APPROVED BY:



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00

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CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-5 11/2/00 1340

NALLYTE   METHOD   RESULTS* UNITS**   LEVEL***   DATE   BY									
HCID-GAS RANGE						ACTION	ANALYSIS	ANALYSIS	
HCID-DIESEL RANGE		ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY	
HCID-DIESEL RANGE NWTPH-HCID NWTPH-HCID NWTPH-HCID NG/KG DSL NWTPH-HCID NG/KG OIL NI/4/00 KAS  TPH-SEMIVOLATILE RANGE NWTPH-DX NO(<200) NG/KG NI/6/00 RAL N-NITROSODIMETHYLAMINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSODIMETHYLAMINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSODIMETHYLAMINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL NNILINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL NNILINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL NILINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSODIMETHYLETHER PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSODENZENE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSODENZENE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSODENZENE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL NITROSO-DI-N-PROPYLAMINE PPA-8270 ND(<200) NG/KG NI/6/00 RAL NITROSHENCU PPA-8270 ND(<200) NG/KG NI/6/00 RAL NAPHTHAILENE PPA-8270 ND(<200) NG/KG NAPHTHAILENE PPA-8270 ND(<200) NG/KG NI/6/00 RAL NAPHTHAILENE PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-CHOROSHENCU PPA-8270 ND(<200) NG/KG NI/6/00 RAL N-		HCID-GAS RANGE	NWTPH-HCID	ND(<20)	MG/KG GAS		11/4/00	KAS	
HCID-OIL RANGE   NWTPH-HCID   >100   MG/KG OIL   11/4/00   KAS		HCID-DIESEL RANGE						KAS	
PYRIDINE         EPA-8270         ND(<200)         UG/KG         11/6/00         RAL           N-NITROSODIMETHYLAMINE         EPA-8270         ND(<200)		HCID-OIL RANGE	NWTPH-HCID	>100			11/4/00	KAS	
N-NITROSODIMETHYLAMINE		TPH-SEMIVOLATILE RANGE	NWTPH-DX	17000	MG/KG		11/7/00	LAH	
N-NITROSODIMETHYLAMINE	eret.	DVDIDINE	EDA 9270	ND( < 200)	IIC/VC		11/6/00	DΔI	
PHENOL         EPA-8270         ND(<200)         UG/KG         11/6/00         RAL           ANILINE         EPA-8270         ND(<200)	-	La Caracia de Caracia							
ANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROETHYL)ETHER EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-CHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,3-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,3-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,4-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 8IS(2-CHLOROISOPROPYL)ETHER EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL N-NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL N-NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL SOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL SOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DIMETHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DIMETHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DIMETHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DIMETHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-TIRCHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROBUTADIENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLO				720			1		
BIS(2-CHLOROETHYL)ETHER         EPA-8270         ND(<200)									
2-CHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,3-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,4-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,4-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 8-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1									
1,3-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,4-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZYL ALCOHOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROISOPROPYL)ETHER EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL SOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-NITROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-NITROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-NITROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1-2-TRICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL NAPHTHALENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NAPHTHALENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1-2-TRICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-6-DICHLOROPHENOL EPA-8270 ND(<2		,							
1,4-DICHLOROBENZENE       EPA-8270       ND(<200)									
BENZYL ALCOHOL         EPA-8270         ND(<200)         UG/KG         11/6/00         RAL           1,2-DICHLOROBENZENE         EPA-8270         ND(<200)				, ,					
1,2-DICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROISOPROPYL)ETHER EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL HEXACHLOROETHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-NITROPHENOL EPA-8270 ND(<400) UG/KG 11/6/00 RAL 2,4-DIMETHYLPHENOL EPA-8270 ND(<400) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL				,					
2-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROISOPROPYL)ETHER EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL HEXACHLOROETHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-NITROPHENOL EPA-8270 ND(<400) UG/KG 11/6/00 RAL 2-ADIMETHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOR									
BIS(2-CHLOROISOPROPYL)ETHER EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL N-NITROSO-DI-N-PROPYLAMINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL HEXACHLOROETHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-NITROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-NITROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4							0.000		
4-METHYLPHENOL       EPA-8270       ND(<200)									
N-NITROSO-DI-N-PROPYLAMINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL HEXACHLOROETHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NITROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL ISOPHORONE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2-NITROPHENOL EPA-8270 ND(<400) UG/KG 11/6/00 RAL 2,4-DIMETHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<200) UG/KG 11/6/00 RAL BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NAPHTHALENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,6-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,6-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROBUTADIENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 R									
HEXACHLOROETHANE         EPA-8270         ND(<200)				, ,	,				
NITROBENZENE         EPA-8270         ND(<200)         UG/KG         11/6/00         RAL           ISOPHORONE         EPA-8270         ND(<200)									
ISOPHORONE									
2-NITROPHENOL EPA-8270 ND(<400) UG/KG 11/6/00 RAL 2,4-DIMETHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<2000) UG/KG 11/6/00 RAL BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NAPHTHALENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,6-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,6-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROBUTADIENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 11/6/00 RAL 4-CHLORO-3-METHYLPHENO					The state of the s				
2,4-DIMETHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL BENZOIC ACID EPA-8270 ND(<2000) UG/KG 11/6/00 RAL BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NAPHTHALENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,6-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROBUTADIENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL									
BENZOIC ACID EPA-8270 ND(<2000) UG/KG 11/6/00 RAL BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NAPHTHALENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,6-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROBUTADIENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 11/6/00 RAL 4-CHLOROBUTADIENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL							and the second of the second o		
BIS(2-CHLOROETHOXY)METHANE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,4-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 1,2,4-TRICHLOROBENZENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL NAPHTHALENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLOROANILINE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 2,6-DICHLOROPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL HEXACHLOROBUTADIENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL 11/6/00 RAL		Part of the second of the seco							
2,4-DICHLOROPHENOL       EPA-8270       ND(<200)				Of the second se			(8 (8)		
1,2,4-TRICHLOROBENZENE       EPA-8270       ND(<200)									
NAPHTHALENE         EPA-8270         ND(<200)         UG/KG         11/6/00         RAL           4-CHLOROANILINE         EPA-8270         ND(<200)									
4-CHLOROANILINE       EPA-8270       ND(<200)		[[설명 : 1841] [1842] [1842] [1842] [1842] [1842] [1842] [1842] [1842] [1842] [1842] [1842] [1842] [1842] [1842]			The state of the s				
2,6-DICHLOROPHENOL       EPA-8270       ND(<200)									
HEXACHLOROBUTADIENE         EPA-8270         ND(<200)									
4-CHLORO-3-METHYLPHENOL EPA-8270 ND(<200) UG/KG 11/6/00 RAL PA-8270 ND(<200) UG/KG 11/6/00 RAL EPA-8270 ND(<200) UG/KG 11/6/00 RAL									
2-METHYLNAPHTHALENE EPA-8270 ND(<200) UG/KG 11/6/00 RAL					17.				
THE THE THE TENT OF THE CENTER		atoma.							
HEXACHLOROCYCLOPENTADIENE EPA-8270 ND(<1000) UG/KG 11/6/00 RAL	6	78.3							
	1	HEXACHLOROCYCLOPENTADIENE	EPA-8270	ND(<1000)	UG/KG		11/6/00	RAL	





CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11

11/8/00

CCIL JOB #:

011014

CCIL SAMPLE #:

5

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-5 11/2/00 1340

						ACTION	ANALYSIS	ANALYSIS
AN	ALYTE	METHOD	RESULTS*	UNITS**		LEVEL***	DATE	BY
2,4	4,6-TRICHLOROPHENOL	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
	4,5-TRICHLOROPHENOL	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
	CHLORONAPHTHANLENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
2-	NITROANILINE	EPA-8270	ND(<400)	UG/KG			11/6/00	RAL
	CENAPHTHYLENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
DI	METHYLPHTHALATE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
)2.	6-DINITROTOLUENE	EPA-8270	ND(<400)	UG/KG			11/6/00	RAL
1	CENAPHATHENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
3-	NITROANILINE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
	4-DINITROPHENOL	EPA-8270	ND(<1000)	UG/KG			11/6/00	RAL
	NITROPHENOL	EPA-8270	ND(<1000)	UG/KG			11/6/00	RAL
D	IBENZOFURAN	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
2,	4-DINITROTOLUENE	EPA-8270	ND(<400)	UG/KG			11/6/00	RAL
	3,4,6-TETRACHLOROPHENOL	EPA-8270	ND(<400)	UG/KG			11/6/00	RAL
	IETHYLPHTHALATE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
FL	LUORENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
4-	CHLOROPHENYL-PHENYLETHER	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
4-	-NITROANILINE	EPA-8270	ND(<400)	UG/KG			11/6/00	RAL
4,	6-DINITRO-2-METHYLPHENOL	EPA-8270	ND(<1000)	UG/KG			11/6/00	RAL
N	-NITROSODIPHENYLAMINE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
A	ZOBENZENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
4-	-BROMOPHENYL-PHENYLETHER	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
Н	EXACHLOROBENZENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
PI	ENTACHLOROPHENOL	EPA-8270	ND(<1000)	UG/KG			11/6/00	RAL
Р	HENANTHRENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
Α	NTHRACENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
C	ARBAZOLE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
D	I-N-BUTYLPHTHALATE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
F	LUORANTHENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
	YRENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
В	UTYLBENZYLPHTHALATE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
	,3'-DICHLOROBENZIDINE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
	ENZO[A]ANTHRACENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
	HRYSENE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL
	IS(2-ETHYLHEXYL)PHTHALATE	EPA-8270	750****	UG/KG			11/6/00	RAL
122 G3A	I-N-OCTYLPHTHALATE	EPA-8270	ND(<200)	UG/KG			11/6/00	RAL



CAMP DRESSER & MCKEE INC. CLIENT:

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

11/8/00

CCIL JOB #:

011014

CCIL SAMPLE #:

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

B-5 11/2/00 1340

				ACTION	ANALYSIS	ANALYSIS	
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY	
BENZO[B]FLUORANTHENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
BENZO[K]FLUORANTHENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
BENZO[A]PYRENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
INDENO[1,2,3-CD]PYRENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
DIBENZ[A,H]ANTHRACENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
BENZO[G,H,I]PERYLENE	EPA-8270	ND(<200)	UG/KG		11/6/00	RAL	
DENZO[G,H,I]FERTEENE	2171 0270			C (1)			
DICHLORODIFLUOROMETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
CHLOROMETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
VINYL CHLORIDE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
BROMOMETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
CHLOROETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
TRICHLOROFLUOROMETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
1,1-DICHLOROETHENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
METHYLENE CHLORIDE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
TRANS-1,2-DICHLOROETHENE	EPA-8260		UG/KG		11/6/00	SAS	
1,1-DICHLOROETHANE	EPA-8260		UG/KG		11/6/00	SAS	
CIS-1,2-DICHLOROETHENE	EPA-8260		UG/KG		11/6/00	SAS	
2,2-DICHLOROPROPANE	EPA-8260		UG/KG		11/6/00	SAS	
BROMOCHLOROMETHANE	EPA-8260		UG/KG		11/6/00	SAS	
CHLOROFORM	EPA-8260		UG/KG		11/6/00	SAS	
1,1,1-TRICHLOROETHANE	EPA-8260		UG/KG		11/6/00	SAS	
1,1-DICHLOROPROPENE	EPA-8260	1	UG/KG		11/6/00	SAS	
CARBON TETRACHLORIDE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
1,2-DICHLOROETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
BENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
TRICHLOROETHENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS	
1,2-DICHLOROPROPANE	EPA-8260		UG/KG		11/6/00	SAS	
DIBROMOMETHANE	EPA-8260		UG/KG		11/6/00	SAS	
BROMODICHLOROMETHANE	EPA-8260		UG/KG		11/6/00	SAS	
TRANS-1,3-DICHLOROPROPENI			UG/KG		11/6/00	SAS	
TOLUENE	EPA-8260	A Charles of the Control of the Cont	UG/KG		11/6/00	SAS	
CIS-1,3-DICHLOROPROPENE	EPA-8260	Charles and the Control of the Contr	UG/KG		11/6/00	SAS	
1,1,2-TRICHLOROETHANE	EPA-8260		UG/KG		11/6/00	SAS	
1,3-DICHLOROPROPANE	EPA-8260		UG/KG		11/6/00	SAS	
ETRACHLOROETHYLENE	EPA-8260		UG/KG		11/6/00	SAS	





CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00

CCIL JOB #: 011014

CCIL SAMPLE #:

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-5 11/2/00 1340

#### DATA RESULTS

					ACTION	ANALYSIS	ANALYSIS
	ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
	DIBROMOCHLOROMETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,2-DIBROMOETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	CHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,1,1,2-TETRACHLOROETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	ETHYLBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
× 27m	M+P XYLENE	EPA-8260	ND(<800)	UG/KG		11/6/00	SAS
	STYRENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
112.7	O-XYLENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	BROMOFORM	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	ISOPROPYLBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,1,2,2-TETRACHLOROETHANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,2,3-TRICHLOROPROPANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	BROMOBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	N-PROPYL BENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	2-CHLOROTOLUENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,3,5-TRIMETHYLBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	4-CHLOROTOLUENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	T-BUTYL BENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,2,4-TRIMETHYL BENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	S-BUTYL BENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	P-ISOPROPYLTOLUENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,3 DICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,4-DICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	N-BUTYLBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,2-DICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,2,4-TRICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	HEXACHLORO1,3-BUTADIENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	NAPHTHALENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	1,2,3-TRICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/6/00	SAS
	-,-,-		, ,	1.5			

CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE PREDOMINANTELY DIESEL #1/JET FUEL RANGE PRODUCT AND SMALLER AMOUNT OF LUBE OIL



CAMP DRESSER & MCKEE INC. CLIENT:

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00 CCIL JOB #:

011014

CCIL SAMPLE #: DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

B-5 11/2/00 1340

#### DATA RESULTS

ACTION

ANALYSIS

**ANALYSIS** 

ANALYTE

METHOD

**RESULTS\*** 

UNITS\*\*

LEVEL\*\*\*

DATE

BY

\* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 2500 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 5000 MG/KG

UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

\*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

.... RESULT DUE TO LABORATORY CONTAMINATION





CLIENT:

CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

11/8/00

CCIL JOB #:

011014

CCIL SAMPLE #:

6

DATE RECEIVED:

11/7/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

CALIBRATION FLUID 11/7/00

**DATA RESULTS** 

ANALYSIS ACTION ANALYSIS LEVEL\*\*\* DATE BY UNITS\*\* METHOD **RESULTS\*** ANALYTE 11/7/00 LAH MG/KG **NWTPH-DX** ND TPH-SEMIVOLATILE RANGE

NOTE:

SAMPLE SHOWS ONLY VOLATILE RANGE ENVELOPE

- \* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

  DIESEL RANGE REPORTING LIMIT IS 500 MG/KG

  LUBE OIL RANGE REPORTING LIMIT IS 1000 MG/KG
- " UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY:





CLIENT: CAMP DRESSER & MCKEE INC.

DATE: CCIL JOB #: 11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

11/8/00 011014

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

#### QUALITY CONTROL RESULTS

SURROGATE	RECOVERY
ANALYTE	

	3	DKKOGATE KECOVEN	**	
CCIL SAMPLE ID		ANALYTE	SUR ID	% RECV
011014-01		NWTPH-HCID	BCB	89
011014-01		NWTPH-HCID	C25	108
011014-01		NWTPH-DX	C25	*
b11014-01		EPA-8260	DIBROMOFLUOROMETHANE	98
011014-01		EPA-8260	TOLUENE-D8	99
011014-01		EPA-8260	BROMOFLUOROBENZENE	.96
011014-01		EPA-8270	2-FLUOROPHENOL	57
011014-01		EPA-8270	PHENOL-d5	59
011014-01		EPA-8270	NITROBENZENE-d5	71
011014-01		EPA-8270	2-FLUOROBIPHENYL	55
011014-01		EPA-8270	2,4,6-TRIBROMOPHENOL	57
011014-01		EPA-8270	TERPHENYL-d14	57
011014-02		NWTPH-HCID	BCB	64
011014-02		NWTPH-HCID	C25	98
011014-02		NWTPH-DX	C25	*
011014-02		EPA-8260	DIBROMOFLUOROMETHANE	93
011014-02		EPA-8260	TOLUENE-D8	99
011014-02		EPA-8260	BROMOFLUOROBENZENE	102
011014-02		EPA-8270	2-FLUOROPHENOL	54
011014-02		EPA-8270	PHENOL-d5	55
011014-02		EPA-8270	NITROBENZENE-d5	64
011014-02		EPA-8270	2-FLUOROBIPHENYL	61
011014-02		EPA-8270	2,4,6-TRIBROMOPHENOL	53
011014-02		EPA-8270	TERPHENYL-d14	54







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C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

### QUALITY CONTROL RESULTS

011014-03	NWTPH-HCID	ВСВ	65
011014-03	NWTPH-HCID	C25	74
011014-03	NWTPH-DX	C25	77
011014-03	EPA-8260	DIBROMOFLUOROMETHANE	97
011014-03	EPA-8260	TOLUENE-D8	99
011014-03	EPA-8260	BROMOFLUOROBENZENE	104
011014-03	EPA-8270	2-FLUOROPHENOL	58
11014-03	EPA-8270	PHENOL-d5	57
011014-03	EPA-8270	NITROBENZENE-d5	70
011014-03	EPA-8270	2-FLUOROBIPHENYL	59
011014-03	EPA-8270	2,4,6-TRIBROMOPHENOL	57
011014-03	EPA-8270	TERPHENYL-d14	60
011014-04	NWTPH-HCID	BCB	62
011014-04	NWTPH-HCID	C25	93
011014-04	NWTPH-DX	C25	*
011014-04	EPA-8260	DIBROMOFLUOROMETHANE	95
011014-04	EPA-8260	TOLUENE-D8	99
011014-04	EPA-8260	BROMOFLUOROBENZENE	105
011014-04	EPA-8270	2-FLUOROPHENOL	51
011014-04	EPA-8270	PHENOL-d5	51
011014-04	EPA-8270	NITROBENZENE-d5	57
011014-04	EPA-8270	2-FLUOROBIPHENYL	56
011014-04	EPA-8270	2,4,6-TRIBROMOPHENOL	44
011014-04	EPA-8270	TERPHENYL-d14	51







CAMP DRESSER & MCKEE INC. CLIENT:

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CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

### QUALITY CONTROL RESULTS

011014-05	NWTPH-HCID	ВСВ	108
011014-05	NWTPH-HCID	C25	97
011014-05	NWTPH-DX	C25	*
011014-05	EPA-8260	DIBROMOFLUOROMETHANE	96
011014-05	EPA-8260	TOLUENE-D8	98
011014-05	EPA-8260	BROMOFLUOROBENZENE	102
)11014-05	EPA-8270	2-FLUOROPHENOL	55
011014-05	EPA-8270	PHENOL-d5	58
011014-05	EPA-8270	NITROBENZENE-d5	68
011014-05	EPA-8270	2-FLUOROBIPHENYL	62
011014-05	EPA-8270	2,4,6-TRIBROMOPHENOL	50
011014-05	EPA-8270	TERPHENYL-d14	56

#### **BLANK AND DUPLICATE RESULTS**

METHOD	BLK RESULT	ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
NWTPH-HCID(GAS )	ND(<20)	011014-01 TO 05	ND(<20)	ND(<20)	****	SAME
NWTPH-HCID(DSL)	ND(<50)	011014-01 TO 05	>50	>50	****	SAME
NWTPH-HCID(OIL)	ND(<100)	011014-01 TO 05	>100	>100	****	SAME
NWTPH-D EXT (DSL)	ND(<25)	011014-01 TO 05	ND(<25)	ND(<25)	****	SAME
EPA-8270	SEE BLANK	REPORT				
EPA-8260	SEE BLANK	REPORT				







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CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

#### QUALITY CONTROL RESULTS

#### SPIKE/ SPIKE DUPLICATE RESULTS

		ASSOCIATED	% SPIKE	% SPIKE DUP	
METHOD	SPIKE ID	SAMPLES	RECOVERY	RECOVERY	REL % DIFF
EPA-8270	BUTHO!	011014-01 TO 05	64	63	15
	PHENOL		-		
EPA-8270	2-CHLOROPHENOL	011014-01 TO 05	-67	66	15
EPA-8270	1,4 DICHLOROBENZENE	011014-01 TO 05	- 28	27**	12
EPA-8270	N-NITROSO-DI-N-PROPYLAMINE	011014-01 TO 05	79	76	14
EPA-8270	1,2,4-TRICHLOROBENZENE	011014-01 TO 05	51	50	16
EPA-8270	4-CHLORO-3-METHYLPHENOL	011014-01 TO 05	77	73	12
EPA-8270	ACENAPHTHENE	011014-01 TO 05	70	66	12
EPA-8270	4-NITROPHENOL	011014-01 TO 05	76	71	12
EPA-8270	2,4-DINITROTOLUENE	011014-01 TO 05	73	68	11
EPA-8270	PENTACHLOROPHENOL	011014-01 TO 05	36	33	10
EPA-8270	PYRENE	011014-01 TO 05	84	78	10
EPA-8260	1,1 DICHLOROETHENE	011014-01 TO 05	93	96	3
EPA-8260	BENZENE	011014-01 TO 05	92	95	4
EPA-8260	TRICHLOROETHENE	011014-01 TO 05	87	93	7
EPA-8260	TOLUENE	011014-01 TO 05	91	97	6
EPA-8260	CHLOROBENZENE	011014-01 TO 05	91	95	5

<sup>\*</sup> SURROGATE DILUTED OUT OF CALIBRATION RANGE

<sup>\*\* %</sup> SPIKE RECOVERY OUTSIDE OF CONTROL LIMITS OF 28-104

<sup>\*\*\*\* %</sup>RPD NOT REPORTED FOR RESULTS < X5 THE REPORTING LIMIT





CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE: 11/8/00

CCIL JOB #: CCIL SAMPLE #:

011014

DATE RECEIVED:

**BLK** 

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

PAINE FIELD/AIRSTUDY

METHOD BLANK FOR EPA-8260

## DATA RESULTS

						ACTION	ANALYSIS	ANALYSIS
	ANALYTE	METHOD	RESULTS*	UNITS**		LEVEL***	DATE	BY
	DICHLORODIFLUOROMETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	CHLOROMETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	VINYL CHLORIDE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	BROMOMETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	CHLOROETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
200	TRICHLOROFLUOROMETHANE	EPA-8260	ND(<400)	UG/KG	*:		11/5/00	SAS
	1,1-DICHLOROETHENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
-	METHYLENE CHLORIDE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	TRANS-1,2-DICHLOROETHENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,1-DICHLOROETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	CIS-1,2-DICHLOROETHENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	2,2-DICHLOROPROPANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	BROMOCHLOROMETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	CHLOROFORM	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,1,1-TRICHLOROETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,1-DICHLOROPROPENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	CARBON TETRACHLORIDE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,2-DICHLOROETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	BENZENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	TRICHLOROETHENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,2-DICHLOROPROPANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	DIBROMOMETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	BROMODICHLOROMETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	TRANS-1,3-DICHLOROPROPENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	TOLUENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	CIS-1,3-DICHLOROPROPENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,1,2-TRICHLOROETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,3-DICHLOROPROPANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	TETRACHLOROETHYLENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	DIBROMOCHLOROMETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,2-DIBROMOETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	CHLOROBENZENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	1,1,1,2-TETRACHLOROETHANE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
	ETHYLBENZENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
9	M+P XYLENE	EPA-8260	ND(<800)	UG/KG			11/5/00	SAS
	STYRENE	EPA-8260	ND(<400)	UG/KG			11/5/00	SAS
4	JI INLIVE	L		- 5/110				



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

11/8/00

CCIL JOB #:

011014

CCIL SAMPLE #:

**BLK** 

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

METHOD BLANK FOR EPA-8260

#### DATA RESULTS

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
O-XYLENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
BROMOFORM	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
ISOPROPYLBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,1,2,2-TETRACHLOROETHANE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,2,3-TRICHLOROPROPANE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
BROMOBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
N-PROPYL BENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
2-CHLOROTOLUENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,3,5-TRIMETHYLBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
4-CHLOROTOLUENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
T-BUTYL BENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,2,4-TRIMETHYL BENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
S-BUTYL BENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
P-ISOPROPYLTOLUENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,3 DICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,4-DICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
N-BUTYLBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,2-DICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,2-DIBROMO 3-CHLOROPROPANE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,2,4-TRICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
HEXACHLORO1,3-BUTADIENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
NAPHTHALENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS
1,2,3-TRICHLOROBENZENE	EPA-8260	ND(<400)	UG/KG		11/5/00	SAS

<sup>&</sup>quot;ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES

APPROVED BY:



<sup>\*\*</sup> UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

<sup>\*\*\*</sup> ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA







CAMP DRESSER & MCKEE INC. CLIENT:

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

11/8/00 DATE:

CCIL JOB #: 011014 CCIL SAMPLE #: BLK

11/2/00

DATE RECEIVED: WDOE ACCREDITATION #: C142

PAM MORRILL CLIENT CONTACT:

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

METHOD BLANK FOR EPA-8270 CLIENT SAMPLE ID:

## DATA RESULTS

	9			ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
PYRIDINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
N-NITROSODIMETHYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
PHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
ANILINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BIS(2-CHLOROETHYL)ETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
?-CHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,3-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
1.4-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZYL ALCOHOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
1,2-DICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BIS(2-CHLOROISOPROPYL)ETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
N-NITROSO-DI-N-PROPYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
HEXACHLOROETHANE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
NITROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
ISOPHORONE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-NITROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,4-DIMETHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZOIC ACID	EPA-8270	ND(<1000)	UG/KG		11/5/00	RAL
BIS(2-CHLOROETHOXY)METHANE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,4-DICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
1,2,4-TRICHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
NAPHTHALENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-CHLOROANILINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,6-DICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
HEXACHLOROBUTADIENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-CHLORO-3-METHYLPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-METHYLNAPHTHALENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
HEXACHLOROCYCLOPENTADIENE	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
2,4,6-TRICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,4,5-TRICHLOROPHENOL	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-CHLORONAPHTHANLENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
ACENAPHTHYLENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
DIMETHYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL





CLIENT: CAMP DRESSER & MCKEE INC.

DATE: 11/8/00

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #:

011014

BELLEVUE, WA 98005

CCIL SAMPLE #:

**BLK** 

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

METHOD BLANK FOR EPA-8270

## DATA RESULTS

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
2,6-DINITROTOLUENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
ACENAPHATHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
3-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,4-DINITROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
4-NITROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
OIBENZOFURAN	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
2,4-DINITROTOLUENE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
2,3,4,6-TETRACHLOROPHENOL	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
DIETHYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
FLUORENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-CHLOROPHENYL-PHENYLETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-NITROANILINE	EPA-8270	ND(<200)	UG/KG		11/5/00	RAL
4,6-DINITRO-2-METHYLPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
N-NITROSODIPHENYLAMINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
AZOBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
4-BROMOPHENYL-PHENYLETHER	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
HEXACHLOROBENZENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
PENTACHLOROPHENOL	EPA-8270	ND(<500)	UG/KG		11/5/00	RAL
PHENANTHRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
CARBAZOLE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
DI-N-BUTYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
PYRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BUTYLBENZYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
3,3'-DICHLOROBENZIDINE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[A]ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
CHRYSENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BIS(2-ETHYLHEXYL)PHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
DI-N-OCTYLPHTHALATE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[B]FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[K]FLUORANTHENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
BENZO[A]PYRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
INDENO[1,2,3-CD]PYRENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
PIBENZ[A,H]ANTHRACENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL
JENZO[G,H,I]PERYLENE	EPA-8270	ND(<100)	UG/KG		11/5/00	RAL





CLIENT: CAMP DRESSER & MCKEE INC.

DATE: 11/8/00

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #: 011014

BELLEVUE, WA 98005

CCIL SAMPLE #:

BLK

DATE RECEIVED:

11/2/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY

CLIENT SAMPLE ID:

METHOD BLANK FOR EPA-8270

#### **DATA RESULTS**

ACTION

ANALYSIS

ANALYSIS

ANALYTE

METHOD

RESULTS\*

UNITS\*\*

LEVEL\*\*\*

DATE

BY

" UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY.

THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY

DECISIONS BASED ON ANALYTICAL DATA

ADDDOVED BY

<sup>\* &</sup>quot;ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES

# External Standard Report

Data File Name : D:\HPCHEM\4\DATA\40110601\010F0901.D Page Number Operator : KAS Vial Number : 10 : DIESEL #2 Ir rument Injection Number: 1 Sample Name : 011014-2 X200 LH Sequence Line : 9 Run Time Bar Code: UNDI4-1 x 10 Instrument Method: 4DXT0800.MTH Acquired on : 07 Nov 00 00:24 AM Analysis Method : 4DSL0899.MTH Report Created on: 07 Nov 00 10:51 AM Sample Amount : 0 Last Recalib on : 19 JUL 00 09:18 AM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\4\DATA\40110601\010F0901.D Ret Time Area Type Width Ref# ug/ml |----|---|----|----|----| 1296925 VH + 0.000 1 448.439 TPH-DSL ENVELOPE 1.371 PENTACOZANE 5215 PB 0.036 1 19.753

 $D = 448.439 \text{ nog/ml} \times \frac{10 \text{ mL}}{25.19g} = 180 \text{ mg/kg} \times 10 = 1800 \text{ mg/kg}$ 

11-7-00LH



: D:\HPCHEM\1\DATA\10110301\030F0801.D Data File Name Page Number Op ator Vial Number : DIESEL #1 Ir lument Injection Number: 1 Sample Name : 011014-1 Sequence Line : 8 Run Time Bar Code: Instrument Method: NWTPHCID.MTH : 04 Nov 00 01:40 AM Acquired on Analysis Method : NWTPHCID.MTH Report Created on: 04 Nov 00 02:54 PM Sample Amount : 0 Last Recalib on : 17 OCT 00 10:57 AM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10110301\030F0801.D Ret Time Area Type Width Ref# ug/ml |-----|----|----|----| 56626 MM T 0.032 1 44.400 Bromochlorobenzene - 50×100-891.
31577 MM T 0.029 1 10.770 Pentacosane - 10×100-1081. User Modified

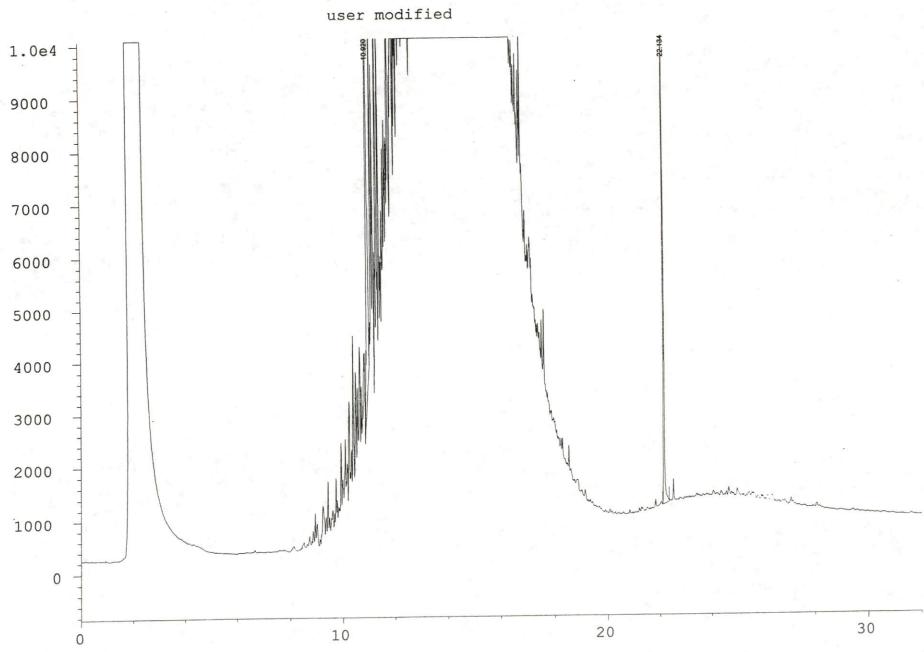
G= 220 mg/kg
D= >50 mg/kg (DESEL #1/In/fai)
LG= 2100 mg/kg
LD= 11>100 mg/kg Lube oil

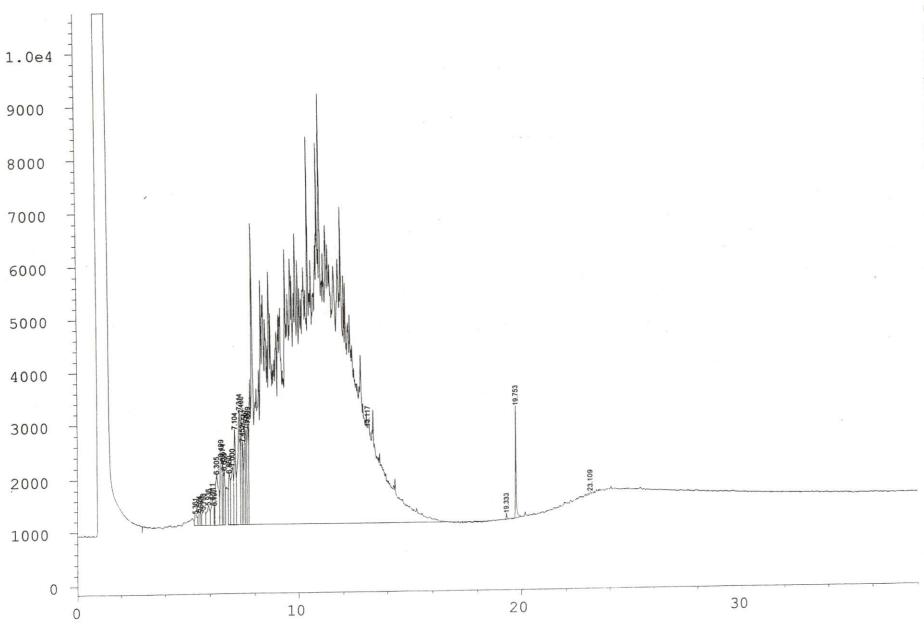
Motor. Majorit of Promet is

Chromatogram indicated Sapir containitepromets which
which are p is prodominant. Direct form
which are p is prodominant.

And smaller amond of lube oil

REVIEWED BY





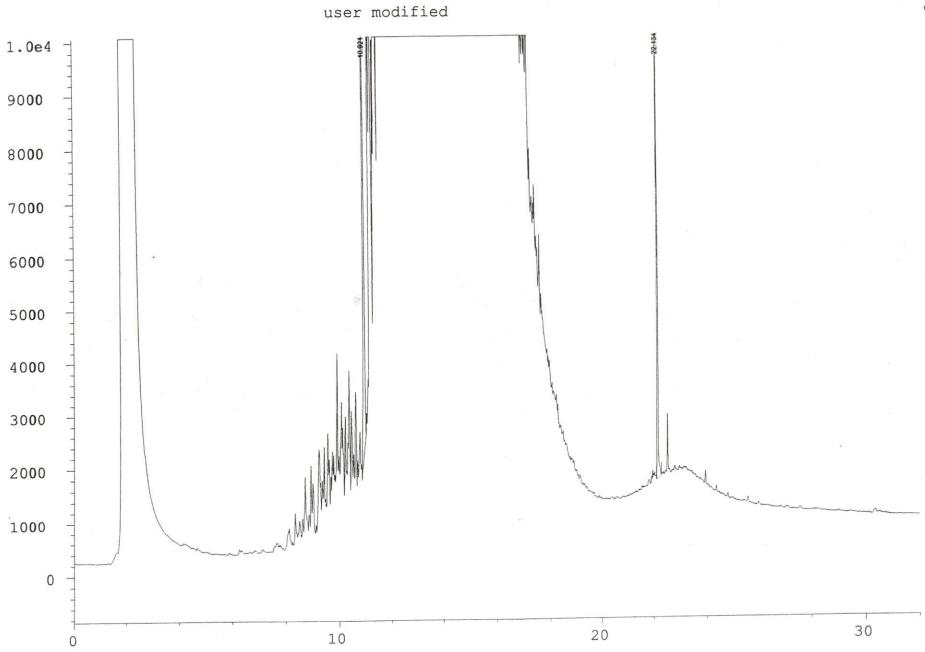
G= >30 mg/kg gas dut dil raye

D= >50 mg/kg dust lange prod.

LO= >100 mg/kg Lubeail

2 produits - predominal unidentified perly dil range produit
and smaller lube oil

REVIEWED BY 11-6-000



#### External Standard Report Data File Name : D:\HPCHEM\4\DATA\40110601\011F0901.D Operator Page Number : KAS Vial Number In Jument : DIESEL #2 Injection Number: 1 : 011014-3 X10 LH Sample Name Run Time Bar Code: 011014-2 x 200 Sequence Line : 9 Instrument Method: 4DXT0800.MTH Acquired on : 07 Nov 00 01:07 AM Analysis Method : 4DSL0899.MTH Report Created on: 07 Nov 00 10:54 AM Sample Amount Last Recalib on : 19 JUL 00 09:18 AM ISTD Amount Multiplier

Sig. 1 in D:\HPCHEM\4\DATA\40110601\011F0901.D

Ret Time Area Type Width Ref# ug/ml Name
|-----|-----|-----|-----|-----|
8.510 834757 MM 1.133 1 288.295 TPH-DSL ENVELOPE
19.794 \* not found \* 1 PENTACOZANE\*

Not all calibrated peaks were found

User Modified

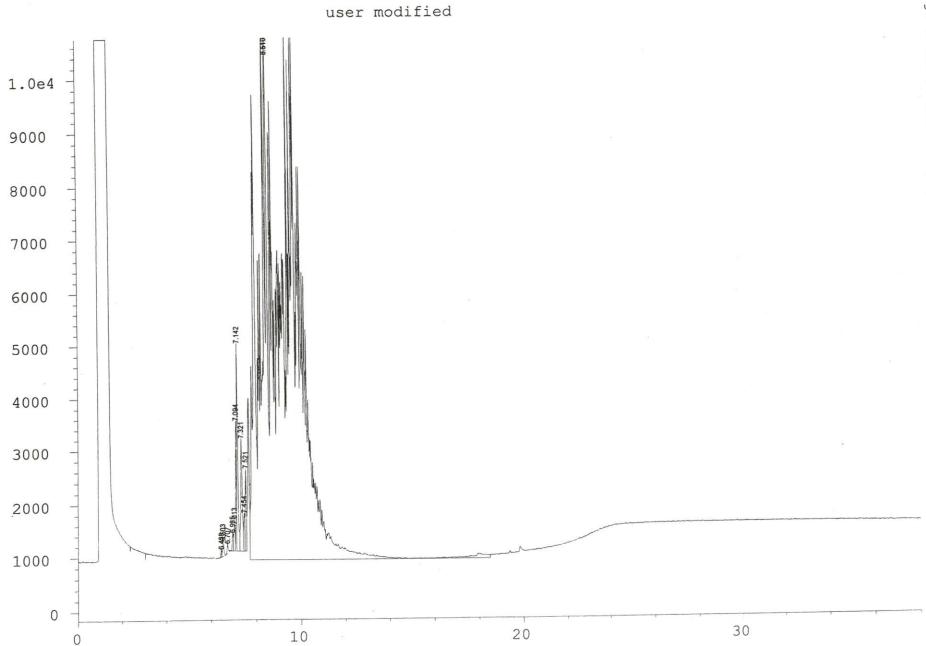
\* low due to dilution

Drywt. = 24.55g

D= 120 mg/kg x 200 = 23000 mg/kg

11-7-00 LH





Data File Name : D:\HPCHEM\1\DATA\10110301\032F0801.D Page Number Operator Vial Number : 32 : DIESEL #1 Ir rument Injection Number: 1 : 011014-3 Sample Name Sequence Line : 8 Instrument Method: NWTPHCID.MTH Run Time Bar Code: Acquired on : 04 Nov 00 03:20 AM Analysis Method : NWTPHCID.MTH Report Created on: 04 Nov 00 03:02 PM Sample Amount Last Recalib on : 17 OCT 00 10:57 AM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10110301\032F0801.D Area Type Width Ref# ug/ml

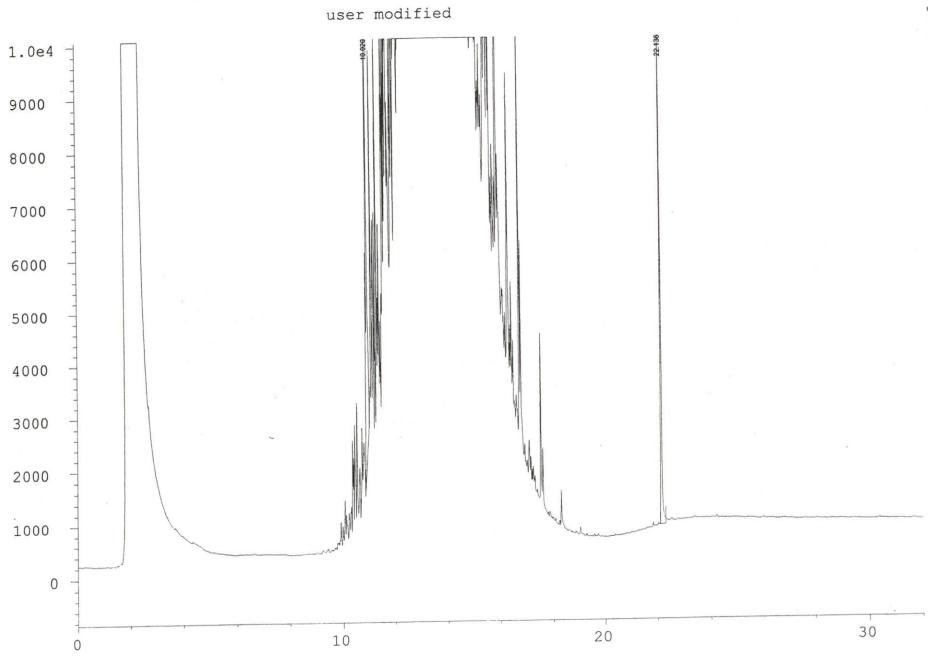
41189 MM T 0.038 1 32.297 Bromochlorobenzene (5).
21606 MM T 0.033 1 7.369 Pentacosane 74. 22.136

User Modified

G= 200mg/kg D= >50mg/kg Diesel range product LO = LICO mgikg

same notre, sample #1 W/o luber

REVIEWED BY 11-600



Data File Name : D:\HPCHEM\4\DATA\40110601\021F1501.D Page Number : 1 Vial Number : 21 Operator : KAS
In rument : DIESEL #2
Sample Name : 011024-3 LH
Run Time Bar Code: OHOIU-3 Injection Number: 1 Sequence Line : 15 Instrument Method: 4DXT0800.MTH Acquired on : 07 Nov 00 11:01 AM Analysis Method : 4DSL0899.MTH Report Created on: 07 Nov 00 11:46 AM Sample Amount : 0 Last Recalib on : 19 JUL 00 09:18 AM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\4\DATA\40110601\021F1501.D Ret Time Area Type Width Ref# ug/ml |-----|----|-----|-----|-----|-----| 13.117 4679626 VH + 0.000 1 1620.567 TPH-DSL ENVELOPE 19.746 29278 PV 0.027 1 7.698 PENTACOZANE :10×100=77/. 19.746

Dry wt = 23.90g

D= 680 mg/kg

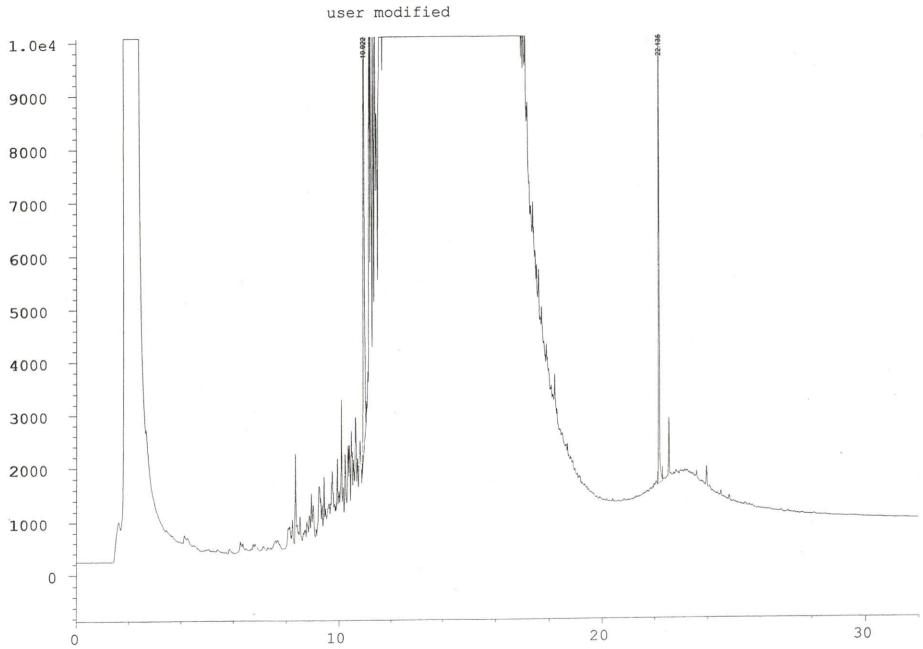
11-7-00 LH



# External Standard Report Data File Name : D:\HPCHEM\1\DATA\10110301\033F0801.D Page Number : 1 Op ator In rument : kas Vial Number : 33 : DIESEL #1 Injection Number: 1 Sample Name : 011014-4 Sequence Line : 8 Run Time Bar Code: Instrument Method: NWTPHCID.MTH Acquired on : 04 Nov 00 04:08 AM Analysis Method : NWTPHCID.MTH Report Created on: 04 Nov 00 03:04 PM Sample Amount : 0 Last Recalib on : 17 OCT 00 10:57 AM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10110301\033F0801.D Ret Time Area Type Width Ref# ug/ml 30.965 Bromochlorobenzene 621. 10.922 39491 MM T 0.034 1 9.305 Pentacosane 931. 27279 MM T 0.027 1 22.135 User Modified G=>30 mg/kg gap and her direct. D=>50 mg/kg dierel range prod. L0=>100 mg/kg Lube dil

Same note as sage #2

REVIEWED BY 11.6.000



#### External Standard Report Data File Name : D:\HPCHEM\4\DATA\40110601\013F0901.D Page Number : 1 Vial Number : 13 Operator : KAS In Jument : DIESEL #2 Sample Name : 011014-8 X100 Injection Number: 1 Sequence Line : 9 Run Time Bar Code: 4 X100 Instrument Method: 4DXT0800.MTH Acquired on : 07 Nov 00 02:35 AM Analysis Method : 4DSL0899.MTH Report Created on: 07 Nov 00 11:10 AM Sample Amount : 0 Last Recalib on : 19 JUL 00 09:18 AM ISTD Amount : 1 Multiplier Sig. 1 in D:\HPCHEM\4\DATA\40110601\013F0901.D Ret Time Area Type Width Ref# ug/ml |-----|----|----|----|-----|-----9.402 1140765 MM 1.066 1 394.329 TPH-DSL ENVELOPE PENTACOZANE \* 19.794 \* not found \* 1

Not all calibrated peaks were found

\* low due to dilution

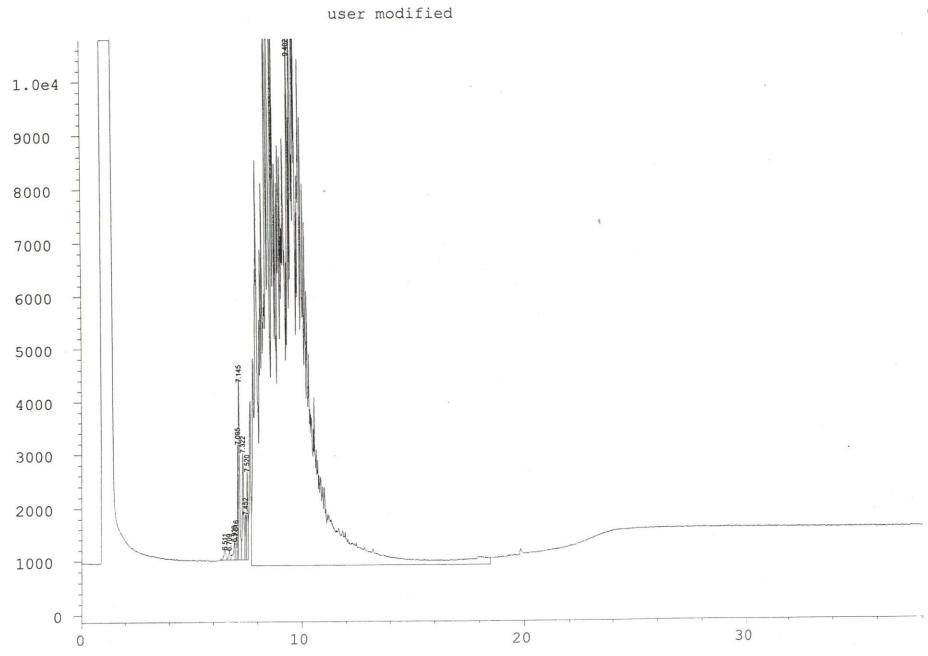
User Modified

D= 16000 mg/kg

Dry Wt. = 25.0 kg

# 4+ 11-7-00LH.





======	=====	
	**	External Standard Report

Data File Name : D:\HPCHEM\1\DATA\10110301\035F0801.D Page Number Operator : kas Vial Number : 35 : DIESEL #1 Ir. rument Injection Number: 1 Sample Name : 011014-5 Sequence Line : 8 Run Time Bar Code: Instrument Method: NWTPHCID.MTH Acquired on : 04 Nov 00 05:53 AM Analysis Method : NWTPHCID.MTH Report Created on: 04 Nov 00 03:06 PM Sample Amount : 0 Last Recalib on : 17 OCT 00 10:57 AM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10110301\035F0801.D Ret Time Area Type Width Ref# ug/ml |-----|-----|-----|-----|-----| 68787 MM T 0.045 1 53.936 Bromochlorobenzene 108 1, 28506 MM T 0.026 1 9.723 Pentacosane 97.1, 28506 MM T 0.026 1 22.136

User Modified

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G= A:>20 mg/kg gas m. to Ditumy.

D= >50 mg/kg dient nampe prod.

LO=> 100 mg/kg Lube dil

Same note as #/

JEVIEWED BY 116 00

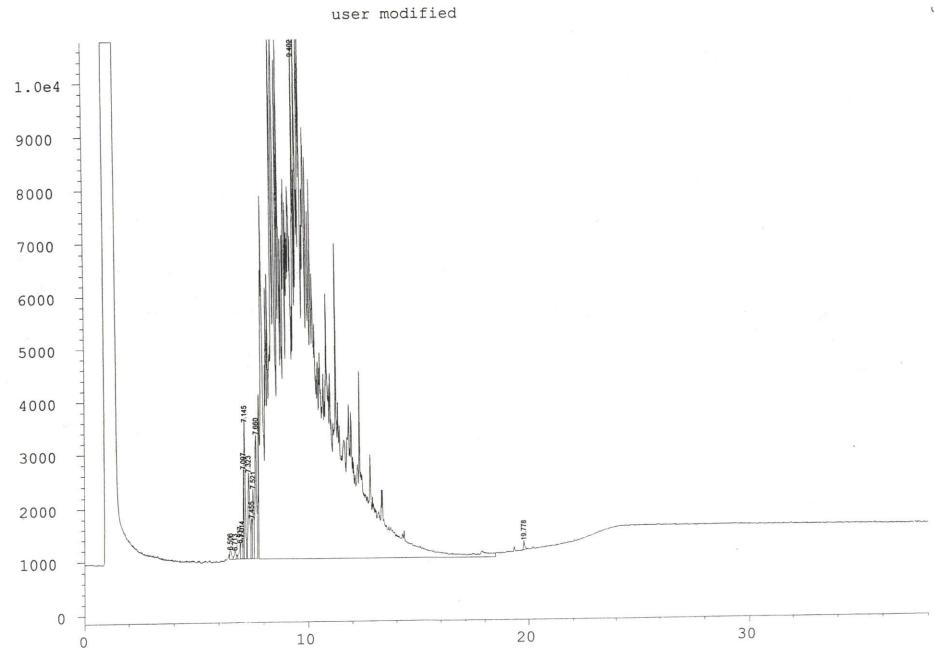
# External Standard Report

Data File Name : D:\HPCHEM\4\DATA\40110601\014F0901.D Page Number : 1 Vial Number : 14 Operator : KAS In ument : DIESEL #2
Sample Name : MB-2 10/6/00 S Injection Number: 1 Sequence Line : 9 Run Time Bar Code: 011014-5 X 100 Instrument Method: 4DXT0800.MTH Acquired on : 07 Nov 00 03:18 AM Report Created on: 07 Nov 00 11:11 AM Analysis Method : 4DSL0899.MTH Sample Amount : 0 Last Recalib on : 19 JUL 00 09:18 AM ISTD Amount : 1 Multiplier Sig. 1 in D:\HPCHEM\4\DATA\40110601\014F0901.D Ret Time Area Type Width Ref# ug/ml |-----| 9.402 1282068 MM 1.468 1 443.291 TPH-DSL ENVELOPE 19.778 708 BV 0.055 1 0.186 PENTACOZANE \*\* User Modified \* low due to dilution

D = 17000 mg/kg

11-7-00LH





=======================================	
Data File Name : D:\HPCHEM\4\DATA\40110601\024 Operator : KAS In rument : DIESEL #2 Sample Name : 011014-6 Run Time Bar Code: Acquired on : 07 Nov 00 01:38 PM Report Created on: 07 Nov 00 02:44 PM Last Recalib on : 04 AUG 99 11:23 AM Multiplier : 1	Page Number : 1 Vial Number : 24 Injection Number : 1 Sequence Line : 4 Instrument Method: 4DXT0800.MTH Analysis Method : 4DXT0899.MTH Sample Amount : 0 ISTD Amount :
Sig. 1 in D:\HPCHEM\4\DATA\40110601\024F0401.D Ret Time Area Type Width Ref# ug/ml	Name
11.449 * not found * 1 20.749 * not found * 1 21.263 * not found * 1 24.647 * not found * 1	TPH-Dsl envelope MOTOR OIL nC-25 surrogate MOTOR OIL {2}

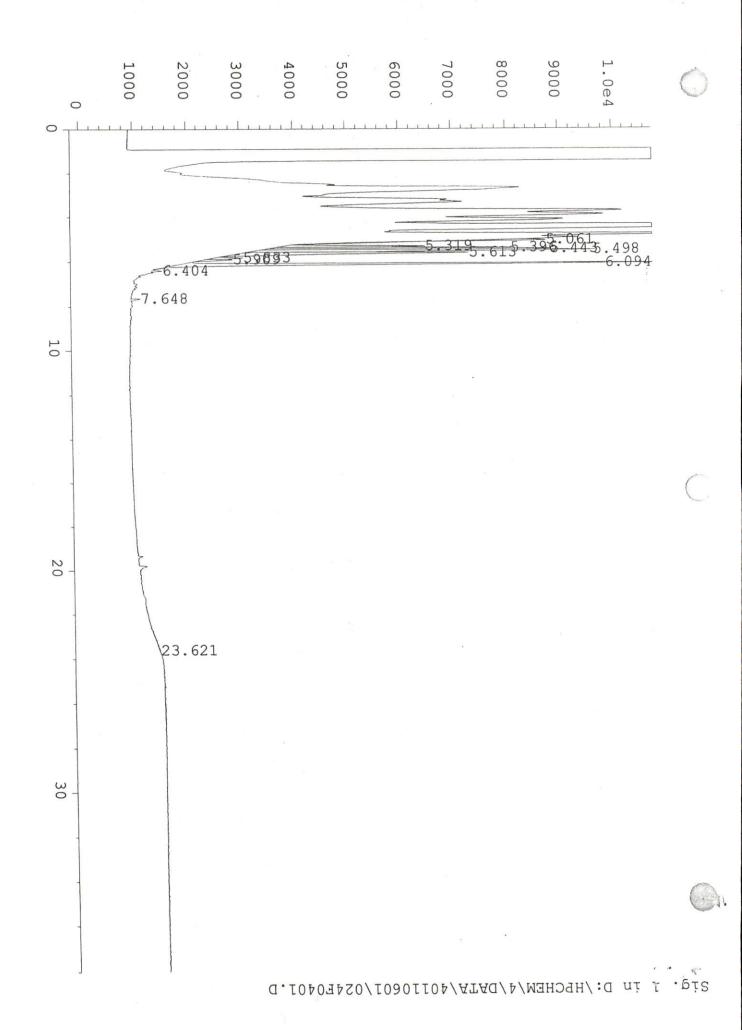
Calibration table contains at least one peak with amt = 0

Not all calibrated peaks were found

Product not in samples run in this Project

[HEVIEWED BY 1900]

[Note: Saple Asir Not show any Till change I sample show only what sample in sample is how only what sample in sample show only what sample is shown only what sample show only in the sample show onl





CHAIN-OF-CUSTODY	CH	AIN	-0	F-C	US	TO	DY
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7-9-17-1	ECT INFOR		1		La	bor	ato	ry N	Vur	nbe	er:				-	-																_			$\dashv$
Project Manager:	M Mare	11							A							A	NA	LY	SIS	R	EQ	UE	ST											_	$\dashv$
Project Name: Q ~~	1.11/1	1 -	<del>,</del> , ,		PETROLEUM											ESTS/PCBs METALS						LEACHING TESTS				OTHER									
Project Number: MH	5mo ( ).	D. Ne	A+ 1.1	ý	1000					-						_	-			_	-	Or	TC	Pri	DW	S T				700	X			1	Z
Site Location:				DAH	TPH-HCID	TPH-G	TPH-D	TPH-418.1	I U	101	20 A	20M	40 G	70 @	10 P	- SV	80 C	80M	400	20 0	lecte	ganic	L Me	ority	· S/	SP-	F -	1	0 5	TCLP -	C				MBE
	SAL INFOR			3	CID			TPH-418.1 State:	1 PH Special Instructions	8010 Halogenated VOCs	8020 Aromatic VOCs	8020M - BETX only	8240 GC/MS Volatiles	8270 GC/MS Semivolatiles	8310 PAHs	DWS - Volatiles and Semivolatiles	8080 OC Pest/PCBs	8080M PCBs only	8140 OP Pesticides	B150 OC Herbicid	Selected Metals: list	Organic Lead (Ca)	TCL Metals (23)	Priority Poll. Metals (13)	DWS - Metals	MFSP - Metals (Wa)	TCLP - Volatiles (ZHE)	Semivolatiles	TCLP - Pesticides	Metals		+			NUMBER OF CONTAINERS
Lab Disposal (	return if not	indicate	d)	7.				i iy	al Ins	ena	atic	XT	SVO	SS	SIS	tiles	est/F	3s or	estic	J/Pe	etals	d (C	(23)	Met	sls	als (	tiles	ivola	icide	200				1	F C
Disposal Method:	)			1	State:	State:	State:	State:	struc	ed V	VOC	only	olatil	yime		and	СВ	Ty.	des	Sides	list	a)	-	als (		Wa)	HZ)	atiles	S	1					TNC
Disposed by:			te:		3:		:.	3.	lions	OCS	S		es	olatil		Sen							1	13)			E								AINE
	RMATION			W	5			-	,	"				es		nivol																			RS
□SW-846 □ CLP □			M Std. □S	Special	·on											atiles														-					
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																									1	1		$\perp$	$\perp$	4	-
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B-2	***************************************	1240	1	2.	×									Y													Ш	$\sqcup$	$\perp$	1	X	$\perp$	$\perp$		3
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LAB INFORMA	TION		SAM	PLE REC	FIE	т				RI	FLI	NO	UIS	SHE	ED I	BY:	1.	F	REL	INC	วบ	SH	IEC	B	Y:	2.	F	REI	IN	QI	JIS	HE	D B	Y:	3.
Lab Name: (I	TION	Tota	al Number of			İ			-	-	matur		1	Ĺ	1948		ime:	8	Signat	ůre:	1	-	4,000/7	2		ime:		Signat	ture:				e i	Tir	ie:
Lab Address:		Cha	in-of-Custody	Seals: Y/N	N/NA						nted I	Vame	,		_		Date:	V.F	rinte	i Nan	ne:		-1	- 4	20	Date:	1 1 3	Printe	ed Na	me:				Da	ite:
		Inta	ct?: Y/N/NA			y.			2	1000		<i>[</i> 1	1100	يد مهم	/	11	l, į	-1/	Kir.	_	-	gna	J	14	12/	6.		Comp	nany.						_
Via:	7:	Red	ceived in Good	Condition/	Cold	:		1	×	Co	mpan	iy:	<	01	^	,		1	Comp	M									100		200			_	
Turn Around Time:	Standard	□24 h	r. 348 hr	r. 🗆 72	hr.		11	wk.		RI	ECI	EIV	ED	BY	<b>/:</b>	- 1	1.	F	REC	Eľ	VE	DB	Y:			2.	1/2		100	-	ED	BY	:		3.
PRIOR AUTHO		and the second s			1000	100	7.7			Sig	gnatu	re:				1	Γime:	5	Signat	ure:					Т	ime:		Signa	iture:	a .				Tir	ne:
Special Instructions:										Pri	inted	Name	:				Date:	F	Printe	d Nar	me:					Date:	T	Printe	ed Na	ame:				D	ate:
										Co	mpar	ny:						-	Comp	any:	4						1	Comp	pany:	:					

CDM OFFICES: Bellevue: (206) 453-8383 rev.9/00 Portland: (503) 232-1800

Gig Harbor: (206) 851-5562

DISTRIBUTION: White, Canary to Analytical Laboratory; Pink to CDM Project Files; Gold to CDM Disposal Files forms\field\chain of custody.p65



CLIENT:

CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

12/8/00

CCIL JOB #:

012002

CCIL SAMPLE #:

DATE RECEIVED:

12/1/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY 0000 CHBNB

CLIENT SAMPLE ID:

TPH-SEMIVOLATILE RANGE

B-1 38" 12/1/00 1010

## DATA RESULTS

ANALYTE

METHOD

**NWTPH-DX** 

**RESULTS\*** 

5700

UNITS\*\*

**ACTION** LEVEL\*\*\* ANALYSIS DATE

ANALYSIS BY

MG/KG

12/7/00

KAS

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL #1/JET FUEL TYPE

PRODUCT

\* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT, REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 250 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 500 MG/KG

\*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

\*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

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DATE:

12/8/00

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012002

CCIL SAMPLE #:

DATE RECEIVED:

12/1/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY 0000 CHBNB

CLIENT SAMPLE ID:

B-2 42" 12/1/00 1115

DAT	AR	ESL	ILT	S

**ACTION** 

**ANALYSIS** 

ANALYSIS

ANALYTE

METHOD

RESULTS\*

UNITS\*\*

LEVEL\*\*\*

DATE

TPH-SEMIVOLATILE RANGE

**NWTPH-DX** 

14000

MG/KG

12/7/00

KAS

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS EARLY DIESEL RANGE PRODUCT WHICH CLOSELY MATCHES SOLTROL 170 PRODUCT

APPROVED BY:

Page 1

<sup>\* &</sup>quot;ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 500 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 1000 MG/KG

<sup>\*\*</sup> UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

<sup>\*\*\*</sup> ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

12/8/00

CCIL JOB #:

012002

CCIL SAMPLE #:

DATE RECEIVED:

12/1/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY 0000 CHBNB

CLIENT SAMPLE ID:

B-3 48" 12/1/00 1215

# DATA RESULTS

**ANALYSIS ANALYSIS** ACTION LEVEL\*\*\* DATE METHOD RESULTS\* UNITS\*\* ANALYTE KAS MG/KG 12/7/00 **NWTPH-DX** 19000 TPH-SEMIVOLATILE RANGE

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS EARLY DIESEL RANGE PRODUCT WHICH CLOSELY MATCHES

SOLTROL 170 PRODUCT

APPROVED BY

<sup>\* &</sup>quot;ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 500 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 1000 MG/KG

<sup>\*\*</sup> UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

<sup>\*\*\*</sup> ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA



CLIENT: CAMP DRESSER & MCKEE INC.

DATE:

12/8/00

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #:

012002

BELLEVUE, WA 98005

DATE RECEIVED:

12/1/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

PAINE FIELD/AIRSTUDY 0000 CHBNB

## QUALITY CONTROL RESULTS

			SURROGATE RECOVERY				
	CCIL SAMPLE ID		ANALYTE	SUR ID			% RECV
	012002-02		NWTPH-DX		C25		*
1	012002-04		NWTPH-DX		C25		. *
)	012002-06		NWTPH-DX		C25		*
			DI ANIC AND DUDI ICATE DECLI TO				
	METHOD	BLK RESULT	BLANK AND DUPLICATE RESULTS ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
	NWTPH-D EXT (DSL)	ND(<25)	012002-02, 04, 06	ND(<25)	ND(<25)	****	SAME

<sup>\*</sup> SURROGATE DILUTED OUT OF CALIBRATION RANGE

APPROVED BY:

<sup>\*\*\*\* %</sup>RPD NOT REPORTED FOR RESULTS < X5 THE REPORTING LIMIT

External Standard Report : D:\HPCHEM\1\DATA\10120701\092F0401.D Da File Name Page Number Of rator : kas Vial Number : DIESEL #1/ Instrument Sample Name Injection Number: 1 : 012002-2(x10 Sequence Line : 4 Run Time Bar Code: Instrument Method: TPHD0700.MTH Acquired on : 07 Dec 00 05:12 PM Analysis Method : DIESEL1.MTH Report Created on: 07 Dec 00 05:51 PM Sample Amount : 0 Last Recalib on : 16 AUG 00 09:39 AM ISTD Amount : 1 Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10120701\092F0401.D Ret Time Area Type Width Ref# ug/ml

User Modified

1400.418mg/1 x 10ml x 10 = 5700mg/kg

Diesel # 1 or similar out of fame product

12 700 E

External Standard Report

: D:\HPCHEM\1\DATA\10120501\086F2401.D Data File Name Page Number : kas Orator : DIESEL #2 Instrument

Sample Name : 012002-4\X20

Run Time Bar Code: : 07 Dec 00 07:13 AM Acquired on

Report Created on: 07 Dec 00 12:32 PM Last Recalib on : 10 NOV 00 12:38 PM

Multiplier

Vial Number : 86 Injection Number: 1 Sequence Line : 24

Instrument Method: TDMO0700.MTH Analysis Method : TPHD0700.MTH

Sample Amount : 0 ISTD Amount

Sig. 1 in D:\HPCHEM\1\DATA\10120501\086F2401.D

Name Ret Time Area Type Width Ref# mg/l |-----|-----|-----3948357 MM 1.059 1 1775.977 Diesel #2
5115 MM T 0.028 1 1.325 nC-25 surrogate low due to Celut.

22.052

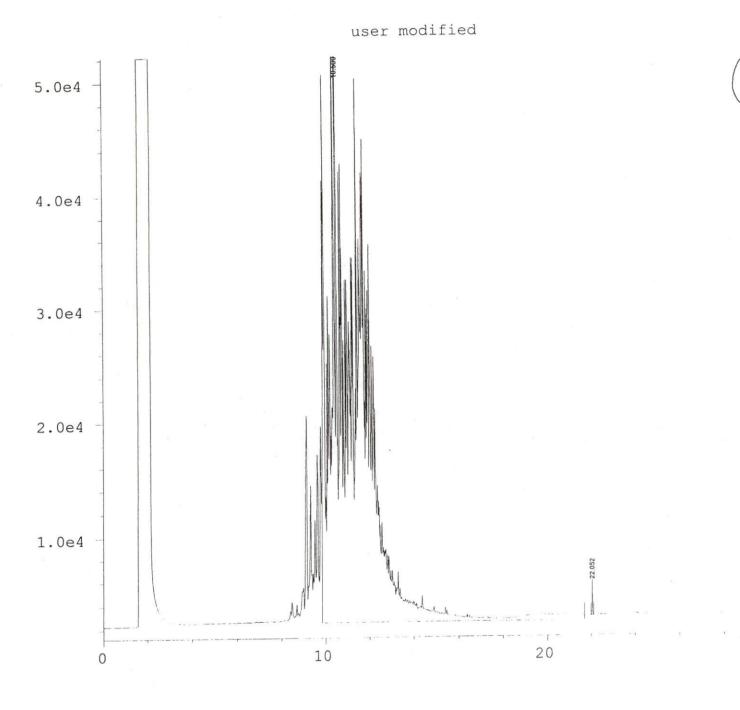
User Modified

1775.977 mg/l x 10ml x 20= 7000 mg/kg 14000 mg/kg

Duril marge product Clase wild my Salter 17 9

1270A

30



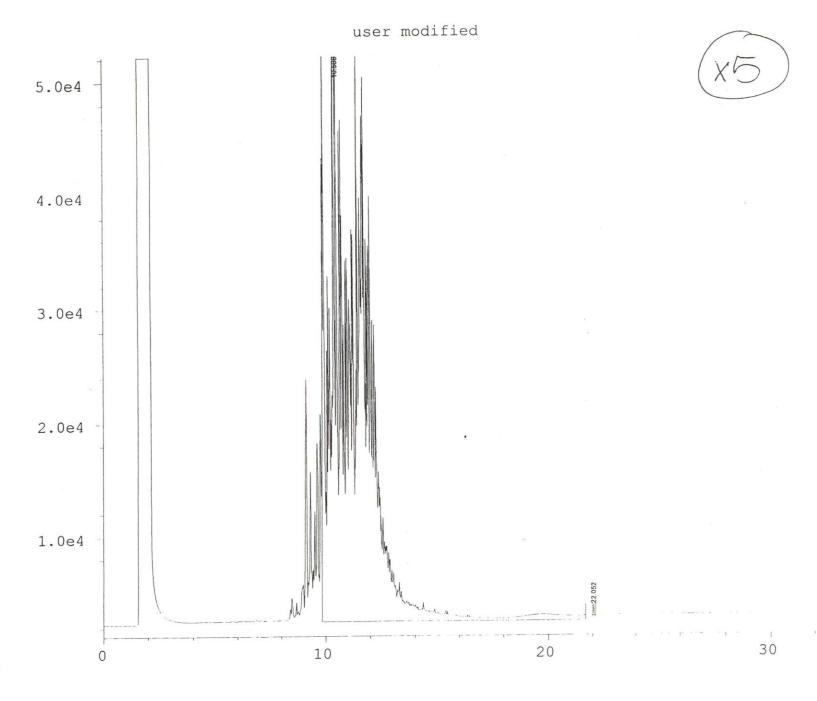
: D:\HPCHEM\1\DATA\10120501\088F2401.D \* a File Name Page Number Orator : kas Vial Number : DIESEL #1 Instrument Injection Number: 1 : 012002-6(X25 Sample Name Sequence Line : 24 Run Time Bar Code: Instrument Method: TDMO0700.MTH : 07 Dec 00 08:40 AM Acquired on Analysis Method : TPHD0700.MTH Report Created on: 07 Dec 00 12:36 PM Sample Amount Last Recalib on : 10 NOV 00 12:38 PM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10120501\088F2401.D Ret Time Area Type Width Ref# mg/l 4233719 MM 1.037 1 1908.806 Diesel #2 10.508 0.462 nC-25 surrogate low due to 1784 MM T 0.028 1 22.052 dilution User Modified

1908. Scho mg/l x 10ml x 25 = 19000 mg/kg

Diesel range product

F. EV. 2 . 27 . 12- 7 9 9 .

17-17-M VA.0





CHAIN-OF-CUSTODY

PROJECT INF	ORMATION	N	-	Lat	bor	ator	y N	lum	ber	7:					14																
Project Manager: P. Mox.R	14													1	NA	ALY	SIS	R	EQ	UE	ST						·				$\Box$
Project Name: SWO. C	OMIR	PORTE	MYEFO	34	ETI	ROL	EUI	N	OR	GAI	AIC (	CON	IPOL	JNDS	P	FST	S/P	CBs	T	N	META	ALS			TES			0	THE	R	
Project Number: 0000	CHB	NB									-	-			-			_	Se				2 4	1	-	-	TCLP	-	П	T	Z
Site Location: EVERETT	Sar Sar	npled By:	DIMA	TPH	WTPH-G	WTPH-D	)15M	S Hc	10 H	20 A	40 G	70 G	8310 PAHs	40 P	80 0	80M	400	20 0	lecte	ganic	L Me	ority	SP-	F -	TCLP -	두	5				MBE
DISPOSAL INF	ORMATIO	N	41	WTPH-HCID	9	WTPH-D	8015M Fuel Hydrocarbon	TPH Special Instructions	aloge	8020 Aromatic VOCs	8240 GC/MS Volatiles	8270 GC/MS Semivolatiles	AHS	DWS - Volatiles and Semivolatiles	8080 OC Pest/PCBs	8080M PCBs only	8140 OP Pesticides	B150 OC Herbicides	Selected Metals: list	Organic Lead (Ca)	TCL Metals (23)	Priority Poll. Metals (13)	MFSP - Metals (Wa)	TCLP - Volatiles (ZHE)	Semivolatiles	TCLP - Pesticides	- Metals				NUMBER OF CONTAINERS
Lab Disposal (return if	ot indicate	d)				-	Hyd	Inst	enate	tic V	S Vol	Sei	1	iles	st/P0	s onl	sticio	Pesi	tals:	d (Ca	(23)	Meta	als (V	iles	volat	cides	S				CO
Disposal Method:	g .						roca	tructi	N P	OCS	atile	nivo		and	Bs	Υ	les	dec	list	Œ		als (1	Va)	THE	iles	0,					NTA
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QC INFORMATIO	N (check c	ne)										S		volat																	ŝ
□SW-846 □CLP □Screeni			pecial	3										lles										-							
SAMPLE ID DATE	TIME	MATRIX	LAB ID	*	40	1 3 m	_		-	-	-	-	$\vdash$	-	-		+	+	+		$\vdash$	+	+	+	H	+	+	+	++	+	Z
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B- ( 31.2" 38" 1	1010	descond	2	$\sqcup$	)	(	+	_		-	+	-	-	_	+		-	+	+		$\vdash$	+	+	+	H	$\dashv$	+		+	+	Z
B-2 26/1 26"	1045	The state of the s	3		-	d	$\perp$	-	Н	1	-	+	$\vdash$	+	+		+	+	+	_	H	+	+	+	H	$\vdash$	+	+	$\forall$	+	1
B-Z 3/5' 42"	1115		4	$\sqcup$	- /	A	+	-	H		_	+	$\vdash$	+	+		+	+	+		+	-	+	+	H	$\dashv$	+	+	$\forall$	+	1
B-3 30" 30"	1210	1	5			,	1	-		_	_	-	-	-	+		+	+	+	-	-	+	+	+	H	$\forall$	+	+	+	+	1
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depth per Pan 12	4100								,		1												_	_			_	_			
LAB INFORMATION		SAMI	PLE REC	EIP	Т		02	F	REL	IN	QUI	SH	ED	BY:	1.	+			UIS	SHE	ED		2.	_			QU	ISH	ED	BY:	3.
Lab Name: CCI	Tota	al Number of C	Containers:	é		6		5	Signat	ure:	LI	1	从	12	me	S	ignatu	ire:					Time:		Signal	lure:	1				
Lab Address: EUELET	100 2	in-of-Custody	Seals: YN	/NA	+			F	ride	d Nan	10: [/]	1	4 BA	18	)ate:	NP	rinted	Nam	e:				Date:	1	Printe	d Nar	me:				Date:
Via: 1.1.0		eived in Good	Condition/0	Cold:	+	1/2		-	Comp	any	7	N	\		17	C	ompa	ny:		1				1	Comp	any	1.				
14.51		r.		_		1 w	k.	F	REC	CEI	VED	B	Y:		1.	F	EC	EIV	ED	B	Y:		2.	.	REC	CEI	VΕ	D B	Y:		3.
Turn Around Time: Standard								5	Signa	ture:	AK	un	at	12:	ime:	S	ignatu	ure					Time:		Signa	ture:				Т	Time:
Special Instructions: //	01	N An	Her						Pripte	d Nar	71	L	nst		Date:		rinted	Nam	e:				Date:		Printe	d Na	ame:		20		Date:
NOC	Je	MOKILL	4/2/5					(			CI			1.	17.	_	ompa	iny:							Comp	any					

AGI OFFIÇ

Bellevue: (425) 453-8383 Portland: (503) 232-1800

Gig Harbor: (253) 851-5562

DISTRIBUTION: White, Canary to Analytical Laboratory; Pink to AGI Project Files; Gold to AGI Disposal Files

ncus pm5-Rev 1/96



#### RECEIVED

## DEC 18 2000

#### CAMP DRESSER & MCKEE INC.

#### CERTIFICATE OF ANALYSIS

CLIENT:

CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

12/15/00

CCIL JOB #:

012037

CCIL SAMPLE #:

1

DATE RECEIVED:

12/8/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

SNO. CO. AIRPORT

CLIENT SAMPLE ID:

B-6 2' 12/7/00 1400

#### DATA RESULTS

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		12/13/00	KAS

- "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
   DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
   LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
- \*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY



CLIENT:

CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

12/15/00

CCIL JOB #:

012037

CCIL SAMPLE #:

2

DATE RECEIVED:

12/8/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

SNO. CO. AIRPORT

CLIENT SAMPLE ID:

B-6 2'6" 12/7/00 1430

#### **DATA RESULTS**

ANALYTE METHOD RESULTS\* UNITS\*\*

ACTION ANALYSIS ANALYSIS BY

TPH-SEMIVOLATILE RANGE NWTPH-DX 400 MG/KG

12/13/00 KAS

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY SOLTROL 170 OR SIMILAR PRODUCT

- "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
   DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
   LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
- \*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY:



CLIENT: CAMP DRESSER & MCKEE INC.

DATE: 12/

12/15/00

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #:

012037

BELLEVUE, WA 98005

CCIL SAMPLE #:

2/0/00

DATE RECEIVED:

12/8/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

SNO. CO. AIRPORT

CLIENT SAMPLE ID:

B-7 2' 12/7/00 1515

#### DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	7,7,75	TION EL***	ANALYSIS DATE	ANALYSIS BY	
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG			12/13/00	KAS	

- "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
   DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
   LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
- " UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY:



CLIENT: CAMP DRESSER & MCKEE INC.

BELLEVUE, WA 98005

0.4

12/15/00

11811 N.E. FIRST ST., SUITE 201

DATE: 12/2 CCIL JOB #: 01

012037

CCIL SAMPLE #:

4

DATE RECEIVED:

12/8/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

SNO. CO. AIRPORT

CLIENT SAMPLE ID:

B-7 2'6" 12/7/00 1545

#### DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		12/13/00	KAS

- "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 25 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
- \*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY



CLIENT: CAMP DRESSER & MCKEE INC.

DATE: 12/15/00

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #: 012037

BELLEVUE, WA 98005

DATE RECEIVED: 12/8/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

SNO. CO. AIRPORT

#### QUALITY CONTROL RESULTS

	SURROGATE REC	COVERY		
CCIL SAMPLE ID	ANALYTE	SUR ID		% RECV
012037-01	NWTPH-DX	C25		62
012037-02	NWTPH-DX	C25	*	70
012037-03	NWTPH-DX	C25		74
012037-04	NWTPH-DX	C25		68

#### **BLANK AND DUPLICATE RESULTS**

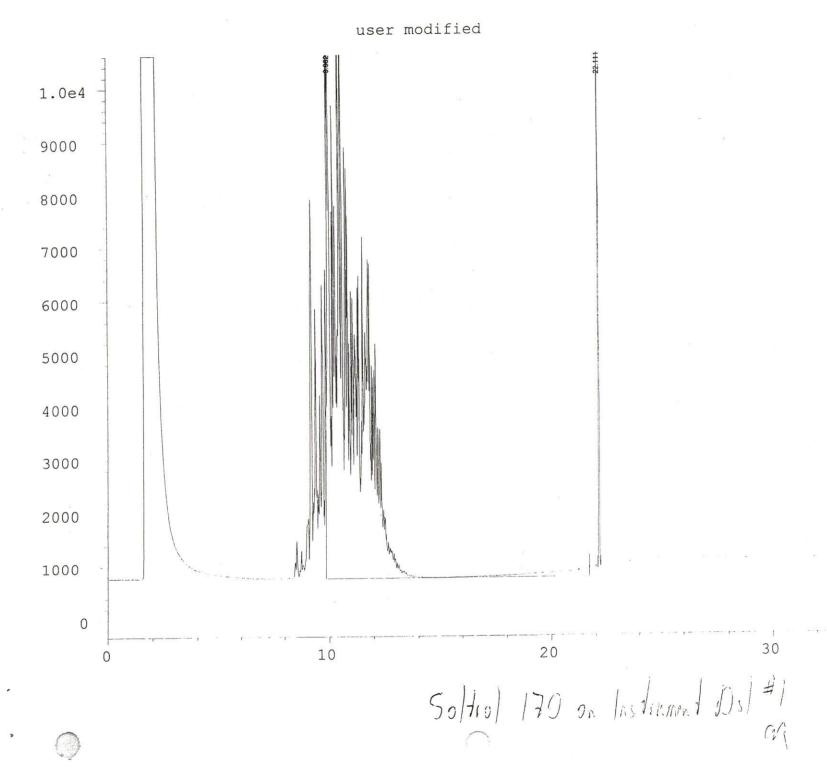
METHOD	BLK RESULT	ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
NWTPH-DX	ND(<25)	012037-01 TO 04	1100	1200	9	SAME

APPROVED BY:\_

External Standard Report Data File Name : D:\HPCHEM\1\DATA\10111601\014F1801.D : kas Page Number Crator Instrument Sample Name

Run Ti-Vial Number : 14 : 011074-1-x Jac 50/10/170 Injection Number: 1 Sequence Line : 18 Run Time Bar Code: Instrument Method: TDMO0700.MTH Acquired on : 17 Nov 00 08:27 PM Analysis Method : TPHD0700.MTH Report Created on: 15 Dec 00 10:41 AM Sample Amount : 0 Last Recalib on : 10 NOV 00 12:38 PM ISTD Amount : 1 Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10111601\014F1801.D Ret Time Area Type Width Ref# mg/l 9.982 699480 MM 0.686 1 263.703 Diesel #2 2.111 24169 MM T 0.028 1 8.465 nC-25 surrogate 22.111

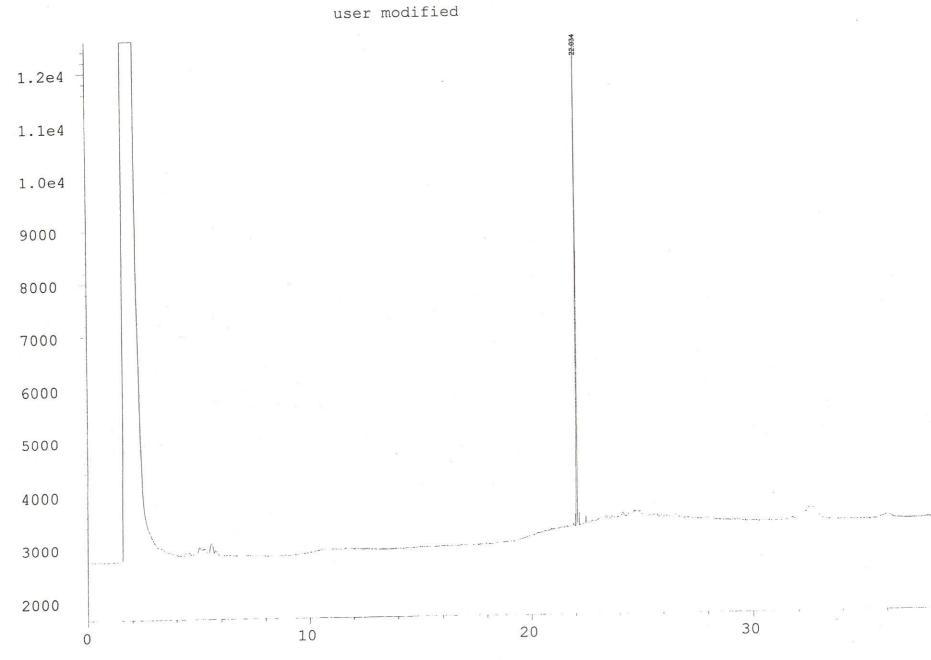
User Modified



External Standard Report Data File Name : D:\HPCHEM\1\DATA\10121201\017F0801.D Page Number Or rator : kas Vial Number : DIESEL #1 Instrument Injection Number: 1 : 012037-1 Sample Name Sequence Line : 8 Run Time Bar Code: Instrument Method: TDMO0700.MTH Acquired on : 13 Dec 00 01:36 AM Analysis Method : TPHD0700.MTH Report Created on: 13 Dec 00 12:28 PM Last Recalib on : 10 NOV 00 12:38 PM Sample Amount ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10121201\017F0801.D Name Ret Time Area Type Width Ref# mg/l Diesel #2 13.377 \* not found \* 1 6.237 nC-25 surrogate 6.7% 22.034 23126 MM T 0.028 1 Not all calibrated peaks were found User Modified

NO D= L25 mg/kg Mo= L50 mg/kg

FEV. 1214 W.



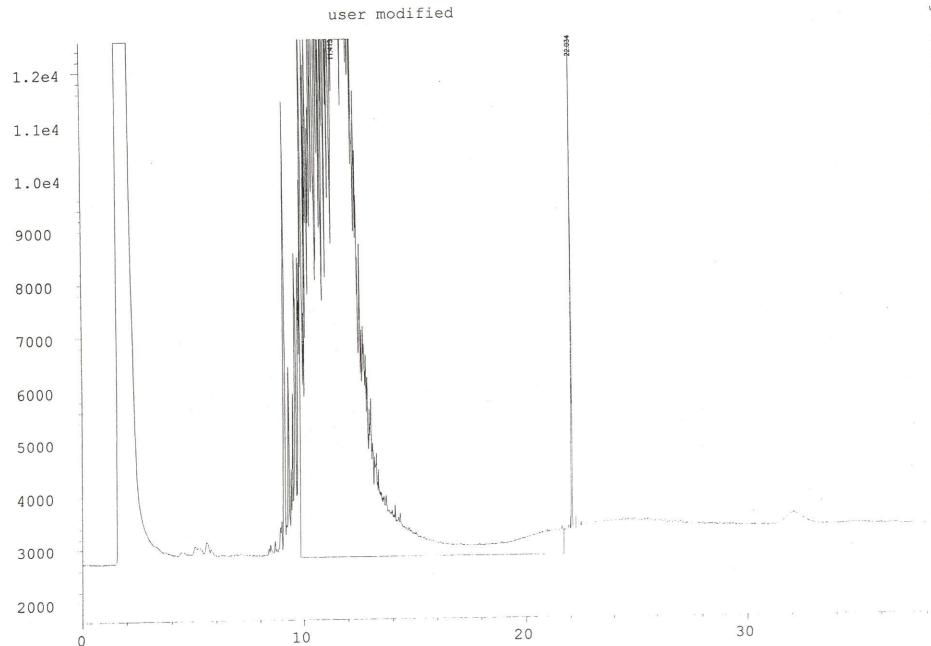
: D:\HPCHEM\1\DATA\10121201\018F0801.D Data File Name Page Number Of rator : kas Vial Number : 18 : DIESEL #1 Instrument Injection Number: 1 : 012037-2 Sample Name Sequence Line : 8 Run Time Bar Code: Instrument Method: TDMO0700.MTH Acquired on : 13 Dec 00 02:20 AM Analysis Method : TPHD0700.MTH Report Created on: 13 Dec 00 12:30 PM Sample Amount Last Recalib on : 10 NOV 00 12:38 PM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10121201\018F0801.D Area Type Width Ref# mg/l Ret Time |-----|----|----|----|----| 2240039 MM 1.081 1 980.796 Diesel #2 6.955 nC-25 surrogate - 10 x 100 = 70 / 25738 MM T 0.028 1 22.034

980.796 mg/1 x 10 ml = CN \ 24.48g = 400mg/kg

DIESEL RANGE Product.

User Modified

12-14-00 KAS



The state of the s		
External	Standard	Report

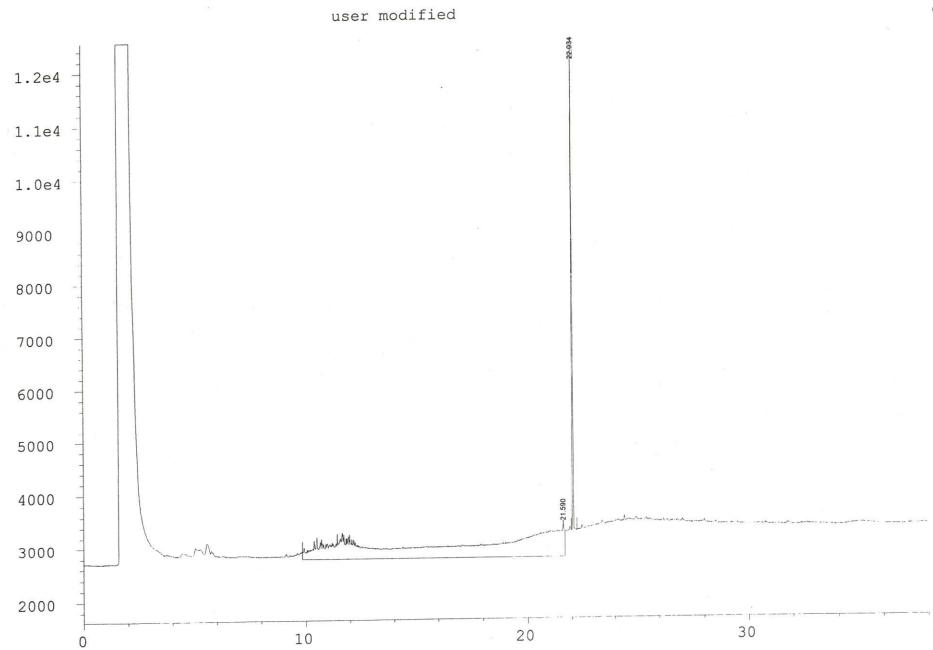
=======================================	
Sample Name : 012037-4  Run Time Bar Code: Acquired on : 13 Dec 00 03:47 AM	F0801.D Page Number : 1 Vial Number : 20 Injection Number : 1 Sequence Line : 8 Instrument Method: TDMO0700.MTH Analysis Method : TPHD0700.MTH Sample Amount : 0 ISTD Amount :
Sig. 1 in D:\HPCHEM\1\DATA\10121201\020F0801.D  Ret Time Area Type Width Ref# mg/l	Name    Diesel #2 nC-25 surrogate 681.

D= Lab mg/kg

User Modified



12-14-00 KAS

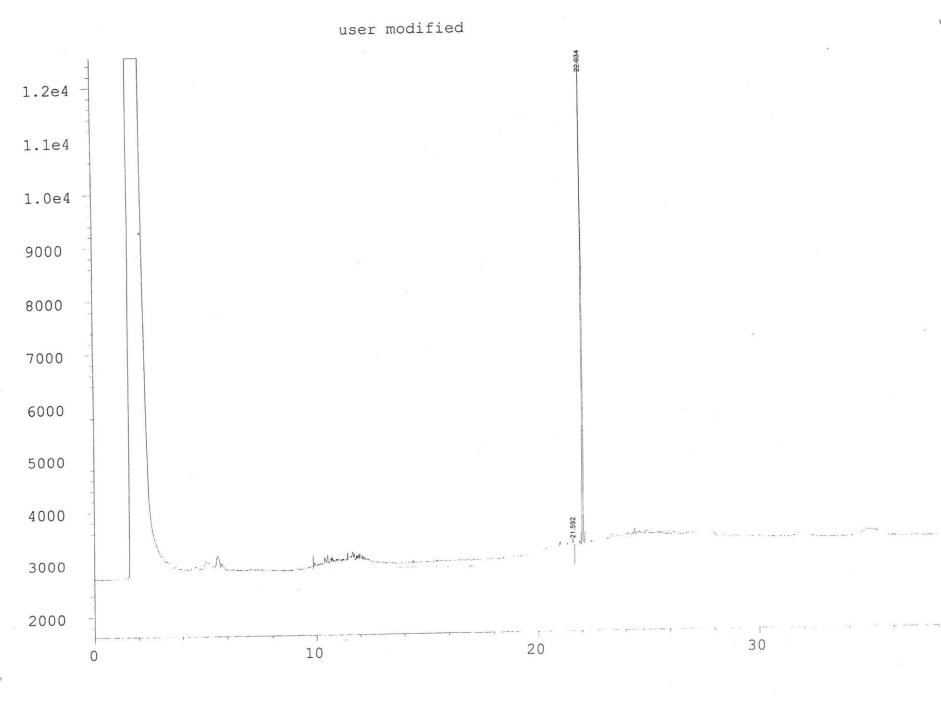


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*	External Standard Rep	port
Trator: Instrument: Sample Name: Run Time Bar Code: Acquired on: Report Created on: Last Recalib on:	DIESEL #1 012037-3	9F0801.D Page Number : 1 Vial Number : 19 Injection Number : 1 Sequence Line : 8 Instrument Method: TDMO0700.MTH Analysis Method : TPHD0700.MTH Sample Amount : 0 ISTD Amount :
Ret Time Area	M\1\DATA\10121201\019F0801.D Type Width Ref# mg/l 	5 Diesel #2
User Modified		

D= L 25mg/kg

121100

12-14-00 KAS





## CHAIN-OF-CUSTODY

Date 2-7-00 Page \_\_\_\_\_\_ of \_\_\_\_\_

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Tab Disposal (					님	2	8.1	8015M Fuel Hydrocarbon	TPH Special Instructions	8020 Aromatic VOCs 8010 Halogenated VOCs	8020M - BETX only	8240 GC/MS Volatiles	8270 GC/MS Semivolatiles	S	latile	8080 OC Pest/PCBs	8080M PCBs only	8150 OC Herbicides	DWS - Herb/Pest	Selected Metals: list	Organic Lead (Ca)	TCL Metals (23)	Maio	DIVIS Metals (VVa)	Motals (Ma)	TCLP - Semivolatiles	Pesticides	tals	7.74				NUMBER OF CONTAINERS
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AGI OFFICE

Bellevue: (425) 453-8383 Portland: (503) 232-1800

Gig Harbor: (253) 851-5562

DISTRIBUTION: White, Canary to Analytical Laboratory; Pink to AGI Project Files; Gold to AGI Disposal Files acus pm5-Rev 1/96



CLIENT: CAMP DRESSER & MCKEE INC.

BELLEVUE, WA 98005

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #:

DATE:

1/3/01

CCIL SAMPLE #:

012115

DATE RECEIVED:

12/27/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

SNO. COUNTY AIRPORT

B-8 2' 12/27/00 1215

DATA RESULTS

ANALYSIS **ANALYSIS** ACTION BY LEVEL\*\*\* DATE **ANALYTE METHOD RESULTS\*** UNITS\*\* MG/KG 12/29/00 KAS TPH-SEMIVOLATILE RANGE **NWTPH-DX** ND

- "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 25 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
- \*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

1/3/01

CCIL JOB #:

012115

CCIL SAMPLE #:

DATE RECEIVED: 12/27/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

SNO. COUNTY AIRPORT

B-8 3' 12/27/00 1300

#### **DATA RESULTS**

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		12/29/00	KAS

- \* "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 25 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
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- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

1/3/01

CCIL JOB #:

012115

CCIL SAMPLE #:

3

DATE RECEIVED:

12/27/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID: CLIENT SAMPLE ID:

SNO. COUNTY AIRPORT

B-9 2' 12/27/00 1012

DATA RESULTS

**ANALYSIS ANALYSIS** ACTION LEVEL\*\*\* DATE BY UNITS\*\* **ANALYTE** METHOD **RESULTS\*** 12/29/00 KAS MG/KG TPH-SEMIVOLATILE RANGE **NWTPH-DX** ND

- "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
   DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
   LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
- \*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: \_



CLIENT: CAMP DRESSER & MCKEE INC. DATE:

1/3/01

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #:

012115

BELLEVUE, WA 98005

CCIL SAMPLE #:

DATE RECEIVED:

12/27/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

SNO. COUNTY AIRPORT

CLIENT SAMPLE ID:

B-9 3' 12/27/00 1040

#### DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	160	MG/KG		12/29/00	KAS

NOTE:

CHROMATOGRAM INDICATES SAMPLE CONTAINS UNIDENTIFIED EARLY DIESEL RANGE PRODUCT

- \* "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 25 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
- \*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
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CAMP DRESSER & MCKEE INC. CLIENT:

DATE:

1/3/01

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #:

012115

BELLEVUE, WA 98005

CCIL SAMPLE #:

12/27/00

DATE RECEIVED:

WDOE ACCREDITATION #:

C142

CLIENT CONTACT:

PAM MORRILL

CLIENT PROJECT ID:

SNO. COUNTY AIRPORT

CLIENT SAMPLE ID:

B-10 2' 12/27/00 1125

#### DATA RESULTS

				ACTION	ANALYSIS	ANALYSIS
ANALYTE	METHOD	RESULTS*	UNITS**	LEVEL***	DATE	ВУ
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		12/29/00	KAS

- \* "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS: DIESEL RANGE REPORTING LIMIT IS 25 MG/KG LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
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APPROVED BY:



CLIENT: CAMP DRESSER & MCKEE INC.

11811 N.E. FIRST ST., SUITE 201

BELLEVUE, WA 98005

DATE:

1/3/01

CCIL JOB #:

012115

CCIL SAMPLE #:

6

DATE RECEIVED:

12/27/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

SNO. COUNTY AIRPORT

CLIENT SAMPLE ID:

B-10 3' 12/27/00 1200

#### **DATA RESULTS**

ANALYTE	METHOD RESULTS*		UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		12/29/00	KAS

- "ND" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

  DIESEL RANGE REPORTING LIMIT IS 25 MG/KG

  LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG
- \*\* UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS
- \*\*\* ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY:



CLIENT: CAMP DRESSER & MCKEE INC.

DATE: 1/3/01

11811 N.E. FIRST ST., SUITE 201

CCIL JOB #: 012115

BELLEVUE, WA 98005

DATE RECEIVED: 12/27/00

WDOE ACCREDITATION #:

C142

CLIENT CONTACT: PAM MORRILL

CLIENT PROJECT ID:

SNO. COUNTY AIRPORT

#### QUALITY CONTROL RESULTS

SURROGATE RECOVERY											
	CCIL SAMPLE ID		ANALYTE	SUR ID			% RECV				
	012115-01		NWTPH-DX	C25			95				
	012115-02		NWTPH-DX	C25			123				
)	012115-03		NWTPH-DX	C25			103				
	012115-04		NWTPH-DX	C25			102				
	012115-05		NWTPH-DX	C25			99				
	012115-06		NWTPH-DX	C25			94				
			BLANK AND DUPLICATE RESULTS								
	метнод .	BLK RESULT	ASSOC SMPLS	DUP RESULT	# ORIG RESULT	%RDP	ASSOC SMPLS				
	NWTPH-DX (DSL)	ND(<25)	012115-01 TO 06	ND(<25)	ND(<25)	****	SAME				
	NWTPH-DX (OIL)	ND(<50)	012115-01 TO 06	ND(<50)	ND(<50)	****	SAME				

\*\*\*\* %RPD NOT REPORTED FOR RESULTS < X5 THE REPORTING LIMIT

: D:\HPCHEM\1\DATA\10122801\035F2101.D ta File Name Page Number operator : kas : 35 Vial Number Instrument : DIESEL #1 Injection Number: 1 : 012115-1 Sample Name Sequence Line : 21 Run Time Bar Code:

Instrument Method: TDM00700.MTH Acquired on : 29 Dec 00 03:36 PM Analysis Method : TDMO0700.MTH Report Created on: 02 Jan 01 10:38 AM

Sample Amount : 0 Last Recalib on : 25 JUL 00 11:34 AM ISTD Amount Multiplier

Sig. 1 in D:\HPCHEM\1\DATA\10122801\035F2101.D Area

Name Type Width Ref# ug/ml |----| 3.567 1 65.781 Diesel #2 21.466 145816 MM 79.643 Motor Oil 204907 MM R 0.206 1 26779 MM T 0.028 1 9.470 nC-25 surrogate 77.((§) 136088 MM

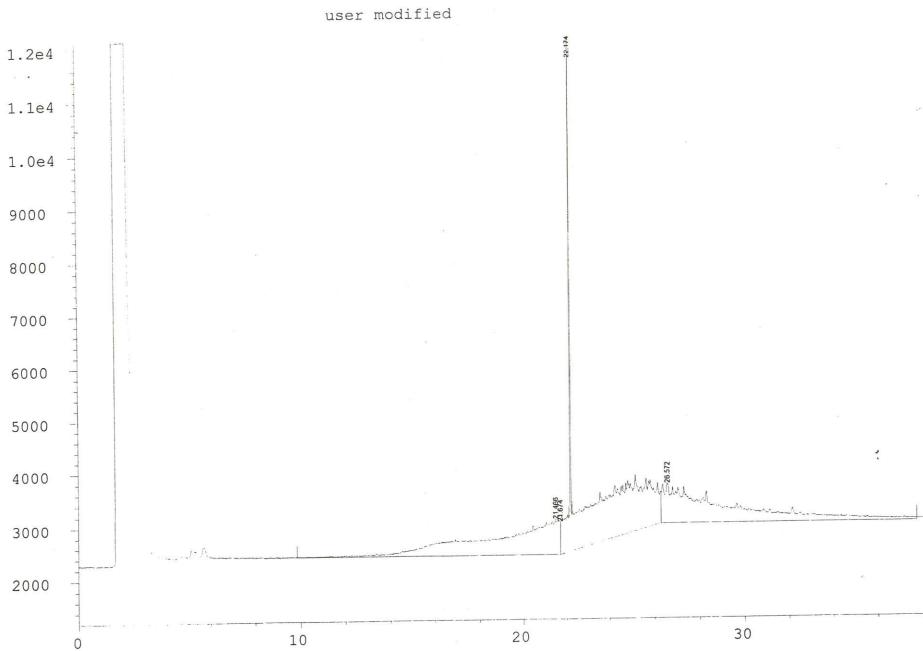
User Modified

21.674

22.174 26.572

D= L25mg/kg
M0= L50mg/kg

eurrogate= 9.470 = 10×100=95%



#### External Standard Report \_\_\_\_\_\_\_

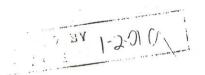
\_\_\_\_\_\_\_\_\_

ta File Name : D:\HPCHEM\1\DATA\10122801\036F2101.D Page Number Operator : kas : 36 Vial Number Instrument : DIESEL #1 Injection Number: 1 : 012115-2 Sample Name Sequence Line : 21 Run Time Bar Code: Instrument Method: TDM00700.MTH : 29 Dec 00 04:19 PM Acquired on Analysis Method : TDM00700.MTH Report Created on: 02 Jan 01 10:40 AM Sample Amount : 0 Last Recalib on : 25 JUL 00 11:34 AM ISTD Amount Multiplier

Sig. 1 in D:\HPCHEM\1\DATA\10122801\036F2101.D Name Ret Time Area Type Width Ref# ug/ml 129266 MM 3.692 1 54.932 Diesel #2 21.673 184821 MM R 0.151 1 71.837 Motor Oil 34011 MM T 0.029 1 12.254 nC-25 surrogate 142447 MM 3.790 1 78.058 Motor Oil {2} 21.677 22.173 26.352

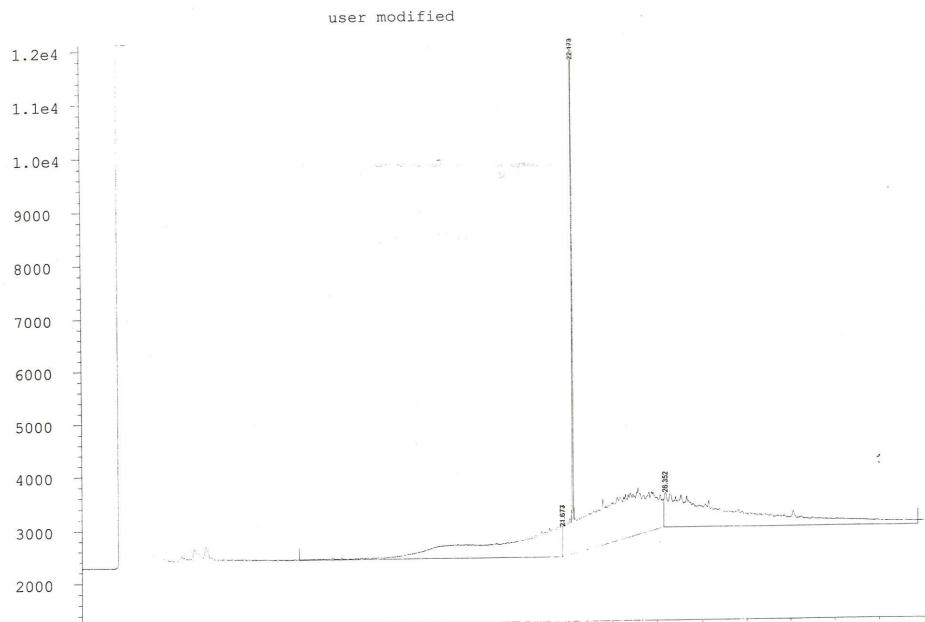
User Modified

D= 225 mg/kg M0= 250 mg/kg



Surregate = 123%

30



20

10

ta File Name : D:\HPCHEM\1\DATA\10122801\037F2101.D Page Number operator : kas Vial Number : 37 Instrument : DIESEL #1 Injection Number: 1 Sample Name : 012115-3 Sequence Line : 21 Run Time Bar Code: Instrument Method: TDM00700.MTH : 29 Dec 00 05:03 PM Acquired on Analysis Method : TPHD0700.MTH Report Created on: 02 Jan 01 10:41 AM Sample Amount : 0 Last Recalib on : 10 NOV 00 12:38 PM ISTD Amount Multiplier

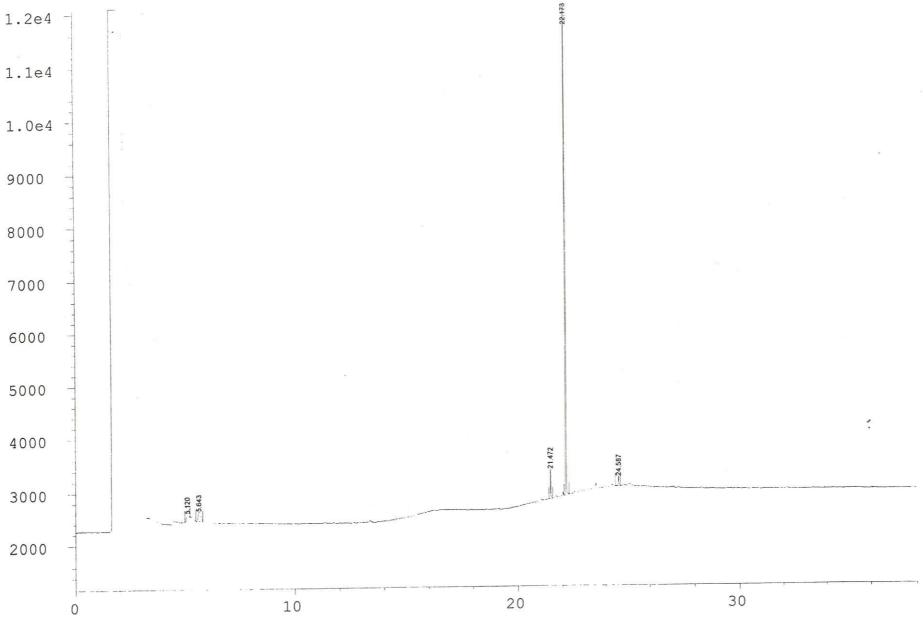
Sig. 1 in D:\HPCHEM\1\DATA\10122801\037F2101.D

Ret Time Area Type Width Ref# mg/l Name

|-----|-----|-----|-----|
13.377 \* not found \* 1 Diesel #2
22.173 28998 PB 0.027 1 10.324 nC-25 surrogate \( \frac{1}{2} 
Not all calibrated peaks were found

ND: D= 225 mg/kg MC= 250 mg/kg

1-2010

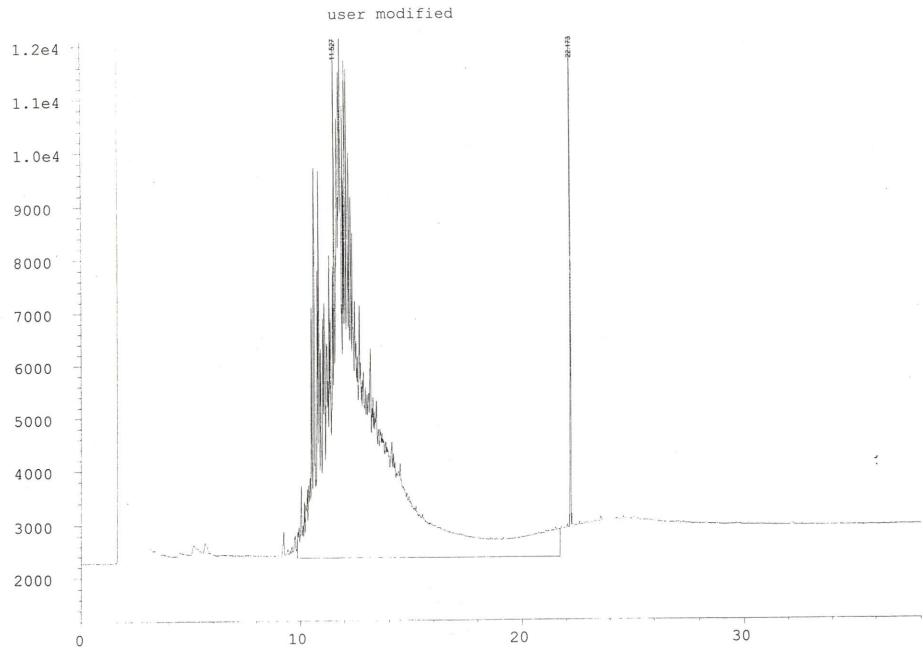


\_\_\_\_\_\_\_ : D:\HPCHEM\1\DATA\10122801\038F2101.D ta File Name Page Number perator : kas Vial Number : 38 : DIESEL #1 Instrument Injection Number: 1 Sample Name : 012115-4 Sequence Line : 21 Run Time Bar Code: Instrument Method: TDMO0700.MTH : 29 Dec 00 05:47 PM Acquired on Analysis Method: TPHD0700.MTH Report Created on: 02 Jan 01 10:43 AM Sample Amount : 0 Last Recalib on : 10 NOV 00 12:38 PM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10122801\038F2101.D Name Ret Time Area Type Width Ref# mg/l |-----|-----|-----|-----|-----1120290 MM 1.297 1 459.580 Diesel #2 10.238 nC-25 surrogate |CZ'/. 28774 MM T 0.029 1

User Modified

459.580 mg/1 x 10ml
28.10g = 160 mg/kg
Midriffed only Diesel nauge product.





External Standard Report : D:\HPCHEM\1\DATA\10122801\040F2501.D ta File Name Page Number operator : kas Vial Number : 40 : DIESEL #1 Instrument Injection Number: 1 : 012115-5 Sample Name Sequence Line : 25 Run Time Bar Code: Instrument Method: TDMO0700.MTH : 29 Dec 00 08:48 PM Acquired on Analysis Method : TPHD0700.MTH

Report Created on: 02 Jan 01 10:44 AM Sample Amount Last Recalib on : 10 NOV 00 12:38 PM ISTD Amount : 1

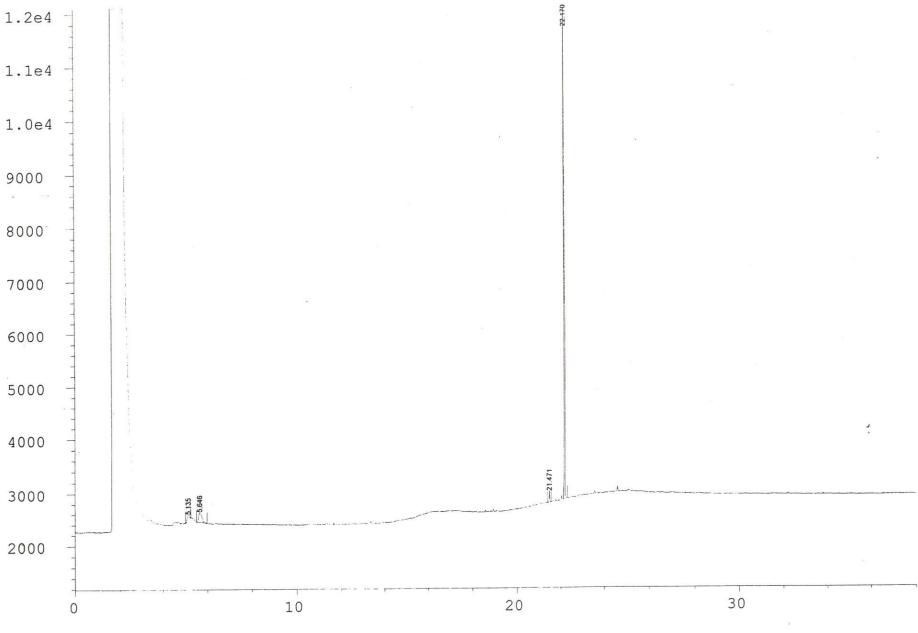
Multiplier

Sig. 1 in D:\HPCHEM\1\DATA\10122801\040F2501.D Name Ret Time Area Type Width Ref# mg/l |-----|-----|-----|-----|-----| 11.527 \* not found \* Diesel #2 9.922 nC-25 surrogate QQ / 27954 BB 0.027 1 22.170

Not all calibrated peaks were found

ND D= L25mg/kg M0= L50mg/kg

1.5.01



ta File Name : D:\HPCHEM\1\DATA\10122801\041F2501.D

reperator : kas Page Number : 1
Instrument : DIESEL #1 Vial Number : 41
Sample Name : 012115-6 Injection Number : 1
Run Time Bar Code: Sequence Line : 25

Acquired on : 29 Dec 00 09:32 PM Instrument Method: TDMO0700.MTH
Report Created on: 02 Jan 01 10:45 AM Analysis Method : TPHD0700.MTH

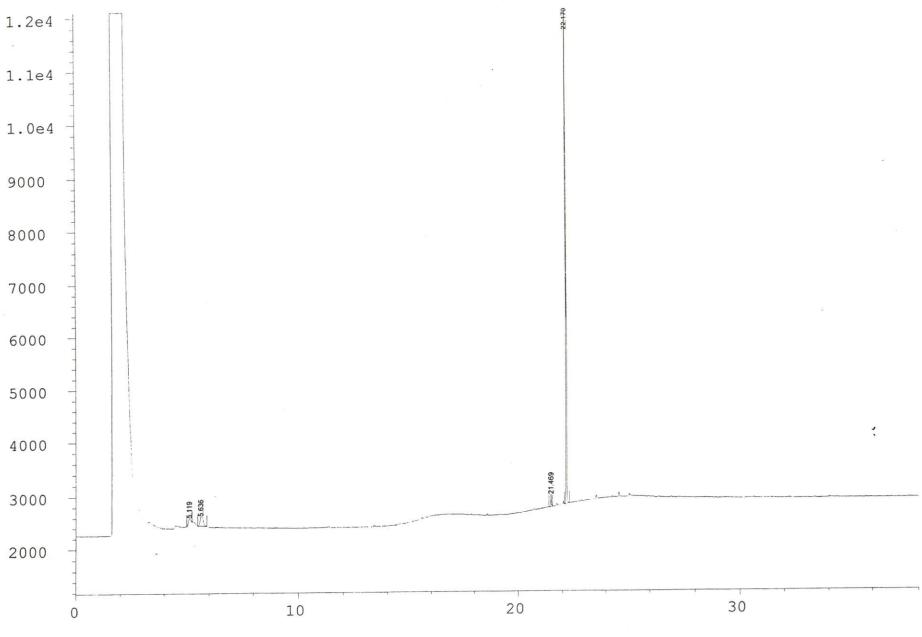
Last Recalib on : 10 NOV 00 12:38 PM Sample Amount : 0 Multiplier : 1 ISTD Amount :

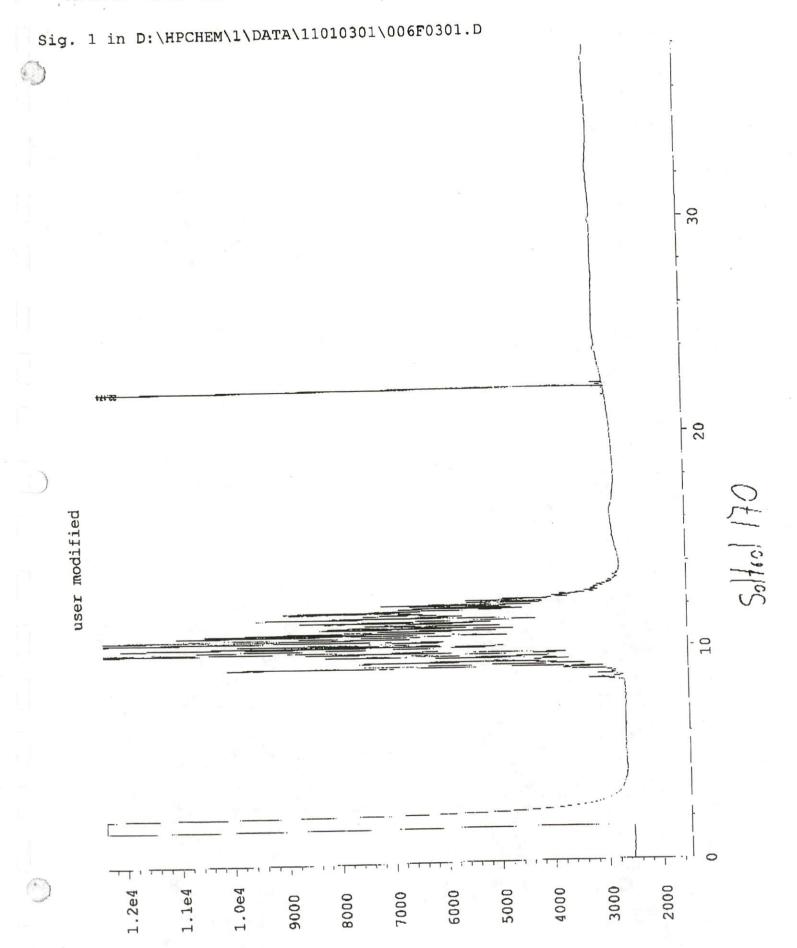
Sig. 1 in D:\HPCHEM\1\DATA\10122801\041F2501.D

Not all calibrated peaks were found

NO: 0= 225 mg/kg MC= 250 mg/kg

TAT 1-2016





## **CHAIN-OF-CUSTODY**

Date 12-27-00 Page 1/ of 1

PROJECT INFORMATION					Laboratory Number:																									
Project Manager: PAM MORRICL										8						AN	ALY	/SIS	RI	EQ	UES	ST			10					
Project Name: SNO, COUNTY ALKRONT					PETROLEUM									S P	PESTS/PCBs				METALS				LEACHING TESTS				OTHER			
Desired Numbers 2000 College III								-			-	1	1 1	[	+-	80	8 6	2 0	Se	Org	70	DV	S T	1					Z	
Site Location: SNUCU AIR Sampled By: MA				TPH-HCID	TPH-G	PH-418	15M	SH	10 H	20 A	40 G	70 G	8310 PAHs	40 P	80 0	80M	400	S S	lecte	ganic	L Me	VS -	SP-	F-	5	TCLP -	15	.	MBE	
DISPO	OSAL INFO	RMATIO	N		SB	TPH-G	18.1	8015M Fuel Hydrocarbon	TPH Special Instructions	8010 Halogenated VOCs	8020 Aromatic VOCs	8240 GC/MS Volatiles	8270 GC/MS Semivolatiles	AHs	8040 PhenoIs	8080 OC Pest/PCBs	8080M PCBs only	8140 OP Pesticides	DWS - Herb/Pest	Selected Metals: list	Organic Lead (Ca)	TCL Metals (23)	DWS - Metals  Priority Poll Metals (13)	MFSP - Metals (Wa)	TCLP - Volatiles (ZHE)	Semivolatiles	Metals	30		NUMBER OF CONTAINERS
🖫 Lab Disposal	(return if not	t indicated	d)		S	2	\$	Hyd	Inst	enate	tic V	V VO	Se		ls	st/P	s onl	sticio	/Pes	tals:	d (Ca	(23)	Moto	als ()	tiles	ivola	Side	3		8
Disposal Method:					State:	State:	State:	roca	ructi	V De	OCs	latile	mivo		and	CBs	٧	des	200	list	a)	100	ole (1	Va)	3HZ	tiles	,			NTA
Disposed by:	Disp	posal Dat	e:			3		rbon	ons	OCs		S	latile		Sem							9	2		۳					NE
	ORMATION	-				State:	2						S		8040 Phenols															S.
□SW-846 □ CLP □		1	M Std. □S		1		`								lles															
SAMPLE ID	DATE	TIME	MATRIX	LAB ID			. 1	-9.			+	-	-	H	-	+	-	+	+	-		+	+	+	Н	$\vdash$	+		++	
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LAB INFORMA	ATION		SAM	PLE REC	EIP	т			F	REL	IN	ວຸບເ	SH	ED	BY:	1.	-	REL		UIS	SHE	D			-			UIS	HED B	Y: 3.
Lab Name: CCT		Tota	Number of C	Containers:					Si	ignati	ure:	1			1/2	73	S	ignatu	re:				Т	ime:	S	Signatu	ire:			Tillie.
Lab Address: EUC	KETT	Chai	in-of-Custody	Seals: Y/N	/NA				Pi	ripled	Nan	e:	1		1	Date:	P	rinted						Date:	P	rinted	Name	9:		Date:
		Intac	t?: Y/N/NA						-	ompa	anv.	11	me	Sp	se.	1	2-10 C	ompa		7_				_	C	Compa	ny:			
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Turn Around Time:	Standard	□ 24 hr	. 🗆 48 hr	. □72 h	ır.						-	REC		ED	BY	:	-	2.	100	1965	190.4	ED	BY:	3.						
PRIOR AUTHO	ORIZATION	IS REQU	JIRED FOR	RUSHE	TAC	Α			S	ignati	ure:			143	30	Time:	: Signature: Time:							Signature: Time:						
Special Instructions:	/		_ /				j		P	rinted	Nam	ne:		10	.27	Date:	P	rinted	Name	1				Date:	P	rinted	Name	<b>9</b> :		Date:
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CDM OFFICES: Bellevue: (206) 453-8383 rev.9/00 Portland: (503) 232-1800 Gig Harbor: (206) 851-5562

DISTRIBUTION: White, Canary to Analytical Laboratory; Pink to CDM Project Files; Gold to CDM Disposal Files

#### External Standard Report : D:\HPCHEM\1\DATA\10120701\092F0401.D Da File Name Page Number Orator : kas Vial Number : 92 : DIESEL #1/ Instrument Injection Number: 1 : 012002-2(x10 Sample Name Sequence Line : 4 Run Time Bar Code: Instrument Method: TPHD0700.MTH : 07 Dec 00 05:12 PM Acquired on Analysis Method : DIESEL1.MTH Report Created on: 07 Dec 00 05:51 PM Sample Amount Last Recalib on : 16 AUG 00 09:39 AM ISTD Amount Multiplier Sig. 1 in D:\HPCHEM\1\DATA\10120701\092F0401.D Name

User Modified

Diesel # 1 or similar out Il pane product

4 DAGE 12 2007

Indoor Air Quality and Subsurface Soil
Investigation
Snohomish County Airport Offices
Snohomish County, Washington

May 22, 2001

NOV 1 5 2001 DEPT OF ECOLOGY

Prepared For:
Snohomish County Airport
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Everett, Washington

Prepared By:
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11811 NE 1st Street, Suite 201
Bellevue, Washington 98005

CDM Project No. 19947-31919.RT