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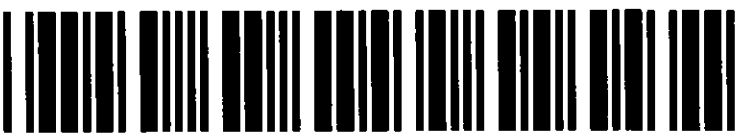

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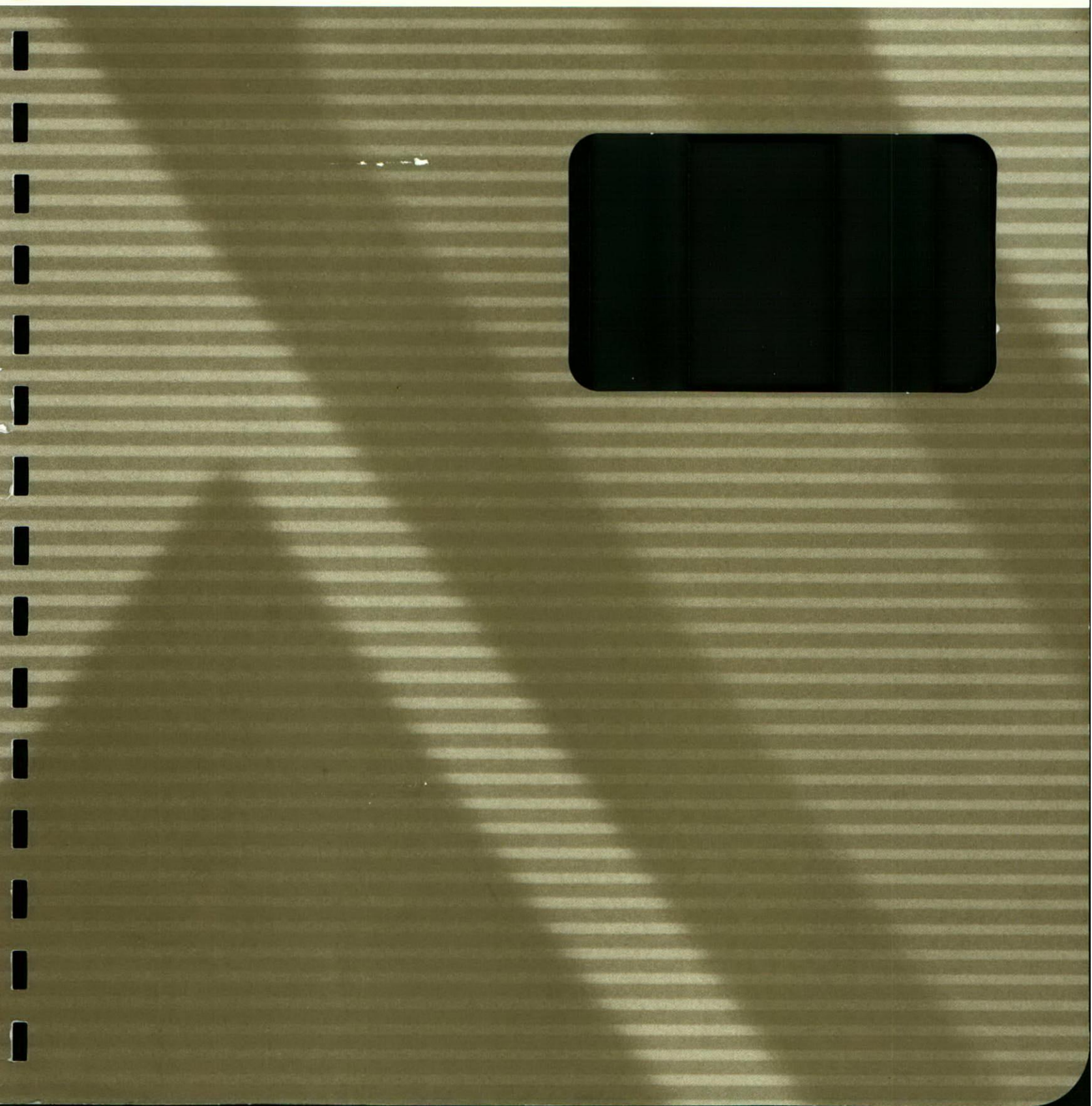

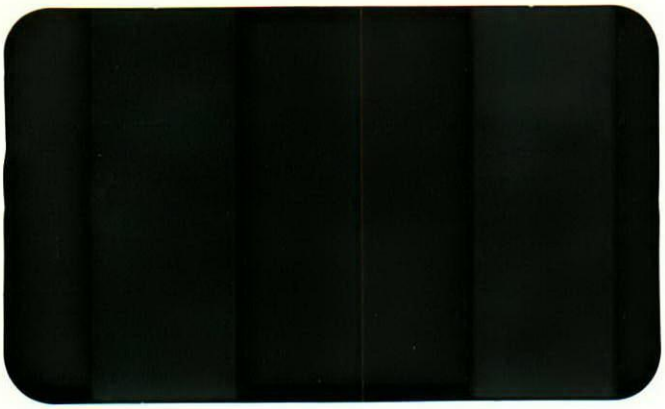

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# PHASE II ENVIRONMENTAL SITE ASSESSMENT

**CP Rail Souris Yard**
**Souris, MB**
**EA780**

**Prepared for: Canadian Pacific Railway**

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APEGM
Certificate of Authorization
Morrow Environmental Consultants Ltd.
No. 708 Expiry: April 30, 2006

PROVINCE OF MANITOBA
A. EASON
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Distribution:

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**131066-A000**
**February 17, 2006**

## EXECUTIVE SUMMARY

Canadian Pacific Railway (CPR) commissioned a Phase II Environmental Site Assessment (ESA) at the Souris Yard in Souris, MB. Morrow Environmental Consultants Inc. (Morrow), a member of the SNC-Lavalin Group, completed an intrusive investigation to assess the onsite soil and groundwater conditions in November and December 2005.

The mandate of the Phase II ESA, as directed by CPR, was to investigate and characterize the presence of potential contaminants in the soil and/or groundwater beneath the site, as well as provide preliminary information with respect to the groundwater flow direction and rate. The objectives of the Phase II ESA are summarized as follows:

- Review the previous Phase I ESA;
- Investigate and characterize soil and groundwater for all areas of concern identified in the Phase I ESA in order to confirm the presence and/or absence of soil and/or groundwater contamination and/or liquid phase hydrocarbons;
- Determine the groundwater flow direction and flow rates; and
- Identify any existing underground infrastructures that could act as migration pathways.

Based on Morrow's review of the Phase I ESA, the relevant environmental concerns are presented on the following table.

### Potential Areas of Concern

| Known or Potential Contamination | Location | Contaminant(s) of Concern | Media | Probable Source |
|---|---|---|---|---|
| Potential | Mile 15.75, Estevan Sub. | hydrocarbons, metals | soil | former roundhouse discharge area |
| Potential | Mile 15.76, Estevan Sub. | hydrocarbons, metals | soil | former engine house |
| Potential | Mile 15.77, Estevan Sub. | hydrocarbons, metals | soil | former coal dock |
| Potential | Mile 15.80, Estevan Sub. | hydrocarbons, metals | soil | former coal shed |
| Potential | Mile 15.82, Estevan Sub. | hydrocarbons, metals | soil | former ash pit |
| Potential | Mile 15.86, Estevan Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 15.88, Estevan Sub. | hydrocarbons, metals | soil | former tool house |

| Known or Potential Contamination | Location | Contaminant(s) of Concern | Media | Probable Source |
|---|---|---|---|---|
| Potential | Mile 15.89, Estevan Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 15.90, Estevan Sub. | hydrocarbons, metals | soil/groundwater | former roundhouse |
| Potential | Mile 16.11, Estevan Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 16.17, Estevan Sub. | hydrocarbons, metals | soil | former oil and dope shed |
| Potential | Mile 16.28, Estevan Sub. | hydrocarbons, metals | soil/groundwater | former fuelling facility |
| Potential | Mile 146.57, Glenboro Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 146.60, Glenboro Sub. | hydrocarbons, metals | soil | former tool houses (north and south of track) |
| Potential | Mile 146.61, Glenboro Sub. | hydrocarbons, metals | soil | former aboveground storage tank |
| Potential | Mile 146.63, Glenboro Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 146.64, Glenboro Sub. | hydrocarbons, metals, fertilizer | soil/groundwater | former Imperial Oil bulk plant and fertilizer warehouse |
| Potential | Mile 146.67, Glenboro Sub. | hydrocarbons, metals, fertilizer | soil/groundwater | former North Star Oil bulk plant |
| Potential | Mile 146.69, Glenboro Sub. | hydrocarbons, metals | soil | former coal shed |
| Potential | Mile 146.99, Glenboro Sub. | hydrocarbons, metals | soil/groundwater | former aboveground storage tank |

The scope of the work for this Phase II ESA, determined through discussions with CPR personnel, consisted of drilling 35 boreholes at locations proximate to the potential areas of concern identified in the above table, installing 14 monitoring wells, the collection of soil and groundwater samples for potential laboratory analysis, the collection of a surficial soil sample at the former roundhouse discharge area, and the determination of groundwater flow direction and rates. It should be noted that boreholes could not be drilled in the former separation pit area of the roundhouse and the former roundhouse discharge area, as these areas were inaccessible by the truck-mounted drill rig.

The results of the Phase II ESA identified residual hydrocarbons at concentrations exceeding the *Canadian Environmental Quality Guidelines* (CEQG), Canadian Council of Ministers of the Environment (CCME), updated 2005, Commercial Land Use assessment guidelines and/or the

*Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil* (CWS), CCME (2001) Commercial Land Use, Protection of Potable Groundwater Pathway assessment guidelines in soil samples recovered from Boreholes 05-11 (former tool house, Mile 15.89, Estevan Subdivision), 05-20, 05-24, 05-25, and 05-27 (former fuelling facility, Mile 16.28, Estevan Subdivision), 05-29, 05-30 and 05-34 (former North Star Oil bulk plant, Mile 146.67, Glenboro Subdivision), and 05-32 and 05-33 (adjacent to the former Imperial Oil bulk plant and fertilizer warehouse, Mile 146.64, Glenboro Subdivision) at depths ranging from 0.5 m to 3.0 m below grade. In addition, benzene was detected in the surficial soil sample recovered from the former roundhouse discharge area (Mile 15.75, Estevan Subdivision) at a concentration exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guideline. The sample was recovered at a depth of 0.15 m to 0.3 m below grade.

Arsenic concentrations equal to or exceeding the CCME (updated 2005) Commercial Land Use assessment guideline were detected in soil samples recovered from Boreholes 05-18 (former coal shed, Mile 15.80, Estevan Subdivision) and 05-34 (former North Star Oil bulk plant, Mile 146.67, Glenboro Subdivision) at depths ranging from 0.5 m to 2.3 m below grade.

Dissolved hydrocarbons in groundwater samples collected from Monitoring Well 05-8 (former roundhouse area, Mile 15.90, Estevan Subdivision), Monitoring Wells 05-20 and 05-25 (former fuelling facility area, Mile 16.28, Estevan Subdivision), Monitoring Wells 05-29, 05-30 and 05-34 (former North Star Oil bulk plant, Mile 146.67, Glenboro Subdivision), and Monitoring Wells 05-32 and 05-33 (adjacent to the former Imperial Oil bulk plant and fertilizer warehouse, Mile 146.64, Glenboro Subdivision) were detected at concentrations exceeding the CCME CEQG (updated 2005), Community Water assessment guidelines.

Dissolved arsenic and/or barium were detected in Monitoring Wells 05-20 and 05-25 (located in the former fuelling facility area) at concentrations exceeding the CCME CEQG (updated 2005) Community Water assessment guidelines.

Dissolved iron and/or manganese were detected in Monitoring Wells 05-6 through 05-9, 05-20, 05-24, 05-25, 05-27, 05-29, 05-30, 05-32, 05-33 and 05-34 (located in the former roundhouse area, the former fuelling facility area, the former North Star Oil bulk plant area, and adjacent to the former Imperial Oil bulk plant and fertilizer warehouse) at concentrations exceeding the

CCME CEQG (updated 2005) Community Water aesthetic objectives. The exceedances of the aesthetic objectives are not considered to be significant environmental concerns.

Based on the December 12, 2005 monitoring data, the apparent direction of shallow groundwater flow in the former fuelling facility area was inferred to be towards the south, in the former North Star Oil and Imperial Oil bulk plant areas was inferred to be towards the east and in the former roundhouse area was inferred to be towards the southeast. The groundwater seepage velocity beneath the former fuelling facility is estimated to be $2 \times 10^{-7}$ m/s (6 m/yr) to the south, and beneath the North Star Oil bulk plant area the groundwater seepage velocity is estimated to be $9 \times 10^{-8}$ m/s (0.3 m/year) to the east. No measurable liquid phase hydrocarbons were detected in any of the monitoring wells on this date.

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**APPENDED TABLES**



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## APPENDICES

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III Laboratory Reports
IV Monitoring Results
V Hydraulic Conductivity Testing

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# 1. INTRODUCTION

At the request of Canadian Pacific Railway (CPR), Morrow Environmental Consultants Inc. (Morrow), a member of the SNC-Lavalin Group, has completed a Phase II Environmental Site Assessment (ESA) of CPR's Souris Yard (the "Yard") in Souris, MB. The scope of work was based on Morrow's proposal dated April 8, 2005 and proposal amendment dated September 7, 2005.

## 1.1. Phase II ESA Objectives and Scope of Investigation

The purpose of the Phase II ESA was to assess the impact of historic and current activities on the soil and groundwater at the Souris Yard, focusing on the areas of concern identified in the Phase I report by the CP Office of the Chief Engineer. The objectives of the investigation are summarized below:

- Review the Phase I ESA;
- Investigate and characterize soil and groundwater for all areas of concern identified in the Phase I ESA in order to confirm the presence and/or absence of soil and/or groundwater impact and/or liquid phase hydrocarbons;
- Determine the groundwater flow direction and flow rates; and
- Identify any existing underground infrastructures that could act as migration pathways.

The scope of the work for the Phase II ESA, determined through discussions with CPR personnel, consisted of drilling 35 boreholes at locations proximate to the areas of potential environmental concern, installing 14 monitoring wells, the collection of soil and groundwater samples for potential laboratory analysis, the collection of a surficial soil sample at the former roundhouse discharge area, and the determination of groundwater flow direction and rates. It should be noted that boreholes could not be drilled in the former separation pit area of the roundhouse and the former roundhouse discharge area, as these areas were inaccessible by the truck-mounted drill rig.

This report presents a description of the work performed by Morrow on the Souris Yard and the results of the Phase II ESA.

### 1.2. Site Description

The subject site is the Souris Yard located in the Town of Souris, MB. The location of the site is presented on the Key Plan, Drawing 131066-001, Appendix I. The limits of the ESA included the Souris Yard between approximate Mile 15.75 and Mile 16.28 of the Estevan Subdivision and Mile 146.57 and 146.99 of the Glenboro Subdivision.

Structures currently located within the Souris Yard include the M/W office, three tool houses (located northwest of the M/W office), the former Cominco fertilizer facilities, a grain elevator, an underground septic tank, and an aboveground propane tank. Current and former site facilities are shown on the Site Plan, Drawing 131066-002 in Appendix I.

The neighbouring property use for the east portion of the Yard (i.e., east of First Street North) is generally described as follows.

| | |
|---|---|
| North: | residential (mobile home park) |
| South: | residential (south and southeast) and commercial (recycling depot and Town of Souris Public Works) |
| East: | CPR right-of-way |
| West: | First Street North, beyond which is CPR right-of-way |

The neighbouring property use for the west portion of the Yard (i.e., west of First Street North) is generally described as follows.

| | |
|---|---|
| North: | residential and vacant |
| South: | residential |
| East: | First Street North, beyond which is CPR right-of-way |
| West: | commercial (card lock and repair shop) and residential, CPR right-of-way (southwest) |

### 1.3. Summary of Previous Studies

A Phase I ESA of the Souris Yard from Mile 15.5 to Mile 16.5 of the Estevan Subdivision was conducted by the CP Office of the Chief Engineer in 1993. The objective of the Phase I ESA was to assess the potential for soil and groundwater impact on the Yard due to current and historical activities. The details of the Phase I ESA are presented in the Chief Engineer's draft

report entitled: *Phase I Environmental Site Assessment of the Souris Yard, Souris, Manitoba,* dated November 10, 1993. Based on Morrow's review of the Phase I ESA, the relevant environmental concerns are presented on the following table.

**TABLE A: Potential Areas of Concern**

| Known or Potential Contamination | Location | Contaminant(s) of Concern | Media | Probable Source |
|---|---|---|---|---|
| Potential | Mile 15.75, Estevan Sub. | hydrocarbons, metals | soil | former roundhouse discharge area |
| Potential | Mile 15.76, Estevan Sub. | hydrocarbons, metals | soil | former engine house |
| Potential | Mile 15.77, Estevan Sub. | hydrocarbons, metals | soil | former coal dock |
| Potential | Mile 15.80, Estevan Sub. | hydrocarbons, metals | soil | former coal shed |
| Potential | Mile 15.82, Estevan Sub. | hydrocarbons, metals | soil | former ash pit |
| Potential | Mile 15.86, Estevan Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 15.88, Estevan Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 15.89, Estevan Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 15.90, Estevan Sub. | hydrocarbons, metals | soil/groundwater | former roundhouse |
| Potential | Mile 16.11, Estevan Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 16.17, Estevan Sub. | hydrocarbons, metals | soil | former oil and dope shed |
| Potential | Mile 16.28, Estevan Sub. | hydrocarbons, metals | soil/groundwater | former fuelling facility |
| Potential | Mile 146.57, Glenboro Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 146.60, Glenboro Sub. | hydrocarbons, metals | soil | former tool houses (north and south of track) |
| Potential | Mile 146.61, Glenboro Sub. | hydrocarbons, metals | soil | former aboveground storage tank |
| Potential | Mile 146.63, Glenboro Sub. | hydrocarbons, metals | soil | former tool house |
| Potential | Mile 146.64, Glenboro Sub. | hydrocarbons, metals, fertilizer | soil/groundwater | former Imperial Oil bulk plant and fertilizer warehouse |
| Potential | Mile 146.67, Glenboro Sub. | hydrocarbons, metals, fertilizer | soil/groundwater | former North Star Oil bulk plant |
| Potential | Mile 146.69, Glenboro Sub. | hydrocarbons, metals | soil | former coal shed |
| Potential | Mile 146.99, | hydrocarbons, metals | soil/groundwater | former aboveground |

| Known or Potential Contamination | Location | Contaminant(s) of Concern | Media | Probable Source |
|---|---|---|---|---|
| | Glenboro Sub. | | | storage tank |

## 2. FIELD INVESTIGATION METHODOLOGY

The original proposed scope of the work for the Phase II ESA consisted of drilling 37 boreholes at the locations outlined in Morrow's proposal dated April 8, 2005 and proposal amendment dated September 7, 2005. Due to restricted drill rig access at the former separation pit area of the roundhouse and the former roundhouse discharge area, the boreholes/monitoring wells proposed for these locations could not be completed. However, a surficial sample was recovered at the former roundhouse discharge area. Therefore, the revised scope of work consisted of drilling 35 boreholes, installing 14 monitoring wells, the collection of soil and groundwater samples for potential laboratory analysis, the collection of a surficial soil sample at the former roundhouse discharge area, and the determination of groundwater flow direction and rates.

The drilling, monitoring well installation, and soil and groundwater sampling were carried out in general accordance with the protocols outlined in the document entitled: *Environmental Site Investigations in Manitoba,* Manitoba Conservation, May 2002, and established Morrow Preferred Operating Procedures.

### 2.1. Drilling Investigation and Monitoring Well Installation

On November 9, 2005, Morrow personnel met with CPR personnel and representatives of the various utility companies to observe the locating of underground utilities, if any, on the site.

On November 14 to 18 and 21, 2005, Morrow observed the drilling of Boreholes 05-1 through 05-35. The boreholes were drilled at the locations shown on Drawing 131066-002, Appendix I. The boreholes were drilled to depths ranging from 2.9 m to 6.1 m below ground surface using a truck-mounted drill rig operated by Maple Leaf Drilling of Winnipeg, MB. The boreholes were advanced using 130 mm diameter solid stem continuous flight augers except Boreholes 05-20, 05-25 and 05-28, which were advanced using 180 mm hollow stem continuous flight augers due to soil sloughing. The following table describes the physical characteristics of each borehole/monitoring well.

**TABLE B: Borehole/Monitoring Well Details**

| Borehole Number | Location (Minnedosa Subdivision) | Borehole Depth (m) | Screened Portion (m) |
|---|---|---|---|
| 05-1 | former engine house (Mile 15.76, Estevan Sub.) | 3.0 | n/a |
| 05-2 | former coal dock (Mile 15.77, Estevan Sub.) | 3.0 | n/a |
| 05-3 | former ash pit (Mile 15.82, Estevan Sub.) | 3.0 | n/a |
| 05-4 | former ash pit (Mile 15.82, Estevan Sub.) | 3.0 | n/a |
| 05-5 | former roundhouse (Mile 15.90, Estevan Sub.) | 3.4 | n/a |
| 05-6 | former roundhouse (Mile 15.90, Estevan Sub.) | 6.1 | 1.5 - 6.1 |
| 05-7 | former roundhouse (Mile 15.90, Estevan Sub.) | 4.0 | 1.5 - 4.0 |
| 05-8 | former roundhouse (Mile 15.90, Estevan Sub.) | 6.1 | 1.8 - 6.1 |
| 05-9 | former roundhouse (Mile 15.90, Estevan Sub.) | 6.1 | 2.3 - 6.1 |
| 05-10 | former tool house (Mile 15.86, Estevan Sub.) | 3.0 | n/a |
| 05-11 | former tool house (Mile 15.89, Estevan Sub.) | 3.0 | n/a |
| 05-12 | former tool house (north of track) (Mile 146.60, Glenboro Sub.) | 3.0 | n/a |
| 05-13 | former aboveground storage tank (AST) (Mile 146.61, Glenboro Sub.) | 3.0 | n/a |
| 05-13/05-14 | former tool house (south of track) (Mile 146.60, Glenboro Sub.) | 3.0 | n/a |
| 05-15 | former tool house (Mile 146.63, Glenboro Sub.) | 3.0 | n/a |
| 05-16 | former tool house (Mile 15.88, Estevan Sub.) | 3.0 | n/a |
| 05-17 | former tool house (Mile 146.57, Glenboro Sub.) | 2.9 | n/a |
| 05-18 | former coal shed (Mile 15.80, Estevan Sub.) | 3.0 | n/a |
| 05-19 | former tool house (Mile 16.11, Estevan Sub.) | 3.0 | n/a |
| 05-20 | former fuelling facility (Mile 16.28, Estevan Sub.) | 4.6 | 0.9 - 4.6 |
| 05-21 | former oil and dope shed (Mile 16.17, Estevan Sub.) | 3.0 | n/a |
| 05-22 | former oil and dope shed (Mile 16.17, Estevan Sub.) | 3.0 | n/a |
| 05-23 | former oil and dope shed (Mile 16.17, Estevan Sub.) | 3.0 | n/a |
| 05-24 | former fuelling facility (Mile 16.28, | 4.6 | 0.8 - 4.5 |

| Borehole Number | Location (Minnedosa Subdivision) | Borehole Depth (m) | Screened Portion (m) |
|---|---|---|---|
| | Estevan Sub.) | | |
| 05-25 | former fuelling facility (Mile 16.28, Estevan Sub.) | 4.6 | 0.9 - 4.6 |
| 05-26 | former AST (Mile 146.99, Glenboro Sub.) | 3.0 | n/a |
| 05-27 | former fuelling facility (Mile 16.28, Estevan Sub.) | 4.6 | 0.9 - 4.6 |
| 05-28 | former fuelling facility (Mile 16.28, Estevan Sub.) | 3.0 | n/a |
| 05-29 | former North Star Oil bulk plant (Mile 146.67, Glenboro Sub.) | 4.6 | 0.9 - 4.6 |
| 05-30 | former North Star Oil bulk plant (Mile 146.67, Glenboro Sub.) | 4.6 | 0.9 - 4.6 |
| 05-31 | Adjacent to former Imperial Oil bulk plant and fertilizer warehouse (Mile 146.64, Glenboro Sub.) | 4.6 | 0.9 - 4.6 |
| 05-32 | Adjacent to former Imperial Oil bulk plant and fertilizer warehouse (Mile 146.64, Glenboro Sub.) | 4.6 | 0.9 - 4.6 |
| 05-33 | Adjacent to former Imperial Oil bulk plant and fertilizer warehouse (Mile 146.64, Glenboro Sub.) | 4.6 | 0.9 - 4.6 |
| 05-34 | former North Star Oil bulk plant (Mile 146.67, Glenboro Sub.) | 4.6 | 0.9 - 4.6 |
| 05-35 | former coal shed (Mile 146.69, Glenboro Sub.) | 3.0 | n/a |

n/a - not applicable. No monitoring well installed. Borehole backfilled with bentonite.

Boreholes 05-13 and 05-14 were originally drilled to assess soil conditions adjacent to the former AST area (Mile 146.61, Glenboro Subdivision) and a former tool house (Mile 146.60, Glenboro Subdivision), respectively. The borehole locations were based on anecdotal information provided by CPR personnel and the Phase I report. Subsequent to drilling these boreholes, Morrow field staff realized that the anecdotal information received was inaccurate. As such, Boreholes 05-13 and 05-14 were used to assess soil conditions at the former tool house. Borehole 05-13 was also used to assess soil conditions at the former AST area.

As the boreholes were advanced, soil conditions were logged in detail with respect to soil composition, density, moisture content, and apparent hydrocarbon impact (i.e., staining). All soil samples were recovered using split spoon samplers except samples recovered at or less than 0.8 m below grade. Due to the granular component of the fill materials at the surface, poor split spoon recovery was anticipated and therefore, "grab" samples were recovered directly from the auger flights. In addition, soil samples ranging in depth from 1 m to 6 m below grade

were recovered from the auger flights in Boreholes 05-1, 05-5, 05-8, 05-9, 05-11, 05-18, 05-27 through 05-29, and 05-32 due to auger refusal or no recovery in the split spoon sampler. The soil samples were recovered at various depths for measurement of soil headspace vapour concentrations and possible laboratory analysis.

The augers were cleaned after each borehole to minimize possible cross contamination. The split spoon samplers were cleaned between samples.

The soil headspace vapour concentrations were determined by placing a portion of the recovered soil sample into a sealable polyethylene bag and, once the soil sample had warmed to ambient temperature, the bag was punctured with the monitoring probe. The headspace above the soil sample was measured for hydrocarbon vapours using a Gastech® hydrocarbon vapour analyser (calibrated to a hexane standard) with no methane response. It should be noted that the headspace test is a semi-quantitative screening method and can only be considered to represent relative volatile contaminant concentrations.

Samples selected for possible laboratory analysis were transferred immediately to laboratory supplied jars to limit the loss of volatiles during sample recovery. The samples were stored in an ice-chilled cooler and shipped to Maxxam Analytics Inc. (Maxxam) in Mississauga, ON, within 48 hours of sampling. Selected samples were analysed for BTEX, CWS hydrocarbon fractions F1 to F4, metals, polycyclic aromatic hydrocarbons (PAHs), nitrate, nitrite, nitrate+nitrite, pH, conductivity, and/or grain-size.

Soil cuttings generated during drilling were screened for evidence of liquid phase hydrocarbons (LPH). The soil samples recovered during the assessment did not contain any evidence of LPH and, as a result, the soil cuttings were spread around the borehole from which they were recovered. The soil cuttings generated during the assessment were not used to backfill the boreholes.

Upon completion of drilling and based on the results of the field observations, a 50 mm diameter PVC monitoring well with machine slotted #10 screen, void of glue and solvent, was installed in Boreholes 05-6 through 05-9, 05-20, 05-24, 05-25, 05-27, and 05-29 through 05-34. The monitoring wells were installed for future monitoring of subsurface conditions and groundwater sampling. Clean silica sand backfill was placed in the borehole annulus surrounding the screened portion of the monitoring well. A bentonite seal was placed to a

depth of at least 0.6 m below ground surface to prevent infiltration of surface water into the wells. Steel bolt-down covers were installed flush with the ground surface to protect the installations on Monitoring Well 05-20 and 05-29. Above grade well protectors were installed on Monitoring Wells 05-6 through 05-9, 05-24, 05-25, 05-27, and 05-30 through 05-34. The horizontal location of each monitoring well was surveyed relative to the CPR rail lines and/or existing structures. The vertical elevation of each new monitoring well was surveyed relative to a temporary benchmark (top of northwest bolt of rail switch to west of First Street North), with an assumed elevation of 100.000 m.

The completion details for the boreholes and monitoring wells are included on the Borehole Logs, Appendix II.

### 2.2. Surficial Sampling

As discussed in Section 2, a borehole could not be drilled at the former roundhouse discharge area (Mile 15.75, Estevan Subdivision) due to restricted drill rig access. As such, a surficial soil sample was recovered at the former roundhouse discharge area at a depth of approximately 0.15 m to 0.3 m below grade. The soil headspace vapour concentration was determined as discussed above. The sample selected for laboratory analysis was processed as discussed above.

### 2.3. Groundwater Monitoring and Sampling Program

All monitoring wells were measured for liquid levels and subsurface vapour concentrations on December 12, 2005; 21 to 27 days after well installation and when the groundwater was expected to be stabilized in the monitoring wells.

The monitoring wells were developed and purged on December 12 and 13, 2005, prior to sampling, to remove fine-grained material and stagnant water from around the well screen and to allow the collection of a water sample representative of the groundwater in the surrounding formation. The development and purging was done using dedicated polyethylene tubing fitted with one-way Waterra® foot valves. The monitoring wells were purged dry one to three times prior to sampling.

Groundwater samples were collected from all the new monitoring wells on December 12 and 13, 2005 using dedicated polyethylene tubing fitted with one-way Waterra® foot valves. Water

samples were immediately transferred to appropriate laboratory supplied bottles, preservatives added as necessary and stored in an ice-chilled cooler for shipment to Maxxam, for analysis of BTEX, CWS hydrocarbon fractions F1 to F4, dissolved metals, PAHs, nitrate, nitrite, nitrate+nitrite, pH, and/or conductivity, within 24 hours of sample collection.

Hydraulic conductivity testing was completed at the site to estimate the rate of groundwater flow. Monitoring Wells 05-24 and 05-30 were bailed using dedicated polyethylene tubing fitted with one-way Waterra® foot valves and allowed to recharge. Water level measurements were taken using an ORS Environmental Equipment Interface Probe, with an accuracy of 1.5 mm, at various time intervals during recharge. The bail test data was analysed using the Bouwer-Rice (1976, 1989) method to estimate the hydraulic conductivity.

Purge water generated during the well development, groundwater sampling and hydraulic conductivity testing was collected and screened for evidence of visible LPH accumulations. The purge water collected during the assessment did not contain any evidence of visible LPH and, as a result, was discharged onto the ground in a location adjacent to the well from which it was purged. No purge water was discharged into, or adjacent to, any surface water bodies or catch basins.

### 2.4. Quality Assurance/Quality Control

Blind field duplicate samples were randomly obtained during the collection of soil and groundwater samples (approximately one blind duplicate for every 10 samples analysed) and submitted to Maxxam. The samples were selectively analysed for concentrations of organic and inorganic parameters to determine the reproducibility of results of the analytical testing. The field duplicates were prepared with a nondescript identifier to secure sample anonymity at Maxxam. The field duplicates were randomly located in coolers containing other sample containers. Trip blanks and/or field blanks were also transported in the coolers with the soil and groundwater samples.

## 3. PHYSICAL SITE CHARACTERISTICS

### 3.1. Regional Geology

General site information was obtained from readily available maps of the area. The maps entitled: *The Groundwater Availability Map Series, Virden Area (62-F)* and *Groundwater Pollution Hazard Map, Virden Area* produced by the Manitoba Natural Resources Water Resources Branch were examined. The document entitled: *Groundwater Resources in the Souris-Glenwood Planning District (A Synopsis)* produced by the Manitoba Natural Resources Water Resources Branch was also examined. Lacustrine and aeolian deposits extend to depths of approximately 20 m below grade and overlie the Riding Mountain formation. The Riding Mountain formation consists of the Coulter member (light grey to buff clayey siltstone and shale), the Odanah member (hard grey siliceous shale) and the Millwood member (soft greenish brown bentonitic silty shale). The area in the vicinity of Souris is considered a groundwater pollution hazard area by Manitoba Natural Resources. A groundwater pollution hazard area is generally defined as having less than 10 m of low permeability soil overlying an aquifer.

### 3.2. Local Geology

The local geology identified during the drilling program was generally consistent with the regional geology described above. Observations made during the drilling program are described as follows:

- The stratigraphy generally encountered throughout the Souris Yard consisted of sand and/or gravel fill to an average depth of approximately 0.7 m below grade. The fill material was not encountered in Boreholes 05-8, 05-13 through 05-15, 05-17, 05-19, 05-23, 05-24, 05-27, 05-28, and 05-35. Underlying the fill materials was a sand unit that extended to depths ranging from 0.9 m to 3.1 m below grade. The sand unit was not intersected in Boreholes 05-3 through 05-6, 05-9, and 05-11. Clay till and/or silt and clay till was encountered beneath the sand to the maximum depth of investigation (6.1 m). A silt and clay unit was encountered in Boreholes 05-25 and 05-27 at depths ranging from 3.1 m to 4.6 m below grade.

- The results of the grain-size analysis for the soil samples submitted from Boreholes 05-6 (clay till), 05-8 (silt and clay till), and 05-20 (sand) indicated that the clay till and silt and clay till are fine-grained (i.e., $D_{50}$ <75 µm) and the sand is coarse-grained (i.e., $D_{50}$ >75 µm).

- Black and/or grey staining were observed in Boreholes 05-24, 05-25, 05-27, 05-29, 05-30, and 05-34 at depths ranging from 1.2 m to 2.5 m below grade.

- Elevated hydrocarbon vapour concentrations (greater than 1,000 parts per million [ppm]) ranging from 1,210 ppm to 9,680 ppm were measured in soil samples recovered from Boreholes 05-20, 05-29, 05-30, 05-32, 05-33 and 05-34 at depths ranging from 1.2 m to 3.0 m below grade. Hydrocarbon vapour concentrations measured in soil samples recovered from the remaining boreholes did not exceed 990 ppm.

- The surficial soil sample recovered at the former roundhouse discharge area (Mile 15.75, Estevan Subdivision) at a depth of approximately 0.15 m to 0.3 m below grade consisted of a gravelly, fine to medium grained, black sand with trace cinders.

Detailed descriptions of the soil conditions encountered and results of the headspace vapour concentrations measured from field screening of the soil samples during the drilling are presented on the Borehole Logs, Appendix II. The results of the grain-size analyses are presented on Table 1. A copy of the laboratory report detailing the grain-size analyses is included in Appendix III.

### 3.3. Hydrology

A topographical map (Souris Map 62F/9) produced by the Surveys and Mapping Branch of the Department of Energy, Mines and Resources identifies the regional topography of the area surrounding the site to be relatively flat with a slight gradient towards the northeast in the portion of the Yard east of First Street North and a slight gradient towards the southwest in the portion of the Yard west of First Street North. The closest major water body is an unnamed creek located approximately 250 m east of the east end of the Yard. Plum Creek, which flows east into the Souris River, is located approximately 450 m south of the west end of the Yard at its nearest point. Based on topographical information, the inferred regional shallow groundwater flow direction is anticipated to be south and southwest towards Plum Creek in the

west portion of the Yard and to the east and southeast towards the unnamed creek and Souris River in the east portion of the Yard.

According to the Phase I ESA report, a majority of the surface runoff on the north side of the tracks, east of First Street North, flows east towards an unnamed creek that flows into the Souris River. Surface drainage to the south of the tracks in the east portion of the Yard appears to flow towards the south. Surface runoff in the portion of the Yard located west of First Street North flows south into Plum Creek and the Souris River.

### 3.4. Regional Hydrogeology

A review of the Manitoba Conservation Water Branch water well database by Morrow personnel identified up to 22 registered water wells located within approximately 500 m of the site. Of the 22 wells, 15 were registered as domestic wells, three were registered for industrial use, two were for livestock use, and two were registered as observation/test wells. It should be noted that the registered water wells are listed in the database by section, township and range. Therefore, at best, the wells can only be located to the nearest quarter section. The domestic wells are cased through the overburden to depths ranging from 2.7 m to 61 m below grade and screened and/or left open hole to depths ranging from 8 m to 70 m below grade.

Based on discussions with the Town of Souris personnel, the residents of Souris obtain their potable water from two water wells located approximately 17 km northeast of Souris, via a piped distribution system. Town personnel provided a map showing the locations of the 19 known private wells that are being used for domestic, irrigation and industrial purposes within the Town of Souris. Based on the map provided by the Town of Souris, there are 13 private wells located within 500 m of the Souris Yard with the closest being approximately 25 m north of the Yard. Of the 13 wells, 10 are listed as multi-use (i.e., domestic, lawn irrigation, etc.), one is listed as domestic, one is listed as industrial, and one is unknown. Based on the information provided by the Town, the domestic and multi-use wells located within 500 m are installed to depths ranging from 5 m to 53 m below grade. The nearest private well to the Yard is listed as multi-use and is installed to a depth of 9 m below grade. There are presently no by-laws in the Town of Souris prohibiting residents from using private water wells for potable purposes.

### 3.5. Local Hydrogeology

Follow-up site monitoring was completed on December 12, 2005; 21 to 27 days after installation of the monitoring wells and when the groundwater was expected to be stabilized in the monitoring wells. The monitoring wells at the site were measured for liquid levels and subsurface vapour concentrations.

The December 12, 2005 monitoring results are provided in Appendix IV. The depth to groundwater ranged from approximately 1.4 m to 2.2 m below grade on this date. The groundwater elevations measured on December 12, 2005 are contoured on Drawing 131066-003, Appendix I. The apparent direction of shallow groundwater flow in the former fuelling facility area was south at an average gradient of 0.03 m/m. The apparent direction of shallow groundwater flow in the former North Star Oil and Imperial Oil bulk plant areas was east at an average gradient of 0.02 m/m. The apparent direction of shallow groundwater flow in the former roundhouse area was southeast at an average gradient of 0.01 m/m.

No measurable LPH was detected in any of the monitoring wells on this date.

A maximum hydrocarbon vapour concentration of 770 ppm was measured in Monitoring Well 05-32, located adjacent to the former Imperial bulk plant. Subsurface hydrocarbon vapour concentrations measured in the remaining monitoring wells did not exceed 225 ppm.

Based on the rising head bail tests performed on Monitoring Wells 05-24 and 05-30, the average horizontal hydraulic conductivity beneath the former fuelling facility area was calculated to be $1.3 \times 10^{-6}$ m/s. The average horizontal hydraulic conductivity beneath the former North Star Oil bulk plant area was calculated to be $1.3 \times 10^{-7}$ m/s. The results of the bail tests, along with the hydraulic conductivity curves, are presented in Appendix V.

Using the hydraulic conductivities measured in the rising head bail tests performed on Monitoring Well 05-24, the average hydraulic gradient of 0.03 m/m to the south and an assumed effective porosity of 0.2 (approximate value for sand), the groundwater seepage velocity beneath the former fuelling facility is estimated to be $2 \times 10^{-7}$ m/s (6 m/yr) to the south. Using the hydraulic conductivity measured in the rising head bail test performed on Monitoring Well 05-30, the average hydraulic gradient of 0.02 m/m to the east and an assumed effective

porosity of 0.3 (approximate value for clay till), the groundwater seepage velocity beneath the North Star Oil bulk plant area is estimated to be $9 \times 10^{-9}$ m/s (0.3 m/year) to the east.

### 3.6. Underground Infrastructure

In addition to evaluating the hydrogeological characteristics of the sites, the underground infrastructure was reviewed to identify if potential migration pathways were present. Information regarding underground utilities was investigated by contacting Manitoba Hydro, Westman Communications (cable TV), the Town of Souris, and CP Rail to conduct utility locates.

Overhead power lines service the M/W office. Underground telephone lines are located crossing the tracks to the east of the former fuelling facility and south of the main track from First Street North to the M/W office. An underground signal line is located south of the main track from the M/W office to west of the former fuelling facility. Underground gas, water and sewer mains and telephone and cable TV conduits (including fibre optic) are located beneath First Street North. A water service runs from the main beneath First Street North to the M/W office.

## 4. DETERMINATION OF APPLICABLE RECEPTOR PATHWAYS

### 4.1. Freshwater Aquatic Life

The freshwater aquatic life pathway was reviewed in the context of an aquatic receptor of ecological significance within 300 m down gradient (+/- 45 degrees of the apparent groundwater flow direction) of the site or within 50 years groundwater travel time of the site. The nearest aquatic receptor (i.e. Plum Creek) to the west portion of the Yard is at a distance in excess of 300 m. As such, the aquatic life pathway is not considered applicable in the west portion of the Yard.

The nearest aquatic receptor (i.e. an unnamed creek) to the east portion of the Yard is at a distance of less than 300 m. Using the average horizontal hydraulic conductivity determined by Morrow of $1.3 \times 10^{-7}$ m/s for the former North Star Oil bulk plant area, an assumed porosity of 0.3 for the former North Star Oil bulk plant area (approximate value for clay till) and the measured hydraulic gradient determined during Morrow's investigation, the groundwater seepage velocity beneath the east portion of the Yard is presented in the following table.

**TABLE C: Groundwater Seepage Velocities**

| Monitoring Date | Portion of Yard | Inferred Groundwater Flow Direction | Hydraulic Gradient (m/m) | Seepage Velocity (m/s) | Seepage Velocity (m/year) |
|---|---|---|---|---|---|
| December 12, 2005 | east | east | 0.02 | $9 \times 10^{-9}$ | 0.3 |

The groundwater seepage velocity beneath the site was calculated using the following equation:

$$v = \frac{Ki}{n}$$

where:
v = average groundwater velocity (m/s)
K = aquifer hydraulic conductivity (m/s)
*i* = average hydraulic gradient
*n* = aquifer porosity, based on literature values from Freeze and Cherry, 1979[1]

[1] Freeze, R.A. and J.A. Cherry, 1979, *Groundwater*. Prentice-Hall Inc., Englewood Cliffs, NJ, USA

Based on the seepage velocity presented in the above table, the approximate travel time to the unnamed creek located 250 m east of the east end of the Yard has been calculated and is presented in the following table.

**TABLE D: Travel Times to Nearest Surface Water**

| Monitoring Date | Portion of Yard | Inferred Groundwater Flow Direction | Distance to Nearest Surface Water (m) | Seepage Velocity (m/year) | Travel Time (years) |
|---|---|---|---|---|---|
| December 12, 2005 | east | east | 250 | 0.3 | 833 |

Supporting technical documentation for the current British Columbia Waste Management Act, *Contaminated Sites Regulation* (CSR) (B.C. Reg. 109/2002) states that if the groundwater travel time to the nearest surface water is greater than 50 years, the aquatic life pathway is not applicable. Based on this and Morrow's monitoring data, the aquatic life pathway is not considered applicable to the east portion of the site.

### 4.2. Drinking Water Pathway

The drinking water pathway was reviewed in the context of a domestic receptor within 500 m down gradient (+/- 45 degrees of the apparent groundwater flow direction) of the site or within 100 m up or cross gradient of the site.

Souris residents receive potable water from two municipal water wells, located approximately 17 km northeast of the Town, via a piped distribution system. Based on information provided by the Town of Souris, there are 13 private water wells located within 500 m of the Yard. Of the 13 private wells, 10 are listed as multi-use (i.e., domestic, lawn irrigation, etc.), one is listed as domestic, one is listed as industrial, and one is unknown. Only one of the 13 private wells could be matched to the registered wells (registered for industrial use) located within 500 m of the Yard (discussed in Section 3.4). The remaining 12 private wells do not appear to be registered with the Manitoba Conservation Water Branch. The nearest well to the Yard is listed for multi-use and is located approximately 25 m north of the Yard (i.e., up gradient). Based on the information provided by the Town, the domestic and multi-use wells located within 500 m are installed to depths ranging from 5 m to 53 m below grade with the majority being installed to depths ranging from 5 m to 9 m below grade. Using a +/- 45 degree flow band in the direction of groundwater flow in the apparent areas of hydrocarbon impact (i.e., former fuelling facility

and former North Star Oil and Imperial Oil bulk plants), there is one private well located down gradient (i.e., south) of the former fuelling facility. There are no private water wells located within 100 m up and/or cross gradient of the apparent impacted areas. Based on a search of the Manitoba Conservation Water Branch water well database, there are up to 15 registered domestic water wells located within 500 m of the Yard. The domestic wells are cased through the overburden to depths ranging from 2.7 m to 61 m below grade and screened and/or left open hole to depths ranging from 8 m to 70 m below grade. Based on baildown tests conducted by Morrow, the average hydraulic conductivity beneath the former fuelling facility is greater than $10^{-4}$ cm/s. As such, the drinking water pathway (i.e., ingestion) appears to be applicable to the Yard.

### 4.3. Irrigation and Livestock Watering Pathway

According to Town of Souris personnel, surface water bodies located within the town (i.e., Plum Creek, Souris River and unnamed creek) are not used for irrigation or livestock watering. Therefore, the irrigation and livestock watering pathways are not considered applicable to the site.

# 5. DATA AND ANALYSIS

## 5.1. Soil and Groundwater Quality Guidelines

The site was investigated and assessed in general accordance with the protocols outlined in the document entitled: *Environmental Site Investigations in Manitoba*, Manitoba Conservation, May 2002. The document outlines the evaluative process that applies risk-based protocol to sites in Manitoba. The process establishes target levels based on the risk to public health and safety and the physical environment.

Environmental Quality Guidelines (EQG) used for comparison purposes are presented in the documents entitled: *Canadian Environmental Quality Guidelines* (CEQG), Canadian Council of Ministers of the Environment (CCME), updated 2005 and *Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil* (CWS), CCME, April 2001.

### *5.1.1. Soil*

The current and expected future land use of the site is commercial. The site surface is sand and gravel and vegetated (i.e., grass and trees). Based on grain-size analysis completed during this investigation, the surface soil and subsoil are coarse-grained (i.e., $D_{50}$ >75 µm). As discussed in Section 4, the drinking water pathway is considered to be applicable to the site.

As such, the assessment guideline for benzene, toluene, ethylbenzene, and xylenes are the CCME CEQG (updated 2005) Commercial Land Use, Drinking Water pathway guidelines for coarse-grained surface soil and subsoil (i.e., protective of human health from the ingestion of hydrocarbons by humans).

The assessment guidelines for hydrocarbon fractions F1 to F4 are the CWS Levels for PHC in coarse-grained surface soil and subsoil, Commercial Land Use, Protection of Potable Groundwater.

The CCME CEQG (updated 2005) for Commercial Land Use guidelines are considered to be the assessment guidelines for PAHs, nutrients and metals in soil.

The assessment EQG for soil are summarized on the following table.

## TABLE E: Soil Assessment Guidelines

| Parameter | Environmental Quality Guidelines | |
|---|---|---|
| **BTEX** | **Levels for BTEX in coarse-grained surface soils, Commercial Land Use[1]** | **Levels for BTEX in coarse-grained subsoils, Commercial Land Use[1]** |
| Benzene | 0.030 | 0.030 |
| Toluene | 0.37 | 0.37 |
| Ethylbenzene | 0.082 | 0.082 |
| Xylenes | 11 | 11 |
| **CWS for PHC** | **Levels for PHC in coarse-grained soils, Commercial Land Use[2]** | |
| | **Surface Soils** | **Subsoil** |
| Fraction F1 ($C_6$-$C_{10}$) | 860[3] | 860[3] |
| Fraction F2 (>$C_{10}$-$C_{16}$) | 1,200 | 1,200 |
| Fraction F3 (>$C_{16}$-$C_{34}$) | NA | NA |
| Fraction F4 (>$C_{34}$-$C_{50}$) | NA | NA |
| **PAHs** | **Commercial Land Use[1]** | |
| Acenaphthene | NG | |
| Acenaphthylene | NG | |
| Anthracene | NG | |
| Benzo(a)anthracene | 10 | |
| Benzo(a)pyrene | 0.7 | |
| Benzo(b+j)fluoranthene | NG | |
| Benzo(g,h,i)perylene | NG | |
| Benzo(k)fluoranthene | 10 | |
| Chrysene | NG | |
| Dibenz(a,h)anthracene | 10 | |
| Fluoranthene | NG | |
| Fluorene | NG | |
| Indeno(1,2,3-cd)pyrene | 10 | |
| 1-Methylnaphthalene | NG | |
| 2-Methylnaphthalene | NG | |
| Naphthalene | 22 | |
| Phenanthrene | 50 | |
| Pyrene | 100 | |
| **Metals** | **Commercial Land Use[1]** | |
| Antimony | 40 | |
| Arsenic | 12 | |
| Barium | 2,000 | |
| Cadmium | 22 | |
| Chromium | 87 | |
| Cobalt | 300 | |

| Parameter | Environmental Quality Guidelines |
|---|---|
| Copper | 91 |
| Lead | 260 |
| Manganese | NG |
| Molybdenum | 40 |
| Nickel | 50 |
| Selenium | 3.9 |
| Silver | 40 |
| Tin | 300 |
| Uranium | NG |
| Vanadium | 130 |
| Zinc | 360 |
| **General** | **Commercial Land Use[1]** |
| pH (pH units) | 6 - 8 |
| Conductivity (µS/cm) | 4,000 |
| Nitrate Nitrogen | NG |
| Nitrite Nitrogen | NG |
| Nitrate+Nitrite | NG |

EQG are expressed in milligrams per dry kilogram unless otherwise noted.
NG – no guideline.
NA – Not applicable. Calculated value exceeds 1,000,000 mg/kg or pathway excluded.
[1] - *Canadian Environmental Quality Guidelines*, CCME, updated 2005
[2] - *Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil*, CCME, April 2001
[3] - excludes the benzene, toluene, ethylbenzene, and xylenes (BTEX) components

### *5.1.2. Groundwater*

As discussed in Section 4, the drinking water pathway is considered applicable to the site. Therefore, the CCME (updated 2005) Community Water guidelines are considered to be the assessment EQG for the current and expected future groundwater use at the site.

The assessment EQG for groundwater are summarized on the following table.

**TABLE F: Groundwater Assessment Guidelines**

| Parameter | Environmental Quality Guidelines |
|---|---|
| **Hydrocarbons** | **Community Water[1]** |
| Benzene | 0.005 |
| Toluene | ≤0.024 |
| Ethylbenzene | ≤0.0024 |
| Xylene(s) | ≤0.3 |
| Fraction F1 ($C_6$-$C_{10}$) | NG |
| Fraction F2 (>$C_{10}$-$C_{16}$) | NG |
| Fraction F3 (>$C_{16}$-$C_{34}$) | NG |

| Parameter | Environmental Quality Guidelines |
|---|---|
| Fraction F4 (>$C_{34}$-$C_{50}$) | NG |
| **PAHs** | **Community Water[1]** |
| Acenaphthene | NG |
| Acenaphthylene | NG |
| Anthracene | NG |
| Benzo(a)anthracene | NG |
| Benzo(a)pyrene | 0.00001 |
| Benzo(b+j)fluoranthene | NG |
| Benzo(g,h,i)perylene | NG |
| Benzo(k)fluoranthene | NG |
| Chrysene | NG |
| Dibenz(a,h)anthracene | NG |
| Fluoranthene | NG |
| Flurorene | NG |
| Indeno(1,2,3-c,d)pyrene | NG |
| 1-Methylnaphthalene | NG |
| 2-Methylnaphthalene | NG |
| Naphthalene | NG |
| Phenanthrene | NG |
| Pyrene | NG |
| **Metals** | **Community Water[1]** |
| Aluminum | NG |
| Arsenic | 0.025 |
| Barium | 1.0 |
| Beryllium | NG |
| Boron | 5 |
| Cadmium | 0.005 |
| Chromium | 0.05 |
| Cobalt | NG |
| Copper | ≤1.0 [2] |
| Iron | ≤0.3 [2] |
| Lead | 0.010 |
| Magnesium | NG |
| Manganese | ≤0.05 [2] |
| Nickel | NG |
| Selenium | 0.01 |
| Silver | NG |
| Thallium | NG |
| Vanadium | NG |
| Zinc | ≤5.0 [2] |
| **General** | **Community Water[1]** |
| pH (pH units) | 6.5 - 8.5 [2] |
| Conductivity (µS/cm) | NG |

| Parameter | Environmental Quality Guidelines |
|---|---|
| Nitrate Nitrogen | 10 |
| Nitrite Nitrogen | NG |
| Nitrate+Nitrite | NG |

EQG are expressed in milligrams per litre unless otherwise noted.
NG - no guideline.
[1] - *Canadian Environmental Quality Guidelines*, CCME, updated 2005
[2] - aesthetic objective

### 5.2. Summary of Soil Analytical Results

Based on the results of the field screening, laboratory analysis was completed on 43 soil samples (including five soil samples for quality assurance/quality control [QA/QC] analysis and one field blank) for parameters including BTEX, CWS hydrocarbon fractions F1 to F4, metals, PAHs, and/or nutrients (i.e., nitrate, nitrite, nitrate+nitrite, pH, and conductivity). In addition, grain-size analysis was completed on five representative soil samples as discussed in Section 3.2.

The results of the hydrocarbon, metals and nutrient analyses are summarized in Tables 2 through 5. Copies of the detailed analytical reports are included in Appendix III. Selected analytical results are presented graphically on Drawing 131066-004, Appendix I.

#### *5.2.1. Former Tool and Engine Houses, Oil Sheds and Ash Pit*

The results of the analyses of the soil samples recovered from Boreholes 05-1 (former engine house), 05-3 and 05-4 (former ash pit), 05-10 through 05-17 and 05-19 (former tool houses), and 05-21 through 05-23 (former oil and dope shed), are summarized as follows.

- Benzene, toluene and ethylbenzene were detected in a soil sample recovered from Borehole 05-11 (former tool house) at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guidelines. Hydrocarbon concentrations in the remaining samples analysed were less than the referenced CCME assessment guidelines.

- The laboratory analysis did not identify any metals at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guidelines and/or the laboratory detection limits in the soil samples recovered and analysed from the boreholes located in the former tool and engine house areas, the oil and dope shed area and the ash pit area.

### 5.2.2. *Former Roundhouse*

The results of the analyses on the soil samples recovered from Boreholes 05-5 through 05-9 are summarized as follows.

- Hydrocarbon and metals components were not detected at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guidelines, the CCME (2001) CWS for PHC in coarse-grained surface soil and subsoils, Commercial Land Use, Protection of Potable Groundwater assessment guidelines in soil samples recovered and analysed during assessment of the former roundhouse area.

### 5.2.3. *Former Coal Storage Areas and Roundhouse Discharge Area*

The results of the analyses on the soil samples recovered from Boreholes 05-2, 05-18 and 05-35 (former coal storage areas) and the surficial soil sample recovered from the former roundhouse discharge area are summarized as follows.

- Benzene was detected in the surficial soil sample recovered from the former roundhouse discharge area at a concentration equal to the CCME CEQG (updated 2005) Commercial Land Use assessment guideline. Hydrocarbon concentrations in the remaining samples analysed were less than the referenced CCME assessment guidelines.

- An arsenic concentration exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guideline was detected in a soil sample recovered from Borehole 05-18 (former coal storage area). Metals concentrations in the remaining samples analysed were less than the referenced CCME assessment guidelines.

### 5.2.4. *Former Fuelling Facility and AST Areas*

The results of the analyses on the soil samples recovered from Boreholes 05-13 and 05-26 (former AST areas) and 05-20, 05-24, 05-25, 05-27, and 05-28 (former fuelling facility) are summarized as follows.

- Toluene, ethylbenzene and/or xylenes and CWS fraction F2 were detected in soil samples recovered from Boreholes 05-20, 05-24, 05-25, and 05-27 (former fuelling facility) at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use

assessment guidelines and/or the CCME (2001) CWS for PHC in coarse-grained surface soils, Commercial Land Use, Protection of Potable Groundwater assessment guidelines. Hydrocarbon concentrations in the remaining samples analysed were less than the referenced CCME assessment guidelines.

- The laboratory analysis did not identify any metals at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guidelines in the soil samples recovered and analysed from the boreholes located in the former fuelling facility and AST areas.

#### *5.2.5. Former North Star Oil Bulk Plant*

The results of the analyses on the soil samples recovered from Boreholes 05-29, 05-30 and 05-34 are summarized as follows.

- Benzene, toluene, ethylbenzene, and/or xylenes and CWS fractions F1 and/or F2 were detected in soil samples recovered from Boreholes 05-29, 05-30 and 05-34 at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use and/or the CCME (2001) CWS for PHC in coarse-grained surface soils, Commercial Land Use, Protection of Potable Groundwater assessment guidelines.

- An arsenic concentration equal to the CCME CEQG (updated 2005) Commercial Land Use assessment guideline was detected in a soil sample recovered from Borehole 05-34. Metals concentrations in the remaining samples analysed were less than the referenced CCME assessment guidelines.

#### *5.2.6. Former Imperial Oil Bulk Plant and Fertilizer Warehouse*

The results of the analyses on the soil samples recovered from Boreholes 05-31 through 05-33 are summarized as follows.

- Benzene, ethylbenzene and xylenes were detected in soil samples recovered from Boreholes 05-32 and 05-33 at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guidelines. Hydrocarbon concentrations in the remaining sample analysed were less than the referenced CCME assessment guidelines.

- The laboratory analysis did not identify any metals at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guidelines in the soil samples recovered from the boreholes located in the former Imperial Oil bulk plant area.

- Nitrate nitrogen, nitrite nitrogen and nitrate+nitrite were not detected at concentrations exceeding the laboratory detection limit in soil samples recovered from Boreholes 05-31 and 05-32. There are no CCME guidelines for these parameters. In addition, conductivity and pH in these soil samples were within the CCME CEQG (updated 2005) Commercial Land Use assessment guidelines.

### 5.3. Summary of Groundwater Analytical Results

All of the monitoring wells installed in the Souris Yard were sampled and analysed for one or more of the following constituents: BTEX, CWS hydrocarbon fractions F1 to F4, dissolved metals, PAHs, and/or nutrients (i.e., nitrate, nitrite, nitrate+nitrite, pH, and/or conductivity).

The results of the groundwater analyses are summarized in Tables 6 through 8. The detailed analytical reports are presented in Appendix III. Selected analytical results are presented graphically on Drawing 131066-005, Appendix I.

#### *5.3.1. Former Roundhouse*

The results of the analyses of the groundwater samples collected from Monitoring Wells 05-6 through 05-9 are summarized as follows.

- Benzo(a)pyrene was detected at a concentration exceeding the CCME CEQG (updated 2005) Community Water assessment guideline in a groundwater sample collected from Monitoring Well 05-8. Dissolved hydrocarbons were not detected in the remaining groundwater samples collected at concentrations greater than the referenced CCME assessment guidelines.

- Dissolved manganese was detected in groundwater samples collected from Monitoring Wells 05-6 through 05-9 at concentrations exceeding the CCME CEQG (updated 2005) Community Water aesthetic objective.

### 5.3.2. *Former Fuelling Facility*

The results of the laboratory analyses on the groundwater samples collected from Monitoring Wells 05-20, 05-24, 05-25, and 05-27 are summarized as follows.

- Dissolved ethylbenzene and/or xylenes were detected at concentrations exceeding the CCME CEQG (updated 2005) Community Water assessment guidelines in groundwater samples collected from Monitoring Wells 05-20 and 05-25. Dissolved hydrocarbons were not detected in the remaining groundwater samples collected at concentrations greater than the referenced CCME assessment guidelines.

- Dissolved arsenic and/or barium were detected in groundwater samples collected from Monitoring Wells 05-20 and 05-25 at concentrations exceeding the CCME CEQG (updated 2005) Community Water assessment guidelines.

- Dissolved iron and manganese were detected in groundwater samples collected from Monitoring Wells 05-20, 05-24, 05-25, and 05-27 at concentrations exceeding the CCME CEQG (updated 2005) Community Water aesthetic objectives.

### 5.3.3. *Former North Star Oil Bulk Plant*

The results of the laboratory analyses on the groundwater samples collected from Monitoring Wells 05-29, 05-30 and 05-34 are summarized as follows.

- Dissolved benzene, toluene, ethylbenzene, and/or xylenes were detected at concentrations exceeding the CCME CEQG (updated 2005) Community Water assessment guidelines in groundwater samples collected from Monitoring Wells 05-29, 05-30 and 05-34.

- Dissolved iron and manganese were detected in groundwater samples collected from Monitoring Wells 05-29, 05-30 and 05-34 at concentrations exceeding the CCME CEQG (updated 2005) Community Water aesthetic objectives.

### 5.3.4. *Former Imperial Oil Bulk Plant and Fertilizer Warehouse*

The results of the analyses conducted on the groundwater samples collected from Monitoring Wells 05-31, 05-32 and 05-33 are summarized as follows.

- Dissolved benzene, ethylbenzene and/or xylenes were detected at concentrations exceeding the CCME CEQG (updated 2005) Community Water assessment guidelines in groundwater samples collected from Monitoring Wells 05-32 and 05-33. Dissolved hydrocarbons were not detected in the remaining groundwater samples collected at concentrations exceeding the referenced CCME assessment guidelines.

- Dissolved iron and/or manganese were detected in groundwater samples collected from Monitoring Wells 05-32 and 05-33 at concentrations exceeding the CCME CEQG (updated 2005) Community Water aesthetic objectives. The groundwater sample collected from Monitoring Well 05-31 was not analysed for dissolved metals concentrations.

- Nutrient concentrations in the groundwater samples collected from Monitoring Wells 05-31 and 05-32 were less than the CCME CEQG (updated 2005) Community Water assessment guidelines.

### 5.4. Quality Assurance/Quality Control

QA/QC procedures were followed by Morrow and Maxxam to ensure the analytical results were accurate and representative. Chain of custody records were maintained to track sample handling between the field and the laboratory. The laboratory QA/QC program included the analysis of sample duplicates, method blanks, spiked method blanks, matrix spikes, and surrogate recovery. The analysis of selected samples in duplicate is used to evaluate the sample variance of the analytical method. Method blank analysis is performed to identify laboratory contributions (e.g., glassware, reagents and/or instrumentation) to the measured analyte level in the samples. Spiked method blanks are conducted by adding known concentrations of the analyte of interest to a known matrix (e.g., ultra pure water or acid washed silica sand). The spiked method blank recoveries are used as an indication of the overall analytical method accuracy, independent of sample matrix effects. Matrix spikes are conducted by adding known concentrations of the analyte of interest to one of the submitted samples. Matrix spike recoveries are used to determine if sample matrix effects are causing a significant bias in the data generated by the test method. Surrogate recovery is analysed by spiking samples with known quantities of surrogate chemicals which have similar chemical properties to the parameters being analysed and reporting the recovery as an indication of the analytical method accuracy.

The results of the laboratory QA/QC program are as follows.

- Analyte concentrations measured in the laboratory method blank samples were within the acceptable limits established by the laboratory QA/QC program;
- Analyte concentrations measured in the field blank soil sample and the trip and field blank water samples were below the laboratory detection limits, except those discussed below. The analytical results of the field and trip blank analysis are presented on Tables 4 through 6 and 8, and in the laboratory reports in Appendix III;
- Analyte concentrations in the samples analysed in duplicate were within the acceptable limits established by the laboratory QA/QC program, except those discussed below;
- Matrix spikes measured in the soil and groundwater samples were within acceptable limits established by the laboratory, except those discussed below;
- Surrogate recoveries measured in soil and groundwater samples were within the acceptable limits established by the laboratory QA/QC program, except those discussed below; and
- Analyte concentrations measured in the laboratory spiked method blank samples were within the acceptable limits established by the laboratory QA/QC program, except those discussed below.

Barium, chromium, manganese, molybdenum, and nickel concentrations in the field blank soil sample and dissolved aluminium in the field blank groundwater sample exceeded the alert limits for a field blank sample (i.e., five times the laboratory detection limit). In addition, the chromium concentration in the field blank soil sample exceeded the CCME (updated 2005) Commercial Land Use assessment guideline. Typically, the exceedance of an alert limit in a field blank sample would indicate a positive bias of the sample batch (i.e., the samples with which the field blank was submitted to the laboratory). However, as all soil samples analysed for barium, chromium, manganese, molybdenum, and nickel concentrations and all groundwater samples analysed for dissolved aluminium concentrations were less than the referenced CCME assessment guidelines, the results of the field blank analysis did not affect the interpretation of the data.

Laboratory duplicate results for the analysis completed on soil sample SS-1-051121 exceeded the relative percent difference ($RPD_{DUP}$) acceptance criteria. Maxxam stated in the laboratory report that "this is likely due to heterogeneity of the sample." Morrow strives to reduce the potential for poor reproducibility by following our Preferred Operating Procedures for collection and handling of soil samples for laboratory analysis, quality control/quality assurance measures and careful documentation and labelling procedures.

Upon reviewing the spiked matrix recoveries, recoveries outside of the acceptable limits established by Maxxam were observed for the matrix spikes conducted for the dissolved metals analysis of groundwater samples recovered from Monitoring Wells 05-29, 05-32 and 05-33 and the trip blank sample. The percent recoveries for dissolved silver were 63% (Monitoring Wells 05-32 and 05-33) and 70% (Monitoring Well 05-29 and the trip blank sample), which do not fall within the Maxxam established limits of 75% to 125%. In the laboratory reports, Maxxam stated that the results "may represent a low bias in some results for this specific element."

Surrogate recoveries for samples BH05-29-4, BH05-29-9 and BH05-30-4 were outside of the control limits. Maxxam stated in the laboratory report that this was due to matrix interference. Further, Maxxam stated, "the overall quality control for this analysis meets our acceptability criteria."

Upon reviewing the chemical spike recoveries, a poor recovery was observed for the spiked method blank conducted for the PAH analysis of soil sample BH05-18-1. The percent recovery for pyrene was 131%, which is marginally beyond the Maxxam established limits of 30% to 130%. In the laboratory report, Maxxam stated that "some compounds are outside control limits, however, the overall quality control for this analysis meets our acceptability criteria".

The measurement used for comparison of two different laboratory results is the $RPD_{DUP}$, which is defined as the absolute value of the difference between the two samples, divided by the average. Analytical error increases near the minimum detection limit (MDL); therefore, $RPD_{DUP}$ should only be applied where the concentrations are above the practical quantitation limit (defined as five times the MDL). For the parameters measured in soil, a $RPD_{DUP}$ value of less than 100% is considered acceptable. For the organic parameters measured in water, a $RPD_{DUP}$ value of less than 80% is considered acceptable. For inorganic parameters in water, a $RPD_{DUP}$ value of less than 50% is considered acceptable. The calculated $RPD_{DUP}$ values for the blind

duplicate samples are presented on Tables 2 through and 5 (soil) and Tables 6 and 8 (groundwater).

Five blind duplicate soil samples were recovered during the drilling assessment. The calculated $RPD_{DUP}$ values for the blind duplicate soil samples analysed ranged from 0% to 76%, which are considered acceptable.

Two blind duplicate water samples were collected during the groundwater sampling. The calculated $RPD_{DUP}$ values for the blind duplicate groundwater samples analysed ranged from 0% to 16%, which are considered acceptable.

## 6. DISCUSSION

A Phase II ESA was undertaken at CPR's Souris Yard to assess the areas of potential environmental concern previously identified in a Phase I ESA. Morrow observed the drilling of Boreholes 05-1 through 05-35 across the Souris Yard. In addition, a surficial soil sample was recovered at the former roundhouse discharge area.

The results of the intrusive assessment identified residual hydrocarbons at concentrations exceeding the CCME CEQG (updated 2005) Commercial Land Use and/or the CWS (2001) Commercial Land Use, Protection of Potable Groundwater Pathway assessment guidelines in soil samples recovered from Boreholes 05-11 (former tool house, Mile 15.89, Estevan Subdivision), 05-20, 05-24, 05-25, and 05-27 (former fuelling facility, Mile 16.28, Estevan Subdivision), 05-29, 05-30 and 05-34 (former North Star Oil bulk plant, Mile 146.67, Glenboro Subdivision), and 05-32 and 05-33 (adjacent to the former Imperial Oil bulk plant and fertilizer warehouse, Mile 146.64, Glenboro Subdivision) at depths ranging from 0.5 m to 3.0 m below grade. In addition, benzene was detected in the surficial soil sample recovered from the former roundhouse discharge area (Mile 15.75, Estevan Subdivision) at a concentration exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guideline. The sample was recovered at a depth of 0.15 m to 0.3 m below grade.

Arsenic concentrations equal to or exceeding the CCME CEQG (updated 2005) Commercial Land Use assessment guideline were detected in soil samples recovered from Boreholes 05-18 (former coal shed, Mile 15.80, Estevan Subdivision) and 05-34 (former North Star Oil bulk plant, Mile 146.67, Glenboro Subdivision) at depths ranging from 0.5 m to 2.3 m below grade.

Based on the results of soil headspace vapour concentration measurements, visual observations and laboratory analyses of the soils, the vertical extent of residual hydrocarbon and/or metals impact appears to be at depths ranging from 0 m to 1.0 m below grade at the former tool house (Borehole 05-11), from 0 m to 1.0 m below grade at the former coal shed (Borehole 05-18), from 0.9 m to 3.1 m below grade in the former fuelling facility area (Boreholes 05-20, 05-24, 05-25, and 05-27), from 1.4 m to 3.3 m below grade at the former North Star Oil bulk plant (Boreholes 05-29, 05-30 and 05-34), and from 0.9 m to 3.0 m below grade adjacent to the former Imperial Oil bulk plant and fertilizer warehouse area (Boreholes 05-32 and 05-33). The vertical extent of hydrocarbon impact at the former roundhouse discharge area is unknown.

Laterally, the residual hydrocarbon impact identified at Borehole 05-11 at the former tool house does not appear to extend beyond Boreholes 05-5, 05-10 and 05-16 to the west, north and east, respectively. The extent of hydrocarbon impact in this area has not been delineated to the south. Arsenic impact identified at Borehole 05-18 at a former coal shed does not appear to extend beyond Boreholes 05-10, 05-3 and 05-2 to the south, west and north, respectively. The extent of hydrocarbon impact in this area has not been delineated to the east. The residual hydrocarbon impact identified at Boreholes 05-20, 05-24, 05-25 and 05-27 in the former fuelling facility area has not been delineated to the north, east, south, and west. Hydrocarbon impact identified at Boreholes 05-29, 05-30 and 05-34 in the former North Star Oil bulk plant area has not been delineated to the north, east, south, and west. Arsenic impact identified in Borehole 05-34 in the former North Star Oil bulk plant area does not appear to extend beyond Borehole 05-30 to the north, 05-29 to the east and 05-35 to the west. The extent of arsenic impact in this area has not been delineated to the south. Residual hydrocarbon impact identified in Boreholes 05-32 and 05-33 adjacent to the former Imperial Oil bulk plant and fertilizer warehouse does not appear to extend beyond Borehole 05-31 to the north. The extent of hydrocarbon impact in this area has not been delineated to the east, south and west. The extent of hydrocarbon impact in the former roundhouse discharge area has not been delineated to the north, east, south, and west.

The depth to groundwater on December 12, 2005 ranged from approximately 1.4 m to 2.2 m below grade in the Souris Yard. Based on the monitoring data for this date, the apparent direction of shallow groundwater flow in the former fuelling facility area was inferred to be towards the south, in the former North Star Oil and Imperial Oil bulk plant areas was inferred to be towards the east and in the former roundhouse area was inferred to be towards the southeast. No measurable LPH was detected in any of the monitoring wells on this date. A maximum hydrocarbon vapour concentration of 770 ppm was measured in Monitoring Well 05-32 located adjacent to the former Imperial Oil bulk plant and fertilizer warehouse. Subsurface hydrocarbon vapour concentrations measured in the remaining monitoring wells did not exceed 225 ppm.

Based on the rising head bail tests performed on Monitoring Wells 05-24 and 05-30, the average horizontal hydraulic conductivity beneath the former fuelling facility area was calculated to be $1.3 \times 10^{-6}$ m/s. The horizontal hydraulic conductivity beneath the former North Star Oil bulk plant area was calculated to be $1.3 \times 10^{-7}$ m/s. The groundwater seepage velocity beneath the former

fuelling facility is estimated to be 2 x $10^{-7}$m/s (6 m/yr) to the south, and beneath the North Star Oil bulk plant area groundwater seepage velocity is estimated to be 9 x $10^{-8}$ m/s (0.3 m/year) to the east.

Dissolved hydrocarbons in groundwater samples collected from Monitoring Well 05-8 (former roundhouse area, Mile 15.90, Estevan Subdivision), Monitoring Wells 05-20 and 05-25 (former fuelling facility area, Mile 16.28, Estevan Subdivision), Monitoring Wells 05-29, 05-30 and 05-34 (former North Star Oil bulk plant, Mile 146.67, Glenboro Subdivision), and Monitoring Wells 05-32 and 05-33 (adjacent to the former Imperial Oil bulk plant and fertilizer warehouse, Mile 146.64, Glenboro Subdivision) were detected at concentrations exceeding the CCME CEQG (updated 2005) Community Water assessment guidelines. Laterally, the dissolved hydrocarbon impact identified at Monitoring Well 05-8 does not appear to extend beyond Monitoring Wells 05-7 and 05-9 to the south and west, respectively. The extent of dissolved hydrocarbon impact in this area has not been delineated to the north and east. Dissolved hydrocarbon impact at Monitoring Well 05-20 (former fuelling facility) does not appear to extend beyond Monitoring Well 05-24 to the west. The extent of dissolved hydrocarbon impact in this area has not been delineated to the north, east and south. Dissolved hydrocarbon impact at Monitoring Well 05-25 (former fuelling facility) does not appear to extend beyond Monitoring Well 05-24 to the east and Monitoring Well 05-27 to the west. The extent of dissolved hydrocarbon impact in this area has not been delineated to the north and south. Dissolved hydrocarbon impact in Monitoring Wells 05-29, 05-30 and 05-32 through 05-34 (former North Star Oil bulk plant and former Imperial Oil bulk plant and fertilizer warehouse) does not appear to extend beyond Monitoring Well 05-6 to the west and Monitoring Well 05-31 to the north. The extent of dissolved hydrocarbon impact in this area has not been delineated to the east and south.

Dissolved arsenic and/or barium were detected in Monitoring Wells 05-20 and 05-25 (located in the former fuelling facility area) at concentrations exceeding the CCME CEQG (updated 2005) Community Water assessment guidelines. Based on laboratory analysis of the groundwater samples collected on December 12, 2005, the lateral extent of the dissolved metals impact has not been delineated to the north, east or south in these areas.

Dissolved iron and/or manganese were detected in Monitoring Wells 05-6, 05-7, 05-8, 05-9, 05-20, 05-24, 05-25, 05-27, 05-29, 05-30, 05-32, 05-33 and 05-34 (located in the former roundhouse area, the former fuelling facility area, the former North Star Oil bulk plant area, and

adjacent to the former Imperial Oil bulk plant and fertilizer warehouse) at concentrations exceeding the CCME CEQG (updated 2005) Community Water aesthetic objectives. The exceedances of the aesthetic objectives are not considered to be significant environmental concerns. The elevated concentrations of dissolved iron and manganese may be associated with biodegradation of hydrocarbons in the former areas of petroleum storage and distribution.

## 7. LIMITATION OF LIABILITY, SCOPE OF REPORT AND THIRD PARTY RELIANCE

This report has been prepared and the work referred to in this report has been undertaken by Morrow Environmental Consultants Inc. (Morrow), a member of the SNC-Lavalin Group, for Canadian Pacific Railway. It is intended for the sole and exclusive use of Canadian Pacific Railway, its affiliated companies and partners and their respective (insurers), agents, employees and advisors (collectively, "Canadian Pacific Railway"). Any use, reliance on or decision made by any person other than Canadian Pacific Railway based on this report is the sole responsibility of such other person. Canadian Pacific Railway and Morrow make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, and decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by Morrow with respect to this report and any conclusions or recommendations made in this report reflect Morrow's judgement based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations in this report may be necessary.

Other than by Canadian Pacific Railway, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of Morrow. Nothing in this report is intended to constitute or provide a legal opinion.

## 8. REFERENCES


- Bouwer, H., & R.C. Rice, 1976, Water Resources Research. *A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells.*

- Canada Centre for Mapping, Energy, Mines and Resources Canada, 1980. *Souris 62 F/9 NTS Map.*

- Canadian Council of Ministers of the Environment, April 2001. *Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil.*

- Canadian Council of Ministers of the Environment, updated 2005. *Canadian Environmental Quality Guidelines.*

- CP Rail Systems, Office of the Chief Engineer, November 10, 1993. *Phase I Environmental Site Assessment of the Souris Yard, Souris, Manitoba, Draft.*

- Groundwater, V. 27, No. 3, 1989. *The Bouwer-Rice slug test - an update.*

- Manitoba Conservation, May 2002. *Environmental Site Investigations in Manitoba.*

- Manitoba Conservation, Water Branch, Groundwater Management Section, May 2005. *Gwdrill Water Well Records.*

- Manitoba Natural Resources, Water Resources Division, 1983. *Groundwater Availability Map Series, Virden Area (62-F).*

- Manitoba Natural Resources, Water Resources Division, 1983. *Groundwater Pollution Hazard Map, Virden Area.*

- Manitoba Natural Resources, Water Resources Division, 1986. *Groundwater Resources in the Souris-Glenwood Planning District (A Synopsis).*

## TABLE 1: Summary of Analytical Results for Soil Grain Size

| Sample Location | Sample ID | Sample Date (yyyy mm dd) | Depth Interval (m) | Field Screen (ppm) | Visual Classification | Percent passing 200 mesh (%) | Soil Texture |
|---|---|---|---|---|---|---|---|
| Minimum Detection Limit | | | | | | 0.01 | - |
| 05-6 | BH05-6-3-051115 | 2005 11 15 | 2.0 - 2.3 | 10 | clay till | 68 | fine grain |
| 05-6 | BH05-6-5-051115 | 2005 11 15 | 3.5 - 3.8 | 5 | clay till | 81 | fine grain |
| 05-8 | BH05-8-7-051115 | 2005 11 15 | 5.0 - 5.3 | ND | silt/clay till | 92 | fine grain |
| 05-20 | BH05-20-2-051116 | 2005 11 16 | 1.2 - 1.5 | 550 | sand | 11 | coarse grain |
| 05-20 | BH05-20-3-051116 | 2005 11 16 | 2.0 - 2.3 | 1,210 | sand | 22 | coarse grain |

Associated Maxxam file: A549575, A549708.

All terms defined within the body of Morrow's report.

ND - not detected.

## TABLE 2 : Summary of Analytical Results for Hydrocarbons in Surface Soil

| Sample Location | Sample ID | Sample Date (yyyy mm dd) | Depth Interval (m) | Field Screen (ppm) | Monocyclic Aromatic Hydrocarbons | | | | Petroleum Hydrocarbon Fractions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Benzene (mg/kg) | Toluene (mg/kg) | Ethyl-benzene (mg/kg) | Xylenes (mg/kg) | F1 (C6-C10)[a] (mg/kg) | F2 (>C10-C16) (mg/kg) | F3 (>C16-C34) (mg/kg) | F4 (>C34-C50) (mg/kg) |
| Minimum Detection Limit | | | | | 0.02 | 0.02 | 0.02 | 0.04 | 10 | 10 | 10 | 10 |
| BH05-1 | BH05-1-1-051114 | 2005 11 14 | 0.4 - 0.8 | 35 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-5 | BH05-5-2-051114 | 2005 11 14 | 1.2 - 1.5 | 95 | < 0.02 | 0.03 | < 0.02 | < 0.04 | < 10 | < 10 | 130 | 24 |
| BH05-6 | BH05-6-2-051115 | 2005 11 15 | 1.1 - 1.5 | 20 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-8 | BH05-8-2-051115 | 2005 11 15 | 1.1 - 1.5 | 20 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-9 | BH05-9-2-051115 | 2005 11 15 | 1.2 - 1.5 | 50 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| | BH05-9-9-051115 | 2005 11 15 | 1.2 - 1.5 | 50 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| | QA/QC RPD % | | | | * | * | * | * | * | * | * | * |
| BH05-10 | BH05-10-1-051115 | 2005 11 15 | 0.5 - 0.8 | 50 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-11 | BH05-11-1-051115 | 2005 11 15 | 0.5 - 0.8 | 30 | ***0.08*** | ***0.51*** | ***0.09*** | 1.1 | 14 | 23 | 64 | < 10 |
| BH05-12 | BH05-12-1-051115 | 2005 11 15 | 0.5 - 0.8 | 25 | < 0.02 | 0.03 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-13 | BH05-13-1-051116 | 2005 11 16 | 0.3 - 0.8 | 30 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-14 | BH05-14-2-051116 | 2005 11 16 | 1.2 - 1.5 | 25 | < 0.02 | < 0.02 | 0.05 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-15 | BH05-15-1-051116 | 2005 11 16 | 0.4 - 0.8 | 40 | < 0.02 | 0.03 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-16 | BH05-16-2-051116 | 2005 11 16 | 1.1 - 1.5 | 30 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-19 | BH05-19-1-051116 | 2005 11 16 | 0.5 - 0.8 | 25 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-21 | BH05-21-1-051117 | 2005 11 17 | 0.5 - 0.8 | 95 | < 0.02 | 0.05 | < 0.02 | 0.27 | < 10 | 13 | 13 | 12 |
| | BH05-21-5-051117 | 2005 11 17 | 0.5 - 0.8 | 95 | < 0.02 | < 0.02 | < 0.02 | 0.08 | < 10 | 20 | 18 | 30 |
| | QA/QC RPD % | | | | * | * | * | * | * | * | * | * |
| BH05-22 | BH05-22-1-051117 | 2005 11 17 | 0.5 - 0.8 | 45 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | 190 | 440 |
| BH05-23 | BH05-23-1-051117 | 2005 11 17 | 0.5 - 0.8 | 30 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-26 | BH05-26-1-051117 | 2005 11 17 | 0.5 - 0.8 | 20 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | 13 | 51 | < 10 |
| SS-1 | SS-1-051121 | 2005 11 21 | 0.15 - 0.3 | - | ***0.03*** | 0.15 | 0.02 | 0.25 | < 10 | 24 | 110 | 27 |
| MB EQG | | | | | | | | | | | | |
| CCME CEQG Commercial Land Use (CL)[b,c] | | | | | 0.030 | 0.37 | 0.082 | 11 | n/a | n/a | n/a | n/a |
| CCME CWS Commercial Land Use[b,c] | | | | | n/a | n/a | n/a | n/a | 860 | 1,200 | n/a | n/a |

Associated Maxxam files: 347605, 393349, 393351, 393352.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

***BOLD*** Concentration greater than or equal to CCME Commercial Land Use guideline.

[a] Excludes the target compounds benzene, toluene, ethylbenzene, and xylenes (BTEX).

[b] Standards for coarse grained surface soil.

[c] The exposure pathway used for determining the standards for this site include: protection of potable groundwater.

## TABLE 3 : Summary of Analytical Results for Hydrocarbons in Subsoil

| Sample Location | Sample ID | Sample Date (yyyy mm dd) | Depth Interval (m) | Field Screen (ppm) | Monocyclic Aromatic Hydrocarbons | | | | Petroleum Hydrocarbon Fractions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Benzene (mg/kg) | Toluene (mg/kg) | Ethyl-benzene (mg/kg) | Xylenes (mg/kg) | F1 (C6-C10)[a] (mg/kg) | F2 (>C10-C16) (mg/kg) | F3 (>C16-C34) (mg/kg) | F4 (>C34-C50) (mg/kg) |
| Minimum Detection Limit | | | | | 0.02 | 0.02 | 0.02 | 0.04 | 10 | 10 | 10 | 10 |
| BH05-7 | BH05-7-3-051115 | 2005 11 15 | 2.0 - 2.3 | 25 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-17 | BH05-17-4-051116 | 2005 11 16 | 2.0 - 2.3 | 45 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-20 | BH05-20-3-051116 | 2005 11 16 | 2.0 - 2.3 | 1,210 | < 0.02 | ***0.69*** | ***3.1*** | ***43*** | 140 | ***13,000*** | 4,100 | < 100 |
| | BH05-20-9-051116 | 2005 11 16 | 2.0 - 2.3 | 1,210 | < 0.02 | ***0.59*** | ***3.0*** | ***41*** | 63 | ***11,000*** | 3,400 | < 100 |
| | QA/QC RPD % | | | | * | 16 | 3 | 5 | 76 | 17 | 19 | * |
| BH05-24 | BH05-24-4-051117 | 2005 11 17 | 2.3 - 2.5 | 770 | < 0.02 | < 0.02 | 0.05 | < 0.04 | 140 | ***1,500*** | 1,100 | < 10 |
| BH05-25 | BH05-25-3-051117 | 2005 11 17 | 1.7 - 1.9 | 990 | < 0.2[d] | < 0.2 | ***0.5*** | 9.5 | 720 | ***3,800*** | 1,300 | < 10 |
| BH05-27 | BH05-27-3-051118 | 2005 11 18 | 1.7 - 2.0 | 500 | < 0.2[d] | < 0.2 | < 0.2[d] | < 0.4 | 600 | ***4,800*** | 1,500 | < 10 |
| BH05-28 | BH05-28-3-051118 | 2005 11 18 | 1.5 - 1.8 | 280 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | 150 | 110 | < 10 |
| BH05-29 | BH05-29-4-051118 | 2005 11 18 | 2.7 - 3.0 | 1,870 | ***1.2*** | 0.2 | ***3.8*** | 3.7 | 790 | 840 | 190 | < 10 |
| | BH05-29-9-051118 | 2005 11 18 | 2.7 - 3.0 | 1,870 | ***1.0*** | 0.2 | ***3.7*** | 4.9 | 760 | 820 | 190 | < 10 |
| | QA/QC RPD % | | | | 18 | * | 3 | 28 | 4 | 2 | 10 | * |
| BH05-30 | BH05-30-4-051118 | 2005 11 18 | 2.0 - 2.3 | 3,630 | ***3.5*** | 0.1 | ***7.8*** | ***34*** | ***1,200*** | ***1,500*** | 300 | < 10 |
| BH05-31 | BH05-31-3-051121 | 2005 11 21 | 1.9 - 2.3 | 40 | < 0.02 | < 0.02 | < 0.02 | < 0.04 | < 10 | < 10 | < 10 | < 10 |
| BH05-32 | BH05-32-4-051121 | 2005 11 21 | 2.0 - 2.3 | 9,680 | ***1.0*** | 0.07 | ***5.9*** | ***17*** | 240 | 44 | < 10 | < 10 |
| | BH05-32-11-051121 | 2005 11 21 | 2.0 - 2.3 | 9,680 | ***1.3*** | 0.07 | ***6.4*** | ***17*** | 310 | 45 | < 10 | < 10 |
| | QA/QC RPD % | | | | 26 | * | 8 | 0 | 26 | * | * | * |
| BH05-33 | BH05-33-5-051121 | 2005 11 21 | 1.5 - 1.8 | 8,030 | ***0.8*** | < 0.4[d] | ***6.6*** | ***34*** | 680 | 340 | < 10 | < 10 |
| BH05-34 | BH05-34-3-051121 | 2005 11 21 | 1.9 - 2.3 | 7,260 | ***3.4*** | ***20*** | ***12*** | ***85*** | ***2,200*** | ***8,700*** | 1,900 | < 100 |
| MB EQG | | | | | | | | | | | | |
| CCME CEQG Commercial Land Use (CL)[b,c] | | | | | 0.030 | 0.37 | 0.082 | 11 | n/a | n/a | n/a | n/a |
| CCME CWS Commercial Land Use[b,c] | | | | | n/a | n/a | n/a | n/a | 860 | 1,200 | n/a | n/a |

Associated Maxxam files: 347605, 393349, 393351, 393352.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

***BOLD*** Concentration greater than or equal to CCME Commercial Land Use guideline.

[a] Excludes the target compounds benzene, toluene, ethylbenzene, and xylenes (BTEX).

[b] Standards for coarse grained subsoil.

[c] The exposure pathway used for determining the standards for this site include: protection of potable groundwater.

[d] Laboratory detection limit exceeds guideline.

## TABLE 4 : Summary of Analytical Results for PAHs in Soil

| Sample Location | | | BH05-1 | BH05-2 | BH05-3 | BH05-4 | BH05-5 | BH05-6 | BH05-7 | BH05-8 | BH05-9 | | | BH05-18 | BH05-35 | SS-1 | Field Blank | MB EQG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | BH05-1-1 -051114 | BH05-2-1 -051114 | BH05-3-2 -051114 | BH05-4-2 -051114 | BH05-5-2 -051114 | BH05-6-2 -051115 | BH05-7-3 -051115 | BH05-8-2 -051115 | BH05-9-2 -051115 | BH05-9-9 -051115 | | BH05-18-1 -051116 | BH05-35-1 -051121 | SS-1 -051121 | F.BLANK -051116 | |
| Sample Date (yyyy mm dd) | | Minimum | 2005 11 14 | 2005 11 14 | 2005 11 14 | 2005 11 14 | 2005 11 14 | 2005 11 15 | 2005 11 15 | 2005 11 15 | 2005 11 15 | 2005 11 15 | QA/QC | 2005 11 16 | 2005 11 21 | 2005 11 21 | 2005 11 16 | CCME CEQG Commercial |
| Depth Interval (m) | | Detection | 0.4 - 0.8 | 0.5 - 0.8 | 1.2 - 1.5 | 1.2 - 1.5 | 1.2 - 1.5 | 1.1 - 1.5 | 2.0 - 2.3 | 1.1 - 1.5 | 1.2 - 1.5 | 1.2 - 1.5 | RPD % | 0.5 - 0.8 | 0.5 - 0.8 | 0.15 - 0.3 | - | Land Use |
| Field Screen (ppm) | | Limit | 35 | 25 | 30 | 10 | 95 | 20 | 25 | 20 | 50 | 50 | - | 10 | 40 | - | - | (CL) |
| Parameter | Units | | Analytical Results | | | | | | | | | | | | | | | |
| Polycyclic Aromatic Hydrocarbons | | | | | | | | | | | | | | | | | | |
| Acenaphthene | mg/g | 0.01 | < 0.02 | < 0.01 | < 0.01 | < 0.01 | 0.13 | < 0.03 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | * | < 0.01 | < 0.01 | < 0.01 | < 0.01 | n/a |
| Acenaphthylene | mg/g | 0.005 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | 0.01 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | < 0.005 | < 0.005 | 0.030 | < 0.005 | n/a |
| Anthracene | mg/g | 0.005 | < 0.01 | 0.006 | < 0.005 | < 0.005 | 0.33 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.007 | < 0.005 | 0.097 | < 0.005 | n/a |
| Benzo(a)anthracene | mg/g | 0.01 | < 0.02 | 0.01 | < 0.01 | < 0.01 | 0.52 | < 0.03 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | * | 0.03 | < 0.01 | 0.21 | < 0.01 | 10 |
| Benzo(a)pyrene | mg/g | 0.005 | < 0.01 | 0.007 | < 0.005 | < 0.005 | 0.53 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.024 | 0.006 | 0.145 | < 0.005 | 0.7 |
| Benzo(b+j)fluoranthene | mg/g | 0.005 | 0.01 | 0.013 | < 0.005 | < 0.005 | 0.60 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.054 | 0.013 | 0.290 | < 0.005 | n/a |
| Benzo(g,h,i)perylene | mg/g | 0.02 | < 0.04 | < 0.02 | < 0.02 | < 0.02 | 0.41 | < 0.05 | < 0.02 | < 0.02 | < 0.02 | < 0.02 | * | 0.03 | < 0.02 | 0.19 | < 0.02 | n/a |
| Benzo(k)fluoranthene | mg/g | 0.01 | < 0.02 | < 0.01 | < 0.01 | < 0.01 | 0.18 | < 0.03 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | * | 0.02 | < 0.01 | 0.06 | < 0.01 | 10 |
| Chrysene | mg/g | 0.01 | < 0.02 | < 0.01 | < 0.01 | < 0.01 | 0.36 | < 0.03 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | * | 0.04 | < 0.01 | 0.20 | < 0.01 | n/a |
| Dibenz(a,h)anthracene | mg/g | 0.02 | < 0.04 | < 0.02 | < 0.02 | < 0.02 | 0.08 | < 0.05 | < 0.02 | < 0.02 | < 0.02 | < 0.02 | * | < 0.02 | < 0.02 | 0.05 | < 0.02 | 10 |
| Fluoranthene | mg/g | 0.005 | 0.02 | 0.018 | < 0.005 | < 0.005 | 0.99 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.029 | 0.011 | 0.268 | < 0.005 | n/a |
| Fluorene | mg/g | 0.005 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | 0.14 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.013 | < 0.005 | 0.120 | < 0.005 | n/a |
| Indeno(1,2,3-cd)pyrene | mg/g | 0.02 | < 0.04 | < 0.02 | < 0.02 | < 0.02 | 0.42 | < 0.05 | < 0.02 | < 0.02 | < 0.02 | < 0.02 | * | 0.02 | < 0.02 | 0.13 | < 0.02 | 10 |
| 1-Methylnaphthalene | mg/g | 0.005 | 0.06 | 0.019 | 0.006 | < 0.005 | 0.03 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.197 | 0.009 | 1.19 | < 0.005 | n/a |
| 2-Methylnaphthalene | mg/g | 0.005 | 0.08 | 0.025 | 0.007 | < 0.005 | 0.04 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.231 | 0.010 | 1.66 | < 0.005 | n/a |
| Naphthalene | mg/g | 0.005 | 0.04 | 0.019 | 0.005 | < 0.005 | 0.03 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.122 | 0.005 | 0.708 | < 0.005 | 22 |
| Phenanthrene | mg/g | 0.005 | 0.06 | 0.027 | < 0.005 | < 0.005 | 1.09 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.147 | 0.009 | 1.08 | < 0.005 | 50 |
| Pyrene | mg/g | 0.005 | 0.02 | 0.015 | < 0.005 | < 0.005 | 0.96 | < 0.01 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | 0.037 | 0.010 | 0.299 | < 0.005 | 100 |

Associated Maxxam files: 347605, 393349, 393352.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

**BOLD** Concentration greater than or equal to CCME CEQG Commercial Land Use (CL) guideline.

## TABLE 5 : Summary of Analytical Results for Nutrients and Metals in Soil

| Sample Location | | | BH05-1 | BH05-2 | BH05-3 | BH05-4 | BH05-5 | BH05-6 | BH05-7 | BH05-8 | BH05-9 | | | BH05-10 | MB EQG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | BH05-1-1 -051114 | BH05-2-1 -051114 | BH05-3-2 -051114 | BH05-4-2 -051114 | BH05-5-2 -051114 | BH05-6-2 -051115 | BH05-7-3 -051115 | BH05-8-2 -051115 | BH05-9-2 -051115 | BH05-9-9 -051115 | | BH05-10-1 -051115 | |
| Sample Date (yyyy mm dd) | | Mininum | 2005 11 14 | 2005 11 14 | 2005 11 14 | 2005 11 14 | 2005 11 14 | 2005 11 15 | 2005 11 15 | 2005 11 15 | 2005 11 15 | 2005 11 15 | QA/QC | 2005 11 15 | CCME CEQG Commercial |
| Depth Interval (m) | | Detection | 0.4 - 0.8 | 0.5 - 0.8 | 1.2 - 1.5 | 1.2 - 1.5 | 1.2 - 1.5 | 1.1 - 1.5 | 2.0 - 2.3 | 1.1 - 1.5 | 1.2 - 1.5 | 1.2 - 1.5 | RPD % | 0.5 - 0.8 | Land Use |
| Field Screen (ppm) | | Limit | 35 | 25 | 30 | 10 | 95 | 20 | 25 | 20 | 50 | 50 | - | 50 | (CL) |
| Parameter | Units | | Analytical Results | | | | | | | | | | | | |
| **Physical Parameters** | | | | | | | | | | | | | | | |
| pH | pH | 0.01 | - | - | - | - | - | - | - | - | - | - | - | - | 6 - 8 |
| Conductivity | µS/cm | 2 | - | - | - | - | - | - | - | - | - | - | - | - | 4,000 |
| Nitrate Nitrogen | µg/g | 2 | - | - | - | - | - | - | - | - | - | - | - | - | n/a |
| Nitrite Nitrogen | µg/g | 0.5 | - | - | - | - | - | - | - | - | - | - | - | - | n/a |
| Nitrate+Nitrite | µg/g | 2.5 | - | - | - | - | - | - | - | - | - | - | - | - | n/a |
| **Total Metals** | | | | | | | | | | | | | | | |
| Antimony | mg/kg | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 40 |
| Arsenic | mg/kg | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 12 |
| Barium | mg/kg | 0.5 | 140 | 81 | 47 | 240 | 120 | 150 | 180 | 48 | 22 | 26 | 17 | 54 | 2,000 |
| Cadmium | mg/kg | 0.3 | < 0.5 | < 0.5 | < 0.5 | 0.6 | < 0.5 | 0.5 | 0.7 | < 0.5 | < 0.5 | < 0.5 | * | < 0.5 | 22 |
| Chromium | mg/kg | 0.5 | 15 | 10 | 6 | 17 | 8 | 19 | 18 | 6 | 5 | 5 | 0 | 6 | 87[a] |
| Cobalt | mg/kg | 0.5 | 7 | 5 | 2 | 11 | 3 | 7 | 9 | 2 | < 2 | < 2 | * | 2 | 300 |
| Copper | mg/kg | 0.5 | 16 | 9 | 3 | 23 | 12 | 24 | 24 | 3 | < 2 | < 2 | * | 4 | 91 |
| Lead | mg/kg | 1 | 8 | 5 | < 5 | 11 | 19 | 10 | 9 | < 5 | < 5 | < 5 | * | 7 | 260 |
| Manganese | mg/kg | 1 | 470 | 350 | 210 | 670 | 210 | 330 | 450 | 210 | 140 | 180 | 25 | 170 | n/a |
| Molybdenum | mg/kg | 0.5 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | 3 | < 2 | < 2 | < 2 | * | < 2 | 40 |
| Nickel | mg/kg | 0.5 | 21 | 13 | 6 | 30 | 8 | 20 | 27 | 6 | < 5 | 5 | * | 6 | 50 |
| Selenium | mg/kg | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 3.9 |
| Silver | mg/kg | 0.3 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | * | < 1 | 40 |
| Tin | mg/kg | 1 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | * | < 20 | 300 |
| Uranium | mg/kg | 20 | - | - | - | - | - | - | - | - | - | - | - | - | n/a |
| Vanadium | mg/kg | 0.5 | 31 | 21 | 12 | 38 | 14 | 43 | 39 | 12 | 9 | 10 | 11 | 11 | 130 |
| Zinc | mg/kg | 3 | 43 | 30 | 19 | 55 | 48 | 58 | 67 | 14 | 12 | 12 | * | 23 | 360 |

Associated Maxxam files: 347605, 393349, 393351, 393352.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

**BOLD** Concentration greater than or equal to CCME CEQG Commercial Land Use (CL) guideline.

[a] Individual standards exist for total chromium and Cr +6. Reported value represents total chromium standard.

## TABLE 5 : Summary of Analytical Results for Nutrients and Metals In Soil

| Sample Location | | | BH05-11 | BH05-12 | BH05-13 | BH05-14 | BH05-15 | BH05-16 | BH05-17 | BH05-18 | BH05-19 | BH05-20 | | | MB EQG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | BH05-11-1 -051115 | BH05-12-1 -051115 | BH05-13-1 -051116 | BH05-14-2 -051116 | BH05-15-1 -051116 | BH05-16-2 -051116 | BH05-17-4 -051116 | BH05-18-1 -051116 | BH05-19-1 -051116 | BH05-20-3 -051116 | BH05-20-9 -051116 | | |
| Sample Date (yyyy mm dd) | | Minimum | 2005 11 15 | 2005 11 15 | 2005 11 16 | 2005 11 16 | 2005 11 16 | 2005 11 16 | 2005 11 16 | 2005 11 16 | 2005 11 16 | 2005 11 16 | 2005 11 16 | QA/QC | CCME CEQG |
| Depth Interval (m) | | Detection | 0.5 - 0.8 | 0.5 - 0.8 | 0.3 - 0.8 | 1.2 - 1.5 | 0.4 - 0.8 | 1.1 - 1.5 | 2.6 - 2.9 | 0.5 - 0.8 | 0.5 - 0.8 | 2.0 - 2.3 | 2.0 - 2.3 | RPD % | Commercial Land Use |
| Field Screen (ppm) | | Limit | 30 | 25 | 30 | 25 | 40 | 30 | 45 | 10 | 25 | 1,210 | 1,210 | | (CL) |
| Parameter | Units | | Analytical Results | | | | | | | | | | | | |
| **Physical Parameters** | | | | | | | | | | | | | | | |
| pH | pH | 0.01 | - | - | - | - | - | - | - | - | - | - | - | | 6 - 8 |
| Conductivity | µS/cm | 2 | - | - | - | - | - | - | - | - | - | - | - | | 4,000 |
| Nitrate Nitrogen | µg/g | 2 | - | - | - | - | - | - | - | - | - | - | - | | n/a |
| Nitrite Nitrogen | µg/g | 0.5 | - | - | - | - | - | - | - | - | - | - | - | | n/a |
| Nitrate+Nitrite | µg/g | 2.5 | - | - | - | - | - | - | - | - | - | - | - | | n/a |
| **Total Metals** | | | | | | | | | | | | | | | |
| Antimony | mg/kg | 1 | - | - | < 1 | < 1 | < 1 | < 1 | < 1 | 2 | < 1 | < 1 | < 1 | | 40 |
| Arsenic | mg/kg | 1 | - | - | 4 | 5 | 4 | 4 | 6 | ***28*** | 2 | 3 | 3 | | 12 |
| Barium | mg/kg | 0.5 | 100 | 76 | 58 | 57 | 98 | 66 | 26 | 130 | 77 | 53 | 57 | 7 | 2,000 |
| Cadmium | mg/kg | 0.3 | < 0.5 | < 0.5 | 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | 0.8 | < 0.3 | < 0.3 | < 0.3 | | 22 |
| Chromium | mg/kg | 0.5 | 7 | 8 | 7.8 | 6.8 | 8.6 | 7.2 | 4.6 | 12 | 6.9 | 5.4 | 5.9 | 9 | 87[a] |
| Cobalt | mg/kg | 0.5 | 5 | 3 | 2.8 | 2.7 | 3.2 | 3.1 | 2.3 | 6.3 | 2.7 | 3.3 | 3.5 | 6 | 300 |
| Copper | mg/kg | 0.5 | 28 | 5 | 5.7 | 4.4 | 4.7 | 3.7 | 6.0 | 18 | 4.7 | 3.3 | 4.0 | 19 | 91 |
| Lead | mg/kg | 1 | 61 | 6 | 6 | 3 | 5 | 3 | 3 | 26 | 5 | 3 | 4 | | 260 |
| Manganese | mg/kg | 1 | 110 | 300 | 260 | 240 | 230 | 280 | 160 | 680 | 250 | 490 | 650 | 28 | n/a |
| Molybdenum | mg/kg | 0.5 | < 2 | < 2 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | 0.8 | 3.5 | < 0.5 | < 0.5 | < 0.5 | | 40 |
| Nickel | mg/kg | 0.5 | 12 | 8 | 7.7 | 11 | 7.6 | 6.9 | 5.7 | 16 | 6.9 | 7.7 | 7.8 | 1 | 50 |
| Selenium | mg/kg | 1 | - | - | < 1 | < 1 | < 1 | < 1 | < 1 | 2 | < 1 | < 1 | < 1 | | 3.9 |
| Silver | mg/kg | 0.3 | < 1 | < 1 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | | 40 |
| Tin | mg/kg | 1 | < 20 | < 20 | < 1 | < 1 | < 1 | < 1 | < 1 | 1 | < 1 | < 1 | < 1 | | 300 |
| Uranium | mg/kg | 20 | - | - | 41 | 34 | 31 | 36 | 35 | 62 | 29 | 32 | 27 | | n/a |
| Vanadium | mg/kg | 0.5 | 15 | 15 | 14 | 14 | 13 | 13 | 10 | 19 | 11 | 8.8 | 9.3 | 6 | 130 |
| Zinc | mg/kg | 3 | 27 | 25 | 22 | 17 | 26 | 17 | 16 | 37 | 23 | 14 | 13 | | 360 |

Associated Maxxam files: 347605, 393349, 393351, 393352.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

***BOLD*** Concentration greater than or equal to CCME CEQG Commercial Land Use (CL) guideline.

[a] Individual standards exist for total chromium and Cr +6. Reported value represents total chromium standard.

## TABLE 5 : Summary of Analytical Results for Nutrients and Metals in Soil

| Sample Location | | | BH05-21 | | | BH05-22 | BH05-23 | BH05-24 | BH05-25 | BH05-26 | BH05-27 | BH05-28 | BH05-29 | | | MB EQG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | BH05-21-1 -051117 | BH05-21-5 -051117 | | BH05-22-1 -051117 | BH05-23-1 -051117 | BH05-24-4 -051117 | BH05-25-3 -051117 | BH05-26-1 -051117 | BH05-27-3 -051118 | BH05-28-3 -051118 | BH05-29-4 -051118 | BH05-29-9 -051118 | | CCME CEQG |
| Sample Date (yyyy mm dd) | Minimum | | 2005 11 17 | 2005 11 17 | QA/QC | 2005 11 17 | 2005 11 17 | 2005 11 17 | 2005 11 17 | 2005 11 17 | 2005 11 18 | 2005 11 18 | 2005 11 18 | 2005 11 18 | QA/QC | Commercial |
| Depth Interval (m) | Detection | | 0.5 - 0.8 | 0.5 - 0.8 | RPD % | 0.5 - 0.8 | 0.5 - 0.8 | 2.3 - 2.5 | 1.7 - 1.9 | 0.5 - 0.8 | 1.7 - 2.0 | 1.5 - 1.8 | 2.7 - 3.0 | 2.7 - 3.0 | RPD % | Land Use |
| Field Screen (ppm) | Limit | | 95 | 95 | | 45 | 30 | 770 | 990 | 20 | 500 | 280 | 1,870 | 1,870 | | (CL) |
| **Parameter** | **Units** | | **Analytical Results** | | | | | | | | | | | | | |
| **Physical Parameters** | | | | | | | | | | | | | | | | |
| pH | pH | 0.01 | - | - | | - | - | - | - | - | - | - | - | - | | 6 - 8 |
| Conductivity | µS/cm | 2 | - | - | | - | - | - | - | - | - | - | - | - | | 4,000 |
| Nitrate Nitrogen | µg/g | 2 | - | - | | - | - | - | - | - | - | - | - | - | | n/a |
| Nitrite Nitrogen | µg/g | 0.5 | - | - | | - | - | - | - | - | - | - | - | - | | n/a |
| Nitrate+Nitrite | µg/g | 2.5 | - | - | | - | - | - | - | - | - | - | - | - | | n/a |
| **Total Metals** | | | | | | | | | | | | | | | | |
| Antimony | mg/kg | 1 | < 1 | < 1 | | 2 | < 1 | < 1 | - | - | - | - | - | - | | 40 |
| Arsenic | mg/kg | 1 | 8 | 7 | 13 | 3 | 2 | 3 | - | - | - | - | - | - | | 12 |
| Barium | mg/kg | 0.5 | 69 | 79 | 14 | 120 | 30 | 100 | 150 | 75 | 54 | 160 | 120 | 130 | 8 | 2,000 |
| Cadmium | mg/kg | 0.3 | < 0.3 | < 0.3 | | < 0.3 | < 0.3 | 0.3 | < 0.5 | < 0.5 | 0.6 | < 0.5 | 0.6 | 1.2 | | 22 |
| Chromium | mg/kg | 0.5 | 7.4 | 8.3 | 12 | 39 | 6.1 | 6.6 | 11 | 7 | 6 | 7 | 18 | 18 | 0 | 87[a] |
| Cobalt | mg/kg | 0.5 | 2.9 | 2.5 | 15 | 2.8 | 2.1 | 3.0 | 3 | 3 | 3 | 5 | 10 | 9 | 11 | 300 |
| Copper | mg/kg | 0.5 | 6.7 | 7.2 | 7 | 10 | 2.9 | 6.2 | 5 | 20 | 5 | 5 | 22 | 23 | 4 | 91 |
| Lead | mg/kg | 1 | 13 | 14 | 7 | 22 | 3 | 4 | < 5 | 82 | < 5 | < 5 | 12 | 12 | 0 | 260 |
| Manganese | mg/kg | 1 | 260 | 260 | 0 | 280 | 170 | 200 | 460 | 250 | 520 | 680 | 600 | 620 | 3 | n/a |
| Molybdenum | mg/kg | 0.5 | < 0.5 | < 0.5 | | < 0.5 | < 0.5 | < 0.5 | 3 | < 2 | < 2 | 3 | 4 | 3 | 29 | 40 |
| Nickel | mg/kg | 0.5 | 6.5 | 6.4 | 2 | 6.5 | 5.6 | 11 | 7 | 7 | 7 | 11 | 28 | 26 | 7 | 50 |
| Selenium | mg/kg | 1 | < 1 | < 1 | | < 1 | < 1 | < 1 | - | - | - | - | - | - | | 3.9 |
| Silver | mg/kg | 0.3 | < 0.3 | < 0.3 | | < 0.3 | < 0.3 | < 0.3 | < 1 | < 1 | < 1 | < 1 | < 1 | < 1 | | 40 |
| Tin | mg/kg | 1 | < 1 | < 1 | | 1 | < 1 | < 1 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | | 300 |
| Uranium | mg/kg | 20 | 28 | < 20 | | < 20 | 20 | 35 | - | - | - | - | - | - | | n/a |
| Vanadium | mg/kg | 0.5 | 8.4 | 8.6 | 2 | 9.0 | 8.1 | 10 | 16 | 11 | 11 | 14 | 38 | 37 | 3 | 130 |
| Zinc | mg/kg | 3 | 27 | 29 | 7 | 26 | 15 | 23 | 18 | 83 | 15 | 25 | 64 | 61 | 5 | 360 |

Associated Maxxam files: 347605, 393349, 393351, 393352.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

**BOLD** Concentration greater than or equal to CCME CEQG Commercial Land Use (CL) guideline.

[a] Individual standards exist for total chromium and Cr +6. Reported value represents total chromium standard.

## TABLE 5 : Summary of Analytical Results for Nutrients and Metals in Soil

| Sample Location | | | BH05-30 | BH05-31 | | BH05-32 | | | BH05-33 | BH05-34 | BH05-35 | SS-1 | Field Blank | MB EQG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | BH05-30-4 -051118 | BH05-31-1 -051121 | BH05-31-3 -051121 | BH05-32-4 -051121 | BH05-32-11 -051121 | | BH05-33-5 -051121 | BH05-34-3 -051121 | BH05-35-1 -051121 | SS-1 -051121 | F.BLANK -051116 | |
| Sample Date (yyyy mm dd) | | Minimum | 2005 11 18 | 2005 11 21 | 2005 11 21 | 2005 11 21 | 2005 11 21 | QA/QC | 2005 11 21 | 2005 11 21 | 2005 11 21 | 2005 11 21 | 2005 11 16 | CCME CEQG Commercial |
| Depth Interval (m) | | Detection | 2.0 - 2.3 | 0.5 - 0.8 | 1.9 - 2.3 | 2.0 - 2.3 | 2.0 - 2.3 | RPD % | 1.5 - 1.8 | 1.9 - 2.3 | 0.5 - 0.8 | 0.15 - 0.3 | - | Land Use |
| Field Screen (ppm) | | Limit | 3,630 | 80 | 40 | 9,680 | 9,680 | | 8,030 | 7,260 | 40 | - | - | (CL) |
| **Parameter** | **Units** | | **Analytical Results** | | | | | | | | | | | |
| **Physical Parameters** | | | | | | | | | | | | | | |
| pH | pH | 0.01 | - | 7.66 | - | 7.69 | - | * | - | - | - | - | - | 6 - 8 |
| Conductivity | µS/cm | 2 | - | 108 | - | 213 | - | * | - | - | - | - | - | 4,000 |
| Nitrate Nitrogen | µg/g | 2 | - | < 2 | - | < 2 | - | * | - | - | - | - | - | n/a |
| Nitrite Nitrogen | µg/g | 0.5 | - | < 0.5 | - | < 0.5 | - | * | - | - | - | - | - | n/a |
| Nitrate+Nitrite | µg/g | 2.5 | - | < 2.5 | - | < 2.5 | - | * | - | - | - | - | - | n/a |
| **Total Metals** | | | | | | | | | | | | | | |
| Antimony | mg/kg | 1 | - | - | < 1 | < 1 | < 1 | * | < 1 | 1 | < 1 | 3 | < 1 | 40 |
| Arsenic | mg/kg | 1 | - | - | 11 | 10 | 11 | 10 | 8 | ***12*** | 3 | 8 | < 1 | 12 |
| Barium | mg/kg | 0.5 | 130 | - | 140 | 120 | 150 | 22 | 130 | 150 | 94 | 310 | 4.2 | 2,000 |
| Cadmium | mg/kg | 0.3 | 1.1 | - | 0.5 | 0.5 | 0.6 | * | 0.5 | 0.5 | < 0.3 | 0.3 | < 0.3 | 22 |
| Chromium | mg/kg | 0.5 | 20 | - | 20 | 20 | 22 | 10 | 20 | 19 | 6.5 | 8.8 | ***130*** | 87[a] |
| Cobalt | mg/kg | 0.5 | 11 | - | 10 | 8.9 | 10 | 12 | 8.6 | 8.7 | 2.7 | 5.5 | < 0.5 | 300 |
| Copper | mg/kg | 0.5 | 23 | - | 23 | 24 | 28 | 15 | 26 | 25 | 4.8 | 31 | 1.8 | 91 |
| Lead | mg/kg | 1 | 13 | - | 12 | 11 | 12 | 9 | 11 | 11 | 9 | 42 | 1 | 260 |
| Manganese | mg/kg | 1 | 600 | - | 440 | 450 | 530 | 16 | 410 | 490 | 210 | 340 | 29 | n/a |
| Molybdenum | mg/kg | 0.5 | < 2 | - | 1.7 | 2.3 | 2.9 | * | 1.1 | 1.2 | < 0.5 | 1.4 | 7.6 | 40 |
| Nickel | mg/kg | 0.5 | 29 | - | 30 | 29 | 33 | 13 | 29 | 28 | 6.8 | 16 | 2.6 | 50 |
| Selenium | mg/kg | 1 | - | - | < 1 | < 1 | < 1 | * | < 1 | < 1 | < 1 | 1 | < 1 | 3.9 |
| Silver | mg/kg | 0.3 | < 1 | - | < 0.3 | < 0.3 | < 0.3 | * | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | 40 |
| Tin | mg/kg | 1 | < 20 | - | < 1 | < 1 | < 1 | * | < 1 | < 1 | < 1 | 5 | < 1 | 300 |
| Uranium | mg/kg | 20 | - | - | < 20 | < 20 | < 20 | * | < 20 | < 20 | < 20 | < 20 | < 20 | n/a |
| Vanadium | mg/kg | 0.5 | 37 | - | 39 | 39 | 42 | 7 | 38 | 42 | 11 | 18 | 0.7 | 130 |
| Zinc | mg/kg | 3 | 62 | - | 63 | 62 | 70 | 12 | 62 | 57 | 40 | 78 | < 3 | 360 |

Associated Maxxam files: 347605, 393349, 393351, 393352.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

***BOLD*** Concentration greater than or equal to CCME CEQG Commercial Land Use (CL) guideline.

[a] Individual standards exist for total chromium and Cr +6. Reported value represents total chromium standard.

## TABLE 6 : Summary of Analytical Results for Hydrocarbons in Groundwater

| Sample Location | Sample ID | Sample Date (yyyy mm dd) | Monocyclic Aromatic Hydrocarbons | | | | Petroleum Hydrocarbon Fractions | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Benzene (mg/L) | Toluene (mg/L) | Ethyl-benzene (mg/L) | Xylenes (mg/L) | F1 (C6-C10)[a] (mg/L) | F2 (>C10-C16) (mg/L) | F3 (>C16-C34) (mg/L) | F4 (>C34-C50) (mg/L) |
| Minimum Detection Limit | | | 0.0002 | 0.0002 | 0.0002 | 0.0004 | 0.100 | 0.100 | 0.100 | 0.100 |
| MW05-6 | MW05-6-051213 | 2005 12 13 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0004 | < 0.100 | < 0.100 | < 0.100 | < 0.100 |
| MW05-7 | MW05-7-051213 | 2005 12 13 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0004 | < 0.100 | < 0.100 | < 0.100 | < 0.100 |
| MW05-8 | MW05-8-051213 | 2005 12 13 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0004 | < 0.100 | < 0.100 | < 0.100 | < 0.100 |
| MW05-9 | MW05-9-051213 | 2005 12 13 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0004 | < 0.100 | < 0.100 | < 0.100 | < 0.100 |
| MW05-20 | MW05-20-051212 | 2005 12 12 | 0.0024 | 0.021 | ***0.069*** | ***0.640*** | 2.900 | 27.000 | 9.800 | < 0.100 |
| MW05-24 | MW05-24-051212 | 2005 12 12 | < 0.0002 | 0.0007 | 0.0004 | 0.0014 | < 0.100 | 0.870 | 0.500 | < 0.100 |
| MW05-25 | MW05-25-051212 | 2005 12 12 | 0.0003 | 0.0009 | ***0.013*** | 0.240 | 1.000 | 22.000 | 7.700 | < 0.100 |
| | MW05-36-051212 | 2005 12 12 | 0.0003 | 0.0009 | ***0.012*** | 0.230 | 1.000 | 25.000 | 8.000 | < 0.100 |
| | QA/QC RPD % | | 0 | 0 | 8 | 4 | 0 | 13 | 4 | 0 |
| MW05-27 | MW05-27-051212 | 2005 12 12 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | 3.100 | 76.000 | 24.000 | < 0.500 |
| MW05-29 | MW05-29-051212 | 2005 12 12 | ***0.140*** | 0.0049 | ***0.032*** | 0.057 | 0.390 | 0.690 | < 0.100 | < 0.100 |
| MW05-30 | MW05-30-051213 | 2005 12 13 | ***1.100*** | 0.009 | ***0.110*** | ***0.510*** | < 1.000 | 0.760 | 0.1400 | < 0.100 |
| MW05-31 | MW05-31-051213 | 2005 12 13 | < 0.0002 | < 0.0002 | < 0.0002 | 0.0006 | < 0.100 | < 0.100 | < 0.100 | < 0.100 |
| MW05-32 | MW05-32-051213 | 2005 12 13 | ***4.200*** | 0.013 | ***0.089*** | ***1.100*** | < 2.000 | 0.510 | < 0.100 | < 0.100 |
| | MW05-37-051213 | 2005 12 13 | ***4.300*** | 0.014 | ***0.091*** | ***1.200*** | < 2.000 | 0.500 | < 0.100 | 0.140 |
| | QA/QC RPD % | | 2 | 7 | 2 | 9 | 0 | 2 | 0 | 0 |
| MW05-33 | MW05-33-051213 | 2005 12 13 | ***3.300*** | 0.010 | ***0.140*** | ***0.450*** | < 2.000 | 0.190 | < 0.100 | < 0.100 |
| MW05-34 | MW05-34-051213 | 2005 12 13 | ***0.530*** | ***0.310*** | ***0.070*** | ***0.450*** | 2.700 | 10.000 | 1.300 | < 0.100 |
| Field Blank | F.BLANK-051212 | 2005 12 12 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0004 | < 0.100 | - | - | - |
| Trip Blank | T.BLANK-051212 | 2005 12 12 | < 0.0002 | < 0.0002 | < 0.0002 | < 0.0004 | < 0.100 | - | - | - |
| MB EQG | | | | | | | | | | |
| CCME CEQG Community Water (CW) | | | 0.005 | ≤0.024 | ≤0.0024 | ≤0.3 | n/a | n/a | n/a | n/a |

Associated Maxxam files: 413334, 413335, 413336.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

***BOLD*** Concentration greater than or equal to CCME CEQG Community Water guideline.

[a] Excludes the target compounds benzene, toluene, ethylbenzene, and xylenes (BTEX).

## TABLE 7 : Summary of Analytical Results for PAHs in Groundwater

| Sample Location / Sample ID / Sample Date (yyyy mm dd) | | Minimum Detection Limit | MW05-7<br>MW05-7-051213<br>2005 12 13 | MW05-8<br>MW05-8-051213<br>2005 12 13 | MW05-9<br>MW05-9-051213<br>2005 12 13 | MB EQG<br>CCME CEQG Community Water |
|---|---|---|---|---|---|---|
| **Parameter** | **Units** | | | | | |
| **Polycyclic Aromatic Hydrocarbons** | | | | | | |
| Acenaphthene | mg/L | 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | n/a |
| Acenaphthylene | mg/L | 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | n/a |
| Anthracene | mg/L | 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | n/a |
| Benzo(a)anthracene | mg/L | 0.00005 | < 0.00005 | 0.00006 | < 0.00005 | n/a |
| Benzo(a)pyrene | mg/L | 0.00001 | < 0.00001 | ***0.00003*** | < 0.00001 | 0.00001 |
| Benzo(b+j)fluoranthene | mg/L | 0.00005 | < 0.00005 | 0.00006 | < 0.00005 | n/a |
| Benzo(g,h,i)perylene | mg/L | 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | n/a |
| Benzo(k)fluoranthene | mg/L | 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | n/a |
| Chrysene | mg/L | 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | n/a |
| Dibenz(a,h)anthracene | mg/L | 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | n/a |
| Fluoranthene | mg/L | 0.00005 | < 0.00005 | 0.00009 | < 0.00005 | n/a |
| Fluorene | mg/L | 0.00005 | < 0.00005 | < 0000.05 | < 0.00005 | n/a |
| Indeno(1,2,3-cd)pyrene | mg/L | 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | n/a |
| 1-Methylnaphthalene | mg/L | 0.00005 | < 0.00005 | 0.00006 | < 0.00005 | n/a |
| 2-Methylnaphthalene | mg/L | 0.00005 | < 0.00005 | 0.00006 | < 0.00005 | n/a |
| Naphthalene | mg/L | 0.00005 | < 0.00005 | 0.00014 | 0.00006 | n/a |
| Phenanthrene | mg/L | 0.00005 | < 0.00005 | 0.00011 | < 0.00005 | n/a |
| Pyrene | mg/L | 0.00005 | < 0.00005 | 0.00011 | < 0.00005 | n/a |

Associated Maxxam files: 413335, 413336.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

n/a Denotes no applicable standard.

***BOLD*** Concentration greater than or equal to CCME CEQG Community Water guideline.

## TABLE 8 : Summary of Analytical Results for Nutrients and Metals in Groundwater

| Sample Location | | | MW05-6 | MW05-7 | MW05-8 | MW05-9 | MW05-20 | MW05-24 | MW05-25 | | | MW05-27 | MW05-29 | MW05-30 | MW05-31 | MW05-32 | | | MW05-33 | MW05-34 | Field Blank | Trip Blank | MB EQG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | Minimum Detection Limit | MW05-6 -051213 | MW05-7 -051213 | MW05-8 -051213 | MW05-9 -051213 | MW05-20 -051212 | MW05-24 -051212 | MW05-25 -051212 | MW05-36 -051212 | QA/QC RPD % | MW05-27 -051212 | MW05-29 -051212 | MW05-30 -051213 | MW05-31 -051213 | MW05-32 -051213 | MW05-37 -051213 | QA/QC RPD % | MW05-33 -051213 | MW05-34 -051213 | F.BLANK -051212 | T.BLANK -051212 | CCME CEQG Community Water (CW) |
| Sample Date (yyyy mm dd) | | | 2005 12 13 | 2005 12 13 | 2005 12 13 | 2005 12 13 | 2005 12 12 | 2005 12 12 | 2005 12 12 | 2005 12 12 | | 2005 12 12 | 2005 12 12 | 2005 12 13 | 2005 12 13 | 2005 12 13 | 2005 12 13 | | 2005 12 13 | 2005 12 13 | 2005 12 12 | 2005 12 12 | |
| Parameter | Units | | Analytical Results | | | | | | | | | | | | | | | | | | | | |
| **Physical Parameters** | | | | | | | | | | | | | | | | | | | | | | | |
| pH | pH | 0.01 | - | - | - | - | - | - | - | - | - | - | - | - | 7.8 | 7.5 | 7.6 | 1 | - | - | - | - | 6.5 - 8.5 [1] |
| Conductivity | µS/cm | 2 | - | - | - | - | - | - | - | - | - | - | - | - | 916 | 922 | 875 | 5 | - | - | - | - | n/a |
| Nitrate | mg/L | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - | 0.2 | < 0.1 | < 0.1 | | - | - | - | - | 10 |
| Nitrite | mg/L | 0.01 | - | - | - | - | - | - | - | - | - | - | - | - | < 0.01 | < 0.01 | < 0.01 | | - | - | - | - | n/a |
| Nitrate+Nitrite | mg/L | 0.1 | - | - | - | - | - | - | - | - | - | - | - | - | 0.2 | < 0.1 | < 0.1 | | - | - | - | - | n/a |
| **Dissolved Metals** | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.012 | < 0.005 | * | < 0.005 | < 0.005 | < 0.005 | - | < 0.005 | < 0.005 | | 0.013 | < 0.005 | 0.029 | < 0.005 | 0.1 |
| Arsenic | mg/L | 0.001 | 0.005 | 0.002 | 0.003 | < 0.001 | ***0.230*** | 0.023 | ***0.100*** | ***0.110*** | 10 | 0.011 | 0.010 | 0.009 | - | 0.002 | 0.002 | | 0.004 | 0.022 | < 0.001 | < 0.001 | 0.025 |
| Barium | mg/L | 0.005 | 0.140 | 0.068 | 0.035 | 0.130 | 0.920 | 0.670 | ***1.300*** | ***1.300*** | 0 | 0.170 | 0.290 | 0.400 | - | 0.340 | 0.290 | 16 | 0.350 | 0.590 | < 0.005 | < 0.005 | 1.0 |
| Beryllium | mg/L | 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | * | < 0.0005 | < 0.0005 | < 0.0005 | - | < 0.0005 | < 0.0005 | * | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | n/a |
| Boron | mg/L | 0.010 | 0.180 | 0.220 | 1.700 | 0.300 | 0.200 | 0.120 | 0.120 | 0.110 | 9 | 0.130 | 0.220 | 0.240 | - | 0.150 | 0.150 | 0 | 0.140 | 0.420 | < 0.010 | < 0.010 | 5 |
| Cadmium | mg/L | 0.0001 | < 0.0001 | 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | * | 0.0005 | < 0.0001 | < 0.0001 | - | 0.0004 | 0.0004 | 7 | 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | 0.005 |
| Chromium | mg/L | 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | * | < 0.005 | < 0.005 | < 0.005 | - | < 0.005 | < 0.005 | * | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.05 |
| Cobalt | mg/L | 0.0005 | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0088 | 0.0078 | 0.012 | 0.012 | 0 | 0.0009 | 0.0078 | 0.0053 | - | 0.0070 | 0.0066 | 6 | 0.0078 | 0.0056 | < 0.0005 | < 0.0005 | n/a |
| Copper | mg/L | 0.001 | 0.001 | 0.002 | 0.001 | 0.005 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | * | < 0.001 | 0.004 | 0.002 | - | 0.004 | 0.002 | * | 0.002 | 0.002 | 0.004 | < 0.001 | ≤1.0 [1] |
| Iron | mg/L | 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | ***36.000*** | ***7.100*** | ***20.000*** | ***21.000*** | 5 | ***5.700*** | ***3.100*** | ***1.100*** | - | 0.089 | 0.120 | * | ***0.340*** | ***8.300*** | < 0.050 | < 0.050 | ≤0.3 [1] |
| Lead | mg/L | 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | * | < 0.0005 | < 0.0005 | < 0.0005 | - | 0.0005 | < 0.0005 | * | < 0.0005 | 0.0005 | < 0.0005 | 0.0013 | 0.010 |
| Magnesium | mg/L | 0.050 | 36.000 | 68.000 | 81.000 | 74.000 | 82.000 | 81.000 | 53.000 | 53.000 | 0 | 57.000 | 52.000 | 28.000 | - | 62.000 | 56.000 | 10 | 49.000 | 42.000 | 0.160 | < 0.00005 | n/a |
| Manganese | mg/L | 0.002 | ***0.640*** | ***0.560*** | ***0.820*** | ***0.620*** | ***1.500*** | ***6.200*** | ***1.300*** | ***1.300*** | 0 | ***1.500*** | ***1.800*** | ***0.710*** | - | ***2.400*** | ***2.400*** | 0 | ***2.300*** | ***2.500*** | 0.003 | < 0.002 | ≤0.05 [1] |
| Nickel | mg/L | 0.001 | < 0.001 | 0.004 | 0.004 | 0.004 | 0.008 | 0.013 | 0.018 | 0.018 | 0 | 0.002 | 0.008 | 0.005 | - | 0.012 | 0.011 | 9 | 0.018 | 0.005 | < 0.001 | < 0.001 | n/a |
| Selenium | mg/L | 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | < 0.002 | 0.002 | < 0.002 | < 0.002 | * | < 0.002 | < 0.002 | < 0.002 | - | < 0.002 | < 0.002 | * | < 0.002 | < 0.002 | < 0.002 | < 0.002 | 0.01 |
| Silver | mg/L | 0.0005 | < 0.0005 | < 0.0005 | 0.0012 | 0.0011 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | * | < 0.0005 | < 0.0005 | < 0.0005 | - | < 0.0005 | < 0.0005 | * | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | n/a |
| Thallium | mg/L | 0.00005 | < 0.00005 | < 0.00005 | 0.00007 | 0.00008 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | * | < 0.00005 | < 0.00005 | < 0.00005 | - | < 0.00005 | < 0.00005 | * | 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | n/a |
| Vanadium | mg/L | 0.001 | < 0.001 | 0.001 | 0.002 | < 0.001 | 0.004 | < 0.001 | 0.003 | 0.003 | * | < 0.001 | < 0.001 | < 0.001 | - | < 0.001 | < 0.001 | * | < 0.001 | < 0.001 | < 0.001 | < 0.001 | n/a |
| Zinc | mg/L | 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.006 | < 0.005 | * | < 0.005 | 0.010 | 0.012 | - | 0.010 | < 0.005 | * | 0.011 | 0.012 | 0.007 | < 0.005 | ≤5.0 [1] |

Associated Maxxam files: 413334, 413335, 413336.

All terms defined within the body of Morrow's report.

< Denotes concentration less than indicated detection limit.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

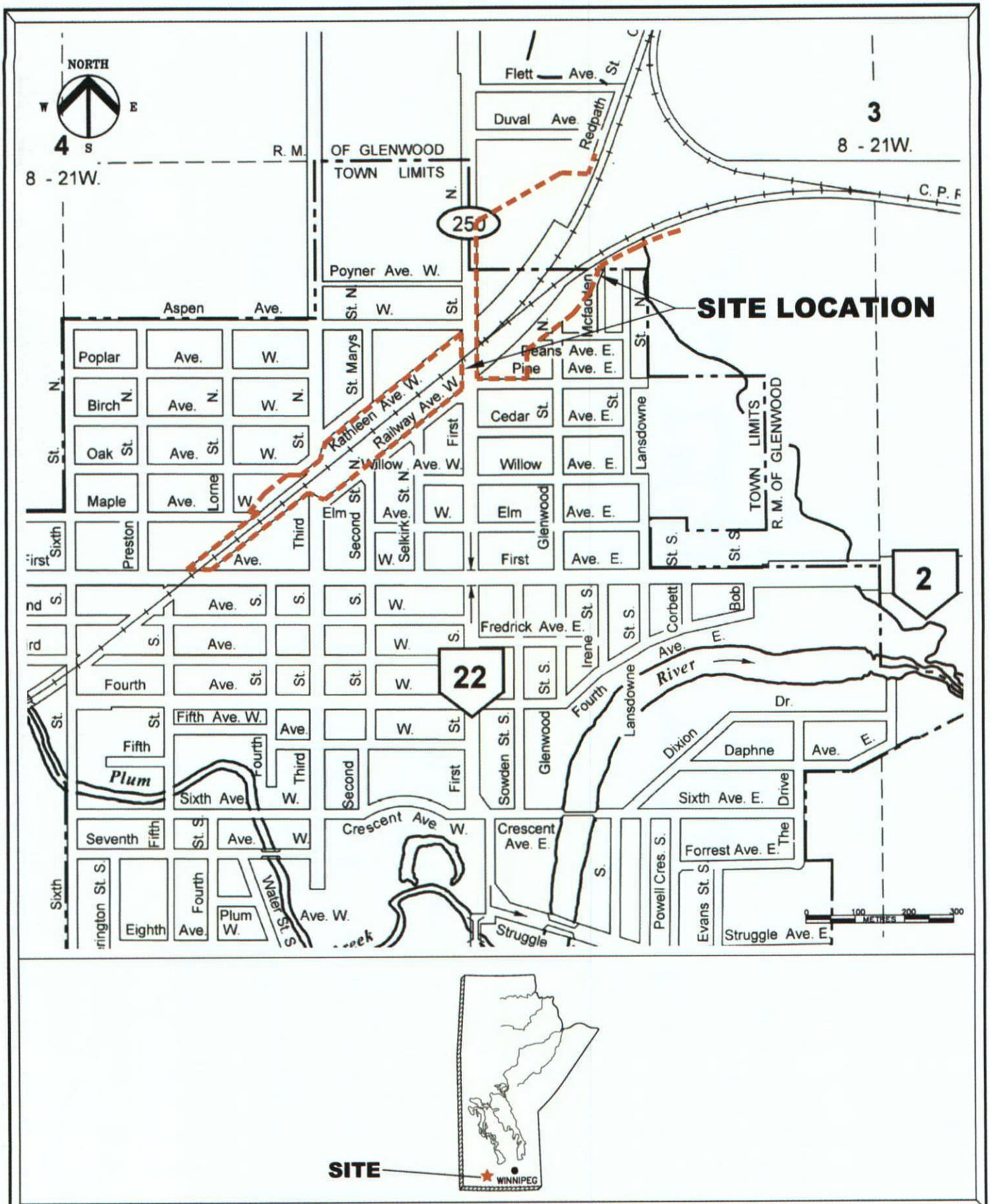
* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

[1] - aesthetic objective

***BOLD*** Concentration greater than or equal to CCME CEQG Community Water guideline.

# APPENDIX I

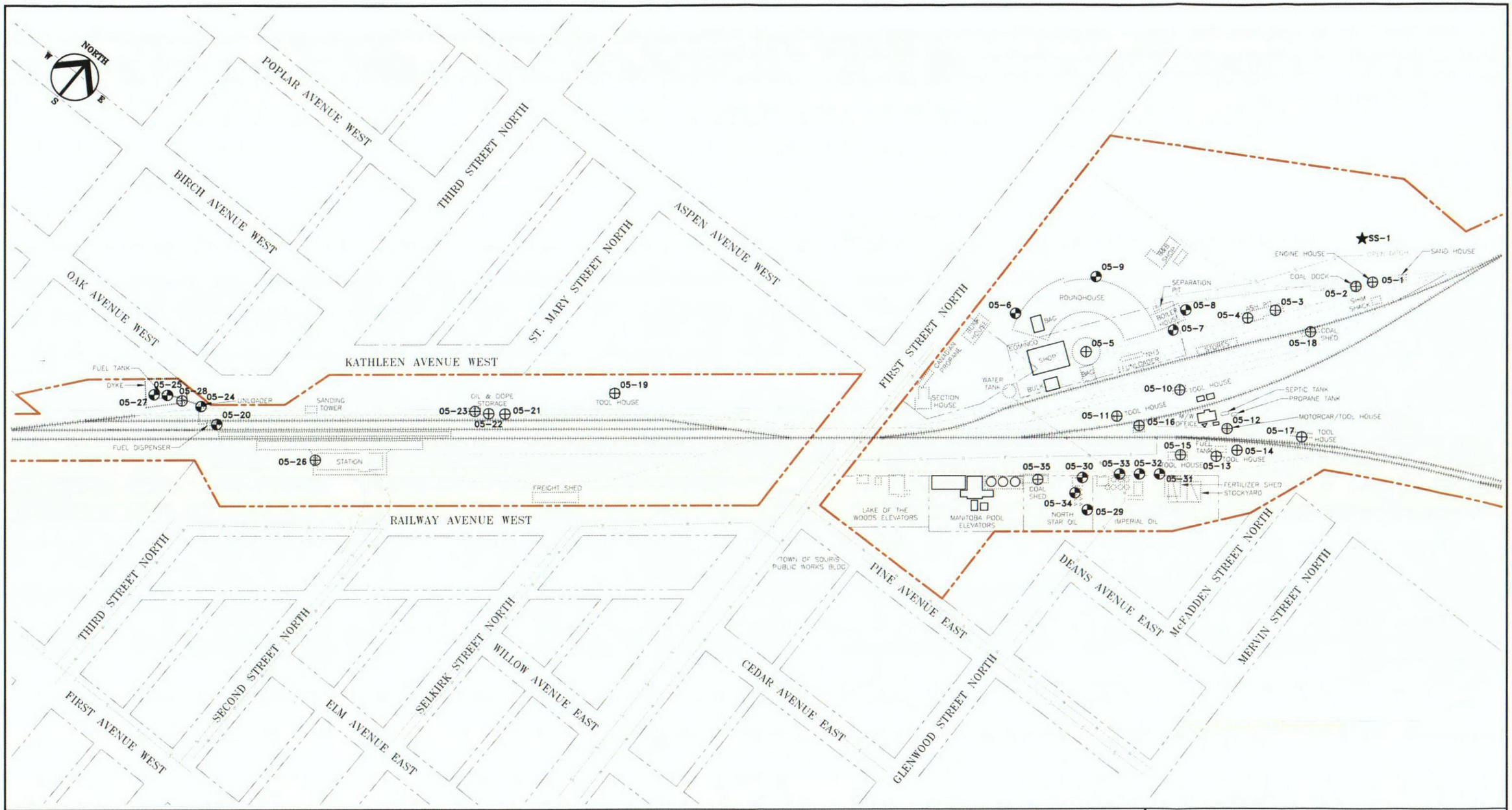
## Drawings




**SNC·LAVALIN**
**Morrow Environmental**

# KEY PLAN

| DATE: Feb.17, 2006 | DRAWN BY: CDC | CHECKED: AE | CLIENT NAME: CANADIAN PACIFIC RAILWAY | SITE ADDRESS: SOURIS YARD, SOURIS, MB | DRAWING NUMBER: 131066-001 |
|---|---|---|---|---|---|




## LEGEND

5 25 50 75 100 125 METRES

- MONITORING WELL LOCATION
- BOREHOLE LOCATION
- SURFICIAL SOIL SAMPLE
- PROPERTY LINE
- TRACK LINE
- FORMER TRACK
- FORMER STRUCTURE
- AIR LINE
- CABLE LINE
- SANITARY SEWER LINE
- TELEPHONE LINE
- WATER LINE

## NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED ON SITE. NOT ALL UTILITIES MAY BE SHOWN.

## REFERENCE DRAWINGS

| DWG. NO. | DATE | DESCRIPTION |
|---|---|---|
| E094-2018 | 1993 10 07 | CP RAIL SOURIS SITE PLAN |

## REVISIONS

| REV. | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 0 | – | – | – | – |

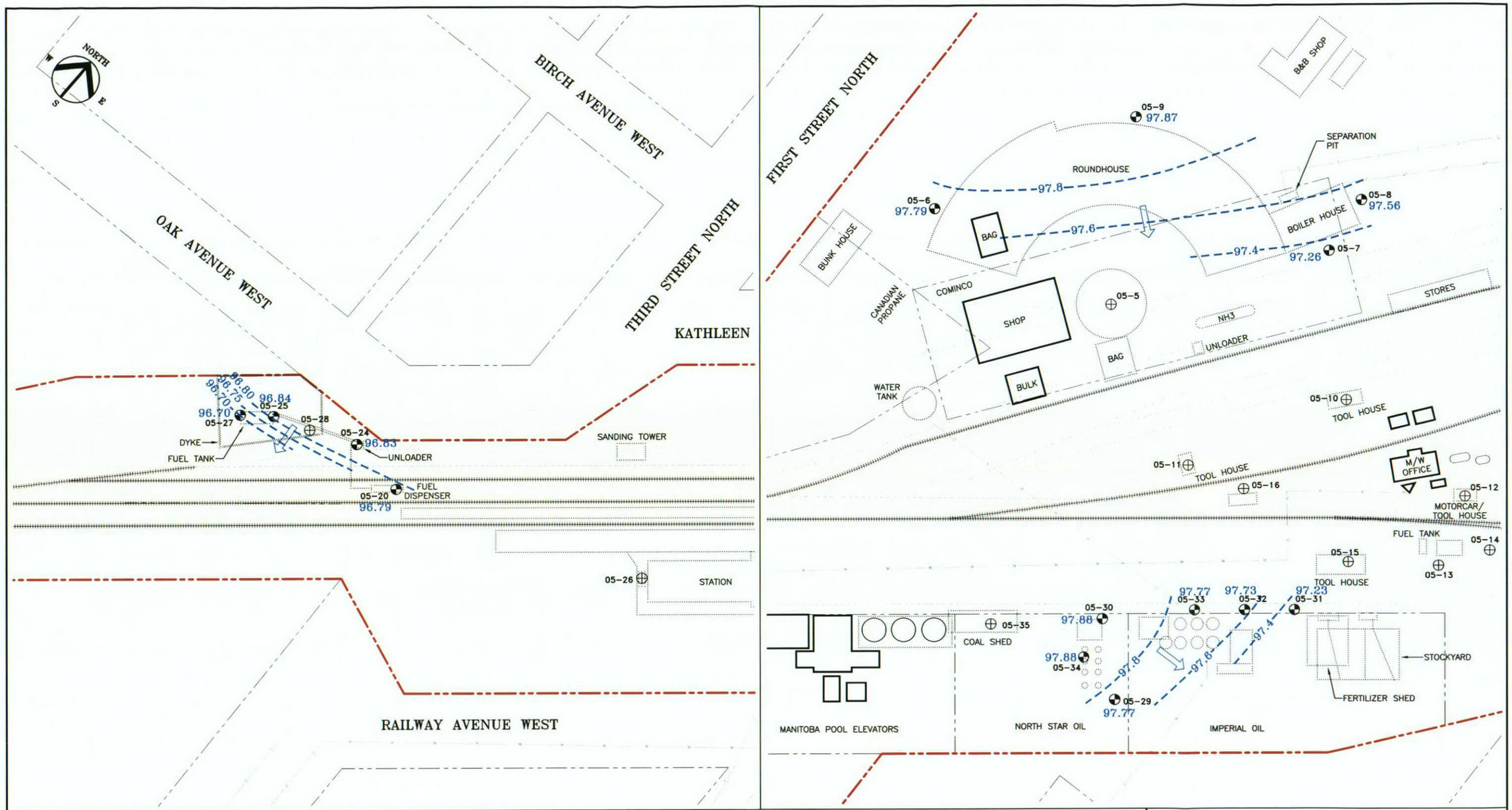
**SNC·LAVALIN Morrow Environmental**

CLIENT NAME: CANADIAN PACIFIC RAILWAY

PROJECT LOCATION: SOURIS YARD SOURIS, MB

TITLE: **SITE PLAN**

| | | | |
|---|---|---|---|
| DWN BY: CDC | SCALE: 1:2,500 | DATE: Feb.17, 2006 | DWG No: 131066-002 REV.: 0 |
| CHK'D: AE | PLOT: | CADFILE: 131066R1 | |




## LEGEND

0 10 20 30 40 50 METRES

- MONITORING WELL LOCATION
- BOREHOLE LOCATION
- PROPERTY LINE
- TRACK LINE
- FORMER TRACK
- FORMER STRUCTURE
- AIR LINE
- CABLE LINE
- SANITARY SEWER LINE
- WATER LINE
- 98.60 GROUNDWATER ELEVATION (m)
- INFERRED GROUNDWATER FLOW DIRECTION

## NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED ON SITE. NOT ALL UTILITIES MAY BE SHOWN.

## REFERENCE DRAWINGS

| DWG. NO. | DATE | DESCRIPTION |
|---|---|---|
| E094-2018 | 1993 10 07 | CP RAIL SOURIS SITE PLAN |

## REVISIONS

| REV. | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 0 | – | – | – | – |

SNC·LAVALIN
Morrow Environmental

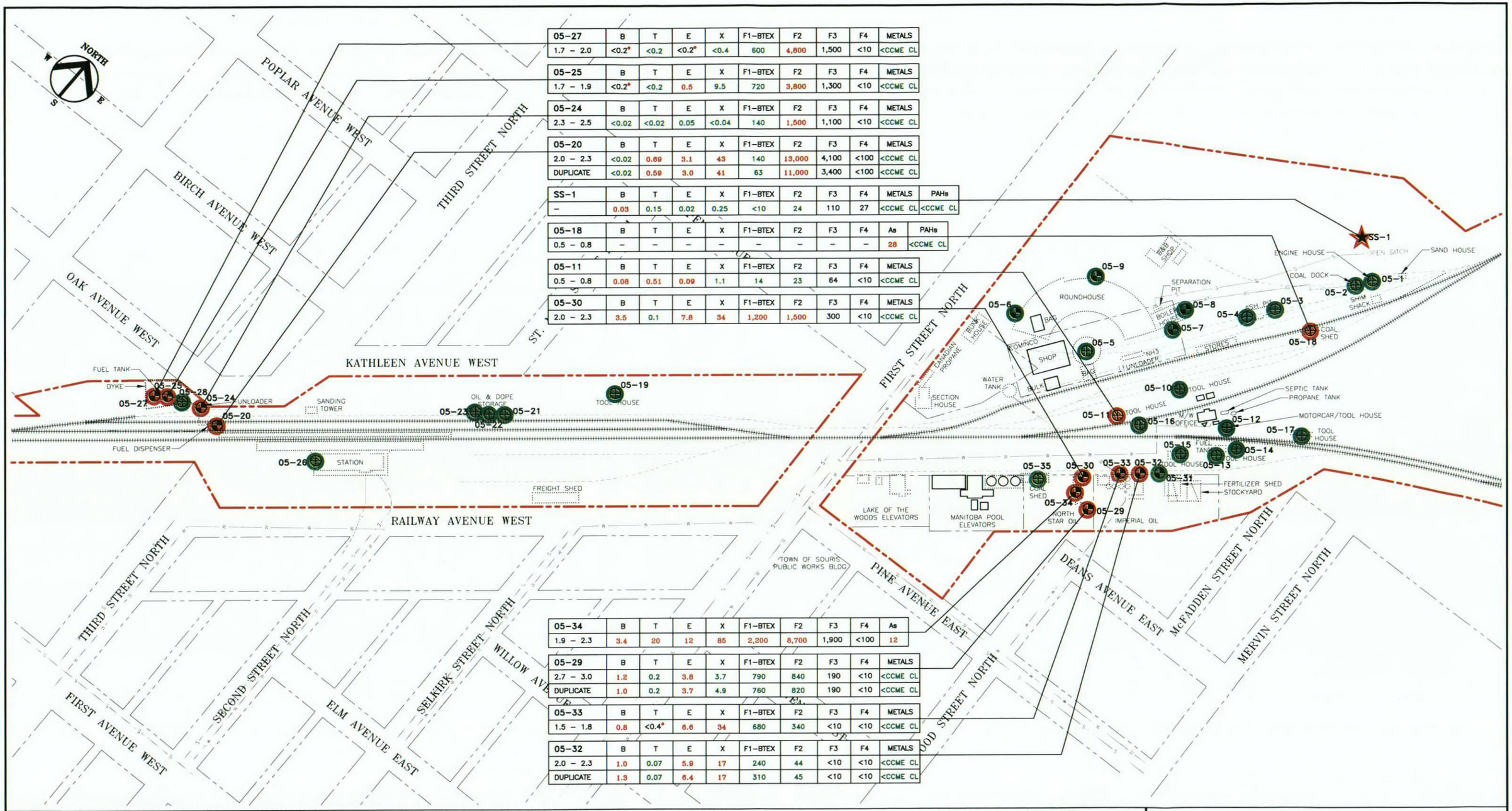
CLIENT NAME: CANADIAN PACIFIC RAILWAY

PROJECT LOCATION: SOURIS YARD SOURIS, MB

TITLE:

# INFERRED GROUNDWATER CONTOURS (December 12, 2005)

| | | | |
|---|---|---|---|
| DWN BY: CDC | SCALE: 1:1,000 | DATE: Feb.17, 2006 | DWG No: 131066-003 REV.: 0 |
| CHK'D: AE | PLOT: | CADFILE: 131066R1 | |




| 05-27 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 1.7 – 2.0 | <0.2* | <0.2 | <0.2* | <0.4 | 600 | 4,800 | 1,500 | <10 | <CCME CL |

| 05-25 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 1.7 – 1.9 | <0.2* | <0.2 | 0.5 | 9.5 | 720 | 3,800 | 1,300 | <10 | <CCME CL |

| 05-24 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2.3 – 2.5 | <0.02 | <0.02 | 0.05 | <0.04 | 140 | 1,500 | 1,100 | <10 | <CCME CL |

| 05-20 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2.0 – 2.3 | <0.02 | 0.69 | 3.1 | 43 | 140 | 13,000 | 4,100 | <100 | <CCME CL |
| DUPLICATE | <0.02 | 0.59 | 3.0 | 41 | 63 | 11,000 | 3,400 | <100 | <CCME CL |

| SS-1 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS | PAHs |
|---|---|---|---|---|---|---|---|---|---|---|
| – | 0.03 | 0.15 | 0.02 | 0.25 | <10 | 24 | 110 | 27 | <CCME CL | <CCME CL |

| 05-18 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | As | PAHs |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.5 – 0.8 | – | – | – | – | – | – | – | – | 28 | <CCME CL |

| 05-11 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 0.5 – 0.8 | 0.08 | 0.51 | 0.09 | 1.1 | 14 | 23 | 64 | <10 | <CCME CL |

| 05-30 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2.0 – 2.3 | 3.5 | 0.1 | 7.8 | 34 | 1,200 | 1,500 | 300 | <10 | <CCME CL |

| 05-34 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | As |
|---|---|---|---|---|---|---|---|---|---|
| 1.9 – 2.3 | 3.4 | 20 | 12 | 85 | 2,200 | 8,700 | 1,900 | <100 | 12 |

| 05-29 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2.7 – 3.0 | 1.2 | 0.2 | 3.8 | 3.7 | 790 | 840 | 190 | <10 | <CCME CL |
| DUPLICATE | 1.0 | 0.2 | 3.7 | 4.9 | 760 | 820 | 190 | <10 | <CCME CL |

| 05-33 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 1.5 – 1.8 | 0.8 | <0.4* | 6.6 | 34 | 680 | 340 | <10 | <10 | <CCME CL |

| 05-32 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2.0 – 2.3 | 1.0 | 0.07 | 5.9 | 17 | 240 | 44 | <10 | <10 | <CCME CL |
| DUPLICATE | 1.3 | 0.07 | 6.4 | 17 | 310 | 45 | <10 | <10 | <CCME CL |

## LEGEND

5 25 50 75 100 125 METRES

- MONITORING WELL LOCATION
- BOREHOLE LOCATION
- SURFICIAL SOIL SAMPLE
- PROPERTY LINE
- TRACK LINE
- FORMER TRACK
- FORMER STRUCTURE
- AIR LINE
- CABLE LINE
- SANITARY SEWER LINE
- TELEPHONE LINE
- WATER LINE

## NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED ON SITE. NOT ALL UTILITIES MAY BE SHOWN.

ANALYTICAL SOIL RESULTS

| WELL ID# | 02-13 | B | T | E | X | F1 | F2 | Pb |
|---|---|---|---|---|---|---|---|---|
| DEPTH OF SAMPLE (m) | 4.1-4.6 | 1.035 | 310 | 550 | 240 | <0.1 | <0.1 | <0.001 |

RED – CONCENTRATION(S) GREATER THAN THE ASSESSMENT GUIDELINES (mg/kg)
GREEN – CONCENTRATION(S) LESS THAN OR EQUAL TO THE ASSESSMENT GUIDELINES (mg/kg)
BLACK – NO ASSESSMENT GUIDELINES FOR CONCENTRATION(S) (mg/kg)
* – LABORATORY DETECTION LIMIT EXCEEDS GUIDELINE

## REFERENCE DRAWINGS

| | | |
|---|---|---|
| E094-2018 | 1993 10 07 | CP RAIL SOURIS SITE PLAN |
| DWG. NO. | DATE | DESCRIPTION |

## REVISIONS

| REV. | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 0 | – | – | – | – |

SNC·LAVALIN Morrow Environmental

CLIENT NAME: CANADIAN PACIFIC RAILWAY

PROJECT LOCATION: SOURIS YARD, SOURIS, MB

TITLE:

# DETAILED SOIL ANALYTICAL RESULTS

DWN BY: CDC | SCALE: 1:2,500 | DATE: Feb.17, 2006 | DWG No: 131066-004 | REV.: 0

CHK'D: AE | PLOT: | CADFILE: 131066R1

| 05-25 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | As | Ba |
|---|---|---|---|---|---|---|---|---|---|---|
| 2005 12 12 | 0.0003 | 0.0009 | 0.013 | 0.24 | 1.0 | 22.0 | 7.7 | <0.1 | 0.10 | 1.30 |
| DUPLICATE | 0.0003 | 0.0009 | 0.012 | 0.23 | 1.0 | 22.0 | 8.0 | <0.1 | 0.11 | 1.30 |

| 05-20 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | As |
|---|---|---|---|---|---|---|---|---|---|
| 2005 12 12 | 0.0024 | 0.021 | 0.069 | 0.64 | 2.9 | 27.0 | 9.8 | <0.1 | 0.23 |

| 05-8 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS | B(a)P |
|---|---|---|---|---|---|---|---|---|---|---|
| 2005 12 13 | <0.0002 | <0.0002 | <0.0002 | <0.0004 | <0.1 | <0.1 | <0.1 | <0.1 | <CCME CW | 0.00003 |

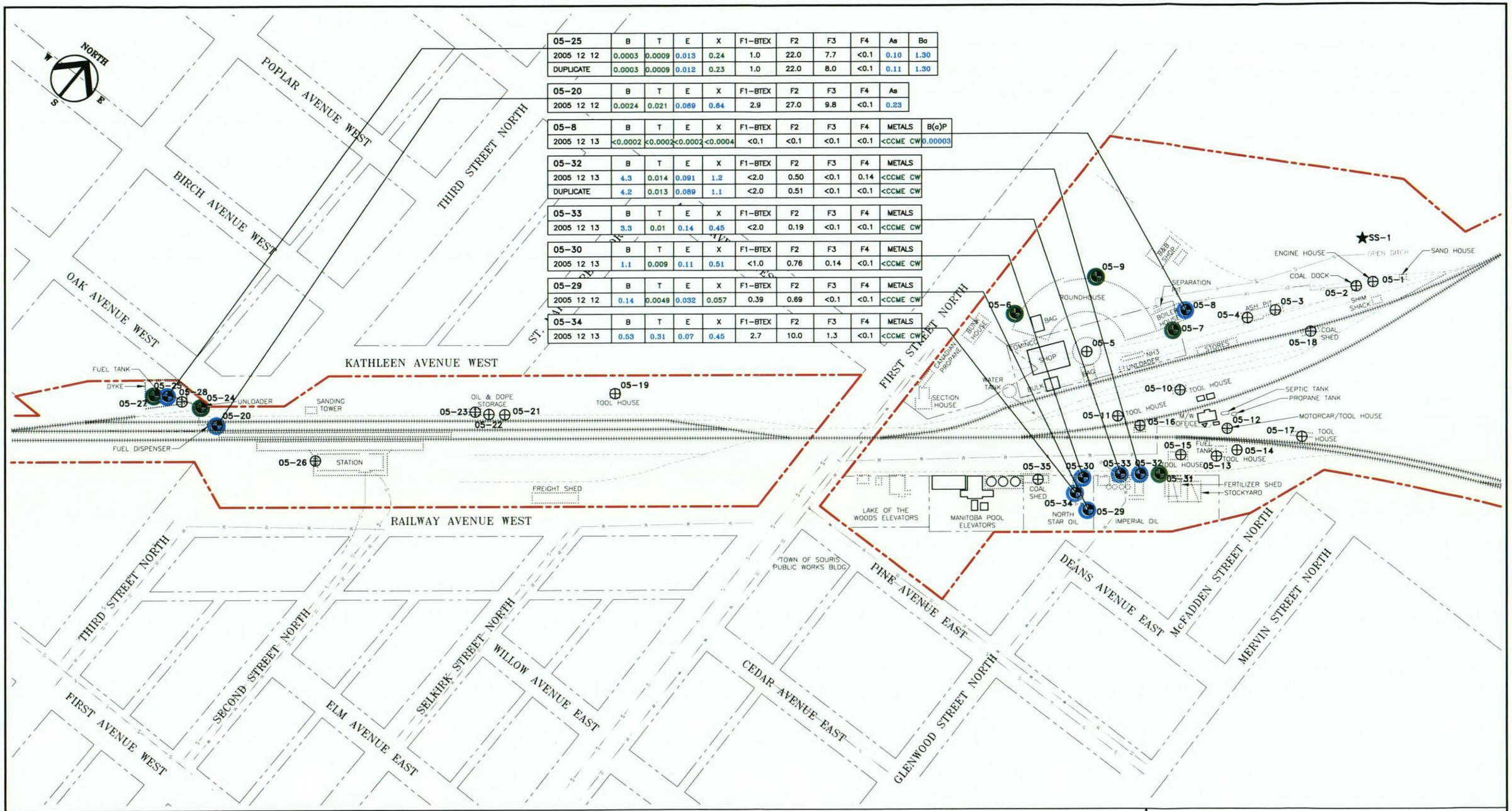
| 05-32 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2005 12 13 | 4.3 | 0.014 | 0.091 | 1.2 | <2.0 | 0.50 | <0.1 | 0.14 | <CCME CW |
| DUPLICATE | 4.2 | 0.013 | 0.089 | 1.1 | <2.0 | 0.51 | <0.1 | <0.1 | <CCME CW |

| 05-33 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2005 12 13 | 3.3 | 0.01 | 0.14 | 0.45 | <2.0 | 0.19 | <0.1 | <0.1 | <CCME CW |

| 05-30 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2005 12 13 | 1.1 | 0.009 | 0.11 | 0.51 | <1.0 | 0.76 | 0.14 | <0.1 | <CCME CW |

| 05-29 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2005 12 12 | 0.14 | 0.0049 | 0.032 | 0.057 | 0.39 | 0.69 | <0.1 | <0.1 | <CCME CW |

| 05-34 | B | T | E | X | F1-BTEX | F2 | F3 | F4 | METALS |
|---|---|---|---|---|---|---|---|---|---|
| 2005 12 13 | 0.53 | 0.31 | 0.07 | 0.45 | 2.7 | 10.0 | 1.3 | <0.1 | <CCME CW |




## LEGEND

5 25 50 75 100 125 METRES

- MONITORING WELL LOCATION
- BOREHOLE LOCATION
- SURFICIAL SOIL SAMPLE
- PROPERTY LINE
- TRACK LINE
- FORMER TRACK
- FORMER STRUCTURE
- AIR LINE
- CABLE LINE
- SANITARY SEWER LINE
- TELEPHONE LINE
- WATER LINE

## NOTES

1. ORIGINAL DRAWING IN COLOUR.
2. LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY AND SHOULD BE CONFIRMED ON SITE. NOT ALL UTILITIES MAY BE SHOWN.

ANALYTICAL GROUNDWATER RESULTS

| WELL ID# | 02-13 | B | T | E | X | F1 | F2 | Pb |
|---|---|---|---|---|---|---|---|---|
| DATE COLLECTED | 2002 04 21 | 1.035 | 310 | 550 | 240 | <0.1 | <0.1 | <0.001 |

BLUE – CONCENTRATION(S) GREATER THAN THE ASSESSMENT GUIDELINES (mg/L)
GREEN – CONCENTRATION(S) LESS THAN OR EQUAL TO THE ASSESSMENT GUIDELINES (mg/L)
BLACK – NO ASSESSMENT GUIDELINES FOR CONCENTRATION(S) (mg/L)

## REFERENCE DRAWINGS

| DWG. NO. | DATE | DESCRIPTION |
|---|---|---|
| E094-2018 | 1993 10 07 | CP RAIL SOURIS SITE PLAN |

## REVISIONS

| REV. | DATE | DESCRIPTION | BY | CHK |
|---|---|---|---|---|
| 0 | – | – | – | – |

SNC·LAVALIN Morrow Environmental

CLIENT NAME: CANADIAN PACIFIC RAILWAY

PROJECT LOCATION: SOURIS YARD, SOURIS, MB

TITLE: **DETAILED GROUNDWATER ANALYTICAL RESULTS**

DWN BY: CDC | SCALE: 1:2,500 | DATE: Feb.17, 2006 | DWG No: 131066-005 | REV.: 0

CHK'D: AE | PLOT: | CADFILE: 131066R1

# APPENDIX II

## Borehole Logs

SNC•LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-1

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 14
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)
1 10 2 10 3 10 4 10

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) | |
|---|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), medium to coarse grained, cinders, trace silt, black, moist | | | BH05-1-5 | | | o 15 | |
| | CLAY (TILL), some silt, trace medium grained sand, trace fine grained gravel, brown, firm, medium plasticity, moist | | | BH05-1-1 | | | o 35 | |
| 1 | - silty below 1.5 m | | | BH05-1-2 | | 92 | o 35 | Bentonite |
| 2 | SAND, fine to medium grained, dark brown | | | BH05-1-3 | | | o 25 | |
| | CLAY (TILL), silty, trace medium grained sand, trace fine grained gravel, brown, firm, medium plasticity, moist - crumbly below 2.3 m | | | BH05-1-4 | | | o 25 | |
| 3 | End of borehole at 3.0 m. | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-2

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 14
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

Soil Vapour (ppm)
1 10 | 2 10 | 3 10 | 4 10

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), medium and coarse grained, cinders, black, loose, moist | | | | | | |
| | CLAY (TILL), sandy, some silt, trace fine grained gravel, brown, firm, medium plasticity, moist | | | | | | |
| | SAND, fine grained, organics, brown, dry | | | BH05-2-1 | | | o 25 |
| | - dark brown below 0.8 m | | | | | 73 | |
| 1 | CLAY (TILL), silty, some fine grained sand to sandy, trace medium grained sand, trace fine grained gravel, trace rootlets, brown, medium plasticity, moist | | | BH05-2-2 | | | o 25 |
| | SILT and CLAY (TILL), some fine grained sand to sandy, trace medium grained sand, trace fine grained gravel, brown, crumbly, medium plasticity, moist | | | | | 100 | |
| 2 | | | | BH05-2-4 | | | o 20 |
| | CLAY (TILL), silty, some fine grained sand to sandy, trace medium grained sand, trace fine grained gravel, brown, medium plasticity, moist | | | | | | |
| 3 | | | | BH05-2-5 | | | |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-3

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 14
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval / Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) o Reading within indicated scale • Reading outside indicated scale (1 10, 2 10, 3 10, 4 10) | |
|---|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), medium and coarse grained, cinders, trace silt, black, moist<br>- fine to medium grained, trace to some fine grained gravel, trace coarse grained sand, clay chunks, brown to dark brown below 0.2 m<br>- fine to medium grained, brown below 0.8 m | | | BH05-3-1 | | | o 15 | |
| 1 | - dark brown below 1.4 m | | | BH05-3-2 | | 70<br>100 | o 30 | Bentonite |
| 2 | CLAY (TILL), silty, trace medium grained sand, trace fine grained gravel, brown, mottled light grey and rust brown, stiff, medium plasticity, moist | | | BH05-3-3 | | | o 15 | |
| 3 | End of borehole at 3.0 m. | | | BH05-3-4 | | | o 20 | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-4

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number :131066
Borehole Logged By :JDT
Date Drilled :2005 11 14
Log Typed By :CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), medium and coarse grained, cinders, trace fine grained gravel, black, moist | | | BH05-4-1 | | | 10 |
| | - fine to medium grained, no cinders, brown below 0.5 m | | | | | 80 | |
| 1 | CLAY (TILL), silty, trace to some fine grained sand, trace fine grained gravel, trace coarse grained sand, firm, medium plasticity, moist | | | BH05-4-2 | | | 10 |
| | | | | | | 100 | |
| 2 | | | | BH05-4-4 | | | 10 |
| 3 | | | | BH05-4-3 | | | 10 |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

o Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm): 1 10 2 10 3 10 4 10

Bentonite

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-5

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 14
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
● Reading outside indicated scale

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 1 10 / 2 10 / 3 10 / 4 10 |
|---|---|---|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), fine to coarse grained gravel, brown | | | BH05-5-1 | | | o 95 |
| | SAND (FILL), fine grained, trace silt, trace fine grained gravel, brick pieces, light brown to dark brown, loose | | | | | 100 | |
| 1 | | | | BH05-5-2 | | | o 95 |
| | - saturated below 1.5 m<br>- split spoon refusal at 1.5 m | | | | | | |
| 2 | | | | BH05-5-3 | | | o 95 |
| | CLAY (TILL), cobbles, silty, trace fine grained gravel, trace fine grained sand, firm, medium plasticity, wet | | | | | | |
| 3 | | | | BH05-5-4 | | | o 25 |
| | Auger refusal | | | | | | |
| | End of borehole at 3.4 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-6

(Page 1 of 1)

*Drilling Contractor: Maple Leaf Drilling*
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

*Date Monitored* : *2005 12 12*
Ground Surf Elev. (m) : 99.228
Top of Casing Elev. (m) : 100.15

*Project Number* : *131066*
Borehole Logged By : JDT
Date Drilled : 2005 11 15
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Depth in Metres | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) | Soil Description

Soil Vapour (ppm): o Reading within indicated scale; • Reading outside indicated scale
Soil Vapour (ppm) scale: 1 10, 2 10, 3 10, 4 10

Well Name: 05-6
- Solid PVC
- Slotted PVC
- Above Ground Casing
- Topsoil
- Bentonite
- Sand

| Depth (m) | Soil Description | Sample Number | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|
| 0 | SAND (FILL), fine grained, trace silt, occasional cobble, brown, moist | BH05-6-1 | 100 | 20 |
| 1 | CLAY (TILL), silty, trace coarse grained sand, brown, mottled rust brown, firm, medium plasticity, moist | BH05-6-2 BH05-6-D | | 20 |
| | - trace to some fine grained sand, mottled grey below 1.5 m | | 90 | |
| 2 | | BH05-6-3 | | 10 |
| | - silty to CLAY and SILT, some fine grained sand, firm to stiff below 2.3 m | | | |
| | | BH05-6-4 | | 15 |
| 3 | | | 97 | |
| | | BH05-6-5 | | 6 |
| 4 | | BH05-6-6 | | 10 |
| | | | 95 | |
| 5 | - some fine grained sand, soft to firm, wet below 5.0 m | BH05-6-7 | | 10 |
| | | BH05-6-8 | | 10 |
| 6 | End of borehole at 6.1 m. | | | |
| 7 | | | | |

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Data Approved: 2006 03 20

SNC•LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-7

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.1
Top of Casing Elev. (m) : 100.04

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 15
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within Indicated scale
• Reading outside Indicated scale

Soil Vapour (ppm)
1 10 | 2 10 | 3 10 | 4 10

Solid PVC
Slotted PVC

Well Name: 05-7

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), fine to medium grained, cinders, trace fine grained gravel, trace silt, black, moist | | | | | | |
| | SAND, fine to medium grained, trace fine grained gravel, brown, moist | | | BH05-7-1 | | | o 20 |
| | - no gravel below 0.8 m | | | BH05-7-2 | | 80 | |
| 1 | CLAY (TILL), silty to CLAY and SILT, trace medium and coarse grained sand, trace fine grained gravel, silt inclusions, brown, crumbly, medium plasticity | | | | | | |
| | - trace coarse grained gravel, sand inclusions, stiff below 1.5 m | | | | | 92 | |
| 2 | | | | BH05-7-3 BH05-7-7 | | | o 25 |
| | | | | BH05-7-4 | | | o 25 |
| 3 | - occasional sand seam below 3.0 m | | | | | 100 | |
| | | | | BH05-7-5 | | | o 20 |
| | Auger refusal | | | | | | |
| 4 | End of borehole at 4.0 m. | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Above Ground Casing
Topsoil
Bentonite
Sand

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-8

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.377
Top of Casing Elev. (m) : 100.42

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 15
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Soil Description

Depth in Metres | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm)

o Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm): 1 10 | 2 10 | 3 10 | 4 10

Solid PVC
Slotted PVC

Well Name: 05-8

| Depth | Soil Description | Sample Number | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|
| 0 | SAND, fine to medium grained, organics, trace fine grained gravel, trace silt, dark brown | BH05-8-1 | | o 20 |
| 1 | - no organics, brown below 0.9 m | BH05-8-2 | 100 | o 20 |
| 2 | CLAY (TILL), silty, trace fine grained gravel, trace medium and coarse grained sand, brown, firm to stiff, medium plasticity, moist<br>- split spoon refusal at 1.5 m<br>- silty to CLAY and SILT, sand inclusions, stiff below 2.3 m | BH05-8-3 | | o 15 |
| 3 | | BH05-8-4 | 100 | o 20 |
| 4 | - occasional fine to medium grained sand seam below 3.8 m | BH05-8-5 | 100 | o 10 |
| 5 | SILT and CLAY (TILL), trace coarse grained sand, trace fine grained gravel, greyish brown, soft, low to medium plasticity, wet | BH05-8-6 | 100 | o 15 |
| 6 | End of borehole at 6.1 m. | BH05-8-7 | | ● |
| 7 | | BH05-8-8 | | ● |

Above Ground Casing
Topsoil
Bentonite
Sand

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-9

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.788
Top of Casing Elev. (m) : 100.798

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 15
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) o Reading within indicated scale e Reading outside indicated scale | Well Name: 05-9 |
|---|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), fine to medium grained, organics, trace coarse grained sand, trace silt, black, moist<br>- brown below 0.2 m<br>- no coarse grained sand below 0.5 m | | | BH05-9-1 | | | o 40 | Above Ground Casing<br>Topsoil |
| 1 | - split spoon refusal at 1.6 m | | | BH05-9-2<br>BH05-9-9 | | 80 | o 50 | Bentonite |
| 2 | CLAY (TILL), silty, trace medium and coarse grained sand, trace fine grained gravel, silt inclusions, brown, stiff, medium plasticity, moist<br>- mottled rust brown below 2.3 m | | | BH05-9-3 | | | o 15 | |
| 3 | | | | BH05-9-4 | | 77 | o 25 | |
| 4 | SILT and CLAY (TILL), trace to some fine grained gravel, trace fine grained sand, silt layers, sand inclusions, brown, mottled rust brown, firm, low to medium plasticity, moist<br>- split spoon refusal at 4.0 m | | | BH05-9-5 | | 30 | o 20 | |
| 5 | - greyish brown, soft to firm below 4.6 m<br>- split spoon refusal at 4.6 m | | | BH05-9-6 | | | o 20 | Sand |
| 6 | End of borehole at 6.1 m. | | | BH05-9-7 | | | e | |
| 7 | | | | BH05-9-8 | | | e | |

Solid PVC
Slotted PVC

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC•LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-10

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 15
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) o Reading within indicated scale • Reading outside indicated scale |
|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), medium to coarse grained, cinders, black, loose | | | BH05-10-1 | | | o50 |
| 1 | SAND, fine to medium grained, trace silt, brown, moist | | | | | 90 | |
| | CLAY (TILL), silty, trace fine grained sand, silt inclusions, brown, mottled grey, crumbly, moist | | | BH05-10-2 | | | o30 |
| 2 | - sand inclusions, mottled rust brown, stiff below 1.5 m | | | | | 100 | |
| | | | | BH05-10-3 | | | o10 |
| 3 | | | | BH05-10-4 | | | • |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Soil Vapour (ppm): 1 10, 2 10, 3 10, 4 10

Bentonite

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Data Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-11

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 15
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
● Reading outside indicated scale

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval / Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 1 10 / 2 10 / 3 10 / 4 10 |
|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), fine to medium grained, cinders, trace coarse grained sand, trace silt, trace fine grained gravel, black, loose | | | BH05-11-1 | | | o 30 |
| 1 | - no recovery in split spoon from 0.8 m to 1.5 m<br>- gravelly, brown, moist below 1.2 m | | | BH05-11-2 | | | o 20 |
| 2 | - clayey, blackish below 1.5 m<br>- split spoon refusal at 1.6 m<br>CLAY (TILL), silty, trace coarse grained sand, trace fine grained gravel, brown, firm, medium plasticity, moist<br>- stiff to very stiff below 2.3 m | | | BH05-11-3 | | 100 | o 25 |
| 3 | | | | BH05-11-4 | | | o 10 |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Data Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-12

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number :131066
Borehole Logged By :JDT
Date Drilled :2005 11 15
Log Typed By :CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 1 10 2 10 3 10 4 10 (o Reading within indicated scale; • Reading outside indicated scale) |
|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), fine to medium grained, cinders, some fine grained gravel, trace silt, trace coarse grained sand, black | | | | | | |
| | SAND, fine to medium grained, trace silt, dark brown | | | BH05-12-1 | | 80 | o 25 |
| 1 | - brown below 0.6 m | | | | | | |
| | CLAY (TILL), silty, trace coarse grained sand, trace fine grained gravel, firm to stiff, medium plasticity, moist | | | BH05-12-2 | | | o 20 |
| | | | | | | 100 | |
| 2 | | | | BH05-12-3 | | | o 20 |
| | | | | | | | |
| 3 | | | | BH05-12-4 | | | o 20 |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-13

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 16
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
● Reading outside indicated scale

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 1 10 / 2 10 / 3 10 / 4 10 |
|---|---|---|---|---|---|---|---|
| 0 | SAND, fine to medium grained, trace silt, dark brown | | | BH05-13-1 | | | o 30 |
| | - light brown below 0.5 m | | | | | 100 | |
| 1 | CLAY (TILL), silty, trace coarse grained sand, crumbly, medium plasticity, moist | | | BH05-13-2 | | | o 25 |
| | - trace fine to coarse grained gravel, trace medium grained sand below 1.5 m | | | | | 83 | |
| 2 | | | | BH05-13-3 | | | ● |
| | - stiff below 2.3 m | | | | | | |
| 3 | | | | BH05-13-4 | | | ● |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC•LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-14

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 16
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) | |
|---|---|---|---|---|---|---|---|---|
| 0 | SAND, fine to medium grained, trace silt, dark brown | | | BH05-14-1 | | | o 20 | |
| 1 | - light brown below 0.8 m | | | BH05-14-2 BH05-14-5 | | 60 100 | o 25 | Bentonite |
| 2 | CLAY (TILL), silty, trace fine and coarse grained sand, brown, mottled light grey and rust brown, stiff, medium plasticity | | | BH05-14-3 | | | o 20 | |
| 3 | | | | BH05-14-4 | | | ● | |
| | End of borehole at 3.0 m. | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |

o Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm): 1 10 2 10 3 10 4 10

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-15

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 16
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)
1 10 | 2 10 | 3 10 | 4 10

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND, fine grained, trace silt, brown to dark brown | | | BH05-15-1<br>BH05-15-5 | | | o 40 |
| 1 | | | | | | 100 | |
| | CLAY (TILL), silty, trace coarse grained sand, trace fine grained gravel, silt inclusions, sand inclusions, brown, mottled rust brown and light grey, firm, medium plasticity, moist<br>- trace fine to corse grained gravel, stiff below 1.5 m | | | BH05-15-2 | | | o 25 |
| 2 | | | | BH05-15-3 | | 87 | o 20 |
| 3 | | | | BH05-15-4 | | | o 15 |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-16

(Page 1 of 1)

*Drilling Contractor: Maple Leaf Drilling*
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

*Project Number* : *131066*
Borehole Logged By : JDT
Date Drilled : 2005 11 16
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Soil Description

Depth in Metres

Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery

Soil Vapour (ppm)
o Reading within indicated scale
• Reading outside indicated scale
1 10 | 2 10 | 3 10 | 4 10

0 – SAND (FILL), fine to coarse grained, cinders, gravelly, black to dark brown, loose
BH05-16-1 — 83 — o 25

1 – SAND, fine grained, trace silt, dark brown
- brown below 1.2 m
BH05-16-2 — 92 — o 30

2 – CLAY (TILL), silty, trace fine to coarse grained gravel, trace fine and coarse grained sand, brown, mottled rust brown and light grey, stiff, medium plasticity, moist
BH05-16-3 — • 

BH05-16-4 — o 10

3 – End of borehole at 3.0 m.

4
5
6
7

Sand
Bentonite

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-17

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 16
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
● Reading outside indicated scale

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 1 10 / 2 10 / 3 10 / 4 10 |
|---|---|---|---|---|---|---|---|
| 0 | SAND, fine grained, organics, trace silt, dark brown | | | BH05-17-1 | | | o 10 |
| | - brown below 0.4 m | | | | | 80 | |
| 1 | - mottled rust brown below 0.8 m | | | BH05-17-2 | | | o 20 |
| | - wet to saturated below 1.5 m | | | | | 93 | |
| 2 | | | | BH05-17-4 | | | o 45 |
| | CLAY (TILL), some silt to silty, trace fine to coarse grained sand, trace fine grained gravel, brown, mottled light grey, stiff, medium plasticity, moist | | | BH05-17-3 | | | |
| 3 | End of borehole at 2.9 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-18

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 16
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

Soil Vapour (ppm)
1 10 | 2 10 | 3 10 | 4 10

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), fine to medium grained, some fine to coarse grained gravel, trace silt, black | | | BH05-18-1 | | | o 10 |
| | - no silt, brown, loose below 0.9 m | | | | | | |
| | - no recovery in split spoon from 0.8 m to 1.5 m | | | | | | |
| 1 | SAND, fine grained, trace silt, dark brown, moist | | | BH05-18-2 | | | o 10 |
| | - brown below 1.3 m | | | | | | |
| | - split spoon refusal at 1.5 m | | | | | | |
| | - some silt below 1.5 m | | | | | | |
| 2 | | | | BH05-18-3 | | | e |
| | - frequent 13 mm clay layers, wet to saturated below 2.3 m | | | | | 73 | |
| | | | | BH05-18-4 | | | e |
| 3 | CLAY (TILL), silty, trace medium grained sand, sand inclusions, stiff, medium plasticity, moist | | | | | | |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-19

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 16
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND, fine grained, trace silt, trace medium grained sand, dark brown | | | BH05-19-1<br>BH05-19-5 | | | 25 |
| 1 | - brown, wet below 0.8 m | | | | | 100 | |
| | CLAY (TILL), silty, trace medium and coarse grained sand, sand inclusions, silt inclusions, firm, medium plasticity, moist<br>- trace fine to coarse grained gravel, mottled light grey and rust brown, stiff.below 1.5 m | | | BH05-19-2 | | 83 | 10 |
| 2 | | | | BH05-19-3 | | | 10 |
| 3 | | | | BH05-19-4 | | | |
| | End of borehole at 3.0 m. | | | | | | |

Bentonite

Soil Vapour (ppm): $10^1$ $10^2$ $10^3$ $10^4$

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-20

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Hollow Stem Auger
Borehole Dia. (m) : 0.18
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 98.681
Top of Casing Elev. (m) : 98.539

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 18
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

Soil Vapour (ppm)

Solid PVC
Slotted PVC

Well Name: 05-20

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), fine grained, some fine to coarse grained gravel, trace silt, dark brown, dry | | | BH05-20-1 | | | 30 |
| | - trace fine grained gravel below 0.5 m | | | | | 93 | |
| 1 | SAND, trace silt, dark brown, moist | | | | | | |
| | - light greyish brown below 1.1 m | | | BH05-20-2 | | | 550 |
| | | | | | | 73 | |
| 2 | - wet to saturated below 2.0 m | | | BH05-20-3 BH05-20-9 | | | 1210 |
| | - frequent silt layers below 2.3 m | | | | | 80 | |
| 3 | | | | BH05-20-5 | | | 825 |
| | CLAY (TILL), silty, trace medium and coarse grained sand, trace fine grained gravel, silt inclusions, sand inclusions, frequent silt layers, greenish brown | | | BH05-20-4 | | 40 | 150 |
| | - greyish brown below 3.8 m | | | | | | |
| 4 | | | | BH05-20-6 | | 40 | 20 |
| | End of borehole at 4.6 m. | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Road Box
Concrete
Bentonite
Sand
Slough

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-21

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 17
Log Typed By : CDC

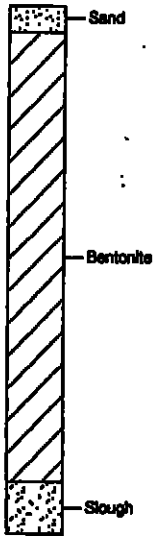
**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval / Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), fine to medium grained sand, fine to coarse grained gravel, brown | | | BH05-21-1<br>BH05-21-5 | | | 85 |
| | SAND, fine grained, trace silt, dark brown to brown, moist | | | | | | |
| 1 | - brown below 1.1 m | | | BH05-21-2 | | 80 | 30 |
| | | | | | | 100 | |
| 2 | CLAY (TILL), silty, trace coarse grained sand, brown, mottled rust brown, firm, medium plasticity, moist | | | BH05-21-3 | | | |
| | - trace fine grained gravel, silt inclusions, sand inclusions, mottled light grey, stiff below 2.3 m | | | | | 73 | |
| 3 | | | | BH05-21-4 | | | |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Soil Vapour (ppm): 1 10, 2 10, 3 10, 4 10

o Reading within indicated scale
● Reading outside indicated scale




**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
*Canadian Pacific Railway*

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-22

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131068
Borehole Logged By : JDT
Date Drilled : 2005 11 17
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) 1 10 2 10 3 10 4 10 |
|---|---|---|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), fine grained sand, fine to coarse grained gravel, trace medium grained sand, dark brown, dry | | | | | | |
| | SAND, fine grained, trace medium grained sand, dark brown, moist | | | BH05-22-1 | | | o 46 |
| | - trace silt, no medium grained sand, brown below 0.8 m | | | | | 83 | |
| 1 | - light brown below 1.2 m | | | BH05-22-2 | | | o 25 |
| | | | | BH05-22-3 | | 87 | o 20 |
| 2 | CLAY (TILL), silty, trace fine to coarse grained gravel, trace medium and coarse grained sand, silt inclusions, brown, mottled light grey, stiff, medium plasticity, moist | | | | | | |
| | | | | BH05-22-4 | | | o 15 |
| 3 | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Bentonite

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-23

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 17
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

Soil Vapour (ppm)
1 10 | 2 10 | 3 10 | 4 10

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND, fine grained, trace silt, trace gravel, trace organics, dark brown, moist<br>- no gravel, no organics below 0.2 m | | | BH05-23-1 | | | o 30 |
| | - brown below 0.5 m | | | | | 83 | |
| 1 | | | | BH05-23-2 | | | o 25 |
| | - clayey from 1.4 m to 1.8 m | | | | | 97 | |
| 2 | CLAY (TILL), silty, trace fine to coarse grained gravel, trace medium and coarse grained sand, mottled rust brown and light grey, stiff, medium plasticity, moist | | | BH05-23-3 | | | e |
| | | | | BH05-23-4 | | | o 18 |
| 3 | End of borehole at 3.0 m. | | | | | | |

Bentonite

Slough

4 5 6 7

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, 09:09 Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-24

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 98.475
Top of Casing Elev. (m) : 99.473

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 17
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)

Solid PVC
Slotted PVC

Well Name: 05-24

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND, fine grained, trace silt, dark brown, dry | | | BH05-24-1 | | | o 60 |
| | - brown below 0.8 m | | | | | 80 | |
| 1 | - greyish brown, moist below 1.1 m | | | BH05-24-2 | | | o 225 |
| | - some silt to silty below 1.5 m | | | BH05-24-3 | | 75 | o 328 |
| 2 | - wet below 2.1 m<br>- saturated, black staining from 2.3 m to 2.5 m | | | BH05-24-4 | | 100 | 770 o |
| | - trace fine grained gravel, brown below 2.5 m | | | | | | |
| | CLAY (TILL), silty, trace organics, trace medium grained sand, silt inclusions, greyish brown, stiff, medium plasticity, moist | | | | | | |
| 3 | - trace fine to coarse grained gravel, trace coarse grained sand, firm to stiff below 3.0 m | | | | | 87 | |
| | | | | BH05-24-5 | | | o 20 |
| | - occasional silt layer, soft, wet below 3.8 m | | | | | | |
| 4 | | | | BH05-24-6 | | | o |
| | End of borehole at 4.6 m. | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Above Ground Casing
Topsoil
Bentonite
Sand
Slough

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-25

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Hollow Stem Auger
Borehole Dia. (m) : 0.18
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 98.115
Top of Casing Elev. (m) : 98.1

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 17
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

Soil Vapour (ppm)

Solid PVC
Slotted PVC

Well Name: 05-25

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval / Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), fine to medium grained sand, fine to coarse grained gravel, trace silt, brown, dry | | | | | | |
| | SAND, fine grained, trace silt, dark brown<br>- light brown below 0.6 m | | | BH05-25-1 | | | 99 |
| | - greyish brown below 0.8 m | | | | | 83 | |
| 1 | | | | BH05-25-2 | | | 999 |
| | - saturated, sheen below 1.5 m<br>- black staining below 1.7 m | | | BH05-25-3 | | 80 | 999 |
| 2 | CLAY (TILL), silty, trace medium and coarse grained sand, trace organics, silt inclusions, greyish brown, mottled rust brown and light grey, stiff, medium plasticity<br>- trace fine to coarse grained gravel, mottled light grey, firm to stiff, wet below 2.3 m | | | BH05-25-4 | | 93 | 50 |
| | | | | BH05-25-5 | | | 35 |
| 3 | | | | | | 95 | |
| | CLAY and SILT, trace medium grained sand, grey, soft, medium plasticity, moist | | | BH05-25-6 | | | 6 |
| 4 | | | | BH05-25-7 | | | 6 |
| | End of borehole at 4.6 m. | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Above Ground Casing
Topsoil
Bentonite
Sand
Slough

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Data Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-26

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 17
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval / Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) | |
|---|---|---|---|---|---|---|---|---|
| 0 | SAND (FILL), fine grained, gravelly, trace silt, black to dark brown | | | | | | | |
| | SAND, *fine grained, trace to some silt, dark brown, moist* | | | BH05-26-1 | | | 20 | |
| | - brown below 0.8 m | | | | | 80 | | |
| 1 | - light brown below 1.2 m | | | BH05-26-2 | | | 10 | |
| | - rust brown below 1.5 m | | | BH05-26-3 | | 60 | 10 | |
| 2 | - wet to saturated below 2.0 m | | | | | | | |
| | - saturated below 2.3 m | | | | | 93 | | |
| | CLAY (TILL), silty, trace medium and coarse grained sand, trace fine grained gravel, silt inclusion, mottled rust brown and light grey, stiff, medium plasticity | | | BH05-26-4 | | | | |
| 3 | End of borehole at 3.0 m. | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |

o Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm): 1 10 2 10 3 10 4 10

Bentonite

Slough

***Notes:***
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Data Approved: 2006 03 20

SNC•LAVALIN Morrow Environmental

Client : Canadian Pacific Railway

Location : Souris Yard, Souris, MB

# Borehole No. : BH05-27

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 98.045
Top of Casing Elev. (m) : 98.96

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 18
Log Typed By : CDC

Drilling Legend: Sample Interval; Split Spoon; Auger Flyte

Water/NAPL Levels: Water Level 1; Water Level 2; NAPL; NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) | Well Name: 05-27 |
|---|---|---|---|---|---|---|---|---|
| 0 | SAND, fine grained, organics, dark brown, loose, moist | | | BH05-27-1 | | | 60 | Above Ground Casing; Topsoil; Bentonite |
| | - trace to some silt, brown below 0.5 m | | | | | 93 | | |
| 1 | - fine to medium grained, trace silt, grey, moist to wet, trace black staining below 1.2 m | | | BH05-27-2 | | | 110 | |
| | - no recovery in split spoon from 1.5 m to 2.3 m | | | | | | | |
| | - saturated, sheen, black staining below 1.7 m | | | BH05-27-3 BH05-27-7 | | | 600 | |
| 2 | CLAY (TILL), silty, trace coarse grained sand, greenish brown, mottled rust brown, soft, medium plasticity, wet | | | | | 50 | | |
| | | | | BH05-27-4 | | | 35 | Sand |
| 3 | SILT and CLAY, trace organics, greyish brown, soft, medium plasticity, moist | | | | | 75 | | |
| | | | | BH05-27-5 | | | 30 | |
| 4 | | | | BH05-27-6 | | | 20 | |
| | End of borehole at 4.6 m. | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |

Soil Vapour (ppm): 1 10, 2 10, 3 10, 4 10

o Reading within indicated scale
● Reading outside indicated scale

Solid PVC
Slotted PVC

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Data Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-28

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Hollow Stem Auger
Borehole Dia. (m) : 0.18

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 18
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- *Split Spoon*
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval / Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) | |
|---|---|---|---|---|---|---|---|---|
| 0 | SAND, fine grained, organics, trace silt, dark brown, moist | | | BH05-28-1 | | | 6 | Sand |
| | - some silt, light brown below 0.5 m | | | | | | | |
| | - trace silt, brown, mottled rust brown below 0.8 m | | | | | 100 | | |
| 1 | | | | BH05-28-2 | | | 35 | Bentonite |
| | - saturated below 1.5 m | | | BH05-28-3 | | 83 | 280 | |
| | - split spoon refusal at 1.8 m | | | BH05-28-4 | | | 60 | Slough |
| 2 | | | | | | 100 | | |
| | CLAY (TILL), silty, trace medium and coarse grained sand, trace organics, silt inclusions, mottled rust brown and light grey, stiff, medium plasticity, moist | | | BH05-28-5 | | | 15 | Bentonite |
| 3 | End of borehole at 3.0 m. | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |

Soil Vapour (ppm): 1 10 2 10 3 10 4 10

o Reading within indicated scale
e Reading outside indicated scale

**Notes:**
Solded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN Morrow Environmental

Client : Canadian Pacific Railway

Location : Souris Yard, Souris, MB

# Borehole No. : BH05-29

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.657
Top of Casing Elev. (m) : 99.517

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 18
Log Typed By : CDC

Drilling Legend: Sample Interval; Split Spoon; Auger Flyte

Water/NAPL Levels: Water Level 1; Water Level 2; NAPL; NAPL

Reading within indicated scale
Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name: 05-29

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) | Well |
|---|---|---|---|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), fine to medium grained sand, fine to coarse grained gravel, brown | | | | | | | Road Box; Concrete |
| | SAND, fine grained, trace silt, dark brown, moist | | | BH05-29-1 | | | 50 | |
| | - greenish light brown below 0.5 m | | | | | 80 | | |
| 1 | - greyish brown below 0.8 m | | | BH05-29-2 | | | 105 | Bentonite |
| | - dark brown at 1.3 m | | | | | 87 | | |
| 2 | CLAY (TILL), silty, trace medium and coarse grained sand, trace fine grained gravel, mottled light grey and brown, stiff, medium plasticity, moist | | | BH05-29-3 | | | 1320 | |
| | - trace grey staining from 2.0 m to 2.3 m | | | | | | | |
| | - sand seams, very stiff below 2.3 m | | | BH05-29-4 BH05-29-5 | | | 1870 | Sand |
| 3 | - trace fine to coarse grained gravel, trace organics, brown, mottled light grey below 3.4 m | | | BH05-29-6 | | 73 | 35 | |
| 4 | SILT and CLAY (TILL), trace fine grained gravel, trace medium and coarse grained sand, greyish brown, mottled light grey, firm, medium plasticity, wet | | | BH05-29-8 | | 73 | 25 | |
| | End of borehole at 4.6 m. | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
*Souris Yard, Souris, MB*

# Borehole No. : BH05-30

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.474
Top of Casing Elev. (m) : 100.389

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 18
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

Soil Vapour (ppm)
1 10 | 2 10 | 3 10 | 4 10

Solid PVC
Slotted PVC

Well Name: 05-30

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery |
|---|---|---|---|---|---|---|
| 0 | SAND (FILL), fine to medium grained, cinders, trace fine grained gravel, trace organics, black, moist | | | BH05-30-1 | | |
| | SAND, fine grained, trace silt, dark brown, dense to very dense, moist | | | | | 57 |
| 1 | - light brown below 0.6 m | | | BH05-30-2 | | |
| | - wet, grey and black staining below 1.4 m | | | BH05-30-3 | | 100 |
| 2 | CLAY (TILL), silty, trace fine to coarse grained gravel, trace medium and coarse grained sand, sand seams, grey, stiff, low to medium plasticity | | | BH05-30-4 | | |
| | - some medium and coarse grained sand, sand inclusions, silt inclusions, brownish grey below 2.3 m | | | | | 83 |
| 3 | - silt seams, brown below 3.0 m | | | BH05-30-5 | | |
| | | | | BH05-30-6 | | 80 |
| 4 | | | | | | 100 |
| | CLAY and SILT (TILL), trace fine grained gravel, trace medium grained sand, brown, firm, moist | | | BH05-30-7 | | |
| | End of borehole at 4.6 m. | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |

| Soil Vapour (ppm) | |
|---|---|
| BH05-30-1 | 35 |
| BH05-30-2 | 10 |
| BH05-30-3 | 350 |
| BH05-30-4 | 3830 |
| BH05-30-5 | 3820 |
| BH05-30-6 | 30 |
| BH05-30-7 | 20 |

Above Ground Casing
Topsoil
Bentonite
Sand

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC•LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-31

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.444
Top of Casing Elev. (m) : 100.334

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 21
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Soil Description

Stratigraphy Plot | Sample Interval / Core Run | Sample Number | Blow Count | % Recovery

o Reading within indicated scale
● Reading outside indicated scale

Soil Vapour (ppm)
1 10 | 2 10 | 3 10 | 4 10

Solid PVC
Slotted PVC

Well Name: 05-31

| Depth in Metres | Soil Description | Sample Number | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), medium grained sand, fine to coarse grained gravel, brown, loose | | | |
| | SAND, fine grained, trace silt, dark brown, moist<br>- light brown below 0.8 m | BH05-31-1 | | o 60 |
| 1 | | BH05-31-2 | 80 | o 60 |
| | CLAY (TILL), silty, trace medium and coarse grained sand, trace fine and coarse grained gravel, trace organics, brown, mottled rust brown and light grey, stiff, medium plasticity, moist<br>- silt inclusions, sand inclusions below 1.5 m | BH05-31-3 | 73 | o 40 |
| 2 | - sand partings, trace fine grained sand below 2.3 m | BH05-31-4 | 97 | o 25 |
| 3 | - silt seams and layers below 3.0 m | BH05-31-5 | 100 | o 25 |
| 4 | | BH05-31-6 | 100 | o 20 |
| | End of borehole at 4.6 m. | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

Above Ground Casing
Topsoil
Bentonite
Sand

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC•LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-32

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.436
Top of Casing Elev. (m) : 100.234

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 21
Log Typed By : CDC

**Drilling Legend**
- Sample Interval
- Split Spoon
- Auger Flyte

**Water/NAPL Levels**
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name: 05-32

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), fine to medium grained sand, fine to coarse grained gravel, brown | | | | | | |
| | SAND, fine grained, trace silt, greyish brown, moist | | | BH05-32-1 | | | o 160 |
| 1 | | | | BH05-32-2 | | 80 | o 525 |
| | CLAY (TILL), silty, trace fine grained gravel, trace medium and coarse grained sand, sand partings and seams, silt inclusions, greyish brown, stiff, medium plasticity, moist | | | BH05-32-3<br>BH05-32-10 | | | o 6710 |
| 2 | | | | BH05-32-4<br>BH05-32-11 | | 83 | o 2080 |
| | | | | BH05-32-5 | | 40 | o 320 |
| 3 | - brown below 3.0 m<br>- split spoon refusal at 3.0 m | | | BH05-32-7 | | | o 25 |
| 4 | - silt layers, firm below 4.3 m | | | BH05-32-8 | | 100 | o 16 |
| | End of borehole at 4.6 m. | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Above Ground Casing
Topsoil
Bentonite
Sand

**Notes:**
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Data Approved: 2006 03 20

SNC·LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-33

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.466
Top of Casing Elev. (m) : 100.326

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 21
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

Reading within indicated scale
Reading outside indicated scale

Soil Vapour (ppm)

Solid PVC
Slotted PVC

Well Name: 05-33

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), medium grained sand, fine to coarse grained gravel, cinders, trace silt, dark brown<br>- brown below 0.9 m | | | BH05-33-1 | | | 80 |
| 1 | SAND, fine grained, trace silt, brown<br>- greyish brown below 0.7 m | | | BH05-33-2 | | 87 | 200 |
| | | | | BH05-33-3 | | | 1870 |
| 2 | CLAY (TILL), silty, trace fine to coarse grained gravel, trace fine and medium grained sand, silt inclusions, greyish brown, stiff to very stiff, medium plasticity | | | BH05-33-5 | | 77 | 8030 |
| | | | | BH05-33-4 | | | 4020 |
| | - sand partings, sand inclusions below 2.3 m | | | BH05-33-6 | | 90 | 1540 |
| 3 | - split spoon refusal at 2.8 m<br>- silt partings, brown, mottled light grey below 3.0 m | | | BH05-33-7 | | 100 | 145 |
| 4 | - frequent silt layers below 3.8 m | | | BH05-33-8 | | 100 | 20 |
| | End of borehole at 4.6 m. | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Above Ground Casing
Topsoil
Bentonite
Sand

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20; Date Approved: 2006 03 20

SNC•LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-34

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13
Pipe/Slotted Pipe Dia. (m): 0.05

Date Monitored : 2005 12 12
Ground Surf Elev. (m) : 99.595
Top of Casing Elev. (m) : 100.456

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 21
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

o Reading within indicated scale
e Reading outside indicated scale

Solid PVC
Slotted PVC

Well Name: 05-34

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) |
|---|---|---|---|---|---|---|---|
| 0 | SAND and GRAVEL (FILL), medium grained sand, fine to coarse grained gravel, brown<br>- cinders, black below 0.9 m | | | | | | |
| | SAND, trace silt, dark brown, moist<br>- brown below 0.5 m | | | BH05-34-1 | | | 60 |
| 1 | | | | | 90 | | |
| | | | | BH05-34-2 | | | 70 |
| | - dark brown to grey below 1.4 m<br>- wet, black staining below 1.5 m | | | BH05-34-4 | 73 | | 1650 |
| 2 | CLAY (TILL), silty, some fine grained sand, trace fine to coarse grained gravel, trace medium and coarse grained sand, trace organics, sand seams, grey, stiff, medium plasticity, moist | | | BH05-34-5 | | | 7280 |
| | | | | BH05-34-6 | 80 | | 5720 |
| | | | | BH05-34-6 | | | 1570 |
| 3 | - sand inclusions, brown, mottled grey below 3.0 m | | | | 100 | | |
| | | | | BH05-34-7 | | | 25 |
| 4 | | | | | 80 | | |
| | - occasional silt layer below 4.4 m | | | BH05-34-8 | | | 10 |
| | End of borehole at 4.6 m. | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Soil Vapour (ppm): 10^1, 10^2, 10^3, 10^4

Above Ground Casing
Topsoil
Bentonite
Sand

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

SNC•LAVALIN
Morrow Environmental

Client :
Canadian Pacific Railway

Location :
Souris Yard, Souris, MB

# Borehole No. : BH05-35

(Page 1 of 1)

Drilling Contractor: Maple Leaf Drilling
Drilling Method : Solid Stem Auger
Borehole Dia. (m) : 0.13

Project Number : 131066
Borehole Logged By : JDT
Date Drilled : 2005 11 21
Log Typed By : CDC

Drilling Legend
- Sample Interval
- Split Spoon
- Auger Flyte

Water/NAPL Levels
- Water Level 1
- Water Level 2
- NAPL
- NAPL

| Depth in Metres | Soil Description | Stratigraphy Plot | Sample Interval/ Core Run | Sample Number | Blow Count | % Recovery | Soil Vapour (ppm) o Reading within indicated scale • Reading outside indicated scale |
|---|---|---|---|---|---|---|---|
| 0 | SAND, fine grained, organics, trace silt, trace fine grained gravel, dark brown, moist | | | | | | |
| | - light brown, mottled rust brown below 0.6 m | | | BH05-35-1 | | 80 | o 40 |
| 1 | - trace fine grained gravel, wet below 1.4 m | | | BH05-35-2 | | 87 | o 30 |
| 2 | CLAY (TILL), silty, trace fine grained gravel, silt inclusions, sand inclusions, brown, mottled light grey, stiff to very stiff, medium plasticity, moist | | | BH05-35-3 | | 87 | o 25 |
| 3 | | | | BH05-35-4 | | | o 20 |
| | End of borehole at 3.0 m. | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

Soil Vapour (ppm): 1 10, 2 10, 3 10, 4 10

Bentonite

Notes:
Bolded sample denotes sample analysed.

Print Date: 2006 03 20, Date Approved: 2006 03 20

# APPENDIX III

## Laboratory Results

Maxxam Analytics Inc

Your Project #: MA5B7882
Site: MORROW ENVIRONMENTAL CONSULTAN

**Attention: SUB CONTRACTOR**
MAXXAM ANALYTICS INC.
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

RECEIVED
JAN - 6 2006
MORROW ENVIRONMENTAL
WINNIPEG

COC Report Date: 2005/11/25

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: A549575**
**Received: 2005/11/22, 9:40**

Sample Matrix: Soil
# Samples Received: 3

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| Particle Size by Wet Sieve (75 micron) | 3 | 2005/11/25 | 2005/11/25 | CAL SOP# 0104 | GRAVIMETRIC |

**Validated by :**
RON VENZI

Total cover pages: 1

Maxxam Analytics Inc

Maxxam Job #: A549575
Report Date: 2005/11/25

MAXXAM ANALYTICS INC.
Client Project #: MA5B7882
Site Reference: MORROW ENVIRONMENTAL CONSULTAN
Sampler Initials:

## RESULTS OF CHEMICAL ANALYSES OF SOIL

| Maxxam ID | | 996113 | 996121 | 996122 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | | | | | |
| | Units | BH05-6-5-051115 (J48456-01) | BH05-6-3-051115 (J48457-01) | BH05-6-7-051115 (J49747-01) | RDL | QC Batch |
| **Physical Properties** | | | | | | |
| Sieve - #200 (>0.075mm -TS) | % | 19 | 32 | 8.2 | 0.01 | 972028 |
| Sieve - Pan | % | 81 | 68 | 92 | 0.01 | 972028 |
| Grain Size | % | FINE | FINE | FINE | N/A | 972028 |

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Analytics Inc

Maxxam Job #: A549575
Report Date: 2005/11/25

MAXXAM ANALYTICS INC.
Client Project #: MA5B7882
Site Reference: MORROW ENVIRONMENTAL CONSULTAN
Sampler Initials:

**General Comments**

Results relate only to the items tested.

Maxxam Analytics Inc

MAXXAM ANALYTICS INC.
Attention: SUB CONTRACTOR
Client Project #: MA5B7882
P.O. #:
Site Reference: MORROW ENVIRONMENTAL CONSULTAN

## Quality Assurance Report

Maxxam Job Number: CA549575

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 972028 DC | QC STANDARD | Sieve - #200 (>0.075mm -TS) | 2005/11/25 | | 104 | % | 76 - 124 |
| | | Sieve - Pan | 2005/11/25 | | 98 | % | 85 - 115 |
| | RPD | Sieve - #200 (>0.075mm) | 2005/11/25 | 0.4 | | % | 40 |
| | | Sieve - Pan | 2005/11/25 | 0.5 | | % | 40 |
| | | Grain Size | 2005/11/25 | NC | | % | 40 |

NC = Non-calculable
RPD = Relative Percent Difference

Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone(403) 291-3077 FAX(403) 291-9468

Maxxam Analytics Inc

Your Project #: MA5B8221
Site: CP RAIL C/O DILLION CONSULTING

**Attention: SUB CONTRACTOR**
MAXXAM ANALYTICS INC.
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

**Report Date: 2005/11/25**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: A549708**
**Received: 2005/11/23, 9:30**

Sample Matrix: Soil
# Samples Received: 2

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| Particle Size by Wet Sieve (75 micron) | 2 | 2005/11/25 | 2005/11/25 | CAL SOP# 0104 | GRAVIMETRIC |

Validated by : _____
LILI ZHOU

Total cover pages: 1

Maxxam Analytics Inc

Maxxam Job #: A549708
Report Date: 2005/11/25

MAXXAM ANALYTICS INC.
Client Project #: MA5B8221
Site Reference: CP RAIL C/O DILLION CONSULTING
*Sampler Initials:*

## RESULTS OF CHEMICAL ANALYSES OF SOIL

| Maxxam ID | | 996736 | 996738 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 | 2005/11/16 | | |
| | Units | BH05-20-2-051116 (J50404-01) | BH05-20-3-051116 (J50405-01) | RDL | QC Batch |
| **Physical Properties** | | | | | |
| Sieve - #200 (>0.075mm -TS) | % | 89 | 78 | 0.01 | 971835 |
| Sieve - Pan | % | 11 | 22 | 0.01 | 971835 |
| Grain Size | % | COARSE | COARSE | N/A | 971835 |

N/A = Not Applicable
RDL = Reportable Detection Limit

Maxxam Analytics Inc

Maxxam Job #: A549708
Report Date: 2005/11/25

MAXXAM ANALYTICS INC.
Client Project #: MA5B8221
Site Reference: CP RAIL C/O DILLION CONSULTING
Sampler Initials:

**General Comments**

**Results relate only to the items tested.**

Maxxam Analytics Inc

MAXXAM ANALYTICS INC.
Attention: SUB CONTRACTOR
Client Project #: MA5B8221
P.O. #:
Site Reference: CP RAIL C/O DILLION CONSULTING

## Quality Assurance Report

Maxxam Job Number: CA549708

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 971835 DC | QC STANDARD | Sieve - #200 (>0.075mm -TS) | 2005/11/25 | | 120 | % | 76 - 124 |
| | | Sieve - Pan | 2005/11/25 | | 89 | % | 85 - 115 |
| | RPD [998736-01] | Sieve - #200 (>0.075mm -TS) | 2005/11/25 | 1.3 | | % | 40 |
| | | Sieve - Pan | 2005/11/25 | 10.4 | | % | 40 |
| | | Grain Size | 2005/11/25 | NC | | % | 40 |

NC = Non-calculable
RPD = Relative Percent Difference

Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone(403) 291-3077 FAX(403) 291-9468

Your P.O. #: EA780
Your Project #: W053011A (CP SOURIS YARD)
Site: SOURIS, MB
Your C.O.C. #: 347605

**Attention: Andrew Eason**
Morrow Environmental
1420 Clarence Ave
Unit E
Winnipeg, MB
CANADA R3T 1T6



Report Date: 2005/11/29

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: A5B7882**
**Received: 2005/11/18, 14:37**

Sample Matrix: Soil
# Samples Received: 13

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Method Reference |
|---|---|---|---|---|---|
| Petroleum Hydro. CCME FI & BTEX in Soil | 10 | 2005/11/23 | 2005/11/23 | Ont SOP-0816 | CCME CWS |
| Petroleum Hydrocarbons F2-F4 in Soil | 10 | 2005/11/23 | 2005/11/23 | Ont SOP-0817 | CCME CWS |
| Total Metals Analysis by ICP | 13 | 2005/11/22 | 2005/11/22 | Ont SOP 0072 | EPA 6010 |
| MOISTURE | 13 | N/A | 2005/11/20 | Ont SOP-0114 | MOE HANDBOOK(1983 |
| PAH Compounds in Soil by GC/MS (SIM) | 7 | 2005/11/21 | 2005/11/22 | EPA 8270 | GC/MS |
| PAH Compounds in Soil by GC/MS (SIM) | 3 | 2005/11/21 | 2005/11/23 | EPA 8270 | GC/MS |

MAXXAM ANALYTICS INC.

BRAD NEWMAN
Scientific Services

BNE/iva
encl.

Total cover pages: 1

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J48443 | J48447 | J48448 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/14 15:17 | 2005/11/14 12:47 | 2005/11/15 08:34 | | |
| COC Number | | 347605 | 347605 | 347605 | | |
| | Units | BH05-6-2-051114 | BH05-1-1-051114 | BH05-6-2-051115 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/g | ND | ND | ND | 0.02 | 871277 |
| Toluene | ug/g | 0.03 | ND | ND | 0.02 | 871277 |
| Ethylbenzene | ug/g | ND | ND | ND | 0.02 | 871277 |
| o-Xylene | ug/g | ND | ND | ND | 0.02 | 871277 |
| p+m-Xylene | ug/g | ND | ND | ND | 0.04 | 871277 |
| Total Xylenes | ug/g | ND | ND | ND | 0.04 | 871277 |
| F1 (C6-C10) | ug/g | ND | ND | ND | 10 | 871277 |
| F1 (C6-C10) - BTEX | ug/g | ND | ND | ND | 10 | 871277 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | ND | ND | ND | 10 | 871310 |
| F3 (C16-C34 Hydrocarbons) | ug/g | 130 | ND | ND | 10 | 871310 |
| F4 (C34-C50 Hydrocarbons) | ug/g | 24 | ND | ND | 10 | 871310 |
| Reached Baseline at C50 | ug/g | YES | YES | YES | | 871310 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 102 | 104 | 104 | | 871277 |
| 4-Bromofluorobenzene | % | 97 | 98 | 97 | | 871277 |
| D10-Ethylbenzene | % | 95 | 102 | 98 | | 871277 |
| D4-1,2-Dichloroethane | % | 96 | 96 | 96 | | 871277 |
| o-Terphenyl | % | 114 | 128 | 122 | | 871310 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J48449 | J48450 | J48451 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/15 16:42 | 2005/11/15 15:46 | 2005/11/15 15:09 | | |
| COC Number | | 347605 | 347605 | 347605 | | |
| | Units | BH05-12-1-051115 | BH05-11-1-051115 | BH05-10-1-051115 | RDL | QC Batch |
| F1 PHC and BTEX | | | | | | |
| Benzene | ug/g | ND | 0.08 | ND | 0.02 | 871277 |
| Toluene | ug/g | 0.03 | 0.51 | ND | 0.02 | 871277 |
| Ethylbenzene | ug/g | ND | 0.09 | ND | 0.02 | 871277 |
| o-Xylene | ug/g | ND | 0.41 | ND | 0.02 | 871277 |
| p+m-Xylene | ug/g | ND | 0.68 | ND | 0.04 | 871277 |
| Total Xylenes | ug/g | ND | 1.1 | ND | 0.04 | 871277 |
| F1 (C6-C10) | ug/g | ND | 15 | ND | 10 | 871277 |
| F1 (C6-C10) - BTEX | ug/g | ND | 14 | ND | 10 | 871277 |
| F2-F4 PHC | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | ND | 23 | ND | 10 | 871310 |
| F3 (C16-C34 Hydrocarbons) | ug/g | ND | 64 | ND | 10 | 871310 |
| F4 (C34-C50 Hydrocarbons) | ug/g | ND | ND | ND | 10 | 871310 |
| Reached Baseline at C50 | ug/g | YES | YES | YES | | 871310 |
| Surrogate Recovery (%) | | | | | | |
| 1,4-Difluorobenzene | % | 104 | 104 | 104 | | 871277 |
| 4-Bromofluorobenzene | % | 98 | 99 | 97 | | 871277 |
| D10-Ethylbenzene | % | 103 | 94 | 105 | | 871277 |
| D4-1,2-Dichloroethane | % | 96 | 95 | 94 | | 871277 |
| o-Terphenyl | % | 120 | 122 | 115 | | 871310 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J48452 | J48453 | J48454 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/15 13:30 | 2005/11/15 13:40 | 2005/11/15 11:02 | | |
| COC Number | | 347605 | 347605 | 347605 | | |
| | Units | BH05-9-2-051115 | BH05-9-9-051115 | BH05-8-2-051115 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/g | ND | ND | ND | 0.02 | 871277 |
| Toluene | ug/g | ND | ND | ND | 0.02 | 871277 |
| Ethylbenzene | ug/g | ND | ND | ND | 0.02 | 871277 |
| o-Xylene | ug/g | ND | ND | ND | 0.02 | 871277 |
| p+m-Xylene | ug/g | ND | ND | ND | 0.04 | 871277 |
| Total Xylenes | ug/g | ND | ND | ND | 0.04 | 871277 |
| F1 (C6-C10) | ug/g | ND | ND | ND | 10 | 871277 |
| F1 (C6-C10) - BTEX | ug/g | ND | ND | ND | 10 | 871277 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | ND | ND | ND | 10 | 871310 |
| F3 (C16-C34 Hydrocarbons) | ug/g | ND | ND | ND | 10 | 871310 |
| F4 (C34-C50 Hydrocarbons) | ug/g | ND | ND | ND | 10 | 871310 |
| Reached Baseline at C50 | ug/g | YES | YES | YES | | 871310 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 103 | 103 | 103 | | 871277 |
| 4-Bromofluorobenzene | % | 97 | 97 | 97 | | 871277 |
| D10-Ethylbenzene | % | 92 | 94 | 97 | | 871277 |
| D4-1,2-Dichloroethane | % | 96 | 96 | 96 | | 871277 |
| o-Terphenyl | % | 125 | 127 | 119 | | 871310 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J48455 | | |
|---|---|---|---|---|
| Sampling Date | | 2005/11/15 10:12 | | |
| COC Number | | 347605 | | |
| | Units | BH05-7-3-051116 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | |
| Benzene | ug/g | ND | 0.02 | 871277 |
| Toluene | ug/g | ND | 0.02 | 871277 |
| Ethylbenzene | ug/g | ND | 0.02 | 871277 |
| o-Xylene | ug/g | ND | 0.02 | 871277 |
| p+m-Xylene | ug/g | ND | 0.04 | 871277 |
| Total Xylenes | ug/g | ND | 0.04 | 871277 |
| F1 (C6-C10) | ug/g | ND | 10 | 871277 |
| F1 (C6-C10) - BTEX | ug/g | ND | 10 | 871277 |
| **F2-F4 PHC** | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | ND | 10 | 871310 |
| F3 (C16-C34 Hydrocarbons) | ug/g | ND | 10 | 871310 |
| F4 (C34-C50 Hydrocarbons) | ug/g | ND | 10 | 871310 |
| Reached Baseline at C50 | ug/g | YES | | 871310 |
| **Surrogate Recovery (%)** | | | | |
| 1,4-Difluorobenzene | % | 103 | | 871277 |
| 4-Bromofluorobenzene | % | 97 | | 871277 |
| D10-Ethylbenzene | % | 99 | | 871277 |
| D4-1,2-Dichloroethane | % | 95 | | 871277 |
| o-Terphenyl | % | 103 | | 871310 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



140 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## RESULTS OF ANALYSES OF SOIL

| Maxxam ID | | J48443 | J48444 | J48445 | J48446 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/14 15:17 | 2005/11/14 14:32 | 2005/11/15 14:05 | 2005/11/14 13:25 | | |
| COC Number | | 347605 | 347605 | 347605 | 347605 | | |
| | Units | BH05-5-2-051114 | BH05-4-2-051114 | BH05-3-2-051114 | BH05-2-1-051114 | RDL | QC Batch |
| INORGANICS | | | | | | | |
| Moisture | % | 20 | 19 | 12 | 11 | 0.2 | 869151 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

| Maxxam ID | | J48447 | J48448 | J48449 | J48450 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/14 12:47 | 2005/11/15 08:34 | 2005/11/15 16:42 | 2005/11/15 15:46 | | |
| COC Number | | 347605 | 347605 | 347605 | 347605 | | |
| | Units | BH05-1-1-051114 | BH05-6-2-051115 | BH05-12-1-051115 | BH05-11-1-051115 | RDL | QC Batch |
| INORGANICS | | | | | | | |
| Moisture | % | 12 | 21 | 13 | 14 | 0.2 | 869151 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

| Maxxam ID | | J48451 | J48452 | J48453 | J48454 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/15 15:09 | 2005/11/15 13:30 | 2005/11/15 13:40 | 2005/11/15 11:02 | | |
| COC Number | | 347605 | 347605 | 347605 | 347605 | | |
| | Units | BH05-10-1-051115 | BH05-9-2-051115 | BH05-9-9-051115 | BH05-8-2-051115 | RDL | QC Batch |
| INORGANICS | | | | | | | |
| Moisture | % | 14 | 11 | 12 | 17 | 0.2 | 869151 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## RESULTS OF ANALYSES OF SOIL

| Maxxam ID | | J48455 | | |
|---|---|---|---|---|
| Sampling Date | | 2005/11/15 10:12 | | |
| COC Number | | 347605 | | |
| | Units | BH05-7-3-051115 | RDL | QC Batch |
| INORGANICS | | | | |
| Moisture | % | 21 | 0.2 | 869151 |

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J48443 | J48444 | J48445 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/14 15:17 | 2005/11/14 14:32 | 2005/11/15 14:05 | | |
| COC Number | | 347605 | 347605 | 347605 | | |
| | Units | BH05-5-2-051114 | BH05-4-2-051114 | BH05-3-2-051114 | RDL | QC Batch |
| **METALS** | | | | | | |
| Total Aluminum (Al) | ug/g | 3200 | 8700 | 2400 | 50 | 870262 |
| Total Barium (Ba) | ug/g | 120 | 240 | 47 | 2 | 870262 |
| Total Beryllium (Be) | ug/g | ND | 0.7 | ND | 0.5 | 870262 |
| Total Cadmium (Cd) | ug/g | ND | 0.6 | ND | 0.5 | 870262 |
| Total Calcium (Ca) | ug/g | 25000 | 60000 | 12000 | 50 | 870262 |
| Total Chromium (Cr) | ug/g | 8 | 17 | 6 | 1 | 870262 |
| Total Cobalt (Co) | ug/g | 3 | 11 | 2 | 2 | 870262 |
| Total Copper (Cu) | ug/g | 12 | 23 | 3 | 2 | 870262 |
| Total Iron (Fe) | ug/g | 8300 | 19000 | 6500 | 50 | 870262 |
| Total Lead (Pb) | ug/g | 19 | 11 | ND | 5 | 870262 |
| Total Magnesium (Mg) | ug/g | 6000 | 17000 | 2700 | 50 | 870262 |
| Total Manganese (Mn) | ug/g | 210 | 670 | 210 | 1 | 870262 |
| Total Molybdenum (Mo) | ug/g | ND | ND | ND | 2 | 870262 |
| Total Nickel (Ni) | ug/g | 8 | 30 | 6 | 5 | 870262 |
| Total Phosphorus (P) | ug/g | 510 | 490 | 430 | 20 | 870262 |
| Total Potassium (K) | ug/g | 700 | 1600 | 640 | 200 | 870262 |
| Total Silver (Ag) | ug/g | ND | ND | ND | 1 | 870262 |
| Total Sodium (Na) | ug/g | 130 | 490 | ND | 100 | 870262 |
| Total Strontium (Sr) | ug/g | 41 | 53 | 16 | 1 | 870262 |
| Total Sulphur (S) | ug/g | 240 | 120 | 84 | 50 | 870262 |
| Total Tin (Sn) | ug/g | ND | ND | ND | 20 | 870262 |
| Total Vanadium (V) | ug/g | 14 | 38 | 12 | 5 | 870262 |
| Total Zinc (Zn) | ug/g | 48 | 55 | 19 | 5 | 870262 |

ND = Not detected
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QC Batch = Quality Control Batch



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Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J48446 | | J48447 | J48448 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/14 13:25 | | 2005/11/14 12:47 | 2005/11/15 08:34 | | |
| COC Number | | 347605 | | 347605 | 347605 | | |
| | Units | BH05-2-1-051114 | QC Batch | BH05-1-1-051114 | BH05-6-2-051115 | RDL | QC Batch |
| **METALS** | | | | | | | |
| Total Aluminum (Al) | ug/g | 4800 | 870252 | 7100 | 9600 | 50 | 870262 |
| Total Barium (Ba) | ug/g | 81 | 870252 | 140 | 150 | 2 | 870262 |
| Total Beryllium (Be) | ug/g | ND | 870252 | 0.5 | 0.7 | 0.5 | 870262 |
| Total Cadmium (Cd) | ug/g | ND | 870252 | ND | 0.5 | 0.5 | 870262 |
| Total Calcium (Ca) | ug/g | 10000 | 870252 | 42000 | 52000 | 50 | 870262 |
| Total Chromium (Cr) | ug/g | 10 | 870252 | 15 | 19 | 1 | 870262 |
| Total Cobalt (Co) | ug/g | 5 | 870252 | 7 | 7 | 2 | 870262 |
| Total Copper (Cu) | ug/g | 9 | 870252 | 16 | 24 | 2 | 870262 |
| Total Iron (Fe) | ug/g | 11000 | 870252 | 15000 | 21000 | 50 | 870262 |
| Total Lead (Pb) | ug/g | 5 | 870252 | 8 | 10 | 5 | 870262 |
| Total Magnesium (Mg) | ug/g | 3500 | 870252 | 12000 | 17000 | 50 | 870262 |
| Total Manganese (Mn) | ug/g | 350 | 870252 | 470 | 330 | 1 | 870262 |
| Total Molybdenum (Mo) | ug/g | ND | 870252 | ND | ND | 2 | 870262 |
| Total Nickel (Ni) | ug/g | 13 | 870252 | 21 | 20 | 5 | 870262 |
| Total Phosphorus (P) | ug/g | 530 | 870252 | 550 | 500 | 20 | 870262 |
| Total Potassium (K) | ug/g | 1100 | 870252 | 1500 | 1800 | 200 | 870262 |
| Total Silver (Ag) | ug/g | ND | 870252 | ND | ND | 1 | 870262 |
| Total Sodium (Na) | ug/g | ND | 870252 | 130 | 190 | 100 | 870262 |
| Total Strontium (Sr) | ug/g | 19 | 870252 | 38 | 48 | 1 | 870262 |
| Total Sulphur (S) | ug/g | 190 | 870252 | 110 | 84 | 50 | 870262 |
| Total Tin (Sn) | ug/g | ND | 870252 | ND | ND | 20 | 870262 |
| Total Vanadium (V) | ug/g | 21 | 870252 | 31 | 43 | 5 | 870262 |
| Total Zinc (Zn) | ug/g | 30 | 870252 | 43 | 58 | 5 | 870262 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



140 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J48449 | | J48450 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/15 16:42 | | 2005/11/15 15:46 | | |
| COC Number | | 347605 | | 347605 | | |
| | Units | BH05-12-1-051115 | QC Batch | BH05-11-1-051115 | RDL | QC Batch |
| **METALS** | | | | | | |
| Total Aluminum (Al) | ug/g | 3400 | 870252 | 3100 | 50 | 870262 |
| Total Barium (Ba) | ug/g | 76 | 870252 | 100 | 2 | 870262 |
| Total Beryllium (Be) | ug/g | ND | 870252 | ND | 0.5 | 870262 |
| Total Cadmium (Cd) | ug/g | ND | 870252 | ND | 0.5 | 870262 |
| Total Calcium (Ca) | ug/g | 23000 | 870252 | 14000 | 50 | 870262 |
| Total Chromium (Cr) | ug/g | 8 | 870252 | 7 | 1 | 870262 |
| Total Cobalt (Co) | ug/g | 3 | 870252 | 5 | 2 | 870262 |
| Total Copper (Cu) | ug/g | 5 | 870252 | 28 | 2 | 870262 |
| Total Iron (Fe) | ug/g | 8600 | 870252 | 16000 | 50 | 870262 |
| Total Lead (Pb) | ug/g | 6 | 870252 | 61 | 5 | 870262 |
| Total Magnesium (Mg) | ug/g | 3900 | 870252 | 2700 | 50 | 870262 |
| Total Manganese (Mn) | ug/g | 300 | 870252 | 110 | 1 | 870262 |
| Total Molybdenum (Mo) | ug/g | ND | 870252 | ND | 2 | 870262 |
| Total Nickel (Ni) | ug/g | 8 | 870252 | 12 | 5 | 870262 |
| Total Phosphorus (P) | ug/g | 510 | 870252 | 460 | 20 | 870262 |
| Total Potassium (K) | ug/g | 720 | 870252 | 630 | 200 | 870262 |
| Total Silver (Ag) | ug/g | ND | 870252 | ND | 1 | 870262 |
| Total Sodium (Na) | ug/g | ND | 870252 | 200 | 100 | 870262 |
| Total Strontium (Sr) | ug/g | 23 | 870252 | 83 | 1 | 870262 |
| Total Sulphur (S) | ug/g | 120 | 870252 | 750 | 50 | 870262 |
| Total Tin (Sn) | ug/g | ND | 870252 | ND | 20 | 870262 |
| Total Vanadium (V) | ug/g | 15 | 870252 | 15 | 5 | 870262 |
| Total Zinc (Zn) | ug/g | 25 | 870252 | 27 | 5 | 870262 |

ND = Not detected
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QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J48451 | J48452 | | J48453 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/15 15:09 | 2005/11/15 13:30 | | 2005/11/15 13:40 | | |
| COC Number | | 347605 | 347605 | | 347605 | | |
| | Units | BH05-10-1-051115 | BH05-9-2-051115 | QC Batch | BH05-9-9-051115 | RDL | QC Batch |
| **METALS** | | | | | | | |
| Total Aluminum (Al) | ug/g | 2500 | 1800 | 870252 | 1900 | 50 | 870262 |
| Total Barium (Ba) | ug/g | 54 | 22 | 870252 | 26 | 2 | 870262 |
| Total Beryllium (Be) | ug/g | ND | ND | 870252 | ND | 0.5 | 870262 |
| Total Cadmium (Cd) | ug/g | ND | ND | 870252 | ND | 0.5 | 870262 |
| Total Calcium (Ca) | ug/g | 7500 | 2200 | 870252 | 3200 | 50 | 870262 |
| Total Chromium (Cr) | ug/g | 6 | 5 | 870252 | 5 | 1 | 870262 |
| Total Cobalt (Co) | ug/g | 2 | ND | 870252 | ND | 2 | 870262 |
| Total Copper (Cu) | ug/g | 4 | ND | 870252 | ND | 2 | 870262 |
| Total Iron (Fe) | ug/g | 6700 | 5000 | 870252 | 5500 | 50 | 870262 |
| Total Lead (Pb) | ug/g | 7 | ND | 870252 | ND | 5 | 870262 |
| Total Magnesium (Mg) | ug/g | 2600 | 1200 | 870252 | 1500 | 50 | 870262 |
| Total Manganese (Mn) | ug/g | 170 | 140 | 870252 | 180 | 1 | 870262 |
| Total Molybdenum (Mo) | ug/g | ND | ND | 870252 | ND | 2 | 870262 |
| Total Nickel (Ni) | ug/g | 6 | ND | 870252 | 5 | 5 | 870262 |
| Total Phosphorus (P) | ug/g | 440 | 320 | 870252 | 400 | 20 | 870262 |
| Total Potassium (K) | ug/g | 730 | 350 | 870252 | 370 | 200 | 870262 |
| Total Silver (Ag) | ug/g | ND | ND | 870252 | ND | 1 | 870262 |
| Total Sodium (Na) | ug/g | ND | ND | 870252 | ND | 100 | 870262 |
| Total Strontium (Sr) | ug/g | 28 | 7 | 870252 | 7 | 1 | 870262 |
| Total Sulphur (S) | ug/g | 140 | ND | 870252 | 53 | 50 | 870262 |
| Total Tin (Sn) | ug/g | ND | ND | 870252 | ND | 20 | 870262 |
| Total Vanadium (V) | ug/g | 11 | 9 | 870252 | 10 | 5 | 870262 |
| Total Zinc (Zn) | ug/g | 23 | 12 | 870252 | 12 | 5 | 870262 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J48454 | J48455 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2005/11/15 11:02 | 2005/11/15 10:12 | | |
| COC Number | | 347605 | 347605 | | |
| | Units | BH05-8-2-051115 | BH05-7-3-051115 | RDL | QC Batch |
| **METALS** | | | | | |
| Total Aluminum (Al) | ug/g | 2100 | 9200 | 50 | 870262 |
| Total Barium (Ba) | ug/g | 48 | 180 | 2 | 870262 |
| Total Beryllium (Be) | ug/g | ND | 0.7 | 0.5 | 870262 |
| Total Cadmium (Cd) | ug/g | ND | 0.7 | 0.5 | 870262 |
| Total Calcium (Ca) | ug/g | 19000 | 44000 | 50 | 870262 |
| Total Chromium (Cr) | ug/g | 6 | 18 | 1 | 870262 |
| Total Cobalt (Co) | ug/g | 2 | 9 | 2 | 870262 |
| Total Copper (Cu) | ug/g | 3 | 24 | 2 | 870262 |
| Total Iron (Fe) | ug/g | 6400 | 22000 | 50 | 870262 |
| Total Lead (Pb) | ug/g | ND | 9 | 5 | 870262 |
| Total Magnesium (Mg) | ug/g | 3900 | 16000 | 50 | 870262 |
| Total Manganese (Mn) | ug/g | 210 | 450 | 1 | 870262 |
| Total Molybdenum (Mo) | ug/g | ND | 3 | 2 | 870262 |
| Total Nickel (Ni) | ug/g | 6 | 27 | 5 | 870262 |
| Total Phosphorus (P) | ug/g | 440 | 570 | 20 | 870262 |
| Total Potassium (K) | ug/g | 540 | 2100 | 200 | 870262 |
| Total Silver (Ag) | ug/g | ND | ND | 1 | 870262 |
| Total Sodium (Na) | ug/g | ND | 180 | 100 | 870262 |
| Total Strontium (Sr) | ug/g | 21 | 51 | 1 | 870262 |
| Total Sulphur (S) | ug/g | ND | 220 | 50 | 870262 |
| Total Tin (Sn) | ug/g | ND | ND | 20 | 870262 |
| Total Vanadium (V) | ug/g | 12 | 39 | 5 | 870262 |
| Total Zinc (Zn) | ug/g | 14 | 67 | 5 | 870262 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | J48443 | | | J48444 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/14 15:17 | | | 2005/11/14 14:32 | | |
| COC Number | | 347605 | | | 347605 | | |
| | Units | BH05-5-2-051114 | RDL | QC Batch | BH05-4-2-051114 | RDL | QC Batch |
| **PAHs** | | | | | | | |
| Acenaphthene | ug/g | 0.13 | 0.02 | 870017 | ND | 0.01 | 869837 |
| Acenaphthylene | ug/g | 0.01 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Anthracene | ug/g | 0.33 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Benzo(a)anthracene | ug/g | 0.52 | 0.02 | 870017 | ND | 0.01 | 869837 |
| Benzo(a)pyrene | ug/g | 0.53 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Benzo(b/j)fluoranthene | ug/g | 0.60 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Benzo(g,h,i)perylene | ug/g | 0.41 | 0.04 | 870017 | ND | 0.02 | 869837 |
| Benzo(k)fluoranthene | ug/g | 0.18 | 0.02 | 870017 | ND | 0.01 | 869837 |
| Chrysene | ug/g | 0.36 | 0.02 | 870017 | ND | 0.01 | 869837 |
| Dibenzo(a,h)anthracene | ug/g | 0.08 | 0.04 | 870017 | ND | 0.02 | 869837 |
| Fluoranthene | ug/g | 0.99 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Fluorene | ug/g | 0.14 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Indeno(1,2,3-cd)pyrene | ug/g | 0.42 | 0.04 | 870017 | ND | 0.02 | 869837 |
| 1-Methylnaphthalene | ug/g | 0.03 | 0.01 | 870017 | ND | 0.005 | 869837 |
| 2-Methylnaphthalene | ug/g | 0.04 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Naphthalene | ug/g | 0.03 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Phenanthrene | ug/g | 1.09 | 0.01 | 870017 | ND | 0.005 | 869837 |
| Pyrene | ug/g | 0.96 | 0.01 | 870017 | ND | 0.005 | 869837 |
| **Surrogate Recovery (%)** | | | | | | | |
| D10-Anthracene | % | 87 | | 870017 | 89 | | 869837 |
| D14-Terphenyl (FS) | % | 79 | | 870017 | 93 | | 869837 |
| D7-Quinoline | % | 75 | | 870017 | 81 | | 869837 |
| D8-Acenaphthylene | % | 79 | | 870017 | 88 | | 869837 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | J48445 | J48446 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2005/11/15 14:05 | 2005/11/14 13:25 | | |
| COC Number | | 347605 | 347605 | | |
| | Units | BH05-3-2-051114 | BH05-2-1-051114 | RDL | QC Batch |
| **PAHs** | | | | | |
| Acenaphthene | ug/g | ND | ND | 0.01 | 869837 |
| Acenaphthylene | ug/g | ND | ND | 0.005 | 869837 |
| Anthracene | ug/g | ND | 0.006 | 0.005 | 869837 |
| Benzo(a)anthracene | ug/g | ND | 0.01 | 0.01 | 869837 |
| Benzo(a)pyrene | ug/g | ND | 0.007 | 0.005 | 869837 |
| Benzo(b/j)fluoranthene | ug/g | ND | 0.013 | 0.005 | 869837 |
| Benzo(g,h,i)perylene | ug/g | ND | ND | 0.02 | 869837 |
| Benzo(k)fluoranthene | ug/g | ND | ND | 0.01 | 869837 |
| Chrysene | ug/g | ND | ND | 0.01 | 869837 |
| Dibenzo(a,h)anthracene | ug/g | ND | ND | 0.02 | 869837 |
| Fluoranthene | ug/g | ND | 0.018 | 0.005 | 869837 |
| Fluorene | ug/g | ND | ND | 0.005 | 869837 |
| Indeno(1,2,3-cd)pyrene | ug/g | ND | ND | 0.02 | 869837 |
| 1-Methylnaphthalene | ug/g | 0.006 | 0.019 | 0.005 | 869837 |
| 2-Methylnaphthalene | ug/g | 0.007 | 0.025 | 0.005 | 869837 |
| Naphthalene | ug/g | 0.005 | 0.019 | 0.005 | 869837 |
| Phenanthrene | ug/g | ND | 0.027 | 0.005 | 869837 |
| Pyrene | ug/g | ND | 0.015 | 0.005 | 869837 |
| **Surrogate Recovery (%)** | | | | | |
| D10-Anthracene | % | 89 | 94 | | 869837 |
| D14-Terphenyl (FS) | % | 96 | 105 | | 869837 |
| D7-Quinoline | % | 89 | 89 | | 869837 |
| D8-Acenaphthylene | % | 94 | 101 | | 869837 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



5740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | J48447 | | | J48448 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/14 12:47 | | | 2005/11/15 08:34 | | |
| COC Number | | 347605 | | | 347605 | | |
| | Units | BH05-1-1-051114 | RDL | QC Batch | BH05-6-2-051115 | RDL | QC Batch |
| **PAHs** | | | | | | | |
| Acenaphthene | ug/g | ND | 0.02 | 870017 | ND | 0.03 | 869837 |
| Acenaphthylene | ug/g | ND | 0.01 | 870017 | ND | 0.01 | 869837 |
| Anthracene | ug/g | ND | 0.01 | 870017 | ND | 0.01 | 869837 |
| Benzo(a)anthracene | ug/g | ND | 0.02 | 870017 | ND | 0.03 | 869837 |
| Benzo(a)pyrene | ug/g | ND | 0.01 | 870017 | ND | 0.01 | 869837 |
| Benzo(b/j)fluoranthene | ug/g | 0.01 | 0.01 | 870017 | ND | 0.01 | 869837 |
| Benzo(g,h,i)perylene | ug/g | ND | 0.04 | 870017 | ND | 0.05 | 869837 |
| Benzo(k)fluoranthene | ug/g | ND | 0.02 | 870017 | ND | 0.03 | 869837 |
| Chrysene | ug/g | ND | 0.02 | 870017 | ND | 0.03 | 869837 |
| Dibenzo(a,h)anthracene | ug/g | ND | 0.04 | 870017 | ND | 0.05 | 869837 |
| Fluoranthene | ug/g | 0.02 | 0.01 | 870017 | ND | 0.01 | 869837 |
| Fluorene | ug/g | ND | 0.01 | 870017 | ND | 0.01 | 869837 |
| Indeno(1,2,3-cd)pyrene | ug/g | ND | 0.04 | 870017 | ND | 0.05 | 869837 |
| 1-Methylnaphthalene | ug/g | 0.06 | 0.01 | 870017 | ND | 0.01 | 869837 |
| 2-Methylnaphthalene | ug/g | 0.08 | 0.01 | 870017 | ND | 0.01 | 869837 |
| Naphthalene | ug/g | 0.04 | 0.01 | 870017 | ND | 0.01 | 869837 |
| Phenanthrene | ug/g | 0.06 | 0.01 | 870017 | ND | 0.01 | 869837 |
| Pyrene | ug/g | 0.02 | 0.01 | 870017 | ND | 0.01 | 869837 |
| **Surrogate Recovery (%)** | | | | | | | |
| D10-Anthracene | % | 86 | | 870017 | 115 | | 869837 |
| D14-Terphenyl (FS) | % | 75 | | 870017 | 99 | | 869837 |
| D7-Quinoline | % | 68 | | 870017 | 87 | | 869837 |
| D8-Acenaphthylene | % | 81 | | 870017 | 100 | | 869837 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | J48452 | J48453 | | J48454 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/15 13:30 | 2005/11/15 13:40 | | 2005/11/15 11:02 | | |
| COC Number | | 347605 | 347605 | | 347605 | | |
| | Units | BH05-9-2-051115 | BH05-9-9-051115 | QC Batch | BH05-8-2-051115 | RDL | QC Batch |
| PAHs | | | | | | | |
| Acenaphthene | ug/g | ND | ND | 869837 | ND | 0.01 | 870017 |
| Acenaphthylene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Anthracene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Benzo(a)anthracene | ug/g | ND | ND | 869837 | ND | 0.01 | 870017 |
| Benzo(a)pyrene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Benzo(b/j)fluoranthene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Benzo(g,h,i)perylene | ug/g | ND | ND | 869837 | ND | 0.02 | 870017 |
| Benzo(k)fluoranthene | ug/g | ND | ND | 869837 | ND | 0.01 | 870017 |
| Chrysene | ug/g | ND | ND | 869837 | ND | 0.01 | 870017 |
| Dibenzo(a,h)anthracene | ug/g | ND | ND | 869837 | ND | 0.02 | 870017 |
| Fluoranthene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Fluorene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Indeno(1,2,3-cd)pyrene | ug/g | ND | ND | 869837 | ND | 0.02 | 870017 |
| 1-Methylnaphthalene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| 2-Methylnaphthalene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Naphthalene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Phenanthrene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Pyrene | ug/g | ND | ND | 869837 | ND | 0.005 | 870017 |
| Surrogate Recovery (%) | | | | | | | |
| D10-Anthracene | % | 95 | 92 | 869837 | 81 | | 870017 |
| D14-Terphenyl (FS) | % | 98 | 95 | 869837 | 80 | | 870017 |
| D7-Quinoline | % | 88 | 83 | 869837 | 66 | | 870017 |
| D8-Acenaphthylene | % | 96 | 96 | 869837 | 78 | | 870017 |

ND = Not detected
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QC Batch = Quality Control Batch



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Maxxam Job #: A5B7882
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | J48455 | | |
|---|---|---|---|---|
| *Sampling Date* | | *2005/11/15 10:12* | | |
| COC Number | | 347605 | | |
| | Units | BH05-7-3-051115 | RDL | QC Batch |
| **PAHs** | | | | |
| Acenaphthene | ug/g | ND | 0.01 | 869837 |
| Acenaphthylene | ug/g | ND | 0.005 | 869837 |
| Anthracene | ug/g | ND | 0.005 | 869837 |
| Benzo(a)anthracene | ug/g | ND | 0.01 | 869837 |
| Benzo(a)pyrene | ug/g | ND | 0.005 | 869837 |
| Benzo(b/j)fluoranthene | ug/g | ND | 0.005 | 869837 |
| Benzo(g,h,i)perylene | ug/g | ND | 0.02 | 869837 |
| Benzo(k)fluoranthene | ug/g | ND | 0.01 | 869837 |
| Chrysene | ug/g | ND | 0.01 | 869837 |
| Dibenzo(a,h)anthracene | ug/g | ND | 0.02 | 869837 |
| Fluoranthene | ug/g | ND | 0.005 | 869837 |
| Fluorene | ug/g | ND | 0.005 | 869837 |
| Indeno(1,2,3-cd)pyrene | ug/g | ND | 0.02 | 869837 |
| 1-Methylnaphthalene | ug/g | ND | 0.005 | 869837 |
| 2-Methylnaphthalene | ug/g | ND | 0.005 | 869837 |
| Naphthalene | ug/g | ND | 0.005 | 869837 |
| Phenanthrene | ug/g | ND | 0.005 | 869837 |
| Pyrene | ug/g | ND | 0.005 | 869837 |
| **Surrogate Recovery (%)** | | | | |
| D10-Anthracene | % | 93 | | 869837 |
| D14-Terphenyl (FS) | % | 99 | | 869837 |
| D7-Quinoline | % | 77 | | 869837 |
| D8-Acenaphthylene | % | 90 | | 869837 |

ND = Not detected
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Morrow Environmental
Client Project #: W053011A (CP SOURIS YARD)
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

**GENERAL COMMENTS**

Sample J48443-01: PAH Analysis: Due to matrix interferences, sample required dilution. DLs were adjusted accordingly.

Sample J48447-01: PAH Analysis: Due to matrix interferences, sample required dilution. DLs were adjusted accordingly.

**Results relate only to the items tested.**



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A (CP SOURIS YARD)
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report

Maxxam Job Number: MA5B7882

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 869151 DAN | RPD [J48443-02] | Moisture | 2005/11/20 | 10.7 | | % | 50 |
| 869837 MWG | MATRIX SPIKE | D10-Anthracene | 2005/11/22 | | 80 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/22 | | 87 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/22 | | 68 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/22 | | 76 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/22 | | 60 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/22 | | 58 | % | 30 - 130 |
| | | Anthracene | 2005/11/22 | | 66 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/22 | | 72 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/22 | | 74 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/22 | | 69 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/22 | | 73 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/22 | | 88 | % | 30 - 130 |
| | | Chrysene | 2005/11/22 | | 74 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/22 | | 72 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/22 | | 71 | % | 30 - 130 |
| | | Fluorene | 2005/11/22 | | 63 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/22 | | 74 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/22 | | 58 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/22 | | 59 | % | 30 - 130 |
| | | Naphthalene | 2005/11/22 | | 52 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/22 | | 66 | % | 30 - 130 |
| | | Pyrene | 2005/11/22 | | 76 | % | 30 - 130 |
| | Spiked Blank | D10-Anthracene | 2005/11/22 | | 85 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/22 | | 97 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/22 | | 88 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/22 | | 100 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/22 | | 77 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/22 | | 78 | % | 30 - 130 |
| | | Anthracene | 2005/11/22 | | 76 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/22 | | 78 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/22 | | 81 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/22 | | 85 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/22 | | 79 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/22 | | 79 | % | 30 - 130 |
| | | Chrysene | 2005/11/22 | | 82 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/22 | | 80 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/22 | | 80 | % | 30 - 130 |
| | | Fluorene | 2005/11/22 | | 79 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/22 | | 83 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/22 | | 84 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/22 | | 85 | % | 30 - 130 |
| | | Naphthalene | 2005/11/22 | | 76 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/22 | | 76 | % | 30 - 130 |
| | | Pyrene | 2005/11/22 | | 80 | % | 30 - 130 |
| | Method Blank | D10-Anthracene | 2005/11/22 | | 90 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/22 | | 97 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/22 | | 49 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/22 | | 58 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/22 | ND, DL=0.01 | | ug/g | |
| | | Acenaphthylene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Anthracene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Benzo(a)anthracene | 2005/11/22 | ND, DL=0.01 | | ug/g | |
| | | Benzo(a)pyrene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Benzo(b/j)fluoranthene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Benzo(g,h,i)perylene | 2005/11/22 | ND, DL=0.02 | | ug/g | |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A (CP SOURIS YARD)
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B7882

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 869837 MWG | Method Blank | Benzo(k)fluoranthene | 2005/11/22 | ND, DL=0.01 | | ug/g | |
| | | Chrysene | 2005/11/22 | ND, DL=0.01 | | ug/g | |
| | | Dibenzo(a,h)anthracene | 2005/11/22 | ND, DL=0.02 | | ug/g | |
| | | Fluoranthene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Fluorene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/22 | ND, DL=0.02 | | ug/g | |
| | | 1-Methylnaphthalene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | 2-Methylnaphthalene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Naphthalene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Phenanthrene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | | Pyrene | 2005/11/22 | ND, DL=0.005 | | ug/g | |
| | RPD | D14-Terphenyl (FS) | 2005/11/22 | 7.8 | | % | N/A |
| | | Acenaphthene | 2005/11/22 | NC | | % | 50 |
| | | Acenaphthylene | 2005/11/22 | NC | | % | 50 |
| | | Anthracene | 2005/11/22 | NC | | % | 50 |
| | | Benzo(a)anthracene | 2005/11/22 | NC | | % | 50 |
| | | Benzo(a)pyrene | 2005/11/22 | NC | | % | 50 |
| | | Benzo(b/j)fluoranthene | 2005/11/22 | NC | | % | 50 |
| | | Benzo(g,h,i)perylene | 2005/11/22 | NC | | % | 50 |
| | | Benzo(k)fluoranthene | 2005/11/22 | NC | | % | 50 |
| | | Chrysene | 2005/11/22 | NC | | % | 50 |
| | | Dibenzo(a,h)anthracene | 2005/11/22 | NC | | % | 50 |
| | | Fluoranthene | 2005/11/22 | NC | | % | 50 |
| | | Fluorene | 2005/11/22 | NC | | % | 50 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/22 | NC | | % | 50 |
| | | 1-Methylnaphthalene | 2005/11/22 | NC | | % | 50 |
| | | 2-Methylnaphthalene | 2005/11/22 | NC | | % | 50 |
| | | Naphthalene | 2005/11/22 | NC | | % | 50 |
| | | Phenanthrene | 2005/11/22 | NC | | % | 50 |
| | | Pyrene | 2005/11/22 | NC | | % | 50 |
| 870017 MWG | MATRIX SPIKE | D10-Anthracene | 2005/11/23 | | 77 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/23 | | 78 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/23 | | 68 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/23 | | 85 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/23 | | 92 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/23 | | 90 | % | 30 - 130 |
| | | Anthracene | 2005/11/23 | | 79 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/23 | | 89 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/23 | | 85 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/23 | | 93 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/23 | | 91 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/23 | | 79 | % | 30 - 130 |
| | | Chrysene | 2005/11/23 | | 90 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/23 | | 90 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/23 | | 94 | % | 30 - 130 |
| | | Fluorene | 2005/11/23 | | 86 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/23 | | 91 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/23 | | 78 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/23 | | 78 | % | 30 - 130 |
| | | Naphthalene | 2005/11/23 | | 73 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/23 | | 84 | % | 30 - 130 |
| | | Pyrene | 2005/11/23 | | 89 | % | 30 - 130 |
| | Spiked Blank | D10-Anthracene | 2005/11/23 | | 80 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/23 | | 78 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/23 | | 76 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/23 | | 85 | % | 30 - 130 |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A (CP SOURIS YARD)
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B7882

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 870017 MWG | Spiked Blank | Acenaphthene | 2005/11/23 | | 92 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/23 | | 92 | % | 30 - 130 |
| | | Anthracene | 2005/11/23 | | 82 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/23 | | 91 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/23 | | 83 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/23 | | 89 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/23 | | 95 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/23 | | 84 | % | 30 - 130 |
| | | Chrysene | 2005/11/23 | | 88 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/23 | | 93 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/23 | | 94 | % | 30 - 130 |
| | | Fluorene | 2005/11/23 | | 88 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/23 | | 96 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/23 | | 89 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/23 | | 89 | % | 30 - 130 |
| | | Naphthalene | 2005/11/23 | | 85 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/23 | | 88 | % | 30 - 130 |
| | | Pyrene | 2005/11/23 | | 92 | % | 30 - 130 |
| | Method Blank | D10-Anthracene | 2005/11/23 | | 83 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/23 | | 81 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/23 | | 77 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/23 | | 89 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/23 | ND, DL=0.01 | | ug/g | |
| | | Acenaphthylene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Anthracene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Benzo(a)anthracene | 2005/11/23 | ND, DL=0.01 | | ug/g | |
| | | Benzo(a)pyrene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Benzo(b/j)fluoranthene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Benzo(g,h,i)perylene | 2005/11/23 | ND, DL=0.02 | | ug/g | |
| | | Benzo(k)fluoranthene | 2005/11/23 | ND, DL=0.01 | | ug/g | |
| | | Chrysene | 2005/11/23 | ND, DL=0.01 | | ug/g | |
| | | Dibenzo(a,h)anthracene | 2005/11/23 | ND, DL=0.02 | | ug/g | |
| | | Fluoranthene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Fluorene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/23 | ND, DL=0.02 | | ug/g | |
| | | 1-Methylnaphthalene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | 2-Methylnaphthalene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Naphthalene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Phenanthrene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | | Pyrene | 2005/11/23 | ND, DL=0.005 | | ug/g | |
| | RPD | D14-Terphenyl (FS) | 2005/11/23 | 9.1 | | % | N/A |
| | | Acenaphthene | 2005/11/23 | NC | | % | 50 |
| | | Acenaphthylene | 2005/11/23 | NC | | % | 50 |
| | | Anthracene | 2005/11/23 | NC | | % | 50 |
| | | Benzo(a)anthracene | 2005/11/23 | NC | | % | 50 |
| | | Benzo(a)pyrene | 2005/11/23 | NC | | % | 50 |
| | | Benzo(b/j)fluoranthene | 2005/11/23 | NC | | % | 50 |
| | | Benzo(g,h,i)perylene | 2005/11/23 | NC | | % | 50 |
| | | Benzo(k)fluoranthene | 2005/11/23 | NC | | % | 50 |
| | | Chrysene | 2005/11/23 | NC | | % | 50 |
| | | Dibenzo(a,h)anthracene | 2005/11/23 | NC | | % | 50 |
| | | Fluoranthene | 2005/11/23 | NC | | % | 50 |
| | | Fluorene | 2005/11/23 | NC | | % | 50 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/23 | NC | | % | 50 |
| | | 1-Methylnaphthalene | 2005/11/23 | NC | | % | 50 |
| | | 2-Methylnaphthalene | 2005/11/23 | NC | | % | 50 |



740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A (CP SOURIS YARD)
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B7882

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 870017 MWG | RPD | Naphthalene | 2005/11/23 | NC | | % | 50 |
| | | Phenanthrene | 2005/11/23 | NC | | % | 50 |
| | | Pyrene | 2005/11/23 | NC | | % | 50 |
| 870252 GST | MATRIX SPIKE | Total Barium (Ba) | 2005/11/22 | | 116 | % | 75 - 125 |
| | | Total Beryllium (Be) | 2005/11/22 | | 95 | % | 75 - 125 |
| | | Total Cadmium (Cd) | 2005/11/22 | | 97 | % | 75 - 125 |
| | | Total Chromium (Cr) | 2005/11/22 | | 93 | % | 75 - 125 |
| | | Total Cobalt (Co) | 2005/11/22 | | 87 | % | 75 - 125 |
| | | Total Copper (Cu) | 2005/11/22 | | 93 | % | 75 - 125 |
| | | Total Lead (Pb) | 2005/11/22 | | 93 | % | 75 - 125 |
| | | Total Manganese (Mn) | 2005/11/22 | | 101 | % | 75 - 125 |
| | | Total Molybdenum (Mo) | 2005/11/22 | | 86 | % | 75 - 125 |
| | | Total Nickel (Ni) | 2005/11/22 | | 86 | % | 75 - 125 |
| | | Total Phosphorus (P) | 2005/11/22 | | 105 | % | 75 - 125 |
| | | Total Silver (Ag) | 2005/11/22 | | 92 | % | 75 - 125 |
| | | Total Sodium (Na) | 2005/11/22 | | 97 | % | 75 - 125 |
| | | Total Strontium (Sr) | 2005/11/22 | | 95 | % | 75 - 125 |
| | | Total Sulphur (S) | 2005/11/22 | | 97 | % | 75 - 125 |
| | | Total Tin (Sn) | 2005/11/22 | | 87 | % | 75 - 125 |
| | | Total Vanadium (V) | 2005/11/22 | | 100 | % | 75 - 125 |
| | | Total Zinc (Zn) | 2005/11/22 | | 96 | % | 75 - 125 |
| | QC STANDARD | Total Aluminum (Al) | 2005/11/22 | | 95 | % | 50 - 150 |
| | | Total Barium (Ba) | 2005/11/22 | | 99 | % | 70 - 130 |
| | | Total Calcium (Ca) | 2005/11/22 | | 99 | % | 77 - 123 |
| | | Total Chromium (Cr) | 2005/11/22 | | 84 | % | 40 - 160 |
| | | Total Cobalt (Co) | 2005/11/22 | | 96 | % | 75 - 125 |
| | | Total Copper (Cu) | 2005/11/22 | | 102 | % | 73 - 127 |
| | | Total Iron (Fe) | 2005/11/22 | | 112 | % | 61 - 139 |
| | | Total Lead (Pb) | 2005/11/22 | | 94 | % | 54 - 146 |
| | | Total Magnesium (Mg) | 2005/11/22 | | 104 | % | 69 - 131 |
| | | Total Manganese (Mn) | 2005/11/22 | | 97 | % | 71 - 129 |
| | | Total Nickel (Ni) | 2005/11/22 | | 103 | % | 61 - 139 |
| | | Total Phosphorus (P) | 2005/11/22 | | 103 | % | 89 - 111 |
| | | Total Potassium (K) | 2005/11/22 | | 92 | % | 44 - 156 |
| | | Total Strontium (Sr) | 2005/11/22 | | 91 | % | 73 - 127 |
| | | Total Vanadium (V) | 2005/11/22 | | 101 | % | 50 - 150 |
| | | Total Zinc (Zn) | 2005/11/22 | | 108 | % | 72 - 128 |
| | Method Blank | Total Aluminum (Al) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Barium (Ba) | 2005/11/22 | ND, DL=2 | | ug/g | |
| | | Total Beryllium (Be) | 2005/11/22 | ND, DL=0.5 | | ug/g | |
| | | Total Cadmium (Cd) | 2005/11/22 | ND, DL=0.5 | | ug/g | |
| | | Total Calcium (Ca) | 2005/11/22 | 69, DL=50 | | ug/g | |
| | | Total Chromium (Cr) | 2005/11/22 | ND, DL=1 | | ug/g | |
| | | Total Cobalt (Co) | 2005/11/22 | ND, DL=2 | | ug/g | |
| | | Total Copper (Cu) | 2005/11/22 | ND, DL=2 | | ug/g | |
| | | Total Iron (Fe) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Lead (Pb) | 2005/11/22 | ND, DL=5 | | ug/g | |
| | | Total Magnesium (Mg) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Manganese (Mn) | 2005/11/22 | ND, DL=1 | | ug/g | |
| | | Total Molybdenum (Mo) | 2005/11/22 | ND, DL=2 | | ug/g | |
| | | Total Nickel (Ni) | 2005/11/22 | ND, DL=5 | | ug/g | |
| | | Total Phosphorus (P) | 2005/11/22 | ND, DL=20 | | ug/g | |
| | | Total Potassium (K) | 2005/11/22 | ND, DL=200 | | ug/g | |
| | | Total Silver (Ag) | 2005/11/22 | ND, DL=1 | | ug/g | |
| | | Total Sodium (Na) | 2005/11/22 | ND, DL=100 | | ug/g | |
| | | Total Strontium (Sr) | 2005/11/22 | ND, DL=1 | | ug/g | |



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A (CP SOURIS YARD)
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B7882

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 870252 GST | Method Blank | Total Sulphur (S) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Tin (Sn) | 2005/11/22 | ND, DL=20 | | ug/g | |
| | | Total Vanadium (V) | 2005/11/22 | ND, DL=5 | | ug/g | |
| | | Total Zinc (Zn) | 2005/11/22 | 6, DL=5 | | ug/g | |
| | RPD | Total Lead (Pb) | 2005/11/22 | NC | | % | 35 |
| 870262 GST | MATRIX SPIKE [J48453-02] | Total Barium (Ba) | 2005/11/22 | | 102 | % | 75 - 125 |
| | | Total Beryllium (Be) | 2005/11/22 | | 98 | % | 75 - 125 |
| | | Total Cadmium (Cd) | 2005/11/22 | | 99 | % | 75 - 125 |
| | | Total Calcium (Ca) | 2005/11/22 | | 98 | % | 75 - 125 |
| | | Total Chromium (Cr) | 2005/11/22 | | 96 | % | 75 - 125 |
| | | Total Cobalt (Co) | 2005/11/22 | | 95 | % | 75 - 125 |
| | | Total Copper (Cu) | 2005/11/22 | | 97 | % | 75 - 125 |
| | | Total Lead (Pb) | 2005/11/22 | | 94 | % | 75 - 125 |
| | | Total Magnesium (Mg) | 2005/11/22 | | 108 | % | 75 - 125 |
| | | Total Manganese (Mn) | 2005/11/22 | | 82 | % | 75 - 125 |
| | | Total Molybdenum (Mo) | 2005/11/22 | | 90 | % | 75 - 125 |
| | | Total Nickel (Ni) | 2005/11/22 | | 94 | % | 75 - 125 |
| | | Total Potassium (K) | 2005/11/22 | | 109 | % | 75 - 125 |
| | | Total Silver (Ag) | 2005/11/22 | | 96 | % | 75 - 125 |
| | | Total Sodium (Na) | 2005/11/22 | | 99 | % | 75 - 125 |
| | | Total Strontium (Sr) | 2005/11/22 | | 98 | % | 75 - 125 |
| | | Total Sulphur (S) | 2005/11/22 | | 93 | % | 75 - 125 |
| | | Total Tin (Sn) | 2005/11/22 | | 94 | % | 75 - 125 |
| | | Total Vanadium (V) | 2005/11/22 | | 100 | % | 75 - 125 |
| | | Total Zinc (Zn) | 2005/11/22 | | 97 | % | 75 - 125 |
| | QC STANDARD | Total Aluminum (Al) | 2005/11/22 | | 102 | % | 50 - 150 |
| | | Total Barium (Ba) | 2005/11/22 | | 109 | % | 70 - 130 |
| | | Total Calcium (Ca) | 2005/11/22 | | 102 | % | 77 - 123 |
| | | Total Chromium (Cr) | 2005/11/22 | | 86 | % | 40 - 160 |
| | | Total Cobalt (Co) | 2005/11/22 | | 97 | % | 75 - 125 |
| | | Total Copper (Cu) | 2005/11/22 | | 110 | % | 73 - 127 |
| | | Total Iron (Fe) | 2005/11/22 | | 123 | % | 61 - 139 |
| | | Total Lead (Pb) | 2005/11/22 | | 95 | % | 54 - 146 |
| | | Total Magnesium (Mg) | 2005/11/22 | | 110 | % | 69 - 131 |
| | | Total Manganese (Mn) | 2005/11/22 | | 99 | % | 71 - 129 |
| | | Total Nickel (Ni) | 2005/11/22 | | 95 | % | 61 - 139 |
| | | Total Phosphorus (P) | 2005/11/22 | | 108 | % | 89 - 111 |
| | | Total Potassium (K) | 2005/11/22 | | 100 | % | 44 - 156 |
| | | Total Strontium (Sr) | 2005/11/22 | | 98 | % | 73 - 127 |
| | | Total Vanadium (V) | 2005/11/22 | | 107 | % | 50 - 150 |
| | | Total Zinc (Zn) | 2005/11/22 | | 113 | % | 72 - 128 |
| | Method Blank | Total Aluminum (Al) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Barium (Ba) | 2005/11/22 | ND, DL=2 | | ug/g | |
| | | Total Beryllium (Be) | 2005/11/22 | ND, DL=0.5 | | ug/g | |
| | | Total Cadmium (Cd) | 2005/11/22 | ND, DL=0.5 | | ug/g | |
| | | Total Calcium (Ca) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Chromium (Cr) | 2005/11/22 | ND, DL=1 | | ug/g | |
| | | Total Cobalt (Co) | 2005/11/22 | ND, DL=2 | | ug/g | |
| | | Total Copper (Cu) | 2005/11/22 | ND, DL=2 | | ug/g | |
| | | Total Iron (Fe) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Lead (Pb) | 2005/11/22 | ND, DL=5 | | ug/g | |
| | | Total Magnesium (Mg) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Manganese (Mn) | 2005/11/22 | ND, DL=1 | | ug/g | |
| | | Total Molybdenum (Mo) | 2005/11/22 | ND, DL=2 | | ug/g | |
| | | Total Nickel (Ni) | 2005/11/22 | ND, DL=5 | | ug/g | |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A (CP SOURIS YARD)
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B7882

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 870262 GST | Method Blank | Total Phosphorus (P) | 2005/11/22 | ND, DL=20 | | ug/g | |
| | | Total Potassium (K) | 2005/11/22 | ND, DL=200 | | ug/g | |
| | | Total Silver (Ag) | 2005/11/22 | ND, DL=1 | | ug/g | |
| | | Total Sodium (Na) | 2005/11/22 | ND, DL=100 | | ug/g | |
| | | Total Strontium (Sr) | 2005/11/22 | ND, DL=1 | | ug/g | |
| | | Total Sulphur (S) | 2005/11/22 | ND, DL=50 | | ug/g | |
| | | Total Tin (Sn) | 2005/11/22 | ND, DL=20 | | ug/g | |
| | | Total Vanadium (V) | 2005/11/22 | ND, DL=5 | | ug/g | |
| | | Total Zinc (Zn) | 2005/11/22 | ND, DL=5 | | ug/g | |
| | RPD [J48453-02] | Total Aluminum (Al) | 2005/11/22 | 1.4 | | % | 35 |
| | | Total Barium (Ba) | 2005/11/22 | 2.9 | | % | 35 |
| | | Total Beryllium (Be) | 2005/11/22 | NC | | % | 35 |
| | | Total Cadmium (Cd) | 2005/11/22 | NC | | % | 35 |
| | | Total Calcium (Ca) | 2005/11/22 | 12.7 | | % | 35 |
| | | Total Chromium (Cr) | 2005/11/22 | NC | | % | 35 |
| | | Total Cobalt (Co) | 2005/11/22 | NC | | % | 35 |
| | | Total Copper (Cu) | 2005/11/22 | NC | | % | 35 |
| | | Total Iron (Fe) | 2005/11/22 | 3.2 | | % | 35 |
| | | Total Lead (Pb) | 2005/11/22 | NC | | % | 35 |
| | | Total Magnesium (Mg) | 2005/11/22 | 5.2 | | % | 35 |
| | | Total Manganese (Mn) | 2005/11/22 | 3.6 | | % | 35 |
| | | Total Molybdenum (Mo) | 2005/11/22 | NC | | % | 35 |
| | | Total Nickel (Ni) | 2005/11/22 | NC | | % | 35 |
| | | Total Phosphorus (P) | 2005/11/22 | 13.3 | | % | 35 |
| | | Total Potassium (K) | 2005/11/22 | NC | | % | 35 |
| | | Total Silver (Ag) | 2005/11/22 | NC | | % | 35 |
| | | Total Sodium (Na) | 2005/11/22 | NC | | % | 35 |
| | | Total Strontium (Sr) | 2005/11/22 | 7.1 | | % | 35 |
| | | Total Sulphur (S) | 2005/11/22 | NC | | % | 35 |
| | | Total Tin (Sn) | 2005/11/22 | NC | | % | 35 |
| | | Total Vanadium (V) | 2005/11/22 | NC | | % | 35 |
| | | Total Zinc (Zn) | 2005/11/22 | NC | | % | 35 |
| 871277 KJI | MATRIX SPIKE | 1,4-Difluorobenzene | 2005/11/23 | | 101 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/23 | | 104 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/23 | | 97 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/23 | | 95 | % | 60 - 140 |
| | | Benzene | 2005/11/23 | | 94 | % | 60 - 140 |
| | | Toluene | 2005/11/23 | | 96 | % | 60 - 140 |
| | | Ethylbenzene | 2005/11/23 | | 96 | % | 60 - 140 |
| | | o-Xylene | 2005/11/23 | | 94 | % | 60 - 140 |
| | | p+m-Xylene | 2005/11/23 | | 95 | % | 60 - 140 |
| | | F1 (C6-C10) | 2005/11/23 | | 92 | % | 60 - 140 |
| | Spiked Blank | 1,4-Difluorobenzene | 2005/11/23 | | 104 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/23 | | 98 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/23 | | 102 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/23 | | 97 | % | 60 - 140 |
| | | Benzene | 2005/11/23 | | 101 | % | 60 - 140 |
| | | Toluene | 2005/11/23 | | 102 | % | 60 - 140 |
| | | Ethylbenzene | 2005/11/23 | | 100 | % | 60 - 140 |
| | | o-Xylene | 2005/11/23 | | 97 | % | 60 - 140 |
| | | p+m-Xylene | 2005/11/23 | | 100 | % | 60 - 140 |
| | | F1 (C6-C10) | 2005/11/23 | | 91 | % | 60 - 140 |
| | Method Blank | 1,4-Difluorobenzene | 2005/11/23 | | 104 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/23 | | 98 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/23 | | 103 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/23 | | 97 | % | 60 - 140 |



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A (CP SOURIS YARD)
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B7882

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 871277 KJI | Method Blank | Benzene | 2005/11/23 | ND, DL=0.02 | | ug/g | |
| | | Toluene | 2005/11/23 | ND, DL=0.02 | | ug/g | |
| | | Ethylbenzene | 2005/11/23 | ND, DL=0.02 | | ug/g | |
| | | o-Xylene | 2005/11/23 | ND, DL=0.02 | | ug/g | |
| | | p+m-Xylene | 2005/11/23 | ND, DL=0.04 | | ug/g | |
| | | Total Xylenes | 2005/11/23 | ND, DL=0.04 | | ug/g | |
| | | F1 (C6-C10) | 2005/11/23 | ND, DL=10 | | ug/g | |
| | | F1 (C6-C10) - BTEX | 2005/11/23 | ND, DL=10 | | ug/g | |
| | RPD | Benzene | 2005/11/23 | NC | | % | 50 |
| | | Toluene | 2005/11/23 | NC | | % | 50 |
| | | Ethylbenzene | 2005/11/23 | NC | | % | 50 |
| | | o-Xylene | 2005/11/23 | NC | | % | 50 |
| | | p+m-Xylene | 2005/11/23 | NC | | % | 50 |
| | | Total Xylenes | 2005/11/23 | NC | | % | 50 |
| | | F1 (C6-C10) | 2005/11/23 | NC | | % | 50 |
| | | F1 (C6-C10) - BTEX | 2005/11/23 | NC | | % | 50 |
| 871310 DCA | MATRIX SPIKE | o-Terphenyl | 2005/11/23 | | 118 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/23 | | 102 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/23 | | 102 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/23 | | 102 | % | 60 - 130 |
| | Spiked Blank | o-Terphenyl | 2005/11/23 | | 122 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/23 | | 89 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/23 | | 89 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/23 | | 89 | % | 60 - 130 |
| | Method Blank | o-Terphenyl | 2005/11/23 | | 120 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/23 | ND, DL=10 | | ug/g | |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/23 | ND, DL=10 | | ug/g | |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/23 | ND, DL=10 | | ug/g | |
| | RPD | F2 (C10-C16 Hydrocarbons) | 2005/11/23 | NC | | % | 50 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/23 | NC | | % | 50 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/23 | NC | | % | 50 |

ND = Not detected
N/A = Not Applicable
NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample



40 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Your P.O. #: EA780
Your Project #: W053011A CP SOURIS YARD
Site: SOURIS, MB
Your C.O.C. #: 393349

**Attention: Andrew Eason**
Morrow Environmental
1420 Clarence Ave
Unit E
Winnipeg, MB
CANADA R3T 1T6



Report Date: 2005/11/29

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: A5B8221**
**Received: 2005/11/19, 14:52**

Sample Matrix: Soil
# Samples Received: 15

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Method Reference |
|---|---|---|---|---|---|
| Petroleum Hydro. CCME FI & BTEX in Soil | 13 | 2005/11/22 | 2005/11/22 | Ont SOP-0816 | CCME CWS |
| Petroleum Hydrocarbons F2-F4 in Soil | 13 | 2005/11/22 | 2005/11/22 | Ont SOP-0817 | CCME CWS |
| Total Metals in Soil by Axial ICP-AES | 1 | 2005/11/24 | 2005/11/24 | SOP ING-101 | EPA SW846-M6010B |
| Total Metals in Soil by Axial ICP-AES | 14 | 2005/11/24 | 2005/11/25 | SOP ING-101 | EPA SW846-M6010B |
| MOISTURE | 15 | N/A | 2005/11/21 | Ont SOP-0114 | MOE HANDBOOK(1983 |
| PAH Compounds in Soil by GC/MS (SIM) | 2 | 2005/11/22 | 2005/11/24 | EPA 8270 | GC/MS |

**MAXXAM ANALYTICS INC.**

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encl.

Total cover pages: 1

Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J50399 | J50400 | J50401 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 10:19 | 2005/11/16 09:31 | 2005/11/16 08:45 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-15-2-051116 | BH05-15-1-051116 | BH05-14-2-051116 | RDL | QC Batch |
| **INORGANICS** | | | | | | |
| Moisture | % | 17 | 15 | 16 | 0.2 | 870151 |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/g | ND | ND | ND | 0.02 | 870228 |
| Toluene | ug/g | ND | 0.03 | ND | 0.02 | 870228 |
| Ethylbenzene | ug/g | ND | ND | 0.05 | 0.02 | 870228 |
| o-Xylene | ug/g | ND | ND | ND | 0.02 | 870228 |
| p+m-Xylene | ug/g | ND | ND | ND | 0.04 | 870228 |
| Total Xylenes | ug/g | ND | ND | ND | 0.04 | 870228 |
| F1 (C6-C10) | ug/g | ND | ND | ND | 10 | 870228 |
| F1 (C6-C10) - BTEX | ug/g | ND | ND | ND | 10 | 870228 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | ND | ND | ND | 10 | 870336 |
| F3 (C16-C34 Hydrocarbons) | ug/g | ND | ND | ND | 10 | 870336 |
| F4 (C34-C50 Hydrocarbons) | ug/g | ND | ND | ND | 10 | 870336 |
| Reached Baseline at C50 | ug/g | YES | YES | YES | | 870336 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 100 | 98 | 98 | | 870228 |
| 4-Bromofluorobenzene | % | 99 | 99 | 98 | | 870228 |
| D10-Ethylbenzene | % | 94 | 91 | 90 | | 870228 |
| D4-1,2-Dichloroethane | % | 99 | 97 | 96 | | 870228 |
| o-Terphenyl | % | 90 | 98 | 93 | | 870336 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J50402 | | J50406 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 08:05 | | 2005/11/16 15:00 | | |
| COC Number | | 393349 | | 393349 | | |
| | Units | BH05-13-1-051116 | RDL | BH05-20-9-051116 | RDL | QC Batch |
| **INORGANICS** | | | | | | |
| Moisture | % | 12 | 0.2 | 13 | 0.2 | 870151 |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/g | ND | 0.02 | ND | 0.02 | 870228 |
| Toluene | ug/g | ND | 0.02 | 0.59 | 0.02 | 870228 |
| Ethylbenzene | ug/g | ND | 0.02 | 3.0 | 0.02 | 870228 |
| o-Xylene | ug/g | ND | 0.02 | 16 | 0.02 | 870228 |
| p+m-Xylene | ug/g | ND | 0.04 | 25 | 0.04 | 870228 |
| Total Xylenes | ug/g | ND | 0.04 | 41 | 0.04 | 870228 |
| F1 (C6-C10) | ug/g | ND | 10 | 110 | 10 | 870228 |
| F1 (C6-C10) - BTEX | ug/g | ND | 10 | 63 | 10 | 870228 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | ND | 10 | 11000 | 100 | 870336 |
| F3 (C16-C34 Hydrocarbons) | ug/g | ND | 10 | 3400 | 100 | 870336 |
| F4 (C34-C50 Hydrocarbons) | ug/g | ND | 10 | ND | 100 | 870336 |
| Reached Baseline at C50 | ug/g | YES | | YES | | 870336 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 97 | | 106 | | 870228 |
| 4-Bromofluorobenzene | % | 96 | | 90 | | 870228 |
| D10-Ethylbenzene | % | 89 | | 101 | | 870228 |
| D4-1,2-Dichloroethane | % | 95 | | 104 | | 870228 |
| o-Terphenyl | % | 94 | | 116 | | 870336 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J50407 | | J50408 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 14:55 | | 2005/11/16 14:00 | | |
| COC Number | | 393349 | | 393349 | | |
| | Units | BH05-20-3-051116 | RDL | BH05-19-1-051116 | RDL | QC Batch |
| **INORGANICS** | | | | | | |
| Moisture | % | 15 | 0.2 | 12 | 0.2 | 870151 |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/g | ND | 0.02 | ND | 0.02 | 870228 |
| Toluene | ug/g | 0.69 | 0.02 | ND | 0.02 | 870228 |
| Ethylbenzene | ug/g | 3.1 | 0.02 | ND | 0.02 | 870228 |
| o-Xylene | ug/g | 17 | 0.02 | ND | 0.02 | 870228 |
| p+m-Xylene | ug/g | 27 | 0.04 | ND | 0.04 | 870228 |
| Total Xylenes | ug/g | 43 | 0.04 | ND | 0.04 | 870228 |
| F1 (C6-C10) | ug/g | 190 | 10 | ND | 10 | 870228 |
| F1 (C6-C10) - BTEX | ug/g | 140 | 10 | ND | 10 | 870228 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | 13000 | 100 | ND | 10 | 870336 |
| F3 (C16-C34 Hydrocarbons) | ug/g | 4100 | 100 | ND | 10 | 870336 |
| F4 (C34-C50 Hydrocarbons) | ug/g | ND | 100 | ND | 10 | 870336 |
| Reached Baseline at C50 | ug/g | YES | | YES | | 870336 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 87 | | 100 | | 870228 |
| 4-Bromofluorobenzene | % | 97 | | 100 | | 870228 |
| D10-Ethylbenzene | % | 93 | | 100 | | 870228 |
| D4-1,2-Dichloroethane | % | 84 | | 93 | | 870228 |
| o-Terphenyl | % | 112 | | 106 | | 870336 |

ND = Not detected
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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J50410 | J50411 | J50412 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 11:09 | 2005/11/17 07:57 | 2005/11/17 08:02 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-17-4-051116 | BH05-21-1-051117 | BH05-21-5-051117 | RDL | QC Batch |
| **INORGANICS** | | | | | | |
| Moisture | % | 20 | 15 | 13 | 0.2 | 870151 |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/g | ND | ND | ND | 0.02 | 870228 |
| Toluene | ug/g | ND | 0.05 | ND | 0.02 | 870228 |
| Ethylbenzene | ug/g | ND | ND | ND | 0.02 | 870228 |
| o-Xylene | ug/g | ND | 0.10 | 0.03 | 0.02 | 870228 |
| p+m-Xylene | ug/g | ND | 0.18 | 0.05 | 0.04 | 870228 |
| Total Xylenes | ug/g | ND | 0.27 | 0.08 | 0.04 | 870228 |
| F1 (C6-C10) | ug/g | ND | ND | ND | 10 | 870228 |
| F1 (C6-C10) - BTEX | ug/g | ND | ND | ND | 10 | 870228 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | ND | 13 | 20 | 10 | 870336 |
| F3 (C16-C34 Hydrocarbons) | ug/g | ND | 13 | 18 | 10 | 870336 |
| F4 (C34-C50 Hydrocarbons) | ug/g | ND | 12 | 30 | 10 | 870336 |
| Reached Baseline at C50 | ug/g | YES | YES | YES | | 870336 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 101 | 103 | 99 | | 870228 |
| 4-Bromofluorobenzene | % | 101 | 103 | 97 | | 870228 |
| D10-Ethylbenzene | % | 95 | 98 | 92 | | 870228 |
| D4-1,2-Dichloroethane | % | 95 | 98 | 94 | | 870228 |
| o-Terphenyl | % | 97 | 87 | 88 | | 870336 |

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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J50413 | | J50414 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/17 08:53 | | 2005/11/17 09:23 | | |
| COC Number | | 393349 | | 393349 | | |
| | Units | BH05-22-1-051117 | QC Batch | BH05-23-1-051117 | RDL | QC Batch |
| **INORGANICS** | | | | | | |
| Moisture | % | 12 | 870151 | 8.1 | 0.2 | 870182 |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/g | ND | 870228 | ND | 0.02 | 870228 |
| Toluene | ug/g | ND | 870228 | ND | 0.02 | 870228 |
| Ethylbenzene | ug/g | ND | 870228 | ND | 0.02 | 870228 |
| o-Xylene | ug/g | ND | 870228 | ND | 0.02 | 870228 |
| p+m-Xylene | ug/g | ND | 870228 | ND | 0.04 | 870228 |
| Total Xylenes | ug/g | ND | 870228 | ND | 0.04 | 870228 |
| F1 (C6-C10) | ug/g | ND | 870228 | ND | 10 | 870228 |
| F1 (C6-C10) - BTEX | ug/g | ND | 870228 | ND | 10 | 870228 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | ND | 870336 | ND | 10 | 870336 |
| F3 (C16-C34 Hydrocarbons) | ug/g | 190 | 870336 | ND | 10 | 870336 |
| F4 (C34-C50 Hydrocarbons) | ug/g | 440 | 870336 | ND | 10 | 870336 |
| Reached Baseline at C50 | ug/g | YES | 870336 | YES | | 870336 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 102 | 870228 | 102 | | 870228 |
| 4-Bromofluorobenzene | % | 98 | 870228 | 98 | | 870228 |
| D10-Ethylbenzene | % | 97 | 870228 | 98 | | 870228 |
| D4-1,2-Dichloroethane | % | 97 | 870228 | 97 | | 870228 |
| o-Terphenyl | % | 96 | 870336 | 104 | | 870336 |

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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
*Your P.O. #: EA780*
Sampler Initials:

## O'REG 153 PETROLUEM HYDROCARBONS (SOIL)

| Maxxam ID | | J50415 | | |
|---|---|---|---|---|
| Sampling Date | | 2005/11/17 11:00 | | |
| COC Number | | 393349 | | |
| | Units | BH05-24-4-051117 | RDL | QC Batch |
| **INORGANICS** | | | | |
| Moisture | % | 21 | 0.2 | 870182 |
| **F1 PHC and BTEX** | | | | |
| Benzene | ug/g | ND | 0.02 | 870228 |
| Toluene | ug/g | ND | 0.02 | 870228 |
| Ethylbenzene | ug/g | 0.05 | 0.02 | 870228 |
| o-Xylene | ug/g | ND | 0.02 | 870228 |
| p+m-Xylene | ug/g | ND | 0.04 | 870228 |
| Total Xylenes | ug/g | ND | 0.04 | 870228 |
| F1 (C6-C10) | ug/g | 140 | 10 | 870228 |
| F1 (C6-C10) - BTEX | ug/g | 140 | 10 | 870228 |
| **F2-F4 PHC** | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/g | 1500 | 10 | 870336 |
| F3 (C16-C34 Hydrocarbons) | ug/g | 1100 | 10 | 870336 |
| F4 (C34-C50 Hydrocarbons) | ug/g | ND | 10 | 870336 |
| Reached Baseline at C50 | ug/g | YES | | 870336 |
| **Surrogate Recovery (%)** | | | | |
| 1,4-Difluorobenzene | % | 100 | | 870228 |
| 4-Bromofluorobenzene | % | 101 | | 870228 |
| D10-Ethylbenzene | % | 99 | | 870228 |
| D4-1,2-Dichloroethane | % | 97 | | 870228 |
| o-Terphenyl | % | 106 | | 870336 |

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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## RESULTS OF ANALYSES OF SOIL

| Maxxam ID | | J50403 | J50409 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 17:10 | 2005/11/16 13:31 | | |
| COC Number | | 393349 | 393349 | | |
| | Units | F.BLANK-051116 | BH05-18-1-051116 | RDL | QC Batch |
| **INORGANICS** | | | | | |
| Moisture | % | ND | 4.5 | 0.2 | 870151 |

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Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50399 | J50400 | J50401 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 10:19 | 2005/11/16 09:31 | 2005/11/16 08:45 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-16-2-051116 | BH05-15-1-051116 | BH05-14-2-051116 | RDL | QC Batch |
| **METALS** | | | | | | |
| Total Aluminum (Al) | ug/g | 2200 | 3500 | 2200 | 50 | 872372 |
| Total Antimony (Sb) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Arsenic (As) | ug/g | 4 | 4 | 5 | 1 | 872372 |
| Total Barium (Ba) | ug/g | 66 | 98 | 57 | 0.5 | 872372 |
| Total Beryllium (Be) | ug/g | ND | ND | ND | 0.5 | 872372 |
| Total Bismuth (Bi) | ug/g | ND | ND | ND | 5 | 872372 |
| Total Cadmium (Cd) | ug/g | ND | ND | ND | 0.3 | 872372 |
| Total Calcium (Ca) | ug/g | 26000 | 25000 | 29000 | 50 | 872372 |
| Total Chromium (Cr) | ug/g | 7.2 | 8.6 | 6.8 | 0.5 | 872372 |
| Total Cobalt (Co) | ug/g | 3.1 | 3.2 | 2.7 | 0.5 | 872372 |
| Total Copper (Cu) | ug/g | 3.7 | 4.7 | 4.4 | 0.5 | 872372 |
| Total Iron (Fe) | ug/g | 7000 | 8300 | 7100 | 50 | 872372 |
| Total Lead (Pb) | ug/g | 3 | 5 | 3 | 1 | 872372 |
| Total Magnesium (Mg) | ug/g | 5200 | 3600 | 6100 | 50 | 872372 |
| Total Manganese (Mn) | ug/g | 280 | 230 | 240 | 1 | 872372 |
| Total Molybdenum (Mo) | ug/g | ND | ND | ND | 0.5 | 872372 |
| Total Nickel (Ni) | ug/g | 6.9 | 7.6 | 11 | 0.5 | 872372 |
| Total Phosphorus (P) | ug/g | 450 | 440 | 480 | 20 | 872372 |
| Total Potassium (K) | ug/g | 400 | 730 | 400 | 200 | 872372 |
| Total Selenium (Se) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Silver (Ag) | ug/g | ND | ND | ND | 0.3 | 872372 |
| Total Sodium (Na) | ug/g | ND | 100 | ND | 100 | 872372 |
| Total Strontium (Sr) | ug/g | 25 | 26 | 28 | 1 | 872372 |
| Total Sulphur (S) | ug/g | 64 | 170 | ND | 50 | 872372 |
| Total Thallium (Tl) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Tin (Sn) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Titanium (Ti) | ug/g | 100 | 110 | 110 | 5 | 872372 |
| Total Uranium (U) | ug/g | 36 | 31 | 34 | 20 | 872372 |
| Total Vanadium (V) | ug/g | 13 | 13 | 14 | 0.5 | 872372 |
| Total Zinc (Zn) | ug/g | 17 | 26 | 17 | 3 | 872372 |

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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50399 | J50400 | J50401 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 10:19 | 2005/11/16 09:31 | 2005/11/16 08:45 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-16-2-051116 | BH05-15-1-051116 | BH05-14-2-051116 | RDL | QC Batch |
| Total Zirconium (Zr) | ug/g | ND | ND | ND | 5 | 872372 |

ND = Not detected
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Maxxam Job #: A5B8221
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Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50402 | J50403 | J50406 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 08:05 | 2005/11/16 17:10 | 2005/11/16 15:00 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-13-1-051116 | F.BLANK-051116 | BH05-20-9-051116 | RDL | QC Batch |
| **METALS** | | | | | | |
| Total Aluminum (Al) | ug/g | 2700 | 82 | 1700 | 50 | 872372 |
| Total Antimony (Sb) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Arsenic (As) | ug/g | 4 | ND | 3 | 1 | 872372 |
| Total Barium (Ba) | ug/g | 58 | 4.2 | 57 | 0.5 | 872372 |
| Total Beryllium (Be) | ug/g | ND | ND | ND | 0.5 | 872372 |
| Total Bismuth (Bi) | ug/g | ND | ND | ND | 5 | 872372 |
| Total Cadmium (Cd) | ug/g | 0.3 | ND | ND | 0.3 | 872372 |
| Total Calcium (Ca) | ug/g | 15000 | 570 | 27000 | 50 | 872372 |
| Total Chromium (Cr) | ug/g | 7.8 | 130 | 5.9 | 0.5 | 872372 |
| Total Cobalt (Co) | ug/g | 2.8 | ND | 3.5 | 0.5 | 872372 |
| Total Copper (Cu) | ug/g | 5.7 | 1.8 | 4.0 | 0.5 | 872372 |
| Total Iron (Fe) | ug/g | 7500 | 1300 | 5600 | 50 | 872372 |
| Total Lead (Pb) | ug/g | 8 | 1 | 4 | 1 | 872372 |
| Total Magnesium (Mg) | ug/g | 3500 | 69 | 5800 | 50 | 872372 |
| Total Manganese (Mn) | ug/g | 260 | 29 | 650 | 1 | 872372 |
| Total Molybdenum (Mo) | ug/g | ND | 7.6 | ND | 0.5 | 872372 |
| Total Nickel (Ni) | ug/g | 7.7 | 2.6 | 7.8 | 0.5 | 872372 |
| Total Phosphorus (P) | ug/g | 540 | 51 | 400 | 20 | 872372 |
| Total Potassium (K) | ug/g | 600 | ND | 310 | 200 | 872372 |
| Total Selenium (Se) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Silver (Ag) | ug/g | ND | ND | ND | 0.3 | 872372 |
| Total Sodium (Na) | ug/g | ND | ND | ND | 100 | 872372 |
| Total Strontium (Sr) | ug/g | 22 | 3 | 23 | 1 | 872372 |
| Total Sulphur (S) | ug/g | 100 | ND | 83 | 50 | 872372 |
| Total Thallium (Tl) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Tin (Sn) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Titanium (Ti) | ug/g | 99 | ND | 95 | 5 | 872372 |
| Total Uranium (U) | ug/g | 41 | ND | 27 | 20 | 872372 |
| Total Vanadium (V) | ug/g | 14 | 0.7 | 9.3 | 0.5 | 872372 |
| Total Zinc (Zn) | ug/g | 22 | ND | 13 | 3 | 872372 |

ND = Not detected
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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50402 | J50403 | J50406 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 08:05 | 2005/11/16 17:10 | 2005/11/16 15:00 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-13-1-051116 | F.BLANK-051116 | BH05-20-9-051116 | RDL | QC Batch |
| Total Zirconium (Zr) | ug/g | ND | ND | ND | 5 | 872372 |

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740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B8221
*Report Date: 2005/11/29*

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
*Project name: SOURIS, MB*
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50407 | J50408 | J50409 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 14:55 | 2005/11/16 14:00 | 2005/11/16 13:31 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-20-3-051116 | BH05-19-1-051116 | BH05-18-1-051116 | RDL | QC Batch |
| **METALS** | | | | | | |
| Total Aluminum (Al) | ug/g | 1800 | 2800 | 4100 | 50 | 872372 |
| Total Antimony (Sb) | ug/g | ND | ND | 2 | 1 | 872372 |
| Total Arsenic (As) | ug/g | 3 | 2 | 28 | 1 | 872372 |
| Total Barium (Ba) | ug/g | 53 | 77 | 130 | 0.5 | 872372 |
| Total Beryllium (Be) | ug/g | ND | ND | ND | 0.5 | 872372 |
| Total Bismuth (Bi) | ug/g | ND | ND | ND | 5 | 872372 |
| Total Cadmium (Cd) | ug/g | ND | ND | 0.8 | 0.3 | 872372 |
| Total Calcium (Ca) | ug/g | 25000 | 18000 | 65000 | 50 | 872372 |
| Total Chromium (Cr) | ug/g | 5.4 | 6.9 | 12 | 0.5 | 872372 |
| Total Cobalt (Co) | ug/g | 3.3 | 2.7 | 6.3 | 0.5 | 872372 |
| Total Copper (Cu) | ug/g | 3.3 | 4.7 | 18 | 0.5 | 872372 |
| Total Iron (Fe) | ug/g | 5600 | 6800 | 28000 | 50 | 872372 |
| Total Lead (Pb) | ug/g | 3 | 5 | 26 | 1 | 872372 |
| Total Magnesium (Mg) | ug/g | 5300 | 2500 | 18000 | 50 | 872372 |
| Total Manganese (Mn) | ug/g | 490 | 250 | 680 | 1 | 872372 |
| Total Molybdenum (Mo) | ug/g | ND | ND | 3.5 | 0.5 | 872372 |
| Total Nickel (Ni) | ug/g | 7.7 | 6.9 | 16 | 0.5 | 872372 |
| Total Phosphorus (P) | ug/g | 350 | 430 | 600 | 20 | 872372 |
| Total Potassium (K) | ug/g | 330 | 520 | 1000 | 200 | 872372 |
| Total Selenium (Se) | ug/g | ND | ND | 2 | 1 | 872372 |
| Total Silver (Ag) | ug/g | ND | ND | ND | 0.3 | 872372 |
| Total Sodium (Na) | ug/g | ND | 170 | ND | 100 | 872372 |
| Total Strontium (Sr) | ug/g | 22 | 27 | 61 | 1 | 872372 |
| Total Sulphur (S) | ug/g | 85 | 130 | 10000 | 50 | 872372 |
| Total Thallium (Tl) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Tin (Sn) | ug/g | ND | ND | 1 | 1 | 872372 |
| Total Titanium (Ti) | ug/g | 92 | 94 | 230 | 5 | 872372 |
| Total Uranium (U) | ug/g | 32 | 29 | 62 | 20 | 872372 |
| Total Vanadium (V) | ug/g | 8.8 | 11 | 19 | 0.5 | 872372 |
| Total Zinc (Zn) | ug/g | 14 | 23 | 37 | 3 | 872372 |

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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50407 | J50408 | J50409 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 14:55 | 2005/11/16 14:00 | 2005/11/16 13:31 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-20-3-051116 | BH05-19-1-051116 | BH05-18-1-051116 | RDL | QC Batch |
| Total Zirconium (Zr) | ug/g | ND | ND | ND | 5 | 872372 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



40 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50410 | J50411 | J50412 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 11:09 | 2005/11/17 07:57 | 2005/11/17 08:02 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-17-4-051116 | BH05-21-1-051117 | BH05-21-5-051117 | RDL | QC Batch |
| **METALS** | | | | | | |
| Total Aluminum (Al) | ug/g | 990 | 2400 | 2500 | 50 | 872372 |
| Total Antimony (Sb) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Arsenic (As) | ug/g | 6 | 8 | 7 | 1 | 872372 |
| Total Barium (Ba) | ug/g | 26 | 69 | 79 | 0.5 | 872372 |
| Total Beryllium (Be) | ug/g | ND | ND | ND | 0.5 | 872372 |
| Total Bismuth (Bi) | ug/g | ND | ND | ND | 5 | 872372 |
| Total Cadmium (Cd) | ug/g | ND | ND | ND | 0.3 | 872372 |
| Total Calcium (Ca) | ug/g | 29000 | 7000 | 6600 | 50 | 872372 |
| Total Chromium (Cr) | ug/g | 4.6 | 7.4 | 8.3 | 0.5 | 872372 |
| Total Cobalt (Co) | ug/g | 2.3 | 2.9 | 2.5 | 0.5 | 872372 |
| Total Copper (Cu) | ug/g | 6.0 | 6.7 | 7.2 | 0.5 | 872372 |
| Total Iron (Fe) | ug/g | 9000 | 6600 | 6600 | 50 | 872372 |
| Total Lead (Pb) | ug/g | 3 | 13 | 14 | 1 | 872372 |
| Total Magnesium (Mg) | ug/g | 6200 | 1900 | 1900 | 50 | 872372 |
| Total Manganese (Mn) | ug/g | 160 | 260 | 260 | 1 | 872372 |
| Total Molybdenum (Mo) | ug/g | 0.8 | ND | ND | 0.5 | 872372 |
| Total Nickel (Ni) | ug/g | 5.7 | 6.5 | 6.4 | 0.5 | 872372 |
| Total Phosphorus (P) | ug/g | 370 | 420 | 430 | 20 | 872372 |
| Total Potassium (K) | ug/g | ND | 590 | 600 | 200 | 872372 |
| Total Selenium (Se) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Silver (Ag) | ug/g | ND | ND | ND | 0.3 | 872372 |
| Total Sodium (Na) | ug/g | ND | ND | ND | 100 | 872372 |
| Total Strontium (Sr) | ug/g | 23 | 24 | 26 | 1 | 872372 |
| Total Sulphur (S) | ug/g | 93 | 150 | 140 | 50 | 872372 |
| Total Thallium (Tl) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Tin (Sn) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Titanium (Ti) | ug/g | 100 | 91 | 92 | 5 | 872372 |
| Total Uranium (U) | ug/g | 35 | 28 | ND | 20 | 872372 |
| Total Vanadium (V) | ug/g | 10 | 8.4 | 8.6 | 0.5 | 872372 |
| Total Zinc (Zn) | ug/g | 16 | 27 | 29 | 3 | 872372 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50410 | J50411 | J50412 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 11:09 | 2005/11/17 07:57 | 2005/11/17 08:02 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-17-4-051116 | BH05-21-1-051117 | BH05-21-5-051117 | RDL | QC Batch |
| Total Zirconium (Zr) | ug/g | ND | ND | ND | 5 | 872372 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



40 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
*Your P.O. #: EA780*
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50413 | J50414 | J50415 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/17 08:53 | 2005/11/17 09:23 | 2005/11/17 11:00 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-22-1-051117 | BH05-23-1-051117 | BH05-24-4-051117 | RDL | QC Batch |
| **METALS** | | | | | | |
| Total Aluminum (Al) | ug/g | 2600 | 1900 | 2400 | 50 | 872372 |
| Total Antimony (Sb) | ug/g | 2 | ND | ND | 1 | 872372 |
| Total Arsenic (As) | ug/g | 3 | 2 | 3 | 1 | 872372 |
| Total Barium (Ba) | ug/g | 120 | 30 | 100 | 0.5 | 872372 |
| Total Beryllium (Be) | ug/g | ND | ND | ND | 0.5 | 872372 |
| Total Bismuth (Bi) | ug/g | ND | ND | ND | 5 | 872372 |
| Total Cadmium (Cd) | ug/g | ND | ND | 0.3 | 0.3 | 872372 |
| Total Calcium (Ca) | ug/g | 8300 | 4000 | 24000 | 50 | 872372 |
| Total Chromium (Cr) | ug/g | 39 | 6.1 | 6.6 | 0.5 | 872372 |
| Total Cobalt (Co) | ug/g | 2.8 | 2.1 | 3.0 | 0.5 | 872372 |
| Total Copper (Cu) | ug/g | 10 | 2.9 | 6.2 | 0.5 | 872372 |
| Total Iron (Fe) | ug/g | 6800 | 5400 | 5800 | 50 | 872372 |
| Total Lead (Pb) | ug/g | 22 | 3 | 4 | 1 | 872372 |
| Total Magnesium (Mg) | ug/g | 2100 | 1600 | 6900 | 50 | 872372 |
| Total Manganese (Mn) | ug/g | 280 | 170 | 200 | 1 | 872372 |
| Total Molybdenum (Mo) | ug/g | ND | ND | ND | 0.5 | 872372 |
| Total Nickel (Ni) | ug/g | 6.5 | 5.6 | 11 | 0.5 | 872372 |
| Total Phosphorus (P) | ug/g | 440 | 330 | 410 | 20 | 872372 |
| Total Potassium (K) | ug/g | 580 | 440 | 460 | 200 | 872372 |
| Total Selenium (Se) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Silver (Ag) | ug/g | ND | ND | ND | 0.3 | 872372 |
| Total Sodium (Na) | ug/g | 110 | ND | 100 | 100 | 872372 |
| Total Strontium (Sr) | ug/g | 40 | 8 | 24 | 1 | 872372 |
| Total Sulphur (S) | ug/g | 240 | 60 | 120 | 50 | 872372 |
| Total Thallium (Tl) | ug/g | ND | ND | ND | 1 | 872372 |
| Total Tin (Sn) | ug/g | 1 | ND | ND | 1 | 872372 |
| Total Titanium (Ti) | ug/g | 94 | 80 | 120 | 5 | 872372 |
| Total Uranium (U) | ug/g | ND | 20 | 35 | 20 | 872372 |
| Total Vanadium (V) | ug/g | 9.0 | 8.1 | 10 | 0.5 | 872372 |
| Total Zinc (Zn) | ug/g | 26 | 15 | 23 | 3 | 872372 |

ND = Not detected
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QC Batch = Quality Control Batch



5740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

| Maxxam ID | | J50413 | J50414 | J50415 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/11/17 08:53 | 2005/11/17 09:23 | 2005/11/17 11:00 | | |
| COC Number | | 393349 | 393349 | 393349 | | |
| | Units | BH05-22-1-051117 | BH05-23-1-051117 | BH05-24-4-051117 | RDL | QC Batch |
| Total Zirconium (Zr) | ug/g | ND | ND | ND | 5 | 872372 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



40 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

| Maxxam ID | | J50403 | J50409 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2005/11/16 17:10 | 2005/11/16 13:31 | | |
| COC Number | | 393349 | 393349 | | |
| | Units | F.BLANK-051116 | BH05-18-1-051116 | RDL | QC Batch |
| **PAHs** | | | | | |
| Acenaphthene | ug/g | ND | ND | 0.01 | 870542 |
| Acenaphthylene | ug/g | ND | ND | 0.005 | 870542 |
| Anthracene | ug/g | ND | 0.007 | 0.005 | 870542 |
| Benzo(a)anthracene | ug/g | ND | 0.03 | 0.01 | 870542 |
| Benzo(a)pyrene | ug/g | ND | 0.024 | 0.005 | 870542 |
| Benzo(b/j)fluoranthene | ug/g | ND | 0.054 | 0.005 | 870542 |
| Benzo(g,h,i)perylene | ug/g | ND | 0.03 | 0.02 | 870542 |
| Benzo(k)fluoranthene | ug/g | ND | 0.02 | 0.01 | 870542 |
| Chrysene | ug/g | ND | 0.04 | 0.01 | 870542 |
| Dibenzo(a,h)anthracene | ug/g | ND | ND | 0.02 | 870542 |
| Fluoranthene | ug/g | ND | 0.029 | 0.005 | 870542 |
| Fluorene | ug/g | ND | 0.013 | 0.005 | 870542 |
| Indeno(1,2,3-cd)pyrene | ug/g | ND | 0.02 | 0.02 | 870542 |
| 1-Methylnaphthalene | ug/g | ND | 0.197 | 0.005 | 870542 |
| 2-Methylnaphthalene | ug/g | ND | 0.231 | 0.005 | 870542 |
| Naphthalene | ug/g | ND | 0.122 | 0.005 | 870542 |
| Phenanthrene | ug/g | ND | 0.147 | 0.005 | 870542 |
| Pyrene | ug/g | ND | 0.037 | 0.005 | 870542 |
| **Surrogate Recovery (%)** | | | | | |
| D10-Anthracene | % | 117 | 94 | | 870542 |
| D14-Terphenyl (FS) | % | 102 | 105 | | 870542 |
| D7-Quinoline | % | 80 | 82 | | 870542 |
| D8-Acenaphthylene | % | 99 | 108 | | 870542 |

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QC Batch = Quality Control Batch



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Maxxam Job #: A5B8221
Report Date: 2005/11/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

**GENERAL COMMENTS**

Sample J50406-01: F24FID-S Analysis:
Due to high concentration of target analytes, the sample required dilution. DLs were adjusted accordingly.

Sample J50407-01: F24FID-S Analysis:
Due to high concentration of target analytes, the sample required dilution. DLs were adjusted accordingly.

**SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)**

PAH Compounds in Soil by GC/MS (SIM): The recovery of pyrene from the spiked blank was above the upper control limit. The results for this particular parameter may be biased high.

**Results relate only to the items tested.**



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report

Maxxam Job Number: MA5B8221

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 870151 BMO | RPD [J50400-02] | Moisture | 2005/11/21 | 0.7 | | % | 50 |
| 870182 BMO | RPD | Moisture | 2005/11/21 | 9.4 | | % | 50 |
| 870228 NBA | MATRIX SPIKE | | | | | | |
| | [J50399-03] | 1,4-Difluorobenzene | 2005/11/22 | | 97 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/22 | | 99 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/22 | | 91 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/22 | | 98 | % | 60 - 140 |
| | | Benzene | 2005/11/22 | | 83 | % | 60 - 140 |
| | | Toluene | 2005/11/22 | | 82 | % | 60 - 140 |
| | | Ethylbenzene | 2005/11/22 | | 76 | % | 60 - 140 |
| | | o-Xylene | 2005/11/22 | | 81 | % | 60 - 140 |
| | | p+m-Xylene | 2005/11/22 | | 78 | % | 60 - 140 |
| | | F1 (C6-C10) | 2005/11/22 | | 79 | % | 60 - 140 |
| | Spiked Blank | 1,4-Difluorobenzene | 2005/11/22 | | 100 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/22 | | 99 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/22 | | 87 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/22 | | 99 | % | 60 - 140 |
| | | Benzene | 2005/11/22 | | 81 | % | 60 - 140 |
| | | Toluene | 2005/11/22 | | 80 | % | 60 - 140 |
| | | Ethylbenzene | 2005/11/22 | | 75 | % | 60 - 140 |
| | | o-Xylene | 2005/11/22 | | 78 | % | 60 - 140 |
| | | p+m-Xylene | 2005/11/22 | | 76 | % | 60 - 140 |
| | | F1 (C6-C10) | 2005/11/22 | | 86 | % | 60 - 140 |
| | Method Blank | 1,4-Difluorobenzene | 2005/11/22 | | 101 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/22 | | 100 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/22 | | 93 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/22 | | 98 | % | 60 - 140 |
| | | Benzene | 2005/11/22 | ND, DL=0.02 | | ug/g | |
| | | Toluene | 2005/11/22 | ND, DL=0.02 | | ug/g | |
| | | Ethylbenzene | 2005/11/22 | ND, DL=0.02 | | ug/g | |
| | | o-Xylene | 2005/11/22 | ND, DL=0.02 | | ug/g | |
| | | p+m-Xylene | 2005/11/22 | ND, DL=0.04 | | ug/g | |
| | | Total Xylenes | 2005/11/22 | ND, DL=0.04 | | ug/g | |
| | | F1 (C6-C10) | 2005/11/22 | ND, DL=10 | | ug/g | |
| | | F1 (C6-C10) - BTEX | 2005/11/22 | ND, DL=10 | | ug/g | |
| | RPD [J50399-03] | Benzene | 2005/11/22 | NC | | % | 50 |
| | | Toluene | 2005/11/22 | NC | | % | 50 |
| | | Ethylbenzene | 2005/11/22 | NC | | % | 50 |
| | | o-Xylene | 2005/11/22 | NC | | % | 50 |
| | | p+m-Xylene | 2005/11/22 | NC | | % | 50 |
| | | Total Xylenes | 2005/11/22 | NC | | % | 50 |
| | | F1 (C6-C10) | 2005/11/22 | NC | | % | 50 |
| | | F1 (C6-C10) - BTEX | 2005/11/22 | NC | | % | 50 |
| 870336 DCA | MATRIX SPIKE | | | | | | |
| | [J50399-03] | o-Terphenyl | 2005/11/22 | | 98 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/22 | | 77 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/22 | | 77 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/22 | | 77 | % | 60 - 130 |
| | Spiked Blank | o-Terphenyl | 2005/11/22 | | 96 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/22 | | 73 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/22 | | 73 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/22 | | 73 | % | 60 - 130 |
| | Method Blank | o-Terphenyl | 2005/11/22 | | 95 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/22 | ND, DL=10 | | ug/g | |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/22 | ND, DL=10 | | ug/g | |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/22 | ND, DL=10 | | ug/g | |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B8221

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 870336 DCA | RPD [J50399-03] | F2 (C10-C16 Hydrocarbons) | 2005/11/22 | NC | | % | 50 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/22 | NC | | % | 50 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/22 | NC | | % | 50 |
| 870542 MWG | MATRIX SPIKE [J50409-02] | | | | | | |
| | | D10-Anthracene | 2005/11/24 | | 100 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/24 | | 100 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/24 | | 81 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/24 | | 101 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/24 | | 109 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/24 | | 110 | % | 30 - 130 |
| | | Anthracene | 2005/11/24 | | 116 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/24 | | 124 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/24 | | 116 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/24 | | 126 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/24 | | 116 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/24 | | 122 | % | 30 - 130 |
| | | Chrysene | 2005/11/24 | | 120 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/24 | | 120 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/24 | | 125 | % | 30 - 130 |
| | | Fluorene | 2005/11/24 | | 117 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/24 | | 120 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/24 | | 105 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/24 | | 110 | % | 30 - 130 |
| | | Naphthalene | 2005/11/24 | | 99 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/24 | | 117 | % | 30 - 130 |
| | | Pyrene | 2005/11/24 | | 125 | % | 30 - 130 |
| | Spiked Blank | D10-Anthracene | 2005/11/24 | | 105 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/24 | | 103 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/24 | | 88 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/24 | | 103 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/24 | | 112 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/24 | | 113 | % | 30 - 130 |
| | | Anthracene | 2005/11/24 | | 125 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/24 | | 128 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/24 | | 121 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/24 | | 126 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/24 | | 108 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/24 | | 117 | % | 30 - 130 |
| | | Chrysene | 2005/11/24 | | 125 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/24 | | 105 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/24 | | 130 | % | 30 - 130 |
| | | Fluorene | 2005/11/24 | | 120 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/24 | | 104 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/24 | | 114 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/24 | | 118 | % | 30 - 130 |
| | | Naphthalene | 2005/11/24 | | 108 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/24 | | 122 | % | 30 - 130 |
| | | Pyrene | 2005/11/24 | | 131 (1) | % | 30 - 130 |
| | Method Blank | D10-Anthracene | 2005/11/24 | | 110 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/24 | | 101 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/24 | | 78 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/24 | | 92 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/24 | ND, DL=0.01 | | ug/g | |
| | | Acenaphthylene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Anthracene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Benzo(a)anthracene | 2005/11/24 | ND, DL=0.01 | | ug/g | |



40 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B8221

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 870542 MWG | Method Blank | Benzo(a)pyrene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Benzo(b/j)fluoranthene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Benzo(g,h,i)perylene | 2005/11/24 | ND, DL=0.02 | | ug/g | |
| | | Benzo(k)fluoranthene | 2005/11/24 | ND, DL=0.01 | | ug/g | |
| | | Chrysene | 2005/11/24 | ND, DL=0.01 | | ug/g | |
| | | Dibenzo(a,h)anthracene | 2005/11/24 | ND, DL=0.02 | | ug/g | |
| | | Fluoranthene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Fluorene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/24 | ND, DL=0.02 | | ug/g | |
| | | 1-Methylnaphthalene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | 2-Methylnaphthalene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Naphthalene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Phenanthrene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | | Pyrene | 2005/11/24 | ND, DL=0.005 | | ug/g | |
| | RPD [J50409-02] | Acenaphthene | 2005/11/24 | NC | | % | 50 |
| | | Acenaphthylene | 2005/11/24 | NC | | % | 50 |
| | | Anthracene | 2005/11/24 | NC | | % | 50 |
| | | Benzo(a)anthracene | 2005/11/24 | NC | | % | 50 |
| | | Benzo(a)pyrene | 2005/11/24 | NC | | % | 50 |
| | | Benzo(b/j)fluoranthene | 2005/11/24 | 9.4 | | % | 50 |
| | | Benzo(g,h,i)perylene | 2005/11/24 | NC | | % | 50 |
| | | Benzo(k)fluoranthene | 2005/11/24 | NC | | % | 50 |
| | | Chrysene | 2005/11/24 | NC | | % | 50 |
| | | Dibenzo(a,h)anthracene | 2005/11/24 | NC | | % | 50 |
| | | Fluoranthene | 2005/11/24 | NC | | % | 50 |
| | | Fluorene | 2005/11/24 | NC | | % | 50 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/24 | NC | | % | 50 |
| | | 1-Methylnaphthalene | 2005/11/24 | 18.7 | | % | 50 |
| | | 2-Methylnaphthalene | 2005/11/24 | 26.4 | | % | 50 |
| | | Naphthalene | 2005/11/24 | 21.7 | | % | 50 |
| | | Phenanthrene | 2005/11/24 | 26.1 | | % | 50 |
| | | Pyrene | 2005/11/24 | 19.7 | | % | 50 |
| 872372 CON | MATRIX SPIKE [J50399-01] | | | | | | |
| | | Total Antimony (Sb) | 2005/11/24 | | 100 | % | 75 - 125 |
| | | Total Arsenic (As) | 2005/11/24 | | 100 | % | 75 - 125 |
| | | Total Barium (Ba) | 2005/11/24 | | 111 | % | 75 - 125 |
| | | Total Beryllium (Be) | 2005/11/24 | | 104 | % | 75 - 125 |
| | | Total Bismuth (Bi) | 2005/11/24 | | 121 | % | 75 - 125 |
| | | Total Cadmium (Cd) | 2005/11/24 | | 93 | % | 75 - 125 |
| | | Total Chromium (Cr) | 2005/11/24 | | 107 | % | 75 - 125 |
| | | Total Cobalt (Co) | 2005/11/24 | | 102 | % | 75 - 125 |
| | | Total Copper (Cu) | 2005/11/24 | | 102 | % | 75 - 125 |
| | | Total Lead (Pb) | 2005/11/24 | | 104 | % | 75 - 125 |
| | | Total Manganese (Mn) | 2005/11/24 | | 76 | % | 75 - 125 |
| | | Total Molybdenum (Mo) | 2005/11/24 | | 109 | % | 75 - 125 |
| | | Total Nickel (Ni) | 2005/11/24 | | 99 | % | 75 - 125 |
| | | Total Potassium (K) | 2005/11/24 | | 113 | % | 75 - 125 |
| | | Total Selenium (Se) | 2005/11/24 | | 102 | % | 75 - 125 |
| | | Total Silver (Ag) | 2005/11/24 | | 102 | % | 75 - 125 |
| | | Total Sodium (Na) | 2005/11/24 | | 112 | % | 75 - 125 |
| | | Total Strontium (Sr) | 2005/11/24 | | 102 | % | 75 - 125 |
| | | Total Sulphur (S) | 2005/11/24 | | 107 | % | 75 - 125 |
| | | Total Thallium (Tl) | 2005/11/24 | | 107 | % | 75 - 125 |
| | | Total Tin (Sn) | 2005/11/24 | | 100 | % | 75 - 125 |
| | | Total Vanadium (V) | 2005/11/24 | | 112 | % | 75 - 125 |
| | | Total Zinc (Zn) | 2005/11/24 | | 104 | % | 75 - 125 |



3740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B8221

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 872372 CON | QC STANDARD | Total Aluminum (Al) | 2005/11/24 | | 87 | % | 50 - 150 |
| | | Total Arsenic (As) | 2005/11/24 | | 112 | % | 30 - 170 |
| | | Total Barium (Ba) | 2005/11/24 | | 114 | % | 70 - 130 |
| | | Total Calcium (Ca) | 2005/11/24 | | 94 | % | 77 - 123 |
| | | Total Chromium (Cr) | 2005/11/24 | | 94 | % | 40 - 160 |
| | | Total Cobalt (Co) | 2005/11/24 | | 105 | % | 75 - 125 |
| | | Total Copper (Cu) | 2005/11/24 | | 108 | % | 73 - 127 |
| | | Total Iron (Fe) | 2005/11/24 | | 108 | % | 61 - 139 |
| | | Total Lead (Pb) | 2005/11/24 | | 102 | % | 54 - 146 |
| | | Total Magnesium (Mg) | 2005/11/24 | | 99 | % | 69 - 131 |
| | | Total Manganese (Mn) | 2005/11/24 | | 105 | % | 71 - 129 |
| | | Total Nickel (Ni) | 2005/11/24 | | 107 | % | 61 - 139 |
| | | Total Phosphorus (P) | 2005/11/24 | | 101 | % | 89 - 111 |
| | | Total Potassium (K) | 2005/11/24 | | 85 | % | 44 - 156 |
| | | Total Strontium (Sr) | 2005/11/24 | | 99 | % | 73 - 127 |
| | | Total Titanium (Ti) | 2005/11/24 | | 117 | % | 45 - 165 |
| | | Total Vanadium (V) | 2005/11/24 | | 105 | % | 50 - 150 |
| | | Total Zinc (Zn) | 2005/11/24 | | 109 | % | 72 - 128 |
| | Method Blank | Total Aluminum (Al) | 2005/11/24 | ND, DL=50 | | ug/g | |
| | | Total Antimony (Sb) | 2005/11/24 | ND, DL=1 | | ug/g | |
| | | Total Arsenic (As) | 2005/11/24 | ND, DL=1 | | ug/g | |
| | | Total Barium (Ba) | 2005/11/24 | ND, DL=0.5 | | ug/g | |
| | | Total Beryllium (Be) | 2005/11/24 | ND, DL=0.5 | | ug/g | |
| | | Total Bismuth (Bi) | 2005/11/24 | ND, DL=5 | | ug/g | |
| | | Total Cadmium (Cd) | 2005/11/24 | ND, DL=0.3 | | ug/g | |
| | | Total Calcium (Ca) | 2005/11/24 | 71, DL=50 | | ug/g | |
| | | Total Chromium (Cr) | 2005/11/24 | ND, DL=0.5 | | ug/g | |
| | | Total Cobalt (Co) | 2005/11/24 | ND, DL=0.5 | | ug/g | |
| | | Total Copper (Cu) | 2005/11/24 | ND, DL=0.5 | | ug/g | |
| | | Total Iron (Fe) | 2005/11/24 | ND, DL=50 | | ug/g | |
| | | Total Lead (Pb) | 2005/11/24 | ND, DL=1 | | ug/g | |
| | | Total Magnesium (Mg) | 2005/11/24 | ND, DL=50 | | ug/g | |
| | | Total Manganese (Mn) | 2005/11/24 | ND, DL=1 | | ug/g | |
| | | Total Molybdenum (Mo) | 2005/11/24 | ND, DL=0.5 | | ug/g | |
| | | Total Nickel (Ni) | 2005/11/24 | ND, DL=0.5 | | ug/g | |
| | | Total Phosphorus (P) | 2005/11/24 | ND, DL=20 | | ug/g | |
| | | Total Potassium (K) | 2005/11/24 | ND, DL=200 | | ug/g | |
| | | Total Selenium (Se) | 2005/11/24 | ND, DL=1 | | ug/g | |
| | | Total Silver (Ag) | 2005/11/24 | ND, DL=0.3 | | ug/g | |
| | | Total Sodium (Na) | 2005/11/24 | ND, DL=100 | | ug/g | |
| | | Total Strontium (Sr) | 2005/11/24 | ND, DL=1 | | ug/g | |
| | | Total Sulphur (S) | 2005/11/24 | ND, DL=50 | | ug/g | |
| | | Total Thallium (Tl) | 2005/11/24 | ND, DL=1 | | ug/g | |
| | | Total Tin (Sn) | 2005/11/24 | ND, DL=1 | | ug/g | |
| | | Total Titanium (Ti) | 2005/11/24 | ND, DL=5 | | ug/g | |
| | | Total Uranium (U) | 2005/11/24 | ND, DL=20 | | ug/g | |
| | | Total Vanadium (V) | 2005/11/24 | ND, DL=0.5 | | ug/g | |
| | | Total Zinc (Zn) | 2005/11/24 | ND, DL=3 | | ug/g | |
| | | Total Zirconium (Zr) | 2005/11/24 | ND, DL=5 | | ug/g | |
| | RPD [J50399-01] | Total Aluminum (Al) | 2005/11/24 | 3.0 | | % | 20 |
| | | Total Antimony (Sb) | 2005/11/24 | NC | | % | 20 |
| | | Total Arsenic (As) | 2005/11/24 | NC | | % | 20 |
| | | Total Barium (Ba) | 2005/11/24 | 7.1 | | % | 20 |
| | | Total Beryllium (Be) | 2005/11/24 | NC | | % | 20 |
| | | Total Bismuth (Bi) | 2005/11/24 | NC | | % | 20 |
| | | Total Cadmium (Cd) | 2005/11/24 | NC | | % | 20 |



140 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B8221

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 872372 CON | RPD [J50399-01] | Total Calcium (Ca) | 2005/11/24 | 3.2 | | % | 20 |
| | | Total Chromium (Cr) | 2005/11/24 | 2.8 | | % | 20 |
| | | Total Cobalt (Co) | 2005/11/24 | 3.0 | | % | 20 |
| | | Total Copper (Cu) | 2005/11/24 | 1.1 | | % | 20 |
| | | Total Iron (Fe) | 2005/11/24 | 3.8 | | % | 20 |
| | | Total Lead (Pb) | 2005/11/24 | NC | | % | 20 |
| | | Total Magnesium (Mg) | 2005/11/24 | 0.2 | | % | 20 |
| | | Total Manganese (Mn) | 2005/11/24 | 6.2 | | % | 20 |
| | | Total Molybdenum (Mo) | 2005/11/24 | NC | | % | 20 |
| | | Total Nickel (Ni) | 2005/11/24 | 4.3 | | % | 20 |
| | | Total Phosphorus (P) | 2005/11/24 | 6.3 | | % | 20 |
| | | Total Potassium (K) | 2005/11/24 | NC | | % | 20 |
| | | Total Selenium (Se) | 2005/11/24 | NC | | % | 20 |
| | | Total Silver (Ag) | 2005/11/24 | NC | | % | 20 |
| | | Total Sodium (Na) | 2005/11/24 | NC | | % | 20 |
| | | Total Strontium (Sr) | 2005/11/24 | 5.1 | | % | 20 |
| | | Total Sulphur (S) | 2005/11/24 | NC | | % | 20 |
| | | Total Thallium (Tl) | 2005/11/24 | NC | | % | 20 |
| | | Total Tin (Sn) | 2005/11/24 | NC | | % | 20 |
| | | Total Titanium (Ti) | 2005/11/24 | 0.4 | | % | 20 |
| | | Total Uranium (U) | 2005/11/24 | NC | | % | 20 |
| | | Total Vanadium (V) | 2005/11/24 | 2.8 | | % | 20 |
| | | Total Zinc (Zn) | 2005/11/24 | 2.4 | | % | 20 |
| | | Total Zirconium (Zr) | 2005/11/24 | NC | | % | 20 |

ND = Not detected
NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample
( 1 ) Please note that the recovery of some compounds are outside control limits however the overall quality control for this analysis meets our acceptability criteria.



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Maxxam Analytics Inc

[redacted] Mississauga, ON [redacted] Phone: 905-817-5700 Fax: 905-817-5777 Toll Free: (800) 563-6266

50 Bathurst Drive, Unit 12, Waterloo, ON N2V 2C5 Phone: 519-747-2575 Fax: 519-747-3806 Toll Free: (866) 747-8749

www.maxxamanalytics.com

Form 79.1992v1

**393349**

| INVOICE INFORMATION: | REPORT INFORMATION (if differs from invoice): | | |
|---|---|---|---|
| Company Name: CP RAIL C/O MORROW | Company Name: SAME | PO #: [redacted]4780 | MAXXAM JOB NUMBER: A5B8221 |
| Contact Name: ANDREW FABIAN | Contact Name: | Project #: [redacted]05301HA | SAMPLES ENTERED BY: AB \| AB |
| Address: 1-1420 CLARENCE AVE WINNIPEG, MB | Address: EMAIL TO: CYNTHIA.CUDDY@SNCLAVALIN.COM | Project Name: CP SOURIS YARD | |
| Phone / Fax #: Phone: 204 475-4755 Fax: 204 477-0199 | Phone / Fax #: Phone: Fax: | Location: SOURIS, MB | |
| | | Quotation #: | |
| | | Submitted By: JDC | |

Are these regulatory samples? Yes ☐ No ☐

If yes, which regulation applies?

☐ GUCSO ☐ MISA ☐ PWQO ☐ SDWA ☐ OTHER _____

WATERWORKS NAME:

WATERWORKS NUMBER:

Is this submission a "resampling" due to previously reported adverse conditions? Yes ☐ No ☒

** UNLESS CLEARLY IDENTIFIED ALL WATER SAMPLES RECEIVED AT MAXXAM ANALYTICS WILL BE TREATED AS NON-POTABLE AND WILL NOT BE SUBJECT TO THE REQUIREMENTS UNDER THE SDWA REGULATION. **

* IF DRINKING WATER, IDENTIFY AS "RAW", "TREATED", "DISTRIBUTION" OR "PLUMBING"

ANALYSIS REQUESTED (Indicate Preferred Method)

Sample requires notification if adverse under the Safe Drinking Water Act

BTEX | LIME PHC F1-F4 | METALS

Health / Chemical Hazard?

DUE DATE:

STANDARD: _____

RUSH: _____

*Note: Rush analysis must be scheduled prior to sample submission.

| | Sample Identification | Sample Type* | Date / Time Sampled | # of Cont. | COMMENTS |
|---|---|---|---|---|---|
| 1 | BH05-16-2-05A16 | SOIL | 05/11/16 / 1019 | 3 | |
| 2 | [illegible] | | /1020 | 2 | |
| 3 | BH05-15-5-051116 | | /0945 | 2 | |
| 4 | [illegible] | | /0950 | 2 | |
| 5 | BH05-14-2-051116 | | /0915 | 2 | |
| 6 | [illegible] | | /0800 | 2 | |
| 7 | BH05-13-1-051116 | | /0805 | 2 | |
| 8 | [illegible] | | /0810 | 2 | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |

"I the undersigned, hereby acknowledge the understanding and acceptance of Maxxam's terms and conditions as listed on the back of this form."

| REQUESTED BY: (Signature/Print) | RECEIVED BY: (Signature/Print) | DATE / TIME | PURPOSE OF CHANGE / REMARKS | TEMP (°C) ON RECEIPT AT MAXXAM |
|---|---|---|---|---|
| JDC / C. Cuddy | Zofia | 05/11/19 2:52 | NOV 19 '05 PM 2:52 | 11.0°C |

# CHAIN OF CUSTODY RECORD

Maxxam Analytics Inc

6740 Campobello Road, Mississauga, ON L5N 2L8 Phone: 905-817-5700 Fax: 905-817-5777 Toll Free: (800) 563-6266

50 Bathurst Drive, Unit 12, Waterloo, ON N2V 2C5 Phone: 519-747-2575 Fax: 519-747-3806 Toll Free: (866) 747-8749

www.maxxamanalytics.com

Form TS1002-1

**347606**

Andrew Eason

| INVOICE INFORMATION: | REPORT INFORMATION (if differs from invoice): | | MAXXAM JOB NUMBER: |
|---|---|---|---|
| Company Name: CP RAIL C/O MORROW | Company Name: SAME | PO #: EA780 | |
| Contact Name: [illegible] Clearance Agent | Contact Name: | Project #: W05301A | |
| Address: E-1470 Clearance WINNIPEG, MB | Address: EMAIL TO CYNTHIA_CUDDY@CNCLAWLIN.COM | Project Name: 730 CP SOURIS YARD | |
| Phone / Fax #: Phone: 204 475 4[illegible] 204 477-9194 | Phone / Fax #: Phone: Fax: | Location: SOURIS, MB | SAMPLES ENTERED BY: |
| | | Quotation #: | |
| | | Submitted By: JDT | |

Are these regulatory samples? Yes ☐ No ☒

If yes, which regulation applies?

☐ GUCSO ☐ MISA ☐ PWQO ☐ SDWA ☐ OTHER _____

WATERWORKS NAME:

WATERWORKS NUMBER:

Is this submission a "resampling" due to previously reported adverse conditions? Yes ☐ No ☒

** UNLESS CLEARLY IDENTIFIED ALL WATER SAMPLES RECEIVED AT MAXXAM ANALYTICS WILL BE TREATED AS NON-POTABLE AND WILL NOT BE SUBJECT TO THE REQUIREMENTS UNDER THE SDWA REGULATION. **

* IF DRINKING WATER, IDENTIFY AS "RAW", "TREATED", "DISTRIBUTION" OR "PLUMBING"

ANALYSIS REQUESTED (Indicate Preferred Method)

DUE DATE:

STANDARD: X

RUSH: _____

*Note: Rush analysis must be scheduled prior to sample submission.

| | Sample Identification | Sample Type* | Date / Time Sampled | # of Cont. | Sample requires notification if adverse under the Safe Drinking Water Act | PAHs | metals | BTEX | CLME PHC F1-F4 | | | | | GRAIN SIZE (% PASS #200) | Health / Chemical Hazard? | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F. BLANK - 051116 | SOIL | 051116/1710 | 2 | | X | X | | | | | | | | | |
| 2 | BH05-20-2-051116 | | 051116/1450 | 2 | | | | | | | | | | X | | ZIPLOC BAG |
| 3 | BH05-20-3-051116 | | 051116/1455 | 1 | | | | | | | | | | X | | ZIPLOC BAG. |
| 4 | BH05-20-1-051116 | | 051116/1500 | 2 | | | X | X | X | | | | | | | |
| 5 | BH05-20-3-051116 | | 051116/1455 | 3 | | | X | X | X | | | | | | | |
| 6 | BH05-19-1-051116 | | 051116/1600 | 2 | | | X | X | X | | | | | | | |
| 7 | BH05-19-2-051116 | | 051116/1606 | 3 | | | | | | | | | | | | |
| 8 | BH05-19-3-051116 | | 051116/1610 | 2 | | | | | | | | | | | | |
| 9 | BH05-18-1-051116 | | 051116/1331 | 3 | | X | X | | | | | | | | | |
| 10 | BH05-18-2-051116 | | 051116/1335 | 3 | | | | | | | | | | | | |
| 11 | BH05-17-4-051116 | | 051116/1109 | 2 | | | X | X | X | | | | | | | |
| 12 | BH05-17-3-051116 | | 051116/1115 | 3 | | | | | | | | | | | | |

"I the undersigned, hereby acknowledge the understanding and acceptance of Maxxam's terms and conditions as listed on the back of this form."

| REQUESTED BY: (Signature/Print) | RECEIVED BY: (Signature/Print) | DATE / TIME | PURPOSE OF CHANGE / REMARKS | TEMP (°C) ON RECEIPT AT MAXXAM |
|---|---|---|---|---|
| JDT. | | | | |
| C. Cuddy | Zohn | 05/11/19 2:52 | NOV 19 '05 PM 2:52 | -1.1°C |

Maxxam Job #: A5B9647
Report Date: 2005/11/30

Morrow Environmental Consultants Inc
Client Project #: W053011A/CP SOURIS YARD
Project name: SOURIS MB
Your P.O. #: EA780
Sampler Initials:

**GENERAL COMMENTS**

Sample J57005-01: F1BTEXHS-S: Sample diluted due to high concentration of target analytes. The DL's were adjusted accordingly.

Sample J57006-01: F1BTEXHS-S and F24FID-S analyses: Sample diluted due to high concentration of target analytes. The DL's were adjusted accordingly.

Sample J57006-01: F24FID-S:
Sample was diluted due to high concentration of target compounds. The DLs were adjusted accordingly.

**SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)**

PAH Compounds in Soil by GC/MS (SIM): Due to matrix interferences, matrix spike required dilution. DLs were adjusted accordingly. The recoveries for some target analytes in the matrix spike were not reported due to the presence of these parameters in high concentration in the parent sample.
Duplicate results for QC batch 874557 exceeded the RPD acceptance criteria. This is likely due to the heterogeneity of the sample.

**Results relate only to the items tested.**



40 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental Consultants Inc
Attention: Andrew Eason
Client Project #: W053011A/CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS MB

## Quality Assurance Report

Maxxam Job Number: MA5B9647

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 873250 JKA | MATRIX SPIKE | o-Terphenyl | 2005/11/25 | | 106 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/25 | | 83 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/25 | | 83 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/25 | | 83 | % | 60 - 130 |
| | Spiked Blank | o-Terphenyl | 2005/11/25 | | 100 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/25 | | 101 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/25 | | 101 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/25 | | 101 | % | 60 - 130 |
| | Method Blank | o-Terphenyl | 2005/11/25 | | 103 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/11/25 | ND, DL=10 | | ug/g | |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/25 | ND, DL=10 | | ug/g | |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/25 | ND, DL=10 | | ug/g | |
| | RPD | F2 (C10-C16 Hydrocarbons) | 2005/11/25 | NC | | % | 50 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/11/25 | NC | | % | 50 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/11/25 | NC | | % | 50 |
| 873269 TDP | MATRIX SPIKE | 1,4-Difluorobenzene | 2005/11/25 | | 93 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/25 | | 98 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/25 | | 97 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/25 | | 110 | % | 60 - 140 |
| | | Benzene | 2005/11/25 | | 92 | % | 60 - 140 |
| | | Toluene | 2005/11/25 | | 88 | % | 60 - 140 |
| | | Ethylbenzene | 2005/11/25 | | 88 | % | 60 - 140 |
| | | o-Xylene | 2005/11/25 | | 94 | % | 60 - 140 |
| | | p+m-Xylene | 2005/11/25 | | 89 | % | 60 - 140 |
| | | F1 (C6-C10) | 2005/11/25 | | 61 | % | 60 - 140 |
| | Spiked Blank | 1,4-Difluorobenzene | 2005/11/25 | | 100 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/25 | | 101 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/25 | | 100 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/25 | | 100 | % | 60 - 140 |
| | | Benzene | 2005/11/25 | | 91 | % | 60 - 140 |
| | | Toluene | 2005/11/25 | | 90 | % | 60 - 140 |
| | | Ethylbenzene | 2005/11/25 | | 92 | % | 60 - 140 |
| | | o-Xylene | 2005/11/25 | | 97 | % | 60 - 140 |
| | | p+m-Xylene | 2005/11/25 | | 94 | % | 60 - 140 |
| | | F1 (C6-C10) | 2005/11/25 | | 80 | % | 60 - 140 |
| | Method Blank | 1,4-Difluorobenzene | 2005/11/25 | | 100 | % | 60 - 140 |
| | | 4-Bromofluorobenzene | 2005/11/25 | | 100 | % | 60 - 140 |
| | | D10-Ethylbenzene | 2005/11/25 | | 100 | % | 30 - 130 |
| | | D4-1,2-Dichloroethane | 2005/11/25 | | 101 | % | 60 - 140 |
| | | Benzene | 2005/11/25 | ND, DL=0.02 | | ug/g | |
| | | Toluene | 2005/11/25 | ND, DL=0.02 | | ug/g | |
| | | Ethylbenzene | 2005/11/25 | ND, DL=0.02 | | ug/g | |
| | | o-Xylene | 2005/11/25 | ND, DL=0.02 | | ug/g | |
| | | p+m-Xylene | 2005/11/25 | ND, DL=0.04 | | ug/g | |
| | | Total Xylenes | 2005/11/25 | ND, DL=0.04 | | ug/g | |
| | | F1 (C6-C10) | 2005/11/25 | ND, DL=10 | | ug/g | |
| | | F1 (C6-C10) - BTEX | 2005/11/25 | ND, DL=10 | | ug/g | |
| | RPD | Benzene | 2005/11/25 | NC | | % | 50 |
| | | Toluene | 2005/11/25 | NC | | % | 50 |
| | | Ethylbenzene | 2005/11/25 | NC | | % | 50 |
| | | o-Xylene | 2005/11/25 | NC | | % | 50 |
| | | p+m-Xylene | 2005/11/25 | NC | | % | 50 |
| | | Total Xylenes | 2005/11/25 | NC | | % | 50 |
| | | F1 (C6-C10) | 2005/11/25 | NC | | % | 50 |
| | | F1 (C6-C10) - BTEX | 2005/11/25 | NC | | % | 50 |
| 873738 SPT | RPD | Moisture | 2005/11/25 | 0.5 | | % | 50 |



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Morrow Environmental Consultants Inc
Attention: Andrew Eason
Client Project #: W053011A/CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B9647

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 874331 SPT | RPD | Moisture | 2005/11/26 | 0 | | % | 50 |
| 874557 MWG | MATRIX SPIKE | D10-Anthracene | 2005/11/30 | | 111 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/30 | | 85 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/30 | | 86 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/30 | | 91 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/30 | | 79 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/30 | | 76 | % | 30 - 130 |
| | | Anthracene | 2005/11/30 | | 93 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/30 | | 35 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/30 | | 82 | % | 30 - 130 |
| | | Fluorene | 2005/11/30 | | 100 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/30 | | 96 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/30 | | 95 | % | 30 - 130 |
| | | Naphthalene | 2005/11/30 | | 91 | % | 30 - 130 |
| | Spiked Blank | D10-Anthracene | 2005/11/30 | | 81 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/30 | | 85 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/30 | | 86 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/30 | | 77 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/30 | | 74 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/30 | | 69 | % | 30 - 130 |
| | | Anthracene | 2005/11/30 | | 83 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/30 | | 93 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/30 | | 77 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/30 | | 86 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/30 | | 101 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/30 | | 86 | % | 30 - 130 |
| | | Chrysene | 2005/11/30 | | 90 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/30 | | 99 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/30 | | 92 | % | 30 - 130 |
| | | Fluorene | 2005/11/30 | | 75 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/30 | | 101 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/30 | | 95 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/30 | | 93 | % | 30 - 130 |
| | | Naphthalene | 2005/11/30 | | 83 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/30 | | 86 | % | 30 - 130 |
| | | Pyrene | 2005/11/30 | | 90 | % | 30 - 130 |
| | Method Blank | D10-Anthracene | 2005/11/30 | | 79 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/30 | | 84 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/30 | | 80 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/30 | | 77 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/30 | ND, DL=0.01 | | ug/g | |
| | | Acenaphthylene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Anthracene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Benzo(a)anthracene | 2005/11/30 | ND, DL=0.01 | | ug/g | |
| | | Benzo(a)pyrene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Benzo(b/j)fluoranthene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Benzo(g,h,i)perylene | 2005/11/30 | ND, DL=0.02 | | ug/g | |
| | | Benzo(k)fluoranthene | 2005/11/30 | ND, DL=0.01 | | ug/g | |
| | | Chrysene | 2005/11/30 | ND, DL=0.01 | | ug/g | |
| | | Dibenzo(a,h)anthracene | 2005/11/30 | ND, DL=0.02 | | ug/g | |
| | | Fluoranthene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Fluorene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/30 | ND, DL=0.02 | | ug/g | |
| | | 1-Methylnaphthalene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | 2-Methylnaphthalene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Naphthalene | 2005/11/30 | ND, DL=0.005 | | ug/g | |



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Client Project #: W053011A/CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B9647

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 874557 MWG | Method Blank | Phenanthrene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Pyrene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| 874978 BGI | MATRIX SPIKE | Total Phosphorus (P) | 2005/11/29 | | 88 | % | 75 - 125 |
| | | Total Potassium (K) | 2005/11/29 | | 125 | % | 75 - 125 |
| | QC STANDARD | Total Phosphorus (P) | 2005/11/29 | | 110 | % | 89 - 111 |
| | | Total Potassium (K) | 2005/11/29 | | 100 | % | 44 - 156 |
| | Method Blank | Total Phosphorus (P) | 2005/11/29 | ND, DL=20 | | ug/g | |
| | | Total Potassium (K) | 2005/11/29 | ND, DL=200 | | ug/g | |
| 875089 CON | MATRIX SPIKE | Total Antimony (Sb) | 2005/11/29 | | 102 | % | 75 - 125 |
| | | Total Arsenic (As) | 2005/11/29 | | 102 | % | 75 - 125 |
| | | Total Barium (Ba) | 2005/11/29 | | 98 | % | 75 - 125 |
| | | Total Beryllium (Be) | 2005/11/29 | | 101 | % | 75 - 125 |
| | | Total Bismuth (Bi) | 2005/11/29 | | 113 | % | 75 - 125 |
| | | Total Cadmium (Cd) | 2005/11/29 | | 96 | % | 75 - 125 |
| | | Total Chromium (Cr) | 2005/11/29 | | 107 | % | 75 - 125 |
| | | Total Cobalt (Co) | 2005/11/29 | | 103 | % | 75 - 125 |
| | | Total Copper (Cu) | 2005/11/29 | | 108 | % | 75 - 125 |
| | | Total Lead (Pb) | 2005/11/29 | | 104 | % | 75 - 125 |
| | | Total Molybdenum (Mo) | 2005/11/29 | | 100 | % | 75 - 125 |
| | | Total Nickel (Ni) | 2005/11/29 | | 105 | % | 75 - 125 |
| | | Total Selenium (Se) | 2005/11/29 | | 95 | % | 75 - 125 |
| | | Total Silver (Ag) | 2005/11/29 | | 99 | % | 75 - 125 |
| | | Total Sodium (Na) | 2005/11/29 | | 122 | % | 75 - 125 |
| | | Total Sulphur (S) | 2005/11/29 | | 114 | % | 75 - 125 |
| | | Total Thallium (Tl) | 2005/11/29 | | 98 | % | 75 - 125 |
| | | Total Tin (Sn) | 2005/11/29 | | 98 | % | 75 - 125 |
| | | Total Vanadium (V) | 2005/11/29 | | 122 | % | 75 - 125 |
| | | Total Zinc (Zn) | 2005/11/29 | | 124 | % | 75 - 125 |
| | QC STANDARD | Total Aluminum (Al) | 2005/11/29 | | 89 | % | 50 - 150 |
| | | Total Arsenic (As) | 2005/11/29 | | 124 | % | 30 - 170 |
| | | Total Barium (Ba) | 2005/11/29 | | 112 | % | 70 - 130 |
| | | Total Calcium (Ca) | 2005/11/29 | | 90 | % | 77 - 123 |
| | | Total Chromium (Cr) | 2005/11/29 | | 97 | % | 40 - 160 |
| | | Total Cobalt (Co) | 2005/11/29 | | 108 | % | 75 - 125 |
| | | Total Copper (Cu) | 2005/11/29 | | 113 | % | 73 - 127 |
| | | Total Iron (Fe) | 2005/11/29 | | 113 | % | 61 - 139 |
| | | Total Lead (Pb) | 2005/11/29 | | 107 | % | 54 - 146 |
| | | Total Magnesium (Mg) | 2005/11/29 | | 106 | % | 69 - 131 |
| | | Total Manganese (Mn) | 2005/11/29 | | 111 | % | 71 - 129 |
| | | Total Nickel (Ni) | 2005/11/29 | | 111 | % | 61 - 139 |
| | | Total Phosphorus (P) | 2005/11/29 | | 101 | % | 89 - 111 |
| | | Total Potassium (K) | 2005/11/29 | | 91 | % | 44 - 156 |
| | | Total Strontium (Sr) | 2005/11/29 | | 104 | % | 73 - 127 |
| | | Total Titanium (Ti) | 2005/11/29 | | 126 | % | 45 - 165 |
| | | Total Vanadium (V) | 2005/11/29 | | 112 | % | 50 - 150 |
| | | Total Zinc (Zn) | 2005/11/29 | | 110 | % | 72 - 128 |
| | Method Blank | Total Aluminum (Al) | 2005/11/29 | ND, DL=50 | | ug/g | |
| | | Total Antimony (Sb) | 2005/11/29 | ND, DL=1 | | ug/g | |
| | | Total Arsenic (As) | 2005/11/29 | ND, DL=1 | | ug/g | |
| | | Total Barium (Ba) | 2005/11/29 | ND, DL=0.5 | | ug/g | |
| | | Total Beryllium (Be) | 2005/11/29 | ND, DL=0.5 | | ug/g | |
| | | Total Bismuth (Bi) | 2005/11/29 | ND, DL=5 | | ug/g | |
| | | Total Cadmium (Cd) | 2005/11/29 | ND, DL=0.3 | | ug/g | |
| | | Total Calcium (Ca) | 2005/11/29 | ND, DL=50 | | ug/g | |
| | | Total Chromium (Cr) | 2005/11/29 | ND, DL=0.5 | | ug/g | |
| | | Total Cobalt (Co) | 2005/11/29 | ND, DL=0.5 | | ug/g | |



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Client Project #: W053011A/CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B9647

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 875089 CON | Method Blank | Total Copper (Cu) | 2005/11/29 | ND, DL=0.5 | | ug/g | |
| | | Total Iron (Fe) | 2005/11/29 | ND, DL=50 | | ug/g | |
| | | Total Lead (Pb) | 2005/11/29 | ND, DL=1 | | ug/g | |
| | | Total Magnesium (Mg) | 2005/11/29 | ND, DL=50 | | ug/g | |
| | | Total Manganese (Mn) | 2005/11/29 | ND, DL=1 | | ug/g | |
| | | Total Molybdenum (Mo) | 2005/11/29 | ND, DL=0.5 | | ug/g | |
| | | Total Nickel (Ni) | 2005/11/29 | ND, DL=0.5 | | ug/g | |
| | | Total Phosphorus (P) | 2005/11/29 | ND, DL=20 | | ug/g | |
| | | Total Potassium (K) | 2005/11/29 | ND, DL=200 | | ug/g | |
| | | Total Selenium (Se) | 2005/11/29 | ND, DL=1 | | ug/g | |
| | | Total Silver (Ag) | 2005/11/29 | ND, DL=0.3 | | ug/g | |
| | | Total Sodium (Na) | 2005/11/29 | ND, DL=100 | | ug/g | |
| | | Total Strontium (Sr) | 2005/11/29 | ND, DL=1 | | ug/g | |
| | | Total Sulphur (S) | 2005/11/29 | ND, DL=50 | | ug/g | |
| | | Total Thallium (Tl) | 2005/11/29 | ND, DL=1 | | ug/g | |
| | | Total Tin (Sn) | 2005/11/29 | ND, DL=1 | | ug/g | |
| | | Total Titanium (Ti) | 2005/11/29 | ND, DL=5 | | ug/g | |
| | | Total Uranium (U) | 2005/11/29 | ND, DL=20 | | ug/g | |
| | | Total Vanadium (V) | 2005/11/29 | ND, DL=0.5 | | ug/g | |
| | | Total Zinc (Zn) | 2005/11/29 | ND, DL=3 | | ug/g | |
| | | Total Zirconium (Zr) | 2005/11/29 | ND, DL=5 | | ug/g | |
| | RPD | Total Antimony (Sb) | 2005/11/29 | NC | | % | 20 |
| | | Total Arsenic (As) | 2005/11/29 | NC | | % | 20 |
| | | Total Barium (Ba) | 2005/11/29 | 8.1 | | % | 20 |
| | | Total Beryllium (Be) | 2005/11/29 | NC | | % | 20 |
| | | Total Cadmium (Cd) | 2005/11/29 | NC | | % | 20 |
| | | Total Chromium (Cr) | 2005/11/29 | 14.7 | | % | 20 |
| | | Total Cobalt (Co) | 2005/11/29 | NC | | % | 20 |
| | | Total Copper (Cu) | 2005/11/29 | 9.6 | | % | 20 |
| | | Total Lead (Pb) | 2005/11/29 | NC | | % | 20 |
| | | Total Molybdenum (Mo) | 2005/11/29 | NC | | % | 20 |
| | | Total Nickel (Ni) | 2005/11/29 | 1.2 | | % | 20 |
| | | Total Selenium (Se) | 2005/11/29 | NC | | % | 20 |
| | | Total Silver (Ag) | 2005/11/29 | NC | | % | 20 |
| | | Total Thallium (Tl) | 2005/11/29 | NC | | % | 20 |
| | | Total Vanadium (V) | 2005/11/29 | 1.2 | | % | 20 |
| | | Total Zinc (Zn) | 2005/11/29 | NC | | % | 20 |
| 875529 LS | QC STANDARD | Conductivity | 2005/11/29 | | 100 | % | 85 - 115 |
| | Method Blank | Conductivity | 2005/11/29 | ND, DL=2 | | umho/cm | |
| | RPD [J57001-01] | Conductivity | 2005/11/29 | 0 | | % | 35 |
| 875762 NMO | MATRIX SPIKE | D10-Anthracene | 2005/11/30 | | 95 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/30 | | 93 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/30 | | 85 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/30 | | 96 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/30 | | 66 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/30 | | 64 | % | 30 - 130 |
| | | Anthracene | 2005/11/30 | | 71 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/30 | | 77 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/30 | | 72 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/30 | | 78 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/30 | | 78 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/30 | | 74 | % | 30 - 130 |
| | | Chrysene | 2005/11/30 | | 76 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/30 | | 74 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/30 | | 79 | % | 30 - 130 |
| | | Fluorene | 2005/11/30 | | 71 | % | 30 - 130 |



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Project name: SOURIS MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B9647

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 875762 NMO | MATRIX SPIKE | Indeno(1,2,3-cd)pyrene | 2005/11/30 | | 78 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/30 | | 67 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/30 | | 66 | % | 30 - 130 |
| | | Naphthalene | 2005/11/30 | | 62 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/30 | | 70 | % | 30 - 130 |
| | | Pyrene | 2005/11/30 | | 78 | % | 30 - 130 |
| | Spiked Blank | D10-Anthracene | 2005/11/30 | | 107 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/30 | | 96 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/30 | | 101 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/30 | | 108 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/30 | | 71 | % | 30 - 130 |
| | | Acenaphthylene | 2005/11/30 | | 71 | % | 30 - 130 |
| | | Anthracene | 2005/11/30 | | 76 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/11/30 | | 78 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/11/30 | | 68 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/11/30 | | 74 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/11/30 | | 78 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/11/30 | | 78 | % | 30 - 130 |
| | | Chrysene | 2005/11/30 | | 78 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/11/30 | | 75 | % | 30 - 130 |
| | | Fluoranthene | 2005/11/30 | | 77 | % | 30 - 130 |
| | | Fluorene | 2005/11/30 | | 75 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/30 | | 74 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/11/30 | | 74 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/11/30 | | 76 | % | 30 - 130 |
| | | Naphthalene | 2005/11/30 | | 70 | % | 30 - 130 |
| | | Phenanthrene | 2005/11/30 | | 71 | % | 30 - 130 |
| | | Pyrene | 2005/11/30 | | 77 | % | 30 - 130 |
| | Method Blank | D10-Anthracene | 2005/11/30 | | 110 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/11/30 | | 90 | % | 30 - 130 |
| | | D7-Quinoline | 2005/11/30 | | 96 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/11/30 | | 103 | % | 30 - 130 |
| | | Acenaphthene | 2005/11/30 | ND, DL=0.01 | | ug/g | |
| | | Acenaphthylene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Anthracene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Benzo(a)anthracene | 2005/11/30 | ND, DL=0.01 | | ug/g | |
| | | Benzo(a)pyrene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Benzo(b/j)fluoranthene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Benzo(g,h,i)perylene | 2005/11/30 | ND, DL=0.02 | | ug/g | |
| | | Benzo(k)fluoranthene | 2005/11/30 | ND, DL=0.01 | | ug/g | |
| | | Chrysene | 2005/11/30 | ND, DL=0.01 | | ug/g | |
| | | Dibenzo(a,h)anthracene | 2005/11/30 | ND, DL=0.02 | | ug/g | |
| | | Fluoranthene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Fluorene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/30 | ND, DL=0.02 | | ug/g | |
| | | 1-Methylnaphthalene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | 2-Methylnaphthalene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Naphthalene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Phenanthrene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | | Pyrene | 2005/11/30 | ND, DL=0.005 | | ug/g | |
| | RPD | D14-Terphenyl (FS) | 2005/11/30 | 5.2 | | % | N/A |
| | | Acenaphthene | 2005/11/30 | NC | | % | 50 |
| | | Acenaphthylene | 2005/11/30 | NC | | % | 50 |
| | | Anthracene | 2005/11/30 | NC | | % | 50 |
| | | Benzo(a)anthracene | 2005/11/30 | NC | | % | 50 |
| | | Benzo(a)pyrene | 2005/11/30 | NC | | % | 50 |



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## Quality Assurance Report (Continued)

Maxxam Job Number: MA5B9647

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 875762 NMO | RPD | Benzo(b/j)fluoranthene | 2005/11/30 | NC | | % | 50 |
| | | Benzo(g,h,i)perylene | 2005/11/30 | NC | | % | 50 |
| | | Benzo(k)fluoranthene | 2005/11/30 | NC | | % | 50 |
| | | Chrysene | 2005/11/30 | NC | | % | 50 |
| | | Dibenzo(a,h)anthracene | 2005/11/30 | NC | | % | 50 |
| | | Fluoranthene | 2005/11/30 | NC | | % | 50 |
| | | Fluorene | 2005/11/30 | NC | | % | 50 |
| | | Indeno(1,2,3-cd)pyrene | 2005/11/30 | NC | | % | 50 |
| | | 1-Methylnaphthalene | 2005/11/30 | NC | | % | 50 |
| | | 2-Methylnaphthalene | 2005/11/30 | NC | | % | 50 |
| | | Naphthalene | 2005/11/30 | NC | | % | 50 |
| | | Phenanthrene | 2005/11/30 | NC | | % | 50 |
| | | Pyrene | 2005/11/30 | NC | | % | 50 |
| 875840 CCI | MATRIX SPIKE | | | | | | |
| | [J57001-01] | Nitrite (N) | 2005/11/30 | | 101 | % | 75 - 125 |
| | | Nitrate (N) | 2005/11/30 | | 107 | % | 75 - 125 |
| | Spiked Blank | Nitrite (N) | 2005/11/30 | | 105 | % | 85 - 115 |
| | | Nitrate (N) | 2005/11/30 | | 100 | % | 85 - 117 |
| | Method Blank | Nitrite (N) | 2005/11/30 | ND, DL=0.5 | | ug/g | |
| | | Nitrate (N) | 2005/11/30 | ND, DL=2 | | ug/g | |
| | | Nitrate + Nitrite | 2005/11/30 | ND, DL=2.5 | | ug/g | |
| | RPD [J57001-01] | Nitrite (N) | 2005/11/30 | NC | | % | 25 |
| | | Nitrate (N) | 2005/11/30 | NC | | % | 25 |
| | | Nitrate + Nitrite | 2005/11/30 | NC | | % | 25 |

ND = Not detected
N/A = Not Applicable
NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample



40 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

# CHAIN OF CUSTODY RECORD

Form TS.1002-1

**Maxxam Analytics Inc**

☒ 6740 Campobello Road, Mississauga, ON L5N 2L8 Phone: 905-817-5700 Fax: 905-817-5777 Toll Free: (800) 563-6266

☐ 50 Bathurst Drive, Unit 12, Waterloo, ON N2V 2C5 Phone: 519-747-2575 Fax: 519-747-3806 Toll Free: (866) 747-8749

www.maxxamanalytics.com

956

**393352**

MAXXAM JOB NUMBER: A539647

SAMPLES ENTERED BY:

| INVOICE INFORMATION: | REPORT INFORMATION (if differs from invoice): |
|---|---|
| Company Name: CP RAIL c/o Morrow | Company Name: SAME |
| Contact Name: A. EASON | Contact Name: |
| Address: 6-1420 Clarence Ave. WINNIPEG, MB. | Address: EMAIL TO: CYNTHIA.CUDDY@SNCLAVALIN.COM |
| Phone / Fax #: Phone: 204 477 4733 Fax: 204 477-9194 | Phone / Fax #: Phone: Fax: |

| | |
|---|---|
| PO #: EA780 | |
| Project #: W053011A | |
| Project Name: CP SOURIS YARD | |
| Location: SOURIS, MB | |
| Quotation #: | |
| Submitted By: JDT | |

Are these regulatory samples? Yes ☐ No ☐

If yes, which regulation applies?

☐ GUCSO ☐ MISA ☐ PWQO ☐ SDWA ☐ OTHER

Is this submission a "resampling" due to previously reported adverse conditions? Yes ☐ No ☒

WATERWORKS NAME:

WATERWORKS NUMBER:

** UNLESS CLEARLY IDENTIFIED ALL WATER SAMPLES RECEIVED AT MAXXAM ANALYTICS WILL BE TREATED AS NON-POTABLE AND WILL NOT BE SUBJECT TO THE REQUIREMENTS UNDER THE SDWA REGULATION. **

* IF DRINKING WATER, IDENTIFY AS "RAW", "TREATED", "DISTRIBUTION" OR "PLUMBING"

ANALYSIS REQUESTED (Indicate Preferred Method)

DUE DATE:

STANDARD: X

RUSH: ____

*Note: Rush analysis must be scheduled prior to sample submission.

| | Sample Identification | Sample Type* | Date / Time Sampled | # of Cont. | Sample requires notification if adverse under the Safe Drinking Water Act | BTEX | F1 to F4 | PAH | METALS - LEP | NITRATE / NITRITE | POTASSIUM PERMANGANATE | PHENOLICS | 1,3-DICHLOROPROPENE | Health Chemical Hazard? | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SS-1- 051121 | SOIL | 051121/0750 | 4 | | X | X | X | X | | | | | | |
| 2 | BH05-31-1-051121 | | 1035 | 3 | | X | X | | X | | | | | | |
| 3 | BH05-31-3-051121 | | 1110 | 3 | | X | X | | X | | | | | | |
| 4 | BH05-32-1- 051121 | | 1245 | 2 | | X | X | | X | | | | | | |
| 5 | BH05-32-3- 051121 | | 1310 | 3 | | X | X | | X | | | | | | |
| 6 | BH05-34-3 - 051121 | | 1450 | 3 | | X | X | | X | | | | | | |
| 7 | BH05-35-1- 051121 | | 1515 | 3 | | X | X | | X | | | | | | |
| 8 | BH05-35-2- 051121 | ↓ | 1550 | 3 | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |

"I the undersigned, hereby acknowledge the understanding and acceptance of Maxxam's terms and conditions as listed on the back of this form."

| REQUESTED BY: (Signature/Print) | RECEIVED BY: (Signature/Print) | DATE / TIME | PURPOSE OF CHANGE / REMARKS | TEMP (°C) ON RECEIPT AT MAXXAM |
|---|---|---|---|---|
| JDT C.Cuddy | Delivered | 05/Nov/23 10:43 | | 9.0/0.0 |

Your P.O. #: EA780
Your Project #: W053011A CP SOURIS YARD
Site: SOURIS, MB
Your C.O.C. #: 00413334

**Attention: Andrew Eason**
Morrow Environmental
1420 Clarence Ave
Unit E
Winnipeg, MB
CANADA R3T 1T6

**Report Date: 2006/03/20**
This report dated: 2006/03/20 supersedes previous report dated: 2005/12/23

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: A5C8587**
**Received: 2005/12/15, 11:17**

Sample Matrix: WATER
# Samples Received: 8

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Method Reference |
|---|---|---|---|---|---|
| Petroleum Hydro. CCME FI & BTEX in Water | 8 | N/A | 2005/12/19 | Ont SOP-0816 | CCME CWS |
| Petroleum Hydrocarbons F2-F4 in Water | 6 | 2005/12/19 | 2005/12/19 | Ont SOP 0817 | CCME Hydrocarbons |
| Dissolved Metals by ICPMS | 8 | N/A | 2005/12/20 | Ont SOP 0624 | EPA 6020 |

**Validated by :**

Eva Pranjic CHEMIST

EWA PRANJIC, M.Sc., C.Chem
Scientific Specialist

Total cover pages: 1



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J98043 | | J98044 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/12 14:30 | | 2005/12/12 14:40 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-24-051212 | QC Batch | T.BLANK-051212 | RDL | QC Batch |
| **METALS** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | ND | 889424 | ND | 5 | 889421 |
| Dissolved Antimony (Sb) | ug/L | ND | 889424 | ND | 1 | 889421 |
| Dissolved Arsenic (As) | ug/L | 23 | 889424 | ND | 1 | 889421 |
| Dissolved Barium (Ba) | ug/L | 670 | 889424 | ND | 5 | 889421 |
| Dissolved Beryllium (Be) | ug/L | ND | 889424 | ND | 0.5 | 889421 |
| Dissolved Bismuth (Bi) | ug/L | ND | 889424 | ND | 1 | 889421 |
| Dissolved Boron (B) | ug/L | 120 | 889424 | ND | 10 | 889421 |
| Dissolved Cadmium (Cd) | ug/L | ND | 889424 | ND | 0.1 | 889421 |
| Dissolved Calcium (Ca) | ug/L | 170000 | 889424 | ND | 200 | 889421 |
| Dissolved Chromium (Cr) | ug/L | ND | 889424 | ND | 5 | 889421 |
| Dissolved Cobalt (Co) | ug/L | 7.8 | 889424 | ND | 0.5 | 889421 |
| Dissolved Copper (Cu) | ug/L | ND | 889424 | ND | 1 | 889421 |
| Dissolved Iron (Fe) | ug/L | 7100 | 889424 | ND | 50 | 889421 |
| Dissolved Lead (Pb) | ug/L | ND | 889424 | 1.3 | 0.5 | 889421 |
| Dissolved Lithium (Li) | ug/L | 44 | 889424 | ND | 5 | 889421 |
| Dissolved Magnesium (Mg) | ug/L | 61000 | 889424 | ND | 50 | 889421 |
| Dissolved Manganese (Mn) | ug/L | 6200 | 889424 | ND | 2 | 889421 |
| Dissolved Molybdenum (Mo) | ug/L | 14 | 889424 | ND | 1 | 889421 |
| Dissolved Nickel (Ni) | ug/L | 13 | 889424 | ND | 1 | 889421 |
| Dissolved Potassium (K) | ug/L | 3900 | 889424 | ND | 200 | 889421 |
| Dissolved Selenium (Se) | ug/L | 2 | 889424 | ND | 2 | 889421 |
| Dissolved Silicon (Si) | ug/L | 15000 | 889424 | ND | 50 | 889421 |
| Dissolved Silver (Ag) | ug/L | ND | 889424 | ND | 0.5 | 889421 |
| Dissolved Sodium (Na) | ug/L | 26000 | 889424 | ND | 100 | 889421 |
| Dissolved Strontium (Sr) | ug/L | 390 | 889424 | ND | 1 | 889421 |
| Dissolved Tellurium (Te) | ug/L | ND | 889424 | ND | 1 | 889421 |
| Dissolved Thallium (Tl) | ug/L | ND | 889424 | ND | 0.05 | 889421 |
| Dissolved Thorium (Th) | ug/L | ND | 889424 | ND | 1 | 889421 |
| Dissolved Tin (Sn) | ug/L | ND | 889424 | ND | 1 | 889421 |
| Dissolved Titanium (Ti) | ug/L | ND | 889424 | ND | 5 | 889421 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J98043 | | J98044 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/12 14:30 | | 2005/12/12 14:40 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-24-051212 | QC Batch | T.BLANK-051212 | RDL | QC Batch |
| Dissolved Tungsten (W) | ug/L | ND | 889424 | ND | 1 | 889421 |
| Dissolved Uranium (U) | ug/L | 4.1 | 889424 | ND | 0.1 | 889421 |
| Dissolved Vanadium (V) | ug/L | ND | 889424 | ND | 1 | 889421 |
| Dissolved Zinc (Zn) | ug/L | ND | 889424 | ND | 5 | 889421 |
| Dissolved Zirconium (Zr) | ug/L | ND | 889424 | ND | 1 | 889421 |
| **NUTRIENTS** | | | | | | |
| Dissolved Phosphorus (P) | ug/L | ND | 889424 | ND | 50 | 889421 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J98045 | J98046 | J98047 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/12 14:45 | 2005/12/12 15:20 | 2005/12/12 16:07 | | |
| COC Number | | 004133 | 004133 | 004133 | | |
| | Units | F.BLANK-051212 | MW05-20-051212 | MW05-25-051212 | RDL | QC Batch |
| **METALS** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | 29 | ND | 12 | 5 | 889424 |
| Dissolved Antimony (Sb) | ug/L | ND | ND | ND | 1 | 889424 |
| Dissolved Arsenic (As) | ug/L | ND | 230 | 100 | 1 | 889424 |
| Dissolved Barium (Ba) | ug/L | ND | 920 | 1300 | 5 | 889424 |
| Dissolved Beryllium (Be) | ug/L | ND | ND | ND | 0.5 | 889424 |
| Dissolved Bismuth (Bi) | ug/L | ND | ND | ND | 1 | 889424 |
| Dissolved Boron (B) | ug/L | ND | 200 | 120 | 10 | 889424 |
| Dissolved Cadmium (Cd) | ug/L | ND | ND | ND | 0.1 | 889424 |
| Dissolved Calcium (Ca) | ug/L | 930 | 210000 | 160000 | 200 | 889424 |
| Dissolved Chromium (Cr) | ug/L | ND | ND | ND | 5 | 889424 |
| Dissolved Cobalt (Co) | ug/L | ND | 8.8 | 12 | 0.5 | 889424 |
| Dissolved Copper (Cu) | ug/L | 4 | ND | ND | 1 | 889424 |
| Dissolved Iron (Fe) | ug/L | ND | 36000 | 20000 | 50 | 889424 |
| Dissolved Lead (Pb) | ug/L | ND | ND | ND | 0.5 | 889424 |
| Dissolved Lithium (Li) | ug/L | ND | 50 | 36 | 5 | 889424 |
| Dissolved Magnesium (Mg) | ug/L | 160 | 82000 | 53000 | 50 | 889424 |
| Dissolved Manganese (Mn) | ug/L | 3 | 1500 | 1300 | 2 | 889424 |
| Dissolved Molybdenum (Mo) | ug/L | ND | 1 | 6 | 1 | 889424 |
| Dissolved Nickel (Ni) | ug/L | ND | 8 | 18 | 1 | 889424 |
| Dissolved Potassium (K) | ug/L | 270 | 7800 | 3500 | 200 | 889424 |
| Dissolved Selenium (Se) | ug/L | ND | ND | ND | 2 | 889424 |
| Dissolved Silicon (Si) | ug/L | 1100 | 29000 | 31000 | 50 | 889424 |
| Dissolved Silver (Ag) | ug/L | ND | ND | ND | 0.5 | 889424 |
| Dissolved Sodium (Na) | ug/L | 2500 | 25000 | 19000 | 100 | 889424 |
| Dissolved Strontium (Sr) | ug/L | 5 | 550 | 640 | 1 | 889424 |
| Dissolved Tellurium (Te) | ug/L | ND | ND | ND | 1 | 889424 |
| Dissolved Thallium (Tl) | ug/L | ND | ND | ND | 0.05 | 889424 |
| Dissolved Thorium (Th) | ug/L | ND | ND | ND | 1 | 889424 |
| Dissolved Tin (Sn) | ug/L | ND | ND | ND | 1 | 889424 |
| Dissolved Titanium (Ti) | ug/L | ND | ND | ND | 5 | 889424 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J98045 | J98046 | J98047 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/12 14:45 | 2005/12/12 15:20 | 2005/12/12 16:07 | | |
| COC Number | | 004133 | 004133 | 004133 | | |
| | Units | F.BLANK-051212 | MW05-20-051212 | MW05-25-051212 | RDL | QC Batch |
| Dissolved Tungsten (W) | ug/L | ND | ND | ND | 1 | 889424 |
| Dissolved Uranium (U) | ug/L | ND | 0.3 | 3.1 | 0.1 | 889424 |
| Dissolved Vanadium (V) | ug/L | ND | 4 | 3 | 1 | 889424 |
| Dissolved Zinc (Zn) | ug/L | 7 | ND | 6 | 5 | 889424 |
| Dissolved Zirconium (Zr) | ug/L | ND | 3 | 6 | 1 | 889424 |
| **NUTRIENTS** | | | | | | |
| Dissolved Phosphorus (P) | ug/L | ND | 240 | ND | 50 | 889424 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J98048 | | J98049 | J98050 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/12 16:12 | | 2005/12/12 16:45 | 2005/12/12 09:30 | | |
| COC Number | | 004133 | | 004133 | 004133 | | |
| | Units | MW05-36-051212 | QC Batch | MW05-27-051212 | MW05-29-051212 | RDL | QC Batch |
| **METALS** | | | | | | | |
| Dissolved Aluminum (Al) | ug/L | ND | 889424 | ND | ND | 5 | 889421 |
| Dissolved Antimony (Sb) | ug/L | ND | 889424 | ND | ND | 1 | 889421 |
| Dissolved Arsenic (As) | ug/L | 110 | 889424 | 11 | 10 | 1 | 889421 |
| Dissolved Barium (Ba) | ug/L | 1300 | 889424 | 170 | 290 | 5 | 889421 |
| Dissolved Beryllium (Be) | ug/L | ND | 889424 | ND | ND | 0.5 | 889421 |
| Dissolved Bismuth (Bi) | ug/L | ND | 889424 | ND | ND | 1 | 889421 |
| Dissolved Boron (B) | ug/L | 110 | 889424 | 130 | 220 | 10 | 889421 |
| Dissolved Cadmium (Cd) | ug/L | ND | 889424 | 0.5 | ND | 0.1 | 889421 |
| Dissolved Calcium (Ca) | ug/L | 150000 | 889424 | 120000 | 220000 | 200 | 889421 |
| Dissolved Chromium (Cr) | ug/L | ND | 889424 | ND | ND | 5 | 889421 |
| Dissolved Cobalt (Co) | ug/L | 12 | 889424 | 0.9 | 7.8 | 0.5 | 889421 |
| Dissolved Copper (Cu) | ug/L | ND | 889424 | ND | 4 | 1 | 889421 |
| Dissolved Iron (Fe) | ug/L | 21000 | 889424 | 5700 | 3100 | 50 | 889421 |
| Dissolved Lead (Pb) | ug/L | ND | 889424 | ND | ND | 0.5 | 889421 |
| Dissolved Lithium (Li) | ug/L | 36 | 889424 | 41 | 36 | 5 | 889421 |
| Dissolved Magnesium (Mg) | ug/L | 53000 | 889424 | 57000 | 52000 | 50 | 889421 |
| Dissolved Manganese (Mn) | ug/L | 1300 | 889424 | 1500 | 1800 | 2 | 889421 |
| Dissolved Molybdenum (Mo) | ug/L | 6 | 889424 | 12 | 5 | 1 | 889421 |
| Dissolved Nickel (Ni) | ug/L | 18 | 889424 | 2 | 8 | 1 | 889421 |
| Dissolved Potassium (K) | ug/L | 3400 | 889424 | 3500 | 7300 | 200 | 889421 |
| Dissolved Selenium (Se) | ug/L | ND | 889424 | ND | ND | 2 | 889421 |
| Dissolved Silicon (Si) | ug/L | 31000 | 889424 | 10000 | 14000 | 50 | 889421 |
| Dissolved Silver (Ag) | ug/L | ND | 889424 | ND | ND | 0.5 | 889421 |
| Dissolved Sodium (Na) | ug/L | 19000 | 889424 | 24000 | 26000 | 100 | 889421 |
| Dissolved Strontium (Sr) | ug/L | 650 | 889424 | 360 | 660 | 1 | 889421 |
| Dissolved Tellurium (Te) | ug/L | ND | 889424 | ND | ND | 1 | 889421 |
| Dissolved Thallium (Tl) | ug/L | ND | 889424 | ND | ND | 0.05 | 889421 |
| Dissolved Thorium (Th) | ug/L | ND | 889424 | ND | ND | 1 | 889421 |
| Dissolved Tin (Sn) | ug/L | ND | 889424 | ND | ND | 1 | 889421 |
| Dissolved Titanium (Ti) | ug/L | ND | 889424 | ND | ND | 5 | 889421 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J98048 | | J98049 | J98050 | | |
|---|---|---|---|---|---|---|---|
| Sampling-Date | | 2005/12/12 16:12 | | 2005/12/12 16:45 | 2005/12/12 09:30 | | |
| COC Number | | 004133 | | 004133 | 004133 | | |
| | Units | MW05-36-051212 | QC Batch | MW05-27-051212 | MW05-29-051212 | RDL | QC Batch |
| Dissolved Tungsten (W) | ug/L | ND | 889424 | ND | ND | 1 | 889421 |
| Dissolved Uranium (U) | ug/L | 2.8 | 889424 | 5.2 | 9.7 | 0.1 | 889421 |
| Dissolved Vanadium (V) | ug/L | 3 | 889424 | ND | ND | 1 | 889421 |
| Dissolved Zinc (Zn) | ug/L | ND | 889424 | ND | 10 | 5 | 889421 |
| Dissolved Zirconium (Zr) | ug/L | 7 | 889424 | ND | ND | 1 | 889421 |
| NUTRIENTS | | | | | | | |
| Dissolved Phosphorus (P) | ug/L | ND | 889424 | ND | 100 | 50 | 889421 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## PETROLEUM HYDROCARBONS (CCME)

| Maxxam ID | | J98043 | J98044 | J98044 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/12 14:30 | 2005/12/12 14:40 | 2005/12/12 14:40 | | |
| COC Number | | 004133 | 004133 | 004133 | | |
| | Units | MW05-24-051212 | T.BLANK-051212 | T.BLANK-051212 Lab-Dup | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/L | ND | ND | ND | 0.2 | 888826 |
| Toluene | ug/L | 0.7 | ND | ND | 0.2 | 888826 |
| Ethylbenzene | ug/L | 0.4 | ND | ND | 0.2 | 888826 |
| o-Xylene | ug/L | 0.3 | ND | ND | 0.2 | 888826 |
| p+m-Xylene | ug/L | 1.1 | ND | ND | 0.4 | 888826 |
| Total Xylenes | ug/L | 1.4 | ND | ND | 0.4 | 888826 |
| F1 (C6-C10) | ug/L | ND | ND | ND | 100 | 888826 |
| F1 (C6-C10) - BTEX | ug/L | ND | ND | ND | 100 | 888826 |
| ***F2-F4 PHC*** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | 870 | | | 100 | 889140 |
| F3 (C16-C34 Hydrocarbons) | ug/L | 500 | | | 100 | 889140 |
| F4 (C34-C50 Hydrocarbons) | ug/L | ND | | | 100 | 889140 |
| Reached Baseline at C50 | ug/L | YES | | | | 889140 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 98 | 98 | 96 | | 888826 |
| 4-Bromofluorobenzene | % | 103 | 103 | 102 | | 888826 |
| D10-Ethylbenzene | % | 95 | 91 | 91 | | 888826 |
| D4-1,2-Dichloroethane | % | 100 | 105 | 102 | | 888826 |
| o-Terphenyl | % | 95 | | | | 889140 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## PETROLEUM HYDROCARBONS (CCME)

| Maxxam ID | | J98045 | J98046 | J98047 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/12 14:45 | 2005/12/12 15:20 | 2005/12/12 16:07 | | |
| COC Number | | 004133 | 004133 | 004133 | | |
| | Units | F.BLANK-051212 | MW05-20-051212 | MW05-25-051212 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/L | ND | 2.4 | 0.3 | 0.2 | 888826 |
| Toluene | ug/L | ND | 21 | 0.9 | 0.2 | 888826 |
| Ethylbenzene | ug/L | ND | 69 | 13 | 0.2 | 888826 |
| o-Xylene | ug/L | ND | 250 | 32 | 0.2 | 888826 |
| p+m-Xylene | ug/L | ND | 390 | 210 | 0.4 | 888826 |
| Total Xylenes | ug/L | ND | 640 | 240 | 0.4 | 888826 |
| F1 (C6-C10) | ug/L | ND | 3700 | 1300 | 100 | 888826 |
| F1 (C6-C10) - BTEX | ug/L | ND | 2900 | 1000 | 100 | 888826 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | | 27000 | 22000 | 100 | 889140 |
| F3 (C16-C34 Hydrocarbons) | ug/L | | 9800 | 7700 | 100 | 889140 |
| F4 (C34-C50 Hydrocarbons) | ug/L | | ND | ND | 100 | 889140 |
| Reached Baseline at C50 | ug/L | | YES | YES | | 889140 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 96 | 95 | 95 | | 888826 |
| 4-Bromofluorobenzene | % | 107 | 104 | 103 | | 888826 |
| D10-Ethylbenzene | % | 91 | 97 | 94 | | 888826 |
| D4-1,2-Dichloroethane | % | 100 | 99 | 96 | | 888826 |
| o-Terphenyl | % | | 112 | 115 | | 889140 |

ND = Not detected
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Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## PETROLEUM HYDROCARBONS (CCME)

| *Maxxam ID* | | *J98048* | | *J98049* | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/12 16:12 | | 2005/12/12 16:45 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-36-051212 | RDL | MW05-27-051212 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/L | 0.3 | 0.2 | ND | 1 | 888826 |
| Toluene | ug/L | 0.9 | 0.2 | ND | 1 | 888826 |
| Ethylbenzene | ug/L | 12 | 0.2 | ND | 1 | 888826 |
| o-Xylene | ug/L | 31 | 0.2 | ND | 1 | 888826 |
| p+m-Xylene | ug/L | 200 | 0.4 | ND | 2 | 888826 |
| Total Xylenes | ug/L | 230 | 0.4 | ND | 2 | 888826 |
| F1 (C6-C10) | ug/L | 1300 | 100 | 3100 | 500 | 888826 |
| F1 (C6-C10) - BTEX | ug/L | 1000 | 100 | 3100 | 500 | 888826 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | 25000 | 100 | 76000 | 500 | 889140 |
| F3 (C16-C34 Hydrocarbons) | ug/L | 8000 | 100 | 24000 | 500 | 889140 |
| F4 (C34-C50 Hydrocarbons) | ug/L | ND | 100 | ND | 500 | 889140 |
| *Reached Baseline at C50* | ug/L | YES | | YES | | 889140 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 96 | | 98 | | 888826 |
| 4-Bromofluorobenzene | % | 110 | | 103 | | 888826 |
| D10-Ethylbenzene | % | 92 | | 93 | | 888826 |
| D4-1,2-Dichloroethane | % | 99 | | 100 | | 888826 |
| o-Terphenyl | % | 104 | | 117 | | 889140 |

ND = Not detected
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QC Batch = Quality Control Batch



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Maxxam Job #: A5C8587
Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## PETROLEUM HYDROCARBONS (CCME)

| Maxxam ID | | J98050 | | |
|---|---|---|---|---|
| Sampling Date | | 2005/12/12 09:30 | | |
| COC Number | | 004133 | | |
| | Units | MW05-29-051212 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | |
| Benzene | ug/L | 140 | 0.2 | 888826 |
| Toluene | ug/L | 4.9 | 0.2 | 888826 |
| Ethylbenzene | ug/L | 32 | 0.2 | 888826 |
| o-Xylene | ug/L | 2.5 | 0.2 | 888826 |
| p+m-Xylene | ug/L | 54 | 0.4 | 888826 |
| Total Xylenes | ug/L | 57 | 0.4 | 888826 |
| F1 (C6-C10) | ug/L | 630 | 100 | 888826 |
| F1 (C6-C10) - BTEX | ug/L | 390 | 100 | 888826 |
| **F2-F4 PHC** | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | 690 | 100 | 889140 |
| F3 (C16-C34 Hydrocarbons) | ug/L | ND | 100 | 889140 |
| F4 (C34-C50 Hydrocarbons) | ug/L | ND | 100 | 889140 |
| Reached Baseline at C50 | ug/L | YES | | 889140 |
| **Surrogate Recovery (%)** | | | | |
| 1,4-Difluorobenzene | % | 95 | | 888826 |
| 4-Bromofluorobenzene | % | 106 | | 888826 |
| D10-Ethylbenzene | % | 94 | | 888826 |
| D4-1,2-Dichloroethane | % | 95 | | 888826 |
| o-Terphenyl | % | 121 | | 889140 |

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Report Date: 2006/03/20

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

**GENERAL COMMENTS**

Sample J98049-01: F24FID-W Analysis:
*Sample was diluted due to high concentration of target analytes. The DL's were adjusted accordingly.*

F1-BTEXHS-W Analysis: Sample was diluted due to high concentration of target compounds. The DL's were adjusted accordingly.

**Results relate only to the items tested.**



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report

Maxxam Job Number: MA5C8587

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 888826 KJI | MATRIX SPIKE [J98044-03] | 1,4-Difluorobenzene | 2005/12/19 | | 96 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/19 | | 104 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/19 | | 89 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/19 | | 104 | % | 70 - 130 |
| | | Benzene | 2005/12/19 | | 101 | % | 70 - 130 |
| | | Toluene | 2005/12/19 | | 99 | % | 70 - 130 |
| | | Ethylbenzene | 2005/12/19 | | 102 | % | 70 - 130 |
| | | o-Xylene | 2005/12/19 | | 102 | % | 70 - 130 |
| | | p+m-Xylene | 2005/12/19 | | 103 | % | 70 - 130 |
| | | F1 (C6-C10) | 2005/12/19 | | 85 | % | 70 - 130 |
| | Spiked Blank | 1,4-Difluorobenzene | 2005/12/19 | | 98 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/19 | | 103 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/19 | | 90 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/19 | | 100 | % | 70 - 130 |
| | | Benzene | 2005/12/19 | | 101 | % | 70 - 130 |
| | | Toluene | 2005/12/19 | | 100 | % | 70 - 130 |
| | | Ethylbenzene | 2005/12/19 | | 105 | % | 70 - 130 |
| | | o-Xylene | 2005/12/19 | | 104 | % | 70 - 130 |
| | | p+m-Xylene | 2005/12/19 | | 105 | % | 70 - 130 |
| | | F1 (C6-C10) | 2005/12/19 | | 94 | % | 70 - 130 |
| | Method Blank | 1,4-Difluorobenzene | 2005/12/19 | | 99 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/19 | | 104 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/19 | | 92 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/19 | | 103 | % | 70 - 130 |
| | | Benzene | 2005/12/19 | ND, RDL=0.2 | | ug/L | |
| | | Toluene | 2005/12/19 | ND, RDL=0.2 | | ug/L | |
| | | Ethylbenzene | 2005/12/19 | ND, RDL=0.2 | | ug/L | |
| | | o-Xylene | 2005/12/19 | ND, RDL=0.2 | | ug/L | |
| | | p+m-Xylene | 2005/12/19 | ND, RDL=0.4 | | ug/L | |
| | | Total Xylenes | 2005/12/19 | ND, RDL=0.4 | | ug/L | |
| | | F1 (C6-C10) | 2005/12/19 | ND, RDL=100 | | ug/L | |
| | | F1 (C6-C10) - BTEX | 2005/12/19 | ND, RDL=100 | | ug/L | |
| | RPD [J98044-03] | Benzene | 2005/12/19 | NC | | % | 40 |
| | | Toluene | 2005/12/19 | NC | | % | 40 |
| | | Ethylbenzene | 2005/12/19 | NC | | % | 40 |
| | | o-Xylene | 2005/12/19 | NC | | % | 40 |
| | | p+m-Xylene | 2005/12/19 | NC | | % | 40 |
| | | Total Xylenes | 2005/12/19 | NC | | % | 40 |
| | | F1 (C6-C10) | 2005/12/19 | NC | | % | 40 |
| | | F1 (C6-C10) - BTEX | 2005/12/19 | NC | | % | 40 |
| 889140 DCA | MATRIX SPIKE | o-Terphenyl | 2005/12/19 | | 108 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/19 | | 92 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/19 | | 92 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/19 | | 92 | % | 60 - 130 |
| | Spiked Blank | o-Terphenyl | 2005/12/19 | | 108 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/19 | | 97 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/19 | | 97 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/19 | | 97 | % | 60 - 130 |
| | Method Blank | o-Terphenyl | 2005/12/19 | | 100 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/19 | ND, RDL=100 | | ug/L | |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/19 | ND, RDL=100 | | ug/L | |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/19 | ND, RDL=100 | | ug/L | |
| | RPD | F2 (C10-C16 Hydrocarbons) | 2005/12/19 | 31.8 | | % | 50 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/19 | NC | | % | 50 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/19 | NC | | % | 50 |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8587

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 889421 JBW | MATRIX SPIKE | Dissolved Aluminum (Al) | 2005/12/20 | | 106 | % | 80 - 120 |
| | | Dissolved Antimony (Sb) | 2005/12/20 | | 106 | % | 80 - 120 |
| | | Dissolved Arsenic (As) | 2005/12/20 | | 101 | % | 80 - 120 |
| | | Dissolved Barium (Ba) | 2005/12/20 | | 98 | % | 80 - 120 |
| | | Dissolved Beryllium (Be) | 2005/12/20 | | 103 | % | 75 - 125 |
| | | Dissolved Bismuth (Bi) | 2005/12/20 | | 100 | % | 75 - 125 |
| | | Dissolved Boron (B) | 2005/12/20 | | 108 | % | 75 - 125 |
| | | Dissolved Cadmium (Cd) | 2005/12/20 | | 106 | % | 80 - 120 |
| | | Dissolved Calcium (Ca) | 2005/12/20 | | NC (1) | % | 75 - 125 |
| | | Dissolved Chromium (Cr) | 2005/12/20 | | 105 | % | 80 - 120 |
| | | Dissolved Cobalt (Co) | 2005/12/20 | | 103 | % | 80 - 120 |
| | | Dissolved Copper (Cu) | 2005/12/20 | | 101 | % | 80 - 120 |
| | | Dissolved Iron (Fe) | 2005/12/20 | | 102 | % | 80 - 120 |
| | | Dissolved Lead (Pb) | 2005/12/20 | | 98 | % | 80 - 120 |
| | | Dissolved Lithium (Li) | 2005/12/20 | | 102 | % | 75 - 125 |
| | | Dissolved Magnesium (Mg) | 2005/12/20 | | 102 | % | 80 - 120 |
| | | Dissolved Manganese (Mn) | 2005/12/20 | | 112 | % | 80 - 120 |
| | | Dissolved Molybdenum (Mo) | 2005/12/20 | | 107 | % | 80 - 120 |
| | | Dissolved Nickel (Ni) | 2005/12/20 | | 101 | % | 80 - 120 |
| | | Dissolved Potassium (K) | 2005/12/20 | | 103 | % | 75 - 125 |
| | | Dissolved Selenium (Se) | 2005/12/20 | | 103 | % | 80 - 120 |
| | | Dissolved Silicon (Si) | 2005/12/20 | | 102 | % | 75 - 125 |
| | | Dissolved Silver (Ag) | 2005/12/20 | | 70 (2) | % | 80 - 120 |
| | | Dissolved Sodium (Na) | 2005/12/20 | | 103 | % | 75 - 125 |
| | | Dissolved Strontium (Sr) | 2005/12/20 | | 100 | % | 80 - 120 |
| | | Dissolved Tellurium (Te) | 2005/12/20 | | 105 | % | 75 - 125 |
| | | Dissolved Thallium (Tl) | 2005/12/20 | | 100 | % | 75 - 125 |
| | | Dissolved Thorium (Th) | 2005/12/20 | | 99 | % | 75 - 125 |
| | | Dissolved Tin (Sn) | 2005/12/20 | | 104 | % | 80 - 120 |
| | | Dissolved Titanium (Ti) | 2005/12/20 | | 101 | % | 75 - 125 |
| | | Dissolved Tungsten (W) | 2005/12/20 | | 104 | % | 75 - 125 |
| | | Dissolved Uranium (U) | 2005/12/20 | | 104 | % | 80 - 120 |
| | | Dissolved Vanadium (V) | 2005/12/20 | | 107 | % | 80 - 120 |
| | | Dissolved Zinc (Zn) | 2005/12/20 | | 89 | % | 80 - 120 |
| | | Dissolved Zirconium (Zr) | 2005/12/20 | | 104 | % | 75 - 125 |
| | | Dissolved Phosphorus (P) | 2005/12/20 | | 114 | % | 75 - 125 |
| | Spiked Blank | Dissolved Aluminum (Al) | 2005/12/20 | | 105 | % | 85 - 115 |
| | | Dissolved Antimony (Sb) | 2005/12/20 | | 104 | % | 85 - 115 |
| | | Dissolved Arsenic (As) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Barium (Ba) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Beryllium (Be) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Bismuth (Bi) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Boron (B) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Cadmium (Cd) | 2005/12/20 | | 103 | % | 85 - 115 |
| | | Dissolved Calcium (Ca) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Chromium (Cr) | 2005/12/20 | | 102 | % | 85 - 115 |
| | | Dissolved Cobalt (Co) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Copper (Cu) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Iron (Fe) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Lead (Pb) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Lithium (Li) | 2005/12/20 | | 95 | % | 85 - 115 |
| | | Dissolved Magnesium (Mg) | 2005/12/20 | | 103 | % | 85 - 115 |
| | | Dissolved Manganese (Mn) | 2005/12/20 | | 98 | % | 85 - 115 |
| | | Dissolved Molybdenum (Mo) | 2005/12/20 | | 105 | % | 85 - 115 |
| | | Dissolved Nickel (Ni) | 2005/12/20 | | 102 | % | 85 - 115 |
| | | Dissolved Potassium (K) | 2005/12/20 | | 101 | % | 85 - 115 |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8587

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 889421 JBW | Spiked Blank | Dissolved Selenium (Se) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Silicon (Si) | 2005/12/20 | | 103 | % | 85 - 115 |
| | | Dissolved Silver (Ag) | 2005/12/20 | | 105 | % | 85 - 115 |
| | | Dissolved Sodium (Na) | 2005/12/20 | | 103 | % | 85 - 115 |
| | | Dissolved Strontium (Sr) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Tellurium (Te) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Thallium (Tl) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Thorium (Th) | 2005/12/20 | | 98 | % | 85 - 115 |
| | | Dissolved Tin (Sn) | 2005/12/20 | | 102 | % | 85 - 115 |
| | | Dissolved Titanium (Ti) | 2005/12/20 | | 98 | % | 85 - 115 |
| | | Dissolved Tungsten (W) | 2005/12/20 | | 103 | % | 85 - 115 |
| | | Dissolved Uranium (U) | 2005/12/20 | | 103 | % | 85 - 115 |
| | | Dissolved Vanadium (V) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Zinc (Zn) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Zirconium (Zr) | 2005/12/20 | | 103 | % | 85 - 115 |
| | | Dissolved Phosphorus (P) | 2005/12/20 | | 97 | % | 85 - 115 |
| | Method Blank | Dissolved Aluminum (Al) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Antimony (Sb) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Arsenic (As) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Barium (Ba) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Beryllium (Be) | 2005/12/20 | ND, RDL=0.5 | | ug/L | |
| | | Dissolved Bismuth (Bi) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Boron (B) | 2005/12/20 | ND, RDL=10 | | ug/L | |
| | | Dissolved Cadmium (Cd) | 2005/12/20 | ND, RDL=0.1 | | ug/L | |
| | | Dissolved Calcium (Ca) | 2005/12/20 | ND, RDL=200 | | ug/L | |
| | | Dissolved Chromium (Cr) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Cobalt (Co) | 2005/12/20 | ND, RDL=0.5 | | ug/L | |
| | | Dissolved Copper (Cu) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Iron (Fe) | 2005/12/20 | ND, RDL=50 | | ug/L | |
| | | Dissolved Lead (Pb) | 2005/12/20 | ND, RDL=0.5 | | ug/L | |
| | | Dissolved Lithium (Li) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Magnesium (Mg) | 2005/12/20 | ND, RDL=50 | | ug/L | |
| | | Dissolved Manganese (Mn) | 2005/12/20 | ND, RDL=2 | | ug/L | |
| | | Dissolved Molybdenum (Mo) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Nickel (Ni) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Potassium (K) | 2005/12/20 | ND, RDL=200 | | ug/L | |
| | | Dissolved Selenium (Se) | 2005/12/20 | ND, RDL=2 | | ug/L | |
| | | Dissolved Silicon (Si) | 2005/12/20 | ND, RDL=50 | | ug/L | |
| | | Dissolved Silver (Ag) | 2005/12/20 | ND, RDL=0.5 | | ug/L | |
| | | Dissolved Sodium (Na) | 2005/12/20 | ND, RDL=100 | | ug/L | |
| | | Dissolved Strontium (Sr) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Tellurium (Te) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Thallium (Tl) | 2005/12/20 | ND, RDL=0.05 | | ug/L | |
| | | Dissolved Thorium (Th) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Tin (Sn) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Titanium (Ti) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Tungsten (W) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Uranium (U) | 2005/12/20 | ND, RDL=0.1 | | ug/L | |
| | | Dissolved Vanadium (V) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Zinc (Zn) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Zirconium (Zr) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Phosphorus (P) | 2005/12/20 | ND, RDL=50 | | ug/L | |
| | RPD | Dissolved Aluminum (Al) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Antimony (Sb) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Arsenic (As) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Barium (Ba) | 2005/12/20 | NC | | % | 25 |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8587

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 889421 JBW | RPD | Dissolved Beryllium (Be) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Bismuth (Bi) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Boron (B) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Cadmium (Cd) | 2005/12/20 | 0.04 | | % | 25 |
| | | Dissolved Calcium (Ca) | 2005/12/20 | 2.1 | | % | 25 |
| | | Dissolved Chromium (Cr) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Cobalt (Co) | 2005/12/20 | 0.06 | | % | 25 |
| | | Dissolved Copper (Cu) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Iron (Fe) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Lead (Pb) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Magnesium (Mg) | 2005/12/20 | 0.4 | | % | 25 |
| | | Dissolved Manganese (Mn) | 2005/12/20 | 0.4 | | % | 25 |
| | | Dissolved Molybdenum (Mo) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Nickel (Ni) | 2005/12/20 | 0.5 | | % | 25 |
| | | Dissolved Potassium (K) | 2005/12/20 | 6.3 | | % | 25 |
| | | Dissolved Selenium (Se) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Silicon (Si) | 2005/12/20 | 1.7 | | % | 25 |
| | | Dissolved Silver (Ag) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Sodium (Na) | 2005/12/20 | 3.7 | | % | 25 |
| | | Dissolved Strontium (Sr) | 2005/12/20 | 1.1 | | % | 25 |
| | | Dissolved Thallium (Tl) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Tin (Sn) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Titanium (Ti) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Uranium (U) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Vanadium (V) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Zinc (Zn) | 2005/12/20 | 0.8 | | % | 25 |
| | | Dissolved Phosphorus (P) | 2005/12/20 | NC | | % | 25 |
| 889424 JBW | MATRIX SPIKE | Dissolved Aluminum (Al) | 2005/12/20 | | 101 | % | 80 - 120 |
| | | Dissolved Antimony (Sb) | 2005/12/20 | | 104 | % | 80 - 120 |
| | | Dissolved Arsenic (As) | 2005/12/20 | | 99 | % | 80 - 120 |
| | | Dissolved Barium (Ba) | 2005/12/20 | | 98 | % | 80 - 120 |
| | | Dissolved Beryllium (Be) | 2005/12/20 | | 105 | % | 75 - 125 |
| | | Dissolved Bismuth (Bi) | 2005/12/20 | | 101 | % | 75 - 125 |
| | | Dissolved Boron (B) | 2005/12/20 | | 108 | % | 75 - 125 |
| | | Dissolved Cadmium (Cd) | 2005/12/20 | | 103 | % | 80 - 120 |
| | | Dissolved Calcium (Ca) | 2005/12/20 | | 99 | % | 75 - 125 |
| | | Dissolved Chromium (Cr) | 2005/12/20 | | 105 | % | 80 - 120 |
| | | Dissolved Cobalt (Co) | 2005/12/20 | | 104 | % | 80 - 120 |
| | | Dissolved Copper (Cu) | 2005/12/20 | | 101 | % | 80 - 120 |
| | | Dissolved Iron (Fe) | 2005/12/20 | | 102 | % | 80 - 120 |
| | | Dissolved Lead (Pb) | 2005/12/20 | | 97 | % | 80 - 120 |
| | | Dissolved Lithium (Li) | 2005/12/20 | | 100 | % | 75 - 125 |
| | | Dissolved Magnesium (Mg) | 2005/12/20 | | 98 | % | 80 - 120 |
| | | Dissolved Manganese (Mn) | 2005/12/20 | | 101 | % | 80 - 120 |
| | | Dissolved Molybdenum (Mo) | 2005/12/20 | | 104 | % | 80 - 120 |
| | | Dissolved Nickel (Ni) | 2005/12/20 | | 103 | % | 80 - 120 |
| | | Dissolved Potassium (K) | 2005/12/20 | | 102 | % | 75 - 125 |
| | | Dissolved Selenium (Se) | 2005/12/20 | | 99 | % | 80 - 120 |
| | | Dissolved Silicon (Si) | 2005/12/20 | | 97 | % | 75 - 125 |
| | | Dissolved Silver (Ag) | 2005/12/20 | | 101 | % | 80 - 120 |
| | | Dissolved Sodium (Na) | 2005/12/20 | | 97 | % | 75 - 125 |
| | | Dissolved Strontium (Sr) | 2005/12/20 | | 96 | % | 80 - 120 |
| | | Dissolved Tellurium (Te) | 2005/12/20 | | 102 | % | 75 - 125 |
| | | Dissolved Thallium (Tl) | 2005/12/20 | | 99 | % | 75 - 125 |
| | | Dissolved Thorium (Th) | 2005/12/20 | | 96 | % | 75 - 125 |
| | | Dissolved Tin (Sn) | 2005/12/20 | | 102 | % | 80 - 120 |



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8587

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 889424 JBW | MATRIX SPIKE | Dissolved Titanium (Ti) | 2005/12/20 | | 100 | % | 75 - 125 |
| | | Dissolved Tungsten (W) | 2005/12/20 | | 101 | % | 75 - 125 |
| | | Dissolved Uranium (U) | 2005/12/20 | | 101 | % | 80 - 120 |
| | | Dissolved Vanadium (V) | 2005/12/20 | | 105 | % | 80 - 120 |
| | | Dissolved Zinc (Zn) | 2005/12/20 | | 103 | % | 80 - 120 |
| | | Dissolved Zirconium (Zr) | 2005/12/20 | | 101 | % | 75 - 125 |
| | | Dissolved Phosphorus (P) | 2005/12/20 | | 97 | % | 75 - 125 |
| | Spiked Blank | Dissolved Aluminum (Al) | 2005/12/20 | | 97 | % | 85 - 115 |
| | | Dissolved Antimony (Sb) | 2005/12/20 | | 104 | % | 85 - 115 |
| | | Dissolved Arsenic (As) | 2005/12/20 | | 97 | % | 85 - 115 |
| | | Dissolved Barium (Ba) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Beryllium (Be) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Bismuth (Bi) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Boron (B) | 2005/12/20 | | 104 | % | 85 - 115 |
| | | Dissolved Cadmium (Cd) | 2005/12/20 | | 104 | % | 85 - 115 |
| | | Dissolved Calcium (Ca) | 2005/12/20 | | 98 | % | 85 - 115 |
| | | Dissolved Chromium (Cr) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Cobalt (Co) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Copper (Cu) | 2005/12/20 | | 98 | % | 85 - 115 |
| | | Dissolved Iron (Fe) | 2005/12/20 | | 96 | % | 85 - 115 |
| | | Dissolved Lead (Pb) | 2005/12/20 | | 97 | % | 85 - 115 |
| | | Dissolved Lithium (Li) | 2005/12/20 | | 96 | % | 85 - 115 |
| | | Dissolved Magnesium (Mg) | 2005/12/20 | | 95 | % | 85 - 115 |
| | | Dissolved Manganese (Mn) | 2005/12/20 | | 95 | % | 85 - 115 |
| | | Dissolved Molybdenum (Mo) | 2005/12/20 | | 104 | % | 85 - 115 |
| | | Dissolved Nickel (Ni) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Potassium (K) | 2005/12/20 | | 96 | % | 85 - 115 |
| | | Dissolved Selenium (Se) | 2005/12/20 | | 98 | % | 85 - 115 |
| | | Dissolved Silicon (Si) | 2005/12/20 | | 94 | % | 85 - 115 |
| | | Dissolved Silver (Ag) | 2005/12/20 | | 105 | % | 85 - 115 |
| | | Dissolved Sodium (Na) | 2005/12/20 | | 93 | % | 85 - 115 |
| | | Dissolved Strontium (Sr) | 2005/12/20 | | 98 | % | 85 - 115 |
| | | Dissolved Tellurium (Te) | 2005/12/20 | | 102 | % | 85 - 115 |
| | | Dissolved Thallium (Tl) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Thorium (Th) | 2005/12/20 | | 96 | % | 85 - 115 |
| | | Dissolved Tin (Sn) | 2005/12/20 | | 102 | % | 85 - 115 |
| | | Dissolved Titanium (Ti) | 2005/12/20 | | 97 | % | 85 - 115 |
| | | Dissolved Tungsten (W) | 2005/12/20 | | 100 | % | 85 - 115 |
| | | Dissolved Uranium (U) | 2005/12/20 | | 101 | % | 85 - 115 |
| | | Dissolved Vanadium (V) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Zinc (Zn) | 2005/12/20 | | 99 | % | 85 - 115 |
| | | Dissolved Zirconium (Zr) | 2005/12/20 | | 103 | % | 85 - 115 |
| | | Dissolved Phosphorus (P) | 2005/12/20 | | 96 | % | 85 - 115 |
| | Method Blank | Dissolved Aluminum (Al) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Antimony (Sb) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Arsenic (As) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Barium (Ba) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Beryllium (Be) | 2005/12/20 | ND, RDL=0.5 | | ug/L | |
| | | Dissolved Bismuth (Bi) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Boron (B) | 2005/12/20 | ND, RDL=10 | | ug/L | |
| | | Dissolved Cadmium (Cd) | 2005/12/20 | ND, RDL=0.1 | | ug/L | |
| | | Dissolved Calcium (Ca) | 2005/12/20 | ND, RDL=200 | | ug/L | |
| | | Dissolved Chromium (Cr) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Cobalt (Co) | 2005/12/20 | ND, RDL=0.5 | | ug/L | |
| | | Dissolved Copper (Cu) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Iron (Fe) | 2005/12/20 | ND, RDL=50 | | ug/L | |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8587

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 889424 JBW | Method Blank | Dissolved Lead (Pb) | 2005/12/20 | ND, RDL=0.5 | | ug/L | |
| | | Dissolved Lithium (Li) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Magnesium (Mg) | 2005/12/20 | ND, RDL=50 | | ug/L | |
| | | Dissolved Manganese (Mn) | 2005/12/20 | ND, RDL=2 | | ug/L | |
| | | Dissolved Molybdenum (Mo) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Nickel (Ni) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Potassium (K) | 2005/12/20 | ND, RDL=200 | | ug/L | |
| | | Dissolved Selenium (Se) | 2005/12/20 | ND, RDL=2 | | ug/L | |
| | | Dissolved Silicon (Si) | 2005/12/20 | ND, RDL=50 | | ug/L | |
| | | Dissolved Silver (Ag) | 2005/12/20 | ND, RDL=0.5 | | ug/L | |
| | | Dissolved Sodium (Na) | 2005/12/20 | ND, RDL=100 | | ug/L | |
| | | Dissolved Strontium (Sr) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Tellurium (Te) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Thallium (Tl) | 2005/12/20 | ND, RDL=0.05 | | ug/L | |
| | | Dissolved Thorium (Th) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Tin (Sn) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Titanium (Ti) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Tungsten (W) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Uranium (U) | 2005/12/20 | ND, RDL=0.1 | | ug/L | |
| | | Dissolved Vanadium (V) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Zinc (Zn) | 2005/12/20 | ND, RDL=5 | | ug/L | |
| | | Dissolved Zirconium (Zr) | 2005/12/20 | ND, RDL=1 | | ug/L | |
| | | Dissolved Phosphorus (P) | 2005/12/20 | ND, RDL=50 | | ug/L | |
| | RPD | Dissolved Antimony (Sb) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Arsenic (As) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Barium (Ba) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Beryllium (Be) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Boron (B) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Cadmium (Cd) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Chromium (Cr) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Cobalt (Co) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Copper (Cu) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Lead (Pb) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Molybdenum (Mo) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Nickel (Ni) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Selenium (Se) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Silver (Ag) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Sodium (Na) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Thallium (Tl) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Vanadium (V) | 2005/12/20 | NC | | % | 25 |
| | | Dissolved Zinc (Zn) | 2005/12/20 | NC | | % | 25 |

ND = Not detected
NC = Non-calculable
RPD = Relative Percent Difference
SPIKE = Fortified sample

( 1 ) *The recovery for Ca in the matrix spiked sample was not calculated.* Because of the high concentration of this compound in the parent sample, the relative difference between the spiked and un-spiked concentrations is not sufficiently significant to permit a reliable recovery calculation.

( 2 ) The recovery for silver in the matrix spike was below the lower control limit. This may represent a low bias in some results for this specific element.



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

# CHAIN OF CUSTODY RECORD

Page 1 of 1

Maxxam — 6740 Campobello Road, Mississauga, ON L4V 1N7 — Phone: 905-817-5700 — Fax: 905-817-5777 — Toll Free: (800) 563-6266

| INVOICE INFORMATION | REPORT INFORMATION (if differs from invoice) | PROJECT INFORMATION | MAXXAM JOB NUMBER |
|---|---|---|---|
| Company Name: CP RAIL c/o MacPlant EMI | Company Name: Same | Quotation #: CP RAIL | A5C5587 |
| Contact Name: ANDREW GASIOR | Contact Name: Same | P.O. #: EA780 | CHAIN OF CUSTODY # |
| Address: E-MAIL Maxxam Aug. WINNIPEG, MB | Address: Same | Project: W053011A | A0/A6 |
| Phone: 204-475-4735 Fax: 204-477-2114 | Phone: Fax: | Project Name: CP Sprague Yard | 0047333 |
| Email: Andrew_Gasior@cpr.ca | Email: Cynthia_Cuddy@snclavalin.com | Location: Sprague, MB | |
| | | Sampled By: JDT | |

**REGULATORY CRITERIA**

Note: For Ontario drinking water samples use the Drinking Water Chain of Custody Form

☐ MISA ☐ PWQO ☐ Reg. 558 — Reg. 153: ☐ Table 1 ☐ Table 2 ☐ Table 3 — Sewer use: ☐ Sanitary ☐ Storm — Region: ____ — ☒ Other: CCME Class (specify / circle)

Report Criteria on C of A? ☐

**ANALYSES REQUESTED (Please be specific)**

255

1 of 1

15-Dec-05 10:13

| Sample Identification | Date Sampled | Time Sampled | Matrix (GW, SW, SO, etc.) | Regulated Drinking Water? (Y / N) | Metals Field Filtered? (Y / N) | BTEX / F1 | F2 - F4 | VOCs | Metals | # of Cont. | COMMENTS / TAT COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW05-24-051712 | 051712 | 1430 | GW | N | Y | X | X | X | 6 | |
| 2 | F. BLANK-051212 | 051129 | 1440 | WATER | N | N | X | | | 4 | |
| 3 | F. BLANK-051212 | 051212 | 1445 | WATER | N | Y | X | X | | 4 | |
| 4 | MW05-29 | 051712 | 1520 | GW | N | Y | X | X | X | 6 | |
| 5 | MW05-25 | 051712 | 1607 | GW | N | Y | X | X | X | 6 | |
| 6 | MW05-26 | 051712 | 1612 | GW | N | Y | X | X | X | 6 | |
| 7 | MW05-27 | 051712 | 1645 | GW | N | Y | X | X | X | 6 | |
| 8 | MW05-28 | 051713 | 0930 | GW | N | Y | X | X | X | 6 | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

**TURNAROUND TIME (TAT) REQUIRED**

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒ 5 to 7 Working Days

☐ 2 days ☐ 3 days

| RELINQUISHED BY (Signature/Print) | RECEIVED BY (Signature/Print) | Date | Time |
|---|---|---|---|
| | | | |
| | Toha | 05/12/15 | 1112 |

**Laboratory Use Only**

Temperature (°C) on Receipt: 0 | 12°C

Custody Seal on Sample on Receipt: ☐ OK ☐ SIF

DEC 15 '05 10:17

MANDATORY SECTIONS IN GREY MUST BE FILLED OUT. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: Maxxam Yellow: Client Pink: Client

Your P.O. #: EA780
Your Project #: W053011A/ CP SOURIS YARD
Site: SOURIS, MB
Your C.O.C. #: 00413336

**Attention: Andrew Eason**
Morrow Environmental
1420 Clarence Ave
Unit E
Winnipeg, MB
CANADA R3T 1T6



**Report Date: 2005/12/29**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: A5C9040**
**Received: 2005/12/15, 11:14**

Sample Matrix: Water
# Samples Received: 5

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Method Reference |
|---|---|---|---|---|---|
| Conductivity | 1 | N/A | 2005/12/20 | Ont SOP 0071 | APHA 2510 |
| Conductivity | 1 | N/A | 2005/12/21 | Ont SOP 0071 | APHA 2510 |
| Petroleum Hydro. CCME FI & BTEX in Water | 4 | N/A | 2005/12/20 | Ont SOP-0816 | CCME CWS |
| Petroleum Hydrocarbons F2-F4 in Water | 4 | 2005/12/19 | 2005/12/19 | Ont SOP 0817 | CCME Hydrocarbons |
| Dissolved Metals by ICPMS | 4 | N/A | 2005/12/21 | Ont SOP 0624 | EPA 6020 |
| Dissolved Metals by ICPMS | 1 | N/A | 2005/12/22 | Ont SOP 0624 | EPA 6020 |
| Nitrate (NO3) and Nitrite (NO2) in Water | 2 | N/A | 2005/12/21 | Ont SOP-0100 | SM 4500 NO3 I |
| PAH Compounds in Water by GC/MS (SIM) | 2 | 2005/12/20 | 2005/12/21 | EPA 8270 | GC/MS |
| pH | 1 | N/A | 2005/12/20 | Ont SOP 0067 | APHA 4500H |
| pH | 1 | N/A | 2005/12/21 | Ont SOP 0067 | APHA 4500H |

**Validated by :** Eva Pranic
EWA PRANIC, M.Sc., C.Chem
Scientific Specialist

Total cover pages: 1



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## OREG 153 PETROLEUM HYDROCARBONS (WATER)

| Maxxam ID | | K00246 | K00247 | | K00249 | | |
|---|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 13:00 | 2005/12/13 13:20 | | 2005/12/13 13:55 | | |
| COC Number | | 004133 | 004133 | | 004133 | | |
| | *Units* | *MW05-9-051213* | *MW05-8-051213* | *RDL* | *MW05-32-051213* | *RDL* | *QC Batch* |
| **F1 PHC and BTEX** | | | | | | | |
| Benzene | ug/L | ND | ND | 0.2 | 4200 | 4 | 889753 |
| Toluene | ug/L | ND | ND | 0.2 | 13 | 4 | 889753 |
| Ethylbenzene | ug/L | ND | ND | 0.2 | 89 | 4 | 889753 |
| o-Xylene | ug/L | ND | ND | 0.2 | 290 | 4 | 889753 |
| p+m-Xylene | ug/L | ND | ND | 0.4 | 790 | 8 | 889753 |
| Total Xylenes | ug/L | ND | ND | 0.4 | 1100 | 8 | 889753 |
| F1 (C6-C10) | ug/L | ND | ND | 100 | 6400 | 2000 | 889753 |
| F1 (C6-C10) - BTEX | ug/L | ND | ND | 100 | ND | 2000 | 889753 |
| **F2-F4 PHC** | | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | ND | ND | 100 | 510 | 100 | 889755 |
| F3 (C16-C34 Hydrocarbons) | ug/L | ND | ND | 100 | ND | 100 | 889755 |
| F4 (C34-C50 Hydrocarbons) | ug/L | ND | ND | 100 | ND | 100 | 889755 |
| Reached Baseline at C50 | ug/L | YES | YES | | YES | | 889755 |
| **Surrogate Recovery (%)** | | | | | | | |
| 1,4-Difluorobenzene | % | 100 | 100 | | 101 | | 889753 |
| 4-Bromofluorobenzene | % | 99 | 99 | | 98 | | 889753 |
| D10-Ethylbenzene | % | 102 | 103 | | 103 | | 889753 |
| D4-1,2-Dichloroethane | % | 99 | 101 | | 99 | | 889753 |
| o-Terphenyl | % | 90 | 91 | | 91 | | 889755 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## OREG 153 PETROLEUM HYDROCARBONS (WATER)

| Maxxam ID | | K00252 | | |
|---|---|---|---|---|
| Sampling Date | | 2005/12/13 14:05 | | |
| COC Number | | 004133 | | |
| | Units | MW05-37-051213 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | |
| Benzene | ug/L | 4300 | 4 | 889753 |
| Toluene | ug/L | 14 | 4 | 889753 |
| Ethylbenzene | ug/L | 91 | 4 | 889753 |
| o-Xylene | ug/L | 310 | 4 | 889753 |
| p+m-Xylene | ug/L | 880 | 8 | 889753 |
| Total Xylenes | ug/L | 1200 | 8 | 889753 |
| F1 (C6-C10) | ug/L | 6600 | 2000 | 889753 |
| F1 (C6-C10) - BTEX | ug/L | ND | 2000 | 889753 |
| **F2-F4 PHC** | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | 500 | 100 | 889755 |
| F3 (C16-C34 Hydrocarbons) | ug/L | ND | 100 | 889755 |
| F4 (C34-C50 Hydrocarbons) | ug/L | 140 | 100 | 889755 |
| Reached Baseline at C50 | ug/L | YES | | 889755 |
| **Surrogate Recovery (%)** | | | | |
| 1,4-Difluorobenzene | % | 101 | | 889753 |
| 4-Bromofluorobenzene | % | 99 | | 889753 |
| D10-Ethylbenzene | % | 102 | | 889753 |
| D4-1,2-Dichloroethane | % | 99 | | 889753 |
| o-Terphenyl | % | 76 | | 889755 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll-free: 800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## RESULTS OF ANALYSES OF WATER

| Maxxam ID | | K00249 | | K00252 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 13:55 | | 2005/12/13 14:05 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-32-051213 | QC Batch | MW05-37-051213 | RDL | QC Batch |
| **INORGANICS** | | | | | | |
| Conductivity | umho/cm | 922 | 890090 | 875 | 2 | 890930 |
| pH | pH | 7.5 | 890096 | 7.6 | 0.01 | 890933 |
| Nitrite (N) | mg/L | ND | 890155 | ND | 0.01 | 890599 |
| Nitrate (N) | mg/L | ND | 890155 | ND | 0.1 | 890599 |
| Nitrate + Nitrite | mg/L | ND | 890155 | ND | 0.1 | 890599 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | K00246 | K00247 | K00248 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 13:00 | 2005/12/13 13:20 | 2005/12/13 13:35 | | |
| COC Number | | 004133 | 004133 | 004133 | | |
| | Units | MW05-9-051213 | MW05-8-051213 | MW05-33-051213 | RDL | QC Batch |
| **METALS** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | ND | ND | 13 | 5 | 890376 |
| Dissolved Antimony (Sb) | ug/L | 2 | ND | ND | 1 | 890376 |
| Dissolved Arsenic (As) | ug/L | ND | 3 | 4 | 1 | 890376 |
| Dissolved Barium (Ba) | ug/L | 130 | 35 | 350 | 5 | 890376 |
| Dissolved Beryllium (Be) | ug/L | ND | ND | ND | 0.5 | 890376 |
| Dissolved Bismuth (Bi) | ug/L | ND | ND | ND | 1 | 890376 |
| Dissolved Boron (B) | ug/L | 300 | 1700 | 140 | 10 | 890376 |
| Dissolved Cadmium (Cd) | ug/L | ND | ND | 0.1 | 0.1 | 890376 |
| Dissolved Calcium (Ca) | ug/L | 260000 | 230000 | 170000 | 200 | 890376 |
| Dissolved Chromium (Cr) | ug/L | ND | ND | ND | 5 | 890376 |
| Dissolved Cobalt (Co) | ug/L | 1.5 | 1.5 | 7.8 | 0.5 | 890376 |
| Dissolved Copper (Cu) | ug/L | 5 | 1 | 2 | 1 | 890376 |
| Dissolved Iron (Fe) | ug/L | ND | ND | 340 | 50 | 890376 |
| Dissolved Lead (Pb) | ug/L | 0.5 | ND | ND | 0.5 | 890376 |
| Dissolved Lithium (Li) | ug/L | 66 | 88 | 38 | 5 | 890376 |
| Dissolved Magnesium (Mg) | ug/L | 74000 | 61000 | 49000 | 50 | 890376 |
| Dissolved Manganese (Mn) | ug/L | 620 | 820 | 2300 | 2 | 890376 |
| Dissolved Molybdenum (Mo) | ug/L | 4 | 8 | 3 | 1 | 890376 |
| Dissolved Nickel (Ni) | ug/L | 4 | 4 | 18 | 1 | 890376 |
| Dissolved Potassium (K) | ug/L | 6900 | 8400 | 4000 | 200 | 890376 |
| Dissolved Selenium (Se) | ug/L | ND | 2 | ND | 2 | 890376 |
| Dissolved Silicon (Si) | ug/L | 11000 | 13000 | 13000 | 50 | 890376 |
| Dissolved Silver (Ag) | ug/L | 1.1 | 1.2 | ND | 0.5 | 890376 |
| Dissolved Sodium (Na) | ug/L | 33000 | 320000 | 28000 | 100 | 890376 |
| Dissolved Strontium (Sr) | ug/L | 800 | 570 | 490 | 1 | 890376 |
| Dissolved Tellurium (Te) | ug/L | ND | ND | ND | 1 | 890376 |
| Dissolved Thallium (Tl) | ug/L | 0.08 | 0.07 | 0.05 | 0.05 | 890376 |
| Dissolved Thorium (Th) | ug/L | ND | ND | ND | 1 | 890376 |
| Dissolved Tin (Sn) | ug/L | ND | ND | ND | 1 | 890376 |
| Dissolved Titanium (Ti) | ug/L | ND | ND | ND | 5 | 890376 |

ND = Not detected
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QC Batch = Quality Control Batch



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Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | K00246 | K00247 | K00248 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 13:00 | 2005/12/13 13:20 | 2005/12/13 13:35 | | |
| COC Number | | 004133 | 004133 | 004133 | | |
| | Units | MW05-9-051213 | MW05-8-051213 | MW05-33-051213 | RDL | QC Batch |
| Dissolved Tungsten (W) | ug/L | ND | ND | ND | 1 | 890376 |
| Dissolved Uranium (U) | ug/L | 19 | 18 | 6.0 | 0.1 | 890376 |
| Dissolved Vanadium (V) | ug/L | ND | 2 | ND | 1 | 890376 |
| Dissolved Zinc (Zn) | ug/L | ND | ND | 11 | 5 | 890376 |
| Dissolved Zirconium (Zr) | ug/L | ND | ND | ND | 1 | 890376 |
| **NUTRIENTS** | | | | | | |
| Dissolved Phosphorus (P) | ug/L | ND | 660 | ND | 50 | 890376 |

ND = Not detected
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QC Batch = Quality Control Batch



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Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | K00249 | | K00252 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 13:55 | | 2005/12/13 14:05 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-32-051213 | QC Batch | MW05-37-051213 | RDL | QC Batch |
| **METALS** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | ND | 890376 | ND | 5 | 891451 |
| Dissolved Antimony (Sb) | ug/L | ND | 890376 | ND | 1 | 891451 |
| Dissolved Arsenic (As) | ug/L | 2 | 890376 | 2 | 1 | 891451 |
| Dissolved Barium (Ba) | ug/L | 340 | 890376 | 290 | 5 | 891451 |
| Dissolved Beryllium (Be) | ug/L | ND | 890376 | ND | 0.5 | 891451 |
| Dissolved Bismuth (Bi) | ug/L | ND | 890376 | ND | 1 | 891451 |
| Dissolved Boron (B) | ug/L | 150 | 890376 | 150 | 10 | 891451 |
| Dissolved Cadmium (Cd) | ug/L | 0.4 | 890376 | 0.4 | 0.1 | 891451 |
| Dissolved Calcium (Ca) | ug/L | 190000 | 890376 | 180000 | 200 | 891451 |
| Dissolved Chromium (Cr) | ug/L | ND | 890376 | ND | 5 | 891451 |
| Dissolved Cobalt (Co) | ug/L | 7.0 | 890376 | 6.6 | 0.5 | 891451 |
| Dissolved Copper (Cu) | ug/L | 4 | 890376 | 2 | 1 | 891451 |
| Dissolved Iron (Fe) | ug/L | 89 | 890376 | 120 | 50 | 891451 |
| Dissolved Lead (Pb) | ug/L | 0.5 | 890376 | ND | 0.5 | 891451 |
| Dissolved Lithium (Li) | ug/L | 52 | 890376 | 46 | 5 | 891451 |
| Dissolved Magnesium (Mg) | ug/L | 62000 | 890376 | 56000 | 50 | 891451 |
| Dissolved Manganese (Mn) | ug/L | 2400 | 890376 | 2400 | 2 | 891451 |
| Dissolved Molybdenum (Mo) | ug/L | 3 | 890376 | 3 | 1 | 891451 |
| Dissolved Nickel (Ni) | ug/L | 12 | 890376 | 11 | 1 | 891451 |
| Dissolved Potassium (K) | ug/L | 5300 | 890376 | 4500 | 200 | 891451 |
| Dissolved Selenium (Se) | ug/L | ND | 890376 | ND | 2 | 891451 |
| Dissolved Silicon (Si) | ug/L | 14000 | 890376 | 13000 | 50 | 891451 |
| Dissolved Silver (Ag) | ug/L | ND | 890376 | ND | 0.5 | 891451 |
| Dissolved Sodium (Na) | ug/L | 31000 | 890376 | 27000 | 100 | 891451 |
| Dissolved Strontium (Sr) | ug/L | 640 | 890376 | 560 | 1 | 891451 |
| Dissolved Tellurium (Te) | ug/L | ND | 890376 | ND | 1 | 891451 |
| Dissolved Thallium (Tl) | ug/L | ND | 890376 | ND | 0.05 | 891451 |
| Dissolved Thorium (Th) | ug/L | ND | 890376 | ND | 1 | 891451 |
| Dissolved Tin (Sn) | ug/L | ND | 890376 | ND | 1 | 891451 |
| Dissolved Titanium (Ti) | ug/L | ND | 890376 | ND | 5 | 891451 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | K00249 | | K00252 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 13:55 | | 2005/12/13 14:05 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-32-051213 | QC Batch | MW05-37-051213 | RDL | QC Batch |
| Dissolved Tungsten (W) | ug/L | ND | 890376 | ND | 1 | 891451 |
| Dissolved Uranium (U) | ug/L | 9.4 | 890376 | 9.6 | 0.1 | 891451 |
| Dissolved Vanadium (V) | ug/L | ND | 890376 | ND | 1 | 891451 |
| Dissolved Zinc (Zn) | ug/L | 10 | 890376 | ND | 5 | 891451 |
| Dissolved Zirconium (Zr) | ug/L | ND | 890376 | ND | 1 | 891451 |
| **NUTRIENTS** | | | | | | |
| Dissolved Phosphorus (P) | ug/L | ND | 890376 | ND | 50 | 891451 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

| Maxxam ID | | K00246 | K00247 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 13:00 | 2005/12/13 13:20 | | |
| COC Number | | 004133 | 004133 | | |
| | Units | MW05-9-051213 | MW05-8-051213 | RDL | QC Batch |
| PAHs | | | | | |
| Acenaphthene | ug/L | ND | ND | 0.05 | 889969 |
| Acenaphthylene | ug/L | ND | ND | 0.05 | 889969 |
| Anthracene | ug/L | ND | ND | 0.05 | 889969 |
| Benzo(a)anthracene | ug/L | ND | 0.06 | 0.05 | 889969 |
| Benzo(a)pyrene | ug/L | ND | 0.03 | 0.01 | 889969 |
| Benzo(b/j)fluoranthene | ug/L | ND | 0.06 | 0.05 | 889969 |
| Benzo(g,h,i)perylene | ug/L | ND | ND | 0.1 | 889969 |
| Benzo(k)fluoranthene | ug/L | ND | ND | 0.05 | 889969 |
| Chrysene | ug/L | ND | ND | 0.05 | 889969 |
| Dibenzo(a,h)anthracene | ug/L | ND | ND | 0.1 | 889969 |
| Fluoranthene | ug/L | ND | 0.09 | 0.05 | 889969 |
| Fluorene | ug/L | ND | ND | 0.05 | 889969 |
| Indeno(1,2,3-cd)pyrene | ug/L | ND | ND | 0.1 | 889969 |
| 1-Methylnaphthalene | ug/L | ND | 0.06 | 0.05 | 889969 |
| 2-Methylnaphthalene | ug/L | ND | 0.06 | 0.05 | 889969 |
| Naphthalene | ug/L | 0.06 | 0.14 | 0.05 | 889969 |
| Phenanthrene | ug/L | ND | 0.11 | 0.05 | 889969 |
| Pyrene | ug/L | ND | 0.11 | 0.05 | 889969 |
| Surrogate Recovery (%) | | | | | |
| 2-Fluorobiphenyl | % | 83 | 91 | | 889969 |
| D10-Anthracene | % | 94 | 95 | | 889969 |
| D14-Terphenyl (FS) | % | 95 | 86 | | 889969 |
| D7-Quinoline | % | 94 | 96 | | 889969 |
| D8-Acenaphthylene | % | 94 | 92 | | 889969 |

ND = Not detected
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QC Batch = Quality Control Batch



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Maxxam Job #: A5C9040
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A/ CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

**GENERAL COMMENTS**

Sample K00249-01: F1BTEXHS-W
Sample was diluted due to high concentration of target compounds. The DL's were adjusted accordingly.

Sample K00252-01: F1BTEXHS-W
Sample was diluted due to high concentration of target compounds. The DL's were adjusted accordingly.

**Results relate only to the items tested.**



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A/ CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report

Maxxam Job Number: MA5C9040

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 889753 ELI | MATRIX SPIKE | 1,4-Difluorobenzene | 2005/12/20 | | 99 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/20 | | 105 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/20 | | 106 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/20 | | 98 | % | 70 - 130 |
| | | Benzene | 2005/12/20 | | 100 | % | 70 - 130 |
| | Spiked Blank | 1,4-Difluorobenzene | 2005/12/20 | | 99 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/20 | | 100 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/20 | | 102 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/20 | | 102 | % | 70 - 130 |
| | | Benzene | 2005/12/20 | | 90 | % | 70 - 130 |
| | | Toluene | 2005/12/20 | | 91 | % | 70 - 130 |
| | | Ethylbenzene | 2005/12/20 | | 91 | % | 70 - 130 |
| | | o-Xylene | 2005/12/20 | | 90 | % | 70 - 130 |
| | | p+m-Xylene | 2005/12/20 | | 86 | % | 70 - 130 |
| | | F1 (C6-C10) | 2005/12/20 | | 80 | % | 70 - 130 |
| | Method Blank | 1,4-Difluorobenzene | 2005/12/20 | | 100 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/20 | | 100 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/20 | | 101 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/20 | | 101 | % | 70 - 130 |
| | | Benzene | 2005/12/20 | ND, DL=0.2 | | ug/L | |
| | | Toluene | 2005/12/20 | ND, DL=0.2 | | ug/L | |
| | | Ethylbenzene | 2005/12/20 | ND, DL=0.2 | | ug/L | |
| | | o-Xylene | 2005/12/20 | ND, DL=0.2 | | ug/L | |
| | | p+m-Xylene | 2005/12/20 | ND, DL=0.4 | | ug/L | |
| | | Total Xylenes | 2005/12/20 | ND, DL=0.4 | | ug/L | |
| | | F1 (C6-C10) | 2005/12/20 | ND, DL=100 | | ug/L | |
| | | F1 (C6-C10) - BTEX | 2005/12/20 | ND, DL=100 | | ug/L | |
| | RPD | Benzene | 2005/12/20 | NC | | % | 40 |
| | | Toluene | 2005/12/20 | 5.3 | | % | 40 |
| | | Ethylbenzene | 2005/12/20 | 6.3 | | % | 40 |
| | | o-Xylene | 2005/12/20 | 6.6 | | % | 40 |
| | | p+m-Xylene | 2005/12/20 | 6.1 | | % | 40 |
| | | Total Xylenes | 2005/12/20 | 6.2 | | % | 40 |
| | | F1 (C6-C10) | 2005/12/20 | NC | | % | 40 |
| | | F1 (C6-C10) - BTEX | 2005/12/20 | NC | | % | 40 |
| 889755 STE | MATRIX SPIKE [K00252-01] | o-Terphenyl | 2005/12/19 | | 103 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/19 | | 97 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/19 | | 97 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/19 | | 97 | % | 60 - 130 |
| | Spiked Blank | o-Terphenyl | 2005/12/19 | | 99 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/19 | | 98 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/19 | | 98 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/19 | | 98 | % | 60 - 130 |
| | Method Blank | o-Terphenyl | 2005/12/19 | | 89 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/19 | ND, DL=100 | | ug/L | |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/19 | ND, DL=100 | | ug/L | |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/19 | ND, DL=100 | | ug/L | |
| | RPD [K00246-02] | F2 (C10-C16 Hydrocarbons) | 2005/12/19 | NC | | % | 50 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/19 | NC | | % | 50 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/19 | NC | | % | 50 |
| 889969 FLM | MATRIX SPIKE | D10-Anthracene | 2005/12/21 | | 92 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/12/21 | | 99 | % | 30 - 130 |
| | | D7-Quinoline | 2005/12/21 | | 88 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/12/21 | | 94 | % | 30 - 130 |
| | | Acenaphthene | 2005/12/21 | | 85 | % | 30 - 130 |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A/ CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C9040

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 889969 FLM | MATRIX SPIKE | Acenaphthylene | 2005/12/21 | | 83 | % | 30 - 130 |
| | | Anthracene | 2005/12/21 | | 97 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/12/21 | | 94 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/12/21 | | 98 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/12/21 | | 104 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/12/21 | | 93 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/12/21 | | 87 | % | 30 - 130 |
| | | Chrysene | 2005/12/21 | | 95 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/12/21 | | 108 | % | 30 - 130 |
| | | Fluoranthene | 2005/12/21 | | 97 | % | 30 - 130 |
| | | Fluorene | 2005/12/21 | | 89 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/12/21 | | 111 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/12/21 | | 75 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/12/21 | | 74 | % | 30 - 130 |
| | | Naphthalene | 2005/12/21 | | 73 | % | 30 - 130 |
| | | Phenanthrene | 2005/12/21 | | 93 | % | 30 - 130 |
| | | Pyrene | 2005/12/21 | | 94 | % | 30 - 130 |
| | Spiked Blank | 2-Fluorobiphenyl | 2005/12/21 | | 76 | % | 30 - 130 |
| | | D10-Anthracene | 2005/12/21 | | 88 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/12/21 | | 95 | % | 30 - 130 |
| | | D7-Quinoline | 2005/12/21 | | 89 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/12/21 | | 92 | % | 30 - 130 |
| | | Acenaphthene | 2005/12/21 | | 79 | % | 30 - 130 |
| | | Acenaphthylene | 2005/12/21 | | 80 | % | 30 - 130 |
| | | Anthracene | 2005/12/21 | | 94 | % | 30 - 130 |
| | | Benzo(a)anthracene | 2005/12/21 | | 92 | % | 30 - 130 |
| | | Benzo(a)pyrene | 2005/12/21 | | 96 | % | 30 - 130 |
| | | Benzo(b/j)fluoranthene | 2005/12/21 | | 95 | % | 30 - 130 |
| | | Benzo(g,h,i)perylene | 2005/12/21 | | 97 | % | 30 - 130 |
| | | Benzo(k)fluoranthene | 2005/12/21 | | 101 | % | 30 - 130 |
| | | Chrysene | 2005/12/21 | | 94 | % | 30 - 130 |
| | | Dibenzo(a,h)anthracene | 2005/12/21 | | 109 | % | 30 - 130 |
| | | Fluoranthene | 2005/12/21 | | 93 | % | 30 - 130 |
| | | Fluorene | 2005/12/21 | | 86 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/12/21 | | 108 | % | 30 - 130 |
| | | 1-Methylnaphthalene | 2005/12/21 | | 68 | % | 30 - 130 |
| | | 2-Methylnaphthalene | 2005/12/21 | | 67 | % | 30 - 130 |
| | | Naphthalene | 2005/12/21 | | 65 | % | 30 - 130 |
| | | Phenanthrene | 2005/12/21 | | 91 | % | 30 - 130 |
| | | Pyrene | 2005/12/21 | | 90 | % | 30 - 130 |
| | Method Blank | 2-Fluorobiphenyl | 2005/12/21 | | 83 | % | 30 - 130 |
| | | D10-Anthracene | 2005/12/21 | | 95 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/12/21 | | 104 | % | 30 - 130 |
| | | D7-Quinoline | 2005/12/21 | | 93 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/12/21 | | 95 | % | 30 - 130 |
| | | Acenaphthene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | Acenaphthylene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | Anthracene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | Benzo(a)anthracene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | Benzo(a)pyrene | 2005/12/21 | ND, DL=0.01 | | ug/L | |
| | | Benzo(b/j)fluoranthene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | Benzo(g,h,i)perylene | 2005/12/21 | ND, DL=0.1 | | ug/L | |
| | | Benzo(k)fluoranthene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | Chrysene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | Dibenzo(a,h)anthracene | 2005/12/21 | ND, DL=0.1 | | ug/L | |
| | | Fluoranthene | 2005/12/21 | ND, DL=0.05 | | ug/L | |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A/ CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C9040

| QA/QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 889969 | FLM | Method Blank | Fluorene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | | Indeno(1,2,3-cd)pyrene | 2005/12/21 | ND, DL=0.1 | | ug/L | |
| | | | 1-Methylnaphthalene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | | 2-Methylnaphthalene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | | Naphthalene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | | Phenanthrene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | | Pyrene | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | RPD | D14-Terphenyl (FS) | 2005/12/21 | 13.6 | | % | N/A |
| | | | Acenaphthene | 2005/12/21 | NC | | % | 40 |
| | | | Acenaphthylene | 2005/12/21 | NC | | % | 40 |
| | | | Anthracene | 2005/12/21 | NC | | % | 40 |
| | | | Benzo(a)anthracene | 2005/12/21 | NC | | % | 40 |
| | | | Benzo(a)pyrene | 2005/12/21 | NC | | % | 40 |
| | | | Benzo(b/j)fluoranthene | 2005/12/21 | NC | | % | 40 |
| | | | Benzo(g,h,i)perylene | 2005/12/21 | NC | | % | 40 |
| | | | Benzo(k)fluoranthene | 2005/12/21 | NC | | % | 40 |
| | | | Chrysene | 2005/12/21 | NC | | % | 40 |
| | | | Dibenzo(a,h)anthracene | 2005/12/21 | NC | | % | 40 |
| | | | Fluoranthene | 2005/12/21 | NC | | % | 40 |
| | | | Fluorene | 2005/12/21 | NC | | % | 40 |
| | | | Indeno(1,2,3-cd)pyrene | 2005/12/21 | NC | | % | 40 |
| | | | 1-Methylnaphthalene | 2005/12/21 | NC | | % | 40 |
| | | | 2-Methylnaphthalene | 2005/12/21 | NC | | % | 40 |
| | | | Naphthalene | 2005/12/21 | NC | | % | 40 |
| | | | Phenanthrene | 2005/12/21 | NC | | % | 40 |
| | | | Pyrene | 2005/12/21 | NC | | % | 40 |
| 890090 | KR | QC STANDARD | Conductivity | 2005/12/20 | | 97 | % | 85 - 115 |
| | | Method Blank | Conductivity | 2005/12/20 | ND, DL=2 | | umho/cm | |
| | | RPD | Conductivity | 2005/12/20 | 0 | | % | 25 |
| 890155 | CCI | MATRIX SPIKE [K00249-02] | Nitrite (N) | 2005/12/21 | | 105 | % | 75 - 125 |
| | | | Nitrate (N) | 2005/12/21 | | 98 | % | 75 - 125 |
| | | Spiked Blank | Nitrite (N) | 2005/12/21 | | 103 | % | 85 - 115 |
| | | | Nitrate (N) | 2005/12/21 | | 98 | % | 85 - 117 |
| | | Method Blank | Nitrite (N) | 2005/12/21 | ND, DL=0.01 | | mg/L | |
| | | | Nitrate (N) | 2005/12/21 | ND, DL=0.1 | | mg/L | |
| | | | Nitrate + Nitrite | 2005/12/21 | ND, DL=0.1 | | mg/L | |
| | | RPD [K00249-02] | Nitrite (N) | 2005/12/21 | NC | | % | 25 |
| | | | Nitrate (N) | 2005/12/21 | NC | | % | 25 |
| | | | Nitrate + Nitrite | 2005/12/21 | NC | | % | 25 |
| 890376 | HRE | MATRIX SPIKE | Dissolved Aluminum (Al) | 2005/12/21 | | 91 | % | 75 - 125 |
| | | | Dissolved Antimony (Sb) | 2005/12/21 | | 98 | % | 75 - 125 |
| | | | Dissolved Arsenic (As) | 2005/12/21 | | 100 | % | 75 - 125 |
| | | | Dissolved Barium (Ba) | 2005/12/21 | | 91 | % | 75 - 125 |
| | | | Dissolved Beryllium (Be) | 2005/12/21 | | 96 | % | 75 - 125 |
| | | | Dissolved Bismuth (Bi) | 2005/12/21 | | 99 | % | 75 - 125 |
| | | | Dissolved Boron (B) | 2005/12/21 | | 102 | % | 75 - 125 |
| | | | Dissolved Cadmium (Cd) | 2005/12/21 | | 99 | % | 75 - 125 |
| | | | Dissolved Calcium (Ca) | 2005/12/21 | | 94 | % | 75 - 125 |
| | | | Dissolved Chromium (Cr) | 2005/12/21 | | 103 | % | 75 - 125 |
| | | | Dissolved Cobalt (Co) | 2005/12/21 | | 100 | % | 75 - 125 |
| | | | Dissolved Copper (Cu) | 2005/12/21 | | 96 | % | 75 - 125 |
| | | | Dissolved Iron (Fe) | 2005/12/21 | | 106 | % | 75 - 125 |
| | | | Dissolved Lead (Pb) | 2005/12/21 | | 97 | % | 75 - 125 |
| | | | Dissolved Lithium (Li) | 2005/12/21 | | 94 | % | 75 - 125 |
| | | | Dissolved Magnesium (Mg) | 2005/12/21 | | NC(1) | % | 75 - 125 |



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Client Project #: W053011A/ CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C9040

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 890376 HRE | MATRIX SPIKE | Dissolved Manganese (Mn) | 2005/12/21 | | 102 | % | 75 - 125 |
| | | Dissolved Molybdenum (Mo) | 2005/12/21 | | 100 | % | 75 - 125 |
| | | Dissolved Nickel (Ni) | 2005/12/21 | | 97 | % | 75 - 125 |
| | | Dissolved Potassium (K) | 2005/12/21 | | 99 | % | 75 - 125 |
| | | Dissolved Selenium (Se) | 2005/12/21 | | 95 | % | 75 - 125 |
| | | Dissolved Silicon (Si) | 2005/12/21 | | 96 | % | 75 - 125 |
| | | Dissolved Silver (Ag) | 2005/12/21 | | 63[2] | % | 75 - 125 |
| | | Dissolved Sodium (Na) | 2005/12/21 | | NC[3] | % | 75 - 125 |
| | | Dissolved Strontium (Sr) | 2005/12/21 | | 94[4] | % | 75 - 125 |
| | | Dissolved Tellurium (Te) | 2005/12/21 | | 97 | % | 75 - 125 |
| | | Dissolved Thallium (Tl) | 2005/12/21 | | 99 | % | 75 - 125 |
| | | Dissolved Thorium (Th) | 2005/12/21 | | 96 | % | 75 - 125 |
| | | Dissolved Tin (Sn) | 2005/12/21 | | 98 | % | 75 - 125 |
| | | Dissolved Titanium (Ti) | 2005/12/21 | | 98 | % | 75 - 125 |
| | | Dissolved Tungsten (W) | 2005/12/21 | | 99 | % | 75 - 125 |
| | | Dissolved Uranium (U) | 2005/12/21 | | 102 | % | 75 - 125 |
| | | Dissolved Vanadium (V) | 2005/12/21 | | 104 | % | 75 - 125 |
| | | Dissolved Zinc (Zn) | 2005/12/21 | | 97 | % | 75 - 125 |
| | | Dissolved Zirconium (Zr) | 2005/12/21 | | 98 | % | 75 - 125 |
| | | Dissolved Phosphorus (P) | 2005/12/21 | | 81 | % | 75 - 125 |
| | Spiked Blank | Dissolved Aluminum (Al) | 2005/12/21 | | 100 | % | 85 - 115 |
| | | Dissolved Antimony (Sb) | 2005/12/21 | | 105 | % | 85 - 115 |
| | | Dissolved Arsenic (As) | 2005/12/21 | | 103 | % | 85 - 115 |
| | | Dissolved Barium (Ba) | 2005/12/21 | | 96 | % | 85 - 115 |
| | | Dissolved Beryllium (Be) | 2005/12/21 | | 98 | % | 85 - 115 |
| | | Dissolved Bismuth (Bi) | 2005/12/21 | | 94 | % | 85 - 115 |
| | | Dissolved Boron (B) | 2005/12/21 | | 96 | % | 85 - 115 |
| | | Dissolved Cadmium (Cd) | 2005/12/21 | | 108 | % | 85 - 115 |
| | | Dissolved Calcium (Ca) | 2005/12/21 | | 106 | % | 85 - 115 |
| | | Dissolved Chromium (Cr) | 2005/12/21 | | 104 | % | 85 - 115 |
| | | Dissolved Cobalt (Co) | 2005/12/21 | | 103 | % | 85 - 115 |
| | | Dissolved Copper (Cu) | 2005/12/21 | | 101 | % | 85 - 115 |
| | | Dissolved Iron (Fe) | 2005/12/21 | | 104 | % | 85 - 115 |
| | | Dissolved Lead (Pb) | 2005/12/21 | | 96 | % | 85 - 115 |
| | | Dissolved Lithium (Li) | 2005/12/21 | | 93 | % | 85 - 115 |
| | | Dissolved Magnesium (Mg) | 2005/12/21 | | 105 | % | 85 - 115 |
| | | Dissolved Manganese (Mn) | 2005/12/21 | | 104 | % | 85 - 115 |
| | | Dissolved Molybdenum (Mo) | 2005/12/21 | | 109 | % | 85 - 115 |
| | | Dissolved Nickel (Ni) | 2005/12/21 | | 103 | % | 85 - 115 |
| | | Dissolved Potassium (K) | 2005/12/21 | | 106 | % | 85 - 115 |
| | | Dissolved Selenium (Se) | 2005/12/21 | | 102 | % | 85 - 115 |
| | | Dissolved Silicon (Si) | 2005/12/21 | | 106 | % | 85 - 115 |
| | | Dissolved Silver (Ag) | 2005/12/21 | | 106 | % | 85 - 115 |
| | | Dissolved Sodium (Na) | 2005/12/21 | | 106 | % | 85 - 115 |
| | | Dissolved Strontium (Sr) | 2005/12/21 | | 102 | % | 85 - 115 |
| | | Dissolved Tellurium (Te) | 2005/12/21 | | 102 | % | 85 - 115 |
| | | Dissolved Thallium (Tl) | 2005/12/21 | | 97 | % | 85 - 115 |
| | | Dissolved Thorium (Th) | 2005/12/21 | | 100 | % | 85 - 115 |
| | | Dissolved Tin (Sn) | 2005/12/21 | | 105 | % | 85 - 115 |
| | | Dissolved Titanium (Ti) | 2005/12/21 | | 104 | % | 85 - 115 |
| | | Dissolved Tungsten (W) | 2005/12/21 | | 99 | % | 85 - 115 |
| | | Dissolved Uranium (U) | 2005/12/21 | | 96 | % | 85 - 115 |
| | | Dissolved Vanadium (V) | 2005/12/21 | | 106 | % | 85 - 115 |
| | | Dissolved Zinc (Zn) | 2005/12/21 | | 100 | % | 85 - 115 |
| | | Dissolved Zirconium (Zr) | 2005/12/21 | | 108 | % | 85 - 115 |
| | | Dissolved Phosphorus (P) | 2005/12/21 | | 90 | % | 85 - 115 |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A/ CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C9040

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 890376 HRE | Method Blank | Dissolved Aluminum (Al) | 2005/12/21 | ND, DL=5 | | ug/L | |
| | | Dissolved Antimony (Sb) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Arsenic (As) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Barium (Ba) | 2005/12/21 | ND, DL=5 | | ug/L | |
| | | Dissolved Beryllium (Be) | 2005/12/21 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Bismuth (Bi) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Boron (B) | 2005/12/21 | ND, DL=10 | | ug/L | |
| | | Dissolved Cadmium (Cd) | 2005/12/21 | ND, DL=0.1 | | ug/L | |
| | | Dissolved Calcium (Ca) | 2005/12/21 | ND, DL=200 | | ug/L | |
| | | Dissolved Chromium (Cr) | 2005/12/21 | ND, DL=5 | | ug/L | |
| | | Dissolved Cobalt (Co) | 2005/12/21 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Copper (Cu) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Iron (Fe) | 2005/12/21 | ND, DL=50 | | ug/L | |
| | | Dissolved Lead (Pb) | 2005/12/21 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Lithium (Li) | 2005/12/21 | ND, DL=5 | | ug/L | |
| | | Dissolved Magnesium (Mg) | 2005/12/21 | ND, DL=50 | | ug/L | |
| | | Dissolved Manganese (Mn) | 2005/12/21 | ND, DL=2 | | ug/L | |
| | | Dissolved Molybdenum (Mo) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Nickel (Ni) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Potassium (K) | 2005/12/21 | ND, DL=200 | | ug/L | |
| | | Dissolved Selenium (Se) | 2005/12/21 | ND, DL=2 | | ug/L | |
| | | Dissolved Silicon (Si) | 2005/12/21 | ND, DL=50 | | ug/L | |
| | | Dissolved Silver (Ag) | 2005/12/21 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Sodium (Na) | 2005/12/21 | ND, DL=100 | | ug/L | |
| | | Dissolved Strontium (Sr) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Tellurium (Te) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Thallium (Tl) | 2005/12/21 | ND, DL=0.05 | | ug/L | |
| | | Dissolved Thorium (Th) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Tin (Sn) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Titanium (Ti) | 2005/12/21 | ND, DL=5 | | ug/L | |
| | | Dissolved Tungsten (W) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Uranium (U) | 2005/12/21 | ND, DL=0.1 | | ug/L | |
| | | Dissolved Vanadium (V) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Zinc (Zn) | 2005/12/21 | ND, DL=5 | | ug/L | |
| | | Dissolved Zirconium (Zr) | 2005/12/21 | ND, DL=1 | | ug/L | |
| | | Dissolved Phosphorus (P) | 2005/12/21 | ND, DL=50 | | ug/L | |
| | RPD | Dissolved Aluminum (Al) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Antimony (Sb) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Arsenic (As) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Barium (Ba) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Beryllium (Be) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Bismuth (Bi) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Boron (B) | 2005/12/21 | 6.8 | | % | 25 |
| | | Dissolved Cadmium (Cd) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Calcium (Ca) | 2005/12/21 | 2.0 | | % | 25 |
| | | Dissolved Chromium (Cr) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Cobalt (Co) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Copper (Cu) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Iron (Fe) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Lead (Pb) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Magnesium (Mg) | 2005/12/21 | 1.9 | | % | 25 |
| | | Dissolved Manganese (Mn) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Molybdenum (Mo) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Nickel (Ni) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Potassium (K) | 2005/12/21 | 4.9 | | % | 25 |
| | | Dissolved Selenium (Se) | 2005/12/21 | NC | | % | 25 |



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Client Project #: W053011A/ CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C9040

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 890376 HRE | RPD | Dissolved Silicon (Si) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Silver (Ag) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Sodium (Na) | 2005/12/21 | 3.4 | | % | 25 |
| | | Dissolved Strontium (Sr) | 2005/12/21 | 0.7 | | % | 25 |
| | | Dissolved Thallium (Tl) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Titanium (Ti) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Uranium (U) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Vanadium (V) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Zinc (Zn) | 2005/12/21 | NC | | % | 25 |
| | | Dissolved Phosphorus (P) | 2005/12/21 | NC | | % | 25 |
| 890599 CCI | MATRIX SPIKE | Nitrite (N) | 2005/12/21 | | 106 | % | 75 - 125 |
| | | Nitrate (N) | 2005/12/21 | | 100 | % | 75 - 125 |
| | Spiked Blank | Nitrite (N) | 2005/12/21 | | 105 | % | 85 - 115 |
| | | Nitrate (N) | 2005/12/21 | | 98 | % | 85 - 117 |
| | Method Blank | Nitrite (N) | 2005/12/21 | ND, DL=0.01 | | mg/L | |
| | | Nitrate (N) | 2005/12/21 | ND, DL=0.1 | | mg/L | |
| | | Nitrate + Nitrite | 2005/12/21 | ND, DL=0.1 | | mg/L | |
| | RPD | Nitrite (N) | 2005/12/21 | NC | | % | 25 |
| | | Nitrate (N) | 2005/12/21 | NC | | % | 25 |
| | | Nitrate + Nitrite | 2005/12/21 | NC | | % | 25 |
| 890930 KR | QC STANDARD | Conductivity | 2005/12/21 | | 97 | % | 85 - 115 |
| | Method Blank | Conductivity | 2005/12/21 | ND, DL=2 | | umho/cm | |
| | RPD | Conductivity | 2005/12/21 | 1.5 | | % | 25 |
| 891451 HRE | MATRIX SPIKE | Dissolved Aluminum (Al) | 2005/12/22 | | 107 | % | 75 - 125 |
| | | Dissolved Antimony (Sb) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | Dissolved Arsenic (As) | 2005/12/22 | | 102 | % | 75 - 125 |
| | | Dissolved Barium (Ba) | 2005/12/22 | | 105 | % | 75 - 125 |
| | | Dissolved Beryllium (Be) | 2005/12/22 | | 106 | % | 75 - 125 |
| | | Dissolved Bismuth (Bi) | 2005/12/22 | | 100 | % | 75 - 125 |
| | | Dissolved Boron (B) | 2005/12/22 | | 118 | % | 75 - 125 |
| | | Dissolved Cadmium (Cd) | 2005/12/22 | | 106 | % | 75 - 125 |
| | | Dissolved Calcium (Ca) | 2005/12/22 | | NC[5] | % | 75 - 125 |
| | | Dissolved Chromium (Cr) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | Dissolved Cobalt (Co) | 2005/12/22 | | 100 | % | 75 - 125 |
| | | Dissolved Copper (Cu) | 2005/12/22 | | 104 | % | 75 - 125 |
| | | Dissolved Iron (Fe) | 2005/12/22 | | 99 | % | 75 - 125 |
| | | Dissolved Lead (Pb) | 2005/12/22 | | 99 | % | 75 - 125 |
| | | Dissolved Lithium (Li) | 2005/12/22 | | 106 | % | 75 - 125 |
| | | Dissolved Magnesium (Mg) | 2005/12/22 | | 106 | % | 75 - 125 |
| | | Dissolved Manganese (Mn) | 2005/12/22 | | 93 | % | 75 - 125 |
| | | Dissolved Molybdenum (Mo) | 2005/12/22 | | 105 | % | 75 - 125 |
| | | Dissolved Nickel (Ni) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | Dissolved Potassium (K) | 2005/12/22 | | 107 | % | 75 - 125 |
| | | Dissolved Selenium (Se) | 2005/12/22 | | 104 | % | 75 - 125 |
| | | Dissolved Silicon (Si) | 2005/12/22 | | 100 | % | 75 - 125 |
| | | Dissolved Silver (Ag) | 2005/12/22 | | 92 | % | 75 - 125 |
| | | Dissolved Sodium (Na) | 2005/12/22 | | 120 | % | 75 - 125 |
| | | Dissolved Strontium (Sr) | 2005/12/22 | | 107 | % | 75 - 125 |
| | | Dissolved Tellurium (Te) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | Dissolved Thallium (Tl) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | Dissolved Thorium (Th) | 2005/12/22 | | 95 | % | 75 - 125 |
| | | Dissolved Tin (Sn) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | Dissolved Titanium (Ti) | 2005/12/22 | | 98 | % | 75 - 125 |
| | | Dissolved Tungsten (W) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | Dissolved Uranium (U) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | Dissolved Vanadium (V) | 2005/12/22 | | 103 | % | 75 - 125 |



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Client Project #: W053011A/ CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C9040

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 891451 HRE | MATRIX SPIKE | Dissolved Zinc (Zn) | 2005/12/22 | | 104 | % | 75 - 125 |
| | | Dissolved Zirconium (Zr) | 2005/12/22 | | 99 | % | 75 - 125 |
| | | Dissolved Phosphorus (P) | 2005/12/22 | | 101 | % | 75 - 125 |
| | Spiked Blank | Dissolved Aluminum (Al) | 2005/12/22 | | 92 | % | 85 - 115 |
| | | Dissolved Antimony (Sb) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Arsenic (As) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Barium (Ba) | 2005/12/22 | | 91 | % | 85 - 115 |
| | | Dissolved Beryllium (Be) | 2005/12/22 | | 93 | % | 85 - 115 |
| | | Dissolved Bismuth (Bi) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Boron (B) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Cadmium (Cd) | 2005/12/22 | | 99 | % | 85 - 115 |
| | | Dissolved Calcium (Ca) | 2005/12/22 | | 102 | % | 85 - 115 |
| | | Dissolved Chromium (Cr) | 2005/12/22 | | 104 | % | 85 - 115 |
| | | Dissolved Cobalt (Co) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Copper (Cu) | 2005/12/22 | | 97 | % | 85 - 115 |
| | | Dissolved Iron (Fe) | 2005/12/22 | | 108 | % | 85 - 115 |
| | | Dissolved Lead (Pb) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Lithium (Li) | 2005/12/22 | | 94 | % | 85 - 115 |
| | | Dissolved Magnesium (Mg) | 2005/12/22 | | 104 | % | 85 - 115 |
| | | Dissolved Manganese (Mn) | 2005/12/22 | | 102 | % | 85 - 115 |
| | | Dissolved Molybdenum (Mo) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Nickel (Ni) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Potassium (K) | 2005/12/22 | | 99 | % | 85 - 115 |
| | | Dissolved Selenium (Se) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Silicon (Si) | 2005/12/22 | | 99 | % | 85 - 115 |
| | | Dissolved Silver (Ag) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Sodium (Na) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Strontium (Sr) | 2005/12/22 | | 95 | % | 85 - 115 |
| | | Dissolved Tellurium (Te) | 2005/12/22 | | 98 | % | 85 - 115 |
| | | Dissolved Thallium (Tl) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Thorium (Th) | 2005/12/22 | | 97 | % | 85 - 115 |
| | | Dissolved Tin (Sn) | 2005/12/22 | | 99 | % | 85 - 115 |
| | | Dissolved Titanium (Ti) | 2005/12/22 | | 103 | % | 85 - 115 |
| | | Dissolved Tungsten (W) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Uranium (U) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Vanadium (V) | 2005/12/22 | | 105 | % | 85 - 115 |
| | | Dissolved Zinc (Zn) | 2005/12/22 | | 97 | % | 85 - 115 |
| | | Dissolved Zirconium (Zr) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Phosphorus (P) | 2005/12/22 | | 89 | % | 85 - 115 |
| | Method Blank | Dissolved Aluminum (Al) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Antimony (Sb) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Arsenic (As) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Barium (Ba) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Beryllium (Be) | 2005/12/22 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Bismuth (Bi) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Boron (B) | 2005/12/22 | ND, DL=10 | | ug/L | |
| | | Dissolved Cadmium (Cd) | 2005/12/22 | ND, DL=0.1 | | ug/L | |
| | | Dissolved Calcium (Ca) | 2005/12/22 | ND, DL=200 | | ug/L | |
| | | Dissolved Chromium (Cr) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Cobalt (Co) | 2005/12/22 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Copper (Cu) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Iron (Fe) | 2005/12/22 | ND, DL=50 | | ug/L | |
| | | Dissolved Lead (Pb) | 2005/12/22 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Lithium (Li) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Magnesium (Mg) | 2005/12/22 | ND, DL=50 | | ug/L | |
| | | Dissolved Manganese (Mn) | 2005/12/22 | ND, DL=2 | | ug/L | |



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A/ CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C9040

| QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 1451 | HRE | Method Blank | Dissolved Molybdenum (Mo) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Nickel (Ni) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Potassium (K) | 2005/12/22 | ND, DL=200 | | ug/L | |
| | | | Dissolved Selenium (Se) | 2005/12/22 | ND, DL=2 | | ug/L | |
| | | | Dissolved Silicon (Si) | 2005/12/22 | ND, DL=50 | | ug/L | |
| | | | Dissolved Silver (Ag) | 2005/12/22 | ND, DL=0.5 | | ug/L | |
| | | | Dissolved Sodium (Na) | 2005/12/22 | ND, DL=100 | | ug/L | |
| | | | Dissolved Strontium (Sr) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Tellurium (Te) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Thallium (Tl) | 2005/12/22 | ND, DL=0.05 | | ug/L | |
| | | | Dissolved Thorium (Th) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Tin (Sn) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Titanium (Ti) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | | Dissolved Tungsten (W) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Uranium (U) | 2005/12/22 | ND, DL=0.1 | | ug/L | |
| | | | Dissolved Vanadium (V) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Zinc (Zn) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | | Dissolved Zirconium (Zr) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | | Dissolved Phosphorus (P) | 2005/12/22 | ND, DL=50 | | ug/L | |
| | | RPD | Dissolved Antimony (Sb) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Arsenic (As) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Barium (Ba) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Beryllium (Be) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Boron (B) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Cadmium (Cd) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Chromium (Cr) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Cobalt (Co) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Copper (Cu) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Lead (Pb) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Molybdenum (Mo) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Nickel (Ni) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Selenium (Se) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Silver (Ag) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Sodium (Na) | 2005/12/22 | 0.8 | | % | 25 |
| | | | Dissolved Tellurium (Te) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Thallium (Tl) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Thorium (Th) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Vanadium (V) | 2005/12/22 | NC | | % | 25 |
| | | | Dissolved Zinc (Zn) | 2005/12/22 | NC | | % | 25 |

ND = Not detected
N/A = Not Applicable
NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample

(1) The recovery for sodiumm and magnesium in the matrix spiked sample was not calculated. Because of the high concentration of this compound in the parent sample, the relative difference between the spiked and un-spiked concentrations is not sufficiently significant to permit a reliable recovery calculation.

(2) ICPMS: The recovery for sodium in the matrix spike was below the lower control limit. This may represent a low bias in some results for this specific parameter.

(3) The recoveryin the matrix spiked sample was not calculated. Because of the high concentration of this compound in the parent sample, the relative difference between the spiked and un-spiked concentrations is not sufficiently significant to permit a reliable recovery calculation.

(4) The recovery for silver in the matrix spiked sample was not calculated. Because of the high concentration of this compound in the parent sample, the relative difference between the spiked and un-spiked concentrations is not sufficiently significant to permit a reliable recovery calculation.

(5) The recovery for Ca in the matrix spiked sample was not calculated. Because of the high concentration of this compound in the parent sample, the relative difference between the spiked and un-spiked concentrations is not sufficiently significant to permit a reliable recovery calculation.



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

# CHAIN OF CUSTODY RECORD

MaxxAm Analytics Inc
6740 Campobello Road, Mississauga, ON M6R 1N7
Phone: 905-817-5700 Fax: 905-817-5777 Toll Free: (800) 563-6266



| INVOICE INFORMATION | REPORT INFORMATION (if differs from invoice) | PROJECT INFORMATION | MAXXAM JOB NUMBER |
|---|---|---|---|
| Company Name: CPR AIL [illegible] | Company Name: | Quotation #: CPRAIL EA780 | A5C9040 PIR PER |
| Contact Name: Andrew J. [illegible] | Contact Name: | P.O. #: | CHAIN OF CUSTODY # |
| Address: E-1780 CHRISTIE AVE WINNIPEG MB | Address: | Project #: W05501A | 00413336 |
| Phone: 204-477-[illegible] 9194 | Phone: Fax: | Project Name: CP SOURIS YARD | |
| Email: Andrew.[illegible] | Email: Cynthia.Cuddy@snclavalin.com | Location: SOURIS, MB | |
| | | Sampled By: JDT | |

## REGULATORY CRITERIA

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form.

- [ ] MISA — Reg. 153: [ ] Table 1 [ ] Table 2 [ ] Table 3
- [ ] PWQO
- [ ] Reg. 558
- Sewer Use: [ ] Sanitary [ ] Storm — Region:
- [x] Other: CCME (Industrial)
- Specify:
- Report Criteria on C of A? [ ]

**SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM.**

## ANALYSIS REQUESTED (Please be specific)

## TURNAROUND TIME (TAT) REQUIRED

**PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS.**

Regular (Standard) TAT:
- [x] 5 to 7 Working Days

Rush TAT: Rush Confirmation #: (Call Lab for #)
- [ ] 1 day [ ] 2 days [ ] 3 days

DATE Required:

TIME Required:

Please note that TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

| | Sample Identification | Date Sampled | Time Sampled | Matrix (GW, SW, Soil, etc.) | Regulated Drinking Water? (Y/N) | Metals Field Filtered? (Y/N) | PAHs | ICP/MS metals (Lowest Detection) | F2-F4 (STEX/PHC) | Nitrate (as N) | Oil & Grease | Total Phenols | # of Cont. | COMMENTS / TAT COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW05-9-051213 | 051213 | 1300 | GW | N | Y | X | X | X | X | | | 8 | |
| 2 | MW05-8-051213 | 051213 | 1320 | GW | N | Y | X | X | X | X | | | 8 | |
| 3 | MW05-35-051213 | 051213 | 1335 | GW | N | Y | | X | | | | | 1 | |
| 4 | MW05-32-051213 | " | 1355 | GW | N | Y | | X | X | X | X | X | 6 | |
| 5 | MW05-37-051213 | ↓ | 1405 | GW | N | Y | | X | X | X | X | X | 6 | |
| 6 | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |

DEC 15 '05 AM 11:14

| RELINQUISHED BY (Signature/Print) | RECEIVED BY (Signature/Print) | Date | Time |
|---|---|---|---|
| JDT | | | |
| | | 05/12/15 | 11:15 |

Laboratory Use Only

| Temperature (°C) on Receipt | Condition of Sample on Receipt |
|---|---|
| 0 \| 2°C | [ ] OK [ ] SIF |

**MANDATORY SECTIONS IN GREY MUST BE FILLED OUT. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.**

Your P.O. #: EA780
Your Project #: W053011A CP SOURIS YARD
Site: SOURIS, MB
Your C.O.C. #: 00413335

**Attention: Andrew Eason**
Morrow Environmental
1420 Clarence Ave
Unit E
Winnipeg, MB
CANADA R3T 1T6



**Report Date: 2005/12/29**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: A5C8950**
**Received: 2005/12/15, 11:27**

Sample Matrix: Water
# Samples Received: 6

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Method Reference |
|---|---|---|---|---|---|
| Conductivity | 1 | N/A | 2005/12/21 | Ont SOP 0071 | APHA 2510 |
| Petroleum Hydro. CCME FI & BTEX in Water | 6 | N/A | 2005/12/21 | Ont SOP-0816 | CCME CWS |
| Petroleum Hydrocarbons F2-F4 in Water | 6 | 2005/12/21 | 2005/12/21 | Ont SOP 0817 | CCME Hydrocarbons |
| Dissolved Metals by ICPMS | 5 | N/A | 2005/12/22 | Ont SOP 0624 | EPA 6020 |
| Nitrate (NO3) and Nitrite (NO2) in Water | 1 | N/A | 2005/12/22 | Ont SOP-0100 | SM 4500 NO3 I |
| PAH Compounds in Water by GC/MS (SIM) | 1 | 2005/12/21 | 2005/12/23 | EPA 8270 | GC/MS |
| pH | 1 | N/A | 2005/12/21 | Ont SOP 0067 | APHA 4500H |

**Validated by :**
EWA PRAVIC, M.Sc., C.Chem
Scientific Specialist

Total cover pages: 1



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## OREG 153 PETROLEUM HYDROCARBONS (WATER)

| Maxxam ID | | J99709 | | J99710 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 09:15 | | 2005/12/13 10:45 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-34-051213 | RDL | MW05-6-051213 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/L | 530 | 4 | ND | 0.2 | 890845 |
| Toluene | ug/L | 310 | 4 | ND | 0.2 | 890845 |
| Ethylbenzene | ug/L | 70 | 4 | ND | 0.2 | 890845 |
| o-Xylene | ug/L | 100 | 4 | ND | 0.2 | 890845 |
| p+m-Xylene | ug/L | 350 | 8 | ND | 0.4 | 890845 |
| Total Xylenes | ug/L | 450 | 8 | ND | 0.4 | 890845 |
| F1 (C6-C10) | ug/L | 4100 | 2000 | ND | 100 | 890845 |
| F1 (C6-C10) - BTEX | ug/L | 2700 | 2000 | ND | 100 | 890845 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | 10000 | 100 | ND | 100 | 891133 |
| F3 (C16-C34 Hydrocarbons) | ug/L | 1300 | 100 | ND | 100 | 891133 |
| F4 (C34-C50 Hydrocarbons) | ug/L | ND | 100 | ND | 100 | 891133 |
| Reached Baseline at C50 | ug/L | YES | | YES | | 891133 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 102 | | 99 | | 890845 |
| 4-Bromofluorobenzene | % | 101 | | 103 | | 890845 |
| D10-Ethylbenzene | % | 102 | | 98 | | 890845 |
| D4-1,2-Dichloroethane | % | 92 | | 92 | | 890845 |
| o-Terphenyl | % | 103 | | 98 | | 891133 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## OREG 153 PETROLEUM HYDROCARBONS (WATER)

| Maxxam ID | | J99711 | | J99712 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 10:05 | | 2005/12/13 10:15 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-33-051213 | RDL | MW05-31-051213 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/L | 3300 | 4 | ND | 0.2 | 890845 |
| Toluene | ug/L | 10 | 4 | ND | 0.2 | 890845 |
| Ethylbenzene | ug/L | 140 | 4 | ND | 0.2 | 890845 |
| o-Xylene | ug/L | 97 | 4 | ND | 0.2 | 890845 |
| p+m-Xylene | ug/L | 350 | 8 | 0.6 | 0.4 | 890845 |
| Total Xylenes | ug/L | 450 | 8 | 0.6 | 0.4 | 890845 |
| F1 (C6-C10) | ug/L | 5000 | 2000 | ND | 100 | 890845 |
| F1 (C6-C10) - BTEX | ug/L | ND | 2000 | ND | 100 | 890845 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | 190 | 100 | ND | 100 | 891133 |
| F3 (C16-C34 Hydrocarbons) | ug/L | ND | 100 | ND | 100 | 891133 |
| F4 (C34-C50 Hydrocarbons) | ug/L | ND | 100 | ND | 100 | 891133 |
| Reached Baseline at C50 | ug/L | YES | | YES | | 891133 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 104 | | 100 | | 890845 |
| 4-Bromofluorobenzene | % | 101 | | 101 | | 890845 |
| D10-Ethylbenzene | % | 102 | | 99 | | 890845 |
| D4-1,2-Dichloroethane | % | 92 | | 93 | | 890845 |
| o-Terphenyl | % | 98 | | 100 | | 891133 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## OREG 153 PETROLEUM HYDROCARBONS (WATER)

| Maxxam ID | | J99713 | | J99714 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 11:20 | | 2005/12/13 11:45 | | |
| COC Number | | 004133 | | 004133 | | |
| | Units | MW05-30-051213 | RDL | MW05-7-051213 | RDL | QC Batch |
| **F1 PHC and BTEX** | | | | | | |
| Benzene | ug/L | 1100 | 2 | ND | 0.2 | 890845 |
| Toluene | ug/L | 9 | 2 | ND | 0.2 | 890845 |
| Ethylbenzene | ug/L | 110 | 2 | ND | 0.2 | 890845 |
| o-Xylene | ug/L | 8 | 2 | ND | 0.2 | 890845 |
| p+m-Xylene | ug/L | 500 | 4 | ND | 0.4 | 890845 |
| Total Xylenes | ug/L | 510 | 4 | ND | 0.4 | 890845 |
| F1 (C6-C10) | ug/L | 2200 | 1000 | ND | 100 | 890845 |
| F1 (C6-C10) - BTEX | ug/L | ND | 1000 | ND | 100 | 890845 |
| **F2-F4 PHC** | | | | | | |
| F2 (C10-C16 Hydrocarbons) | ug/L | 760 | 100 | ND | 100 | 891133 |
| F3 (C16-C34 Hydrocarbons) | ug/L | 140 | 100 | ND | 100 | 891133 |
| F4 (C34-C50 Hydrocarbons) | ug/L | ND | 100 | ND | 100 | 891133 |
| Reached Baseline at C50 | ug/L | YES | | YES | | 891133 |
| **Surrogate Recovery (%)** | | | | | | |
| 1,4-Difluorobenzene | % | 93 | | 100 | | 890845 |
| 4-Bromofluorobenzene | % | 106 | | 103 | | 890845 |
| D10-Ethylbenzene | % | 80 | | 97 | | 890845 |
| D4-1,2-Dichloroethane | % | 99 | | 95 | | 890845 |
| o-Terphenyl | % | 99 | | 100 | | 891133 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## RESULTS OF ANALYSES OF WATER

| Maxxam ID | | J99712 | | |
|---|---|---|---|---|
| Sampling Date | | 2005/12/13 10:15 | | |
| COC Number | | 004133 | | |
| | Units | MW05-31-051213 | RDL | QC Batch |
| **INORGANICS** | | | | |
| Conductivity | umho/cm | 916 | 2 | 890930 |
| pH | pH | 7.8 | 0.01 | 890933 |
| Nitrite (N) | mg/L | ND | 0.01 | 891168 |
| Nitrate (N) | mg/L | 0.2 | 0.1 | 891168 |
| Nitrate + Nitrite | mg/L | 0.2 | 0.1 | 891168 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



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Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J99709 | J99710 | J99712 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 09:15 | 2005/12/13 10:45 | 2005/12/13 10:15 | | |
| COC Number | | 004133 | 004133 | 004133 | | |
| | Units | MW05-34-051213 | MW05-6-051213 | MW05-31-051213 | RDL | QC Batch |
| **METALS** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | ND | ND | | 5 | 891451 |
| Dissolved Antimony (Sb) | ug/L | ND | ND | | 1 | 891451 |
| Dissolved Arsenic (As) | ug/L | 22 | 5 | | 1 | 891451 |
| Dissolved Barium (Ba) | ug/L | 590 | 140 | | 5 | 891451 |
| Dissolved Beryllium (Be) | ug/L | ND | ND | | 0.5 | 891451 |
| Dissolved Bismuth (Bi) | ug/L | ND | ND | | 1 | 891451 |
| Dissolved Boron (B) | ug/L | 420 | 180 | | 10 | 891451 |
| Dissolved Cadmium (Cd) | ug/L | ND | ND | | 0.1 | 891451 |
| Dissolved Calcium (Ca) | ug/L | 180000 | 150000 | | 200 | 891451 |
| Dissolved Chromium (Cr) | ug/L | ND | ND | | 5 | 891451 |
| Dissolved Cobalt (Co) | ug/L | 5.6 | 1.0 | | 0.5 | 891451 |
| Dissolved Copper (Cu) | ug/L | 2 | 1 | | 1 | 891451 |
| Dissolved Iron (Fe) | ug/L | 6300 | ND | | 50 | 891451 |
| Dissolved Lead (Pb) | ug/L | 0.5 | ND | | 0.5 | 891451 |
| Dissolved Lithium (Li) | ug/L | 31 | 72 | | 5 | 891451 |
| Dissolved Magnesium (Mg) | ug/L | 42000 | 36000 | | 50 | 891451 |
| Dissolved Manganese (Mn) | ug/L | 2500 | 640 | | 2 | 891451 |
| Dissolved Molybdenum (Mo) | ug/L | 5 | 4 | | 1 | 891451 |
| Dissolved Nickel (Ni) | ug/L | 5 | ND | | 1 | 891451 |
| Dissolved Potassium (K) | ug/L | 2600 | 5700 | 5100 | 200 | 891451 |
| Dissolved Selenium (Se) | ug/L | ND | ND | | 2 | 891451 |
| Dissolved Silicon (Si) | ug/L | 20000 | 11000 | | 50 | 891451 |
| Dissolved Silver (Ag) | ug/L | ND | ND | | 0.5 | 891451 |
| Dissolved Sodium (Na) | ug/L | 35000 | 13000 | | 100 | 891451 |
| Dissolved Strontium (Sr) | ug/L | 450 | 530 | | 1 | 891451 |
| Dissolved Tellurium (Te) | ug/L | ND | ND | | 1 | 891451 |
| Dissolved Thallium (Tl) | ug/L | ND | ND | | 0.05 | 891451 |
| Dissolved Thorium (Th) | ug/L | ND | ND | | 1 | 891451 |
| Dissolved Tin (Sn) | ug/L | ND | ND | | 1 | 891451 |
| Dissolved Titanium (Ti) | ug/L | ND | ND | | 5 | 891451 |

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J99709 | J99710 | J99712 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 09:15 | 2005/12/13 10:45 | 2005/12/13 10:15 | | |
| COC Number | | 004133 | 004133 | 004133 | | |
| | Units | MW05-34-051213 | MW05-6-051213 | MW05-31-051213 | RDL | QC Batch |
| Dissolved Tungsten (W) | ug/L | ND | ND | | 1 | 891451 |
| Dissolved Uranium (U) | ug/L | 3.2 | 18 | | 0.1 | 891451 |
| Dissolved Vanadium (V) | ug/L | ND | ND | | 1 | 891451 |
| Dissolved Zinc (Zn) | ug/L | 12 | ND | | 5 | 891451 |
| Dissolved Zirconium (Zr) | ug/L | ND | ND | | 1 | 891451 |
| **NUTRIENTS** | | | | | | |
| Dissolved Phosphorus (P) | ug/L | ND | ND | ND | 50 | 891451 |

ND = Not detected
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Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J99713 | J99714 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 11:20 | 2005/12/13 11:45 | | |
| COC Number | | 004133 | 004133 | | |
| | Units | MW05-30-051213 | MW05-7-051213 | RDL | QC Batch |
| **METALS** | | | | | |
| Dissolved Aluminum (Al) | ug/L | ND | ND | 5 | 891451 |
| Dissolved Antimony (Sb) | ug/L | ND | ND | 1 | 891451 |
| Dissolved Arsenic (As) | ug/L | 9 | 2 | 1 | 891451 |
| Dissolved Barium (Ba) | ug/L | 400 | 68 | 5 | 891451 |
| Dissolved Beryllium (Be) | ug/L | ND | ND | 0.5 | 891451 |
| Dissolved Bismuth (Bi) | ug/L | ND | ND | 1 | 891451 |
| Dissolved Boron (B) | ug/L | 240 | 220 | 10 | 891451 |
| Dissolved Cadmium (Cd) | ug/L | ND | 0.1 | 0.1 | 891451 |
| Dissolved Calcium (Ca) | ug/L | 120000 | 240000 | 200 | 891451 |
| Dissolved Chromium (Cr) | ug/L | ND | ND | 5 | 891451 |
| Dissolved Cobalt (Co) | ug/L | 5.3 | 1.0 | 0.5 | 891451 |
| Dissolved Copper (Cu) | ug/L | 2 | 2 | 1 | 891451 |
| Dissolved Iron (Fe) | ug/L | 1100 | ND | 50 | 891451 |
| Dissolved Lead (Pb) | ug/L | ND | ND | 0.5 | 891451 |
| Dissolved Lithium (Li) | ug/L | 17 | 100 | 5 | 891451 |
| Dissolved Magnesium (Mg) | ug/L | 26000 | 68000 | 50 | 891451 |
| Dissolved Manganese (Mn) | ug/L | 710 | 560 | 2 | 891451 |
| Dissolved Molybdenum (Mo) | ug/L | 5 | 6 | 1 | 891451 |
| Dissolved Nickel (Ni) | ug/L | 5 | 4 | 1 | 891451 |
| Dissolved Potassium (K) | ug/L | 3900 | 7200 | 200 | 891451 |
| Dissolved Selenium (Se) | ug/L | ND | ND | 2 | 891451 |
| Dissolved Silicon (Si) | ug/L | 12000 | 12000 | 50 | 891451 |
| Dissolved Silver (Ag) | ug/L | ND | ND | 0.5 | 891451 |
| Dissolved Sodium (Na) | ug/L | 14000 | 46000 | 100 | 891451 |
| Dissolved Strontium (Sr) | ug/L | 320 | 570 | 1 | 891451 |
| Dissolved Tellurium (Te) | ug/L | ND | ND | 1 | 891451 |
| Dissolved Thallium (Tl) | ug/L | ND | ND | 0.05 | 891451 |
| Dissolved Thorium (Th) | ug/L | ND | ND | 1 | 891451 |
| Dissolved Tin (Sn) | ug/L | ND | 1 | 1 | 891451 |
| Dissolved Titanium (Ti) | ug/L | ND | ND | 5 | 891451 |

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Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Maxxam ID | | J99713 | J99714 | | |
|---|---|---|---|---|---|
| Sampling Date | | 2005/12/13 11:20 | 2005/12/13 11:45 | | |
| COC Number | | 004133 | 004133 | | |
| | Units | MW05-30-051213 | MW05-7-051213 | RDL | QC Batch |
| Dissolved Tungsten (W) | ug/L | ND | ND | 1 | 891451 |
| Dissolved Uranium (U) | ug/L | 2.8 | 31 | 0.1 | 891451 |
| Dissolved Vanadium (V) | ug/L | ND | 1 | 1 | 891451 |
| Dissolved Zinc (Zn) | ug/L | 12 | ND | 5 | 891451 |
| Dissolved Zirconium (Zr) | ug/L | ND | ND | 1 | 891451 |
| *NUTRIENTS* | | | | | |
| Dissolved Phosphorus (P) | ug/L | ND | 740 | 50 | 891451 |

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Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

## SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

| Maxxam ID | | J99714 | | |
|---|---|---|---|---|
| Sampling Date | | 2005/12/13 11:45 | | |
| COC Number | | 004133 | | |
| | Units | MW05-7-051213 | RDL | QC Batch |
| PAHs | | | | |
| Acenaphthene | ug/L | ND | 0.05 | 891362 |
| Acenaphthylene | ug/L | ND | 0.05 | 891362 |
| Anthracene | ug/L | ND | 0.05 | 891362 |
| Benzo(a)anthracene | ug/L | ND | 0.05 | 891362 |
| Benzo(a)pyrene | ug/L | ND | 0.01 | 891362 |
| Benzo(b/j)fluoranthene | ug/L | ND | 0.05 | 891362 |
| Benzo(g,h,i)perylene | ug/L | ND | 0.1 | 891362 |
| Benzo(k)fluoranthene | ug/L | ND | 0.05 | 891362 |
| Chrysene | ug/L | ND | 0.05 | 891362 |
| Dibenzo(a,h)anthracene | ug/L | ND | 0.1 | 891362 |
| Fluoranthene | ug/L | ND | 0.05 | 891362 |
| Fluorene | ug/L | ND | 0.05 | 891362 |
| Indeno(1,2,3-cd)pyrene | ug/L | ND | 0.1 | 891362 |
| 1-Methylnaphthalene | ug/L | ND | 0.05 | 891362 |
| 2-Methylnaphthalene | ug/L | ND | 0.05 | 891362 |
| Naphthalene | ug/L | ND | 0.05 | 891362 |
| Phenanthrene | ug/L | ND | 0.05 | 891362 |
| Pyrene | ug/L | ND | 0.05 | 891362 |
| Surrogate Recovery (%) | | | | |
| D10-Anthracene | % | 88 | | 891362 |
| D14-Terphenyl (FS) | % | 93 | | 891362 |
| D7-Quinoline | % | 88 | | 891362 |
| D8-Acenaphthylene | % | 85 | | 891362 |

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Maxxam Job #: A5C8950
Report Date: 2005/12/29

Morrow Environmental
Client Project #: W053011A CP SOURIS YARD
Project name: SOURIS, MB
Your P.O. #: EA780
Sampler Initials:

**GENERAL COMMENTS**

Sample J99709-01: F1BTEXHS-W analysis:
The sample was diluted due to high concentrations of target compounds. The DL's were adjusted accordingly.

Sample J99711-01: F1BTEXHS-W analysis:
The sample was diluted due to high concentrations of target compounds. The DL's were adjusted accordingly.

Sample J99713-01: F1BTEXHS-W analysis:
The sample was diluted due to high concentrations of target compounds. The DL's were adjusted accordingly.

**Results relate only to the items tested.**



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report

Maxxam Job Number: MA5C8950

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 890845 NBA | MATRIX SPIKE | 1,4-Difluorobenzene | 2005/12/21 | | 102 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/21 | | 101 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/21 | | 101 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/21 | | 93 | % | 70 - 130 |
| | | Benzene | 2005/12/21 | | 93 | % | 70 - 130 |
| | | Toluene | 2005/12/21 | | 94 | % | 70 - 130 |
| | | Ethylbenzene | 2005/12/21 | | 81 | % | 70 - 130 |
| | | o-Xylene | 2005/12/21 | | 96 | % | 70 - 130 |
| | | p+m-Xylene | 2005/12/21 | | 89 | % | 70 - 130 |
| | | F1 (C6-C10) | 2005/12/21 | | 90 | % | 70 - 130 |
| | Spiked Blank | 1,4-Difluorobenzene | 2005/12/21 | | 104 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/21 | | 101 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/21 | | 105 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/21 | | 94 | % | 70 - 130 |
| | | Benzene | 2005/12/21 | | 104 | % | 70 - 130 |
| | | Toluene | 2005/12/21 | | 107 | % | 70 - 130 |
| | | Ethylbenzene | 2005/12/21 | | 93 | % | 70 - 130 |
| | | o-Xylene | 2005/12/21 | | 109 | % | 70 - 130 |
| | | p+m-Xylene | 2005/12/21 | | 100 | % | 70 - 130 |
| | | F1 (C6-C10) | 2005/12/21 | | 92 | % | 70 - 130 |
| | Method Blank | 1,4-Difluorobenzene | 2005/12/21 | | 102 | % | 70 - 130 |
| | | 4-Bromofluorobenzene | 2005/12/21 | | 102 | % | 70 - 130 |
| | | D10-Ethylbenzene | 2005/12/21 | | 103 | % | 70 - 130 |
| | | D4-1,2-Dichloroethane | 2005/12/21 | | 94 | % | 70 - 130 |
| | | Benzene | 2005/12/21 | ND, DL=0.2 | | ug/L | |
| | | Toluene | 2005/12/21 | ND, DL=0.2 | | ug/L | |
| | | Ethylbenzene | 2005/12/21 | ND, DL=0.2 | | ug/L | |
| | | o-Xylene | 2005/12/21 | ND, DL=0.2 | | ug/L | |
| | | p+m-Xylene | 2005/12/21 | ND, DL=0.4 | | ug/L | |
| | | Total Xylenes | 2005/12/21 | ND, DL=0.4 | | ug/L | |
| | | F1 (C6-C10) | 2005/12/21 | ND, DL=100 | | ug/L | |
| | | F1 (C6-C10) - BTEX | 2005/12/21 | ND, DL=100 | | ug/L | |
| | RPD | Benzene | 2005/12/21 | NC | | % | 40 |
| | | Toluene | 2005/12/21 | NC | | % | 40 |
| | | Ethylbenzene | 2005/12/21 | NC | | % | 40 |
| | | o-Xylene | 2005/12/21 | NC | | % | 40 |
| | | p+m-Xylene | 2005/12/21 | NC | | % | 40 |
| | | Total Xylenes | 2005/12/21 | NC | | % | 40 |
| | | F1 (C6-C10) | 2005/12/21 | NC | | % | 40 |
| | | F1 (C6-C10) - BTEX | 2005/12/21 | NC | | % | 40 |
| 890930 KR | QC STANDARD | Conductivity | 2005/12/21 | | 97 | % | 85 - 115 |
| | Method Blank | Conductivity | 2005/12/21 | ND, DL=2 | | umho/cm | |
| | RPD | Conductivity | 2005/12/21 | 1.5 | | % | 25 |
| 891133 JJE | MATRIX SPIKE [J99709-01] | o-Terphenyl | 2005/12/21 | | 109 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/21 | | 71 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/21 | | 71 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/21 | | 71 | % | 60 - 130 |
| | Spiked Blank | o-Terphenyl | 2005/12/21 | | 83 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/21 | | 86 | % | 60 - 130 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/21 | | 86 | % | 60 - 130 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/21 | | 86 | % | 60 - 130 |
| | Method Blank | o-Terphenyl | 2005/12/21 | | 100 | % | 30 - 130 |
| | | F2 (C10-C16 Hydrocarbons) | 2005/12/21 | ND, DL=100 | | ug/L | |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/21 | ND, DL=100 | | ug/L | |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/21 | ND, DL=100 | | ug/L | |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8950

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 891133 JJE | RPD [J99710-01] | F2 (C10-C16 Hydrocarbons) | 2005/12/21 | NC | | % | 50 |
| | | F3 (C16-C34 Hydrocarbons) | 2005/12/21 | NC | | % | 50 |
| | | F4 (C34-C50 Hydrocarbons) | 2005/12/21 | NC | | % | 50 |
| 891168 CCI | MATRIX SPIKE | Nitrite (N) | 2005/12/22 | | 102 | % | 75 - 125 |
| | | Nitrate (N) | 2005/12/22 | | 88 | % | 75 - 125 |
| | Spiked Blank | Nitrite (N) | 2005/12/22 | | 102 | % | 85 - 115 |
| | | Nitrate (N) | 2005/12/22 | | 90 | % | 85 - 117 |
| | Method Blank | Nitrite (N) | 2005/12/22 | ND, DL=0.01 | | mg/L | |
| | | Nitrate (N) | 2005/12/22 | ND, DL=0.1 | | mg/L | |
| | | Nitrate + Nitrite | 2005/12/22 | ND, DL=0.1 | | mg/L | |
| | RPD | Nitrite (N) | 2005/12/22 | NC | | % | 25 |
| | | Nitrate (N) | 2005/12/22 | NC | | % | 25 |
| | | Nitrate + Nitrite | 2005/12/22 | NC | | % | 25 |
| 891362 MWG | Spiked Blank | D10-Anthracene | 2005/12/23 | | 91 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/12/23 | | 91 | % | 30 - 130 |
| | | D7-Quinoline | 2005/12/23 | | 94 | % | 30 - 130 |
| | | D8-Acenaphthylene | 2005/12/23 | | 101 | % | 30 - 130 |
| | | Acenaphthene | 2005/12/23 | | 84 | % | 30 - 130 |
| | RPD | Acenaphthene | 2005/12/23 | 1.2 | | % | 40 |
| | Spiked Blank | Acenaphthylene | 2005/12/23 | | 100 | % | 30 - 130 |
| | RPD | Acenaphthylene | 2005/12/23 | 4.6 | | % | 40 |
| | Spiked Blank | Anthracene | 2005/12/23 | | 98 | % | 30 - 130 |
| | RPD | Anthracene | 2005/12/23 | 3.0 | | % | 40 |
| | Spiked Blank | Benzo(a)anthracene | 2005/12/23 | | 92 | % | 30 - 130 |
| | RPD | Benzo(a)anthracene | 2005/12/23 | 3.6 | | % | 40 |
| | Spiked Blank | Benzo(a)pyrene | 2005/12/23 | | 100 | % | 30 - 130 |
| | RPD | Benzo(a)pyrene | 2005/12/23 | 4.3 | | % | 40 |
| | Spiked Blank | Benzo(b/j)fluoranthene | 2005/12/23 | | 99 | % | 30 - 130 |
| | RPD | Benzo(b/j)fluoranthene | 2005/12/23 | 0.3 | | % | 40 |
| | Spiked Blank | Benzo(g,h,i)perylene | 2005/12/23 | | 80 | % | 30 - 130 |
| | RPD | Benzo(g,h,i)perylene | 2005/12/23 | 4.4 | | % | 40 |
| | Spiked Blank | Benzo(k)fluoranthene | 2005/12/23 | | 98 | % | 30 - 130 |
| | RPD | Benzo(k)fluoranthene | 2005/12/23 | 12.2 | | % | 40 |
| | Spiked Blank | Chrysene | 2005/12/23 | | 95 | % | 30 - 130 |
| | RPD | Chrysene | 2005/12/23 | 1.9 | | % | 40 |
| | Spiked Blank | Dibenzo(a,h)anthracene | 2005/12/23 | | 98 | % | 30 - 130 |
| | RPD | Dibenzo(a,h)anthracene | 2005/12/23 | 4.3 | | % | 40 |
| | Spiked Blank | Fluoranthene | 2005/12/23 | | 93 | % | 30 - 130 |
| | RPD | Fluoranthene | 2005/12/23 | 0.6 | | % | 40 |
| | | Fluorene | 2005/12/23 | 5.3 | | % | 40 |
| | Spiked Blank | Fluorene | 2005/12/23 | | 105 | % | 30 - 130 |
| | | Indeno(1,2,3-cd)pyrene | 2005/12/23 | | 92 | % | 30 - 130 |
| | RPD | Indeno(1,2,3-cd)pyrene | 2005/12/23 | 2.9 | | % | 40 |
| | Spiked Blank | 1-Methylnaphthalene | 2005/12/23 | | 85 | % | 30 - 130 |
| | RPD | 1-Methylnaphthalene | 2005/12/23 | 1.8 | | % | 40 |
| | Spiked Blank | 2-Methylnaphthalene | 2005/12/23 | | 83 | % | 30 - 130 |
| | RPD | 2-Methylnaphthalene | 2005/12/23 | 1.5 | | % | 40 |
| | Spiked Blank | Naphthalene | 2005/12/23 | | 74 | % | 30 - 130 |
| | RPD | Naphthalene | 2005/12/23 | 11.0 | | % | 40 |
| | Spiked Blank | Phenanthrene | 2005/12/23 | | 94 | % | 30 - 130 |
| | RPD | Phenanthrene | 2005/12/23 | 1.8 | | % | 40 |
| | Spiked Blank | Pyrene | 2005/12/23 | | 95 | % | 30 - 130 |
| | RPD | Pyrene | 2005/12/23 | 3.0 | | % | 40 |
| | Method Blank | D10-Anthracene | 2005/12/23 | | 85 | % | 30 - 130 |
| | | D14-Terphenyl (FS) | 2005/12/23 | | 89 | % | 30 - 130 |
| | | D7-Quinoline | 2005/12/23 | | 85 | % | 30 - 130 |



6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: 905-817-5700 Toll free:800-563-6266 Fax: 905-817-5777

Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8950

| QA/QC Batch Num | Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|---|
| 891362 | MWG | Method Blank | D8-Acenaphthylene | 2005/12/23 | | 84 | % | 30 - 130 |
| | | | Acenaphthene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Acenaphthylene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Anthracene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Benzo(a)anthracene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Benzo(a)pyrene | 2005/12/23 | ND, DL=0.01 | | ug/L | |
| | | | Benzo(b/j)fluoranthene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Benzo(g,h,i)perylene | 2005/12/23 | ND, DL=0.1 | | ug/L | |
| | | | Benzo(k)fluoranthene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Chrysene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Dibenzo(a,h)anthracene | 2005/12/23 | ND, DL=0.1 | | ug/L | |
| | | | Fluoranthene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Fluorene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Indeno(1,2,3-cd)pyrene | 2005/12/23 | ND, DL=0.1 | | ug/L | |
| | | | 1-Methylnaphthalene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | 2-Methylnaphthalene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Naphthalene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Phenanthrene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| | | | Pyrene | 2005/12/23 | ND, DL=0.05 | | ug/L | |
| 891451 | HRE | MATRIX SPIKE | Dissolved Aluminum (Al) | 2005/12/22 | | 107 | % | 75 - 125 |
| | | | Dissolved Antimony (Sb) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | | Dissolved Arsenic (As) | 2005/12/22 | | 102 | % | 75 - 125 |
| | | | Dissolved Barium (Ba) | 2005/12/22 | | 105 | % | 75 - 125 |
| | | | Dissolved Beryllium (Be) | 2005/12/22 | | 106 | % | 75 - 125 |
| | | | Dissolved Bismuth (Bi) | 2005/12/22 | | 100 | % | 75 - 125 |
| | | | Dissolved Boron (B) | 2005/12/22 | | 118 | % | 75 - 125 |
| | | | Dissolved Cadmium (Cd) | 2005/12/22 | | 106 | % | 75 - 125 |
| | | | Dissolved Calcium (Ca) | 2005/12/22 | | NC(1) | % | 75 - 125 |
| | | | Dissolved Chromium (Cr) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | | Dissolved Cobalt (Co) | 2005/12/22 | | 100 | % | 75 - 125 |
| | | | Dissolved Copper (Cu) | 2005/12/22 | | 104 | % | 75 - 125 |
| | | | Dissolved Iron (Fe) | 2005/12/22 | | 99 | % | 75 - 125 |
| | | | Dissolved Lead (Pb) | 2005/12/22 | | 99 | % | 75 - 125 |
| | | | Dissolved Lithium (Li) | 2005/12/22 | | 106 | % | 75 - 125 |
| | | | Dissolved Magnesium (Mg) | 2005/12/22 | | 106 | % | 75 - 125 |
| | | | Dissolved Manganese (Mn) | 2005/12/22 | | 93 | % | 75 - 125 |
| | | | Dissolved Molybdenum (Mo) | 2005/12/22 | | 105 | % | 75 - 125 |
| | | | Dissolved Nickel (Ni) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | | Dissolved Potassium (K) | 2005/12/22 | | 107 | % | 75 - 125 |
| | | | Dissolved Selenium (Se) | 2005/12/22 | | 104 | % | 75 - 125 |
| | | | Dissolved Silicon (Si) | 2005/12/22 | | 100 | % | 75 - 125 |
| | | | Dissolved Silver (Ag) | 2005/12/22 | | 92 | % | 75 - 125 |
| | | | Dissolved Sodium (Na) | 2005/12/22 | | 120 | % | 75 - 125 |
| | | | Dissolved Strontium (Sr) | 2005/12/22 | | 107 | % | 75 - 125 |
| | | | Dissolved Tellurium (Te) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | | Dissolved Thallium (Tl) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | | Dissolved Thorium (Th) | 2005/12/22 | | 95 | % | 75 - 125 |
| | | | Dissolved Tin (Sn) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | | Dissolved Titanium (Ti) | 2005/12/22 | | 98 | % | 75 - 125 |
| | | | Dissolved Tungsten (W) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | | Dissolved Uranium (U) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | | Dissolved Vanadium (V) | 2005/12/22 | | 103 | % | 75 - 125 |
| | | | Dissolved Zinc (Zn) | 2005/12/22 | | 104 | % | 75 - 125 |
| | | | Dissolved Zirconium (Zr) | 2005/12/22 | | 99 | % | 75 - 125 |
| | | | Dissolved Phosphorus (P) | 2005/12/22 | | 101 | % | 75 - 125 |
| | | Spiked Blank | Dissolved Aluminum (Al) | 2005/12/22 | | 92 | % | 85 - 115 |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8950

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 891451 HRE | Spiked Blank | Dissolved Antimony (Sb) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Arsenic (As) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Barium (Ba) | 2005/12/22 | | 91 | % | 85 - 115 |
| | | Dissolved Beryllium (Be) | 2005/12/22 | | 93 | % | 85 - 115 |
| | | Dissolved Bismuth (Bi) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Boron (B) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Cadmium (Cd) | 2005/12/22 | | 99 | % | 85 - 115 |
| | | Dissolved Calcium (Ca) | 2005/12/22 | | 102 | % | 85 - 115 |
| | | Dissolved Chromium (Cr) | 2005/12/22 | | 104 | % | 85 - 115 |
| | | Dissolved Cobalt (Co) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Copper (Cu) | 2005/12/22 | | 97 | % | 85 - 115 |
| | | Dissolved Iron (Fe) | 2005/12/22 | | 108 | % | 85 - 115 |
| | | Dissolved Lead (Pb) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Lithium (Li) | 2005/12/22 | | 94 | % | 85 - 115 |
| | | Dissolved Magnesium (Mg) | 2005/12/22 | | 104 | % | 85 - 115 |
| | | Dissolved Manganese (Mn) | 2005/12/22 | | 102 | % | 85 - 115 |
| | | Dissolved Molybdenum (Mo) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Nickel (Ni) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Potassium (K) | 2005/12/22 | | 99 | % | 85 - 115 |
| | | Dissolved Selenium (Se) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Silicon (Si) | 2005/12/22 | | 99 | % | 85 - 115 |
| | | Dissolved Silver (Ag) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Sodium (Na) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Strontium (Sr) | 2005/12/22 | | 95 | % | 85 - 115 |
| | | Dissolved Tellurium (Te) | 2005/12/22 | | 98 | % | 85 - 115 |
| | | Dissolved Thallium (Tl) | 2005/12/22 | | 100 | % | 85 - 115 |
| | | Dissolved Thorium (Th) | 2005/12/22 | | 97 | % | 85 - 115 |
| | | Dissolved Tin (Sn) | 2005/12/22 | | 99 | % | 85 - 115 |
| | | Dissolved Titanium (Ti) | 2005/12/22 | | 103 | % | 85 - 115 |
| | | Dissolved Tungsten (W) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Uranium (U) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Vanadium (V) | 2005/12/22 | | 105 | % | 85 - 115 |
| | | Dissolved Zinc (Zn) | 2005/12/22 | | 97 | % | 85 - 115 |
| | | Dissolved Zirconium (Zr) | 2005/12/22 | | 101 | % | 85 - 115 |
| | | Dissolved Phosphorus (P) | 2005/12/22 | | 89 | % | 85 - 115 |
| | Method Blank | Dissolved Aluminum (Al) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Antimony (Sb) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Arsenic (As) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Barium (Ba) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Beryllium (Be) | 2005/12/22 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Bismuth (Bi) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Boron (B) | 2005/12/22 | ND, DL=10 | | ug/L | |
| | | Dissolved Cadmium (Cd) | 2005/12/22 | ND, DL=0.1 | | ug/L | |
| | | Dissolved Calcium (Ca) | 2005/12/22 | ND, DL=200 | | ug/L | |
| | | Dissolved Chromium (Cr) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Cobalt (Co) | 2005/12/22 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Copper (Cu) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Iron (Fe) | 2005/12/22 | ND, DL=50 | | ug/L | |
| | | Dissolved Lead (Pb) | 2005/12/22 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Lithium (Li) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Magnesium (Mg) | 2005/12/22 | ND, DL=50 | | ug/L | |
| | | Dissolved Manganese (Mn) | 2005/12/22 | ND, DL=2 | | ug/L | |
| | | Dissolved Molybdenum (Mo) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Nickel (Ni) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Potassium (K) | 2005/12/22 | ND, DL=200 | | ug/L | |
| | | Dissolved Selenium (Se) | 2005/12/22 | ND, DL=2 | | ug/L | |



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Morrow Environmental
Attention: Andrew Eason
Client Project #: W053011A CP SOURIS YARD
P.O. #: EA780
Project name: SOURIS, MB

## Quality Assurance Report (Continued)

Maxxam Job Number: MA5C8950

| QA/QC Batch Num Init | QC Type | Parameter | Date Analyzed yyyy/mm/dd | Value | Recovery | Units | QC Limits |
|---|---|---|---|---|---|---|---|
| 891451 HRE | Method Blank | Dissolved Silicon (Si) | 2005/12/22 | ND, DL=50 | | ug/L | |
| | | Dissolved Silver (Ag) | 2005/12/22 | ND, DL=0.5 | | ug/L | |
| | | Dissolved Sodium (Na) | 2005/12/22 | ND, DL=100 | | ug/L | |
| | | Dissolved Strontium (Sr) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Tellurium (Te) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Thallium (Tl) | 2005/12/22 | ND, DL=0.05 | | ug/L | |
| | | Dissolved Thorium (Th) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Tin (Sn) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Titanium (Ti) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Tungsten (W) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Uranium (U) | 2005/12/22 | ND, DL=0.1 | | ug/L | |
| | | Dissolved Vanadium (V) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Zinc (Zn) | 2005/12/22 | ND, DL=5 | | ug/L | |
| | | Dissolved Zirconium (Zr) | 2005/12/22 | ND, DL=1 | | ug/L | |
| | | Dissolved Phosphorus (P) | 2005/12/22 | ND, DL=50 | | ug/L | |
| | RPD | Dissolved Antimony (Sb) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Arsenic (As) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Barium (Ba) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Beryllium (Be) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Boron (B) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Cadmium (Cd) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Chromium (Cr) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Cobalt (Co) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Copper (Cu) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Lead (Pb) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Molybdenum (Mo) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Nickel (Ni) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Selenium (Se) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Silver (Ag) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Sodium (Na) | 2005/12/22 | 0.8 | | % | 25 |
| | | Dissolved Tellurium (Te) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Thallium (Tl) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Thorium (Th) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Vanadium (V) | 2005/12/22 | NC | | % | 25 |
| | | Dissolved Zinc (Zn) | 2005/12/22 | NC | | % | 25 |

ND = Not detected
NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample
( 1 ) The recovery for Ca in the matrix spiked sample was not calculated. Because of the high concentration of this compound in the parent sample, the relative difference between the spiked and un-spiked concentrations is not sufficiently significant to permit a reliable recovery calculation.



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Phone: 905-817-5700 Fax: 905-817-5777 Toll Free: (800) 563-6266

ENV-295

# CHAIN OF CUSTODY RECORD

Page ____ of ____

| INVOICE INFORMATION | REPORT INFORMATION (if differs from invoice) | PROJECT INFORMATION | MAXXAM JOB NUMBER |
|---|---|---|---|
| Company Name: CP RAIL c/o MOTCO | Company Name: same | Quotation #: CP RAIL EA780 | A568950 |
| Contact Name: Andrew Cowan | Contact Name: | P.O. #: | CHAIN OF CUSTODY # |
| Address: E. McCreary Ave. Winnipeg, MB | Address: | Project #: WO5 301/A | 00413385 |
| Phone: Fax: 949 | Phone: Fax: | Project Name: CP SOURIS YARD | |
| Email: Andrew_Cowan@cpr.ca | Email: Cynthia_Cuddy@snclavalin.com | Location: SOURIS, MB | |
| | | Sampled By: JDT | |

## REGULATORY CRITERIA

*Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form.*

- [ ] MISA — [ ] Reg. 153 — Sewer Use: [ ] Municipality
- [ ] PWQO — [ ] Table 1 — [ ] Sanitary
- [ ] Reg. 558 — [ ] Table 2 — [ ] Storm
- [ ] Table 3 — Region:
- [X] Other: CCME (low level)
- specify
- Report Criteria on C of A? [ ]

**SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM.**

## ANALYSIS REQUESTED (Please be specific)

## TURNAROUND TIME (TAT) REQUIRED

**PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS.**

Regular (Standard) TAT:
[X] 5 to 7 Working Days

Rush TAT: Rush Confirmation #: (call Lab for #)
[ ] 1 day [ ] 2 days [ ] 3 days

DATE Required:
TIME Required:

Please note that TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

| | Sample (Identification) | Date Sampled | Time Sampled | Matrix (GW, SW, Soil, etc.) | Regulated Drinking Water? (Y/N) | Metals Field Filtered? (Y/N) | BTEX/F1 | F2-F4 | ICP-MS METALS (DISSOLVED) (Low Level) | PAHs | NORM NITRATE (NITRITE) | PH | Elec. Conductivity | POTASSIUM | PHOSPHORUS | # of Cont. | COMMENTS / TAT COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | MW05-34-051213 | 051213 | 0945 | GW | N | Y | X | X | X | | | | | | | 6 | |
| 2 | MW05-6-051213 | 051213 | 1045 | GW | N | Y | X | X | X | X | | | | | | 6 | |
| 3 | MW05-35-051213 | 051213 | 1005 | GW | N | Y | X | X | X | | | | | | | 5 | |
| 4 | MW05-31-051213 | 051213 | 1015 | GW | N | Y | X | X | | | X | X | X | X | X | 5 | |
| 5 | MW05-30-051213 | 051213 | 1170 | GW | N | Y | X | X | X | | | | | | | 6 | |
| 6 | MW05-7-051213 | 051213 | 1145 | GW | N | Y | X | X | X | X | | | | | | 7 | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | |

DEC 15 05 AM 11:27

| RELINQUISHED BY (Signature/Print) | RECEIVED BY (Signature/Print) | Date | Time |
|---|---|---|---|
| JDT | | | |

Laboratory Use Only

Temperature (°C) on Receipt: 6/11.2°C

Condition of Sample on Receipt: [ ] OK [ ] SIF

*MANDATORY SECTIONS IN GREY MUST BE FILLED OUT. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

ENVCOC-ONT-09/05

White: Maxxam Yellow: Client

# APPENDIX IV

## Monitoring Results

SNC·LAVALIN
Morrow Environmental

## MONITORING REPORT

Project No.: W053011A

Canadian Pacific Railway
Souris Yard
Souris, MB

Date: Dec. 12, 2005
Observer: JDT
Weather: -2°C Cloudy
Time: 09:40

Approved by:

| Monitoring Well No. | Reference Elevation[1] (m) | Depth to NAPL[2] (m) | Apparent NAPL[2] Thickness (mm) | Depth to Water (m) | Potentio-Metric Elevation[3] (m) | Vapour Conc. (ppm) | Comments |
|---|---|---|---|---|---|---|---|
| 05-6 | 100.150 | - | 0 | 2.360 | 97.790 | 10 | |
| 05-7 | 100.040 | - | 0 | 2.783 | 97.257 | 25 | |
| 05-8 | 100.420 | - | 0 | 2.862 | 97.558 | 5 | |
| 05-9 | 100.798 | - | 0 | 2.932 | 97.866 | 10 | |
| 05-20 | 98.539 | - | 0 | 1.752 | 96.787 | 105 | |
| 05-24 | 99.473 | - | 0 | 2.640 | 96.833 | 25 | |
| 05-25 | 99.100 | - | 0 | 2.259 | 96.841 | 40 | |
| 05-27 | 98.960 | - | 0 | 2.262 | 96.698 | 75 | |
| 05-29 | 99.517 | - | 0 | 1.747 | 97.770 | 225 | |
| 05-30 | 100.389 | - | 0 | 2.505 | 97.884 | 60 | |
| 05-31 | 100.334 | - | 0 | 3.101 | 97.233 | 25 | |
| 05-32 | 100.234 | - | 0 | 2.504 | 97.730 | 770 | |
| 05-33 | 100.326 | - | 0 | 2.555 | 97.771 | 55 | |
| 05-34 | 100.456 | - | 0 | 2.577 | 97.879 | 70 | |

NOTES:

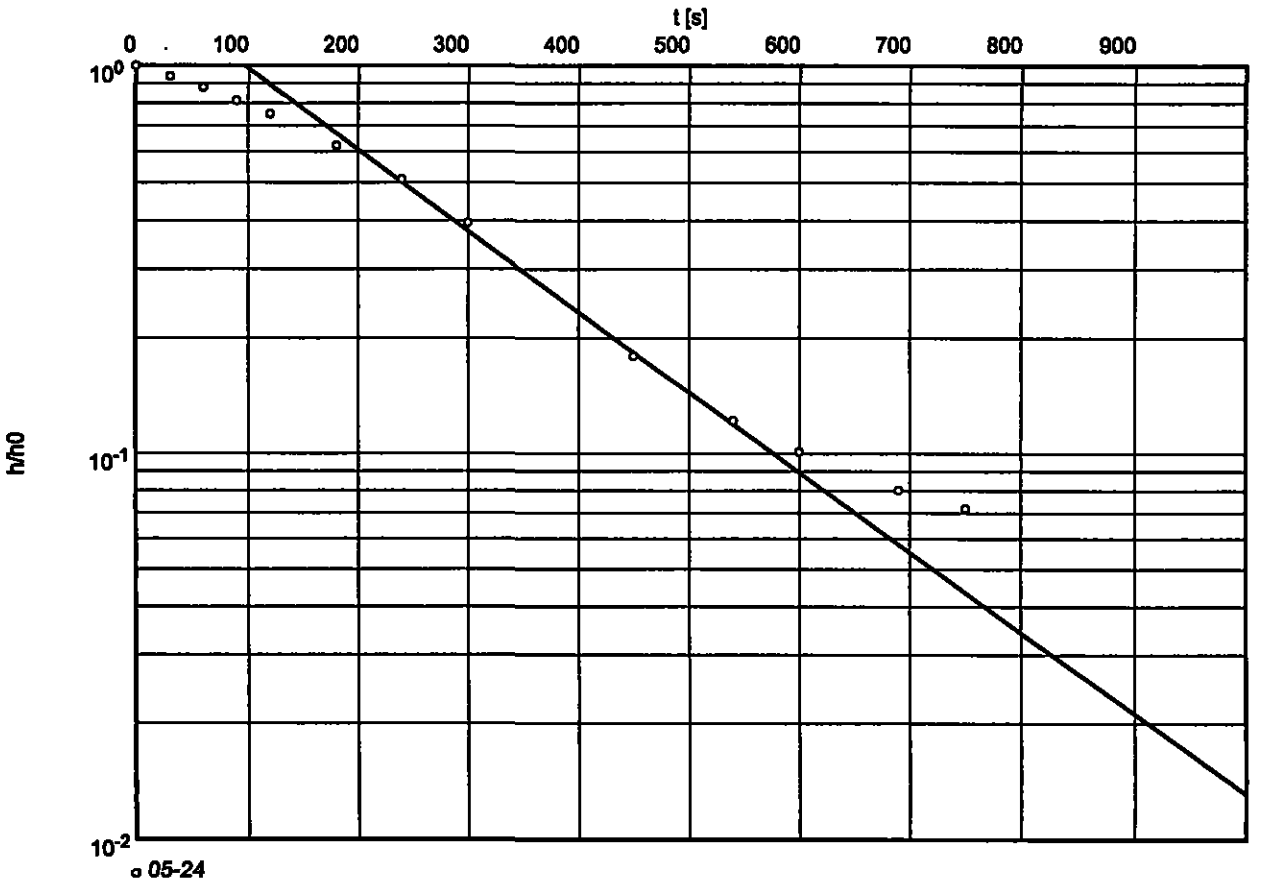
[1] Reference Elevation is a mark on the rim of the monitoring well standpipe surveyed with respect to local datum.
[2] Non-Aqueous Phase Liquid.
[3] NAPL specific gravity assumed to be 0.75.

# APPENDIX V

## Hydraulic Conductivity Testing

| | | | |
|---|---|---|---|
| **Morrow Environmental** Consultants Inc.<br>Unit E - 1420 Clarence Avenue<br>Winnipeg, Manitoba | slug/bail test analysis<br>BOUWER-RICE's method | Date: 15.02.2006 | Page 1 |
| | | Project: CP Rail Souris Yard | |
| | | Evaluated by: RGG | |

| | |
|---|---|
| Slug Test No. Slug Test No. 1 | Test conducted on: 13.12.2005 |
| 05-24 | |
| | |




Hydraulic conductivity [m/s]: $1.33 \times 10^{-6}$

| Morrow Environmental Consultants Inc.<br>Unit E - 1420 Clarence Avenue<br>Winnipeg, Manitoba | slug/bail test analysis<br>BOUWER-RICE's method | Date: 15.02.2006 | Page 2 |
|---|---|---|---|
| | | Project: CP Rail Souris Yard | |
| | | Evaluated by: RGG | |

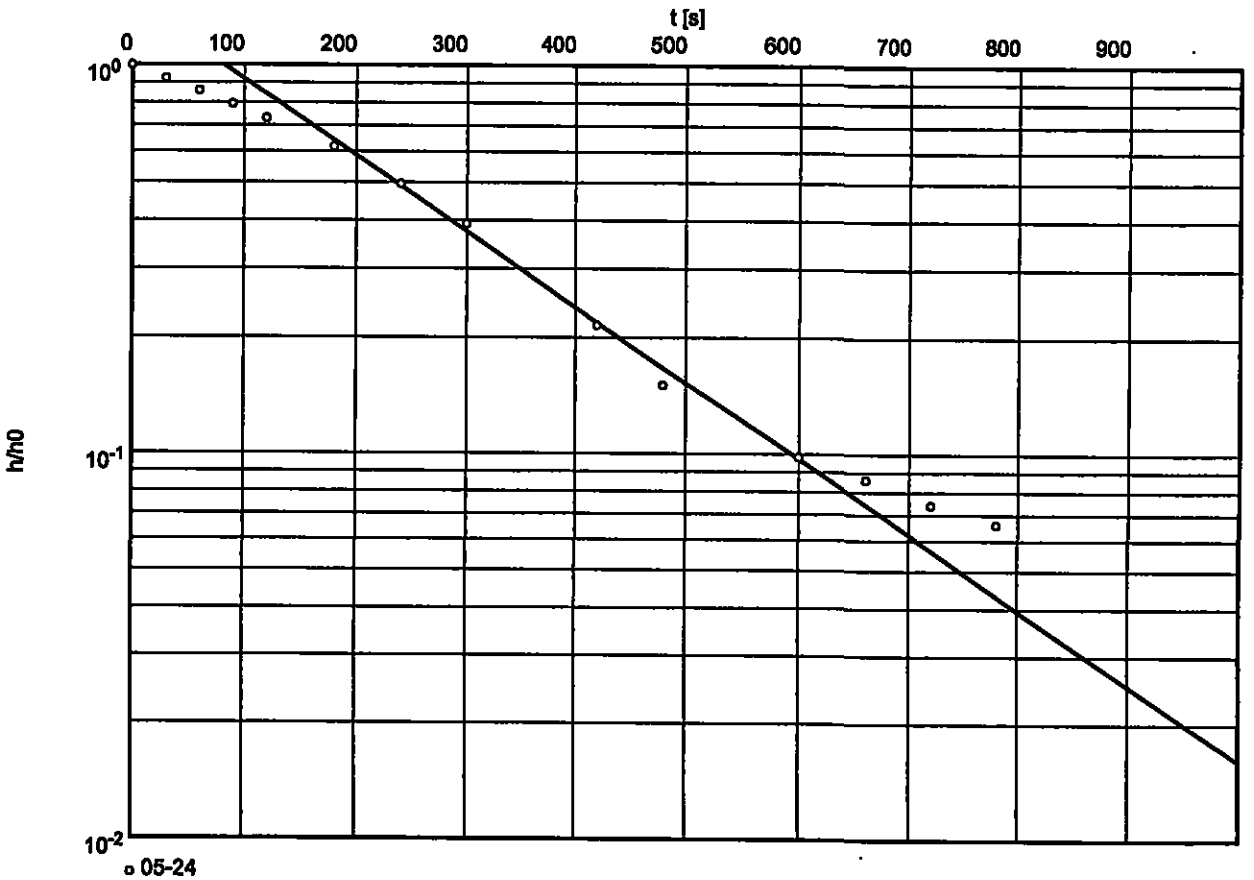
| Slug Test No. Slug Test No. 1 | Test conducted on: 13.12.2005 |
|---|---|
| 05-24 | 05-24 |
| | |

Static water level: 2.636 m below datum

| | Pumping test duration [s] | Water level [m] | Drawdown [m] | |
|---|---|---|---|---|
| 1 | 0 | 5.050 | 2.414 | |
| 2 | 30 | 4.900 | 2.264 | |
| 3 | 60 | 4.760 | 2.124 | |
| 4 | 90 | 4.600 | 1.964 | |
| 5 | 120 | 4.450 | 1.814 | |
| 6 | 180 | 4.140 | 1.504 | |
| 7 | 240 | 3.870 | 1.234 | |
| 8 | 300 | 3.590 | 0.954 | |
| 9 | 450 | 3.070 | 0.434 | |
| 10 | 540 | 2.930 | 0.294 | |
| 11 | 600 | 2.880 | 0.244 | |
| 12 | 690 | 2.830 | 0.194 | |
| 13 | 750 | 2.810 | 0.174 | |

| | | | |
|---|---|---|---|
| **Morrow Environmental** Consultants Inc.<br>Unit E - 1420 Clarence Avenue<br>Winnipeg, Manitoba | slug/bail test analysis<br>BOUWER-RICE's method | Date: 15.02.2006 | Page 1 |
| | | Project: CP Rail Souris Yard | |
| | | Evaluated by: RGG | |

| | |
|---|---|
| Slug Test No. Slug Test No: 2 | Test conducted on: 13.12.2005 |
| 05-24 | |
| | |




Hydraulic conductivity [m/s]: $1.18 \times 10^{-6}$

| Morrow Environmental Consultants Inc.<br>Unit E - 1420 Clarence Avenue<br>Winnipeg, Manitoba | slug/ball test analysis<br>BOUWER-RICE's method | Date: 15.02.2006 | Page 2 |
|---|---|---|---|
| | | Project: CP Rail Souris Yard | |
| | | Evaluated by: RGG | |

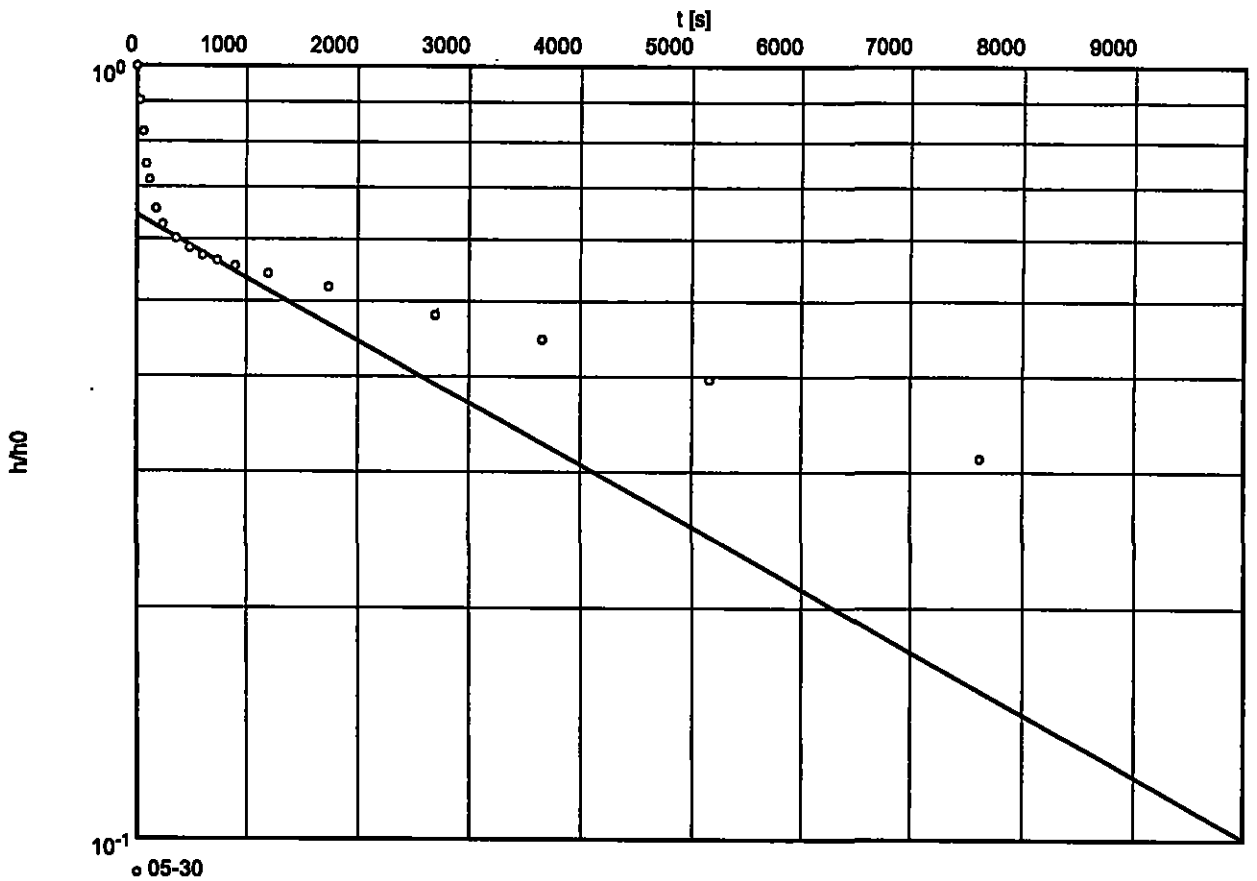
| Slug Test No. Slug Test No. 2 | Test conducted on: 13.12.2005 |
|---|---|
| 05-24 | 05-24 |
| | |

Static water level: 2.636 m below datum

| | Pumping test duration [s] | Water level [m] | Drawdown [m] | |
|---|---|---|---|---|
| 1 | 0 | 5.120 | 2.484 | |
| 2 | 30 | 4.930 | 2.294 | |
| 3 | 60 | 4.770 | 2.134 | |
| 4 | 90 | 4.610 | 1.974 | |
| 5 | 120 | 4.450 | 1.814 | |
| 6 | 180 | 4.170 | 1.534 | |
| 7 | 240 | 3.870 | 1.234 | |
| 8 | 300 | 3.610 | 0.974 | |
| 9 | 420 | 3.170 | 0.534 | |
| 10 | 480 | 3.010 | 0.374 | |
| 11 | 600 | 2.880 | 0.244 | |
| 12 | 660 | 2.850 | 0.214 | |
| 13 | 720 | 2.820 | 0.184 | |
| 14 | 780 | 2.800 | 0.164 | |

| | | | |
|---|---|---|---|
| **Morrow Environmental** Consultants Inc.<br>Unit E - 1420 Clarence Avenue<br>Winnipeg, Manitoba | slug/bail test analysis<br>BOUWER-RICE's method | Date: 15.02.2006 | Page 1 |
| | | Project: CP Rail Souris Yard | |
| | | Evaluated by: RGG | |

| | |
|---|---|
| Slug Test No. Slug Test No. 3 | Test conducted on: 13.12.2005 |
| 05-30 | |
| | |




Hydraulic conductivity [m/s]: $1.29 \times 10^{-7}$

| Morrow Environmental Consultants Inc.<br>Unit E - 1420 Clarence Avenue<br>Winnipeg, Manitoba | slug/bail test analysis<br>BOUWER-RICE's method | Date: 15.02.2006 | Page 2 |
|---|---|---|---|
| | | Project: CP Rail Souris Yard | |
| | | Evaluated by: RGG | |

| Slug Test No. Slug Test No. 3 | Test conducted on: 13.12.2005 |
|---|---|
| 05-30 | 05-30 |
| | |

Static water level: 2.505 m below datum

| | Pumping test duration [s] | Water level [m] | Drawdown [m] | |
|---|---|---|---|---|
| 1 | 0 | 4.890 | 2.385 | |
| 2 | 30 | 4.660 | 2.155 | |
| 3 | 60 | 4.470 | 1.965 | |
| 4 | 90 | 4.290 | 1.785 | |
| 5 | 120 | 4.210 | 1.705 | |
| 6 | 180 | 4.070 | 1.565 | |
| 7 | 240 | 4.000 | 1.495 | |
| 8 | 360 | 3.940 | 1.435 | |
| 9 | 480 | 3.900 | 1.395 | |
| 10 | 600 | 3.870 | 1.365 | |
| 11 | 735 | 3.850 | 1.345 | |
| 12 | 900 | 3.830 | 1.325 | |
| 13 | 1200 | 3.800 | 1.295 | |
| 14 | 1740 | 3.750 | 1.245 | |
| 15 | 2700 | 3.650 | 1.145 | |
| 16 | 3660 | 3.570 | 1.065 | |
| 17 | 5160 | 3.450 | 0.945 | |
| 18 | 7620 | 3.250 | 0.745 | |

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