Appendix A 2004 EBA Spill Report

Windy Camp, Nunavut Diesel Fuel Spill Assessment and Remediation report, EBA 2004

MIRAMAR HOPE BAY LTD.

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Date: July 22, 2004

Mr Dave Hohnstein
Technical Advisor – Mining
Nunavut Water Board
PO Box 119
Gjoa Haven, Nunavut X0E 1J0

Dear Mr Hohnstein,

Subject: Interim Report – Windy Lake Fuel Spill – Spill Number 04-388

Please find enclosed the interim report submitted for Spill Number 04-338 as per legislative requirements under NWB Licence No. NWB2HOP0207.

The report will be finalised after receiving comments from your department. A hard copy of the interim report and pictures on CD will be sent to your office via express mail.

Any communication with respect to this interim report would be greatly appreciated preferable in writing to the attention of the undersigned.

Sincerely,

K. Wilson / for

Mr Scott Stringer
Human Resource Superintendent
Miramar Con Mine

Cc: Ken Russell, Environment Canada
Jack Kaniak, KIA Lands Manager
Hugh Wilson, Manager, Environmental Affairs, Miramar Mining Corporation
Matthew Kawei, Senior Environmental Coordinator – Miramar Hope Bay Project

Windy Camp, Nunavut

Diesel Fuel Spill Assessment and Remediation

Submitted to:

Miramar Hope Bay Limited

Prepared by:

EBA Engineering Consultants Ltd.

July, 2004

EBA ENGINEERING CONSULTANTS LTD.

SPILL ASSESSMENT AND REMEDIATION
WINDY CAMP, NUNAVUT

Submitted to:

MIRAMAR HOPE BAY LIMITED

Prepared by:

EBA ENGINEERING CONSULTANTS LTD.

1740065.003

July 2004

EXECUTIVE SUMMARY

OVERVIEW

EBA Engineering Consultants Ltd. (EBA) was retained by Miramar Hope Bay Limited (Miramar) to assess and implement remedial measures concerning hydrocarbon impacted soil and groundwater at Miramar's advanced exploration mining camp at Windy Lake, Nunavut (Windy Camp or "the site").

On or about Wednesday June 16, 2004, approximately 19,000 litres of diesel fuel was reported to have been spilled from a 50,000 litre above ground storage tank (AST) located on-site. Miramar personnel reported the spill to the 24-hr NWT Spill Report Line on June 16, 2004 and the incident was assigned **Spill Number 04-388.**

EBA personnel arrived on-site at approximately 6:30 p.m. on Thursday June 17, 2004. Upon arrival, a site walkover was conducted to assess the nature and extent of the spill incident.

The total surface area affected by the spill on both land and water, was estimated to be in the order of 3,500 m^2.

Containment trenches were excavated to redirect natural surface runoff away from the impacted area, or in the case of impacted runoff, into the containment area on the frozen lake surface.

Hydrocarbon-absorbent booms were installed on the surface of the lake ice and around melt-water pools containing diesel at locations where possible containment breaches could occur. Following installation, the entire perimeter of the containment area was surrounded by absorbent booms. The approximate linear distance of the perimeter of the area was 90 m. The impacted area was located along the shoreline directly down-slope of the storage tanks where the spill incident had occurred. This was done due to displacement of fuel partially by industrial waste lay-down area, which in turn delayed a possible direct flow into Windy Lake.

Free diesel fuel was manually recovered using absorbent pads placed on the surface of the melt-water pools. Coffee cans were also used to skim the diesel fuel from the surface of the melt-water pools and the recovered product was placed into 205 litre barrels for future treatment and

re-use. An estimated 6,700 litres of diesel fuel was collected and stored onsite in barrels and tanks. Miramar personnel indicated that this recovered product will be filtered and re-used.

In addition, approximately 1,000 absorbent pads and 25 absorbent booms were incinerated. Some free product was manually removed from the surface of the melt-water on the ice prior to incineration. Approximately 1,550 litres of diesel fuel was recovered in this manner and stored onsite in above ground tanks. Thus, in total, approximately 8,250 litres of free diesel fuel was recovered by physical means.

Given the remote nature of the site and the need to respond quickly and effectively, EBA recommended that for diesel fuel which had moved down-gradient onto the surface of the melting lake ice, that in situ incineration be employed to eliminate the risk of fuel oil spreading further into the lake water and potentially impacting Windy Lake and its associated aquatic habitats.

Authorization for incineration was obtained from the on-site regulatory authorities before the operation was initiated. The selection of an appropriate time to initiate incineration was critical to the success of the operation due to the nature of the activity. In particular, wind velocity and direction were key factors that needed to be considered.

At 12:30 a.m. on June 20, 2004, when environmental conditions were considered to be ideal for the operation, the free diesel fuel present on the surface of melt-pools on the lake ice was ignited. The approximate volume of free diesel fuel burned off by in situ incineration was estimated to be in the range of 2,750 to 5,500 litres.

In the upland area, hydrocarbon impacted soil was stripped from sites where hydrocarbon odours and staining were detected. The soil was stripped using a D5 CAT Dozer to an approximate depth of 10 cm below surface grade where frozen ground was encountered.

The land treatment area (LTA) was constructed by borrowing material within the footprint of the stripped area. The construction of the berms for the LTA required the removal of an additional 20 cm (approximate) of soil. The LTA was lined using 60 mil high density polyethylene (HDPE) liner underlain by native soil consisting of silty sand. The surficial area of the land treatment area (inside corners used for measurement) is 600 m^2. Approximately 100 m^3 of hydrocarbon-impacted soil was placed into the LTA.

A surface runoff interception trench was also constructed to reduce the risk of hydrocarbon migration from any residual source areas into Windy Lake. Approximately 25,000 litres of water was pumped from the interception trench, firebreak and various pools and puddles throughout the impacted and processed and pumped to the camp's RBC sewage treatment facility located to the northwest of the impacted site.

Water samples were collected from the camp tap, lake inlet and lake outlet for monitoring purposes. All samples returned laboratory analysis results below detection limits and applicable guidelines.

RECOMMENDATIONS

Soil within the LTA should be cleared of all large objects, segregated based on the date the material was placed in the LTA, and periodically aerated to promote remediation.

All water captured in the catch basins installed at the southeast corner of the interception trench should be removed and treated prior to discharge.

Diesel fuel-impacted soil located immediately below the tank was not excavated due to the proximity of the tank and the concern that, by removing the material, the soil stability could be compromised, resulting in damage to the tank. Therefore, it is recommended that this area be dewatered using a series of diversion trenches installed upslope to control surface runoff through the area. The impacted soil in this area should also be covered with waterproof material prior to snowfall to further limit melt water migration through the soil. These methods are recommended until such time as the soil can be safely excavated and placed into the LTA for remediation.

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1.0 INTRODUCTION

1.1 General

EBA Engineering Consultants Ltd. (EBA) was retained by Miramar Hope Bay Limited (Miramar) to assess and implement remedial measures concerning hydrocarbon impacted soil and groundwater present at Miramar's advanced exploration mining camp at Windy Lake, Nunavut (Windy Camp or "the site").

A request from Mr. J. Stard, Manager of Miramar, on June 16, 2004, was made to EBA to dispatch personnel to respond to a diesel fuel spill at Windy Camp. On June 17, 2004, EBA mobilized staff to site to assess the situation and initiate remedial and mitigation activities as required.

The work conducted was conducted consistent with the terms of EBA's Environmental Report – General Conditions, provided in Appendix A.

1.2 Site Location and Description

Windy Camp is situated in western Nunavut, east of Bathurst Inlet within the Hope Bay Greenstone Belt (Figure 1). It is located within the zone of continuous permafrost at approximately 68°03'99.1" north and 106°36'55.6" east.

The site consists of an approximate 100-person camp constructed for support services directed towards exploration activities. The camp is situated on the slope of the eastern bank of Windy Lake. The lakeshore is approximately 50 m distant toward the west and the regional gradient surrounding the camp ranges from approximately 2% to 20% towards the west. The camp is approximately 400 metres (m) in length from north to south and 100 m wide from east to west, covering an area of 40,000 m^2. The camp facilities are located on natural tundra underlain by a 10 cm organic layer overlying silty-sand parent material. In high traffic areas, no organic material was present.

A site plan depicting the layout of the camp is presented in Figure 2. The northern portion of the camp consists of a series of tents and wooden structures that comprise the sleeping and eating quarters. The camp has the capacity to accommodate approximately 100 personnel. Located immediately south of the sleeping quarters are a series of tents

and wooden structures used for offices and a core logging area. Three above-ground storage tanks (AST), containing diesel fuel, are located south of the offices and have a capacity of 50,000 and 70,000 litres. A barrel storage area (approximately 200 drums of Jet-B fuel) is located to the northeast (upslope) of the ASTs. A second area, southeast of the ASTs, is used for storage of approximately 80 barrels of gasoline.

The camp is serviced by a RBC sewage treatment facility which is located northwest of the site. The discharge from this unit is directed to an upland area situated north of the camp.

Solid wastes generate from the camp are segregated with food and paper products being incinerated within the camp incinerator. Wood and metal wastes are stored in the southern-most area of the camp. The wood is periodically burned.

Potable water is obtained from Windy Lake with the freshwater intake being located directly west of the camp buildings.

1.3 Description of Spill Incident

On or about Wednesday June 16, 2004 approximately 19,000 litres of diesel fuel was reported to have been spilled from a 50,000 litre above ground storage tank (AST) located on-site. Miramar personnel reported the spill incident to the 24-hour NWT Spill Report Line on June 16, 2004, and the incident was assigned Spill Number 04-388. A copy of the spill report is presented in Appendix B.

1.4 Site Conditions at Time of Arrival

EBA personnel (Messrs. Brent Murphy and Steven Taylor) arrived on-site at approximately 6:30 p.m. on Thursday June 17, 2004. Upon arrival, a site walkover was conducted to assess the spill incident. The following observations were made:

- Booms, containment barriers and absorbent pads had been installed on the frozen lake surface around melt-water pools.
- Approximately 0.25 cm to 6 cm of free diesel fuel was present on the nearshore ice surface and melt-water pools of Windy Lake, within the area of the containment booms.

- The thickest area of diesel fuel was located on the southwest side of the containment area (approximately 10% of the total area) as a result of wind blowing from the northeast.
- Solid lake ice was present around and below the melt-water pools containing free diesel fuel.
- Containment booms were installed at the edge of the ice, surrounding the diesel fuel.
- Barrels and plastic basins, full of diesel/water saturated absorbent pads, were located on the ice and shoreline surrounding the containment area.
- Several drainage interception trenches, approximately 10 cm deep, were excavated on the bank with absorbent booms installed within.
- Soil with diesel fuel odours was found to be present, extending from the 50,000 litre AST to the shoreline area located down-gradient.
- The spill pathway appeared to pass directly below a collection of stored debris and drums located on-site.
- Water with noticeable hydrocarbon sheen was observed draining (at a rate of less that one litre per minute) into the lake outside of the containment area.
- Surface runoff up-gradient of the spill was migrating though the spill area.

1.5 Scope of Reporting

This report provides a summary of the work completed at the site and a description of remedial and mitigation measures implemented.

Soil quality analytical test results for benzene, toluene, ethylbenzene and xylenes (BTEX) concentrations were compared to Canadian Council of Ministers of the Environment Guidelines for parkland usage (CCME 2001). Concentrations of petroleum hydrocarbon (PHC) fractions F1 to F4 in soil were compared to (CCME Canada-Wide Standards for Petroleum Hydrocarbons in Soil (CWS) for coarse-grained soil in parkland areas (CCME 2001).

Water quality analytical test results for BTEX concentrations were compared to CCME Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life, (CCME 2001). Although no guidelines currently exist in Nunavut for PHC concentrations in water, for reference purposes, the concentrations of PHC F1 and F2 were analyzed to confirm hydrocarbon removal during water treatment.

2.0 INITIAL RESPONSE

2.1 Spill Area Site Survey

The site was surveyed on June 17, 2004 by EBA and Miramar to determine the surficial area of diesel fuel impacts on both land and water.

2.1.1 Land

The surveyed boundary for the impacted area on the land was based upon EBA's visual identification of diesel fuel within the soil or surface drainage network. The estimated surficial area of hydrocarbon impacts on land was 2,400 m^2 as illustrated in Figure 3.

2.1.2 Water

The boundary of the impacted area of melt-water located on the surface of the Windy Lake ice was delineated by the location of the booms and containment barriers installed by Miramar personnel. The surficial area of melt-water on the ice surface was estimated at 1,100 m^2.

The total area, both on land and water affected by the spill was estimated to be 3,500 m^2.

2.2 Runoff Containment Trench Construction

A runoff containment trench was excavated using a Kubota 320 to redirect surface runoff into the diesel fuel containment area that extended onto the lake ice surface. The location of the trench is shown on Figure 3.

2.3 Watershed Diversion

Hand-excavated trenches were installed up-gradient of the spill location to re-direct surface runoff away from the diesel-impacted area therefore preventing further transport of diesel fuel onto the still frozen lake ice..

3.0 PRIMARY REMEDIATION

3.1 Installation of Containment Booms in Melt-water pools

Hydrocarbon-absorbent booms were installed around diesel fuel-impacted melt-water pools located on the surface of the nearshore lake ice in areas where possible containment breaches could occur. Following installation, the entire perimeter of the containment area was surrounded by absorbent booms. The approximate linear distance of the perimeter of the area was 90 m. The impacted area was located along the shoreline directly down-slope of the storage tanks where the spill incident had occurred.

3.2 Skimming of Free Diesel Fuel

Free diesel fuel was manually recovered using absorbent pads that were placed on the surface of the melt-water pools. Once the pads became saturated, they were wrung out to remove excess fluids and then re-used. Coffee cans were also used to skim free product from the surface of the melt-water pools and the recovered product was placed into 205 litre barrels for future treatment and re-use. The volumes of the contents of the barrels were measured and the data are presented in Table 1.

Approximately 6,700 litres of free diesel fuel was collected and stored on-site in barrels and tanks. Miramar personnel had indicated that the recovered fuel will be filtered and re-used.

3.3 In Situ Incineration of Diesel Fuel in Melt-Water Pools

Given the remote nature of the site and the need to respond quickly and effectively, EBA recommended that in situ incineration be employed on the lake ice surface to eliminate the risk of diesel fuel spreading further into the lake water and potentially impacting the lake and its associated aquatic habitats.

Prior to implementing in situ incineration, a firebreak was excavated along the adjacent shoreline to a depth of 10 cm, where frozen ground was encountered, to prevent potential flame migration up the slope. Two soil samples were collect and stored in laboratory-

provided Teflon-lined jars, placed in coolers and maintained at 4°C until shipment to Enviro-Test Laboratories (ETL) in Edmonton, Alberta, for hydrocarbon analysis to determine if hydrocarbon migration had occurred into the frozen ground. The requested analytical suite included benzene, toluene, ethylbenzene, xylenes (BTEX) and petroleum hydrocarbon fractions F1 to F4 (PHC F1 to F4). Shipment was completed via Air North using accepted Chain of Custody protocols. The locations of the firebreak and sample points are shown in Figure 3.

Table 1 summarizes the soil analytical results. Laboratory analytical results for soil samples A1 and A2 recorded BTEX and PHC F1 to F4 concentrations below detection limits and applicable guidelines. Complete laboratory analytical reports and results are presented in Appendix C.

At 12:30 a.m. on June 20, 2004, after obtaining authorization from the on-site regulatory authorities, and when the environmental conditions were observed to be ideal, the free diesel fuel present in the contained melt-water pool area located on the frozen lake surface was ignited. The initial point of ignition was located along the northwest perimeter of the contained area. Following ignition, the flames swept over the entire containment area at a rate of approximately 125 cm per minute and terminated at the western corner, by the shoreline, at 1:30 a.m. on June 20, 2004. Based on the estimated surveyed area (1,100 m^2) and the observed heating oil thickness (0.25 to 0.5 cm average) in the melt-water on the lake ice surface, the approximate volume of free diesel fuel product that was consumed during incineration was estimated at between 2,750 to 5,500 litres.

4.0 SECONDARY REMEDIATION

4.1 Incineration of Used Hydrocarbon-Absorbent Material

All used absorbent materials were hand squeezed to remove diesel fuel and water and incinerated in barrels. Approximately 1,000 absorbent pads and 25 absorbent booms were incinerated. All free diesel fuel was physically removed prior to incineration. Approximately 1,550 litres of diesel fuel was recovered and stored onsite in above ground tanks. Thus, in total, approximately 8,250 litres of free diesel fuel was recovered by physical means.

4.2 Use of Skimmer Unit for Residual Diesel Fuel Removal

A skimmer unit was transported to site and an attempt was made to recover residual diesel fuel following the in situ incineration operation. However, as a result of the successful incineration activity, only hydrocarbon sheens remained on the surface of the melt-water pools. These residual sheens appeared to originate from the shoreline and, the skimmer unit was ineffective at removing these very thin (<1μ) sheens. Hydrocarbon-absorbent booms were installed in the melt-water pools, along the shoreline to contain the migration of sheens.

4.3 Removal of Impacted Soil and Landfarm Construction

The area topographically down-gradient of the storage tank was the primary location of diesel-related hydrocarbon impacts to the soil.

The hydrocarbon-impacted soil was stripped from the area where hydrocarbon odours and staining were detected. The soil was stripped using a D5 CAT Dozer to an approximate depth of 10 cm below surface grade where frozen ground was encountered.

Soil with noticeable hydrocarbon impacts surrounding the tanks was not excavated due to the proximity of the tanks and the concern that, by removing the material, the soil stability would be compromised and result in damage to the tank. A composite soil sample from the tank farm area was collected from four sub-sample locations, randomly chosen, to determine the amount of residual hydrocarbons in the vicinity of the tanks. A soil sample was also collected from a location where the diesel fuel on the soil appeared to be most concentrated (worst case2). The samples were submitted, as described in Section 3.3, for laboratory analysis of BTEX and PHC F1 to F4 concentrations.

Table 2 summarizes the soil analytical results. As expected, soil sample worst case2 recorded hydrocarbon concentrations significantly higher than applicable guidelines. However, the composite soil sample for the tank area recorded hydrocarbon concentrations lower than applicable guidelines.

Following removal of the hydrocarbon-impacted soil, soil samples (B1 to B6) were collected at six locations, shown on Figure 3, throughout the area and submitted for laboratory analysis of BTEX and PHC F1 to F4, as described in Section 3.3.

Table 2 summarizes the soil analytical results. Laboratory analytical results for soil sample B2 recorded a PHC F3 concentration higher than the applicable guideline. Soil samples B1 and B3 to B6 recorded BTEX and PHC F1 to F4 concentrations lower than applicable guidelines. Complete laboratory analytical reports and results are provided as Appendix C.

After the collection of samples B1 to B6, the berms for the land treatment area (LTA) were constructed by borrowing material within the footprint of the previously stripped area. The construction of the berms required the removal of an additional 20 cm (approximate) of soil. Once the berms were constructed, six soil point samples (C1 to C6) were collected and submitted to ETL, as described in Section 3.3, for analysis of BTEX and PHC F1 to PHC F4 concentrations. One composite soil sample was collected from the six sub samples location (C1 to C6) and submitted to ETL, as above, for grain size analysis.

Table 2 summarizes the soil analytical results. Laboratory analytical results for soil sample C4 recorded PHC F2 concentration higher than the applicable guideline (150 mg/kg). Soil samples C1 to C3, C5 and C6 recorded BTEX and PHC F1 to F4 concentrations below applicable guidelines. Grain size analysis of the composite soil sample indicate that the material is coarse-grained. Complete laboratory analytical reports and results are provided as Appendix C.

The LTA was constructed using a 60 mil high density polyethylene (HDPE) liner underlain by native soil consisting of silty sand. The LTA was surveyed on June 27, 2004 and is illustrated Figure 3. An as-built diagram is provided as Figure 4. The surficial area of the land treatment area (inside corners used for measurement) is 600 m^2.

The estimated volume of soil placed into the LTA was 100 m^3.

4.4 Completion of Surface Runoff Interception Trench

A surface runoff interception trench was constructed to reduce the risk of hydrocarbon migration from any residual source areas into Windy Lake. The trench was excavated to a depth of approximately 1 m, lined on the down-gradient wall and base with hydrocarbon resistant high-density polyethylene (HDPE) liner and backfilled with the excavated material. A catch basin was installed at the southeast corner. The basin, consisting of a 205 litre drum with holes drilled along the sides, will allow for water to be pumped out, deterring further migration of hydrocarbons by creating a flow gradient towards the basin and the removal of potentially impacted water. An as-built diagram of trench construction is provided as Figure 5.

4.5 Water Treatment and Discharge

Approximately 25,000 litres of water was pumped from the interception trench, firebreak and various pools and puddles throughout the impacted area and processed using an FII Oil Absorption System supplied by Terry Ruddy Sales of Edmonton, Alberta. The water was first pumped into 1,400 litre capacity basins for coarse sediment removal then processed though the system. Following treatment, the water was pumped to the camp's RBC sewage treatment facility located to the northwest of the site. The discharge from this unit was directed to an area situated north of the camp.

To verify the effective removal of hydrocarbons from system operation, water samples were collected daily during. Water samples were collected prior to and following treatment. All water collected samples were in laboratory-provided containers, stored in coolers at 4°C and transported by courier to ETL, for analysis. The requested analytical suite included BTEX, PHC F1 and PHC F2 concentrations.

Table 3 summarizes the process water analytical results. The results indicate that BTEX, PHC F1 and F2 concentrations, already below the applicable guidelines prior to treatment, had been further reduced by processing through the treatment unit. Complete laboratory analytical reports and results are provided in Appendix C.

All spent media from the water treatment unit was placed within the LTA as recommended by the supplier.

4.6 Lake Inlet and Outlet Sampling

Water samples were collected and stored, as described in Section 4.5, from the lake inlet and outlet for monitoring purposes. The samples were analyzed for BTEX, PHC F1 and F2 concentrations. Both samples returned laboratory analysis below detection limits and applicable guidelines. Complete laboratory analytical reports and results are provided in Appendix C.

4.7 Camp Tap Water Sampling

Water samples were collected and stored, as described in Section 4.5, from the kitchen tap and analyzed for BTEX, PHC F1 and F2 concentrations to determine if hydrocarbons are present in the camp water supply. All tap water samples returned laboratory analytical result below detection limits and applicable guidelines. Complete laboratory analytical reports and results are provided in Appendix C.

5.0 CONCLUSIONS AND DISCUSSION

As indicated in the spill report submitted by Miramar (spill # 04-388) approximately 19,000 litres of hydrocarbons were released on or about June 16, 2004-07-13.

Approximately 8,250 litres of free diesel fuel was recovered using mechanical means. Between 2,750 and 5,500 litres of diesel fuel was successfully burned off by *in situ* incineration.

A land treatment area (LTA) was constructed for the treatment of approximately 100 m^3 of hydrocarbon-impacted soil.

Approximately 25,000 litres of water was collected from various locations, treated using an activated carbon system and discharged to the camp grey water discharge.

6.0 RECOMMENDED ON-GOING REMEDIATION AND MONITORING

A remediation action plan should be developed to address the following issues:

6.1 Mechanical Aeration of Soil Within Landfarm

Soil within the LTA should be cleared of all large objects, segregated based on the date the material was placed in the LTA, and periodically aerated to promote remediation.

6.2 Continued Treatment of Contained Water

All water captured in the catch basins installed at the southeast corner of the interception trench should be removed and treated prior to discharge.

6.3 Containment of Remaining Impacted Soil Surrounding the ASTs

Diesel fuel-impacted soil located immediately below the tank was not excavated due to the proximity of the tank and the concern that, by removing the material, the soil stability could be compromised, resulting in damage to the tank. Therefore, it is recommended that this area be dewatered using a series of diversion trenches installed upslope to control surface runoff through the area. The impacted soil in this area should also be covered with waterproof material prior to snowfall to further limit melt water migration through the soil. These methods are recommended until such time as the soil can be safely excavated and placed into the LTA for remediation.

7.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please do not hesitate to contact the undersigned directly.

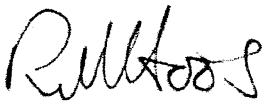
EBA Engineering Consultants Ltd.

Prepared by:

Steve Taylor, B.Sc., Geol.I.T.
Environmental Scientist
Environmental Practice
(Direct Line: (780) 451-2130, ext. 260)

/dln

Reviewed by:



Richard Hoos, M.Sc., R.P. Bio.
Principal Scientist
Arctic Practice
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TABLES

TABLES

Table 1
Contents of Barrels with Recovered Liquids
Fuel Spill Remediation
WindyCamp, Nunavut

Barrel #	Total Liquid	Water
1	83	44
2	84	44
3	84	40
4	78	11
5	82	39
6	80	42
7	76	57
8	79	50
9	83	46
10	86	52
11	78	63
12	79	52
13	73	57
14	83	61
15	79	18
16	78	69
17	81	74
18	77	62
19	83	61
20	83	47
21	76	69
22	77	44
23	80	69
24	78	47
25	74	45
Subtotals:	1994	1263

Barrel #	Total Liquid	Water
26	81	48
27	80	38
28	79	69
29	79	49
30	77	66
31	86	7
32	82	23
33	82	0
34	82	0
35	81	57
36	79	64
37	83	51
38	80	35
39	82	52
40	80	26
41	80	0
42	84	0
43	82	48
44	87	56
45	86	85
46	76	66
47	83	75
48	82	0
49	0	0
50	80	0
	1953	915

Barrel #	Total Liquid	Water
51	22	0
52	59	0
53	0	0
54	59	0
55	10	0
56	9	0
57	9	0
58	50	0
59	83	0
60	78	0
61	80	15
62	80	2
63	80	0
64	83	0
65	82	0
66	82	7
67	83	0
68	84	0

1033	24

Notes:
Liquid and Water measurements in cm

Calculations:

Total Liquid:	4980 cm		
Total Water	2202 cm		
Total Hydrocarbons:	2778 cm	at 85 cm/barrel =	32.68 barrels
		at 205 litres/barrel =	**6700 Litres of Liquid Hydrocarbons**

Table 2
Soil Analytical Results
Fuel Spill Remediation
WindyCamp, Nunavut

Parameters	Units	June 19, 2004			June 26, 2004						Guideline	
		Worst Case	A1	A2	B1	B2	B3	B4	B5	B6		Value
Benzene	mg/kg	<0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	CCME	0.5
Toluene	mg/kg	<0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	CCME	0.1
Ethylbenzene	mg/kg	<0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	CCME	0.1
Total Xylenes (o,m & p)	mg/kg	<0.06	<0.01	0.03	<0.01	0.06	<0.01	<0.01	<0.01	<0.01	CCME	0.1
Fraction 1 (C_6-C_{10})(-BTEX)	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	CWS	30
Fraction 2 (C_{10}-C_{16})	mg/kg	<5	<5	<5	<5	110	49	<5	12	<5	CWS	150
Fraction 3 (C_{16}-C_{34})	mg/kg	240	<5	13	<5	**990**	32	19	24	16	CWS	400
Fraction 4 (C_{34+})	mg/kg	220	21	<5	11	430	<5	5	<5	<5	CWS	2800
Soil Moisture Content	%	73	20	20	16	21	19	17	19	18	NC	NC

Parameters	Units	June 30, 2004									Guideline	
		C1	C2	C3	C4	C5	C6	Worst Case2	Tank Area	Composite		Value
Benzene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01		CCME	0.5
Toluene	mg/kg	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	0.1	<0.01		CCME	0.1
Ethylbenzene	mg/kg	<0.01	<0.01	<0.01	<0.01	0.1	<0.01	0.04	<0.01		CCME	0.1
Total Xylenes (o,m & p)	mg/kg	<0.01	<0.01	0.07	<0.01	1.1	<0.01	**0.21**	<0.01		CCME	0.1
Fraction 1 (C_6-C_{10})(-BTEX)	mg/kg	<5	<5	<5	<5	25	<5	37	<5		CWS	30
Fraction 2 (C_{10}-C_{16})	mg/kg	22	<5	<5	**170**	140	<5	**190000**	100		CWS	150
Fraction 3 (C_{16}-C_{34})	mg/kg	13	27	27	26	28	13	**46000**	160		CWS	400
Fraction 4 (C_{34+})	mg/kg	8	10	10	11	10	5	**5300**	33		CWS	2800
Soil Moisture Content	%										NC	NC
Particle Size Analysis (hydrometer)												
MUST PSA D50 > 75 um	%									71	NC	NC

Notes:
Canadian Council of Ministers of the Environment (CCME). 2001. Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life (FAL).
NC - No criteria established by Alberta Environment.
Blank - Not analyzed.
Bold - Greater than established criteria

Table 3
Water Analytical Results
Fuel Spill Remediation
WindyCamp, Nunavut

		Tap		Lake Samples										Guideline	
		Kitchen	Kitchen	North		South		Spill		Inlet	Outlet			FAL	
Parameters	Units	20-Jun-04	30-Jun-04	20-Jun-04	30-Jun-04	20-Jun-04	30-Jun-04	20-Jun-04	30-Jun-04	30-Jun-04	30-Jun-04			Year	Value
Benzene	mg/kg.	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			2001	0.37
Toluene	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			2001	0.002
Ethylbenzene	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			2001	0.09
Total Xylenes (o, m & p)	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0019	<0.0005	<0.0005	0.0005			2001	0.18
Fraction 1 (C_6-C_{10})(-BTEX)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			NG	NG
Fraction 2 (C_{10}-C_{16})	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.85	0.09	<0.05	<0.05			NG	NG

		Water Treatment												Guideline	
		4pm Before	4pm After	2pm Before	2pm After	1pm Before	1pm After	11am Before	11am After	11am Before	11am After			FAL	
Parameters	Units	22-Jun-04	22-Jun-04	23-Jun-04	23-Jun-04	24-Jun-04	24-Jun-04	25-Jun-04	25-Jun-04	27-Jun-04	27-Jun-04			Year	Value
Benzene	mg/kg	<0.0005	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			2001	0.37
Toluene	mg/kg	<0.0005	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			2001	0.002
Ethylbenzene	mg/kg	<0.0005	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005			2001	0.09
Total Xylenes (o, m & p)	mg/kg	0.0040	<0.0005	-	<0.0005	<0.0005	<0.0005	0.0013	<0.0005	0.0017	<0.0005			2001	0.18
Fraction 1 (C_6-C_{10})(-BTEX)	mg/kg	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			NG	NG
Fraction 2 (C_{10}-C_{16})	mg/kg	0.79	0.19	0.80	<0.05	4.6	0.06	2.0	0.06	0.98	<0.05			NG	NG

Notes:
Results compared to Canadian Council of Ministers of the Environment (CCME). 2001. Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life (FAL).
NG - No Guidelines Established
Blank - Not analyzed.
Bold - Greater than established criteria

FIGURES

FIGURES

Figure 1

Site Location

1740065003L02A.cdr

eba

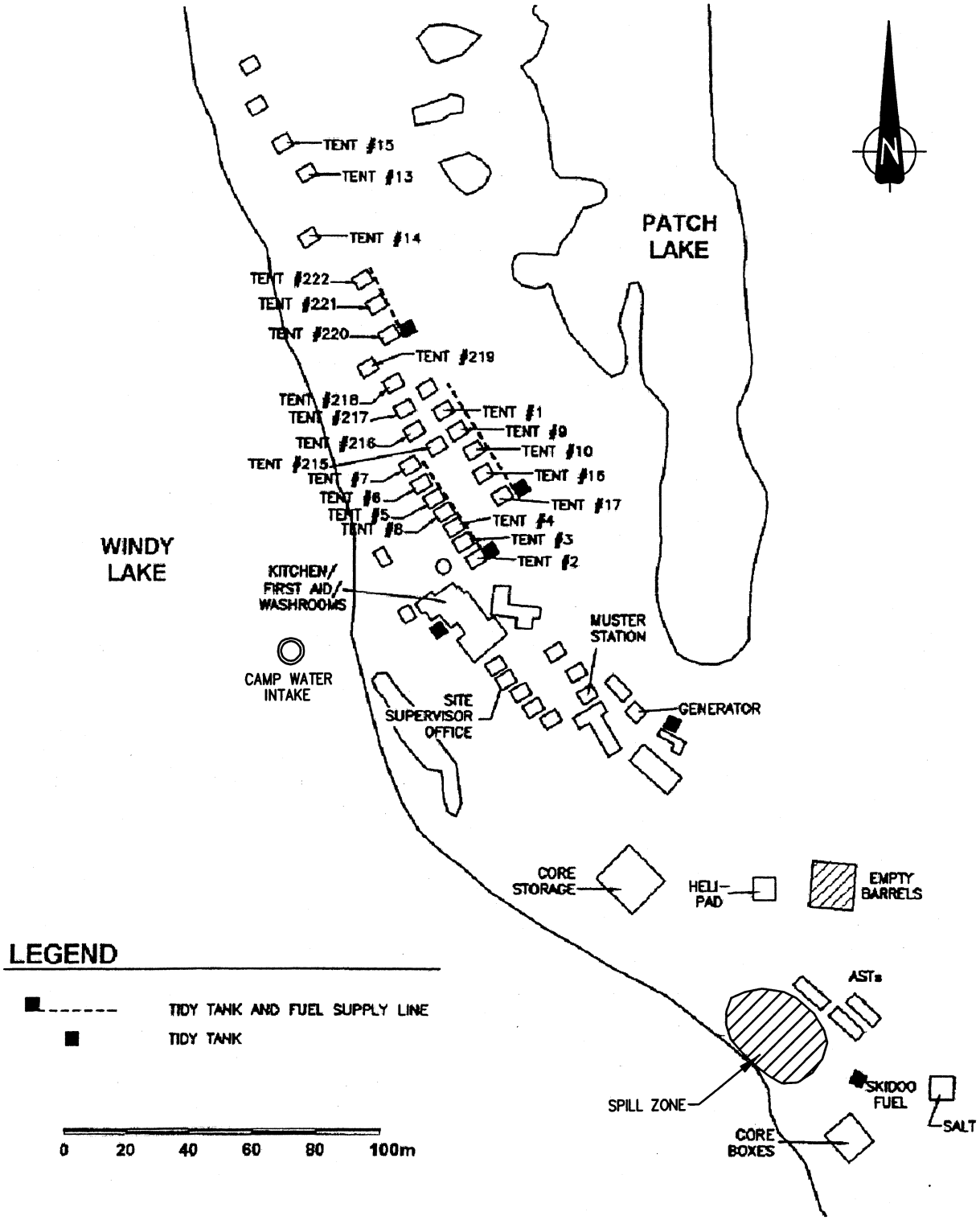


Figure 2
Site Plan
Windy Camp Site

DRAWING PROVIDED BY KOMEX INTERNATIONAL LTD. DWG. NO. WL-2004

1740065003L02B.dwg

eba

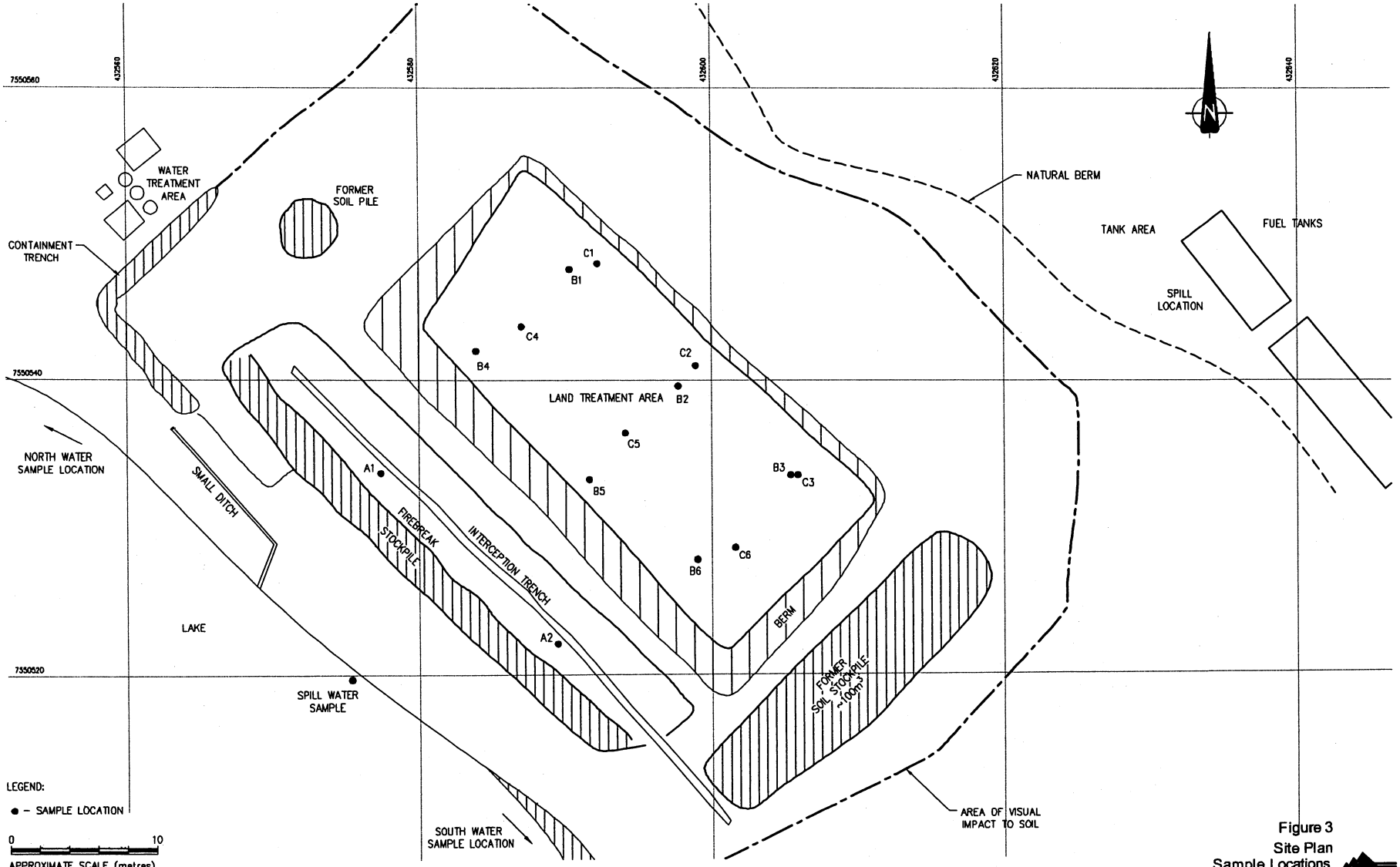
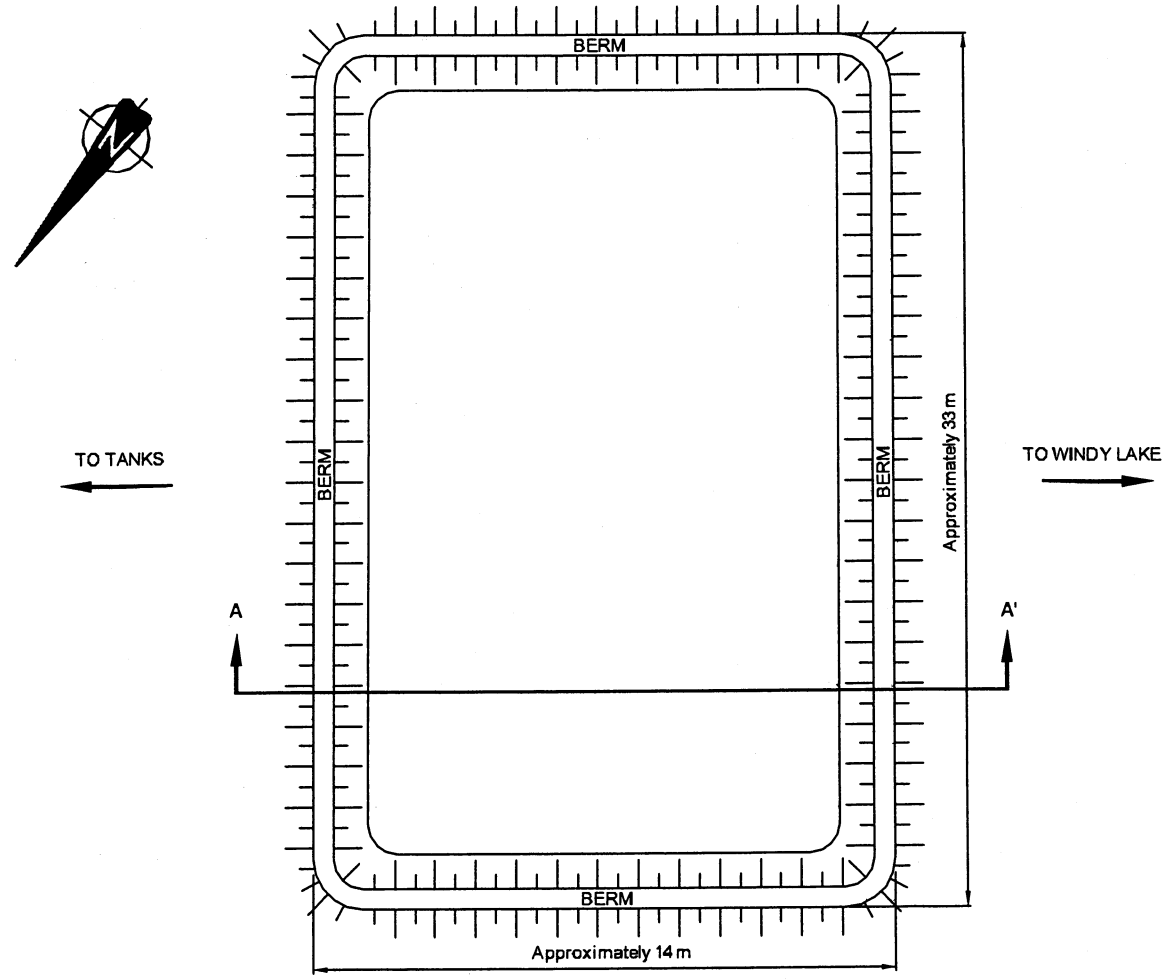


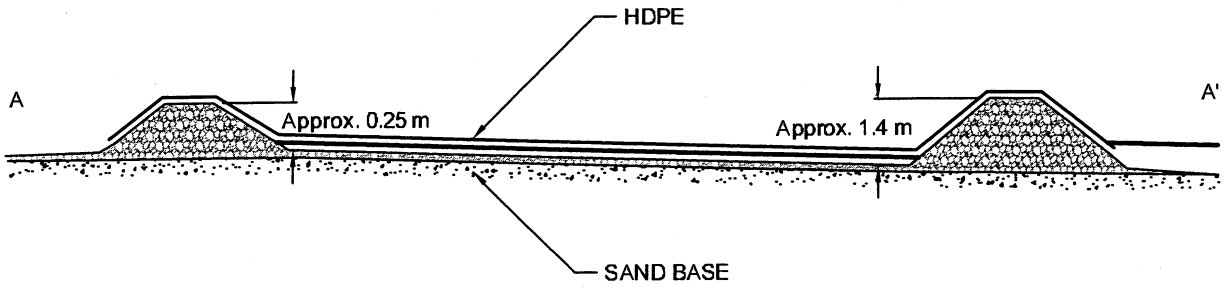
Figure 3
Site Plan
Sample Locations

1740065003L01C.dwg

eba



Plan View

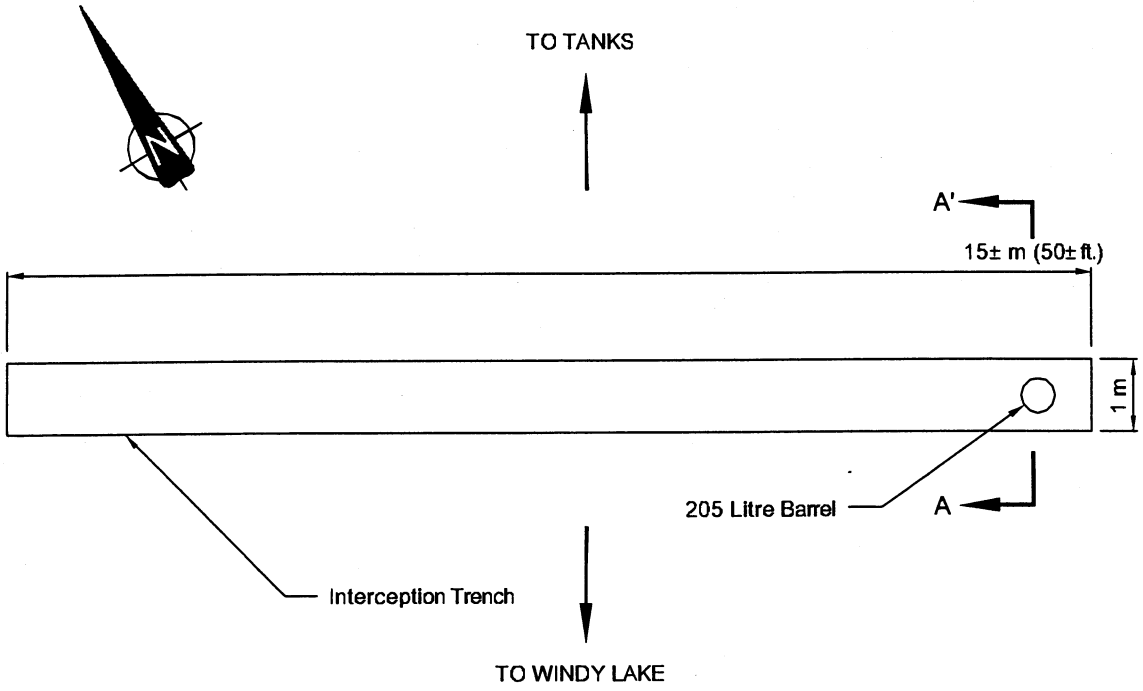


Cross-Section A-A'

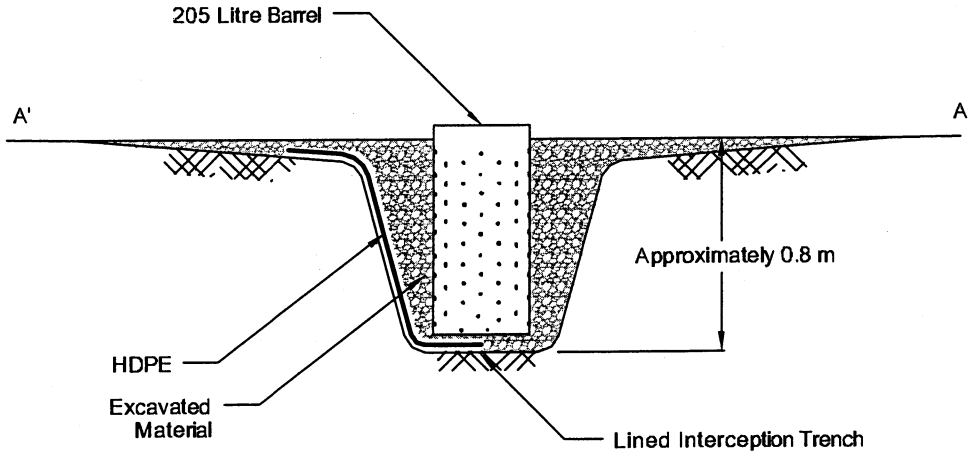
Figure 4
As Built of
Land Treatment Area

Not To Scale

1740065003Q02a.dwg



Plan View



Cross-Section A-A'

Figure 5
Proposed As Built
Interception Trench

Not To Scale

1740065003Q01a.dwg

PHOTOGRAPHS

Photo 1
Spill area at the time of EBA's arrival.

Photo 2
Spill area hours after EBA's arrival.

Photo 3
Water surface prior to in situ incineration.

Photo 4
Removal of liquid hydrocarbon, using absorbent pads, prior to in situ incineration.

Photo 5
Incineration of used hydrocarbon-absorbent material.

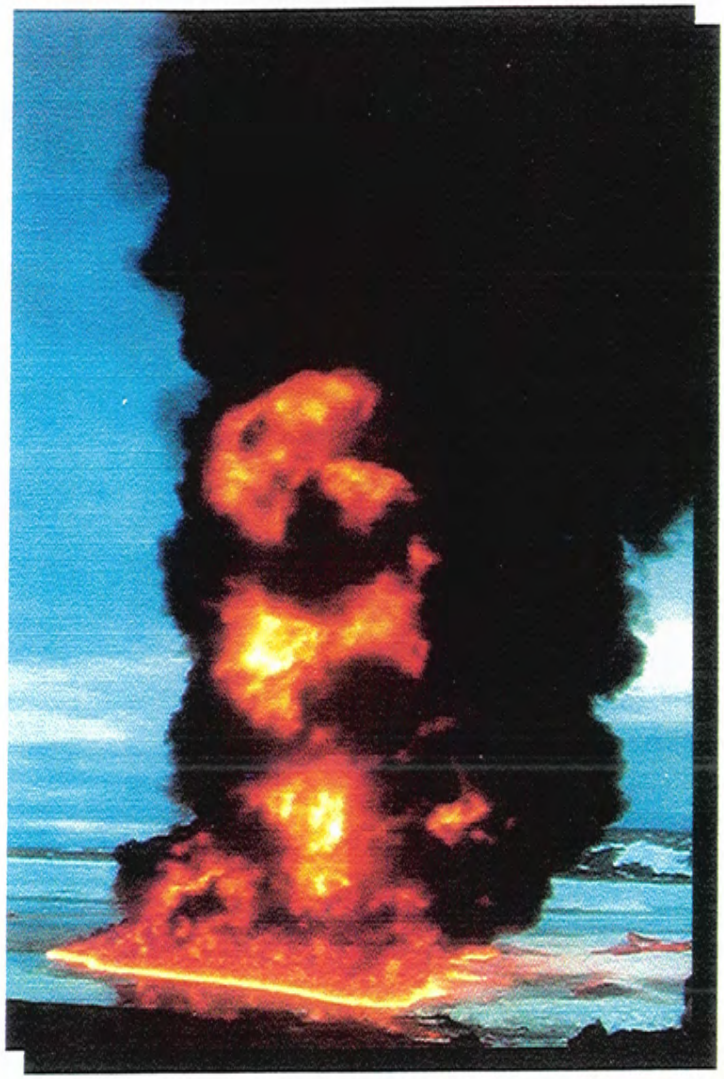


Photo 6
In situ incineration of liquid hydrocarbons on surface of water.

Photo 7
In situ incineration of liquid hydrocarbons on surface of water.

Photo 8
In situ incineration of liquid hydrocarbons on surface of water.

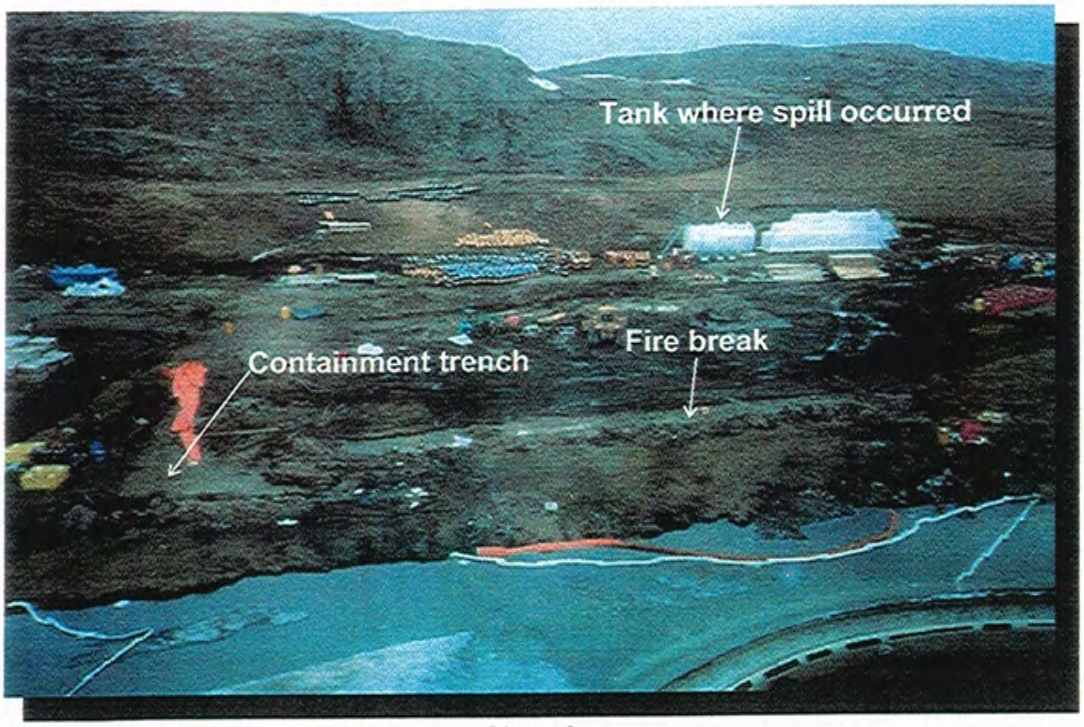


Photo 9
Aerial photo of spill area.

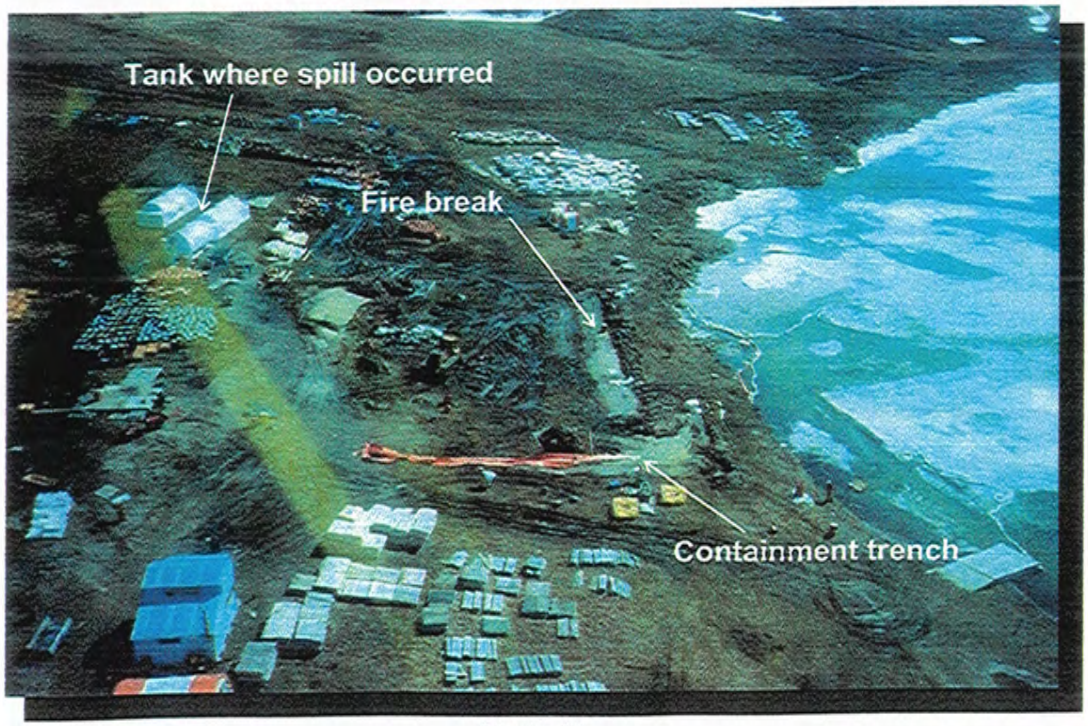


Photo 10
Aerial photo of spill area.

Photo 11
Removal of water within firebreak for treatment and disposal.

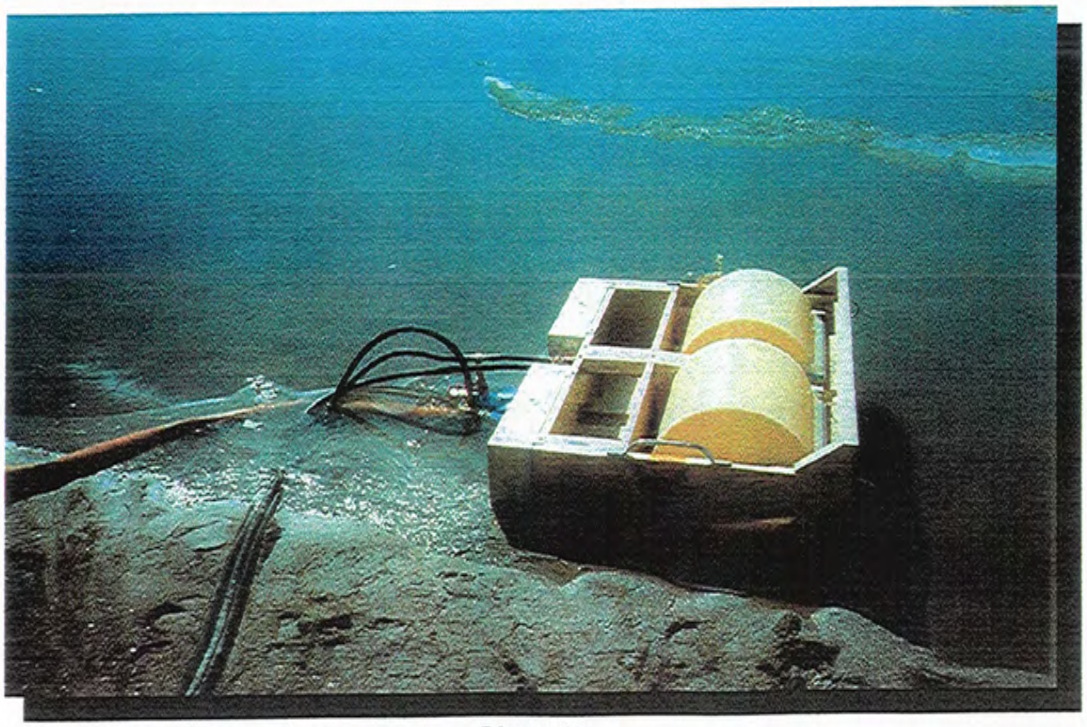


Photo 12
Skimmer used for attempted removal of liquid hydrocarbons on surface of water.

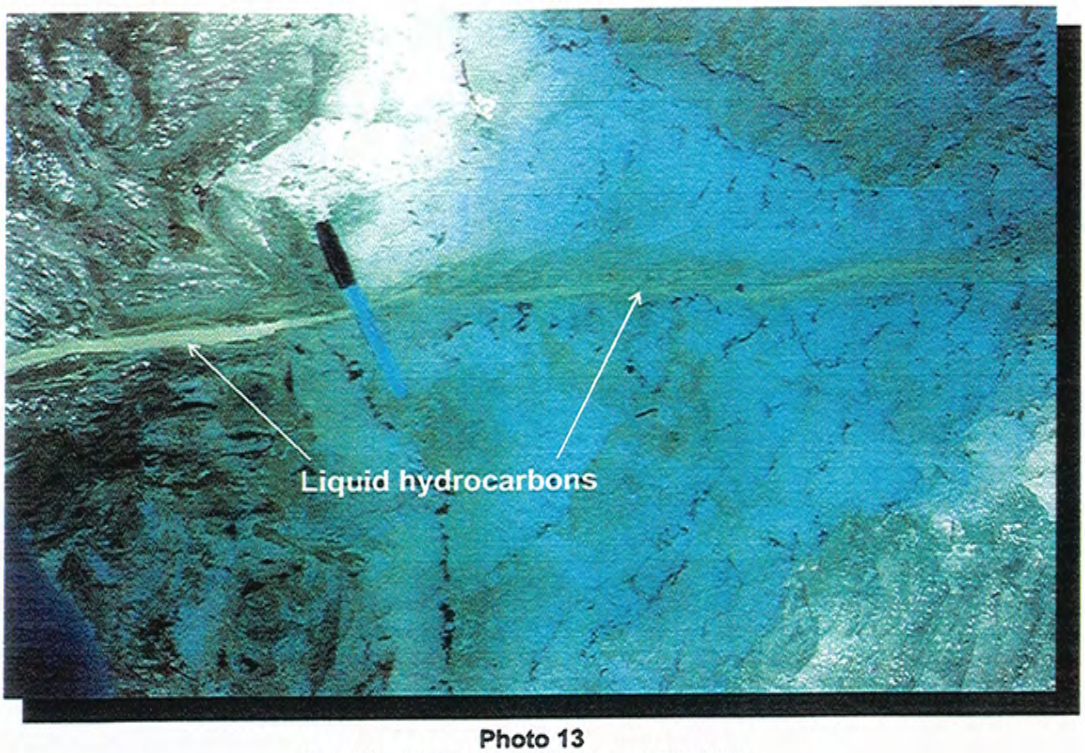


Photo 13
Liquid hydrocarbons within cracks of ice.

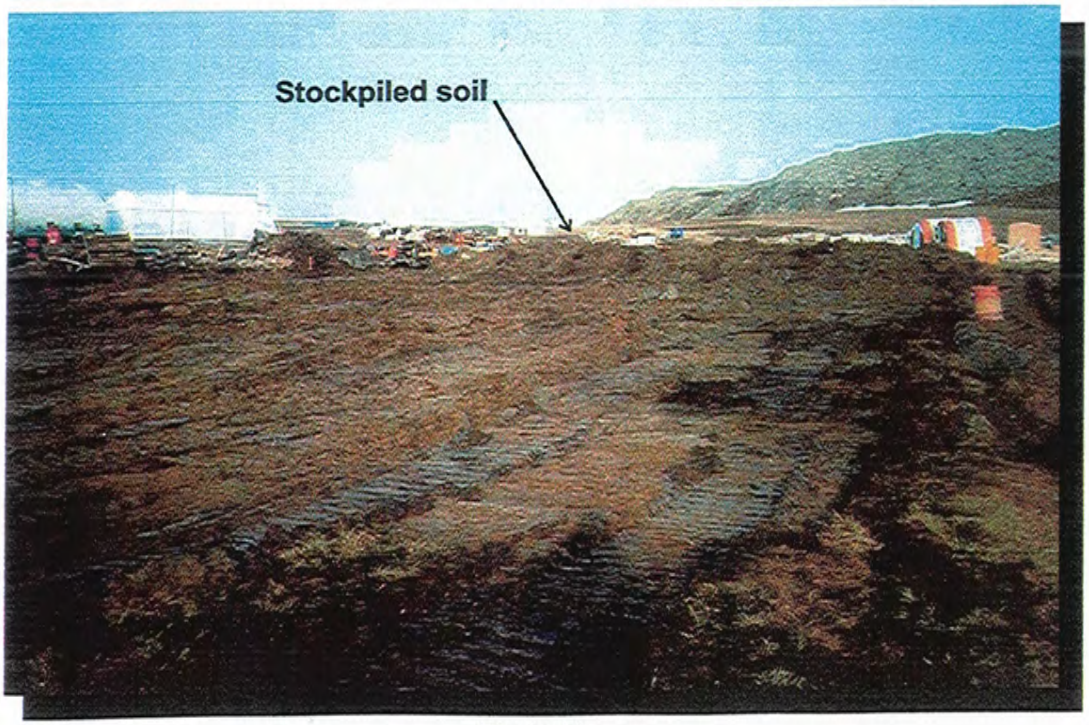


Photo 14
Spill area with impacted soil removed and stockpiled.

Photo 15
Land treatment area.

Photo 16
Placement of impacted soil within land treatment area.

Photo 17
Excavation of drainage trench around land treatment area.

Photo 18
Water treatment system.

APPENDIX A

APPENDIX A

EBA TERMS AND CONDITIONS

EBA Engineering Consultants Ltd. (EBA)
ENVIRONMENTAL REPORT – GENERAL CONDITIONS

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report, and the assessments and recommendations contained in it, are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 LIMITATIONS OF REPORT

This report is based solely on the conditions that existed on-site at the time of EBA's investigation. The client, and any other parties using this report with the express written consent of the client and EBA, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

The client, and any other party using this report with the express written consent of the client and EBA, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site, and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The client acknowledges that EBA is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

2.1 Information Provided to EBA by Others

During the performance of the work and the preparation of this report, EBA may have relied on information provided by persons other than the client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the client, EBA accepts no responsibility for the accuracy or the reliability of such information that may affect the report.

3.0 LIMITATION OF LIABILITY

The client recognizes that property containing contaminants and hazardous wastes creates a high risk of claims brought by third parties arising out of the presence of those materials. In consideration of these risks, and in consideration of EBA providing the services requested, the client agrees that EBA's liability to the client, with respect to any issues relating to contaminants or other hazardous wastes located on the subject site shall be limited as follows:

(1) With respect to any claims brought against EBA by the client arising out of the provision or failure to provide services hereunder shall be limited to the amount of fees paid by the client to EBA under this Agreement, whether the action is based on breach of contract or tort;

(2) With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject site, the client agrees to indemnify, defend and hold harmless EBA from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor-client costs, arising or alleged to arise either in whole or part out of services provided by EBA, whether the claim be brought against EBA for breach of contract or tort.

4.0 JOB SITE SAFETY

EBA is only responsible for the activities of its employees on the job site and is not responsible for the supervision of any other persons whatsoever. The presence of EBA personnel on-site shall not be construed in any way to relieve the client or any other persons on-site from their responsibility for job site safety.

5.0 DISCLOSURE OF INFORMATION BY CLIENT

The client agrees to fully cooperate with EBA with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The client acknowledges that in order for EBA to properly provide the service, EBA is relying upon the full disclosure and accuracy of any such information.

6.0 STANDARD OF CARE

Services performed by EBA for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Engineering judgment has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

7.0 EMERGENCY PROCEDURES

The client undertakes to inform EBA of all hazardous conditions, or possible hazardous conditions which are known to it. The client recognizes that the activities of EBA may uncover previously unknown hazardous materials or conditions and that such discovery may result in the necessity to undertake emergency procedures to protect EBA employees, other persons and the environment. These procedures may involve additional costs outside of any budgets previously agreed upon. The client agrees to pay EBA for any expenses incurred as a result of such discoveries and to compensate EBA through payment of additional fees and expenses for time spent by EBA to deal with the consequences of such discoveries.

8.0 NOTIFICATION OF AUTHORITIES

The client acknowledges that in certain instances the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

9.0 OWNERSHIP OF INSTRUMENTS OF SERVICE

The client acknowledges that all reports, plans, and data generated by EBA during the performance of the work and other documents prepared by EBA are considered its professional work product and shall remain the copyright property of EBA.

10.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EBA shall be the original documents for record and working purposes and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EBA shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

The Client recognizes and agrees that electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

APPENDIX B

APPENDIX B

NWT SPILL REPORT

MIRAMAR CON MINE, LTD.
Box 2000
Yellowknife, NT X1A 2M1
TELEPHONE: (867) 766-5300
FAX: (867) 873-6357

FAX COMMUNICATION COVER PAGE

DATE: July-12-04
NO. OF PAGES: 2
(Including Cover Page)
TO: EBA ENGINEERING
FAX NUMBER: (780)454-5688
ATTENTION: STEVE TAYLOR
FROM: SCOTT
SUBJECT: SPILL REPORT
ORIGINALS TO FOLLOW BY MAIL: YES_____ NO ✓

REMARKS:

STEVE PLEASE SEE ATTACHED SPILL REPORT AS PER YOUR REQUEST.

SCOTT

ANY PROBLEMS WITH TRANSMISSION, PHONE (867) 766-5300

NWT SPILL REPORT (Oil, Gas, Hazardous chemicals or other materials)

FAXED June-16-04

Northwest Territories

24 - Hour Report Line

Phone: (867) 920-8130
Fax: (867) 873-6924

A Report Date and Time	B Date and Time of Spill (if known)	C 9 (Original Report) 9 Update No.	Spill Number
JUNE-16-04 5:00 AM	BETWEEN JUNE-15-04 9:00 PM AND JUNE-16-04 2:00 AM.		04-388

D Location and map coordinates (if known) and direction (if moving)
WINDY CAMP

E Party Responsible for Spill
MIRAMAR HOPE BAY.

F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible)
P-40 DIESEL FUEL APPROXIMATELY 19,000 LITRES

G Cause of spill FUEL LINE USED FOR DRAWING FUEL FROM TANK SEPERATED AT A CONNECTION IN THE LINE. THIS RESULTED IN A SYPHON EFFECT WHICH RESULTED IN A FUEL SPILL.

H Is spill terminated?	I If spill is continuing give estimated rate	J Is further spill possible?	K extent of contaminated area in m²
(9 yes) 9 no		9 yes (9 no)	370 M²

L Factors affecting spill or recovery (weather conditions, terrain snow cover etc)
HIGH WINDS CAUSED THE LINE TO SEPERATE

M Containment (natural depression, dyke etc)
NATURAL DEPRESSIONS OIL BOOMS & ABSORBANT MATERIALS.

N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials
① LEAKING FUEL LINE WAS STOPPED IMMEDIATELY
② OIL BOOMS PUT IN PLACE.
③ ABSORBANT MATERIALS PLACED & CLEAND UP UNDERWAY

O Do you require assistance?
(9 no) 9 yes

P Possible hazards to persons, property, or environment; eg: fire, drinking water, fish or wildlife.
POSSIBLE HAZARD TO DRINKING WATER, FISH & WILDLIFE.

Q Comments and/or recommendations EMERGENCY RESPONSE MEASURES WERE PUT IN PLACE IMMEDIATELY. CRIBS PLACED OIL BOOMS ONTHE ICE TO CONTAIN OIL IN WATER & STARTED PUMPING THIS OIL INTO DRUMS. SHOVELING OF CONTAMINATED SOIL INTO DRUMS IS PRESENTLY UNDERWAY AND A TRENCH HAS BEEN DUG TO CONTAIN THE REMAINING SEEPAGE.

A FULL DETAIL REPORT TO FOLLOW.

SCOTT STRICKER

FOR SPILL LINE USE ONLY

Lead Agency	
Spill Significance	
Lead Agency contact and time	
Is this file now closed? 9 yes 9 no	

Reported by:	Position, Employer, Location: SUPERINTENDENT HUMAN RESOURCES MIRAMAR HOPE BAY.	Telephone No:
Reported to:	Position, Employer, Location	Telephone No:

APPENDIX C

APPENDIX C

LABORATORY ANALYTICAL REPORTS (ENVIRO-TEST LABORATORIES)

ETL Enviro-Test LABORATORIES

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

PRELIMINARY RESULTS

EBA ENG CONSULTANTS LTD

ATTN: S.TAYLOR

14940 123 AVE NORTH BLDG

EDMONTON AB T5V 1B4

DATE: 25-JUN-04 09:16 AM

Lab Work Order #: L181189 **Sampled By:** S.TAYLOR **Date Received:** 22-JUN-04

Project P.O. #:

Project Reference: MIRAMAR

Comments:

Sample Specific Comments: L181189-1: raise DL due to moisture content,

DOUG JOHNSON
Director of Operations, Edmonton

KAREN HUEBNER
Client Service Specialist

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L181189-1 WORST CASE								
Sample Date: 19-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		24-JUN-04		
F1-BTEX	<5		5	mg/kg		24-JUN-04		
F2 (C10-C16)	240		5	mg/kg		24-JUN-04		
F3 (C16-C34)	1100		5	mg/kg		24-JUN-04		
F4 (C34-C50)	220		5	mg/kg		24-JUN-04		
Total Hydrocarbons (C6-C50)	1600		5	mg/kg		24-JUN-04		
Chromatogram to baseline at nC50	NO					24-JUN-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					23-JUN-04	24-JUN-04	AML	R193985
CCME BTEX								
Benzene	<0.06		0.06	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Toluene	<0.06		0.06	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Ethylbenzene	<0.06		0.06	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Xylenes	<0.06		0.06	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Note: raise DL due to moisture content								
% Moisture	73		0.1	%		23-JUN-04	BDH	R193591
L181189-2 A1								
Sample Date: 19-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		24-JUN-04		
F1-BTEX	<5		5	mg/kg		24-JUN-04		
F2 (C10-C16)	<5		5	mg/kg		24-JUN-04		
F3 (C16-C34)	21		5	mg/kg		24-JUN-04		
F4 (C34-C50)	6		5	mg/kg		24-JUN-04		
Total Hydrocarbons (C6-C50)	27		5	mg/kg		24-JUN-04		
Chromatogram to baseline at nC50	YES					24-JUN-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					23-JUN-04	24-JUN-04	AML	R193985
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Toluene	<0.01		0.01	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Ethylbenzene	<0.01		0.01	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Xylenes	<0.01		0.01	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
% Moisture	20		0.1	%		23-JUN-04	BDH	R193591
L181189-3 A2								
Sample Date: 19-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		24-JUN-04		
F1-BTEX	<5		5	mg/kg		24-JUN-04		
F2 (C10-C16)	<5		5	mg/kg		24-JUN-04		
F3 (C16-C34)	13		5	mg/kg		24-JUN-04		
F4 (C34-C50)	<5		5	mg/kg		24-JUN-04		
Total Hydrocarbons (C6-C50)	13		5	mg/kg		24-JUN-04		

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L181189-3 A2								
Sample Date: 19-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
Chromatogram to baseline at nC50	YES					24-JUN-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					23-JUN-04	24-JUN-04	AML	R193985
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Toluene	<0.01		0.01	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Ethylbenzene	<0.01		0.01	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
Xylenes	0.03		0.01	mg/kg	22-JUN-04	23-JUN-04	IAG	R193764
% Moisture	20		0.1	%		23-JUN-04	BDH	R193591
L181189-4 SPILL								
Sample Date: 20-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	0.85		0.05	mg/L	22-JUN-04	22-JUN-04	AML	R193782
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Toluene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
EthylBenzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Xylenes	0.0019		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1(C6-C10)	<0.5		0.5	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1-BTEX	<0.1		0.1	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
L181189-5 NORTH								
Sample Date: 20-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	22-JUN-04	22-JUN-04	AML	R193782
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Toluene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
EthylBenzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Xylenes	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1(C6-C10)	<0.5		0.5	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1-BTEX	<0.1		0.1	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
L181189-6 SOUTH								
Sample Date: 20-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	22-JUN-04	22-JUN-04	AML	R193782
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Toluene	0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
EthylBenzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Xylenes	0.0028		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1(C6-C10)	<0.5		0.5	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1-BTEX	<0.1		0.1	mg/L	22-JUN-04	23-JUN-04	EMP	R193689

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L181189-7 EAST								
Sample Date: 20-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	22-JUN-04	22-JUN-04	AML	R193782
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Toluene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
EthylBenzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Xylenes	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1(C6-C10)	<0.5		0.5	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1-BTEX	<0.1		0.1	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
L181189-8 TAP								
Sample Date: 20-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	22-JUN-04	22-JUN-04	AML	R193782
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Toluene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
EthylBenzene	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
Xylenes	<0.0005		0.0005	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1(C6-C10)	<0.5		0.5	mg/L	22-JUN-04	23-JUN-04	EMP	R193689
F1-BTEX	<0.1		0.1	mg/L	22-JUN-04	23-JUN-04	EMP	R193689

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5030	EPA 5030/8015&8260-P&T GC-MS & FID
ETL-BTX,TVH-CCME-ED	Soil	CCME BTEX	EPA 5030	CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TEH-CCME-ED	Soil	CCME Total Extractable Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310
F2-ED	Water	F2 (>C10-C16)		EPA 3510/8000-GC-FID
PREP-MOISTURE-ED	Soil	% Moisture		Oven dry 105C-Gravimetric

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

097963

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ETL Enviro-Test LABORATORIES

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

PRELIMINARY RESULTS

EBA ENG CONSULTANTS LTD
ATTN: STEVE TAYLOR
14940 123 AVE NORTH BLDG
EDMONTON AB T5V 1B4

DATE: 25-JUN-04 04:49 PM

Lab Work Order #: L182149 **Sampled By:** S.TAYLOR **Date Received:** 24-JUN-04

Project P.O. #:

Project Reference: MIRAMAR

Comments:

DOUG JOHNSON
Director of Operations, Edmonton

KAREN HUEBNER
Client Service Specialist

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L182149-1 4 PM BEFORE								
Sample Date: 22-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	0.79		0.05	mg/L	24-JUN-04	24-JUN-04	AAT	R194427
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
Toluene	<0.0005		0.0005	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
EthylBenzene	<0.0005		0.0005	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
Xylenes	0.0040		0.0005	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
F1(C6-C10)	0.1		0.1	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
F1-BTEX	<0.1		0.1	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
L182149-2 4 PM AFTER								
Sample Date: 22-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	0.19		0.05	mg/L	24-JUN-04	24-JUN-04	AAT	R194427
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
Toluene	<0.0005		0.0005	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
EthylBenzene	<0.0005		0.0005	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
Xylenes	<0.0005		0.0005	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
F1(C6-C10)	<0.1		0.1	mg/L	23-JUN-04	25-JUN-04	K1M	R194487
F1-BTEX	<0.1		0.1	mg/L	23-JUN-04	25-JUN-04	K1M	R194487

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BTX,F1-ED	Water	BTEX and F1 (C6-C10)		EPA 5030/8015&8260-P&T GC-MS & FID
F2-ED	Water	F2 (>C10-C16)		EPA 3510/8000-GC-FID

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ETL Enviro-Test LABORATORIES

A DIVISION OF *ETL CHEMSPEC ANALYTICAL LIMITED*

PRELIMINARY RESULTS

EBA ENG CONSULTANTS LTD

ATTN: STEVE TAYLOR

14940 123 AVE NORTH BLDG

EDMONTON AB T5V 1B4

DATE: 12-JUL-04 05:06 PM

Lab Work Order #: L184439 **Sampled By:** CLIENT **Date Received:** 02-JUL-04

Project P.O. #:

Project Reference: 40065.003

Comments:

DOUG JOHNSON
Director of Operations, Edmonton

KAREN HUEBNER
Client Service Specialist

LABORATORY ACCREDITATIONS:
- **STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL)** FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- **AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA)** IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- **STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA)** FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)

LABORATORY RECOGNITIONS:
- **STANDARDS COUNCIL OF CANADA** - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184439-1 B1								
Sample Date: 26-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	<5		5	mg/kg		12-JUL-04		
F3 (C16-C34)	11		5	mg/kg		12-JUL-04		
F4 (C34-C50)	<5		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	11		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	YES					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	08-JUL-04	AAT	R198290
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Xylenes	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
% Moisture	16		0.1	%		07-JUL-04	DDU	R197545
L184439-2 B2								
Sample Date: 26-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	110		5	mg/kg		12-JUL-04		
F3 (C16-C34)	990		5	mg/kg		12-JUL-04		
F4 (C34-C50)	430		5	mg/kg		12-JUL-04		
F4G-SG (GHH-Silica)	400		100	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	1500		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	NO					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	08-JUL-04	AAT	R198290
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Xylenes	0.06		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
% Moisture	21		0.1	%		07-JUL-04	DDU	R197545
Prep/Analysis Dates					12-JUL-04	12-JUL-04	AAT	R198840
L184439-3 B3								
Sample Date: 26-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	49		5	mg/kg		12-JUL-04		
F3 (C16-C34)	32		5	mg/kg		12-JUL-04		
F4 (C34-C50)	<5		5	mg/kg		12-JUL-04		

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184439-3 B3								
Sample Date: 26-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
Total Hydrocarbons (C6-C50)	81		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	YES					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	08-JUL-04	AAT	R198290
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Xylenes	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
% Moisture	19		0.1	%		07-JUL-04	DDU	R197545
L184439-4 B4								
Sample Date: 26-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	<5		5	mg/kg		12-JUL-04		
F3 (C16-C34)	19		5	mg/kg		12-JUL-04		
F4 (C34-C50)	5		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	24		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	YES					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	08-JUL-04	AAT	R198290
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Xylenes	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
% Moisture	17		0.1	%		07-JUL-04	DDU	R197545
L184439-5 B5								
Sample Date: 26-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	12		5	mg/kg		12-JUL-04		
F3 (C16-C34)	24		5	mg/kg		12-JUL-04		
F4 (C34-C50)	<5		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	36		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	YES					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	08-JUL-04	AAT	R198290
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184439-5 B5								
Sample Date: 26-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME BTEX								
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Xylenes	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
% Moisture	19		0.1	%		07-JUL-04	DDU	R197545
L184439-6 B6								
Sample Date: 26-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	<5		5	mg/kg		12-JUL-04		
F3 (C16-C34)	16		5	mg/kg		12-JUL-04		
F4 (C34-C50)	<5		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	16		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	YES					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	08-JUL-04	AAT	R198290
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	11-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	11-JUL-04	IAG	R198503
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	11-JUL-04	IAG	R198503
Xylenes	<0.01		0.01	mg/kg	10-JUL-04	11-JUL-04	IAG	R198503
% Moisture	18		0.1	%		07-JUL-04	DDU	R197545

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
ETL-BTX,TVH-CCME-ED	Soil	CCME BTEX	EPA 5030	CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-OGG-CCME-ED	Soil	CCME Gravimetric Heavy Hydrocarbons (Sil		CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TEH-CCME-ED	Soil	CCME Total Extractable Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TVH,TEH-CCME-ED	Soil	CCME Total Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

PREP-MOISTURE-ED	Soil	% Moisture	Oven dry 105C-Gravimetric

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

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Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

Reference Information

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

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UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.
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ETL Enviro-Test LABORATORIES

A DIVISION OF *ETL CHEMSPEC ANALYTICAL LIMITED*

PRELIMINARY RESULTS

EBA ENG CONSULTANTS LTD
ATTN: STEVE TAYLOR
14940 123 AVE NORTH BLDG
EDMONTON AB T5V 1B4

DATE: 12-JUL-04 06:23 PM

Lab Work Order #: L184451 **Sampled By:** CLIENT **Date Received:** 02-JUL-04

Project P.O. #:

Project Reference: MIRAMAR 40065.003

Comments:

DOUG JOHNSON
Director of Operations, Edmonton

KAREN HUEBNER
Client Service Specialist

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184451-1 N OF SPILL								
Sample Date: 30-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
Toluene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
EthylBenzene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
Xylenes	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
F1(C6-C10)	<0.1		0.1	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
F1-BTEX	<0.1		0.1	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
L184451-2 S OF SPILL								
Sample Date: 30-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
Toluene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
EthylBenzene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
Xylenes	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
F1(C6-C10)	<0.1		0.1	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
F1-BTEX	<0.1		0.1	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
L184451-3 SPILL								
Sample Date: 30-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	0.09		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
Toluene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
EthylBenzene	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
Xylenes	<0.0005		0.0005	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
F1(C6-C10)	<0.1		0.1	mg/L	11-JUL-04	12-JUL-04	IAG	R198848
F1-BTEX	<0.1		0.1	mg/L	11-JUL-04	12-JUL-04	IAG	R198848

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5030	EPA 5030/8015&8260-P&T GC-MS & FID
F2-ED	Water	F2 (>C10-C16)		EPA 3510/8000-GC-FID

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

GLOSSARY OF REPORT TERMS
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The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

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UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.
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ETL Enviro-Test LABORATORIES

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

PRELIMINARY RESULTS

EBA ENG CONSULTANTS LTD
ATTN: STEVE TAYLOR
14940 123 AVE NORTH BLDG
EDMONTON AB T5V 1B4

DATE: 03-JUL-04 02:51 PM

Lab Work Order #: L184325 **Sampled By:** CLIENT **Date Received:** 02-JUL-04

Project P.O. #:

Project Reference: MIRAMAR

Comments:

DOUG JOHNSON
Director of Operations, Edmonton

KAREN HUEBNER
Client Service Specialist

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184325-1 TAP								
Sample Date: 30-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	02-JUL-04	02-JUL-04	AMB	R196275
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	02-JUL-04	03-JUL-04	EMP	R196232
Toluene	<0.0005		0.0005	mg/L	02-JUL-04	03-JUL-04	EMP	R196232
EthylBenzene	<0.0005		0.0005	mg/L	02-JUL-04	03-JUL-04	EMP	R196232
Xylenes	<0.0005		0.0005	mg/L	02-JUL-04	03-JUL-04	EMP	R196232
F1(C6-C10)	<0.1		0.1	mg/L	02-JUL-04	03-JUL-04	EMP	R196232
F1-BTEX	<0.1		0.1	mg/L	02-JUL-04	03-JUL-04	EMP	R196232

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5030	EPA 5030/8015&8260-P&T GC-MS & FID
F2-ED	Water	F2 (>C10-C16)		EPA 3510/8000-GC-FID

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

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Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

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mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

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ETL Enviro-Test LABORATORIES

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

PRELIMINARY RESULTS

EBA ENG CONSULTANTS LTD
ATTN: STEVE TAYLOR
14940 123 AVE NORTH BLDG
EDMONTON AB T5V 1B4

DATE: 10-JUL-04 04:55 PM

Lab Work Order #: L184450 **Sampled By:** CLIENT **Date Received:** 02-JUL-04

Project P.O. #:

Project Reference: MIRAMAR

Comments:

DOUG JOHNSON
Director of Operations, Edmonton

KAREN HUEBNER
Client Service Specialist

LABORATORY ACCREDITATIONS:
- **STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL)** FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- **AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA)** IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- **STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA)** FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)

LABORATORY RECOGNITIONS:
- **STANDARDS COUNCIL OF CANADA** - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184450-1 LAKE INLET								
Sample Date: 30-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
Toluene	<0.0005		0.0005	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
EthylBenzene	<0.0005		0.0005	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
Xylenes	<0.0005		0.0005	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
F1(C6-C10)	<0.1		0.1	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
F1-BTEX	<0.1		0.1	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
L184450-2 LAKE OUTLET								
Sample Date: 30-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
Toluene	<0.0005		0.0005	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
EthylBenzene	<0.0005		0.0005	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
Xylenes	0.0005		0.0005	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
F1(C6-C10)	<0.1		0.1	mg/L	09-JUL-04	10-JUL-04	IAG	R198428
F1-BTEX	<0.1		0.1	mg/L	09-JUL-04	10-JUL-04	IAG	R198428

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5030	EPA 5030/8015&8260-P&T GC-MS & FID
F2-ED	Water	F2 (>C10-C16)		EPA 3510/8000-GC-FID

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mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

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ETL Enviro-Test LABORATORIES

A DIVISION OF *ETL CHEMSPEC ANALYTICAL LIMITED*

PRELIMINARY RESULTS

EBA ENG CONSULTANTS LTD
ATTN: STEVE TAYLOR
14940 123 AVE NORTH BLDG
EDMONTON AB T5V 1B4

DATE: 13-JUL-04 10:51 AM

Lab Work Order #: L184448 **Sampled By:** CLIENT **Date Received:** 02-JUL-04

Project P.O. #:

Project Reference: MIRAMAR

Comments:

DOUG JOHNSON
Director of Operations, Edmonton

KAREN HUEBNER
Client Service Specialist

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184448-1 2 PM BEFORE								
Sample Date: 23-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	0.80		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
L184448-2 2 PM AFTER								
Sample Date: 23-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Toluene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
EthylBenzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Xylenes	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1(C6-C10)	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1-BTEX	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
L184448-3 1 PM AFTER								
Sample Date: 24-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	0.06		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Toluene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
EthylBenzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Xylenes	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1(C6-C10)	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1-BTEX	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
L184448-4 1 PM BEFORE								
Sample Date: 24-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	4.6		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Toluene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
EthylBenzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Xylenes	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1(C6-C10)	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1-BTEX	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
L184448-5 11 AM BEFORE								
Sample Date: 25-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	2.0		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Toluene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184448-5 11 AM BEFORE								
Sample Date: 25-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
BTEX and F1 (C6-C10)								
EthylBenzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Xylenes	0.0013		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1(C6-C10)	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1-BTEX	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
L184448-6 11 AM AFTER								
Sample Date: 25-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	0.06		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Toluene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
EthylBenzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Xylenes	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1(C6-C10)	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1-BTEX	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
L184448-7 11 AM BEFORE								
Sample Date: 27-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	0.98		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Toluene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
EthylBenzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Xylenes	0.0017		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1(C6-C10)	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1-BTEX	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
L184448-8 11 AM AFTER								
Sample Date: 27-JUN-04								
Matrix: WATER								
BTEX, F1 (C6-C10) and F2 (>C10-C16)								
F2 (>C10-C16)	<0.05		0.05	mg/L	07-JUL-04	07-JUL-04	AMB	R197809
BTEX and F1 (C6-C10)								
Benzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Toluene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
EthylBenzene	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
Xylenes	<0.0005		0.0005	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1(C6-C10)	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786
F1-BTEX	<0.1		0.1	mg/L	10-JUL-04	11-JUL-04	SCM	R198786

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BTX,F1-ED	Water	BTEX and F1 (C6-C10)	EPA 5030	EPA 5030/8015&8260-P&T GC-MS & FID
F2-ED	Water	F2 (>C10-C16)		EPA 3510/8000-GC-FID

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

GLOSSARY OF REPORT TERMS
Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.
mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ETL Enviro-Test LABORATORIES

A DIVISION OF *ETL CHEMSPEC ANALYTICAL LIMITED*

PRELIMINARY RESULTS

EBA ENG CONSULTANTS LTD
ATTN: STEVE TAYLOR
14940 123 AVE NORTH BLDG
EDMONTON AB T5V 1B4

DATE: 13-JUL-04 10:51 AM

Lab Work Order #: L184445 **Sampled By:** CLIENT **Date Received:** 02-JUL-04

Project P.O. #:

Project Reference: MIRAMAR 40065.003

Comments:

DOUG JOHNSON
Director of Operations, Edmonton

KAREN HUEBNER
Client Service Specialist

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184445-1 TANK AREA								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	100		5	mg/kg		12-JUL-04		
F3 (C16-C34)	160		5	mg/kg		12-JUL-04		
F4 (C34-C50)	33		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	290		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	NO					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	09-JUL-04	AML	R198458
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Xylenes	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
% Moisture	17		0.1	%		07-JUL-04	DDU	R197545
L184445-2 WORST CASE 2								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	37		5	mg/kg		12-JUL-04		
F1-BTEX	37		5	mg/kg		12-JUL-04		
F2 (C10-C16)	190000		5	mg/kg		12-JUL-04		
F3 (C16-C34)	46000		5	mg/kg		12-JUL-04		
F4 (C34-C50)	5300		5	mg/kg		12-JUL-04		
F4G-SG (GHH-Silica)	3400		100	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	240000		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	NO					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	09-JUL-04	AML	R198458
CCME BTEX								
Benzene	0.04		0.01	mg/kg	10-JUL-04	11-JUL-04	IAG	R198848
Toluene	0.10		0.01	mg/kg	10-JUL-04	11-JUL-04	IAG	R198848
Ethylbenzene	0.04		0.01	mg/kg	10-JUL-04	11-JUL-04	IAG	R198848
Xylenes	0.21		0.01	mg/kg	10-JUL-04	11-JUL-04	IAG	R198848
% Moisture	47		0.1	%		07-JUL-04	DDU	R197545
Prep/Analysis Dates					12-JUL-04	12-JUL-04	AAT	R198840
L184445-3 C1								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	22		5	mg/kg		12-JUL-04		
F3 (C16-C34)	13		5	mg/kg		12-JUL-04		
F4 (C34-C50)	8		5	mg/kg		12-JUL-04		

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184445-3 C1								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
Total Hydrocarbons (C6-C50)	43		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	YES					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	09-JUL-04	AML	R198458
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Xylenes	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
% Moisture	16		0.1	%		07-JUL-04	DDU	R197545
L184445-4 C2								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	<5		5	mg/kg		12-JUL-04		
F3 (C16-C34)	27		5	mg/kg		12-JUL-04		
F4 (C34-C50)	10		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	37		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	YES					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	09-JUL-04	AML	R198458
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Toluene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Ethylbenzene	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
Xylenes	<0.01		0.01	mg/kg	10-JUL-04	12-JUL-04	IAG	R198503
% Moisture	16		0.1	%		07-JUL-04	DDU	R197545
L184445-5 C3								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	<5		5	mg/kg		12-JUL-04		
F3 (C16-C34)	31		5	mg/kg		12-JUL-04		
F4 (C34-C50)	13		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	44		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	NO					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	09-JUL-04	AML	R198458
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Toluene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184445-5 C3								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME BTEX								
Ethylbenzene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Xylenes	0.07		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
% Moisture	18		0.1	%		07-JUL-04	DDU	R197545
L184445-6 C4								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	170		5	mg/kg		12-JUL-04		
F3 (C16-C34)	26		5	mg/kg		12-JUL-04		
F4 (C34-C50)	11		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	210		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	NO					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	09-JUL-04	AML	R198458
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Toluene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Ethylbenzene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Xylenes	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
% Moisture	19		0.1	%		07-JUL-04	DDU	R197545
L184445-7 C5								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	26		5	mg/kg		12-JUL-04		
F1-BTEX	25		5	mg/kg		12-JUL-04		
F2 (C10-C16)	140		5	mg/kg		12-JUL-04		
F3 (C16-C34)	28		5	mg/kg		12-JUL-04		
F4 (C34-C50)	10		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	200		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	NO					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	09-JUL-04	AML	R198458
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Toluene	0.07		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Ethylbenzene	0.10		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Xylenes	1.1		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
% Moisture	16		0.1	%		07-JUL-04	DDU	R197545
L184445-8 C6								
Sample Date: 25-JUN-04								
Matrix: SOIL								

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L184445-8 C6								
Sample Date: 25-JUN-04								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	<5		5	mg/kg		12-JUL-04		
F1-BTEX	<5		5	mg/kg		12-JUL-04		
F2 (C10-C16)	<5		5	mg/kg		12-JUL-04		
F3 (C16-C34)	13		5	mg/kg		12-JUL-04		
F4 (C34-C50)	5		5	mg/kg		12-JUL-04		
Total Hydrocarbons (C6-C50)	18		5	mg/kg		12-JUL-04		
Chromatogram to baseline at nC50	NO					12-JUL-04		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					08-JUL-04	09-JUL-04	AML	R198458
CCME BTEX								
Benzene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Toluene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Ethylbenzene	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
Xylenes	<0.01		0.01	mg/kg	11-JUL-04	12-JUL-04	IAG	R198848
% Moisture	18		0.1	%		07-JUL-04	DDU	R197545
L184445-9 BASE COMPOSITE								
Sample Date: 25-JUN-04								
Matrix: SOIL								
MUST PSA D50 > 75um	71		1	%		08-JUL-04	NKC	R197800

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
ETL-BTX,TVH-CCME-ED	Soil	CCME BTEX	EPA 5030	CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-OGG-CCME-ED	Soil	CCME Gravimetric Heavy Hydrocarbons (Sil		CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TEH-CCME-ED	Soil	CCME Total Extractable Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TVH,TEH-CCME-ED	Soil	CCME Total Hydrocarbons		CCME CWS-PHC Dec-2000 - Pub# 1310

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

PREP-MOISTURE-ED	Soil	% Moisture	Oven dry 105C-Gravimetric
PSA-MUST-ED	Soil	MUST PSA D50 > 75um	ASTM D422-63-Hydrometer/Sieve

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

Reference Information

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mg/kg (units) - unit of concentration based on mass, parts per million
mg/L (units) - unit of concentration based on volume, parts per million
< - Less than
D.L. - Detection Limit
N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

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